PROPOSAL FOR A PROFIT BASED PRODUCTION TAX FOR ALASKA

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EXECUTIVE SUMMARY

The severance tax (production tax) of the State of Alaska has essentially remained unchanged since 1989. The current tax is based on a percentage of the gross revenues less the royalty. The percentage is adjusted with a formula (Economic Limit Factor or ELF), which for oil is based on field size and well productivity. This formula has served Alaska well for more than a decade. However, the economic framework on which the ELF formula was based is no longer realistic for North Slope conditions. As a result, based on the formula, the amount of tax will significantly decrease over the coming decade to a point were less than 20% of the oil is actually taxed. This is not in the interest of Alaska. Furthermore, the current ELF formula is not sensitive to variations in oil price creating significant losses for Alaska under current conditions. Also the production tax does not provide incentives to re-invest in Alaska.

It is suggested to repeal sections of the current act dealing with production tax (AS 43.55) and replace them with a profit based tax, the Profit based Production Tax ("PPT").

The profit based approach is a widely accepted international practice, including for instance Norway, the UK, Nigeria and Angola adopted this approach for the offshore. Alberta is using this approach to develop the oil sands.

The international competitive situation with respect to oil has changed drastically over the last two years. It is now apparent that there is strong upward pressure on the government take for oil. This is the result of many factors. Many of the oil producing nations had adopted in the past progressive fiscal systems which adjust the government take automatically upward in case of higher prices. Therefore, in these nations the average government take is now higher compared to two years ago.

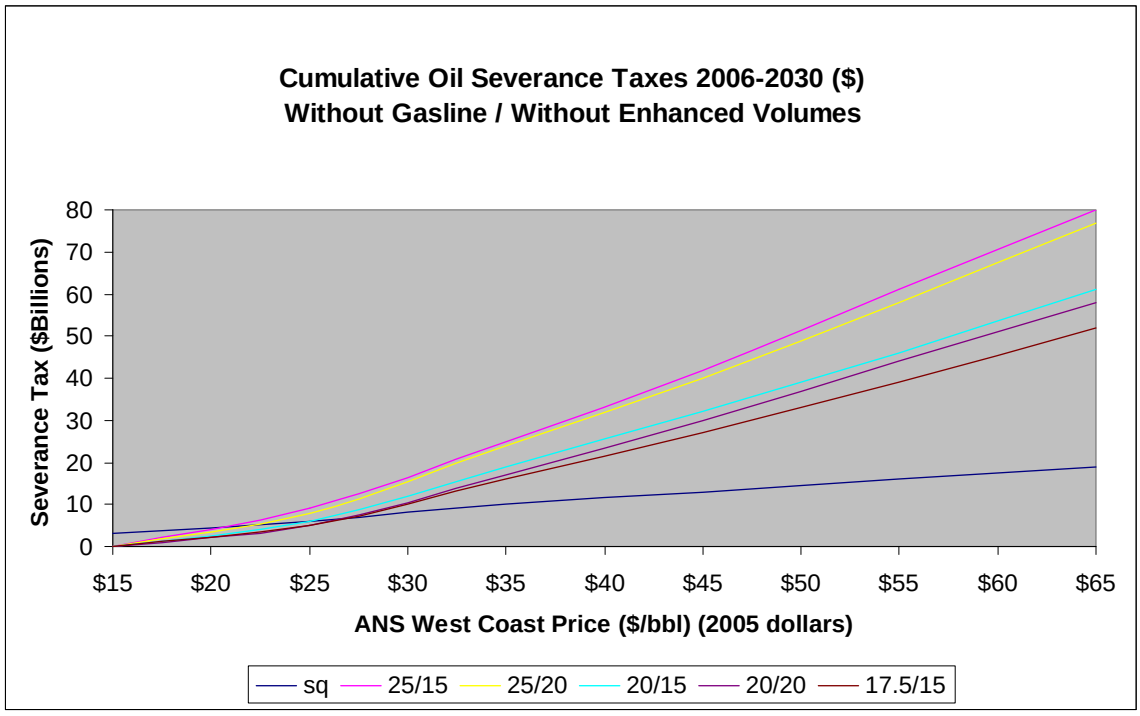
The higher oil prices are the result of difficulties in the supply of the strongly increasing world oil demand. Good exploration and development areas for oil are increasingly difficult to obtain. This puts now a premium on Alaska acreage for oil.

At the same time, new and aggressive players have entered world exploration and production. New companies from China, India, Russia, Latin America, Australia and Europe are willing to pay more for exploration and development acreage, driving up world wide government take.

All these factors make a re-evaluation of the production tax in Alaska highly desirable and appropriate at this moment. A much higher tax under average and high oil prices is justified.

Therefore, a PPT of 25% on the net revenues is proposed, with tax credits of 20% on all capital expenditures.

The Department of Revenue ("DOR") presented a number of alternative PPT's to the Alaska Legislature. The following graph from this presentation shows the cumulative revenues under various options based on existing production and modest new developments.



This graph shows how under the proposed PPT (25/20 in the graph) and at an average ANS price of $ 40 per barrel the cumulative production tax revenues over 25 years to Alaska will increase from the current estimate of $ 10 billion to about $ 30 billion. At $ 60 per barrel the cumulative revenues will increase to $ 70 billion. These revenues would be largely derived from existing production.

It is important to ensure that the new PPT encourages investment in Alaska.

On the North Slope smaller conventional oil fields and reservoirs are now the main target. Furthermore, heavy oil is an important new resource to Alaska. Improved technology may unlock billions of additional barrels of oil.

Therefore, tax credits are important to encourage such developments. A loss in any year can be converted in a tax credit by taking the 25% tax value. Therefore, in total, a credit of 45% can be obtained for new investments in Alaska.

Furthermore a tax free allowance of $ 73 million per year per company is proposed in order to ensure that small companies are not subject to tax and that new investors are provided with a strong incentive to invest in Alaska.

Under low prices and high costs the strong tax credits create a situation where there will be no PPT. Under high prices and low costs the PPT will be considerable. The PPT is therefore a progressive system.

The tax credits can be traded. Therefore investments in exploration, small and marginal fields or heavy oils will result in immediate credits even when the investor does not have prior income in Alaska. This will strongly attract new investors.

The PPT will be levied on a corporate basis. The tax credits and the profit based system ensures that when oil companies actively re-invest in Alaska the PPT payable will be less, even zero. When companies do not re-invest the PPT will be much higher.

As can be seen from the DOR graph, the PPT is primarily a tax on <u>existing production.</u> This tax is very significant under average or high prices.

However, with respect to production from <u>new investments</u>, the PPT can be negative or positive. On average, for large producers, the PPT payable will be zero on new small 50 million barrel fields on the North Slope at a WTI price of $ 30 per barrel. Under low prices and high costs, the tax credits are more than the tax that will be paid eventually and therefore the PPT will be "negative" (provided a company has PPT payable or can trade its credits). Under high prices and low costs, the tax credits will be less than the tax that will be paid eventually and therefore the PPT will be "positive".

There is, of course, a State wide "floor" of zero for the total PPT. Under low prices Alaska may not receive PPT at all. No matter how many tax credits a company has, the tax cannot be reduced below zero. Also there will be no trade in tax credits under low price conditions because all tax payers will have zero taxes.

Royalties, property taxes and state corporate income tax will not be affected by the PPT (other than that the PPT will be a deduction for federal income tax).

This report contains an in depth international comparative analysis which confirms that the proposed PPT is indeed more attractive to new investors than the current system.

A detailed rating was done to compare the attractiveness of the PPT with the current system in Alaska and eight other fiscal systems around the world: the UK, Norway, US Gulf of Mexico, Alberta oil sands, Nigeria, Russia and Azerbaijan.

The considerable increase in international competitiveness of the Alaska PPT for new investors can be studied from the following table. The best fiscal system would be rated 48 and the worst 480.

The Alaska Current system has an index of 363. The PPT would improve the index to 244.

COMPETITIVENESS INDEX

Hypothetical best	**48**	
US GOM	**54**	**#1**
UK	**139**	**#2**
Alberta-Oil Sands	**163**	**#3**
Nigeria	**179**	**#4**
Alaska PPT	**244**	**#5**
Angola	**322**	**#6**
Azerbaijan	**329**	**#7**
Alaska Current	**363**	**#8**
Norway	**402**	**#9**
Russia-Sakhalin	**445**	**#10**
Hypothetical worst	**480**	

The rating was done taking into account the low well head prices for Alaska crude oil. For instance, in the economic analysis it was assumed that in the US Gulf of Mexico producers will receive $ 7 per barrel more at the well head than in Alaska. Therefore, the rating fully accounts for the geographical disadvantage of Alaska.

The competitiveness also improves modestly for large existing producers which re-invest in Alaska. Such companies do not benefit from the tax free allowance upon re-investment. The large producers will in particular see an improvement in the rate of return on new investment.

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1. INTRODUCTION

1.1. Preliminary Comments

This report is a draft which reflects the analysis carried out at the request of the Governor of Alaska to review the severance tax for oil and gas. In a report which I prepared on June 15, 2003 it was concluded that deep revisions were necessary. Two options were considered over time:

- a revision of the ELF factors to make them more sensitive to price and the introduction of tax credits to create more incentive for re-investment, and
- a replacement of the current severance tax with a profits based tax.

The purpose of the 2003 review was to:

- Make this tax more effective in the light of changed economic and technical circumstances
- Make the tax more progressive and better linked to the profitability of the operations resulting in a more reasonable balance between government and petroleum industry over a wider range of economic circumstances
- Provide stronger incentives to re-invest in Alaska

This report constitutes therefore a follow up on the earlier reports.

The first question to be raised is whether changes in the severance tax would create an environment of fiscal instability that would undermine the confidence of the petroleum industry in Alaska.

1.2. Changing the Severance Tax

The Alaska severance tax is a tax of general application to the petroleum industry and can therefore be changed by the Legislature.

Many jurisdictions have taxes that are only or primarily related to petroleum or minerals. Examples are the PRT in the United Kingdom, the Hydrocarbon Tax in Norway, the PRRT in Australia , the SPT in Trinidad , the SRB in Thailand or the APT in Papua New Guinea.

The international practice is to change these type of resource based taxes only occasionally. Frequent changes in resource taxes create instability because this makes it difficult for the petroleum industry to undertake the long term planning that is required for decisions on exploration and oil and gas field development.

Nevertheless, the implicit understanding with respect to a resource tax is that such a tax can be modified occasionally where new conditions justify such a change, where governments want to implement a new policy or where deficiencies in the structure of the tax make adjustment desirable.

Alaska has introduced changes to the severance tax in 1977 and in 1989. If Alaska were to implement another change during 2006, it would mean that this tax is being changed seventeen years since the last major change in this tax. This is a reasonable frequency of change for a resource tax from an international perspective.

This then raises the issue as to whether there is a justification for adjustments to the Alaska severance tax.

Therefore the next section discusses why changes to the severance tax are appropriate.

1.3. ELF "design flaws" and technical and economic conditions on the North Slope.

When the recent ELF was introduced in 1989 it was from a fiscal perspective an advanced and modern feature.

The production tax (severance tax) for oil was based on a rate of 12.25% for the first five years of production of a field and 15% thereafter. The rate applies after the deduction of the royalty. A flat severance tax rate of this nature would be a severely regressive tax which would risk making smaller oil fields with modest well productivities uneconomic.

The ELF factor made this tax progressive with respect to field size and well productivity. This was achieved through multiplying the severance tax rate with the ELF factor, which varies between zero and one. Fields with high field and well productivities have a factor of close to one. Fields with low field and well productivities have a factor of close to zero. The formula is as follows:

$$ELF = \left[1 - \frac{(300 \times wells)}{volume}\right]^{\left[\left(\frac{150{,}000}{volume}\right)^{\wedge 1.53333}\right]}$$

"wells" is the number of producing wells in the field; "volume" is the total daily production for the field

This formula contemplates that a marginal oil well would produce 300 barrels per day and that therefore fields with wells that produce less should not be taxed. The field also considers that a 150,000 barrel field is a marginal field.

The ELF therefore encouraged the development of smaller and less prolific oil fields. Alaska has benefited from this concept, because it is likely that as a result of the introduction of the ELF a number of additional oil fields and satellites to existing fields have been developed which otherwise might not have been economic.

However, after the ELF has now been for 17 years in operation, five "flaws" have now been identified with the current ELF formula:

1. The ELF is no longer corresponding reasonably to oil field decline.
2. The ELF does not react reasonably to the current economics of field size and well productivity and the specific relief that is granted through the ELF does not seem appropriate for the circumstances.
3. The ELF does not relate rationally to incremental investments in oil field development, which now have become very important mode of operation in North Slope developments.
4. The ELF does not respond to higher or lower oil or gas prices.
5. The ELF does not provide an incentive for re-investment.

Following is a discussion of each of these five "flaws".

1.3.1. The ELF and field production decline

One issue relates to the decline of the ELF during the decline of production during the final phase of an oil field.

It is reasonable for the ELF to become gradually less if production declines in an oil field. Typically operating costs per barrel increase if production in an oil field declines. This is the result of the fact that some of the operating costs are fixed and therefore with declining production the costs per barrel go up. Also usually as the field production declines, gas and water production per barrel increase which means increased operating costs and sometimes additional facility requirements. For all these reasons it is reasonable to reduce the ELF gradually with declining field production.

Once the field approaches the end of the field life, it is reasonable to reduce the ELF to zero. This will help prolong the economic life of the field. The current ELF formula achieves this result.

The main question is whether the current formula results in a reasonable decline of the ELF under declining production.

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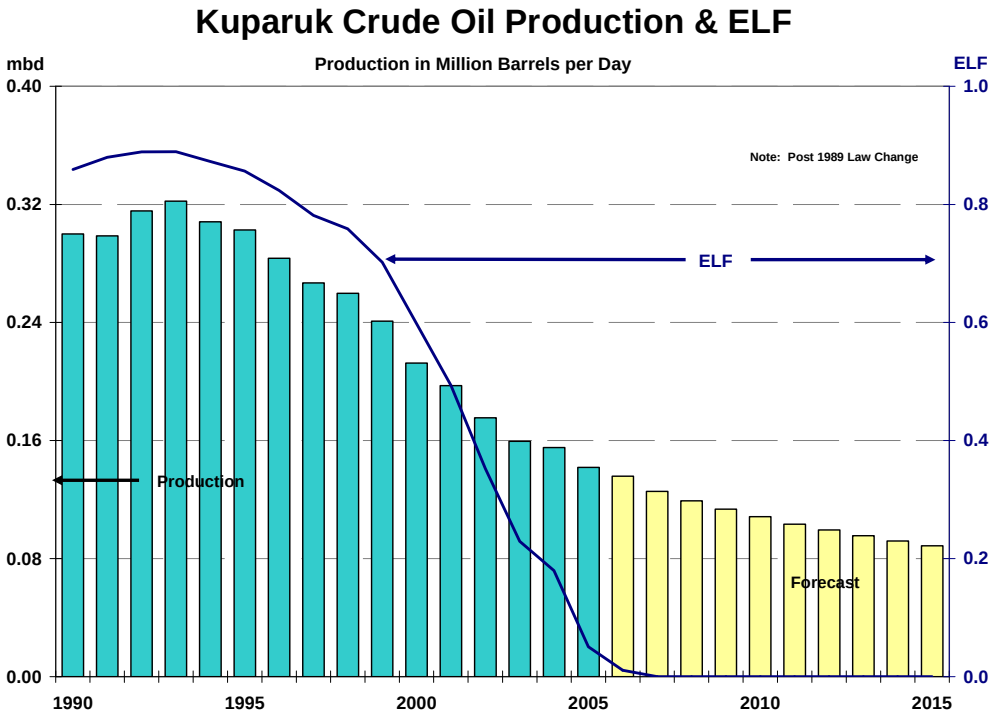
An important case is the Kuparuk field. In fiscal year 2000, this field produced 212,000 bopd. By the year 2011 it is estimated that the field will produce 98,000 bopd.

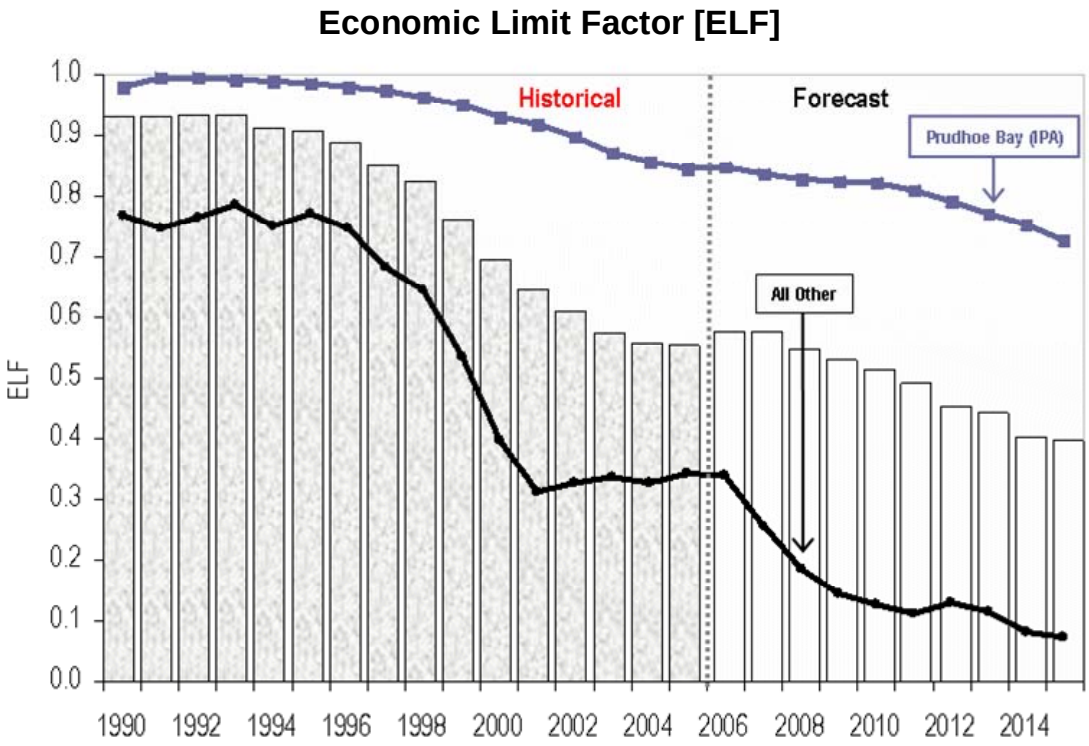
In the year 2000, the ELF on the field was 0.60. In March 2003 the same ELF factor was only 0.25. In the year 2007, the ELF will be 0.

Following is the anticipated graphs of production and ELF decline:



Therefore, the ELF reaches zero well before this is necessary as a result of the economic circumstances. This is unreasonable from a government perspective. Kuparuk is a world class and profitable oil field and there is no reason why Alaska should not receive production taxes from this field.

In general, the level of production tax will decline strongly due to a reduction of the ELF during the next decade as can be seen from the following graph:



The rapid decline of the ELF is not reasonable and unfair to Alaska, in particular under the current high oil prices. This aspect of the current production tax alone justifies a revision of the production tax.

1.3.2. General relationship between ELF and field and well production

The ELF formula is very sensitive to well productivity and has the following effects:

Well Prod bopd	Wells	Volume bopd	ELF
300	2000	600000	0.00
300	500	150000	0.00
1500	100	150000	0.80
1500	20	30000	0.07
6000	5	30000	0.55

It can be seen that a 150,000 bopd with 100 wells has an ELF of 0.8 and with 500 wells the ELF is down to zero. For a 30,000 bopd field, the ELF is 0.55 with 5 wells and 0.07 with 20 wells.

These relationships are no longer logical. The economics of a field is influenced by the number of wells. Obviously fields with more wells to achieve the same level of production typically require higher capital and operating costs. Nevertheless the relationship contained in the formula is extreme and no longer representative of current conditions.

In an oil field with declining production it is economic under current price conditions on the North Slope, to keep wells operating with well productivities that are well below 300 bopd. This automatically results in the rapid elimination of the ELF.

Also the strong sensitivity of the formula with respect to the number of wells provides an inducement to keep wells flowing that otherwise would be abandoned under normal economic circumstances. In other words producers would be able to manipulate the ELF downward with a "maximum number of flowing wells" strategy.

In 1989 a "marginal well" was set at 300 barrels per day. Today with $ 60 oil prices maintaining a 10 barrel a day well is economic. In effect, the higher the oil price the lower the production from a marginal well and therefore Alaska is very exposed to downward manipulation of the ELF under high oil prices.

Under current economic conditions the relationship between well productivity and the ELF is no longer in the interest of the State of Alaska.

1.3.3. ELF and incremental developments

A rather fundamental "design flaw" of the ELF relates to incremental developments.

Infill drilling in an existing field could result in significant increases in ELF if such wells have high well productivities, for instance in case of horizontal wells. The incremental production would result in a very significant increase in ELF **for the whole field.** For economic purposes the increase in ELF on the whole field needs to be attributed to the economics of the incremental wells.

This means the incremental ELF could be very high and could exceed 1.00.

As a result is it unattractive for companies to increase production in existing fields in case the incremental wells would have a higher well productivity.

This problem is rather important since over the last ten years many satellite fields have been developed. It could be argued that these satellite fields really are economically part of the main field and should be counted as production of the main field. However, over the years the government has approved these satellites as separate developments until some modest adjustments were made as of January 1, 2005.

Therefore, if new wells are drilled in a satellite field the severance tax rate is 0%. If the same additional production is developed as part of the original field the incremental severance tax may be as higher than 15%.

The wide discrepancy of the incremental severance tax rate between a development in the same field and a satellite field is illogical from an economic perspective and it is a major deficiency of the current formula.

The developments on the North Slope during the last decade have resulted in new trends. These trends are:

- Exploration for and development of new “stand alone” fields with maximum field production rates in the 25,000 to 100,000 bopd range.
- Development of satellite fields with maximum production levels in the range of 5,000 to 50,000 bopd.
- A rapid decline in the production of the primary fields.

All these developments result jointly in a situation where the average ELF factor for the production of the total North Slope is declining very rapidly.

This sharp decline in the overall ELF for the North Slope area as a whole is not correlated with rapidly deteriorating economics and is therefore not a reasonable result from a government perspective.

There is ample justification to deal with the current deficiencies in the ELF formula and bring this formula more in balance with reasonable economic conditions and consequences.

1.3.4. The ELF and international oil prices.

A major deficiency of the ELF factor is that it does not deal with the oil price.

This means that when oil prices are low, the burden on the petroleum industry is very high, while in case of high oil prices, the burden is very modest.

As a result Alaska leaves considerable possible revenues "on the table" during high oil prices and burdens the oil industry unreasonably during low oil prices.

This means that the fiscal system of Alaska is regressive with price. The higher the oil price the lower the share is that the government receives from the operations. This is not logical. It is a very unbalanced situation.

Many other major oil exporting jurisdictions have fiscal systems that are more balanced. The government take either stays more or less the same with higher prices or actually increases.

The recent high oil prices and the recent developments in fiscal terms around the world create a significant new environment which justifies a re-evaluation of the ELF system. In the next chapter a more detailed review will be provided of this matter.

Given the extreme volatility of the oil price during the last decade and the volatility that can be expected during the next decade, the current ELF factor is not appropriate for the circumstances.

1.3.5. Re-investment under the Severance Tax

One of the most important characteristics of the severance tax is that it is essentially based on gross income (after deduction of royalty) rather than net income.

Many jurisdictions have resource taxes, production shares or participations that are based on net income. These features are often applied in addition to a royalty and corporate income tax.

Alaska is one of the few jurisdictions in the world that has a resource tax that is based on gross income.

The fact that most other jurisdictions have fiscal features that are based on net income means that exploration and development expenditures are deductible from gross income. Therefore, payments to government can be reduced by re-investing in the country, through the deductions that can be claimed.

The final result of such fiscal features is that companies that re-invest in the jurisdiction pay less to government than companies that take their profits out.

Such re-investment incentive does not exist in Alaska.

The result of this may be that companies are actually induced through the fiscal terms to take their profits out of Alaska for re-investment in other parts of the world.

Therefore, the current severance tax may not provide sufficient incentive to maintain or increase re-investment in the State.

As an illustration, the table below provides the net investment per dollar related to an exploration well:

Azerbaijan	$ 0.05
Canada, Northwest Terr	$ 0.10
Australia	$ 0.18
Norway	$ 0.22
Qatar	$ 0.22
Brunei	$ 0.25
Malaysia	$ 0.30
Canada, Nova Scotia	$ 0.35
Oman	$ 0.35
Venezuela – Orinoco Belt	$ 0.35
Indonesia	$ 0.38
Thailand	$ 0.45, less depending on level of production
Colombia	$ 0.45
Trinidad & Tobago	$ 0.45
Abu Dhabi	$ 0.50
Kazakhstan	$ 0.55, some agreements much less
Alberta	$ 0.58
China	$ 0.60, less depending on level of production
United Kingdom	$ 0.60
Sakhalin, Russia	$ 0.62, much less depending on level of production
US Gulf of Mexico	$ 0.65
Alaska - Current	**$ 0.65**

As can be seen, the Alaska net exploration costs are among the highest in the world and compare very poorly with other similar frontier areas such as the Canadian North West Territories or Offshore Nova Scotia.

2. NEW INTERNATIONAL TRENDS IN GOVERNMENT TAKE

(Note: parts of this chapter have been published earlier in the Oxford Energy Forum, Volume 63, November 2005)

In general it can be predicted that the higher oil prices will lead to upward pressure on the government take for oil and a stabilization of the government take for gas. It is also likely that governments will base their fiscal terms increasingly on sliding scales which are progressive with oil and gas prices.

2.1. Developments during the last two decades

Over the last twenty years the world arithmetic average government take for oil and for gas has typically declined, from high levels of about 75% during the energy crisis in the late 1970's to about 60% today.

The main reason for the decline of the average government take has been the relative "over supply" of exploration and development opportunities until recently. This was caused by two separate trends:

- new jurisdictions opening up for investment, and
- increased access to petroleum basins through improved technology.

The government take is determined by competition among governments. In essence, the government take is the "price" for the "petroleum properties" a government has available. A large increase in new opportunities creates a drop in "price". Governments were forced to lower government take in order to attract investment or maintain or expand petroleum production. The decline in government take has been stronger for gas than for oil due to the new pipeline and LNG opportunities and large volumes of "stranded" gas.

Since the early 1980's, important new acreage became available for petroleum exploration and production in the People's Republic of China, the former Soviet Union and Eastern Europe, Venezuela, Argentina, Brazil, Bolivia and Peru, Vietnam and Cambodia, and Saudi Arabia and Iran.

During the last two decades we have also seen many new investment opportunities as a result of improvements in technology. Companies now are able to develop oil and gas discoveries in 2000 meter water depth. New pipeline technology, including deep water pipelines, has resulted in connecting many new areas to markets, such as Algeria to Europe. LNG developments now make it possible to ship LNG from Qatar to East Asia.

This significant increase in new development opportunities has resulted in a gradual lowering of the government take during the last two decades.

2.2. Current Situation

This process is now coming to a halt. Except for Kuwait and Iraq, there are no important jurisdictions left in the world that can still be opened up. Most of the continental shelves and slopes are now accessible. Most petroleum basins in the world are now connected to markets through pipelines or LNG shipments. From now onwards, petroleum companies will be forced to "pick over" the existing acreage in order to identify new exploration and development targets.

At the same time a large number of new "buyers" of "petroleum properties" have come in the market. During the last two decades many new petroleum companies from China, Russia, Latin America, Europe, Asia and the Middle East have entered world petroleum exploration and development. Also many small Canadian, Australian and British companies have decided to go "international". These new investors bid aggressively in the available bidding rounds in order to acquire new acreage positions.

Will these new trends in conjunction with the high oil prices drive the government take back up?

2.3. Future

There are two types of fiscal systems with respect to high oil and gas prices:

- Systems that are progressive with price, whereby the government take adjusts upward automatically with higher prices, and
- Systems that are regressive of neutral with price, whereby the government take remains about the same or even declines somewhat with higher prices.

There are a considerable number of countries with progressive systems. There are two ways in which the upward adjustment in government take is taking place:

- *"One Way" adjustments.* These are systems that are based on cumulative profitability. In these systems a higher government take "locks in" once certain levels of IRR, Profitability ratios or cumulative revenues are being reached. In other words if the oil price would decline again, the government take will stay high. These jurisdictions include:
    - IRR based profit oil and gas shares such as in Angola, Russia and Azerbaijan and IRR based profit shares or taxes, such as in Saudi Arabia, the Canadian frontier areas, Australia and Kazakhstan.
    - Profit ratio based profit oil and gas shares in Libya, Qatar, Azerbaijan and India, profit ratio based royalties and taxes in Peru and Tunisia,
    - The PRT in Algeria.

- *"Two Way" adjustments.* These are systems that are based on price related formula or shares. In these systems the government take goes up when prices are high, but the take comes down when prices decline again. This is done through windfall profits taxes, supplemental payments, uplifts or other mechanisms. Examples are the fiscal systems of Alberta, Colombia, Trinidad and Tobago, Malaysia, Pakistan, Thailand, Indonesia, East Timor, Norway and the Netherlands.

Certain countries have service contracts with fees which are not price sensitive, such as in Iran, Mexico and Venezuela. These countries receive the entire price upside.

As can be seen from the above list, there will be an automatic upward adjustment of government take in a large group of important petroleum producing countries as a result of higher oil and gas prices. In all countries this upward adjustment applies to oil as well as gas, except for Trinidad and Tobago and Qatar where it only applies to oil.

Price Upside Countries.

The countries with regressive or neutral fiscal systems are "price upside countries", where investors will earn a significant "wind fall" as a result of the price increases.

These countries can be divided in two groups:

- Countries with systems that primarily consist of royalties and corporate income tax. In almost all of these countries there are no fiscal stability provisions and therefore governments are free to impose new petroleum taxes.
- Countries with production sharing agreements whereby the percentage profit oil or gas to government is determined on production levels only, rather than certain formulas. Many of these contracts are subject to fiscal stability provisions.

Countries with royalty-tax systems include the United States (federal as well as state fiscal systems), certain provinces of Canada, the Venezuelan concessions, Argentina and Brazil, onshore Australia and the new licenses in the UK.

Countries with production level based production sharing agreements include Congo, Gabon, Egypt, Sudan, Yemen, Bangladesh, certain Indonesian contracts, Vietnam and China.

Trends

The oil supply shortage will induce many countries to have new bidding rounds for remaining acreage or acreage that is being relinquished. The high oil prices and the large number of new companies interested in acreage will result in high bids.

The high bids and the automatic upward adjustment of the government take in many jurisdictions with progressive systems creates a "competitive space" for price upside countries. It makes it easier for these countries to adjust their government take upward without becoming less competitive. This will have the following effects:

- In countries which are not subject to fiscal stability provisions, it can be expected that certain governments will review their fiscal terms in order to determine whether the government take should be adjusted upward through new or increased taxes.
- In countries with contracts that are subject to fiscal stability, it can be expected that a higher government take will be established for new model contracts. In some cases, governments may try to renegotiate certain production sharing contracts.
- Price upside countries will consider moving to price progressive fiscal systems.

Some nations are already in the process of reviewing or adjusting their fiscal terms. Venezuela cancelled the royalty holiday on heavy oil development and is currently trying to force investors into the new concession terms. Bolivia just introduced a new hydrocarbon law, which provides for a significantly higher government take. Trinidad and Tobago is reviewing its SPT terms. Kazakhstan is considering new fiscal terms with a very high government take. In the case of Bolivia and Kazakhstan the proposed increases are so strong that they may be counter-productive. Norway introduced a number of interesting small improvements in its fiscal terms, but this process may now come to a halt. Most recently in December 2005 the UK announced that it would increase its overall tax rate applicable to the petroleum industry from 40% to 50%.

Although it can be expected that the government take for oil will start to increase, the strong developments in gas pipeline and LNG technology are still creating significant new gas development opportunities. The ratio between world gas reserves and production is still 68 years and therefore there are considerable stranded gas reserves in nations which are still actively trying to market this gas. Following table[1] provides an overview of the major nations with stranded gas. In addition to the nations listed on the table there are six other nations with more modest gas reserves which are also actively trying to monetize their gas reserves, which are Vietnam, PNG, Peru, Yemen, Myanmar and Syria.

The possibility for still considerable supplies of gas, will depress the trend towards a higher government take. Therefore, the government take for gas may stabilize on average, with some countries leaving government take the same and other countries increasing or decreasing their take on gas.

[1] The table has been derived from the data of the Petroleum Encyclopedia, 2004.

WORLD GAS RESERVES AND PRODUCTION

	Reserves (Tcf)	Productio (Tcf)	Ratio years	
Canada	59	6.5	9.1	
USA	187	19.3	9.7	
Argentina	23	1.3	18.1	
Bolivia	**24**	**0.2**	**136.0**	**stranded gas**
Trinidad&Tobago	26	0.6	43.3	**stranded gas**
Venezuela	**148**	**1.0**	**155.3**	**stranded gas**
Netherlands	62	2.1	29.3	
Norway	75	2.3	32.7	
UK	22	3.6	6.1	
Iran	**940**	**2.3**	**409.7**	**stranded gas**
Iraq	**110**	**0.6**	**194.8**	**stranded gas**
Kuwait	**55**	**0.3**	**173.1**	
Oman	**29**	**0.5**	**54.8**	
Qatar	**910**	**1.0**	**888.9**	**stranded gas**
Saudi Arabia	**231**	**2.0**	**116.9**	
UAE	**212**	**1.6**	**130.6**	**stranded gas**
Algeria	**160**	**2.8**	**56.7**	**stranded gas**
Egypt	**59**	**0.8**	**72.7**	**stranded gas**
Libya	**46**	**0.2**	**217.2**	**stranded gas**
Nigeria	**159**	**0.6**	**250.2**	**stranded gas**
Azerbaijan	**30**	**0.2**	**170.0**	**stranded gas**
Kazakhstan	**65**	**0.4**	**153.4**	**stranded gas**
Russia	**1680**	**19.6**	**85.8**	**stranded gas**
Turkmenistan	71	1.8	40.2	**stranded gas**
Ukraine	**40**	**0.6**	**66.7**	
Uzbekistan	66	1.9	34.6	**stranded gas**
Australia	**90**	**1.2**	**72.8**	**stranded gas**
China	53	1.2	45.5	
India	30	1.0	30.4	
Indonesia	90	2.5	35.9	**stranded gas**
Malaysia	75	1.8	42.5	**stranded gas**
Pakistan	27	0.7	36.4	
Others	222	6.7	33.3	
Total	**6076**	**89.2**	**68.1**	

The speed with which these new trends will develop will depend in part on political developments which could create significant new opportunities, such as

- A stabilization of the security situation in Iraq and subsequent an opening of Iraq for new investment based on attractive contracts,
- The re-introduction of production sharing contracts in Russia.
- A strong opening of Mexico, in particular the deep water acreage.
- Resolution of political issues in Iran together with the introduction of more attractive upstream contracts.

However, none of these four above developments is expected to make a major impact during the next two years.

In general, it can therefore be concluded that it is clear that there is a new international environment with respect to the government take for oil. Previous competitive relationships have now been transformed in a new framework where it is obvious that there will be considerable upward pressure on government take for oil.

This matter justifies a review of the competitiveness of the severance tax in Alaska, in particular with respect to oil.

3. ECONOMIC ANALYSIS

3.1. Preliminary economic studies

During the last two years two broad alternative ways were evaluated to re-structure the severance tax:

- Modifications to the ELF structure, making the ELF more price sensitive and adjusting the ELF formula. This structure also included tax credits in order to encourage re-investment in the State.
- An new Petroleum Profits Tax ("PPT") regime, based entirely on profits and with tax credits in order to encourage re-investment in the State.

A complete study was done on the first option and was updated in the June 2003 report.

Subsequent, to the June 2003 report the Alaska Gas Project negotiations started and it was decided to first evaluate the result of these negotiations before finalizing the plans for a review of the severance tax.

However, during the last year, the high oil prices made an acceleration of the severance tax review imperative. It was decided that the PPT concept was more desirable than revising the ELF.

Geological and technical conditions in Alaska have now become widely different. The Cook Inlet, Yukon Flats, North Slope and other regions reflect very different geological and technical environments. On the North Slope there are very different geological-technical conditions represented by conventional oil fields, gas condensate field, heavy oils, fields in state offshore waters, etc.

The strong increases in oil prices made it obvious that a profit based system was more appropriate on an Alaska wide basis than a more complex ELF concept. Conditions have become too variable and different in order to "capture" all variations in a simple ELF formula.

A profit based system also is a stronger basis for encouraging re-investment and attracting new investment.

For these reasons it was decided to go forward with the introduction of a PPT that would replace the current severance tax for oil and gas.

In this report, the development, the structure and the international competitiveness of the PPT will be evaluated. In particular, the attractiveness of the PPT to new investors will be dealt with.

A separate analysis has been prepared by the Department of Revenue which analyzes the impact of the PPT on overall State revenues, based on the various models in operation by the State. The results of this analysis were presented to the Alaska Legislature.

3.2. Economic assumptions

3.2.1. Cost and field size estimates

In order to test the economics of the PPT, six alternative exploration targets were evaluated, with the following targets:

- 50 million barrels – low well productivity
- 150 million barrels – low well productivity
- 500 million barrels – low well productivity

- 50 million barrels – high well productivity
- 150 million barrels – high well productivity
- 500 million barrels – high well productivity

The production levels and number of wells is of great importance for the ELF calculations. The following assumptions were made:

Field Size	Maximum production	Maximum number of wells	Number of wells at abandonment
(million barrels)	(barrels of oil per day)		
50	13,700	15	8
150	35,600	24	10
500	109,600	52	11
50	13,700	8	2
150	35,600	12	4
500	109,600	28	6

As can be seen the economic runs assume that there will be a considerable number of wells abandoned during the decline of the field. This maintains the ELF factor at a relative attractive level and production taxes will be relatively robust.

If it would have been assumed that few wells would be abandoned, the ELF factors would be substantially less during the decline phase.

It was assumed that the exploration program would have a 1:4 success ratio.

Cost assumptions were made which are reflective of the Alaska North Slope environment. Following are the cost assumptions for each of the six cases in total costs:

COST SCENARIOS
Total Costs

			DRY HOLE	FIELD#1 50MM-LOW	FIELD#2 150MM-LOW	FIELD#3 500MM-LOW	FIELD#4 50MM-HIGH	FIELD#5 150MM-HIGH	FIELD#6 500MM-HIGH
TOTAL OIL PRODUCTION		**(MMbbls)**	**0.0**	**50.0**	**150.0**	**500.0**	**50.0**	**150.0**	**500.0**
HIGH COSTS:									
TOTAL CAPEX	**Exploration**	**(m$)**	**45**	**45**	**45**	**45**	**45**	**45**	**45**
	Development	**(m$)**		**375**	**900**	**2625**	**300**	**675**	**1500**
TOTAL OPEX		**(m$)**		**300.0**	**750.0**	**1875.0**	**225.0**	**525.0**	**1500.0**
AVERAGE COSTS:									
TOTAL CAPEX	**Exploration**	**(m$)**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**
	Development	**(m$)**		**312.5**	**750.0**	**2187.5**	**240.0**	**562.5**	**1250.0**
TOTAL OPEX		**(m$)**		**250.0**	**625.0**	**1562.5**	**187.5**	**437.5**	**1250.0**
LOW COSTS:									
TOTAL CAPEX	**Exploration**	**(m$)**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
	Development	**(m$)**		**250.0**	**600.0**	**1750.0**	**200.0**	**450.0**	**1000.0**
TOTAL OPEX		**(m$)**		**200.0**	**500.0**	**1250.0**	**150.0**	**350.0**	**1000.0**

Following are the per barrel costs:

COST SCENARIOS
Per barrel costs

			DRY HOLE	FIELD#1 50MM-LOW	FIELD#2 150MM-LOW	FIELD#3 500MM-LOW	FIELD#4 50MM-HIGH	FIELD#5 150MM-HIGH	FIELD#6 500MM-HIGH
TOTAL OIL PRODUCTION		**(MMbbls)**	**0.0**	**50.0**	**150.0**	**500.0**	**50.0**	**150.0**	**500.0**
HIGH COSTS:									
TOTAL CAPEX	**Exploration**	**(m$)**	**45**	**45**	**45**	**45**	**45**	**45**	**45**
	Development	**($/bbl)**		**7.50**	**6.00**	**5.25**	**6.00**	**4.50**	**3.00**
TOTAL OPEX		**($/bbl)**		**6.00**	**5.00**	**3.75**	**4.50**	**3.50**	**3.00**
AVERAGE COSTS:									
TOTAL CAPEX	**Exploration**	**(m$)**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**	**37.5**
	Development	**($/bbl)**		**6.25**	**5.00**	**4.37**	**4.80**	**3.75**	**2.50**
TOTAL OPEX		**($/bbl)**		**5.00**	**4.17**	**3.12**	**3.75**	**2.92**	**2.50**
LOW COSTS:									
TOTAL CAPEX	**Exploration**	**(m$)**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
	Development	**($/bbl)**		**5.00**	**4.00**	**3.50**	**4.00**	**3.00**	**2.00**
TOTAL OPEX		**($/bbl)**		**4.00**	**3.33**	**2.50**	**3.00**	**2.33**	**2.00**

It was assumed that the exploration period would be 4 years and that production would start in year 7 of the cash flow.

Broad price sensitivity was done in the $ 10 - $ 60 per barrel range and more detailed analysis in the $ 22 - $ 40 per barrel range.

Escalation and inflation were assumed to be 2% per year.

All cash flows were done in nominal US dollars and all results in this report are expressed on this basis.

A differential of $ 7 per barrel was assumed between the WTI price and the well head price at the North Slope due to transportation and quality differentials.

3.2.2. Profitability indicators

All profitability indicators were calculated on nominal cash flows.

The following profitability indicators were used:

- The internal rate of return on a cash flow basis (IRR). This indicator illustrates how fast profits are being made and the attractiveness of the cash flow relative to the investment.
- The net present value discounted at 10% (NPV@10%). This indicator illustrates the present value of an investment. It is a good indicator of the total amount of profits that is being made with the venture.
- The expected monetary value at 10% (EMV@10%). This is the weighted average of the exploration investment discounted at 10% and the NPV@10%. A success ration of 1:4 was used. This indicator illustrates the attractiveness of the fiscal system for exploration. A high EMV@10% is obtained through a high NPV@10%, or low net exploration expenditures (for instance as a result of exploration tax credits).
- The undiscounted Government Take. This is a good indicator of percentage that the government receives of the long term pre-tax cash flow. The remaining cash flow is the Corporate Take. A low Government Take and high Corporate Take is attractive to companies, in particular on large fields, since it indicates a long and large undiscounted cash flow.

4. ANALYSIS OF THE PETROLEUM PROFITS TAX ("PPT")

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in order to provide maximum information about the PPT it is desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

4.1. PPT terms of the 20/15 system.

Following is a description of the 20/15 option, which was used for much of the international comparative analysis.

The PPT is based on the yearly cash flow from oil and gas in Alaska of the tax payer (company). The PPT is therefore consolidated at the level of the company, not calculated on the basis of individual leases as is currently the case for the severance tax.

The PPT rate is 20% of the positive cash flow.

In order to calculate the Alaska cash flow for the company, the company takes all oil and gas gross revenues and deduct all lease expenditures, being capital and operating expenditures. These expenditures will be defined in more detail in the new PPT legislation. All expenditures are deducted in the year these costs are incurred for the full amount. In other words, it is not required to depreciate the capital expenditures.

If there is a negative cash flow, 20% of the "loss" can be converted to a tax credit against future PPT obligations. These tax credits can be traded with other companies.

Furthermore, there will be a 15% tax credit on all capital expenditures. These tax credits can also be traded.

In order to attract new investors and to protect the smaller companies in Alaska, there is a tax free allowance for the first $ 200,000 per day cash flow for a maximum of up to $ 73 million per year.

In other words if the positive cash flow is $ 40 million in a year, this amount will not be subject to tax. However, the $ 33 million difference between the $ 73 million maximum and the $ 40 million can not be used or carried forward. If the positive cash flow is $ 100 million per year, only $ 27 million will be subject to PPT.

If there would be a Stranded Gas Contract with the current Sponsors, and if this contract provides for taking tax gas in kind, than the respective provisions that would modify the general PPT law will be in the contract.

4.2. PPT analysis

The PPT payments depend on whether a field is developed while a company is benefiting in total or in part of the tax free allowance of up to $ 73 million. The economics will therefore be analyzed with and without the benefit of such allowance.

The large companies will receive the allowance, but most of their production operations under average oil prices will result in profits well above the $ 73 million and therefore new field investment will not benefit from this allowance.

The following table provides the general overview of all low and high well productivity cases that were studied for a $ 40 per barrel scenario for the first investment in Alaska which fully benefits from the $ 73 million tax free allowance.

PPT GOVERNMENT TAKE WITH $ 73 MILLION TAX FREE ALLOWANCE

		DRY HOLE	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
TOTAL OIL PRODUCTION	**(MMbbls)**	**0.0**	**50.0**	**150.0**	**500.0**	**50.0**	**150.0**	**500.0**
TOTAL GROSS REVENUES	**(m$)**	0.0	2115.2	6565.2	22620.3	2115.2	6565.2	22620.3
TOTAL CAPEX	**(m$)**	46.8	472.7	1075.5	3082.1	397.6	825.4	1789.9
TOTAL OPEX	**(m$)**	0.0	389.3	1018.1	2654.3	290.0	708.6	2107.2
DIVISIBLE INCOME	**(m$)**	**-46.8**	**1253.1**	**4471.5**	**16883.9**	**1427.5**	**5031.1**	**18723.2**
ROYALTIES	**(m$)**	0.0	264.4	820.6	2827.5	264.4	820.6	2827.5
PPT	**(m$)**	-16.4	-86.5	234.4	1884.4	-42.0	381.9	2443.4
PROPERTY TAXES	**(m$)**	0.0	28.3	86.3	292.3	28.3	86.3	292.3
STATE CORPORATE TAX	**(m$)**	-2.9	98.4	313.0	1116.7	111.3	351.8	1237.0
TOTAL ALASKA	**(m$)**	**-19.3**	**304.6**	**1454.4**	**6121.0**	**362.0**	**1640.7**	**6800.3**
FEDERAL INCOME TAX	**(m$)**	**-9.7**	**332.8**	**1058.7**	**3776.5**	**376.4**	**1189.7**	**4183.6**
GOVERNMENT INCOME	**(m$)**	**-28.9**	**637.4**	**2513.0**	**9897.5**	**738.4**	**2830.3**	**10983.8**
STATE TAKE:		**41.1%**	**24.3%**	**32.5%**	**36.3%**	**25.4%**	**32.6%**	**36.3%**
FEDERAL TAKE:		**20.7%**	**26.6%**	**23.7%**	**22.4%**	**26.4%**	**23.6%**	**22.3%**
GOVERNMENT TAKE:		**61.8%**	**50.9%**	**56.2%**	**58.6%**	**51.7%**	**56.3%**	**58.7%**

The table illustrates a number of issues. Is shows how there would be a very significant support for an exploration well or dry hole from government. The PPT losses than can be converted into credits, the investment credits and the benefit from state and federal tax deductions would be in total 61.8% of the cost of the dry hole.

On the small 50 million barrel fields the PPT is negative. This means that the company will not pay PPT because it is benefiting from the $ 73 tax free allowance, but the company can trade the loss credits and the investment credits and receive the benefits of the tax credits.

The table also shows how the PPT becomes quite substantial in case of a large field. The equivalent PPT rates are provided below. The equivalent PPT rates are the production tax rates that would equate to the PPT payments. For the 50 million barrel field these rates are negative.

	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
EQUIVALENT PPT RATES	-4.67%	4.08%	9.52%	-2.27%	6.65%	12.34%

The following table shows the results for a company who has already used its tax free allowance and considers reinvestment in new fields.

PPT GOVERNMENT TAKE FOR A COMPANY THAT HAS ALREADY USED ITS TAX FREE ALLOWANCE

		DRY HOLE	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
TOTAL OIL PRODUCTION	**(MMbbls)**	**0.0**	**50.0**	**150.0**	**500.0**	**50.0**	**150.0**	**500.0**
TOTAL GROSS REVENUES	**(m$)**	0.0	2115.2	6565.2	22620.3	2115.2	6565.2	22620.3
TOTAL CAPEX	**(m$)**	46.8	472.7	1075.5	3082.1	397.6	825.4	1789.9
TOTAL OPEX	**(m$)**	0.0	389.3	1018.1	2654.3	290.0	708.6	2107.2
DIVISIBLE INCOME	**(m$)**	**-46.8**	**1253.1**	**4471.5**	**16883.9**	**1427.5**	**5031.1**	**18723.2**
ROYALTIES	**(m$)**	0.0	264.4	820.6	2827.5	264.4	820.6	2827.5
PPT	**(m$)**	-16.4	121.2	551.6	2290.5	167.3	701.0	2852.2
PROPERTY TAXES	**(m$)**	0.0	28.3	86.3	292.3	28.3	86.3	292.3
STATE CORPORATE TAX	**(m$)**	-2.9	78.9	283.2	1078.5	91.6	321.8	1198.6
TOTAL ALASKA	**(m$)**	**-19.3**	**492.8**	**1741.7**	**6488.8**	**551.6**	**1929.7**	**7170.6**
FEDERAL INCOME TAX	**(m$)**	**-9.7**	**266.8**	**957.8**	**3647.5**	**309.9**	**1088.2**	**4053.6**
GOVERNMENT INCOME	**(m$)**	-28.9	759.6	2699.6	10136.3	861.5	3018.0	11224.2
STATE TAKE:		**41.1%**	**39.3%**	**39.0%**	**38.4%**	**38.6%**	**38.4%**	**38.3%**
FEDERAL TAKE:		**20.7%**	**21.3%**	**21.4%**	**21.6%**	**21.7%**	**21.6%**	**21.7%**
GOVERNMENT TAKE:		**61.8%**	**60.6%**	**60.4%**	**60.0%**	**60.3%**	**60.0%**	**59.9%**

It can be seen how the same exploration incentive is being provided. However, now the PPT on small fields is positive and generally the PPT is higher, resulting in a lower corporate income tax.

The equivalent PPT rates now range up to 14.41%. In other words under favorable field and price conditions the PPT is essentially restored to a situation that would be equivalent a PPT without ELF with the blended rate of 12.25% and 15%.

	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
EQUIVALENT PPT RATES	6.55%	9.60%	11.57%	9.04%	12.20%	14.41%

The equivalent rates also show how the PPT is progressive with field size and costs.

The same is true for prices.

Following table provides the equivalent rates based on WTI prices:

PPT EQUIVALENT RATES FOR PRODUCTION TAX

WTI	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
$20	**-14.15%**	**-6.40%**	**-1.39%**	**-7.82%**	**0.21%**	**5.81%**
$30	**0.70%**	**5.08%**	**7.91%**	**4.28%**	**8.81%**	**11.98%**
$40	**6.55%**	**9.60%**	**11.57%**	**9.04%**	**12.20%**	**14.41%**
$50	**9.68%**	**12.02%**	**13.53%**	**11.59%**	**14.02%**	**15.71%**
$60	**11.62%**	**13.53%**	**14.75%**	**13.18%**	**15.15%**	**16.52%**

As can be seen from the table, with a WTI price of $ 20 per barrel and a net back of $ 13 and costs of $ 13.50 per barrel as assumed for the 50 MM barrel case, the producer would sell his tax loss credits and his tax investment credits to others. It should be noted, however, that the PPT bill provides for the fact that the PPT cannot be negative, therefore, in a situation where all producers would have a loss in a year, the State would not be out of pocket on the PPT. There is no “negative” PPT on an Alaska wide basis.

At very high prices, the PPT would be equivalent to a 16.52% production tax without ELF.

It can be noted how the PPT is very progressive in terms of the production tax equivalent rate with field size, field costs and price for a situation where large producers have already used their tax free allowance.

The system is more progressive with field size as illustrated above, where the field is the first investment.

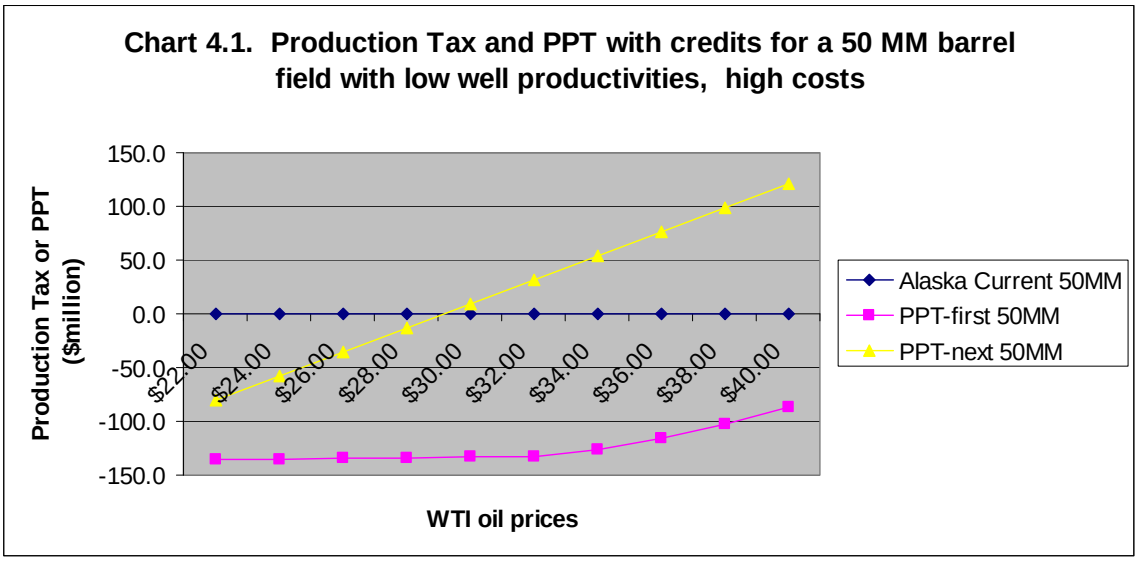
4.3. PPT payments

High Cost Fields

The following graphs illustrate the PPT payments relative to the current severance tax that would result under three cases:

- 50 million barrels, low well productivity, high costs
- 150 million barrels, low well productivity, high costs
- 500 million barrels, high well productivity, high costs

The economics with the tax free allowance is indicated as "First" in the graphs and without the tax free allowance as "Next".

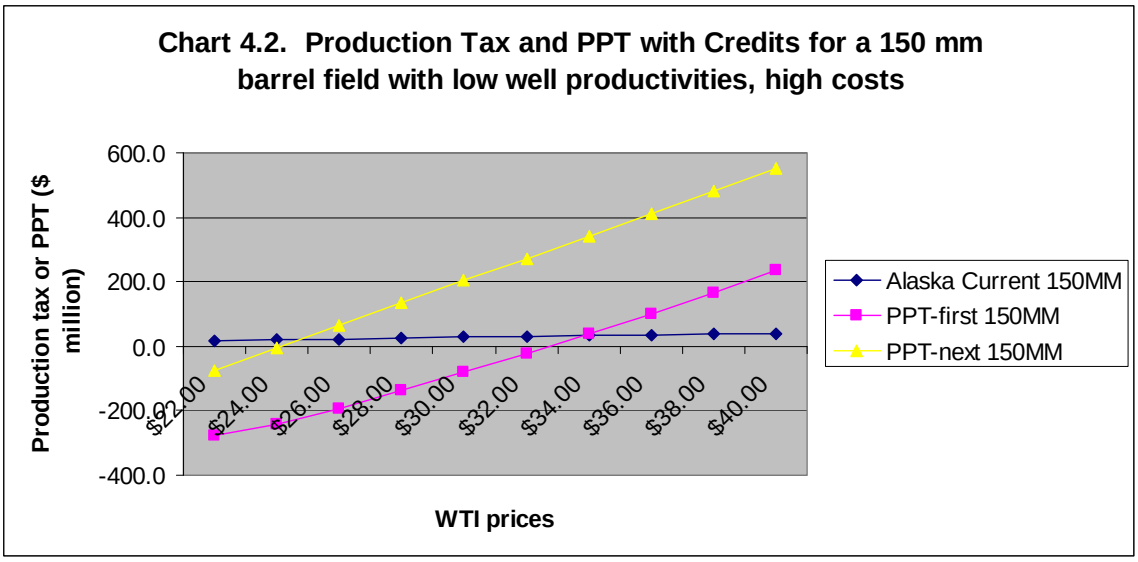


As can be seen from the 50 million barrel graph, a new investor or a small company developing a 50 million barrel field would not pay any PPT in the $ 22 - $ 40 per barrel price range. This is because the yearly tax free allowance would eliminate the obligation to pay taxes. However, such an investor would nevertheless receive the tax credits, whenever the cash flow is negative or as a result of his capital expenditures. These tax credits can be traded. Therefore, the new or small investors receives significant support through the PPT for such an investment.

Under the current severance tax system there is only an exploration tax credit which is being phased out (not included in this analysis). Therefore, the PPT is significantly more attractive to a new or small investor than the current severance tax with the ELF structure, despite the fact that under the current ELF there would be no severance tax payable on the 50 million barrel field.

A large oil company re-investing in a 50 million barrel field as provided in Chart 4.1 will find that for WTI prices below $ 29 per barrel the tax credits received under the PPT are higher an the PPT payable prior to tax credits and therefore PPT is "negative" and therefore this is better than the current severance tax. Over the $ 29 per barrel there is PPT payable and the system results therefore in more tax. Of course, these WTI benchmarks depend on the economic assumptions about capital and operating costs, production profiles, etc.

The 50 MM barrel high cost and low well productivity case is a very important benchmark for large producers because this is a fairly representative case of most of the incremental developments that may take place on the North Slope. This case will therefore see a significant improvement of overall economics while on average there is no increase in tax (assuming that large companies maintain a long term price forecast in the $ 25 to $ 30 range).



For the 150 million barrel field as assumed in our economic analysis a low amount of severance tax would be payable under the current system.

For a new investor, the cash flow under high prices would exceed the tax free allowance. Also the relative importance of tax credits is less. Therefore, PPT would be payable for WTI prices in excess of $ 33 per barrel. Below these prices the PPT would be less than the current system and would be negative.

A large oil company re-investing in a 150 million field would find a break-even point at a WTI price of $ 25 per barrel relative to the current system. Over this price the company would pay more tax.

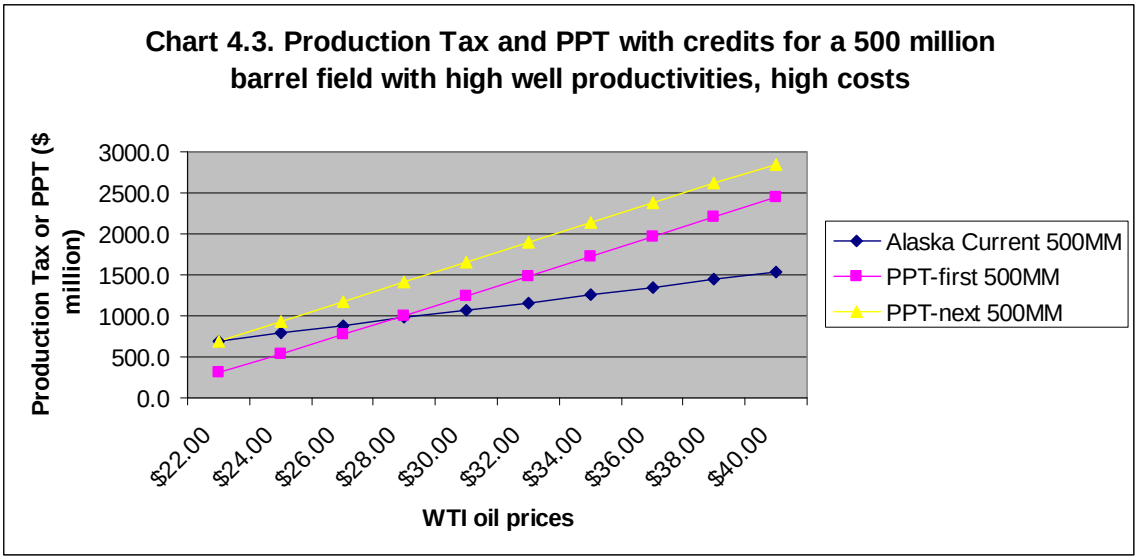
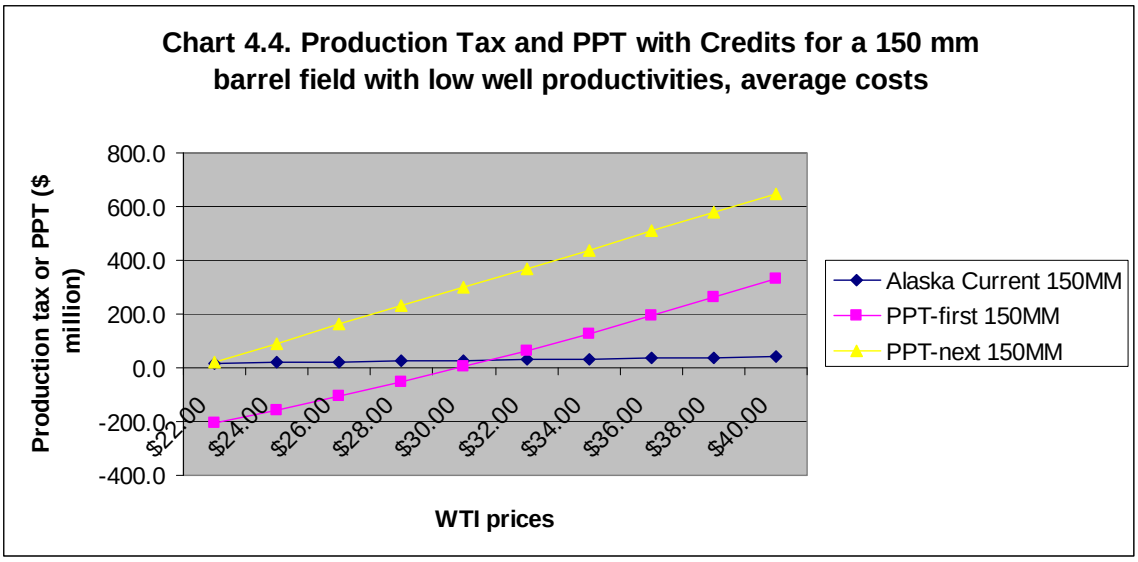


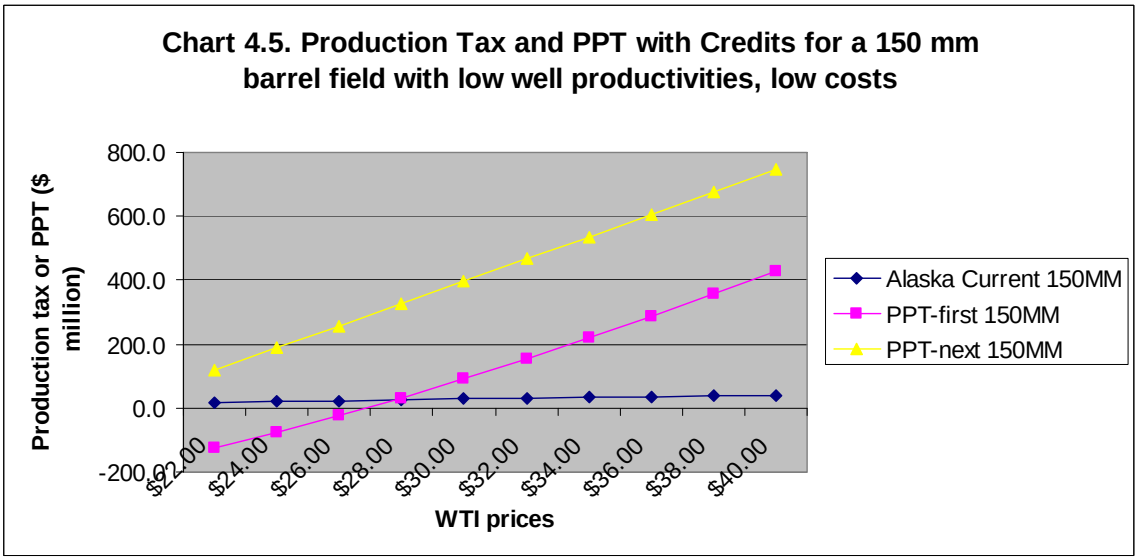
Chart 4.3 shows how for a 500 million barrel field with high well productivities, but high costs, the PPT results in more tax for a new investor at a break even WTI price of $ 29 per barrel and a large oil company would have a break even WTI price of $ 22 per barrel.

Lower Cost Fields

Because the PPT is profit sensitive and provides incentives through the tax credits, the break even WTI prices depend very much on cost assumptions. The graphs below show the same field 150 million barrel field of Chart 4.2, but now for lower costs.

Chart 4.4 shows how the WTI break even price for a new investor in a 150 million barrel field would drop from $ 33 to $ 31 per barrel, when average costs are being assumed. For a large company it drops from $ 25 to $ 22 per barrel.





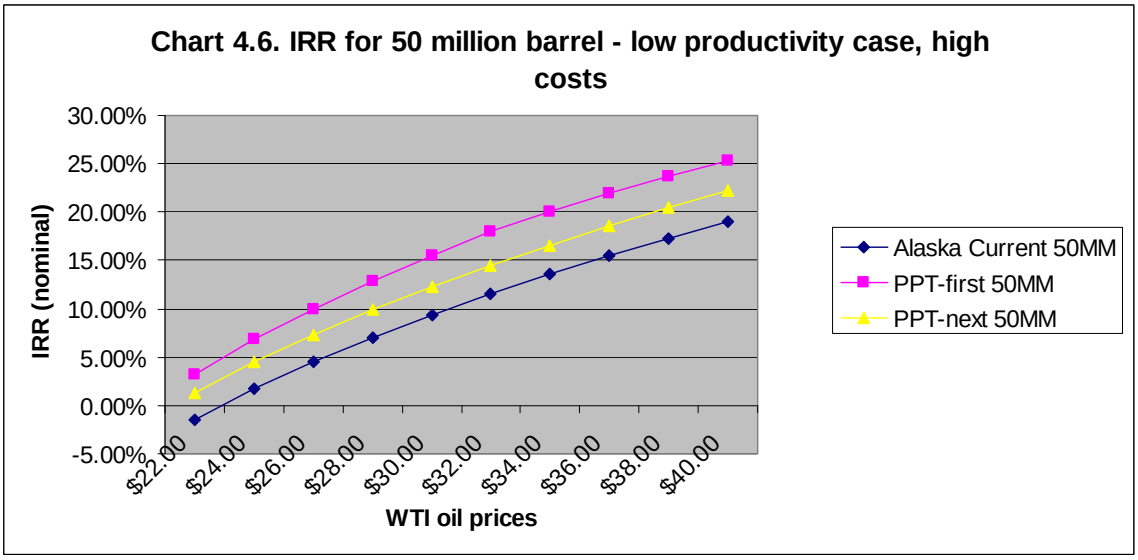
For low costs assumptions the WTI break even prices drop to $ 29 and $ 19 respectively as can be seen on Chart 4.5.

4.4. Investor economics

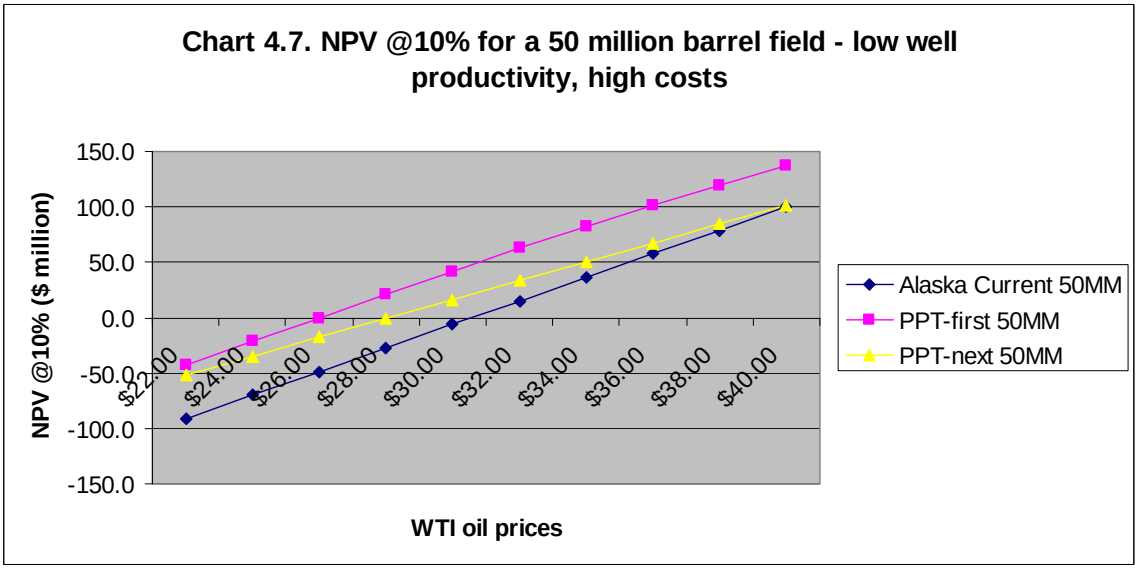
The investor economics are different depending on the field sizes.

50 million barrels

The following three graphs show the investor economics for the 50 million barrel field.



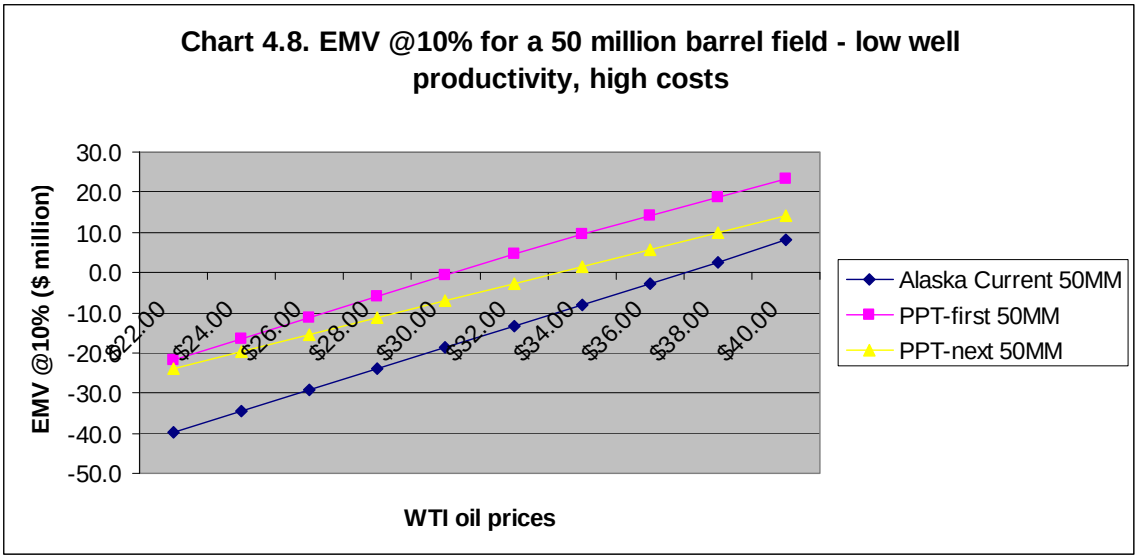
The IRR is much higher for the new investor or small investor and therefore small fields will become much more attractive targets. However, even for the large oil companies the IRR on small fields would improve considerably as a result of the tax credits, even if companies have already used their tax free allowance.



The NPV@10% is much better for new and small investors. For large companies, which have already used their tax free allowance, the NPV break even point is a WTI price of $ 40 per barrel.

For lower cost 50 million barrel fields the WTI break even prices for the NPV@10% are lower, as indicated in the small table below.

	First 50 million	Next 50 million
High Costs	< $ 60	$ 40
Average Costs	< $ 60	$ 35
Low Costs	<$ 50	$ 30



The EMV@10% is much better for small and new investors. For large oil companies who have already used their tax free allowance, the EMV has a break even price which is in excess of $ 50 per barrel. This indicates that even for large oil companies, small fields would be more attractive exploration targets up to rather high WTI price levels under the PPT.

For EMV@10% the WTI breakeven prices are lower under lower costs, but higher than the NPV values.

Generally, the PPT makes exploration for 50 million barrel fields and their development economically more attractive, in particular at low or average prices.

150 million barrels

For the 150 million barrel field with low well productivities and high costs, the IRR is always much better for a new or small investor and also for a large company.

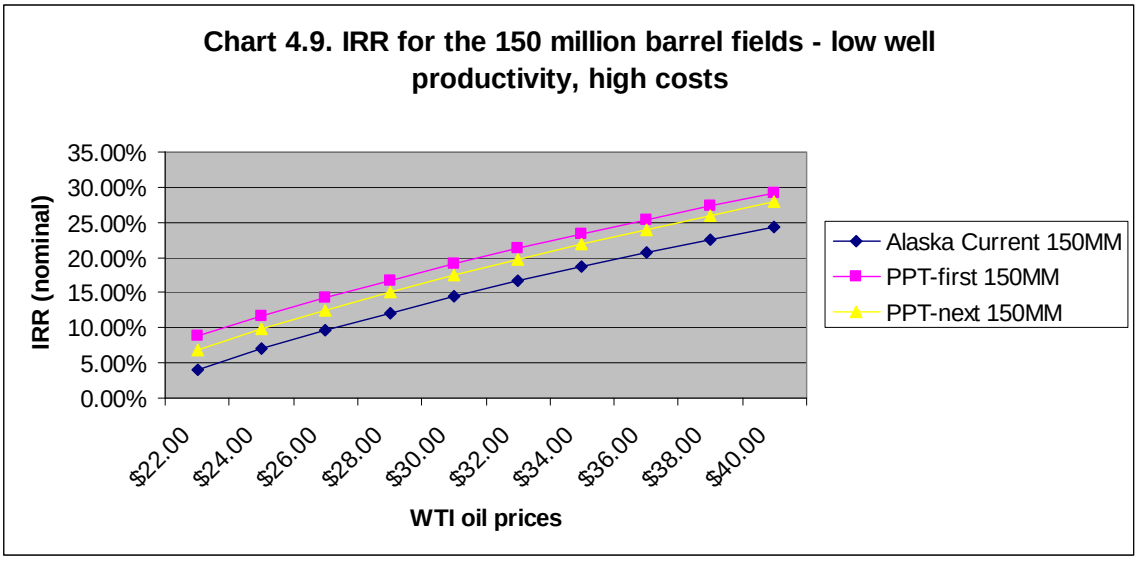
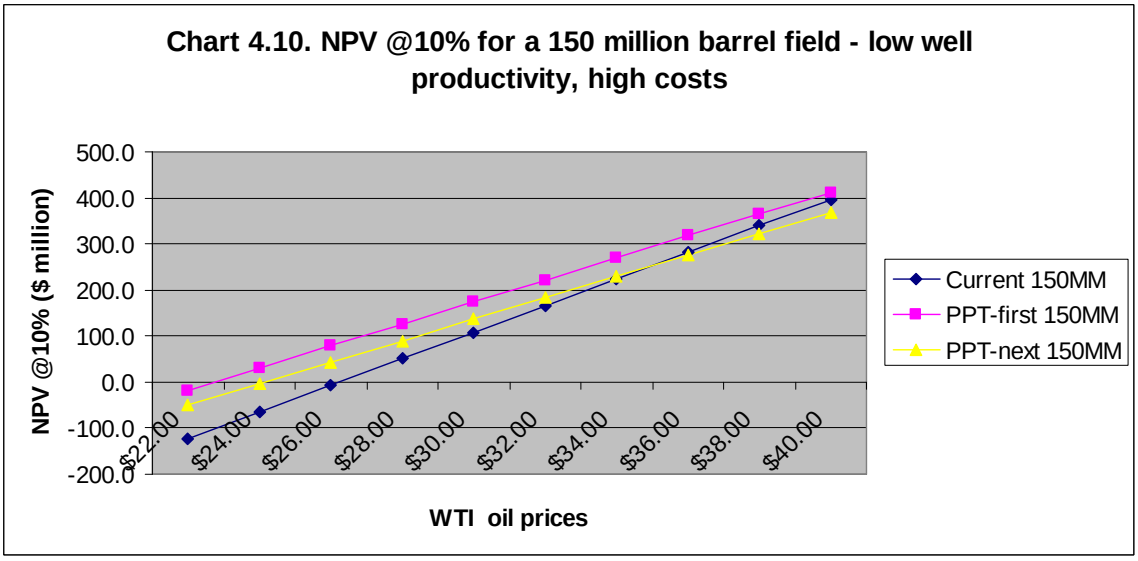
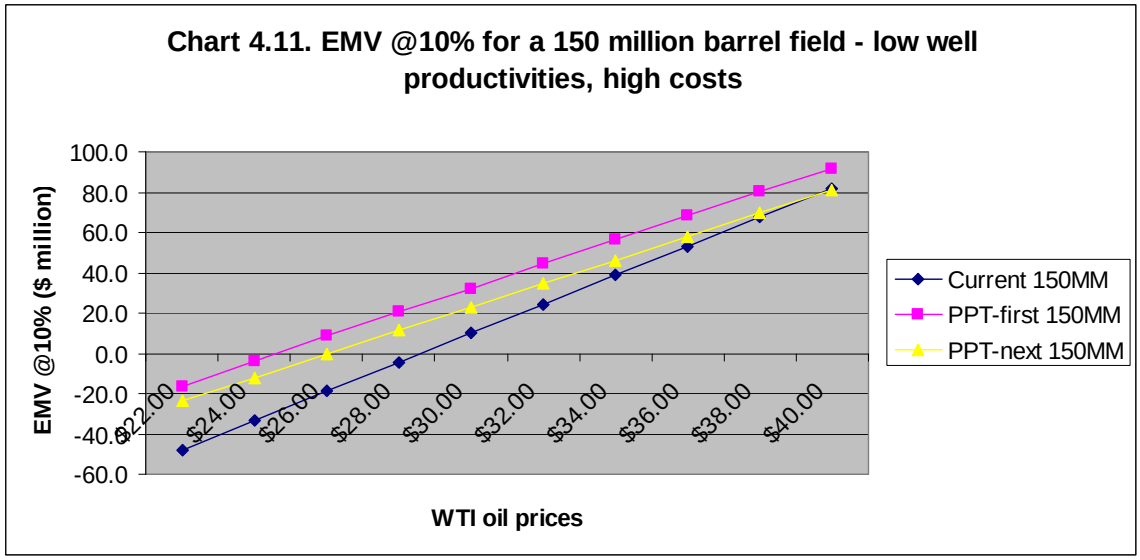


Chart 4.10 illustrates how also the NPV@10% for a 150 million fields for a new or small investor is better over $ 40 per barrel. The WTI break even point is about $ 35 per barrel for a large company, which has already used the tax free allowance.



The EMV@10% for a 150 million barrel field is better for a WTI price range of well over $ 40 per barrel. The WTI break even point for a large company is about $ 39 per barrel.

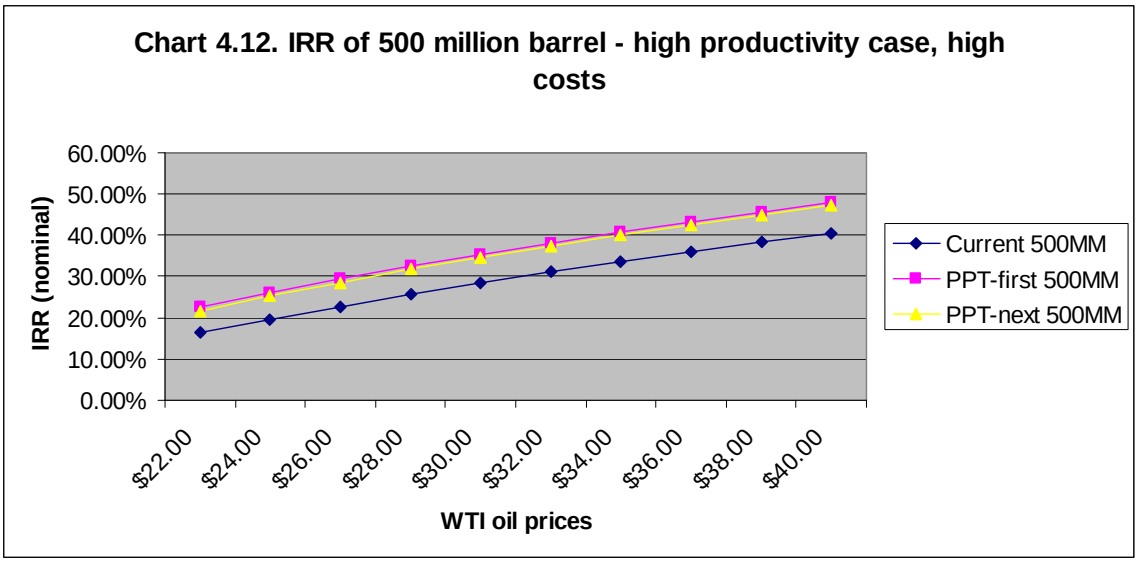


For the average and low cost scenarios, the break even points are somewhat less.

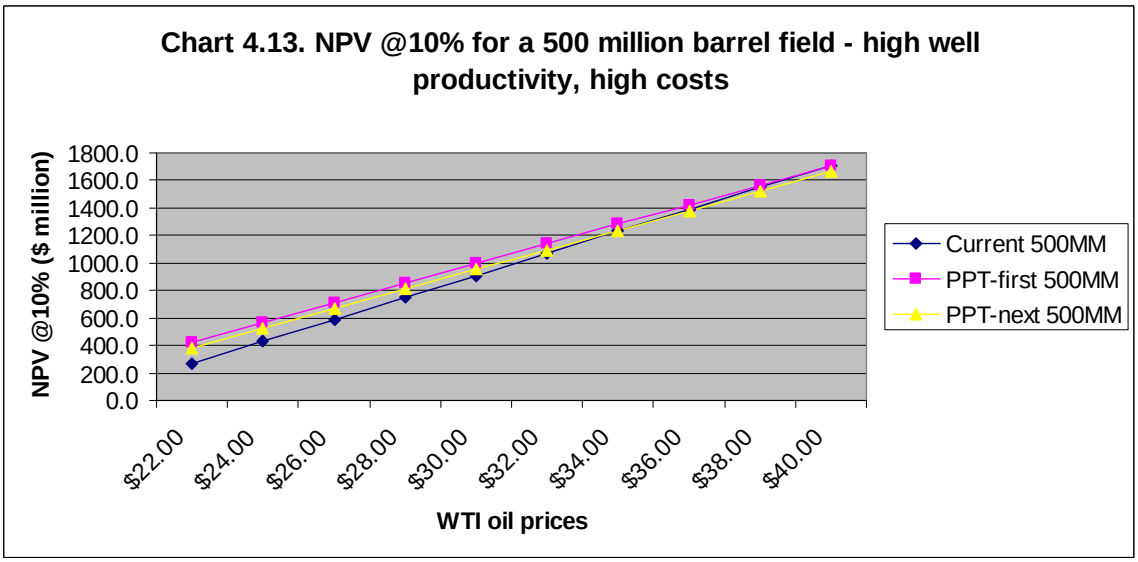
The analysis for the 150 million barrel field indicates that the economics of this field improves for both the new investor and large oil companies, in particular under low and average oil prices.

500 million barrels

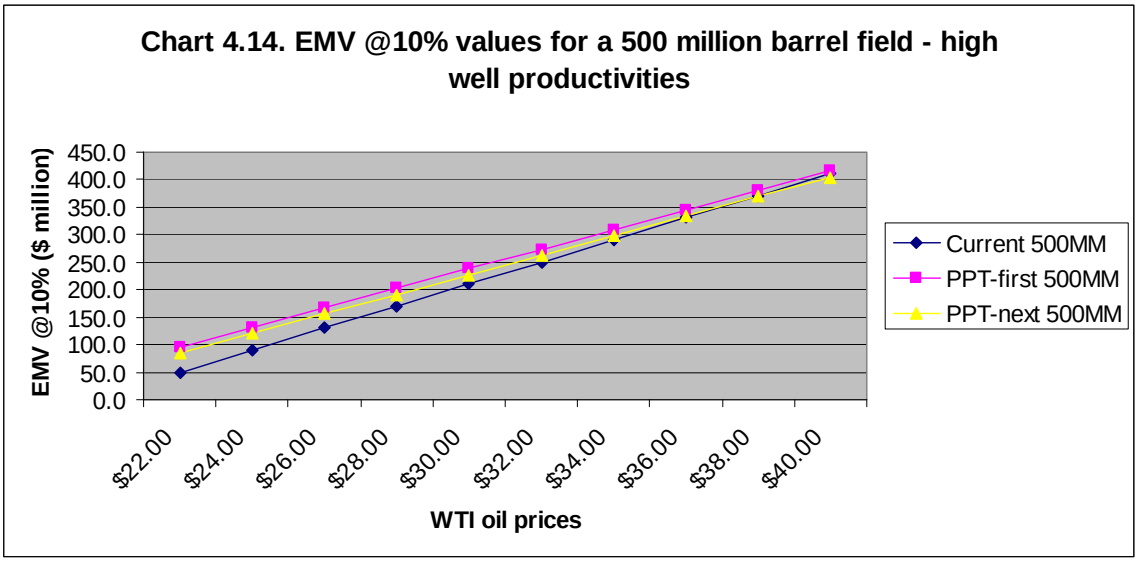
Even for a large field of 500 million barrels, the IRR improves considerably for both the new investor and a large company.



For the NPV@10% and EMV@10%, the WTI break even price for the 500 million barrel fields is about $ 40 per barrel for the new investor and $ 34 per barrel for a large company which already applied its tax free allowance.



For lower costs the break even prices for the NPV@10% and EMV@10% are somewhat lower. For the 500 million barrel, high well productivity, low cost case, the break even price of the NPV@10% is about $ 26 per barrel and for the EMV@10% about $ 28 per barrel for large companies.



It can be concluded that for a 500 million barrel field, the economics for new investors and large oil companies is better under the PPT, in particular for low prices.

Conclusion

In general it can be concluded that the PPT based on 20% tax and a 15% tax credit improves the IRR considerably of investments by new investors or large oil companies.

For targets in the 50 – 150 million barrel range, the NPV@10% and EMV@10% is typically better for new investors over a wide price range. For large oil companies, who have already used their tax free allowance, the NPV@ and EMV@10% is typically better for low and average prices.

For large targets, the NPV@10% and EMV@10% is typically better for low prices and for new investors also for average prices.

In general, the PPT will be a strong encouragement to invest for new investors or to re-invest for small investors since the profitability of ventures under the PPT well exceeds that of the current system.

For large companies with price expectations in the $ 25-$30 per barrel range, the PPT is more attractive from an IRR perspective and equally attractive from an NPV@10% or EMV@10% perspective than the current system. For small fields in the 50 million barrel class the tax is zero at the long term price range.

In general therefore the introduction of the PPT can be expected to result in a higher level of activity in the North Slope and other areas of Alaska.

5. ANALYSIS OF ALTERNATIVE PETROLEUM PROFITS TAX ("PPT") CONFIGURATIONS

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in the interest of providing the maximum information about the PPT it was considered desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

5.1. PPT Rate

5.1.1. PPT income

Sensitivity analysis was done on the PPT rate. Rates from 10% to 30% were studied in detail. The following graphs show the results for the PPT income compared to the current severance tax for 10%, 20% and 30% PPT. These rates were analyzed in conjunction with a 15% tax credit on all capital. The negative cash flow credits were also adjusted to 10% of the negative cash flow, 20% and 30%.

For clarity, the $ 73 million yearly tax free allowance was not included in this analysis. The investment economics are therefore from the perspective of a re-investment by a large petroleum company who has already used the tax free allowance.

The following Charts 5.1, 5.2 and 5.3 show the PPT compared with the current severance tax for the three field combinations that were also displayed earlier in Chapter 4.

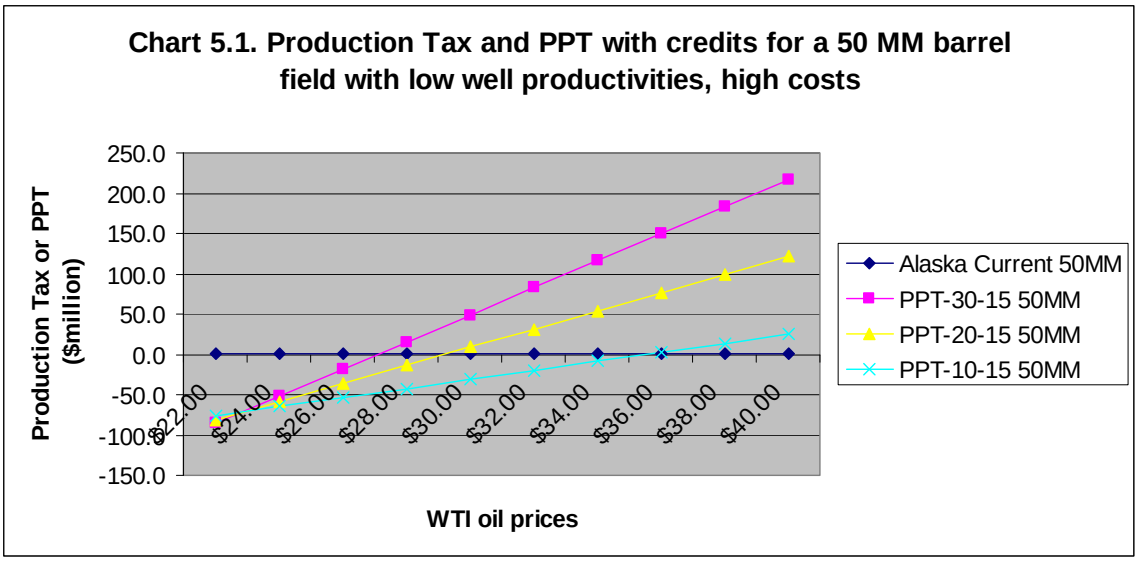


Chart 5.1 shows that a PPT of 10% would be less below WTI prices of $ 36 per barrel, a PPT of 20% would have a WTI break even point of $ 29 and a PPT of 30% a WTI break even point of $ 27 per barrel.

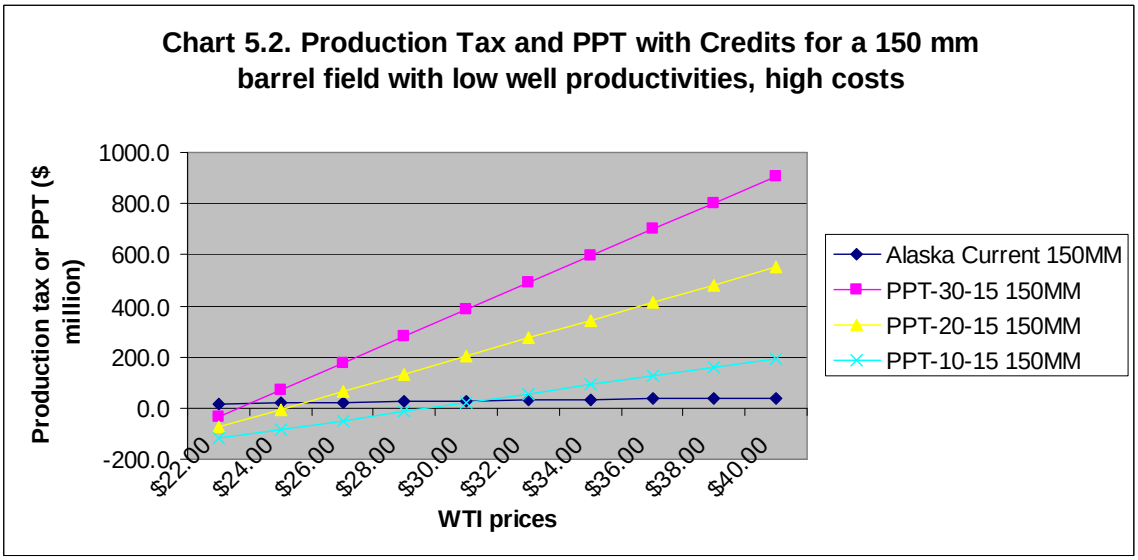


Chart 5.2 shows that a PPT of 10% would be less below WTI prices of $ 31 per barrel, a PPT of 20% would have a WTI break even point of $ 25 and a PPT of 30% a WTI break even point of $ 23 per barrel.

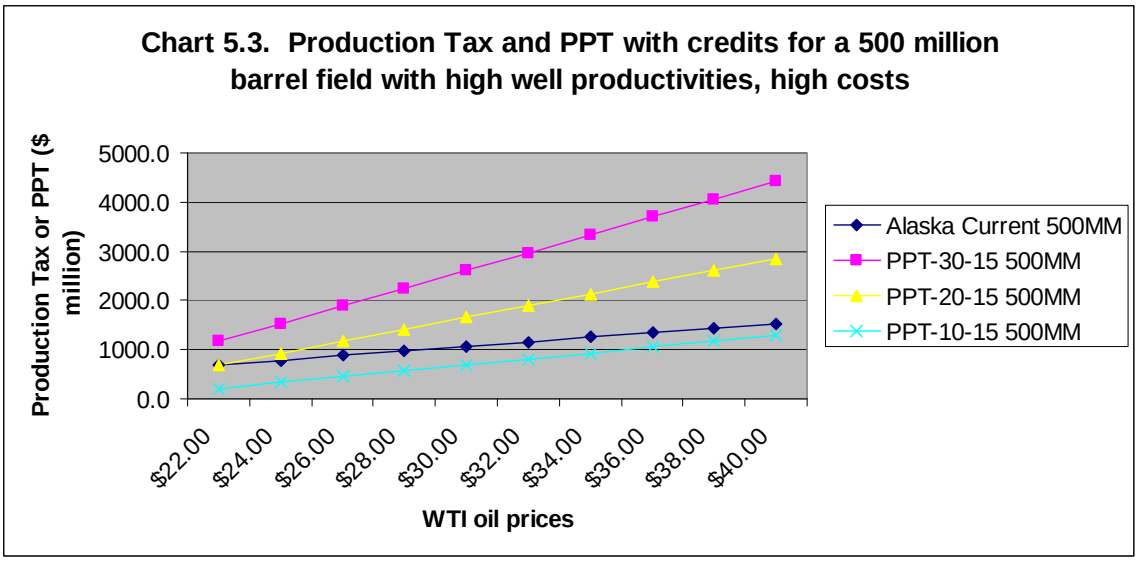


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Chart 5.3 shows clearly that a 10% rate would result in less PPT than the current severance tax for the 500 million barrel field for the entire price range.

A PPT of 20% would have a break even point of $ 22 per barrel and a PPT of 30% would have a much lower break even point.

From these graphs it is clear that a PPT of 10% would be unattractive to Alaska. Both a PPT of 20% or 30% would be attractive and would under reasonable prices result in considerably more revenues for Alaska.

In chapter 8 the international competitiveness of the PPT with respect to re-investment will be analyzed and this analysis will conclude that a 30% rate would be too high.

The following graphs provide more detail for PPT rates between 15% and 20%.

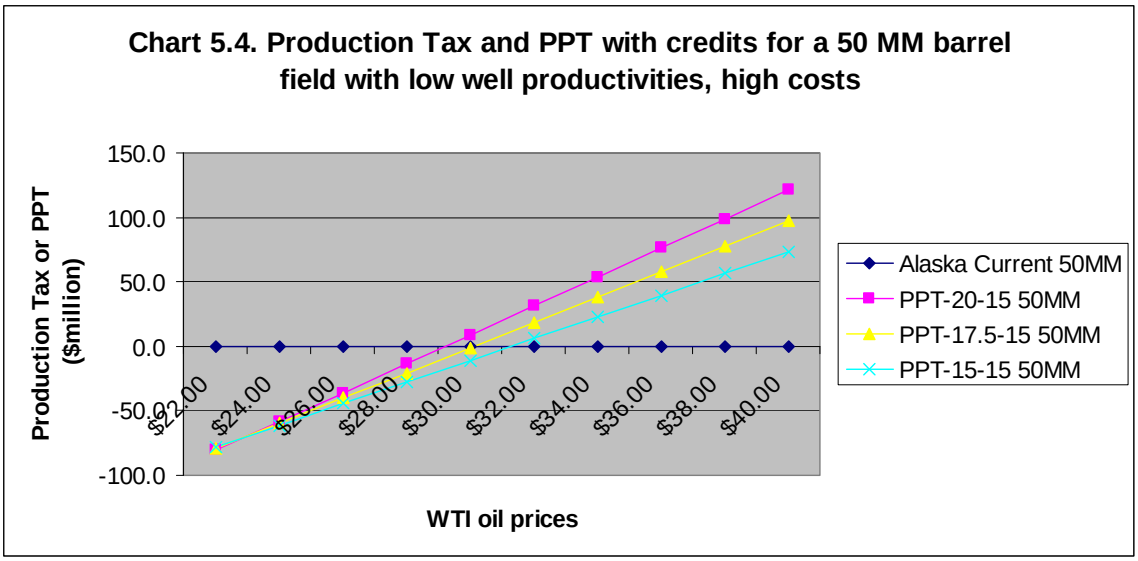


Chart 5.4. Production Tax and PPT with credits for a 50 MM barrel field with low well productivities, high costs
Production Tax or PPT ($million)
150.0
100.0
50.0
0.0
-50.0
-100.0
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Alaska Current 50MM
PPT-20-15 50MM
PPT-17.5-15 50MM
PPT-15-15 50MM

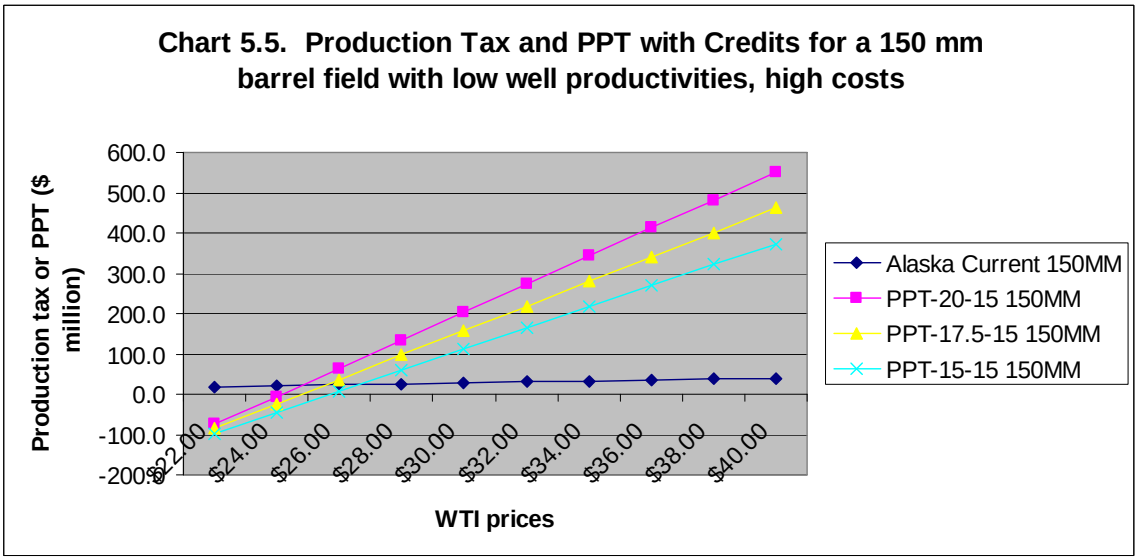
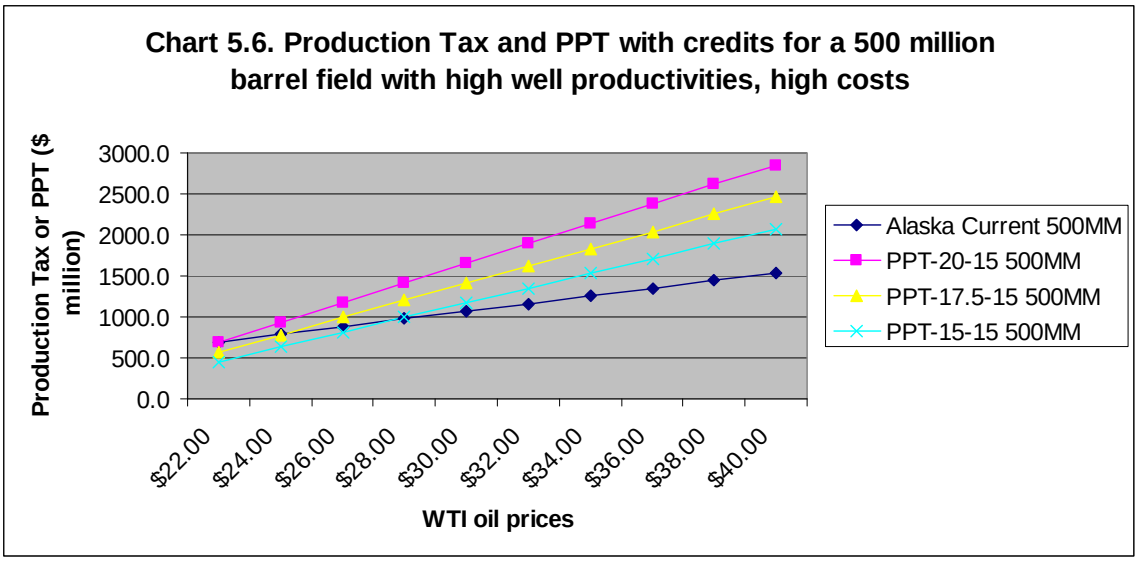


Chart 5.5. Production Tax and PPT with Credits for a 150 mm barrel field with low well productivities, high costs
Production tax or PPT ($ million)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
-100.0
-200.0
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI prices
Alaska Current 150MM
PPT-20-15 150MM
PPT-17.5-15 150MM
PPT-15-15 150MM



It can be seen how even a 15% rate would not provide a clear advantage to Alaska. The WTI break even points for the various fields are too high. The WTI range of $ 27 - $ 31 would expose Alaska too much to the possibility that PPT revenues would actually be less than the current severance tax under average price scenarios.

Only the 20% rate seems reasonable from an Alaska perspective. This rate has a WTI break even range of $ 22 - $ 29 per barrel.

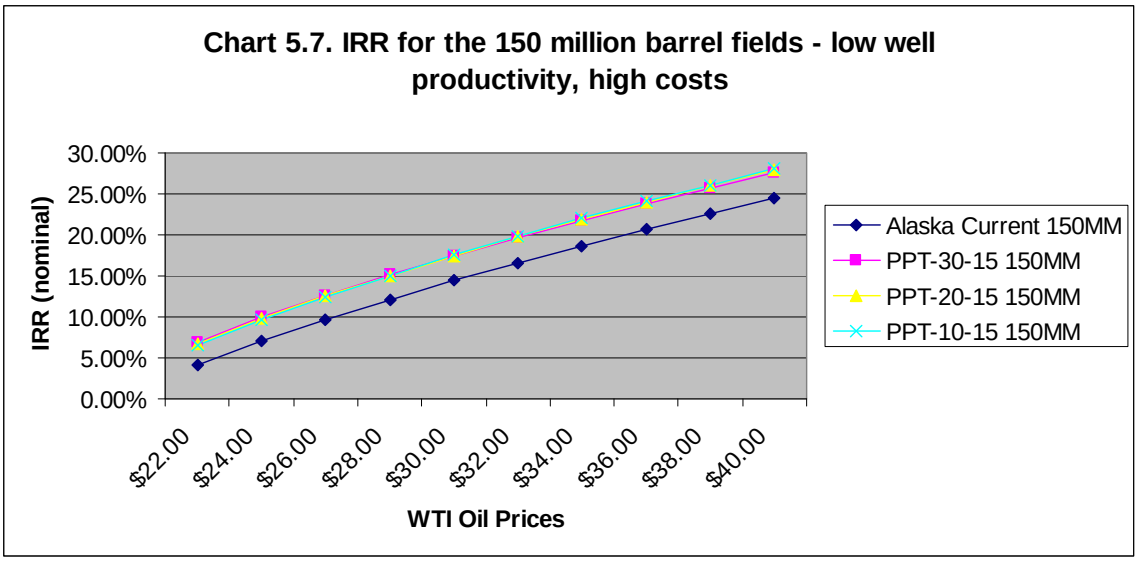
5.1.2. Impact on Investors

The following graphs are for the 150 million barrel field. However, the results for the other fields are similar in trend and nature.

Under all PPT rates the IRR is approximately the same and is much higher than the under the current severance tax. Whether the PPT rate is 30% or 10% results about in the same IRR. The reason is the fact that the negative cash flow losses can be converted into tax credits at the PPT rate and these credits can be traded. In other words the State of Alaska equally shares in the negative and positive cash flow. This creates a situation where the IRR is about the same for a high or low PPT rate. It should be remembered that the IRR is a profitability yardstick which measures the speed at which profits are being made, not the amount of profits.

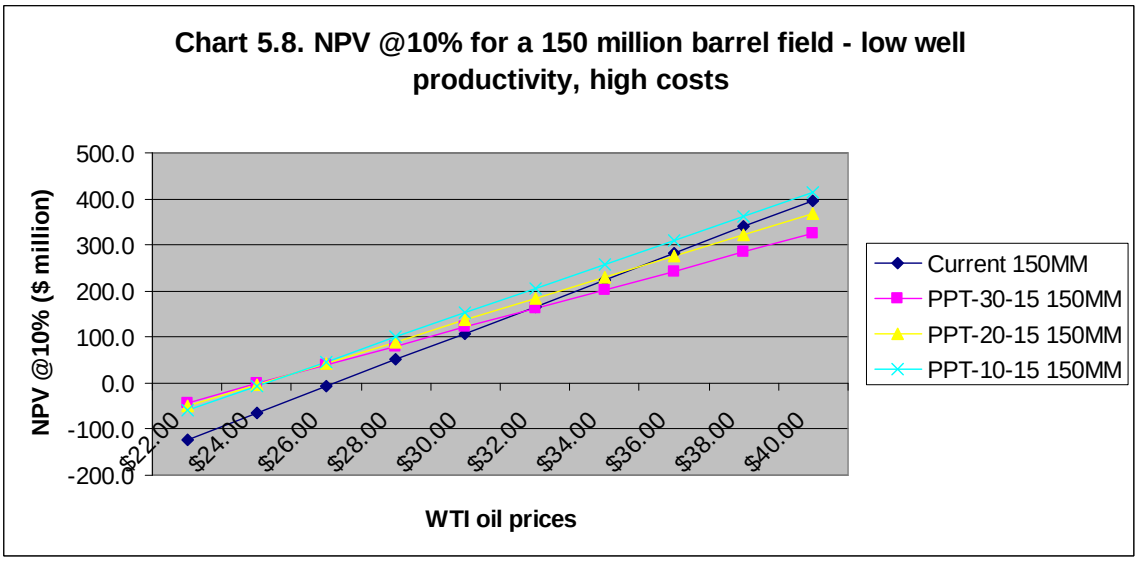
Additionally, there are the 15% tax credits on capital expenditures, which are unaffected by the PPT rate.

The IRR effect of different rates can be seen in Chart 5.7.



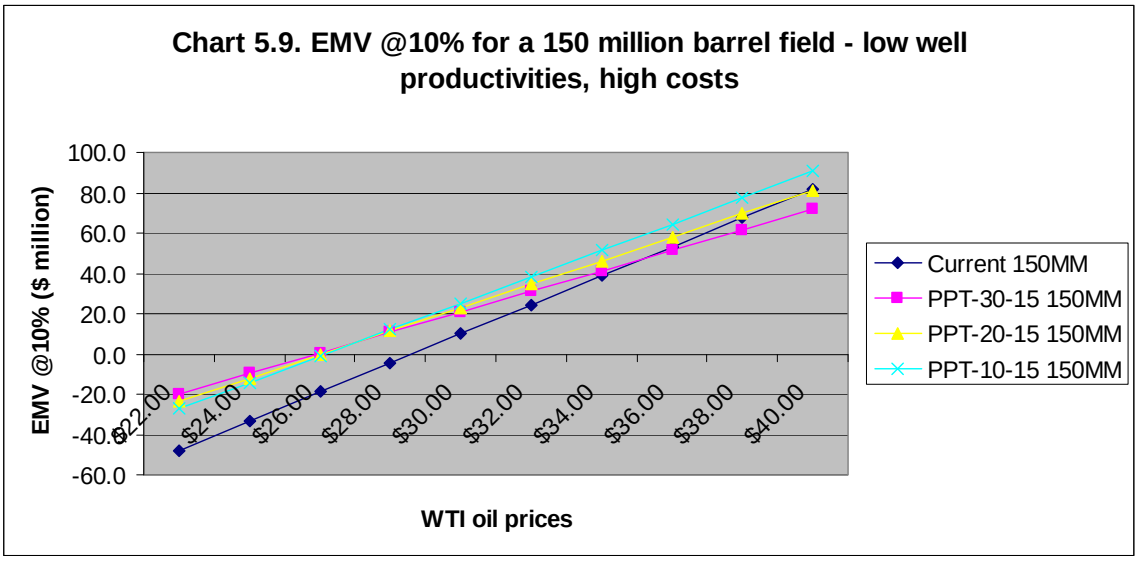
The NPV@10% nominal is, of course, affected by the PPT rate. As can be expected a PPT rate of 10% will result in a NPV@10% that is better than the current severance tax for the entire price range.

A PPT rate of 20% would result in a WTI price cross over point of US $ 35 per barrel and a PPT rate of 30% in a cross over point of US $ 32 per barrel.



Also on an EMV@10% basis, the PPT rate of 10% would be better than the current system for the entire price range used in this report.

The cross over points are a WTI price of US $ 39 per barrel for the 20% PPT and $ 35 for the 30% PPT.



Conclusion. From a large existing producer perspective the combination of a PPT rate of 10% and a tax credit rate of 15% would create economics that would be better than the current system for the entire price range. A 20% PPT rate would have a better IRR, but would have cross over points for the NPV@10% and EMV@10%, whereby at high prices, the current system would be more attractive.

5.2. Tax Credit Rate for Capital Expenditures

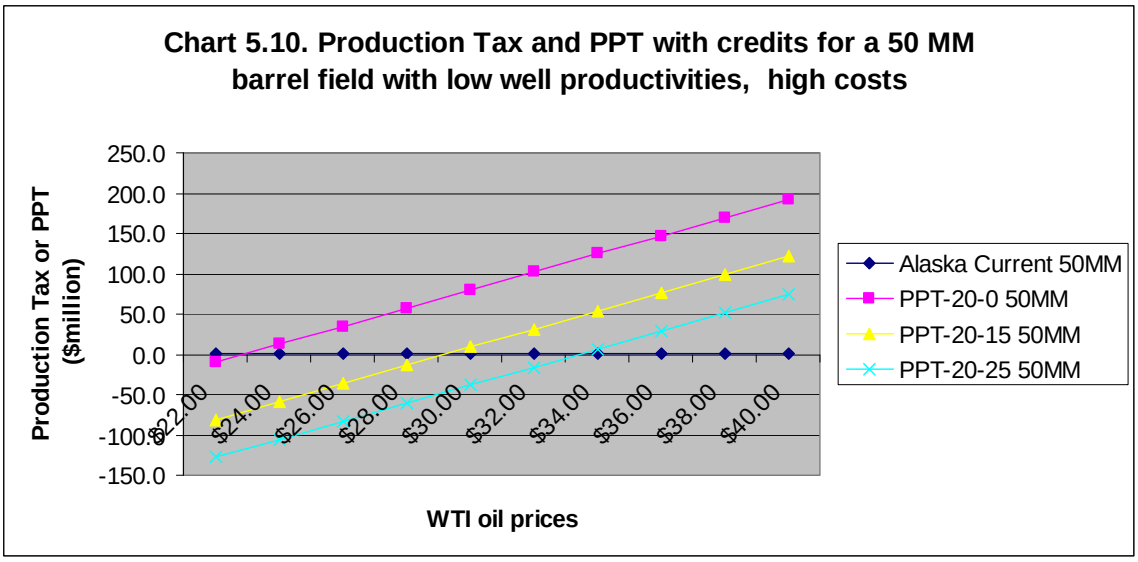
An important factor in the total package is the tax credit on capital expenditures. Therefore, a sensitivity analysis was done on this matter.

5.2.1. Impact on PPT

The impact of the tax credit on capital expenditures is independent of price. The tax credit is a fixed amount and depends on the level of capital expenditures, not the price. Therefore, in Chart 5.10 it can be noted that the PPT curves for the various levels of tax credit are parallel.

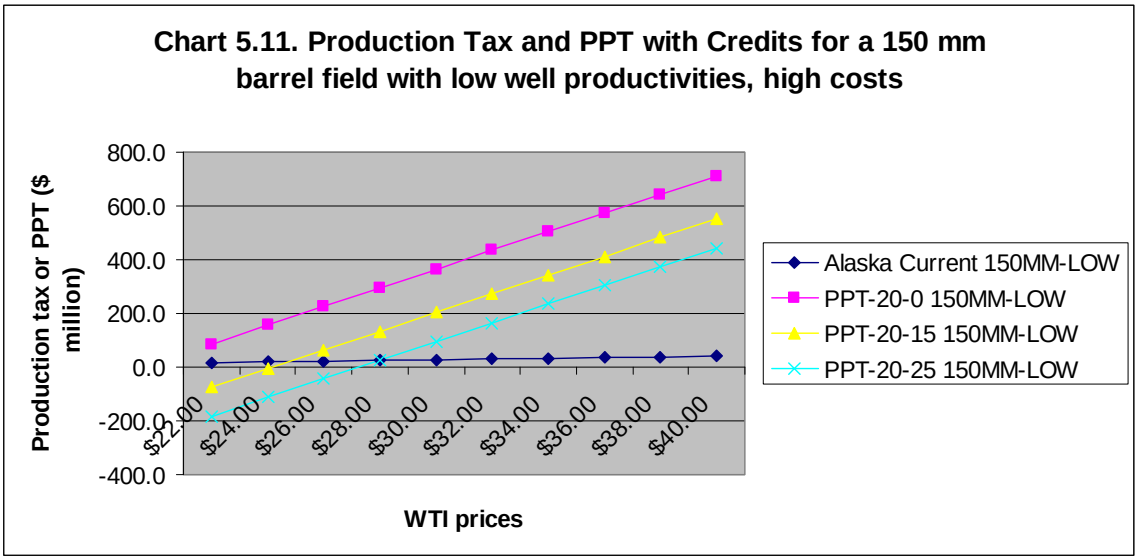
Chart 5.10 shows that above a WTI price of $ 22 per barrel, the PPT based on a 20% rate with no tax credits on capital expenditures would result in a significant level of PPT for a small field, compared with zero severance tax under the current system.

A PPT of 20% without tax free allowance and without a tax credit would therefore result in a rather negative impact on small companies and new investors. This was an important reason to consider the tax credits and the tax free allowance.

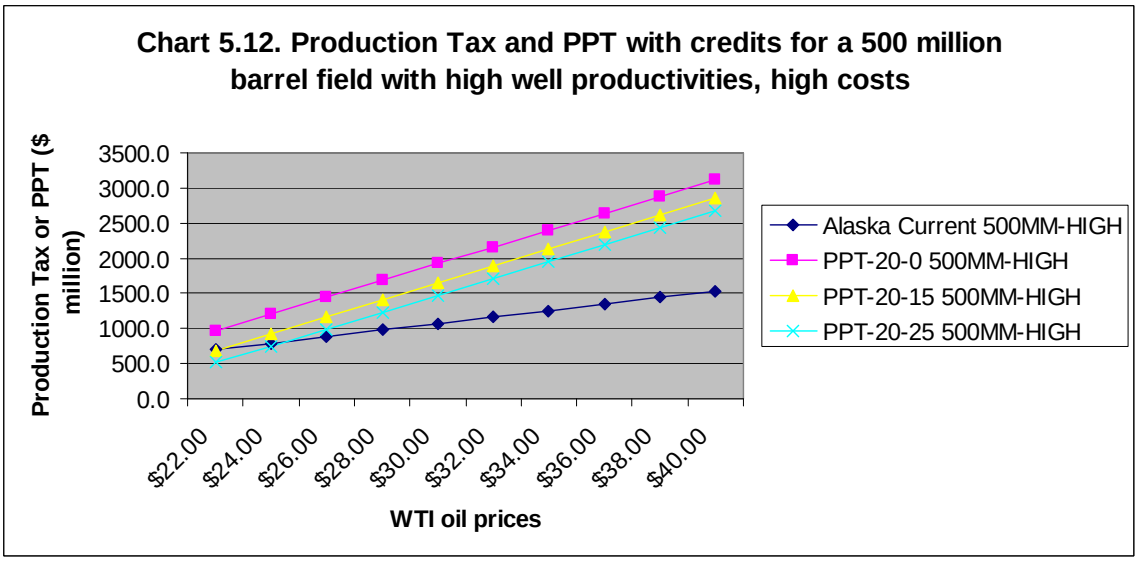


A PPT of 20% with a 15% tax credit results in a WTI break even point of $ 29 per barrel as previously discussed and a 25% tax credit results in a break even point of $ 34 per barrel for a 50 million barrel field.

For the 150 MM barrel field, as can be expected, a PPT of 20% without tax credit and without tax free allowance would result in considerably higher taxes over the entire $ 22 - $ 40 price range. The PPT with a 15% credit would result in a WTI break even price of $ 25 per barrel and a 25% credit would result in a break even price of $ 28 per barrel.



The results for the 500 million barrel field are similar, only the break even prices are lower. For a 15% tax credit the break even price would be $ 22 per barrel and a 25% credit it would be $ 24 per barrel.

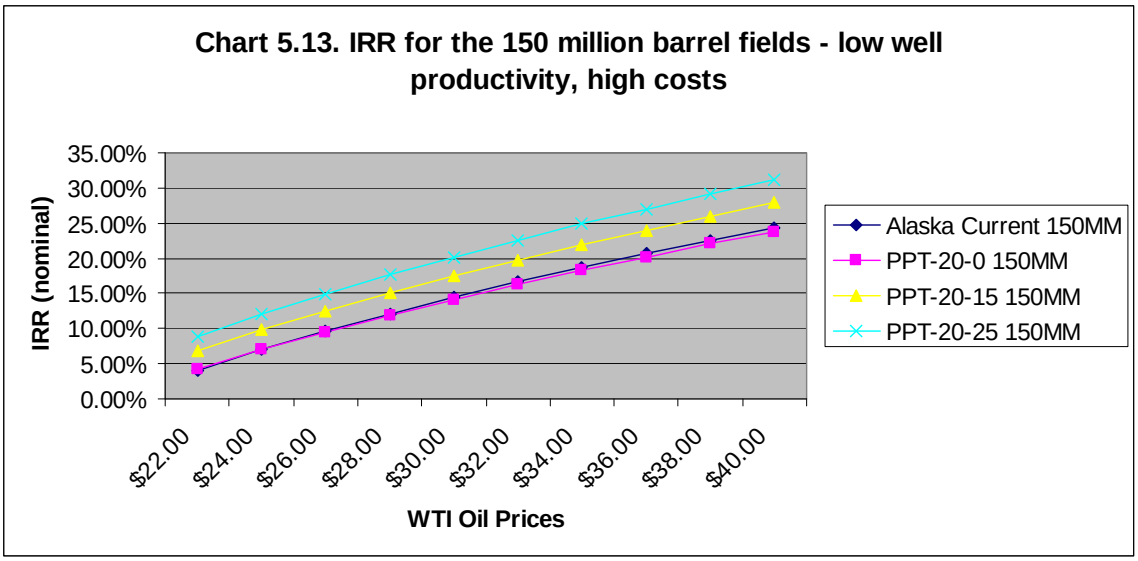


5.2.2. Impact on Investor Economics

The 150 million barrel field is again a good field to illustrate the overall investor economics. Based on this field size, a 20% PPT without tax credits and tax free allowance would result in about the same IRR as the current severance tax system.

It can be seen from Chart 5.13 that the boost in IRR is mainly created through the tax credits on capital expenditures. A tax credit of 15% significantly improves the IRR. A stronger improvement is obtained with a tax credit of 25%. The reason that the tax credits improve the IRR so significantly relates to the fact that the tax credits benefit the investor during the investment phase, early in the cash flow. Since the tax credits can be traded, this effect is the same for small and large companies.

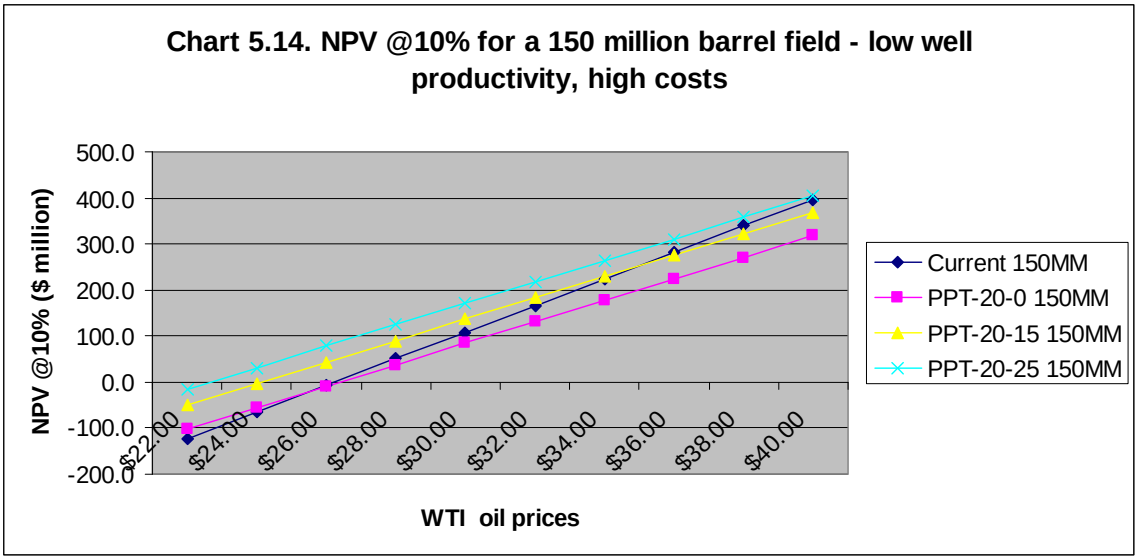
The overall improvement in IRR is an important feature for the world wide competitiveness of Alaska and therefore this is a powerful instrument to attract investment as can be seen from Chart 5.13.



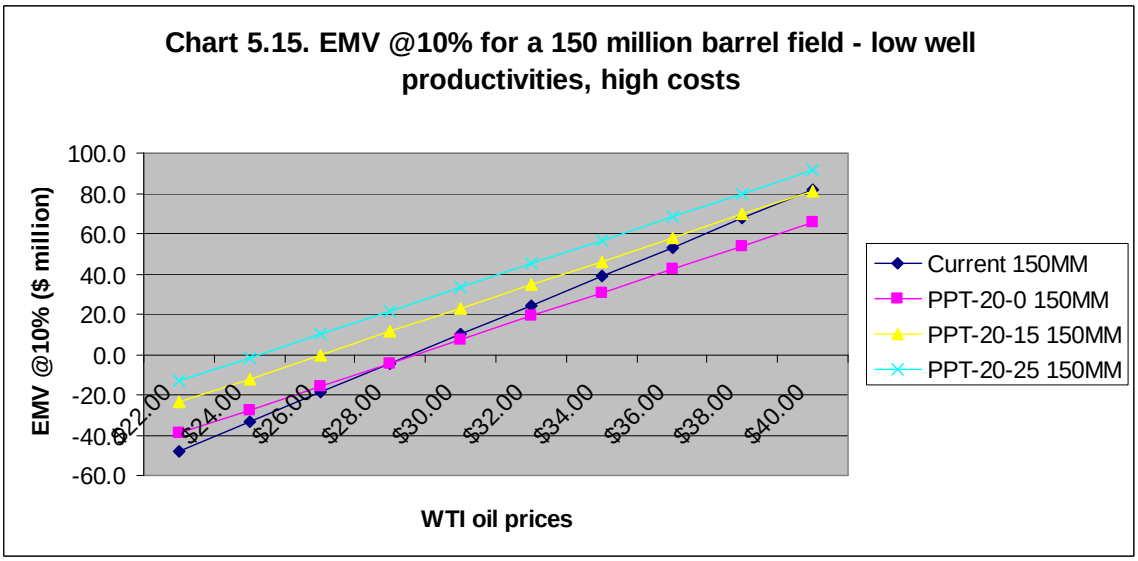
The tax credits also play an important role with respect to the NPV@10%. If a 20% PPT would be introduced without tax credits and without tax free allowance, the result would be that the PPT would be less attractive over a WTI break even price of $ 24 per barrel.

A tax credit of 15% moves the WTI break even price to $ 35 per barrel and a tax credit of 25% put is over the $ 40 per barrel level.

The tax credits therefore play a major role in creating a new fiscal package that results in higher taxes for Alaska above average price expectations, but at the same time encourages new investment.



The tax credits have even a more important impact on the EMV@10%, because these credits will also apply to the exploration phase. In case of a dry hole, the tax credit can be traded, in effect lowering the net costs of exploration. Therefore Chart 5.15 shows a significant impact on the EMV@15% of these credits. With no credits the break even price is about $ 28 per barrel. The break even price improves to $ 39 per barrel with a credit of 15% and well over $ 40 with a credit of 25%.



The results of the analysis clearly indicate that a PPT without tax credits would be received unfavorably by investors.

At the same time a tax credit of 25% would make the fiscal system more attractive in the entire $ 22 - $ 40 price range. The introduction of such a strong tax credit would expose Alaska over time to the fact that PPT payments may decline over time, as fields become smaller and more costly. Tax payments may reduce strongly over time. This seems an incentive that is too strong and too risky for Alaska.

5.3. Tax Free Allowance

As was already concluded from Chart 5.10, even if a 15% tax credit would be adopted, small companies and new investors would still pay PPT over a WTI price of $ 29 per barrel. These companies would not pay severance tax at all on such small fields with under the current system. Therefore, a 20% PPT with a 15% tax credit may be considered unattractive by small companies, since it means that they may have to be PPT under high prices, even on small fields. Also for new investors, looking at modest oil field targets, the need to pay a PPT under high prices would be negative factor.

It is for this reason that an additional feature is recommended to protect the small companies and to encourage new investors more strongly. This feature is the tax free allowance on up to $ 73 million of cash flow per year.

Following is an analysis of this feature, with sensitivity to an allowance of $ 50 million per year and $ 100 million per year.

5.3.1. Impact on PPT

Chart 5.16 provides the PPT on a first 50 million barrel field with full application of the tax free allowance. The graphs shows clearly that for the price range of $ 22 - $ 40 per barrel the PPT would be negative. This is because there is no or little tax payable and the tax credits easily offset the tax that may have to be paid.

However, the graph also shows that for the $ 50 million allowance, the WTI break even price would be about $ 43 per barrel. Therefore under high oil prices, over $ 43 per barrel, small companies would still pay some PPT. This still may create some concern, when compared to the current severance tax.

As indicated above, economic analysis was also done for the price range $ 10 - $ 60 per barrel. This analysis indicates that the WTI break even point for $ 73 million tax free allowance would be $ 50 per barrel and for $ 100 million it would be $ 56 per barrel.

It should be noted that the tax free allowance would be applicable to all companies, the large and small ones. The DOR analysis, to be presented in a separate report, indicated that a $ 100 million allowance would reduce the overall Alaska PPT payable too much. Therefore, this level is too high.

For this reason the $ 73 million level was selected. Despite, the fact that small companies and new investors will pay some PPT when prices are over $ 50 per barrel on this 50 million barrel field, it should be noted that otherwise the tax credits they receive improve the economics considerably. Therefore, this seems a reasonable balance.

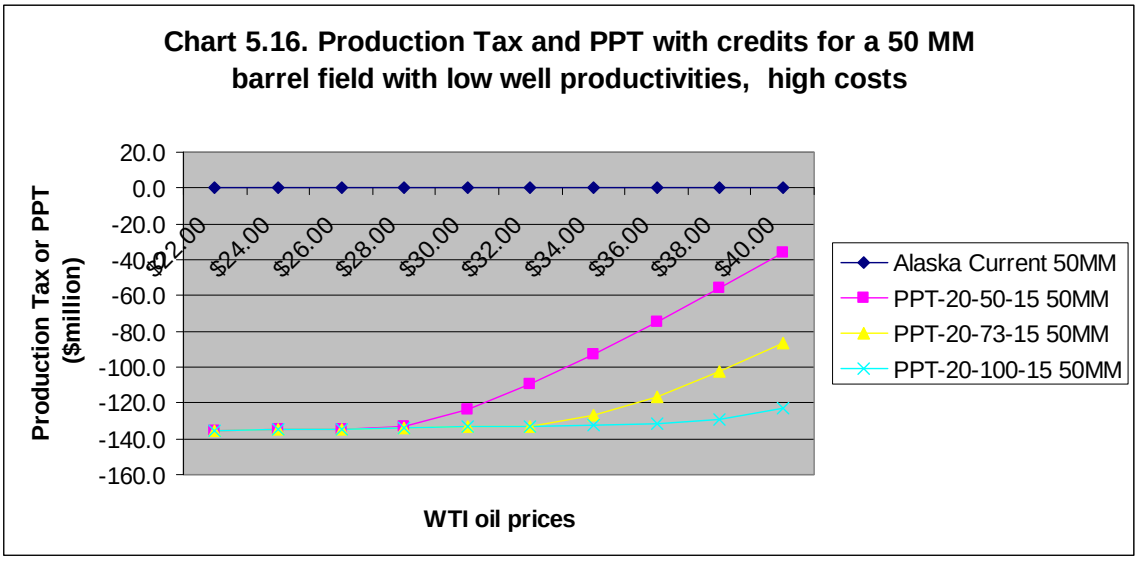


Chart 5.17 indicates that a $ 73 million tax free allowance would result in a significant reduction of PPT on the first 150 million barrel field as well, resulting in a very material improvement of economics. This means that some of the larger new companies may be interested in more actively considering Alaska for the new first investments.

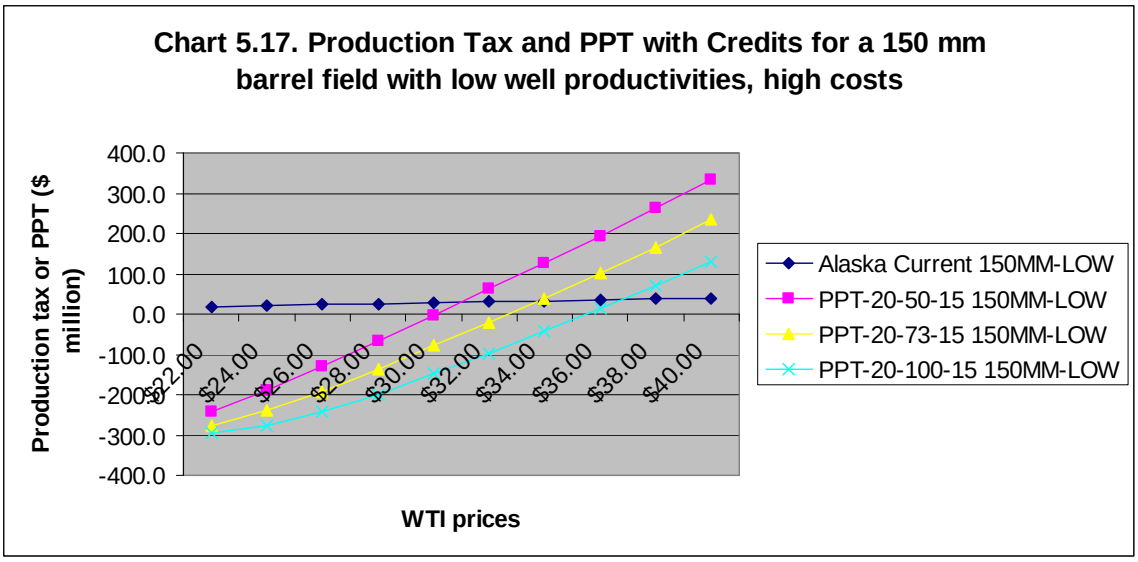
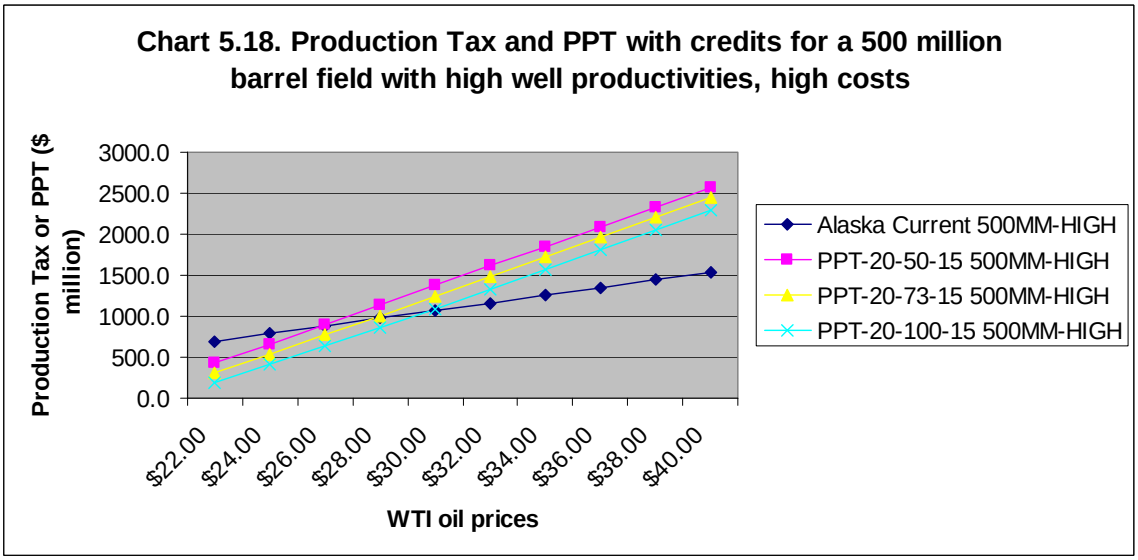


Chart 5.18 indicates that even on a $ 500 million target the tax free allowance will provide a material improvement in PPT for a new investor.



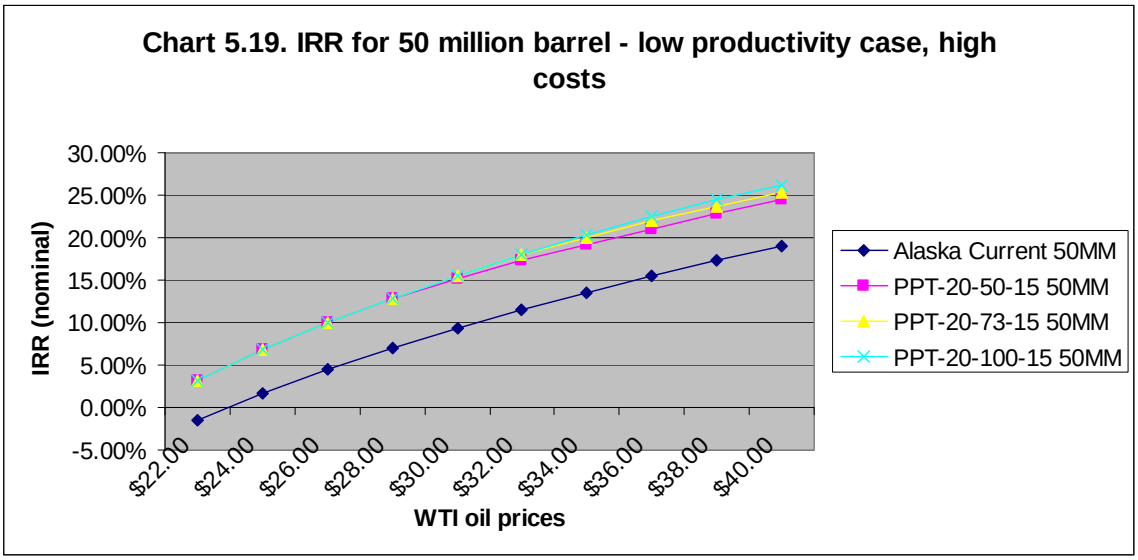
The $ 73 million tax free allowance will not only assist small companies, but will also attract new large potential producers to Alaska. The positive impact is material on investments in the first large fields.

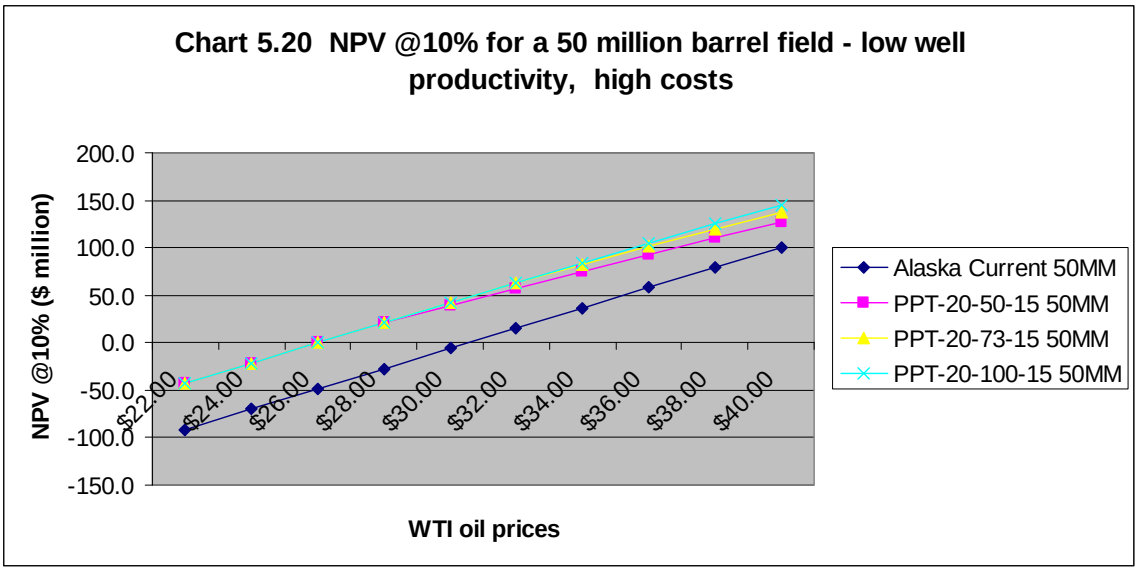
5.3.2. Impact on investor economics

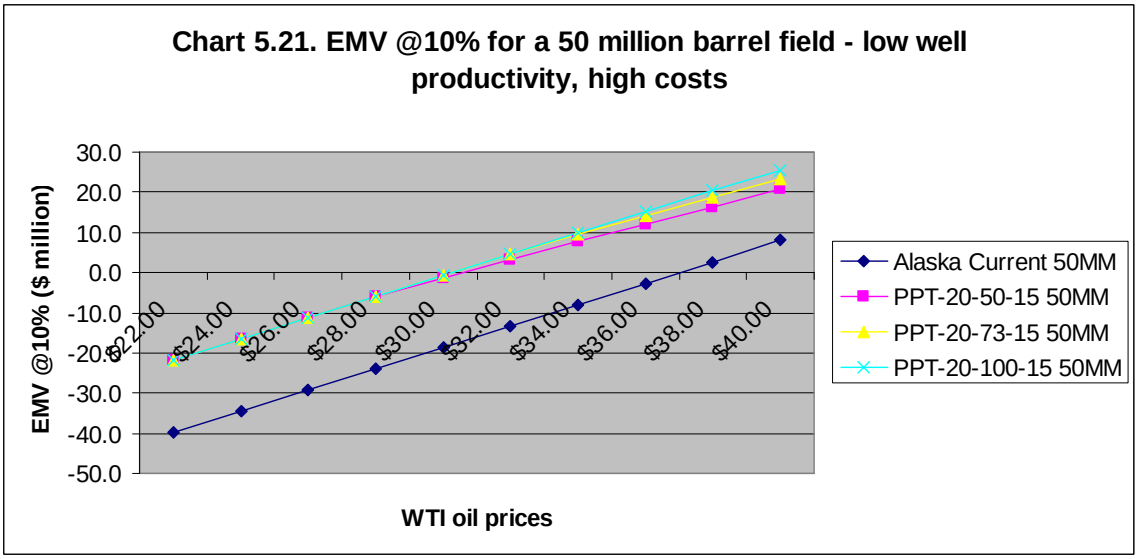
The following graphs relate to the 50 MM barrel field, which is the important field to evaluate the impact on small and new investors.

All the charts 5.19, 5.20 and 5.21 indicate that at low prices it makes no difference whether a tax free allowance of $ 50 million, $ 73 million or $ 100 million is applied, since in all cases $ 50 million is sufficient not to pay the PPT and the higher levels of tax free allowance have therefore no impact.

For higher prices the impact is rather modest. The reason is that the amount of profit subject to tax in all cases is modest. The tax free allowance therefore does not impact much on the traditional profitability indicators for the small 50 MM barrel field.







With respect to small fields and tax free allowance in the range of $ 50 to $ 100 million is adequate. A level of $ 200,000 per day was selected because this is administratively easy and it is also material for larger fields, as was indicated above.

5.4. Other PTT variations

Other variations to the PPT were also considered, but are not recommended. Following is a listing of items that was considered.

Differential tax credit

Instead of a flat tax credit of 15%, it is possible to consider different levels of tax credits for different activities. For instance, development of conventional oil and gas could be a 10% credit, exploration could be a 15% credit and development of heavy oil a 20% credit. The advantage of this approach is that it makes the credit more targeted towards investments in opportunities that seem to justify such credits. The State of Alaska would therefore re-distribute the credit to "where it is most needed".

This approach is not recommended. The main reason is that it would be difficult to properly audit and verify all the different classes of capital expenditures. It could also lead to many disagreements among companies and the State of Alaska.

A more detailed analysis will be provided for Heavy Oils in Chapter 10.

Uplifts

Instead of tax credits it is possible to provide uplifts. Uplifts are extra deductions of capital expenditures. For a particular tax rate a particular level of uplift corresponds to a level of tax credit. For instance, for a 20% PPT a 50% uplift would be equal to a 10% tax credit. Uplifts and tax credits can therefore be used in order to create identical economic effects. However, it would be more complicated to have separately uplifts and tax credits based on negative cash flows and allow both the uplifts and the tax credits to be traded. This would create confusion. So it seems easier to simply only adopt tax credits, which can then be traded without distinction.

Carry forwards

A similar issue is related to carry forwards. Instead of converting a negative cash flow into tax credits, it is possible to apply the more traditional way of permitting carry forwards. It is simpler to have both for the uplifts and the carry forwards, tax credits instead.

Minimum Tax

Considerable study was done of the possibility to have a minimum tax. During periods of low oil prices or periods of strong investment, the State of Alaska would always be assured of some type of minimum payment. This would have psychological-political value and would provide some assistance to State budgeting in case of such conditions.

In reality, the minimum tax is not very useful. It is fair to carry forward any minimum tax and offset such minimum taxes from the full PPT to be paid as soon as economic conditions improve. It is highly unlikely that strong investment would co-exist very long with sustained periods of low oil prices. Therefore, it is highly likely that periods of minimum tax would be of limited duration. Under these conditions, the minimum tax becomes really an interest-free loan of short duration. For the long term future of the State this is an irrelevant feature.

In addition, the minimum tax, when applied would complicate the tax credit system and the overall administration of the tax credits, which now would have to be split between tax credits that can be traded and tax credits as a result of minimum tax which cannot be traded. This is a complex system for a very modest purpose.

Furthermore, the minimum tax would interfere with the concept of a tax free allowance. It would mean that small companies and new investors would always pay the minimum tax. This seems contradictory to the objective of providing support for these investors.

For these reasons a minimum tax is not recommended.

6. ANALYSIS OF INTERNATIONAL COMPETITIVENESS OF THE PETROLEUM PROFITS TAX ("PPT")

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in the interest of providing the maximum information about the PPT it was considered desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

The competitive level of PPT that can be sustained in Alaska depends very much on the international framework. As indicated in Chapter 2, this framework has changed rather drastically as a result of the high oil prices.

In this chapter a comparative analysis will be done of proposed PPT with fiscal systems of other countries. It is not possible to isolate the PPT for comparison. The total fiscal terms need to be compared. These total terms include the US Federal income tax.

Eight different fiscal systems were selected for the comparison. The fiscal systems were selected to present a reasonable distribution of high and low government take regimes around the world, in order to ensure that the total comparison reflects the world wide conditions. However, the eight specific areas were all selected based on the level of activity. All eight areas represent significant developments by large international oil companies, including the ones also operating in Alaska. Therefore, it is confirmed that these investment terms result in considerable activity in the particular areas.

The eight areas that were selected are:

- Norway
- UK
- US Gulf of Mexico
- Nigeria
- Alberta Oil Sands
- Angola
- Russia-Sakhalin
- Azerbaijan

6.1. Preliminary economic comments

The comparison will be made on the basis of the same fields as were provided in Chapter 3. These fields reflect a wide enough cost range to be relevant for international conditions. In order to provide an overview over the entire cost range the High Cost and the Low Costs scenario results will be compared. Also to test a large range, graphs for the 50 MM and 500 MM barrel fields will be provided.

A major difference between Alaska North Slope and most other jurisdictions in the world is that the net back value at the well head in Alaska North Slope is much lower than in most other jurisdictions, due to the high transport costs and a quality of crude oil that is less than WTI or Brent. Therefore, an international comparison has to take this difference into account.

Therefore all fiscal systems will be compared on the basis of the same WTI price. For each system an approximate net back will be included in the analysis. The net backs differentials relative to WTI are the following:

Jurisdiction	Net back differential
	($ per barrel)
Alaska-North Slope	$ 7
Norway	$ 1
UK	$ 1
US Gulf of Mexico – Deep water	0
Nigeria – Deep Water	$ 2
Alberta – oil sands	$ 2
Angola	$ 2
Russia-Sakhalin	$ 1
Azerbaijan	$ 6

First fiscal comparisons will be made between Alaska and each jurisdiction and in Chapter 6 subsequently an overall rating will be provided in Chapters 7 and 8.

The main emphasis in this report is an analysis of the attractiveness of Alaska to new investors. Therefore, for the analysis of the international competitiveness of the PPT the $ 73 million allowance will be included.

Also for convenience two fiscal systems are included in each graph. In order to make the graphs easier to analyze typically a system with a high government take and a low government take selected.

The main emphasis of the analysis will be on the $ 22 – $ 40 per barrel WTI price range. This is the long term price range which is still applied by most oil companies. As indicated in Chapter 3, these prices are escalated by 2% per year.

Some fiscal systems feature signature bonuses. These include Alaska, Canada, the US Gulf of Mexico, Angola, Russia, etc. For economic comparison, the signature bonuses were set at zero, since in all cases they are freely biddable or negotiable. Where there were specific requirements for social expenditures, such as in Russia, these expenditures were included in the fiscal terms.

6.2. Comparisons with other jurisdictions

Of course, the attractiveness of the petroleum resources of each country is different. International comparisons on the basis of the same standard fields do not reflect actual investment decisions of investors, which are based on specific prospects and projects in the various countries. These opportunities could be less attractive or more attractive than Alaska. The comparison in this chapter and the subsequent rating in the following chapters therefore serve only as a very general benchmarking of the attractiveness of Alaska terms.

6.2.1. Norway

The comparison between Alaska and Norway is relevant because Norway typically has a high cost environment. Also Norway has seen over the last decade a gradual outflow of capital from the major oil companies and therefore Norway has recently taken some steps to increase the interest of new investors. One of these measures was to provide new investors with a tax rebate equal to the tax value of their losses in case their operations in Norway would be unsuccessful. This is very similar to the proposed Alaska tax credit that can be traded for capital expenditures. Therefore, Norway and Alaska are considering the same type of policies in order to make their jurisdictions more attractive to new investors.

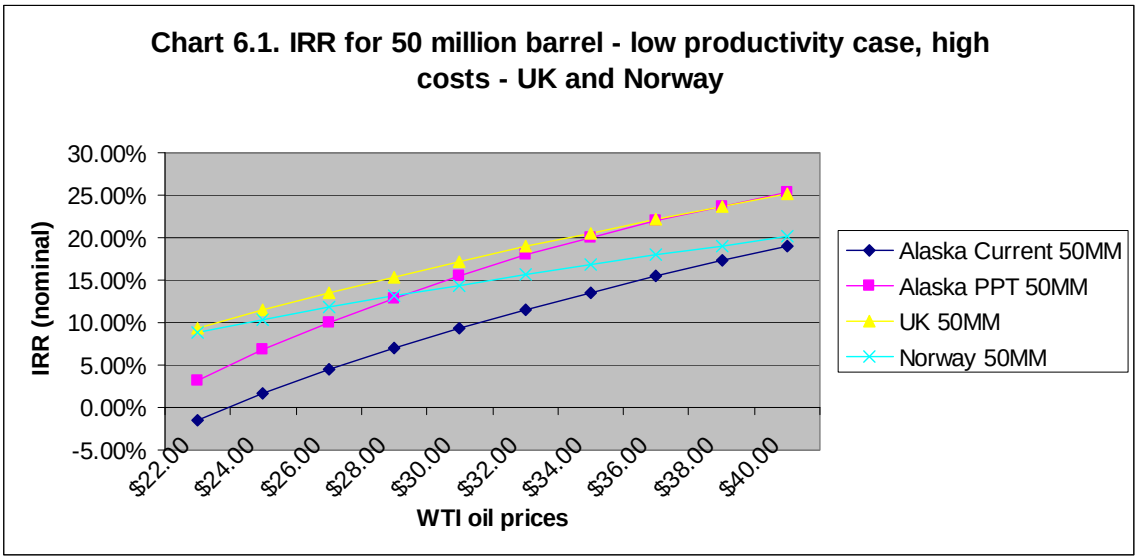
Norwegian terms. The terms of Norway are a basic 28% corporate income tax and a 50% hydrocarbon tax. The hydrocarbon tax has a 30% uplift which can be earned over a 4 year period. Furthermore, there are modest surface rentals. It is assumed that Norway would have a $ 6 per barrel advantage over Alaska North Slope at the well head.

Norway does not provide fiscal stability on its terms.

50MM high cost

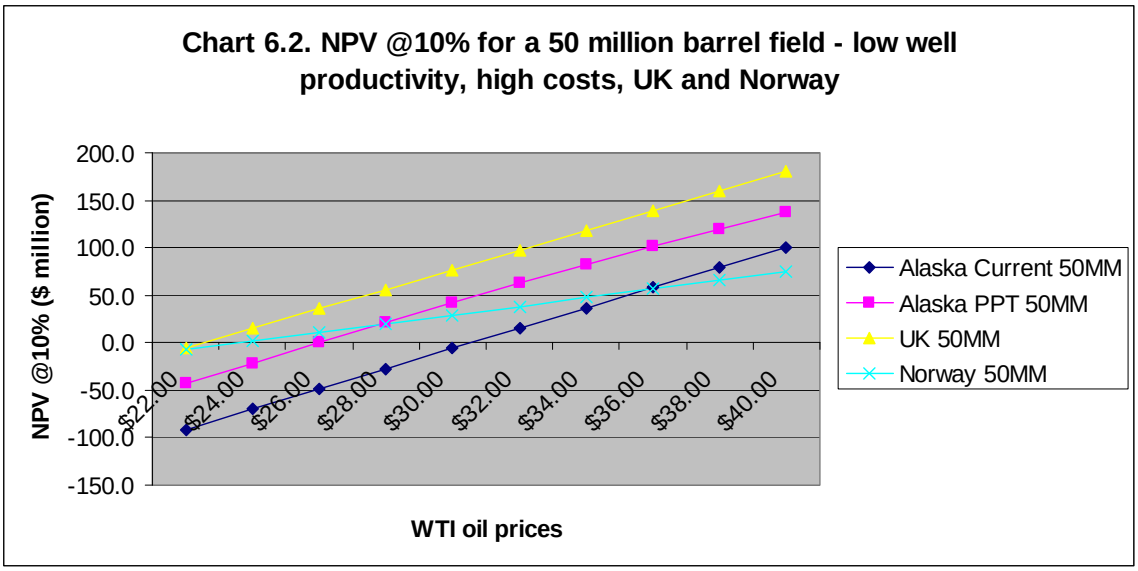
The following graphs display the economics for the UK and Norway for the 50 MM high cost field compared with fiscal conditions for a new investors in Alaska. In this section we will discuss the Norway results.

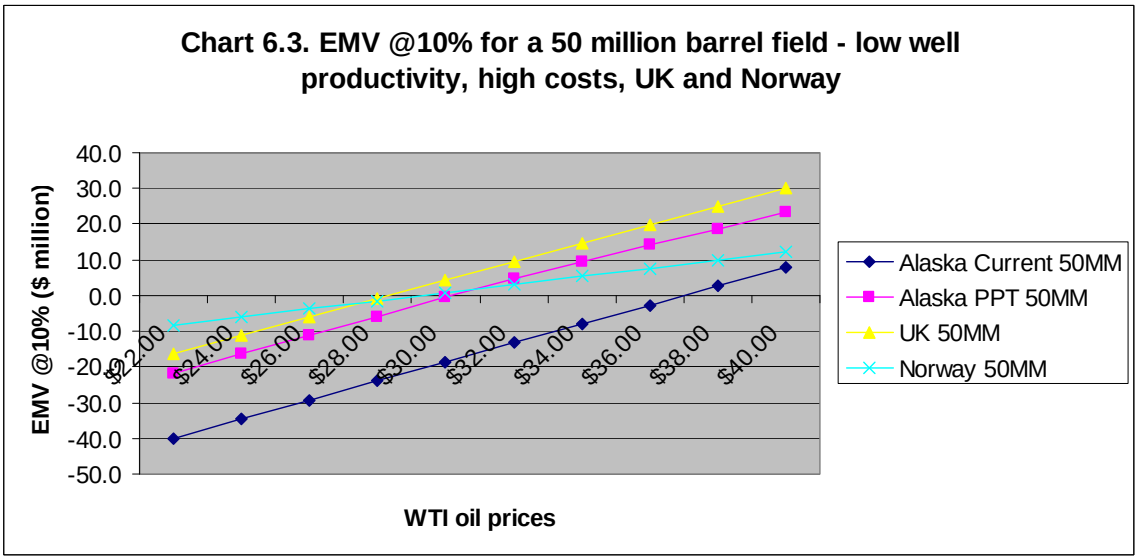
Chart 6.1. illustrates how the proposed PPT relative to the current severance tax will be a very material improvement relative to the Norwegian fiscal system with respect to the IRR. The WTI break even point with Norway was $ 42 per barrel under the current system and this is now reduced to $ 28 per barrel under the PPT proposal. This means that the Alaska PPT terms are now more attractive than the Norwegian terms for prices over $ 28 per barrel. These terms are therefore considerably more competitive than the current severance tax with respect to the IRR.



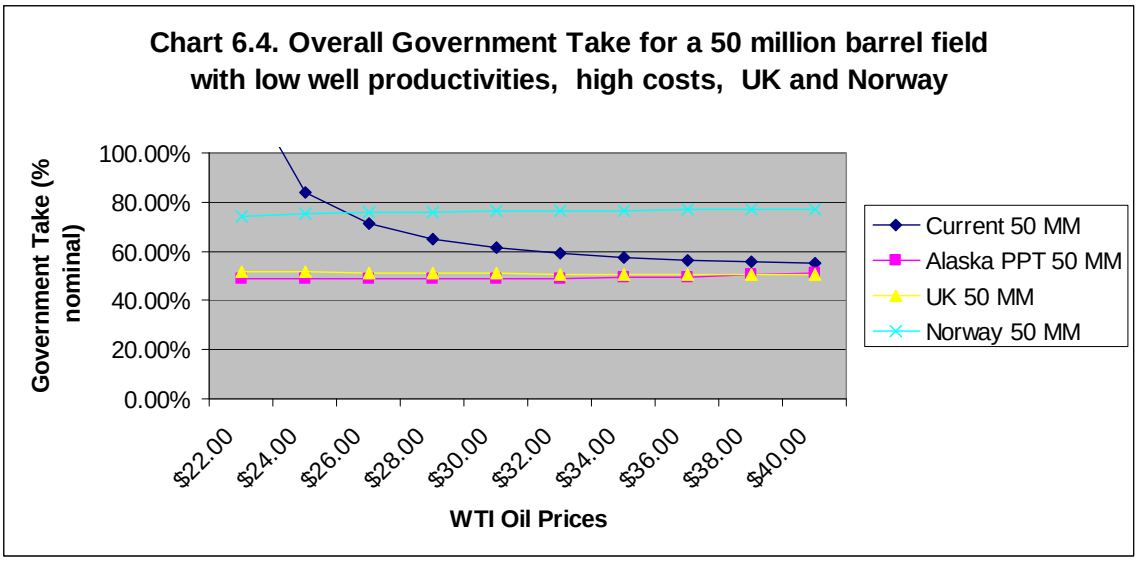
The NPV@10% results show a similar pattern. The WTI break even oil price is $ 36 per barrel under the current severance taxes and would now be $ 28 per barrel.

The PPT would also improve the EMV results relative to Norway. With the current severance tax the WTI break even point would be $ 42 per barrel. However, with the new PPT the EMV@10% is better than Norway over $ 30 per barrel.



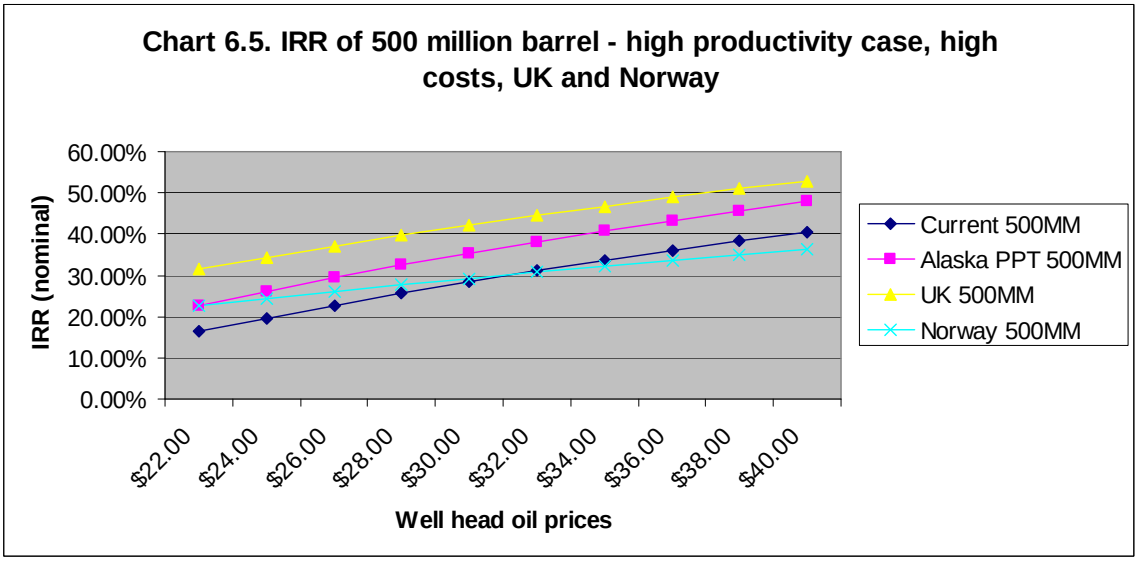


The proposed PPT **lowers** the overall Federal/Alaska government take for this field for new investors. This is because new investors receive the tax credits, but will actually not pay PPT on this field, because of the tax free allowance. This makes the overall government take attractive from an international perspective as can be seen by comparing this with the government take in Norway.



500MM high cost

Also for the IRR of a 500 MM barrel field the PPT system results in a very substantial reduction of the WTI break even points relative to Norway, making the Alaska PPT fiscal system much more competitive.



For the NPV@10% and EMV@10% there are significant improvements in the competitiveness with a lower WTI break even point for the PPT compared to the current severance tax. This is in part caused by the tax free allowance for new investors, which still has a significant impact even on the 500 MM barrel field.

Chart 6.6. NPV @10% for a 500 million barrel field - high well productivity, high costs, Uk and Norway

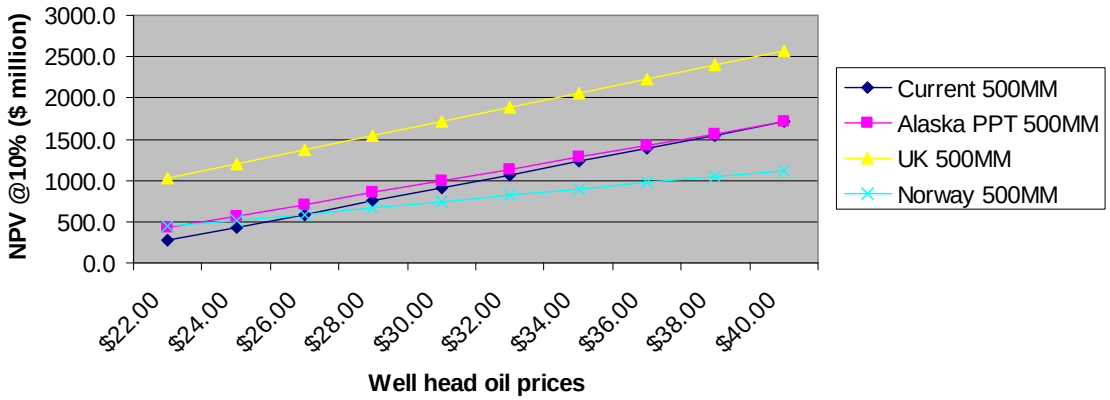


Chart 6.7. EMV @10% values for a 500 million barrel field - high well productivities, high costs, UK and Norway

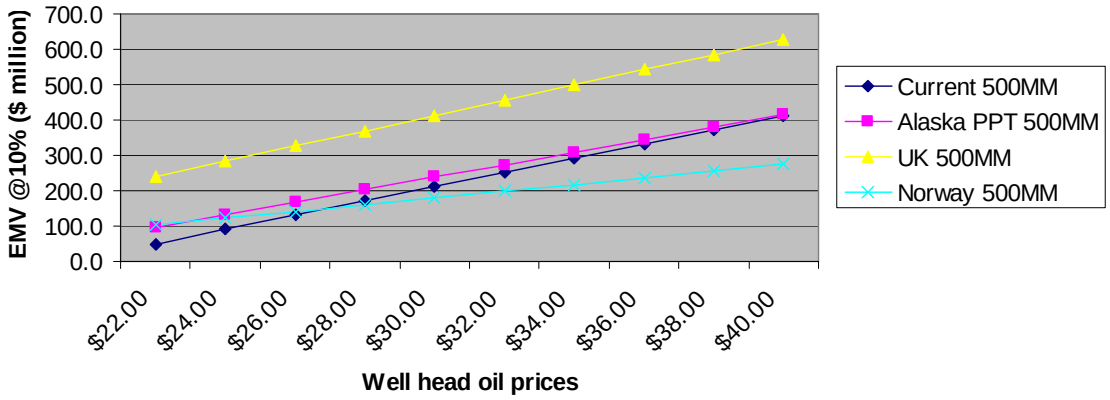
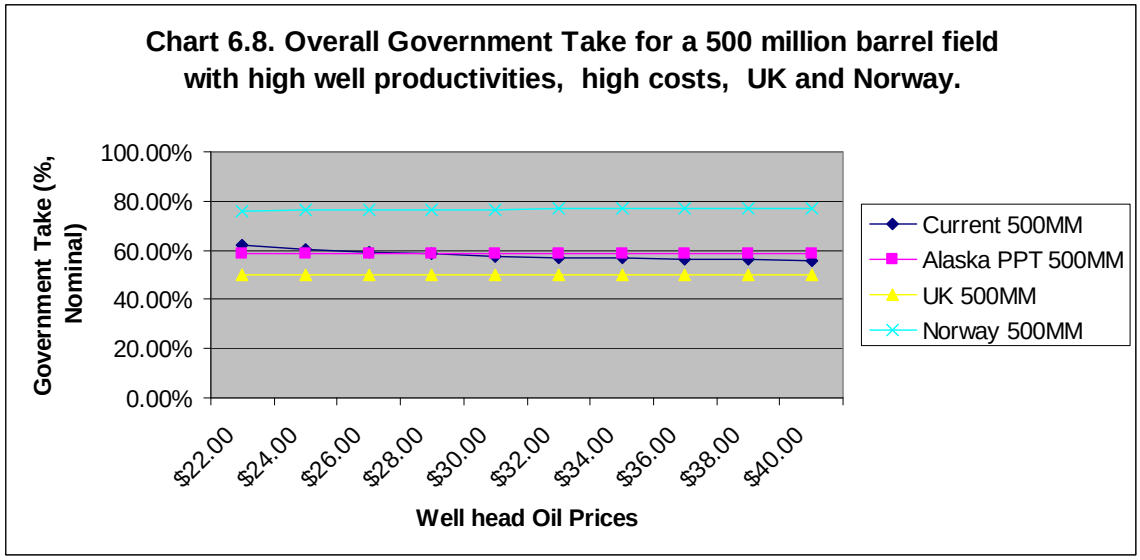
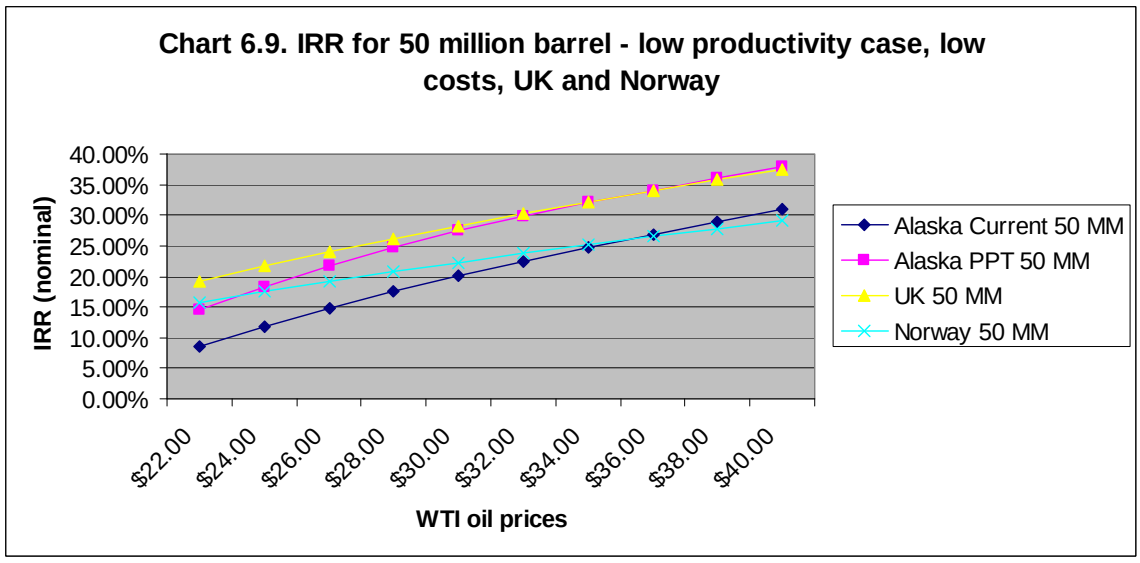


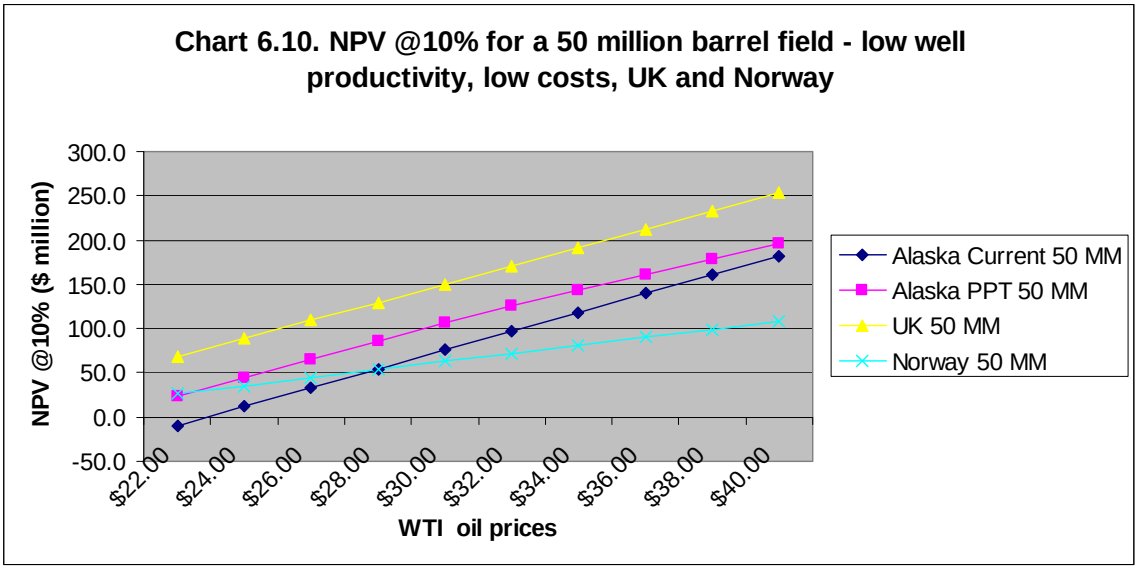
Chart 6.8 indicates that the overall government take for the 500 million barrel field is higher than for the 50 million barrel field as a result of the progressive nature of the PPT. Yet, this government take is still substantially less than the government take in Norway.



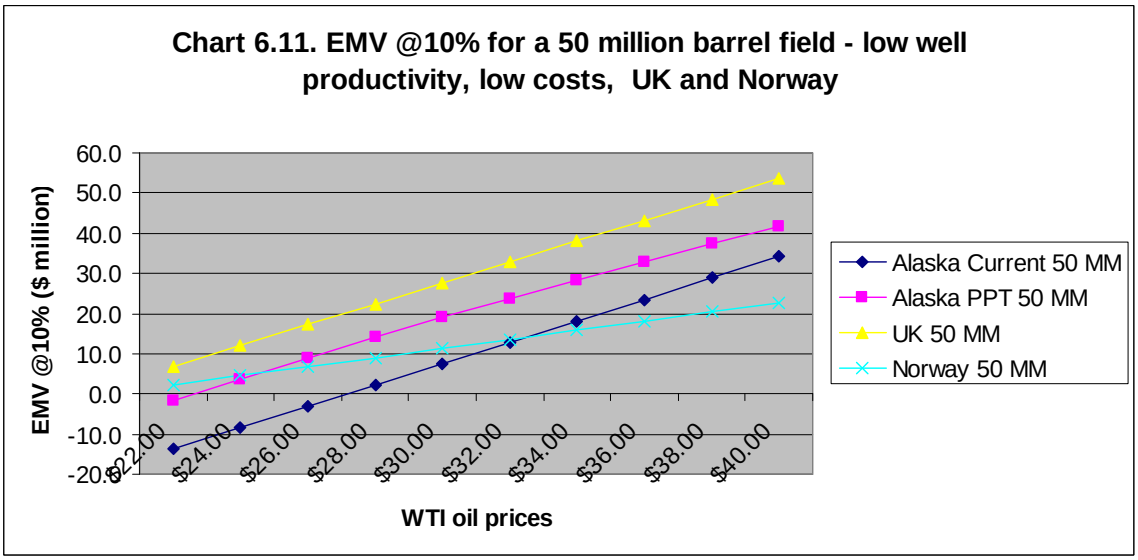
50MM low cost

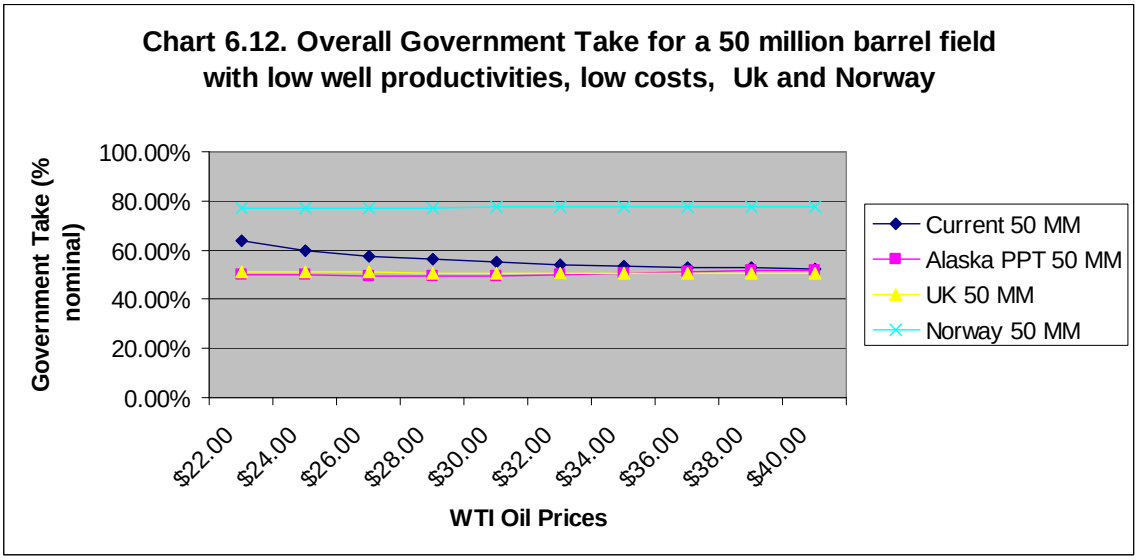
As can be observed in Charts 6.9, 6.10 and 6.11, the results for the low costs cases provide the same overall conclusion as those for the high cost cases. For all profitability indicators the WTI break even points for the new PPT are considerably below those of the current severance tax compared to Norway.





The government take results are also very similar to the 50 MM high cost case. A new investment in a 50 MM barrel field even with low costs, has a considerably lower government take than in Norway.





500 MM low cost

The results for the 500 MM low cost field are very similar to the 500 MM high cost field as can be seen from Charts 6.13, 6.14., 6.15 and 6.16.

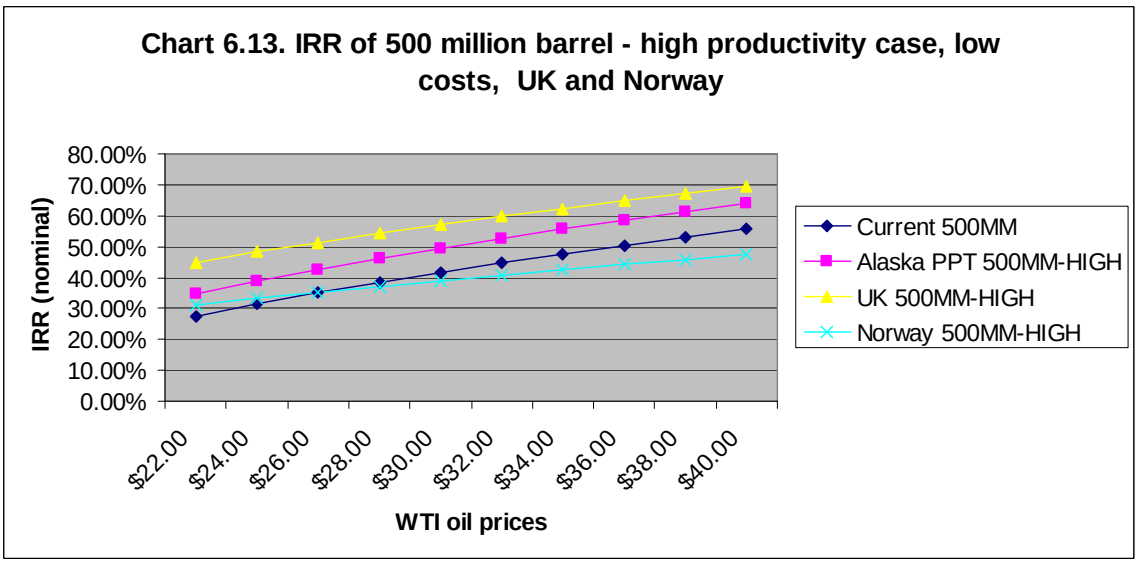


Chart 6.14. NPV @10% for a 500 million barrel field - high well productivity, low costs, Uk and Norway

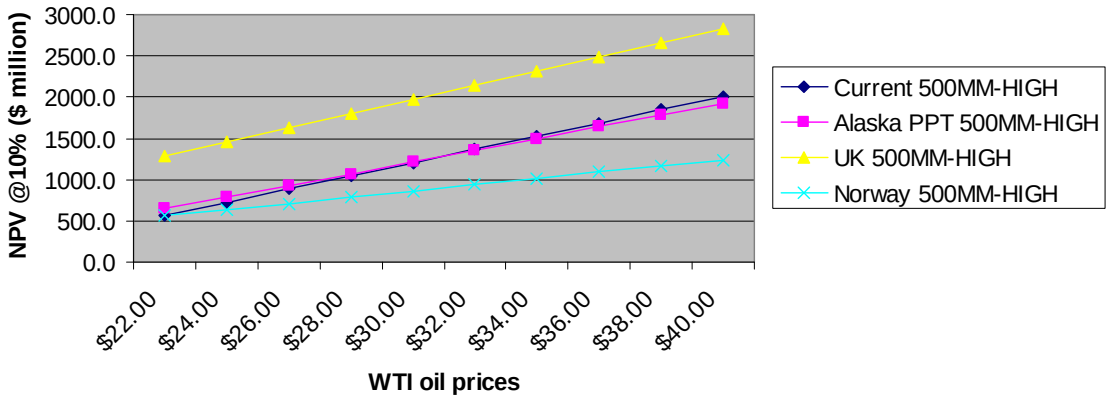
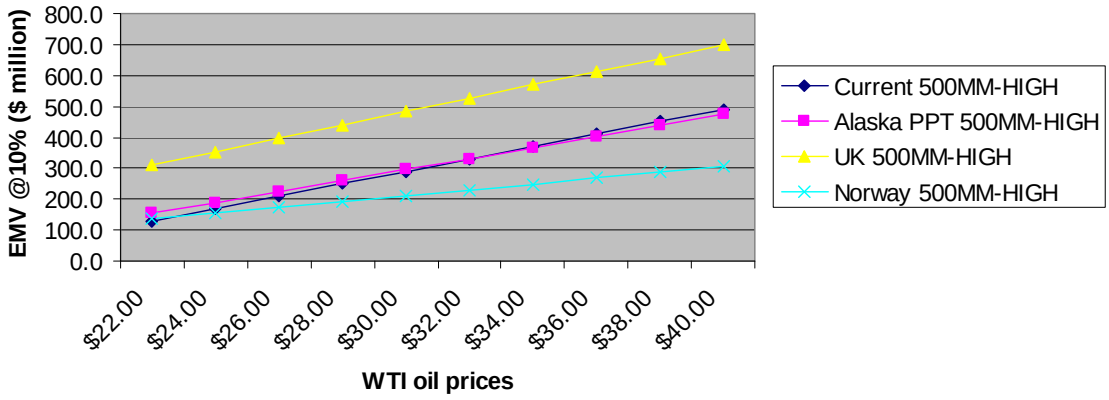
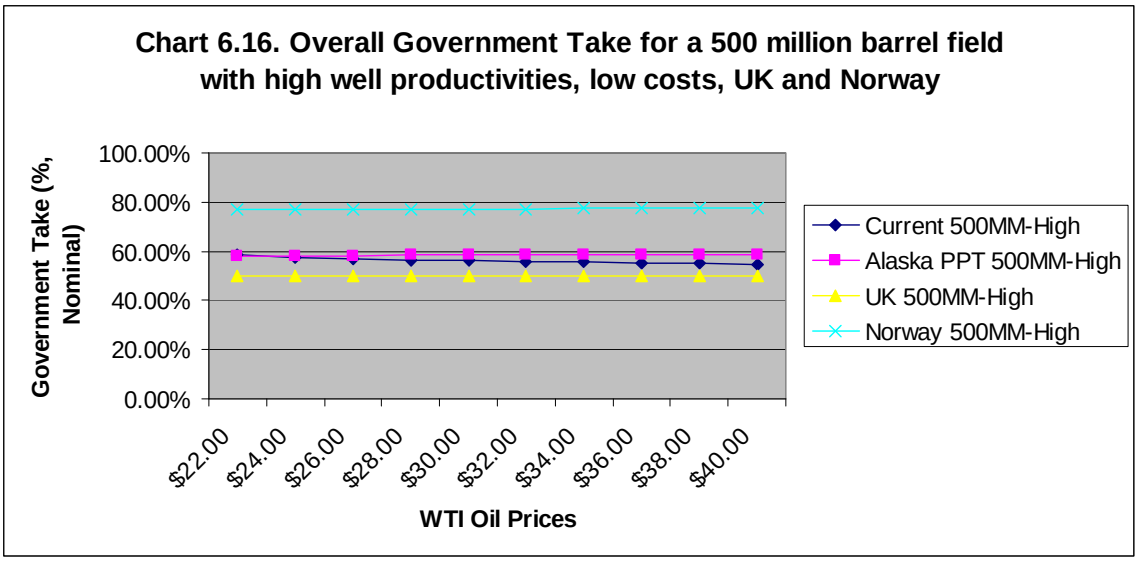


Chart 6.15. EMV @10% values for a 500 million barrel field - high well productivities, low costs, UK and Norway





<u>Norway Conclusion.</u> The PPT makes Alaska more competitive relative to Norway for new investors compared to the current production tax. Relative to Norway the PPT has attractive IRR results, also under high prices the NPV and EMV are better. The PPT is in particular more attractive for first investments in small fields.

6.2.2. UK

UK terms. The UK fundamentally changed its fiscal system in the North Sea in 1993 when it removed the Petroleum Revenue Tax and established that for new licenses the only applicable fiscal terms would be corporate income tax and some rentals. A surcharge was established for corporate income tax, creating a total rate of 40%. In December 2005 the UK proposed to increase the surtax, so that the total tax rate is now 50%. The UK change in fiscal terms is an important indication of the world wide trend to a higher government take.

It is assumed that the UK has a $ 6 per barrel advantage over Alaska North Slope at the well head.

The previous UK system was one of the most attractive in the world. With the increase in the surtax, the US Gulf of Mexico terms have clearly become more attractive. It should be noted, however, that the UK offshore went through a very rapid development in only four decades and that as a result the remaining prospects are small and marginal. As a result, even under these very favorable fiscal terms investors are looking abroad for new opportunities.

The UK does not provide fiscal stability on its terms.

Charts 6.1 through 6.4 show that for small high cost fields the PPT terms do not compare unfavorably with the UK terms. For high prices the IRR is the same. The NPV and EMV are somewhat less due to the much higher well head values in the UK. The government take is similar.

Tables 6.5 through 6.16 show that the UK has a more favorable fiscal system than Alaska under the proposed PPT terms for low cost fields and large fields.

UK Conclusion. The PPT terms would be less attractive than the fiscal terms for the UK. Nevertheless, the PPT would significantly reduce the gap in competition and the PPT compares relatively favorable for small high cost fields. Small high cost fields are typical for the North Sea today.

6.2.3. US – Gulf of Mexico – Deep water

The deep waters of the US Gulf of Mexico have been an area of intensive oil activity and therefore, the fiscal terms are attractive for the environment. The Gulf of Mexico is for US oil companies a direct alternative to Alaska. Therefore, this comparison is important.

US-Gulf of Mexico-Deep Water terms. The area has a favorable royalty regime of 12.5%. An initial royalty suspension volume of 87.5 million barrel equivalent of oil was assumed. Furthermore, the area is subject to the Federal corporate income tax, as well as rentals and bonuses. It is assumed that the US Gulf has a $ 7 per barrel advantage over Alaska North Slope at the well head.

The Federal Government of the United States does not provide fiscal stability on its terms.

50MM high cost

Charts 6.17 through 6.20 clearly indicate that for a 50 MM barrel high cost field the fiscal terms in the US Gulf of Mexico are considerably more attractive to investors, assuming the same costs conditions, than the proposed Alaska PPT terms. This is true in terms of IRR, NPV@10%, EMV@% and Undiscounted Government Take.

The relative attractiveness of the EMV@10% depends very much on the assumptions about bonuses in either the US Gulf of Mexico or Alaska. Bonuses influence these values considerably and therefore investor assumptions about the level of bonuses that may have to be paid has a large impact on the relative outcome.

However, it is also obvious from the graphs that the Alaska PPT is an important step in reducing the gap in competitiveness between the Gulf of Mexico and Alaska. Therefore, the Alaska PPT terms will increase interest of new US investors in Alaska.

Chart 6.17. IRR for 50 million barrel - low productivity case, high costs, US GOM and Nigeria

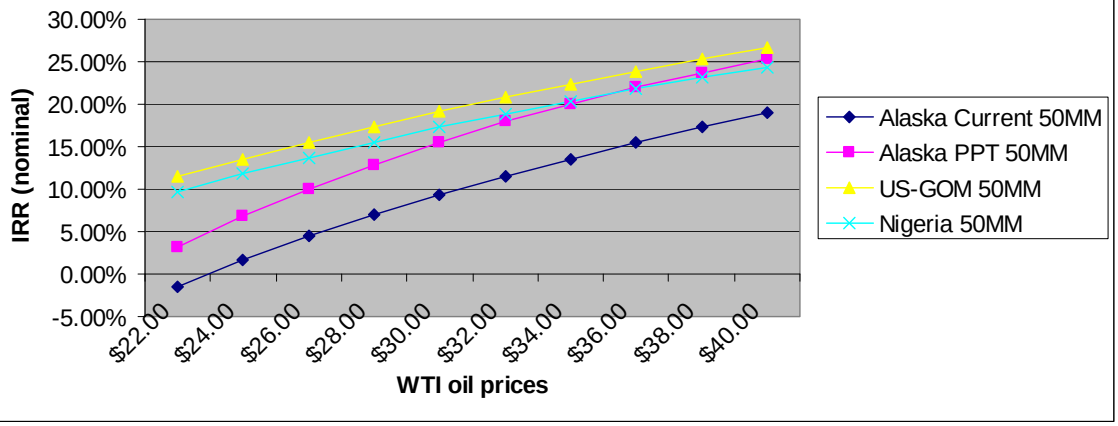
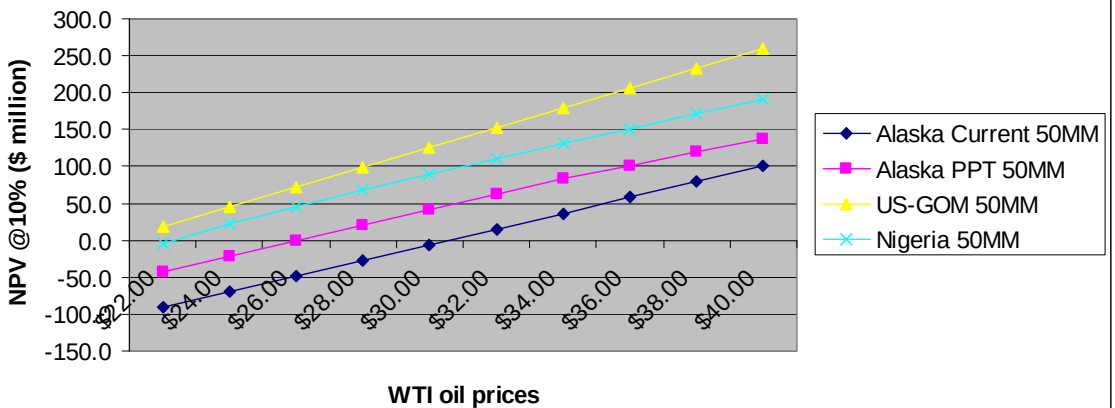
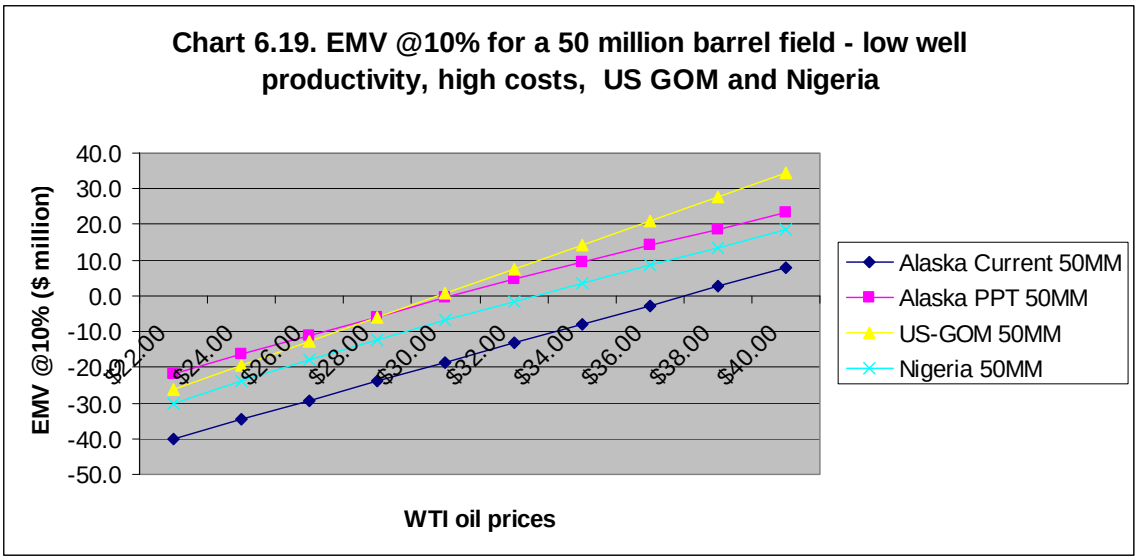
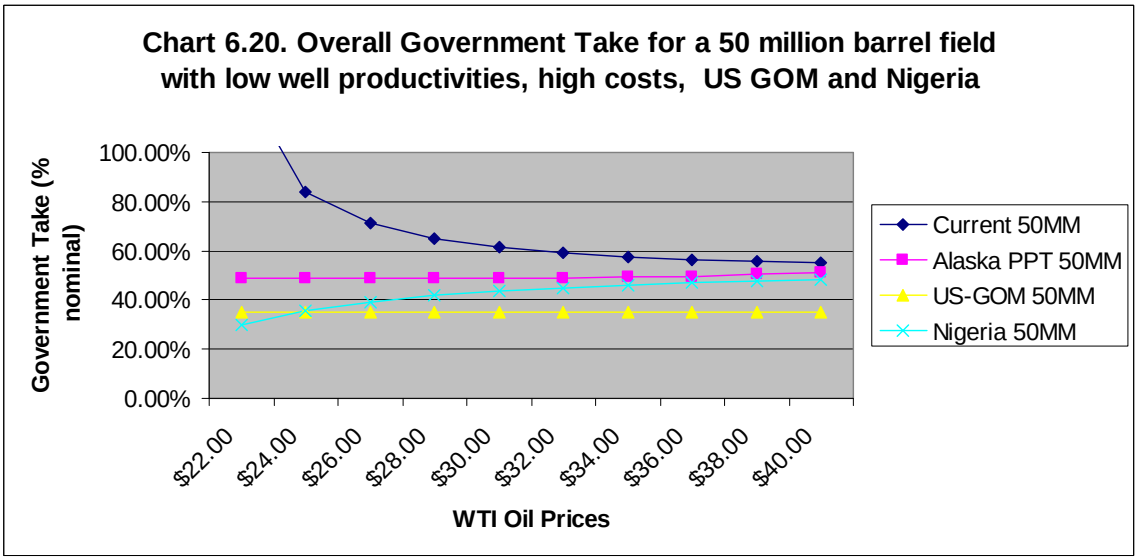


Chart 6.18. NPV @10% for a 50 million barrel field - low well productivity, high costs, US GOM and Nigeria







500MM high cost

Charts 6.21 through 6.24 indicate that for a 500 MM barrel, high cost, field the fiscal terms for the US GOM are considerably more attractive than the Alaska PPT terms for new investors. The Alaska PPT terms narrow the gap somewhat relative to the current severance tax and therefore more interest from US investors can be expected.

Chart 6.21. IRR of 500 million barrel - high productivity case, high costs, US GOM and Nigeria

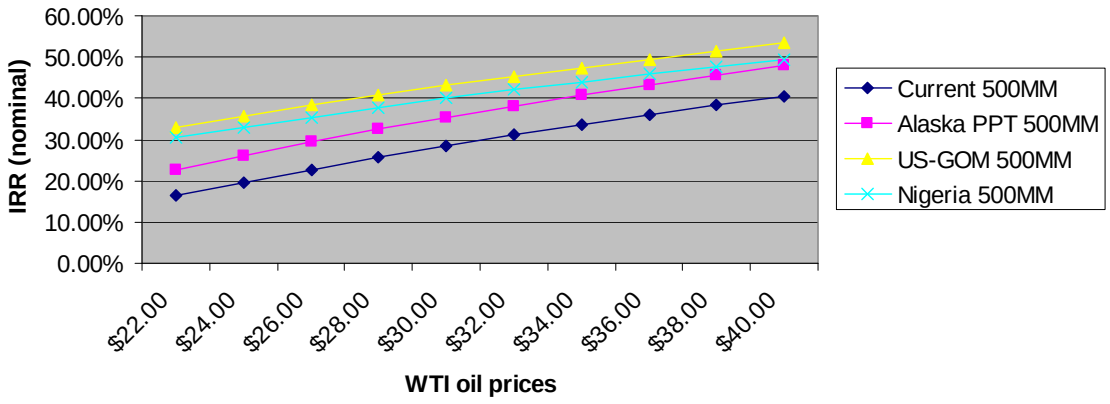
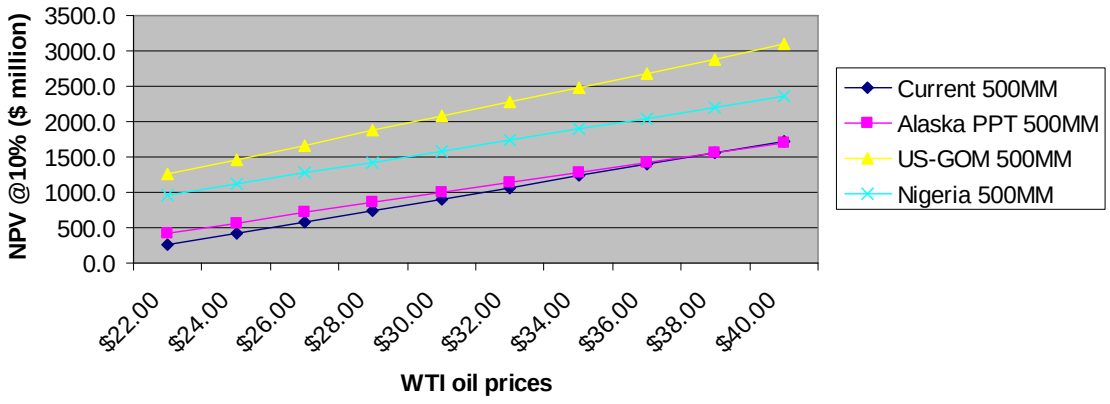
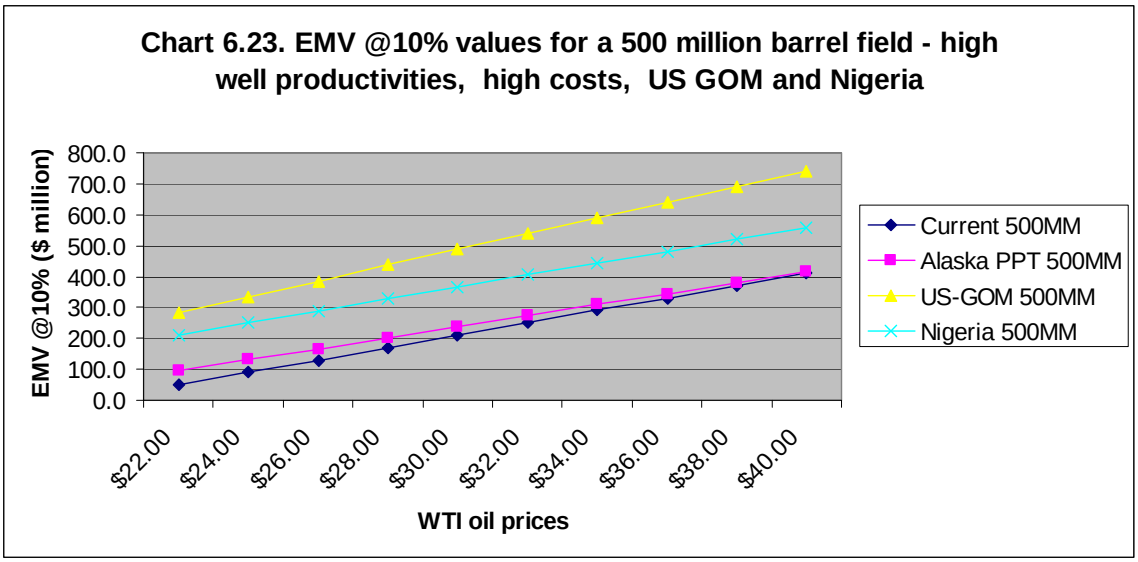
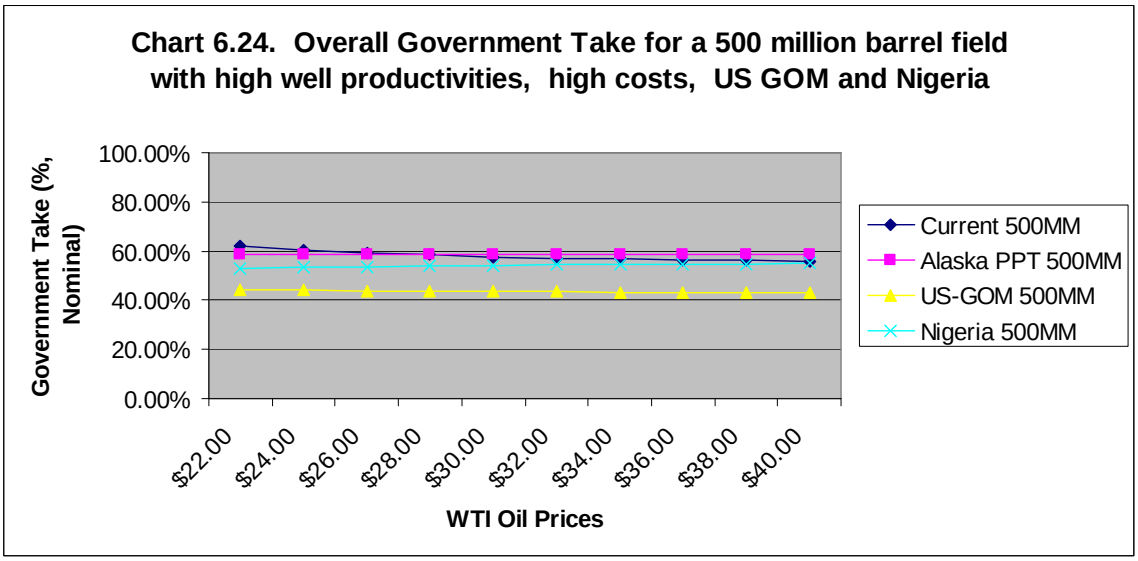


Chart 6.22. NPV @10% for a 500 million barrel field - high well productivity, high costs, US GOM and Nigeria







50MM low cost

Charts 6.25 through 6.28 indicate that also for a 50 MM barrel low cost field the fiscal terms of the US Gulf of Mexico are much more attractive than the proposed Alaska PPT terms. However, also the PPT terms narrow the competitiveness gas with the US Gulf of Mexico.

Chart 6.25. IRR for 50 million barrel - low productivity case, low costs, US GOM and Nigeria

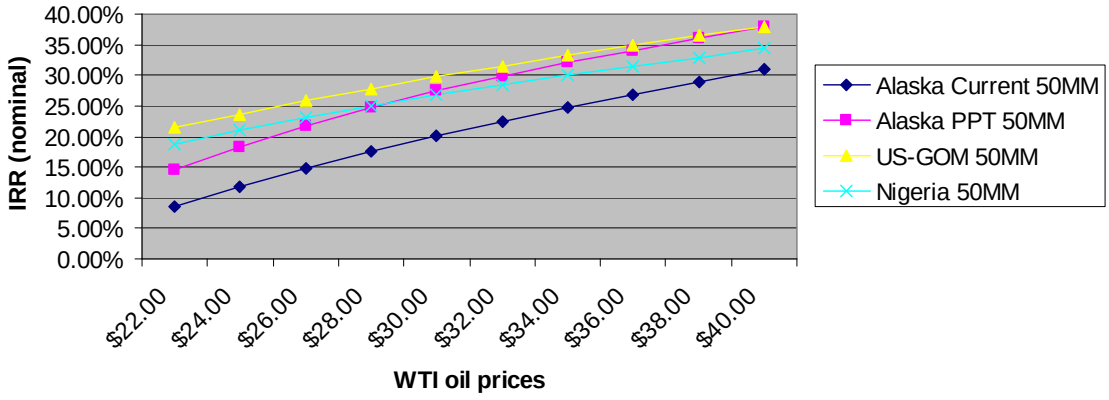
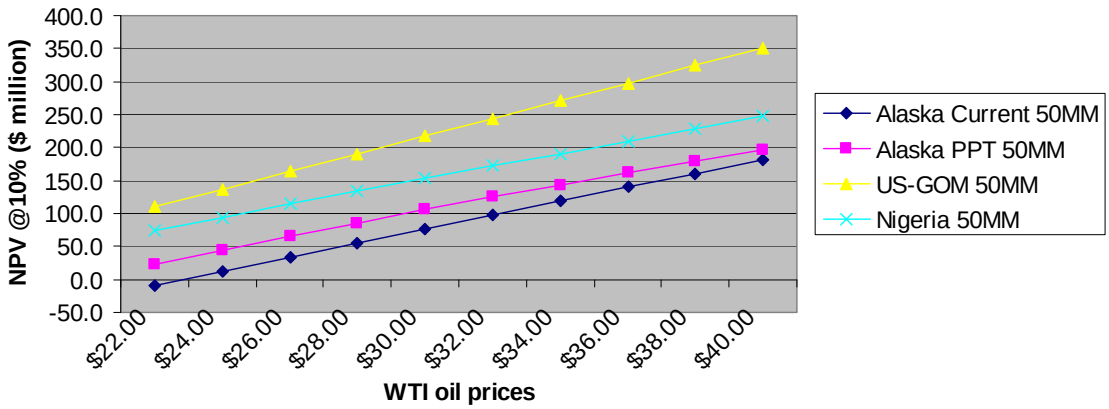
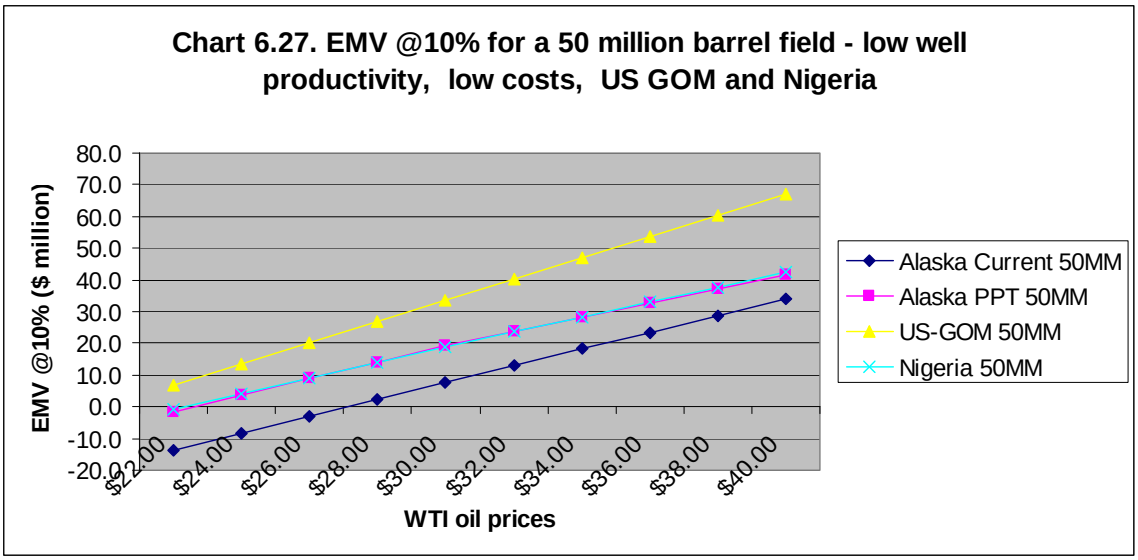
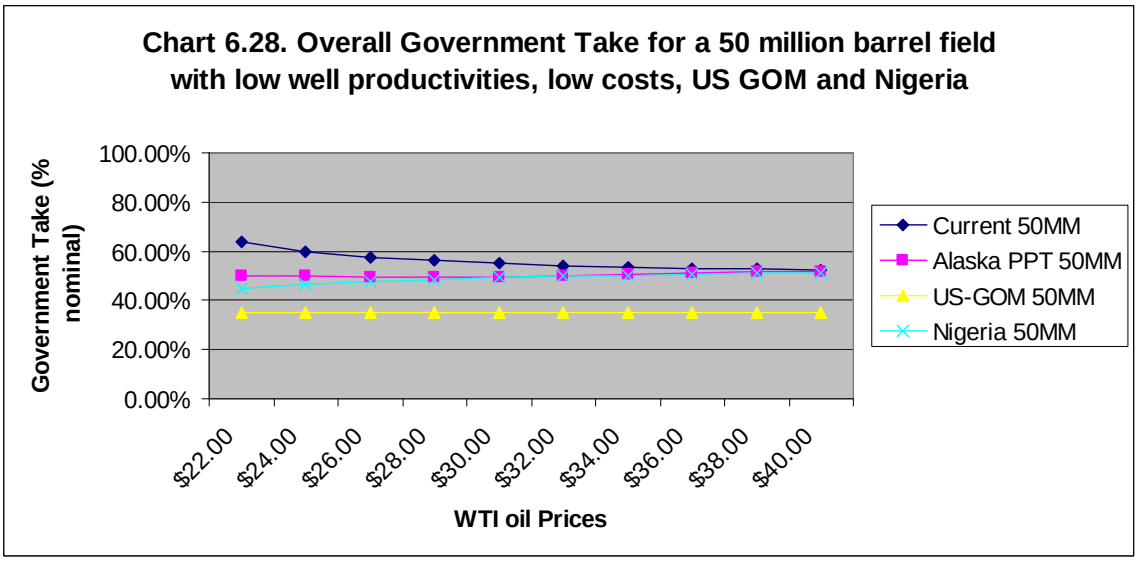


Chart 6.26. NPV @10% for a 50 million barrel field - low well productivity, low costs, US GOM and Nigeria







500 MM low cost

For low cost 500 MM barrel fields, the fiscal terms of the US Gulf are clearly more attractive than the Alaska PPT terms for new investors as can be seen in Charts 6.29 through 6.32. Chart 6.29 indicates, however, the strong IRR characteristics that the Alaska PPT would have.

Chart 6.29. IRR of 500 million barrel - high productivity case, low costs, US GOM and Nigeria

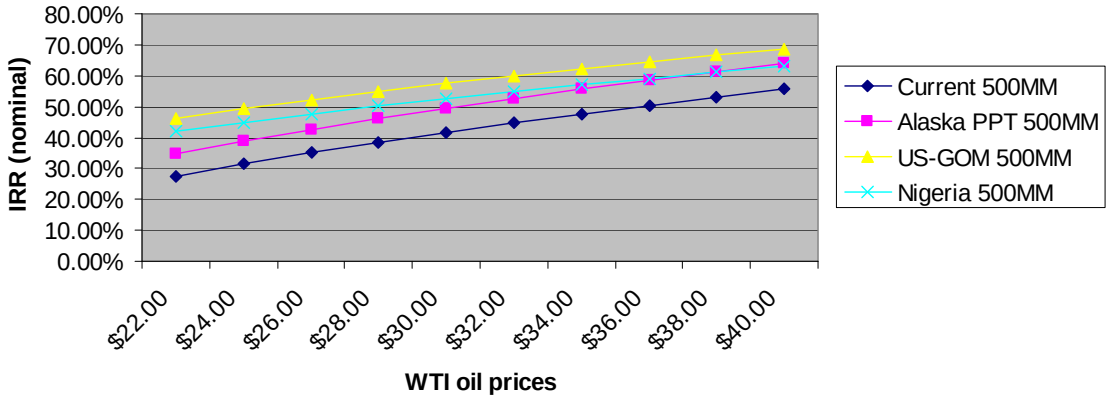
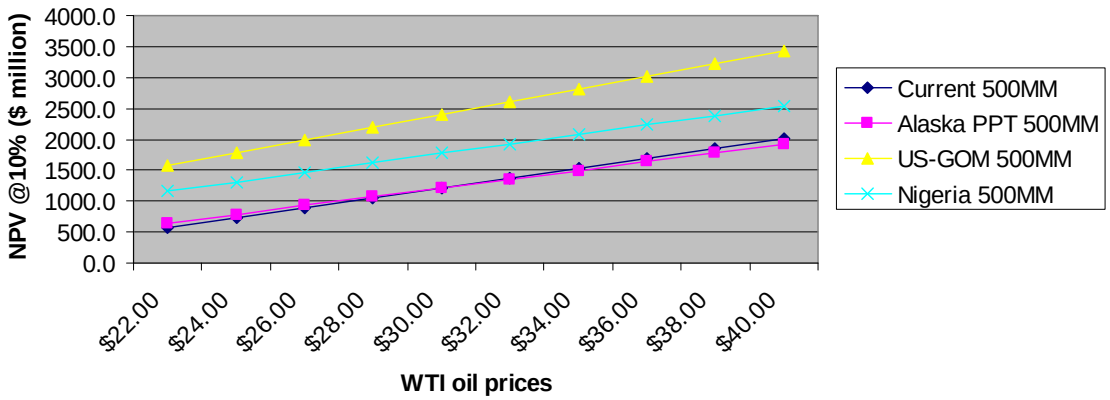
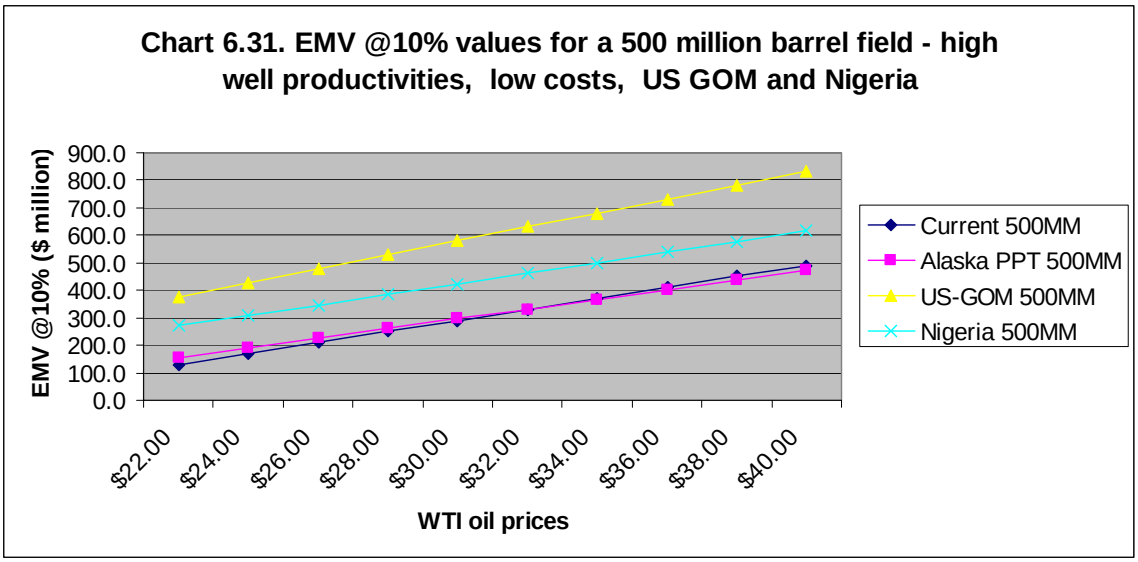
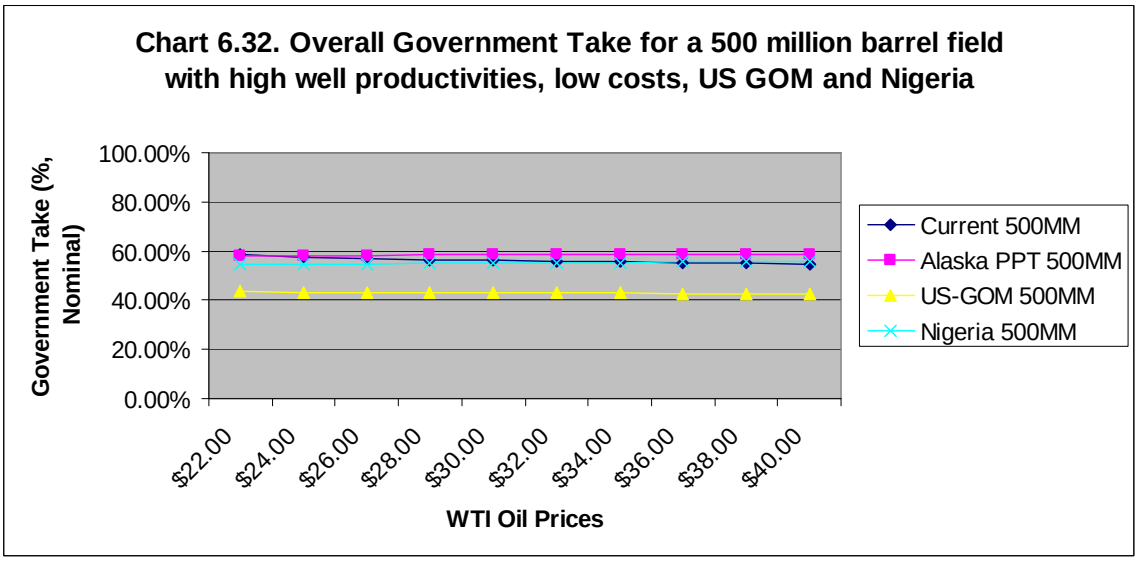


Chart 6.30. NPV @10% for a 500 million barrel field - high well productivity, low costs, US GOM and Nigeria







<u>US Gulf of Mexico Conclusion.</u> The US Gulf of Mexico has a much more attractive fiscal system than Alaska. Also the value of oil at the well head is considerably higher. For these reasons the Alaska PPT would not be competitive with the US Gulf of Mexico. However, the Alaska PPT will help narrow the gap compared to the current severance tax.

6.2.4. Nigeria – Deep water

The deep waters in the offshore of Nigeria have experienced considerable activity during the last decade. This due to the relatively attractive terms that Nigeria is offering, which include a 0% royalty for very deep water in excess of 1000 meter water depth.

Nigeria-Deep water terms. The Nigerian terms are different from block to block, but following terms are representative of typical terms. These terms provide for a 50% corporate income tax, but with tax credits of 25% on capital expenditures. Furthermore, Nigeria has a production sharing agreement with a profit oil share ranging from 20% to 60% based on a sliding scale based on cumulative production, starting at 300 million barrels and going up to 2 billion barrels. It is assumed that Nigeria has a $ 5 per barrel advantage over Alaska North Slope at the well head.

Nigeria does not provide fiscal stability under its production sharing contracts, but Nigeria has traditionally negotiated MOU's with a typical duration of 10 years which may provide for some fiscal stability.

50 MM high cost

Fields of 50 MM barrels with high costs are not necessarily economic offshore Nigeria. However, fiscal conditions for larger fields up to 300 million barrels, which would be competitive, are the same and therefore this analysis can be used as a proxy for such fields.

Chart 6.17 illustrates how the Alaska PPT would compete well on the basis of IRR, with a cross over point of a WTI price of $ 34 under which Alaska terms would become more competitive.

Chart 6.18 shows how the NPV@10% would be less attractive, but the EMV@10% would be more attractive in Alaska. Much depends in this case on the ability to consolidate in Nigeria.

Chart 6.19 indicates how the government take in Nigeria for low prices is relative low due to the considerable tax credits, at higher prices the government take is only slightly less than in Alaska.

500 MM high cost

Charts 6.21 through 6.24 indicate how for high cost 500 MM barrel fields, Nigerian terms would be more attractive than the Alaska PPT for new investors. Nevertheless, the Alaska PPT narrows the competitive gap compared to the current severance tax.

50 MM low cost

The fiscal comparison for the 50 MM low cost field is similar to the 50 MM high cost field as is indicated in Charts 6.25 through 6.28. However, for the low cost field the EMV@10% values are equal in Nigeria and Alaska.

500 MM low cost

Charts 6.29 through 6.32 indicate that for 500MM low cost fields, Nigeria has typically much more attractive fiscal terms than the Alaska PPT.

Nigeria deep water Conclusion. Alaska competes relatively well with Nigeria on an IRR and EMV@10% basis, in particular for smaller fields, however, the NPV% is more attractive in Nigeria. Also the government take is less and the well head values are considerably higher. For these reasons the Alaska PPT would not be competitive with Nigeria, except for exploration investments in smaller fields.

6.2.5. Alberta – Oil Sands

The Alberta oil sands are the subject of major expansion and investment. This is in part due to an attractive fiscal regime offered by the Province of Alberta. The oil sands plants are often of a scale that is larger than oil field developments on the North Slope. Nevertheless, a fiscal comparison seems important since the Alberta oil sands form one of the most important upstream petroleum investment opportunities in North America. Therefore, for comparative purposes the 50 and 500 MM barrel field comparisons will be provided, in order to provide consistency in the analysis.

Also, of course, the oil sands have already been discovered. Therefore, the EMV analysis is only illustrative.

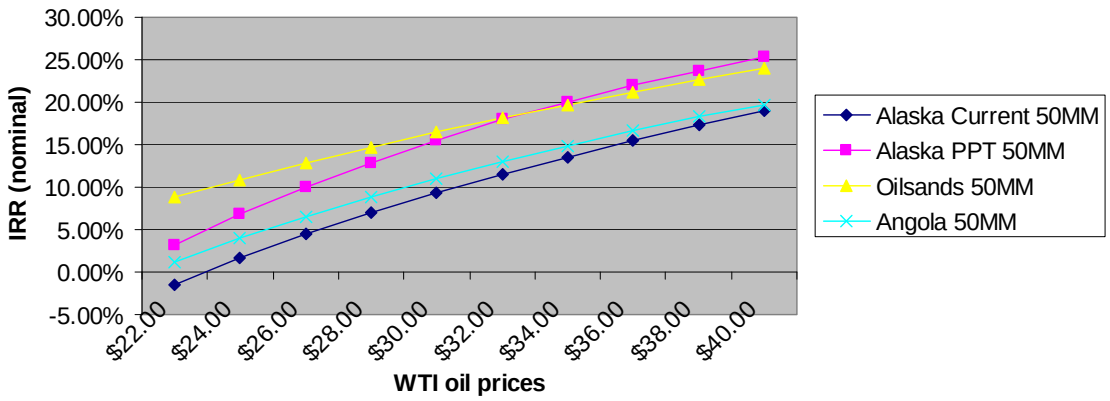
Alberta oil sand terms. The province requires a profit share of 25% after payout or a royalty of 1% whatever is the higher amount. Furthermore Alberta requires rentals and a bonus. The Federal Canadian/Alberta corporate income tax rate is 33.62%. It is assumed that the Alberta oil sand oil has an advantage of US $ 5 per barrel at the delivery point over Alaska North Slope crude.

The province of Alberta and the Federal Government of Canada typically do not provide fiscal stability on their terms.

50 MM high cost

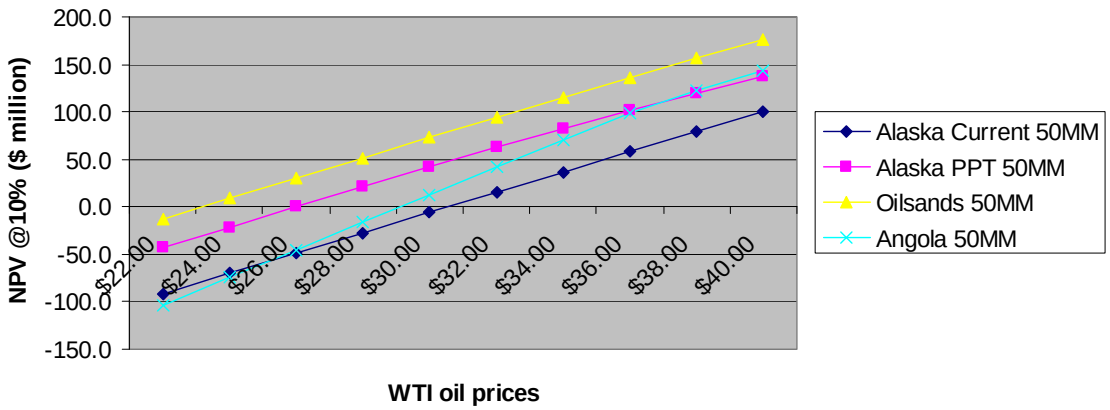
Chart 6.33 shows how the IRR for the Alaska PPT would be rather competitive with Alberta oil sands terms, despite the $ 5 per barrel advantage for the oil sands.

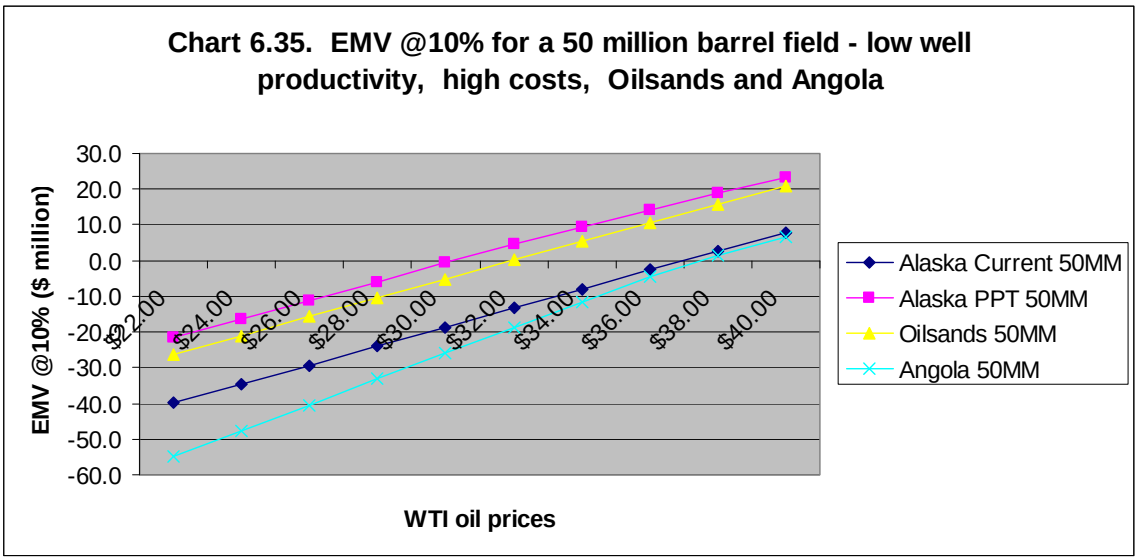
Chart 6.33. IRR for 50 million barrel - low productivity case, high costs, Oilsands and Angola



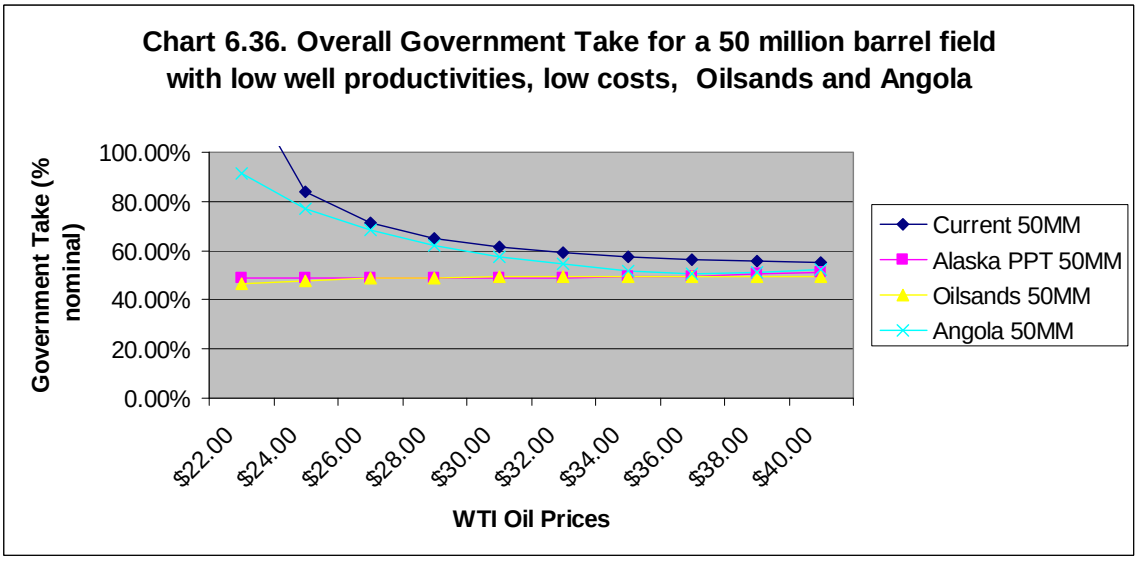
The NPV@10% is more favorable for the Alberta oil sands for the entire price range. The EMV@10% is less favorable, however, this depends primarily on the respective bonus assumptions.

Chart 6.34. NPV @10% for a 50 million barrel field - low well productivity, high costs, Oilsands and Angola





The overall government take is remarkably similar. Therefore the better NPV@10% for the Alberta oil sands is primarily due to the higher net back value of the oil.



500 MM high cost

Charts 6.37 through 6.40 indicate how the Alberta oil sands economics are better for all indicators for the $ 22 - $ 40 per barrel price range. This is due to the lower government take and the higher net back.

Chart 6.37. IRR of 500 million barrel - high productivity case, high costs, Oilsands and Angola

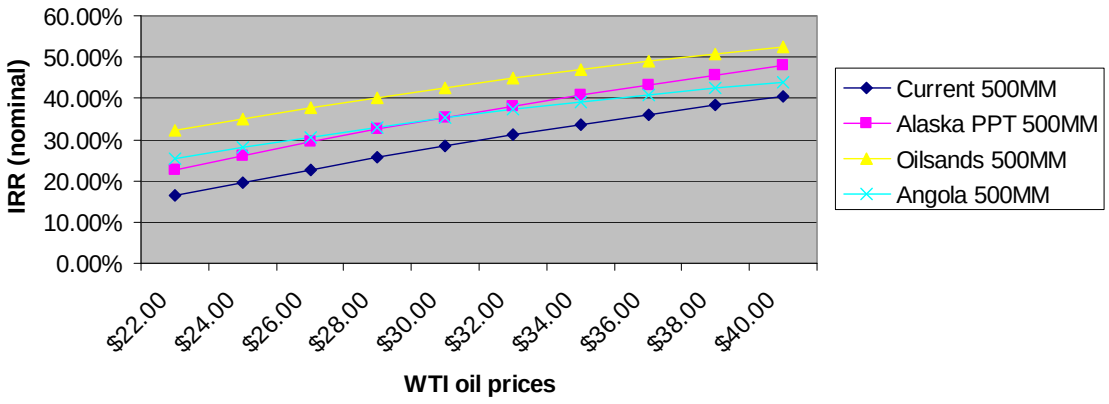
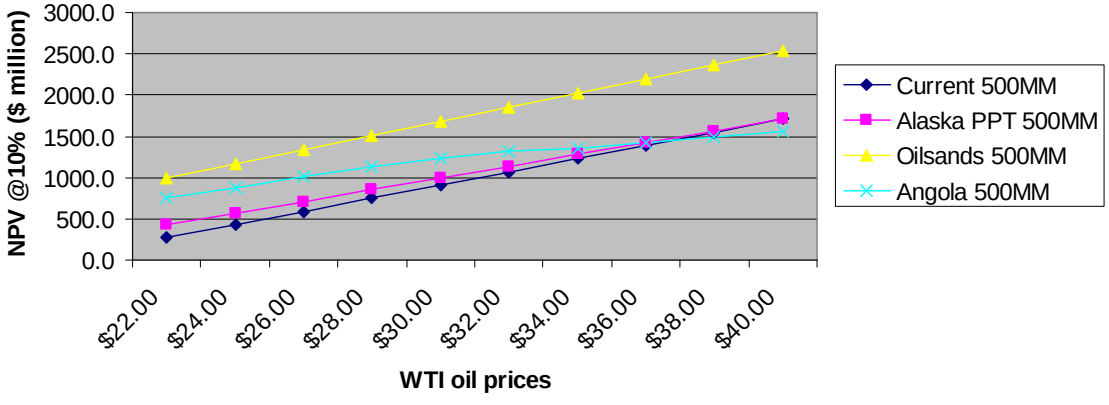
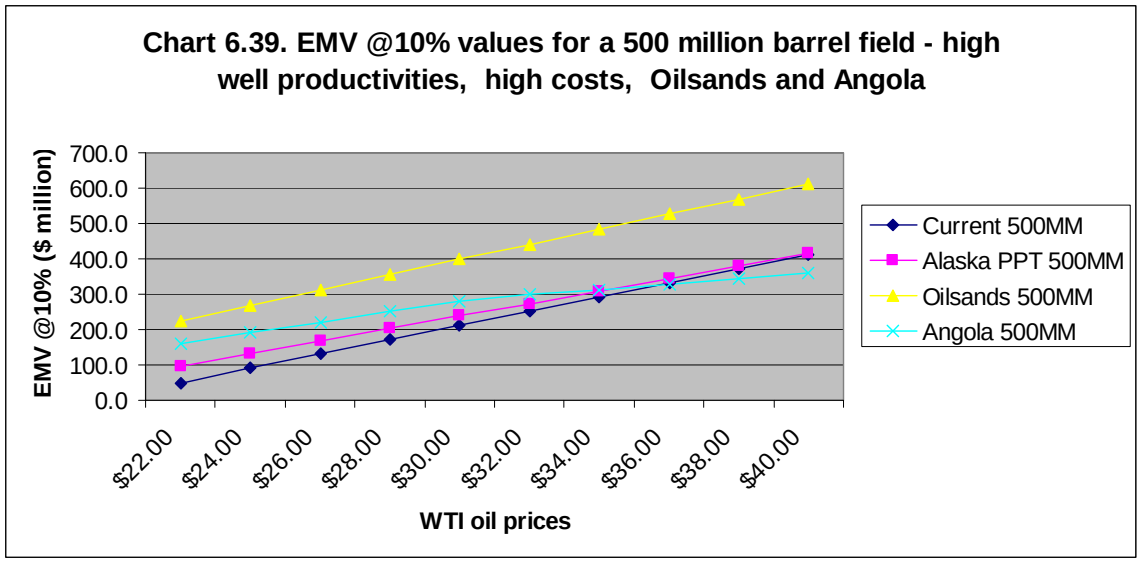
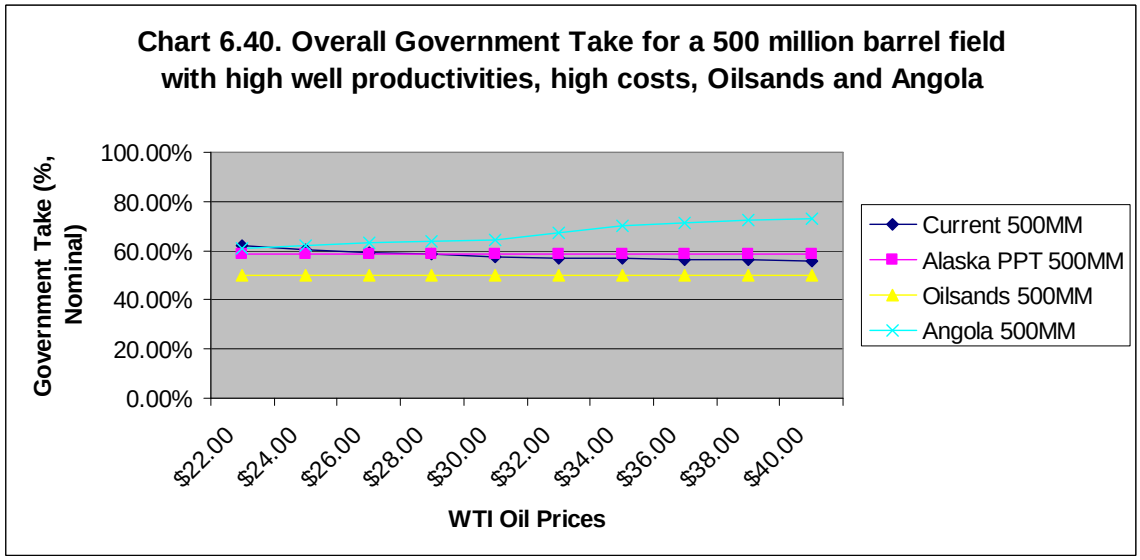


Chart 6.38. NPV @10% for a 500 million barrel field - high well productivity, high costs, Oilsands and Angola







50 MM low cost

Charts 6.41 through 6.44 indicate about the same economics as for the 50 MM high cost case. The IRR of the Alaska PPT compares rather favorable, the NPV@10% does not, the EMV@10% depends primarily on bonus assumptions and the government take is almost identical.

Chart 6.41. IRR for 50 million barrel - low productivity case, low costs, Oil sands and Angola

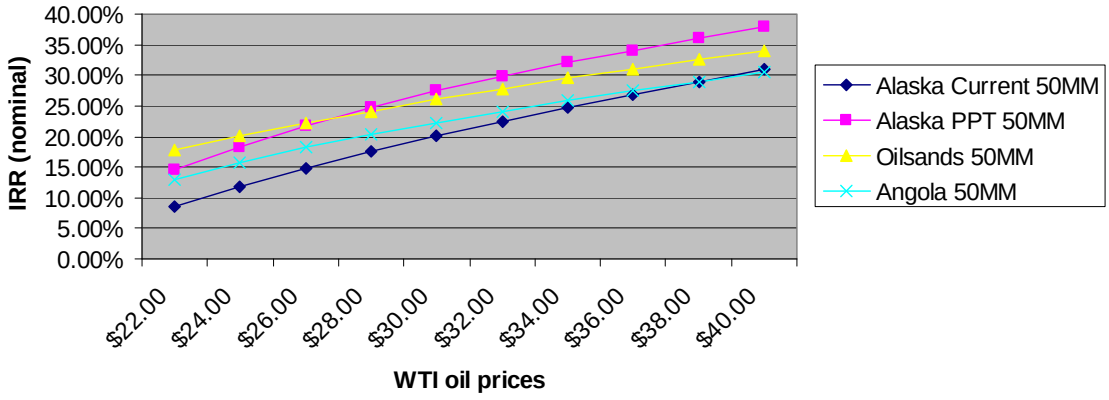
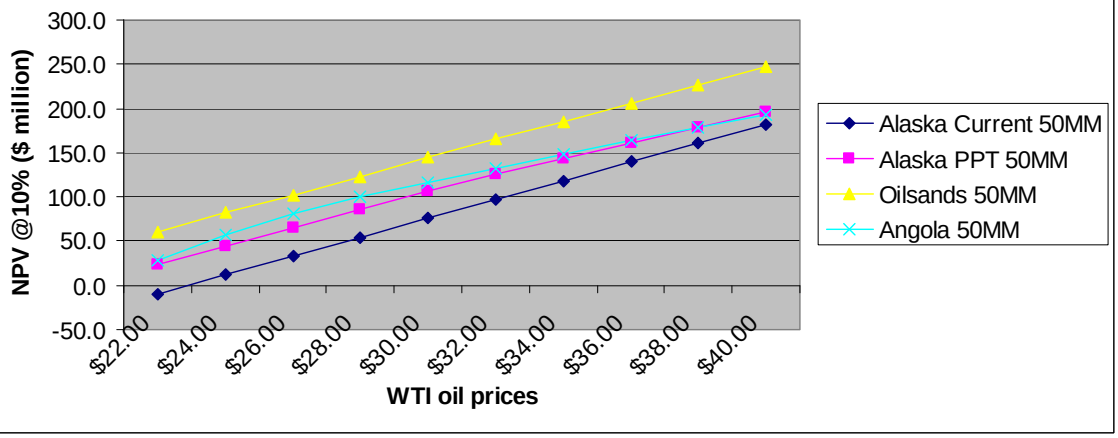
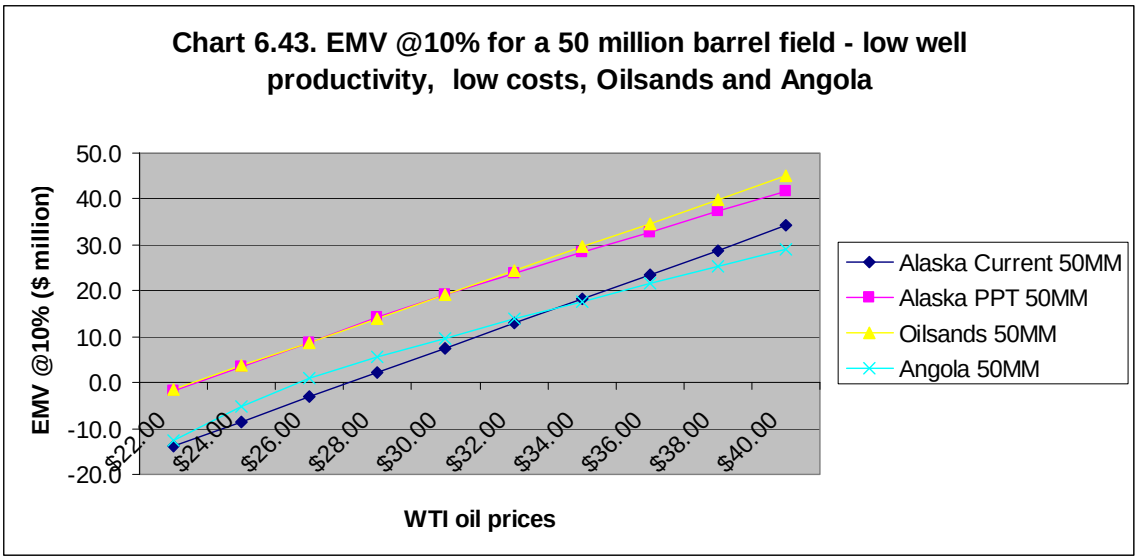
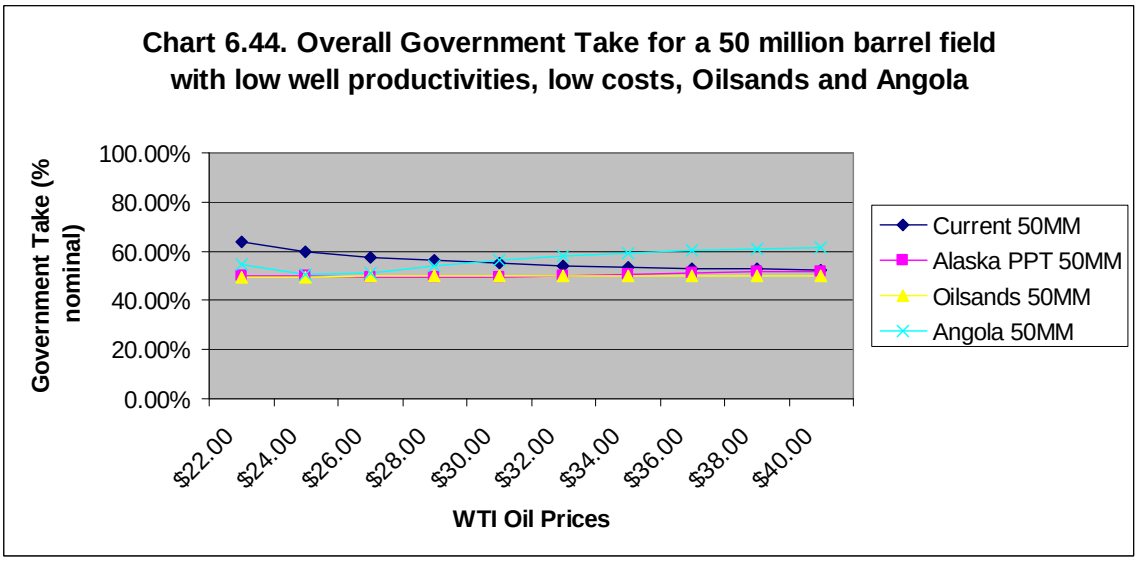


Chart 6.42. NPV @10% for a 50 million barrel field - low well productivity, low costs, Oil Sands and Angola







500 MM low cost

The 500 MM low cost case also indicates more favorable economics for the Alberta oil sands, primarily due to the higher net back and lower government take.

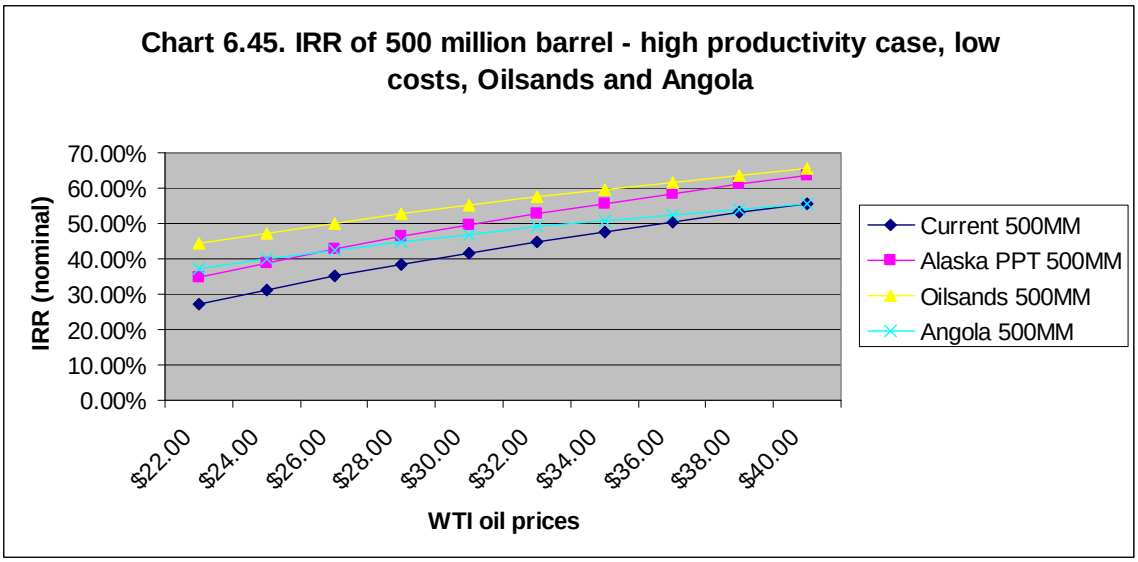


Chart 6.45. IRR of 500 million barrel - high productivity case, low costs, Oilsands and Angola
IRR (nominal)
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Current 500MM
Alaska PPT 500MM
Oilsands 500MM
Angola 500MM

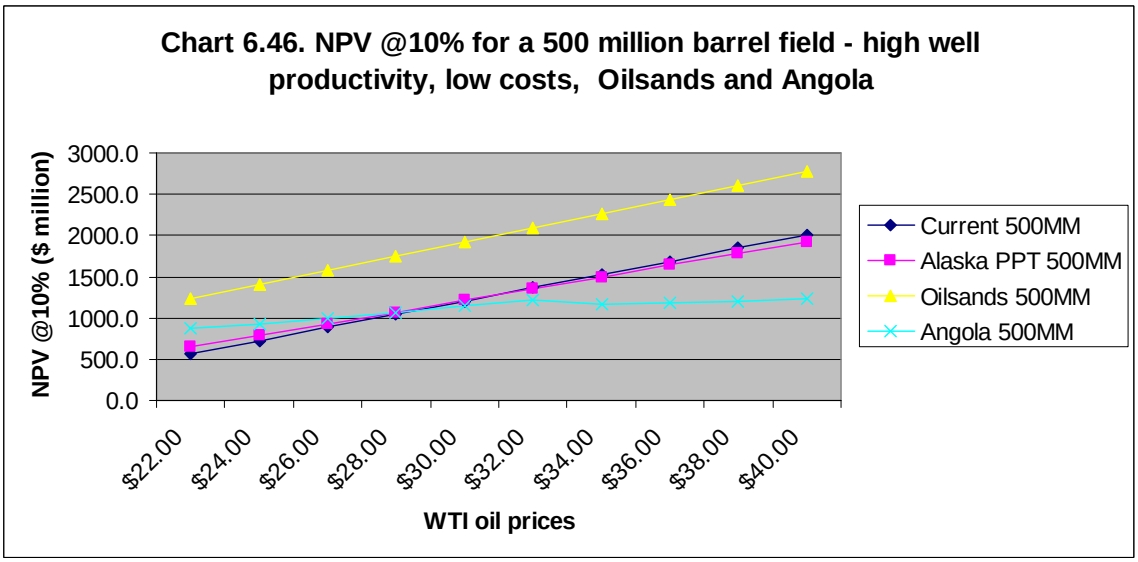
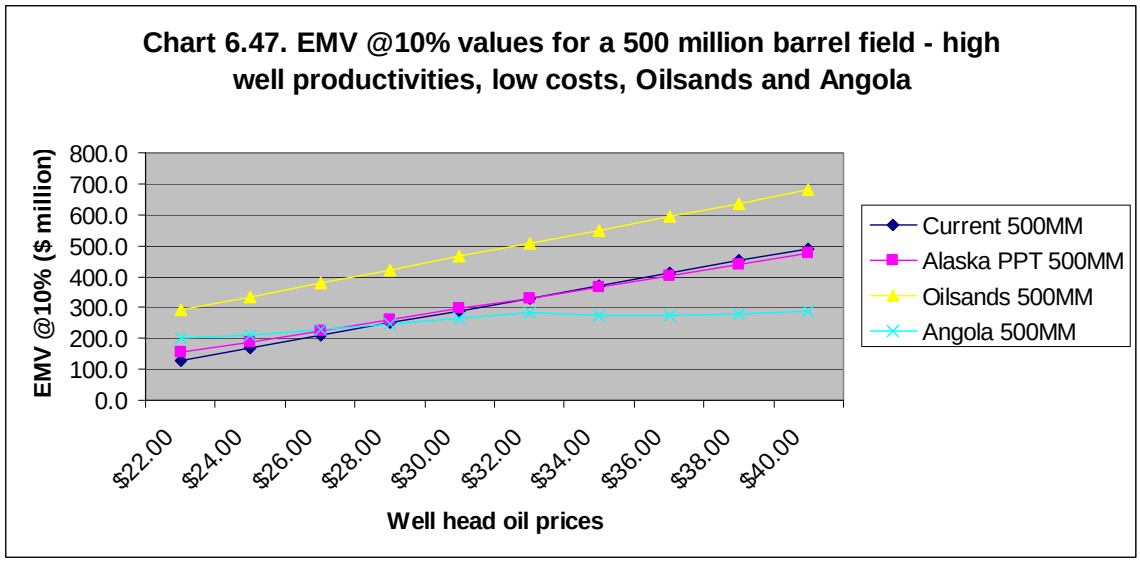
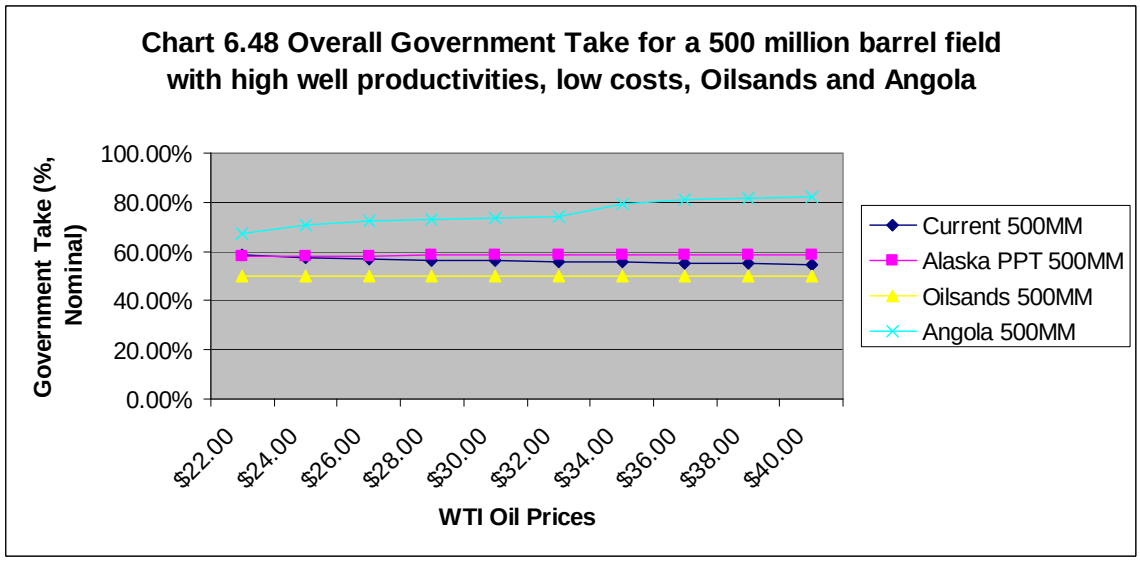


Chart 6.46. NPV @10% for a 500 million barrel field - high well productivity, low costs, Oilsands and Angola
NPV @10% ($ million)
3000.0
2500.0
2000.0
1500.0
1000.0
500.0
0.0
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Current 500MM
Alaska PPT 500MM
Oilsands 500MM
Angola 500MM





Alberta Oil Sands Conclusion. The Alberta Oil Sands fiscal terms are more favorable than those of the Alaska PPT because the government take for large fields is less and the net back value is higher. For small fields, Alaska PPT and EMV@10% compares relatively favorably.

6.2.6. Angola – Deep offshore

The Angola Deep offshore has been a prime area of development, in particular for large companies that work also in Alaska, such as BP and ExxonMobil. Angola has a rfather progressive system, which in particular under current high oil prices will result eventually in a high government take for most fields, if prices continue. As for Nigeria, in the deep waters offshore Angola, 50 MM barrel fields are not economic. However, for consistency such fields will be reviewed.

Angola terms. The Angolan terms are based on a production sharing agreement. These agreements are different from block to block. Following are representative terms. It is assumed that there is a cost oil limit of 50%. The profit oil is based on an IRR sliding scale and moves from 20% profit oil for government to 80% profit oil for government depending on profitability. There is a 45% uplift on capital expenditures. The corporate income tax is 50%. **It should be noted that very high bonuses were paid for the blocks offshore Angola.** A negative feature of the Angola system is that each development area is ring-fenced for production sharing and tax purposes. It is assumed that Angola has a $ 5 per barrel advantage relative to the Alaska North Slope at the well head.

Angola provides for near complete fiscal stability on its terms.

50 MM high cost

Charts 6.33 through 6.36 show some interesting features. The IRR for the Alaska PPT is much higher than for Angola. This is primarily due to the ring-fenced nature of the Angolan operations. The NPV@10% is higher than the Alaska Current system but less attractive than the Alaska PPT system. The EMV@10% is much better in Alaska, due to the possibility for consolidation in Alaska. The government take is regressive for the small field in the $ 22 - $ 40 price range, despite the progressive sliding scale and follows approximately the Alaska Current system. This is largely due to the cost oil limit.

500 MM high cost

For the 500 MM high the IRR is much better than the Alaska Current system, but straddles the Alaska PPT system. Both for the NPV@10% and the EMV@10% Angola is better than Alaska for low prices but worse than Alaska for high prices. This is due to

the progressive nature of the Angolan system. The government take is about equal to Alaska for low prices, but becomes much higher for high prices.

50 MM low cost

The 50 MM low cost field provides for and IRR that is again between the Alaska Current and the Alaska PPT system. The NPV@10% is about equal to the Alaska PPT system. The EMV@10% is about equal to the Alaska Current system. The government take is higher for high prices.

500 MM low cost

The Angolan terms result in an IRR which is between the Alaska Current and Alaska PPT systems. The NPV@10% and EMV@10% become much less at high prices. The government take is considerably higher across the board.

Angola Deep Water Conclusion. The Alaska PPT terms are generally competitive with Angolan terms. The IRR is generally more attractive for the PPT despite the lower net backs. The Alaska PPT is more attractive for larger fields and for high prices. Angola is more attractive for low prices and small fields.

6.2.7. Russia - Sakhalin

The Russia-Sakhalin developments have been very important over the last decade. ExxonMobil and Shell have large projects in Sakhalin. The Sakhalin projects relate to developments of both oil and gas. The projects are very large scale and the fiscal systems that were negotiated for these contracts reflect the nature of these activities. The Sakhalin terms are based on production sharing contracts.

Russia – Sakhalin terms. The Sakhalin terms include a 6% royalty, a 32% corporate income tax and a production sharing agreement based on an after tax rate of return based sliding scale. There is no cost oil limit under the contract. The sliding scale moves the profit oil share earned by the government upward in three steps based on the real after tax rate of return. The steps are as follows:

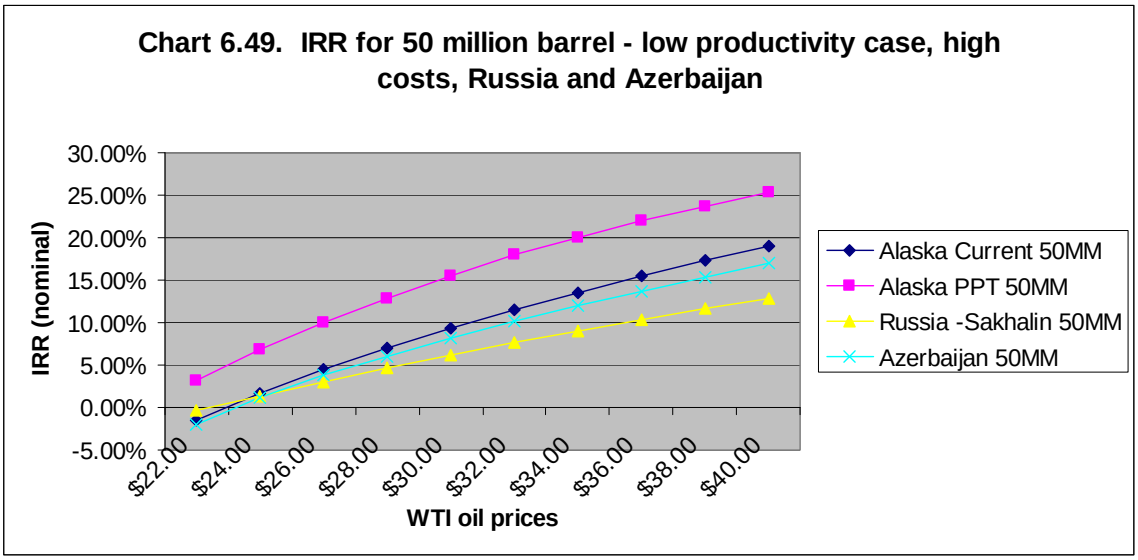
Up to 17.5% IRR	- 10% to government
Up to 24% IRR	- 50% to government
Over 24% IRR	- 70% to government

It should be noted that a high bonus was paid on the Sakhalin contract, in the Shell contract this was a $ 55 million bonus. As states previously this bonus is not taken into consideration. The Sakhalin project involved considerable expenditures for local costs. These costs have been included.

Russia provides for a high degree of fiscal stability on its production sharing contracts.

50 MM high cost

Chart 6.49 shows how the Sakhalin contracts have a rate of return that is much less than the Alaska Current system and the Alaska PPT. This is in part due to the high social expenditures required during the construction phase. For very low prices, Alaska Current becomes less attractive because of the low net back values.



The NPV@10% and the EMV@10% are substantially less favorable than Alaska.

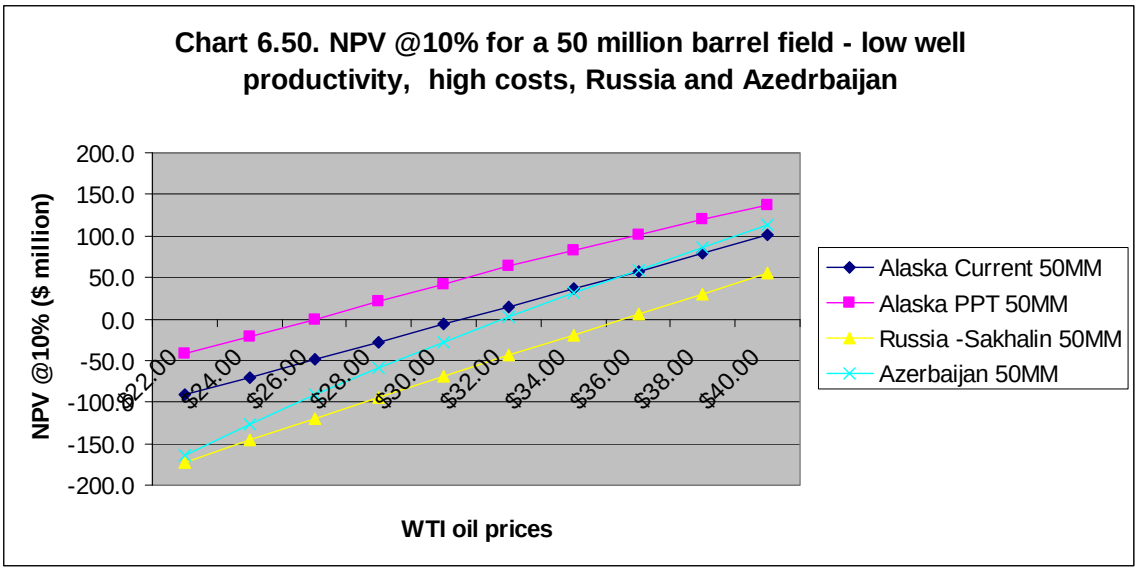


Chart 6.50. NPV @10% for a 50 million barrel field - low well productivity, high costs, Russia and Azedrbaijan
NPV @10% ($ million)
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Alaska Current 50MM
Alaska PPT 50MM
Russia -Sakhalin 50MM
Azerbaijan 50MM

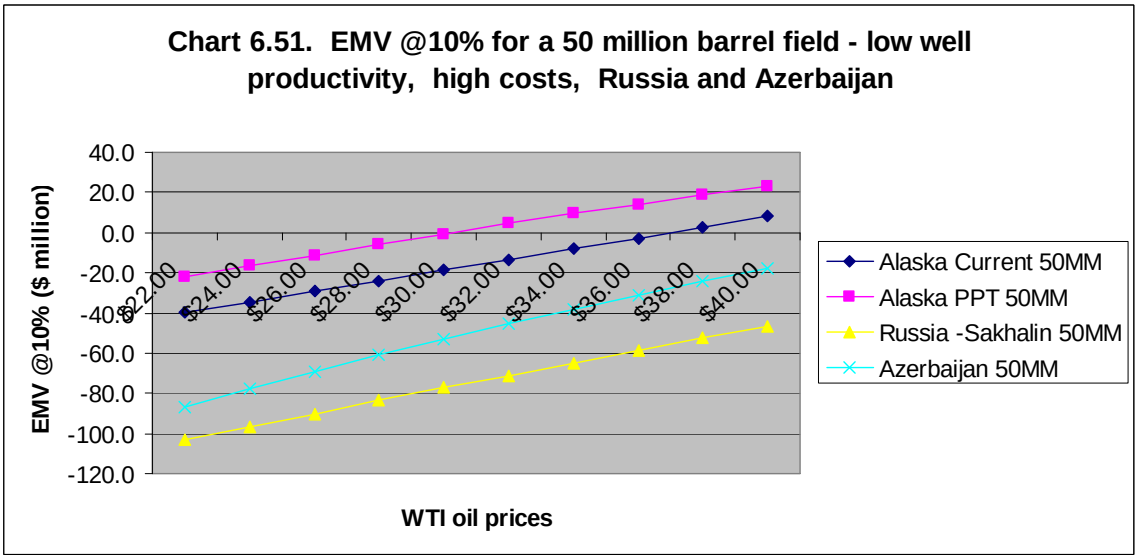


Chart 6.51. EMV @10% for a 50 million barrel field - low well productivity, high costs, Russia and Azerbaijan
EMV @10% ($ million)
40.0
20.0
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Alaska Current 50MM
Alaska PPT 50MM
Russia -Sakhalin 50MM
Azerbaijan 50MM

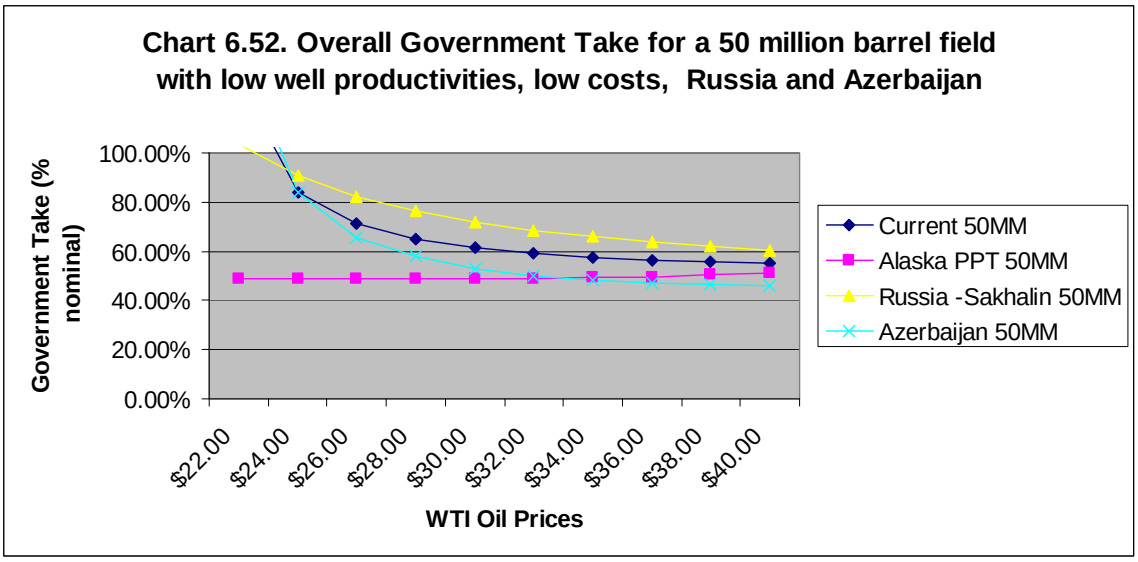


Chart 6.52 shows how the Russian system for small fields is rather regressive, primarily due to the high social expenditures. The Russion system is not designed for small fields.

500 MM high cost

Charts 6.53 through 6.56 indicate how the high government take over high rates of return result in a much flatter IRR, NPV and EMV curve than for Alaska. For large fields, Alaska is less attractive than Russia at low prices, but at higher prices Alaska becomes rapidly more attractive.

Chart 6.53. IRR of 500 million barrel - high productivity case, high costs, Russia and Azerbaijan

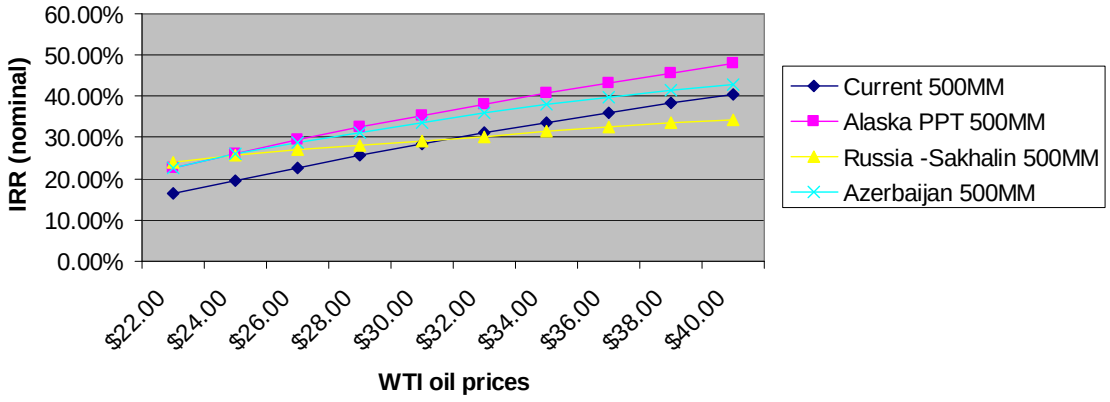
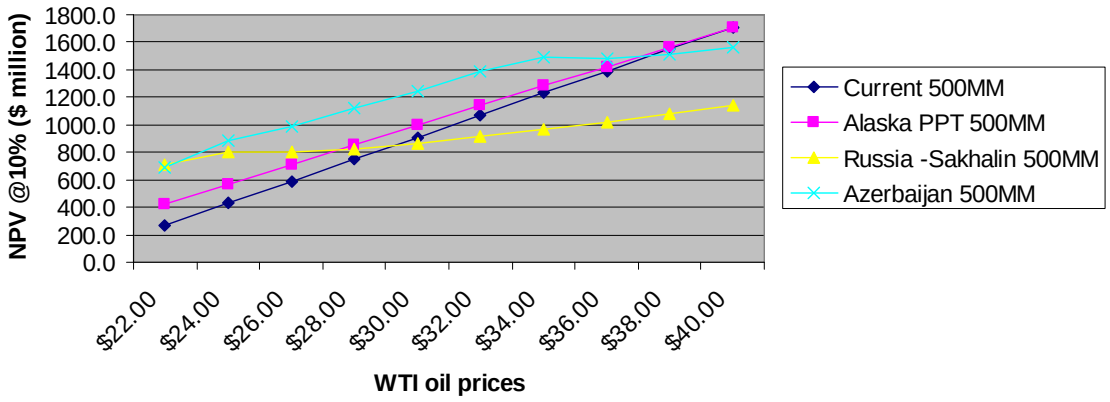
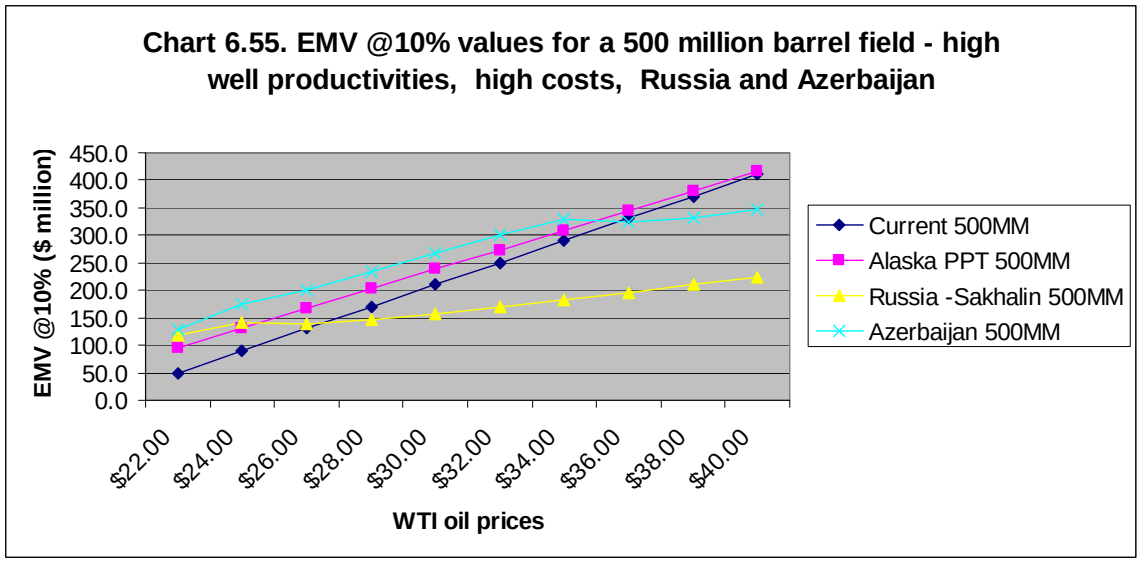
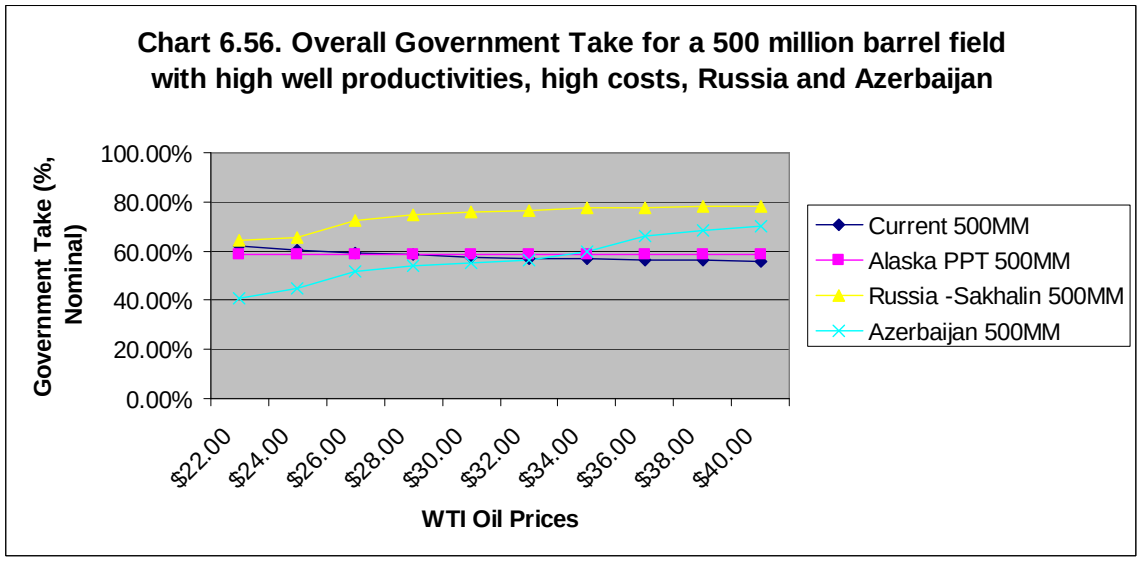


Chart 6.54. NPV @10% for a 500 million barrel field - high well productivity, high costs, Russia and Azerbaijan





The strongly progressive Russian system is clearly illustrated in Chart 6.56.



50 MM low cost

Charts 6.57 through 6.60 indicate about the same economics as for the 50 MM high cost case. The Russian system is clearly less attractive than the Alaska system for small fields, whether it is the current system of the PPT. Also the system is regressive.

Chart 6.57. IRR for 50 million barrel - low productivity case, low costs, Russia and Azerbaijan

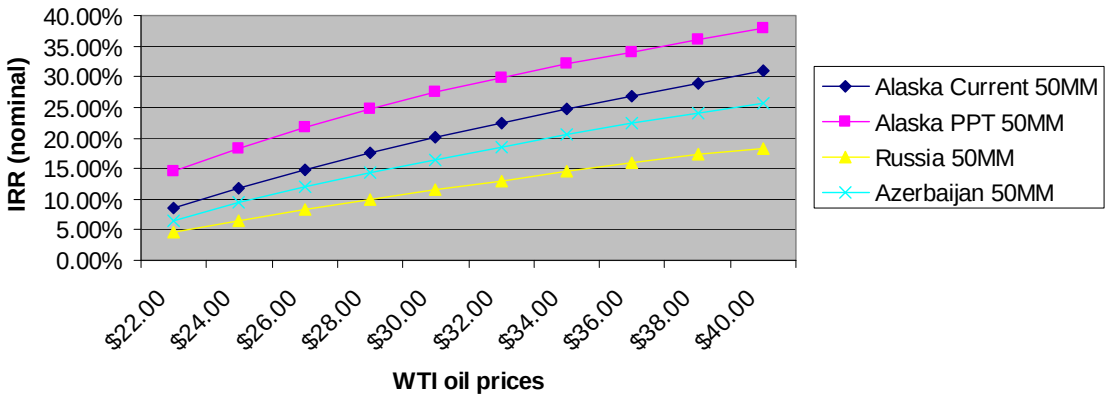
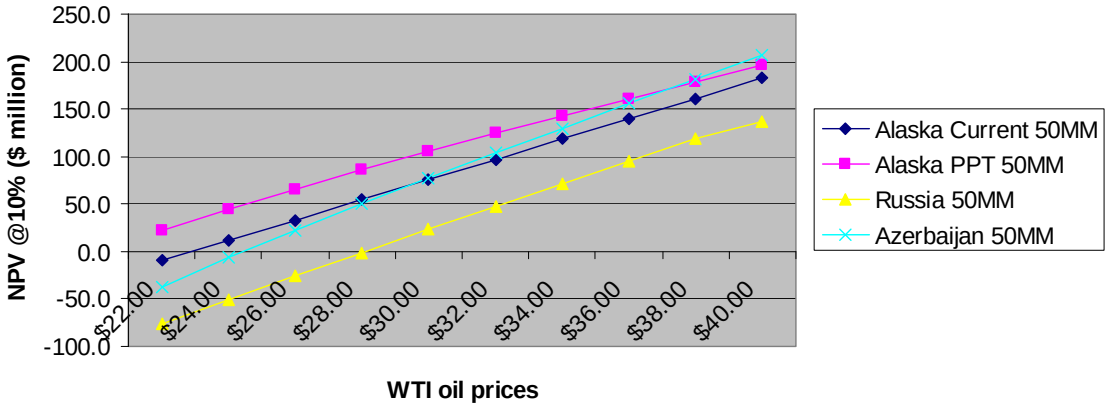
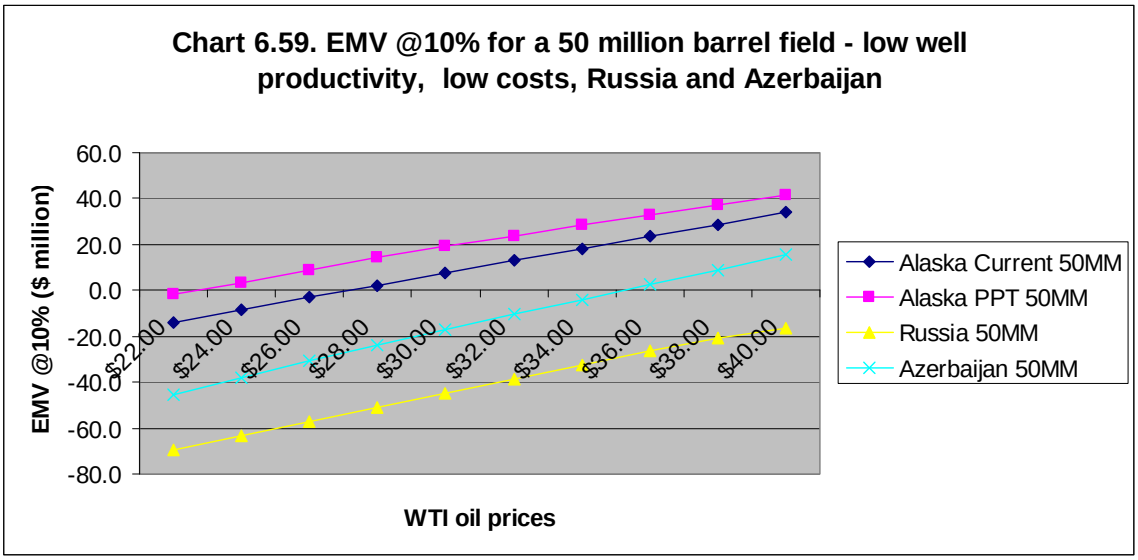
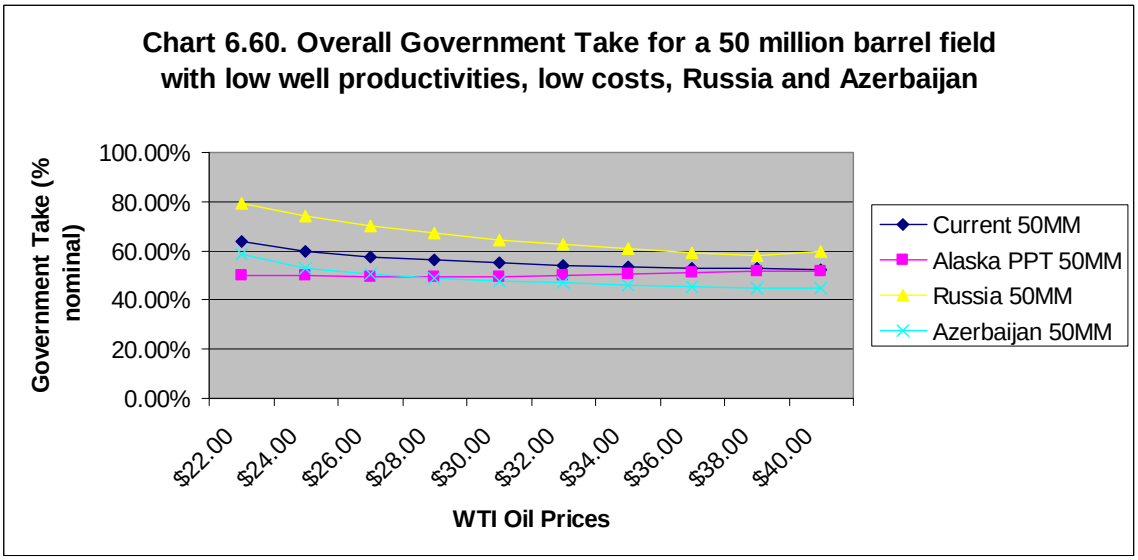


Chart 6.58. NPV @10% for a 50 million barrel field - low well productivity, low costs, Russia and Azerbaijan







500 MM low cost

Charts 6.61 through 6.64 indicates how the Russian system is much less attractive than the Alaska system for the low cost case. This is because the low cost result in a situation where the rate of return benchmarks are reached earlier in time and therefore the profit oil shares for the government increase more rapidly.

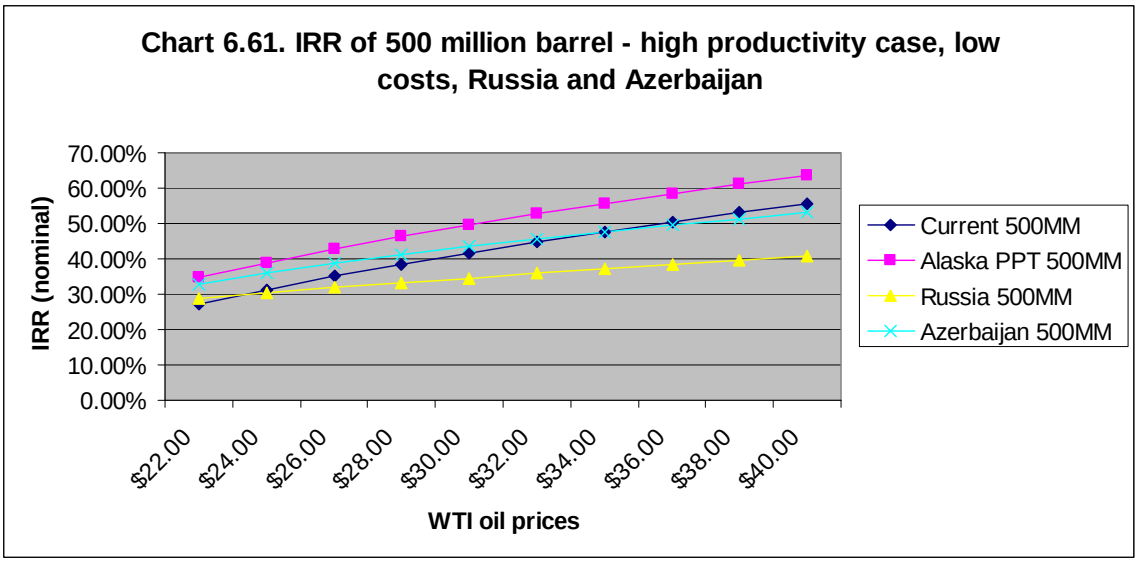


Chart 6.61. IRR of 500 million barrel - high productivity case, low costs, Russia and Azerbaijan
IRR (nominal)
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Current 500MM
Alaska PPT 500MM
Russia 500MM
Azerbaijan 500MM

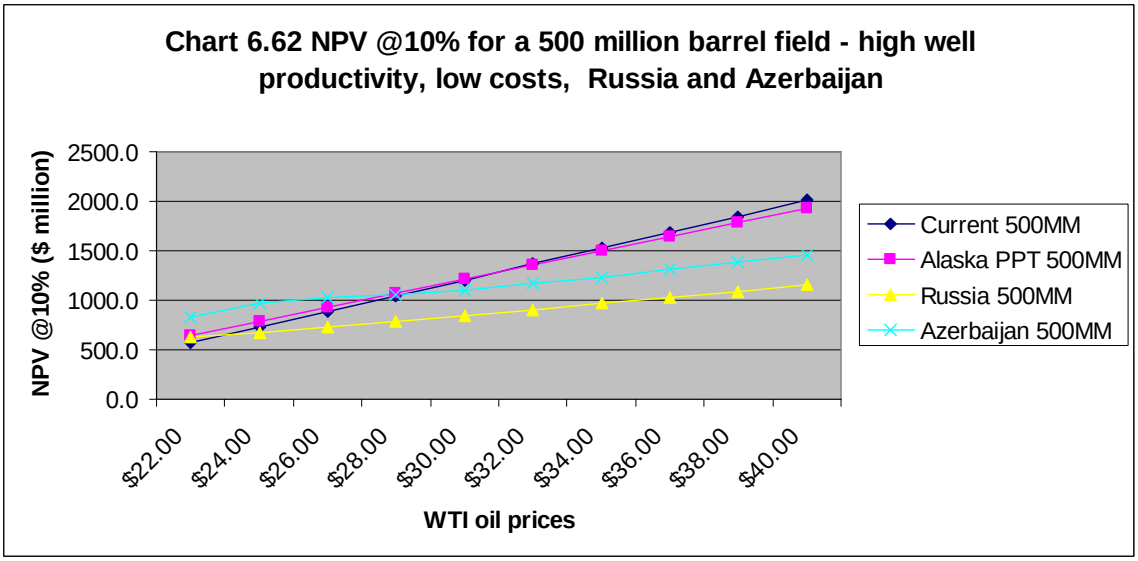
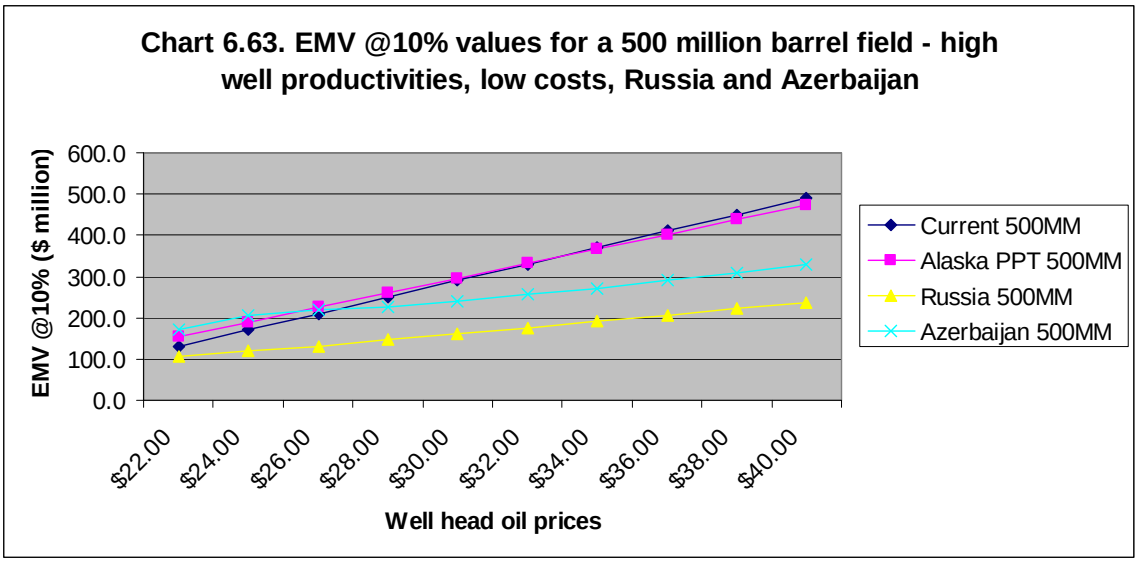
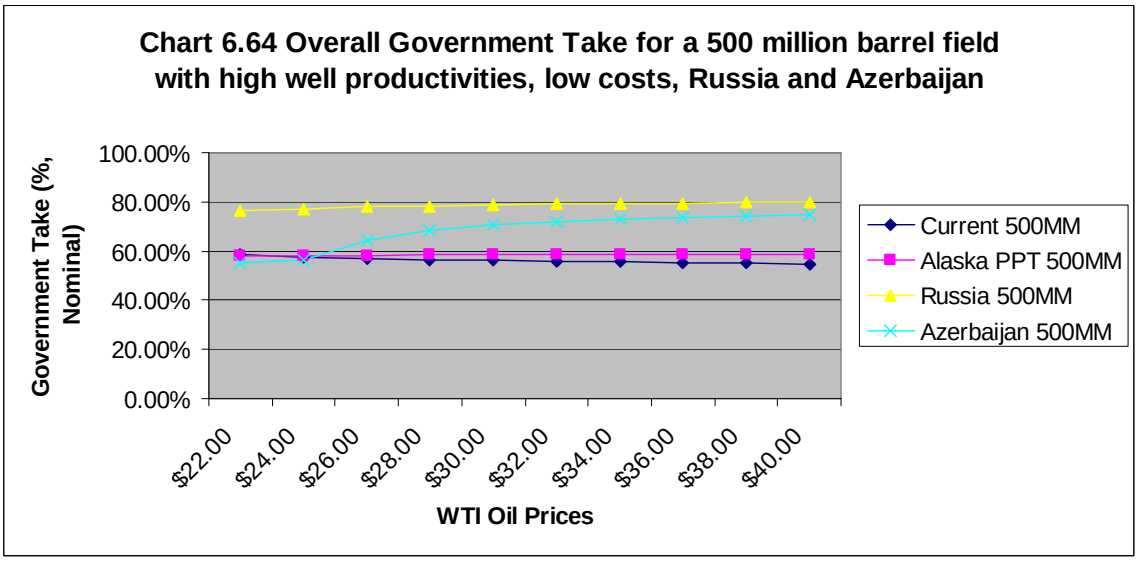


Chart 6.62 NPV @10% for a 500 million barrel field - high well productivity, low costs, Russia and Azerbaijan
NPV @10% ($ million)
2500.0
2000.0
1500.0
1000.0
500.0
0.0
$22.00
$24.00
$26.00
$28.00
$30.00
$32.00
$34.00
$36.00
$38.00
$40.00
WTI oil prices
Current 500MM
Alaska PPT 500MM
Russia 500MM
Azerbaijan 500MM





Russia-Sakhalin Conclusion. The Russian system is designed for large fields and is not attractive for small fields compared to Alaska. In general, under average or high oil prices and low costs, the rate of return based system creates conditions of a high government take in Russia. This makes Alaska more competitive. The PPT increases the competitiveness relative to Russia.

6.2.8. Azerbaijan

Azerbaijan represents a very important new oil development for the petroleum industry. Just as Alaska, Azerbaijan has to export its crude through long distance and costly pipeline systems and therefore the net back price for its crudes is relatively low. It is therefore an important country to compare with. Azerbaijan concludes its terms through production sharing agreements.

Azerbaijan terms. Azerbaijan does not have royalties. There is a 25% corporate income tax. Furthermore there is a production sharing arrangements. The cost oil limit is 50% for capital expenditures. Operating costs are not subject to the limit. The profit oil is based on an IRR based sliding scale which related to a real after tax IRR. This sliding scale is based on the pipeline transport costs. Higher transport costs result in a lower scale. It is assumed here that the transport costs are in excess of $ 4 per barrel. For these costs, the following scale of profit oil to government is being used:

Up to a real IRR of	16.75%	- 20% profit oil to government
Up to a real IRR of	24.75%	- 50% profit oil to government
Over a real IRR of	24.75%	- 75% profit oil to government

The national oil company SOCAR participates for 20% in the venture, but this is almost on a “straight up” basis and therefore this is participation is not included in the government take.

There was a bonus of $ 120 million on the project. However, that bonus is excluded for analysis as explained in the beginning of this Chapter. A sequence of social expenditures was included.

Azerbaijan provides near absolute fiscal stability on its fiscal terms.

50 MM high cost

Chart 6.49 shows how the IRR and NPV@10% in Azerbaijan is generally worse than the Alaska Current system and in particular relative to the Alaska PPT. But the Alaska PPT is fare more favorable than Azerbaijan.

The EMV@10% is far less favorable in Azerbaijan, due to the ring-fenced nature of the production sharing agreement and the social expenditures.

The government take in Azerbaijan for small high cost fields is regressive, because the higher benchmarks on the IRR sliding scale do not click in.

500 MM high cost

For a high cost field, the IRR feature works rather favorable under low prices (with very low netbacks). Therefore, IRR is between the PPT and the Alaska Current system. The NPV@10% and the EMV@10% are actually more favorable under low prices than the Alaska PPT due to the relatively low government take at low prices, but these indicators become more favorable for Alaska at higher prices..

As can be seen from Chart 6.56 the government take is rather progressive. It is less than Alaska for low prices and becomes about higher than Alaska at high prices for this large field.

50 MM low cost

The 50 MM low cost field has about the same characteristics as the high cost field. The NPV performance worse than the PPT and has a cross over with the Alaska Current system.

500 MM low cost

Under low cost conditions, the government take under the Azerbaijan terms becomes strongly progressive. Therefore, compared to the high cost case, the IRR, NPV@10% and EMV@10% all become considerable less than the PPT for high prices.

Azerbaijan conclusion. The system is strongly progressive with costs and prices. Therefore under low cost and high price conditions the PPT is far more favorable than the system in Azerbaijan for investors. Under low prices and high costs, the system in Azerbaijan is more favorable. It should be noted that the production sharing contract was designed for large fields.

7. INTERNATIONAL RATING OF THE ALASKA PETROLEUM PROFITS TAX ("PPT")

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in the interest of providing the maximum information about the PPT it was considered desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

7.1. Introduction

This chapter contains an rating analysis of the Alaska PPT in order to evaluate in more detail the actual improvement in competitiveness that this fiscal change would create.

The rating is done by comparing in detail the economic results of the 8 world fiscal systems evaluated in Chapter 6.

The same fields will be used for the rating analysis, based on the high and the low cost cases. However, three of the fields were selected for the analysis:

- 50 MM barrels with low well productivities
- 150 MM barrels with low well productivities
- 500 MM barrels with high well productivities

The rating is done for two price levels:

- a WTI price of $ 26 per barrel
- a WTI price of $ 36 per barrel

These two levels reflect approximately the long term average price range that some oil companies may use to evaluate opportunities in Alaska. Large international major oil companies may still use lower prices in the $ 25 to $ 30 price range, but many of the large and medium sized oil companies have now shifted to higher levels of long term price expectation. Therefore, this price range may be representative of possible new investors in Alaska.

The rating will be based on the PPT for new investors, which means including the tax free allowance.

The same weighting was given to the 50 MM, 150 MM and 500 MM fields. This implies that the distribution of field sizes will be logarithmic. In other words a typical distribution is ten 50 MM barrel fields, about three 150 MM barrel fields and one 500 MM barrel field. This is a fairly representative distribution for the North Slope.

7.2. IRR rating

Table 7.1 and 7.2 summarize the IRR results that were obtained for the 10 fiscal systems.

Table 7.1

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	4.54%	15.47%	9.69%	20.67%	22.76%	36.00%
Alaska PPT	9.98%	21.96%	14.35%	25.44%	29.38%	43.29%
Norway	11.75%	17.98%	15.38%	21.47%	26.06%	33.54%
UK	13.50%	22.17%	18.81%	28.12%	37.13%	48.90%
US GOM	15.51%	23.84%	21.04%	30.47%	38.26%	49.52%
Nigeria	13.73%	21.76%	19.12%	27.99%	35.45%	45.82%
Alberta-Oil Sands	12.84%	21.21%	19.07%	28.50%	37.75%	48.91%
Angola	6.46%	16.68%	13.08%	22.80%	30.67%	40.80%
Russia-Sakhalin	3.02%	10.30%	12.69%	20.40%	26.98%	32.49%
Azerbaijan	3.79%	13.72%	11.21%	21.84%	28.71%	39.85%

Table 7.2

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	14.75%	26.91%	19.92%	32.93%	35.07%	50.47%
Alaska PPT	21.63%	34.06%	25.25%	38.45%	42.70%	58.54%
Norway	19.22%	26.48%	22.79%	30.17%	35.20%	44.27%
UK	23.99%	34.01%	30.16%	41.32%	51.42%	64.73%
US GOM	25.83%	34.93%	32.83%	43.48%	52.26%	64.49%
Nigeria	23.13%	31.51%	29.49%	39.30%	47.59%	59.20%
Alberta-Oil Sands	22.15%	31.09%	29.74%	40.20%	50.07%	61.77%
Angola	18.26%	27.44%	24.39%	34.47%	42.38%	52.36%
Russia-Sakhalin	8.21%	15.91%	19.70%	25.58%	31.90%	38.34%
Azerbaijan	11.95%	22.34%	20.70%	31.69%	38.90%	49.49%

Tables 7.3 and 7.4 rank these results from “1” to “10”. In other words the highest IRR is number “1” and the lowest IRR is number “10”

The total ranking for the IRR is done by simply adding the ranking numbers. The last column in table 7.4 provides the total for the high and the low cases. The lower the number the more attractive the fiscal system is for investors.

The competitiveness index for the IRR indicates the relative competitiveness of the 10 fiscal systems related to each other, based on 6 fields for the high and low cost scenarios. If the IRR rates best in all 10 of them, the index is 12 (1 x 6 x 2 = 12). If the system rates worst in all of them, the index is 120 (10 x 6 x 2 = 120).

The US Gulf of Mexico is the most attractive system with a number 13. The Russia-Sakhalin agreement is the least attractive system with a number 116. The Alaska Current system is the next least attractive with a score of 100. The Alaska PPT improves the number to 58. In other words with respect to the IRR, the Alaska PPT improves the competitive position from a # 9 ranking for the current severance tax to a # 5 ranking among 10 fiscal systems. This means that the PPT improves the Alaska terms considerably from an IRR point of view.

Table 7.3

IRR	**50MM $26 high**	**50MM $36 high**	**150MM $26 high**	**150MM $36 high**	**500MM $26 high**	**500MM $36 high**	**Subtotal**
Alaska Current	8	8	10	9	10	8	**53**
Alaska PPT	6	3	6	5	6	5	**31**
Norway	5	6	5	8	9	9	**42**
UK	3	2	4	3	3	3	**18**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	4	2	4	4	4	**20**
Alberta-Oil Sands	4	5	3	2	2	2	**18**
Angola	7	7	7	6	5	6	**38**
Russia-Sakhalin	10	10	8	10	8	10	**56**
Azerbaijan	9	9	9	7	7	7	**48**

Table 7.4

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	9	7	9	7	**47**	**100**
Alaska PPT	5	2	5	5	5	5	**27**	**58**
Norway	6	8	7	9	8	9	**47**	**89**
UK	2	3	2	2	2	1	**12**	**30**
US GOM	1	1	1	1	1	2	**7**	**13**
Nigeria	3	4	4	4	4	4	**23**	**43**
Alberta-Oil Sands	4	5	3	3	3	3	**21**	**39**
Angola	7	6	6	6	6	6	**37**	**75**
Russia-Sakhalin	10	10	10	10	10	10	**60**	**116**
Azerbaijan	9	9	8	8	7	8	**49**	**97**

7.3. NPV @10% rating

Tables 7.5 through 7.8 provide the same analysis for the NPV@10%. It can be seen how the Alaska Current system would rank # 8 and the Alaska PPT would rank # 7 under the 10 fiscal systems. The relative competitiveness improvement of the PPT relative to the Current System is moderate for the PPT. This is caused by the fact that the government take under high prices is higher for the PPT.

Table 7.5

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-48.6	57.8	-7.1	281.2	589.0	1390.5
Alaska PPT	-0.1	101.5	78.6	317.6	711.1	1423.9
Norway	11.0	56.5	90.4	214.9	590.9	970.4
UK	35.5	139.0	220.5	503.5	1365.4	2228.0
US GOM	71.4	205.8	322.6	677.8	1667.2	2685.6
Nigeria	45.3	151.0	245.7	519.0	1273.8	2045.1
Alberta-Oil Sands	30.3	135.5	220.0	504.3	1338.6	2201.0
Angola	-45.2	98.6	97.1	391.2	1003.0	1420.6
Russia-Sakhalin	-119.8	5.7	95.6	366.0	797.5	1023.3
Azerbaijan	-91.5	59.3	38.4	409.1	990.2	1476.6

Table 7.6

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	33.2	139.7	172.9	461.2	885.4	1687.0
Alaska PPT	64.9	161.2	211.0	447.8	928.7	1638.9
Norway	44.5	90.0	163.2	287.7	709.3	1088.8
UK	109.1	212.5	381.8	664.8	1628.0	2490.6
US GOM	163.5	297.8	522.4	877.6	1993.5	3012.0
Nigeria	114.0	210.0	381.0	641.2	1465.5	2232.0
Alberta-Oil Sands	102.6	206.2	372.3	655.6	1580.3	2439.5
Angola	81.3	164.1	290.3	493.5	991.6	1176.3
Russia-Sakhalin	-25.9	95.5	260.0	379.8	729.2	1026.7
Azerbaijan	22.2	155.6	256.8	511.3	1023.5	1312.7

Table 7.7

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	9	8	**52**
Alaska PPT	6	5	8	8	8	6	**41**
Norway	5	9	7	10	10	10	**51**
UK	3	3	3	4	2	2	**17**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	2	2	2	4	4	**16**
Alberta-Oil Sands	4	4	4	3	3	3	**21**
Angola	7	6	5	6	5	7	**36**
Russia-Sakhalin	10	10	6	7	7	9	**49**
Azerbaijan	9	7	9	5	6	5	**41**

Table 7.8

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	8	9	7	8	5	**45**	**97**
Alaska PPT	6	6	8	8	7	6	**41**	**82**
Norway	7	10	10	10	10	9	**56**	**107**
UK	3	2	2	2	2	2	**13**	**30**
US GOM	1	1	1	1	1	1	**6**	**12**
Nigeria	2	3	3	4	4	4	**20**	**36**
Alberta-Oil Sands	4	4	4	3	3	3	**21**	**42**
Angola	5	5	5	6	6	8	**35**	**71**
Russia-Sakhalin	10	9	6	9	9	10	**53**	**102**
Azerbaijan	9	7	7	5	5	7	**40**	**81**

7.4. EMV @10% rating

Tables 7.9 through 7.12 provide the analysis for the EMV@10%. From an EMV perspective, the Alaska current system would rank # 8 and the Alaska PPT would rank # 5. The EMV improvement for the PPT is due to a large extent to the tax credits which have a significant impact on the EMV. The PPT improvement therefore is very significant for explorers.

Table 7.9

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-29.3	-2.7	-18.9	53.2	130.1	330.5
Alaska PPT	-11.2	14.2	8.5	68.3	166.6	344.8
Norway	-3.7	7.6	16.1	47.2	141.2	236.1
UK	-6.0	19.9	40.3	111.0	326.5	542.2
US GOM	-12.7	20.9	50.1	138.9	386.2	640.8
Nigeria	-17.8	8.6	32.3	100.6	289.3	482.1
Alberta-Oil Sands	-15.7	10.6	31.7	102.8	311.4	527.0
Angola	-40.4	-4.5	-4.9	68.7	221.6	326.0
Russia-Sakhalin	-90.1	-58.7	-36.2	31.4	139.2	195.7
Azerbaijan	-68.9	-31.2	-36.4	56.2	201.5	323.1

Table 7.10

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	-3.1	23.5	31.8	103.9	209.9	410.3
Alaska PPT	8.8	32.9	45.3	104.5	224.8	402.3
Norway	6.8	18.2	36.4	67.6	173.0	267.9
UK	17.3	43.2	85.5	156.2	397.0	612.7
US GOM	20.0	53.6	109.7	198.5	477.5	732.1
Nigeria	9.1	33.1	75.8	140.9	347.0	538.6
Alberta-Oil Sands	8.8	34.7	76.2	147.1	378.2	593.0
Angola	0.9	21.6	53.1	103.9	228.5	274.6
Russia-Sakhalin	-56.9	-26.5	14.6	44.5	131.9	206.3
Azerbaijan	-30.8	2.6	27.9	91.5	219.5	291.8

Table 7.11

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	7	7	8	8	10	6	**46**
Alaska PPT	3	3	6	6	7	5	**30**
Norway	1	6	5	9	8	9	**38**
UK	2	2	2	2	2	2	**12**
US GOM	4	1	1	1	1	1	**9**
Nigeria	6	5	3	4	4	4	**26**
Alberta-Oil Sands	5	4	4	3	3	3	**22**
Angola	8	8	7	5	5	7	**40**
Russia-Sakhalin	10	10	9	10	9	10	**58**
Azerbaijan	9	9	10	7	6	8	**49**

Table 7.12

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	6	8	7	8	5	**42**	**88**
Alaska PPT	5	5	6	5	6	6	**33**	**63**
Norway	6	8	7	9	9	9	**48**	**86**
UK	2	2	2	2	2	2	**12**	**24**
US GOM	1	1	1	1	1	1	**6**	**15**
Nigeria	3	4	4	4	4	4	**23**	**49**
Alberta-Oil Sands	4	3	3	3	3	3	**19**	**41**
Angola	7	7	5	6	5	8	**38**	**78**
Russia-Sakhalin	10	10	10	10	10	10	**60**	**118**
Azerbaijan	9	9	9	8	7	7	**49**	**98**

7.5. Government Take rating

Tables 7.13 through 7.16 show the attractiveness of the government take to investors. In this case, of course, the lower the government take is the more attractive the fiscal system is for investors. So here a "1" is given for the lowest government take and an "10" is provided for the highest government take.

The Alaska current system ranks # 7. Alaska needs a somewhat better government take in order to compensate for the low net back.

The PPT for new investors, with the tax free allowance, would on an overall basis be slightly less because of the government take improves strongly on small fields and higher government take on large fields. Therefore the Alaska PPT would rate # 6. On an overall basis the government take improvement is very modest.

Table 7.13

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	71.03%	56.57%	61.48%	54.67%	59.25%	56.37%
Alaska PPT	48.80%	49.70%	53.98%	55.73%	58.54%	58.64%
Norway	75.65%	76.74%	75.17%	76.33%	76.43%	76.97%
UK	51.25%	50.67%	50.50%	50.30%	50.15%	50.10%
US GOM	35.16%	35.13%	41.41%	40.40%	43.91%	43.27%
Nigeria	39.27%	46.92%	45.97%	49.82%	53.66%	54.74%
Alberta-Oil Sands	48.60%	49.53%	49.13%	49.70%	49.86%	49.98%
Angola	68.24%	50.31%	53.43%	58.26%	63.10%	71.29%
Russia-Sakhalin	82.36%	63.79%	54.26%	59.16%	72.42%	77.81%
Azerbaijan	65.76%	47.07%	44.81%	41.94%	51.62%	66.24%

Table 7.14

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	57.70%	53.13%	55.54%	52.52%	57.00%	55.23%
Alaska PPT	49.66%	51.00%	54.39%	55.93%	58.30%	58.51%
Norway	77.13%	77.47%	76.59%	77.09%	77.08%	77.38%
UK	50.90%	50.55%	50.41%	50.26%	50.14%	50.09%
US GOM	35.14%	35.12%	40.24%	39.76%	43.16%	42.79%
Nigeria	47.64%	50.58%	50.23%	51.99%	54.87%	55.47%
Alberta-Oil Sands	49.76%	49.98%	49.81%	49.97%	50.01%	50.10%
Angola	51.17%	60.31%	59.41%	63.53%	72.15%	80.94%
Russia-Sakhalin	70.12%	59.47%	58.68%	69.84%	78.00%	79.51%
Azerbaijan	50.60%	45.56%	42.90%	53.99%	64.20%	73.44%

Table 7.15

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	9	6	7	5	**43**
Alaska PPT	4	5	7	7	6	6	**35**
Norway	9	10	10	10	10	9	**58**
UK	5	7	5	5	3	3	**28**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	2	3	4	5	4	**20**
Alberta-Oil Sands	3	4	4	3	2	2	**18**
Angola	7	6	6	8	8	8	**43**
Russia-Sakhalin	10	9	8	9	9	10	**55**
Azerbaijan	6	3	2	2	4	7	**24**

Table 7.16

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	7	5	5	4	**36**	**79**
Alaska PPT	3	6	6	7	6	6	**34**	**69**
Norway	10	10	10	10	9	8	**57**	**115**
UK	6	4	5	3	3	2	**23**	**51**
US GOM	1	1	1	1	1	1	**6**	**12**
Nigeria	2	5	4	4	4	5	**24**	**44**
Alberta-Oil Sands	4	3	3	2	2	3	**17**	**35**
Angola	7	9	9	8	8	10	**51**	**94**
Russia-Sakhalin	9	8	8	9	10	9	**53**	**108**
Azerbaijan	5	2	2	6	7	7	**29**	**53**

7.6. Overall rating

It can be seen from the previous tables that the Alaska PPT strongly boosts the IRR and the EMV@10%. The NPV@10% is less strongly affected but the Alaska PPT still provides an improvement. The Government Take is about the same for new investors because it improves significantly for small fields for new investors but is higher on large fields.

Despite the relatively modest government take compared Norway and Angola, the Alaska PPT does not rate that well on an NPV@10% basis due to the low net back prices.

The reason therefore that the Alaska current system rates # 8 economically is because of the low net back prices.

Therefore, the current severance tax and the proposed Alaska PPT need to accommodate the low net back through a generally modest government take compared to world wide standards. Compared to some other high cost environments in North America the government take is tougher.

Table 7.17 provides the overall ranking. The table summarizes the results for the four variables. The overall ranking of the Alaska PPT would be # 5 compared with # 8 for the current system. It can be seen how there is a considerable reduction in number from 364 to 272.

This indicates that the improvement in competitiveness of the Alaska PPT is considerable for new investors. It should result in attracting new entrants to Alaska.

Table 7.17

Overall	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	97	88	79	364	#8
Alaska PPT	58	82	63	69	272	#5
Norway	89	107	86	115	397	#9
UK	30	30	24	51	135	#2
US GOM	13	12	15	12	52	#1
Nigeria	43	36	49	44	172	#4
Alberta-Oil Sands	39	42	41	35	157	#3
Angola	75	71	78	94	318	#6
Russia-Sakhalin	116	102	118	108	444	#10
Azerbaijan	97	81	98	53	329	#7

The following table summarizes the total competitiveness index from attractive to unattractive for new investors in Alaska.

Table 7.18
COMPETITIVENESS INDEX

Hypothetical best	48	
US GOM	52	#1
UK	135	#2
Alberta-Oil Sands	157	#3
Nigeria	172	#4
Alaska PPT	272	#5
Angola	318	#6
Azerbaijan	329	#7
Alaska Current	364	#8
Norway	397	#9
Russia-Sakhalin	444	#10
Hypothetical worst	480	

8. COMPETITIVENESS AND THE PPT RATE

(Note: After the initial scoping a PPT tax rate of 20% and a credit rate of 15% seemed a reasonable combination. Therefore much economic work was done on this combination. As a result of subsequent work it was concluded that a 25% tax rate and 20% tax credit rate is more in the interest of Alaska. Nevertheless in the interest of providing the maximum information about the PPT it was considered desirable to leave the Chapters that were based on the 20% tax rate and 15% credit rate in the report. These are Chapters 4,5,6,7 and 8. Chapter 9,10 and 11 are based on the recommended fiscal terms.)

8.1. Introduction

As was illustrated in Chapter 4, a new investor will not be concerned about the PPT rate for small fields because of the tax free allowance. The new investor will receive the tax credits for negative cash flow and for capital expenditures on the small field, but will typically not pay PPT unless oil prices are very high. Therefore, small companies and new investors in small fields will not be concerned about the PPT rate.

The PPT rate will be mainly a concern for existing larger oil companies. It is therefore important to analyze the international economic competitiveness with respect to the PPT rate for a situation where companies have already used their tax free allowance and are re-investing in Alaska. Such re-investments should be attractive from an international perspective, otherwise there is not an increased incentive to re-invest in Alaska.

An important Alaska PPT concept is that large oil companies that actively re-invest in Alaska should be rewarded with better economics. Large oil companies that are largely in a “harvest” mode and re-direct their Alaska profits in other jurisdictions, should pay a higher tax.

A PPT rate that is too high might discourage re-investment if the overall economic rating becomes unattractive. In order to review the effect of a high PPT rate, an analysis was done of various rates.

In this chapter the analysis will be provided for PPT rates of 30%, 25% and 20% in order to evaluate the economics from this perspective.

Following is the same competitiveness analysis as done in Chapter 7 for the proposed PPT for new investors, but now for re-investment by oil companies which have already used their tax free allowance.

8.2. Results of the analysis

8.2.1. IRR results

The IRR results show the IRR is not very different depending on the PPT rate, for the 30%, 25% and 20% cases (indicated in the table as PPT-30, PPT-25 and PPT-20). The reason is that both the negative as well as the positive cash flows are subject to the PPT rate and therefore, a higher rate also results in higher tax credits for negative cash flows.

Table 8.1

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	4.54%	15.47%	4.54%	20.67%	22.76%	36.00%
PPT-20	7.33%	18.56%	12.54%	23.97%	28.61%	42.61%
Norway	11.75%	17.98%	15.38%	21.47%	26.06%	33.54%
UK	13.50%	22.17%	18.81%	28.12%	37.13%	48.90%
US GOM	15.51%	23.84%	21.04%	30.47%	38.26%	49.52%
Nigeria	13.73%	21.76%	19.12%	27.99%	35.45%	45.82%
Alberta-Oil Sands	12.84%	21.21%	19.07%	28.50%	37.75%	48.91%
Angola	6.46%	16.68%	13.08%	22.80%	30.67%	40.80%
Russia-Sakhalin	3.02%	10.30%	12.69%	20.40%	26.98%	32.49%
Azerbaijan	3.79%	13.72%	11.21%	21.84%	28.71%	39.85%
PPT-30	7.58%	18.62%	12.61%	23.80%	28.22%	41.96%
PPT-25	7.45%	18.59%	12.57%	23.89%	28.43%	42.30%

Table 8.2

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	14.75%	26.91%	19.92%	32.93%	35.07%	50.47%
PPT-20	17.82%	30.38%	23.19%	36.73%	41.66%	57.75%
Norway	19.22%	26.48%	22.79%	30.17%	35.20%	44.27%
UK	23.99%	34.01%	30.16%	41.32%	51.42%	64.73%
US GOM	25.83%	34.93%	32.83%	43.48%	52.26%	64.49%
Nigeria	23.13%	31.51%	29.49%	39.30%	47.59%	59.20%
Alberta-Oil Sands	22.15%	31.09%	29.74%	40.20%	50.07%	61.77%
Angola	18.26%	27.44%	24.39%	34.47%	42.38%	52.36%
Russia-Sakhalin	8.21%	15.91%	19.70%	25.58%	31.90%	38.34%
Azerbaijan	11.95%	22.34%	20.70%	31.69%	38.90%	49.49%
PPT-30	17.89%	30.30%	23.04%	36.35%	41.03%	56.90%
PPT-25	17.86%	30.34%	23.12%	36.55%	41.36%	57.35%

Even without specific rating analysis, it can be seen how the IRR results for all PPT rates are generally more attractive than the Current system. This is because of the tax credits on negative cash flow and on capital expenditures, which are important during the first part of the cash flow.

8.2.2. NPV@10% results

The NPV@10% results are sensitive to the PPT rate as can be seen in Tables 8.3 and 8.4. The lower the PPT rate, the more attractive the NPV@10%. As can be expected for the large fields and under high prices is the PPT 30% system less attractive than the Current system, in view of the fact that the 30% takes away considerable positive cash flow.

Table 8.3

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-48.6	57.8	-7.1	281.2	589.0	1390.5
PPT-20	-17.7	67.5	43.3	276.3	668.6	1378.8
Norway	11.0	56.5	90.4	214.9	590.9	970.4
UK	35.5	139.0	220.5	503.5	1365.4	2228.0
US GOM	71.4	205.8	322.6	677.8	1667.2	2685.6
Nigeria	45.3	151.0	245.7	519.0	1273.8	2045.1
Alberta-Oil Sands	30.3	135.5	220.0	504.3	1338.6	2201.0
Angola	-45.2	98.6	97.1	391.2	1003.0	1420.6
Russia-Sakhalin	-119.8	5.7	95.6	366.0	797.5	1023.3
Azerbaijan	-91.5	59.3	38.4	409.1	990.2	1476.6
PPT-30	-14.3	60.3	39.6	243.5	586.5	1207.9
PPT-25	-16.0	63.9	41.5	259.9	627.5	1293.3

Table 8.4

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	33.2	139.7	172.9	461.2	885.4	1687.0
PPT-20	40.7	125.9	172.5	405.4	883.6	1593.8
Norway	44.5	90.0	163.2	287.7	709.3	1088.8
UK	109.1	212.5	381.8	664.8	1628.0	2490.6
US GOM	163.5	297.8	522.4	877.6	1993.5	3012.0
Nigeria	114.0	210.0	381.0	641.2	1465.5	2232.0
Alberta-Oil Sands	102.6	206.2	372.3	655.6	1580.3	2439.5
Angola	81.3	164.1	290.3	493.5	991.6	1176.3
Russia-Sakhalin	-25.9	95.5	260.0	379.8	729.2	1026.7
Azerbaijan	22.2	155.6	256.8	511.3	1023.5	1312.7
PPT-30	36.4	111.0	152.1	355.9	774.1	1395.5
PPT-25	38.6	118.4	162.3	380.7	828.9	1494.7

8.2.3. EMV@10% results.

Also with respect to the EMV@10% the PPT rate is important. Generally, the higher the PPT rate, the less attractive the exploration for the field. An exception is the small field under low prices. In fact in this case the PPT 30% indicates the least unattractive results. This is because the exploration costs are also subject to the tax credit. With a PPT of 30% the tax credit is more and therefore, the net costs of an exploratory dry hole is less.

Table 8.5

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-29.3	-2.7	-18.9	53.2	130.1	330.5
PPT-20	-15.6	5.7	-0.3	57.9	156.0	333.6
Norway	-3.7	7.6	16.1	47.2	141.2	236.1
UK	-6.0	19.9	40.3	111.0	326.5	542.2
US GOM	-12.7	20.9	50.1	138.9	386.2	640.8
Nigeria	-17.8	8.6	32.3	100.6	289.3	482.1
Alberta-Oil Sands	-15.7	10.6	31.7	102.8	311.4	527.0
Angola	-40.4	-4.5	-4.9	68.7	221.6	326.0
Russia-Sakhalin	-90.1	-58.7	-36.2	31.4	139.2	195.7
Azerbaijan	-68.9	-31.2	-36.4	56.2	201.5	323.1
PPT-30	-13.0	5.6	0.5	51.4	137.2	292.5
PPT-25	-14.3	5.7	0.1	54.7	146.6	313.1

Table 8.6

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	-3.1	23.5	31.8	103.9	209.9	410.3
PPT-20	2.8	24.1	35.7	93.9	213.5	391.0
Norway	6.8	18.2	36.4	67.6	173.0	267.9
UK	17.3	43.2	85.5	156.2	397.0	612.7
US GOM	20.0	53.6	109.7	198.5	477.5	732.1
Nigeria	9.1	33.1	75.8	140.9	347.0	538.6
Alberta-Oil Sands	8.8	34.7	76.2	147.1	378.2	593.0
Angola	0.9	21.6	53.1	103.9	228.5	274.6
Russia-Sakhalin	-56.9	-26.5	14.6	44.5	131.9	206.3
Azerbaijan	-30.8	2.6	27.9	91.5	219.5	291.8
PPT-30	2.8	21.5	31.7	82.7	187.2	342.6
PPT-25	2.8	22.8	33.7	88.3	200.4	366.8

8.2.4. Government Take results

The most negative factor of a high PPT of 30% for large oil companies with large operations in Alaska would be the resulting high government take, which means losses on undiscounted cash. This is unattractive from a long term perspective. This is clearly illustrated in the following two tables. The higher the PPT rate, the higher the government take (which means a correspondingly lower corporate take) and the less attractive the field economics are to the investors.

Table 8.7

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	71.03%	56.57%	61.48%	54.67%	59.25%	56.37%
PPT-20	65.10%	61.07%	62.92%	60.71%	61.12%	60.14%
Norway	75.65%	76.74%	75.17%	76.33%	76.43%	76.97%
UK	51.25%	50.67%	50.50%	50.30%	50.15%	50.10%
US GOM	35.16%	35.13%	41.41%	40.40%	43.91%	43.27%
Nigeria	39.27%	46.92%	45.97%	49.82%	53.66%	54.74%
Alberta-Oil Sands	48.60%	49.53%	49.13%	49.70%	49.86%	49.98%
Angola	68.24%	50.31%	53.43%	58.26%	63.10%	71.29%
Russia-Sakhalin	82.36%	63.79%	54.26%	59.16%	72.42%	77.81%
Azerbaijan	65.76%	47.07%	44.81%	41.94%	51.62%	66.24%
PPT-30	68.00%	65.41%	66.85%	65.30%	65.76%	65.00%
PPT-25	66.55%	63.24%	64.88%	63.00%	63.44%	62.57%

Table 8.8

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	57.70%	53.13%	55.54%	52.52%	57.00%	55.23%
PPT-20	61.84%	60.34%	61.33%	60.19%	60.61%	59.90%
Norway	77.13%	77.47%	76.59%	77.09%	77.08%	77.38%
UK	50.90%	50.55%	50.41%	50.26%	50.14%	50.09%
US GOM	35.14%	35.12%	40.24%	39.76%	43.16%	42.79%
Nigeria	47.64%	50.58%	50.23%	51.99%	54.87%	55.47%
Alberta-Oil Sands	49.76%	49.98%	49.81%	49.97%	50.01%	50.10%
Angola	51.17%	60.31%	59.41%	63.53%	72.15%	80.94%
Russia-Sakhalin	70.12%	59.47%	58.68%	69.84%	78.00%	79.51%
Azerbaijan	50.60%	45.56%	42.90%	53.99%	64.20%	73.44%
PPT-30	66.07%	65.02%	65.83%	64.99%	65.41%	64.84%
PPT-25	63.95%	62.68%	63.58%	62.59%	63.01%	62.37%

8.3. Rating

The rating will be done separately for the 8 fiscal systems, comparing a PPT of 30%, 25% and 20% with the other 7 fiscal terms, including the Current System.

The PPT 30% will be shown in detail. Subsequently, the summary results of the PPT of 25% and 20% will also be provided.

8.3.1. Rating of the PPT of 30%

Following are all the tables for the PPT rating of 30%.

Table 8.9

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	10	8	**53**
PPT-30	6	5	8	5	7	5	**36**
Norway	5	6	5	8	9	9	**42**
UK	3	2	4	3	3	3	**18**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	3	2	4	4	4	**19**
Alberta-Oil Sands	4	4	3	2	2	2	**17**
Angola	7	7	6	6	5	6	**37**
Russia-Sakhalin	10	10	7	10	8	10	**55**
Azerbaijan	9	9	9	7	6	7	**47**

Table 8.10

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	9	7	9	7	**47**	**100**
PPT-30	7	5	6	5	6	5	**34**	**70**
Norway	5	8	7	9	8	9	**46**	**88**
UK	2	2	2	2	2	1	**11**	**29**
US GOM	1	1	1	1	1	2	**7**	**13**
Nigeria	3	3	4	4	4	4	**22**	**41**
Alberta-Oil Sands	4	4	3	3	3	3	**20**	**37**
Angola	6	6	5	6	5	6	**34**	**71**
Russia-Sakhalin	10	10	10	10	10	10	**60**	**115**
Azerbaijan	9	9	8	8	7	8	**49**	**96**

Table 8.11

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	8	9	7	**50**
PPT-30	6	6	8	9	10	8	**47**
Norway	5	9	7	10	8	10	**49**
UK	3	3	3	4	2	2	**17**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	2	2	2	4	4	**16**
Alberta-Oil Sands	4	4	4	3	3	3	**21**
Angola	7	5	5	6	5	6	**34**
Russia-Sakhalin	10	10	6	7	7	9	**49**
Azerbaijan	9	7	9	5	6	5	**41**

Table 8.12

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	8	7	7	5	**42**	**92**
PPT-30	7	8	10	9	8	7	**49**	**96**
Norway	6	10	9	10	10	9	**54**	**103**
UK	3	2	2	2	2	2	**13**	**30**
US GOM	1	1	1	1	1	1	**6**	**12**
Nigeria	2	3	3	4	4	4	**20**	**36**
Alberta-Oil Sands	4	4	4	3	3	3	**21**	**42**
Angola	5	6	5	6	6	8	**36**	**70**
Russia-Sakhalin	10	9	7	8	9	10	**53**	**102**
Azerbaijan	9	5	6	5	5	6	**36**	**77**

Table 8.13

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	7	7	8	7	10	5	**44**
PPT-30	4	6	6	8	9	8	**41**
Norway	1	5	5	9	7	9	**36**
UK	2	2	2	2	2	2	**12**
US GOM	3	1	1	1	1	1	**8**
Nigeria	6	4	3	4	4	4	**25**
Alberta-Oil Sands	5	3	4	3	3	3	**21**
Angola	8	8	7	5	5	6	**39**
Russia-Sakhalin	10	10	9	10	8	10	**57**
Azerbaijan	9	9	10	6	6	7	**47**

Table 8.14

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	5	7	6	7	5	**38**	**82**
PPT-30	6	7	8	8	8	6	**43**	**84**
Norway	5	8	6	9	9	9	**46**	**82**
UK	2	2	2	2	2	2	**12**	**24**
US GOM	1	1	1	1	1	1	**6**	**14**
Nigeria	3	4	4	4	4	4	**23**	**48**
Alberta-Oil Sands	4	3	3	3	3	3	**19**	**40**
Angola	7	6	5	5	5	8	**36**	**75**
Russia-Sakhalin	10	10	10	10	10	10	**60**	**117**
Azerbaijan	9	9	9	7	6	7	**47**	**94**

Table 8.15

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	7	8	6	6	5	**40**
PPT-30	6	9	9	9	8	6	**47**
Norway	9	10	10	10	10	9	**58**
UK	4	6	5	5	3	3	**26**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	2	3	4	5	4	**20**
Alberta-Oil Sands	3	4	4	3	2	2	**18**
Angola	7	5	6	7	7	8	**40**
Russia-Sakhalin	10	8	7	8	9	10	**52**
Azerbaijan	5	3	2	2	4	7	**23**

Table 8.16

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	7	6	6	5	5	4	**33**	**73**
PPT-30	8	9	9	8	7	6	**47**	**94**
Norway	10	10	10	10	9	8	**57**	**115**
UK	5	4	5	3	3	2	**22**	**48**
US GOM	1	1	1	1	1	1	**6**	**12**
Nigeria	2	5	4	4	4	5	**24**	**44**
Alberta-Oil Sands	3	3	3	2	2	3	**16**	**34**
Angola	6	8	8	7	8	10	**47**	**87**
Russia-Sakhalin	9	7	7	9	10	9	**51**	**103**
Azerbaijan	4	2	2	6	6	7	**27**	**50**

As can be seen from the above eight tables, in general the PPT 30% rates favorably compared to the Current System with respect to the IRR, but rates unfavorably with respect to NPV@10% and the EMV@10% and rates very unfavorably with respect to the Government Take.

The following two summary tables illustrate how on balance the PPT has about the same competitiveness rating as the Current Systems in total.

A PPT rate of 30% would not improve the competitiveness of Alaska for re-investment by large companies which have already used their tax free allowance. Therefore this rate would be too high.

Table 8.17

Overview	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	92	82	73	347	#8
PPT-30	70	96	84	94	344	#7
Norway	88	103	82	115	388	#9
UK	29	30	24	48	131	#2
US GOM	13	12	14	12	51	#1
Nigeria	41	36	48	44	169	#4
Alberta-Oil Sands	37	42	40	34	153	#3
Angola	71	70	75	87	303	#5
Russia-Sakhalin	115	102	117	103	437	#10
Azerbaijan	96	77	94	50	317	#6

Table 8.18
COMPETITIVENESS INDEX

Hypothetical best	48	
US GOM	51	#1
UK	131	#2
Alberta-Oil Sands	153	#3
Nigeria	169	#4
Angola	302	#5
Azerbaijan	317	#6
PPT-30	344	#7
Alaska Current	347	#8
Norway	388	#9
Russia-Sakhalin	438	#10
Hypothetical worst	480	

8.3.2. Rating of the PPT of 25%

Comparing Table 8.19 with 8.17 it can be seen how the PPT of 25% improves with respect to the NPV@10% and EMV@10%. This results in an overall better rating of the PPT at 25%. Which is now slightly more attractive than the Current system, as can be seen from Table 8.20. Nevertheless the competitive position is still close to the Current System based on a tax credit of 15%.

Table 8.19

Overview	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	100	93	84	73	350	#8
PPT-25	70	93	79	92	334	#7
Norway	88	104	83	115	390	#9
UK	29	30	24	48	131	#2
US GOM	13	12	14	12	51	#1
Nigeria	41	36	48	44	169	#4
Alberta-Oil Sands	37	42	40	34	153	#3
Angola	71	70	76	88	305	#5
Russia-Sakhalin	115	103	118	103	439	#10
Azerbaijan	96	77	94	51	318	#6

Table 8.20
COMPETITIVENESS INDEX

Hypothetical best	48	
US GOM	51	#1
UK	131	#2
Alberta-Oil Sands	153	#3
Nigeria	169	#4
Angola	305	#5
Azerbaijan	318	#6
PPT-25	334	#7
Alaska Current	350	#8
Norway	390	#9
Russia-Sakhalin	439	#10
Hypothetical worst	480	

Subsequent to these results, a further rating was done on a 25% tax rate and a 20% tax credit. This rating resulted in a rather attractive rating as will be discussed in Chapter 9.

8.3.3. Rating of the PPT of 20%

Comparing Tables 8.21 and 8.19, the NPV@10% and EMV@10% improve further relative to the Current System. Also the Government Take difference in rating is now less. This now results in a much better rating for the PPT with 20% relative to the Current System.

Table 8.21

Overview	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	**100**	**93**	**87**	**73**	**353**	**#8**
PPT-20	**70**	**91**	**72**	**89**	**322**	**#6**
Norway	**88**	**105**	**83**	**115**	**391**	**#9**
UK	**29**	**30**	**24**	**48**	**131**	**#2**
US GOM	**13**	**12**	**14**	**12**	**51**	**#1**
Nigeria	**41**	**36**	**48**	**44**	**169**	**#4**
Alberta-Oil Sands	**37**	**42**	**40**	**34**	**153**	**#3**
Angola	**71**	**70**	**77**	**89**	**307**	**#5**
Russia-Sakhalin	**115**	**103**	**118**	**104**	**440**	**#10**
Azerbaijan	**96**	**78**	**97**	**52**	**323**	**#7**

The competitiveness index for a PPT of 20% shows some considerable improvement over the Current System.

In this case much depends on how investors attribute weight to the various factors. If a low government take is considered very important, a PPT of 20% may be considered still less attractive. If on the other hand the IRR and EMV@10% are considered important the PPT of 20% offers a better deal than the Current System.

On average the improvement in competitiveness of the PPT-20 is enough to ensure that the behavior of large producers will not be negatively impacted relative to the current situation. Large producers may maintain operations unchanged or may accelerate their investments, in particular in exploration, while smaller producers will find a considerable incentive to invest and explore.

It should be noted that the competitive position depends considerably on price levels. As can be seen from Charts 6.6, 6.38 and 6.54, the PPT improves the competitive position for new investors rapidly under high prices relative to Norway, Angola, Russia-Sakhalin and Azerbaijan. The same would be true for a wide variety of other fiscal systems in the

world which are progressive, as discussed in Chapter 2. Therefore, as long as WTI long term price predictions of investors are $ 30 per barrel or higher, considerable interest can be expected for investment in Alaska by such investors.

Table 8.22
COMPETITIVENESS INDEX

Hypothetical best	**48**	
US GOM	**51**	**#1**
UK	**131**	**#2**
Alberta-Oil Sands	**153**	**#3**
Nigeria	**169**	**#4**
Angola	**307**	**#5**
PPT-20	**322**	**#6**
Azerbaijan	**323**	**#7**
Alaska Current	**353**	**#8**
Norway	**391**	**#9**
Russia-Sakhalin	**440**	**#10**
Hypothetical worst	**480**	

9. FURTHER RATING BASED ON HIGHER TAX CREDIT RATES.

9.1. Introduction

The DOR model indicated that the overall revenues to the State were primarily determined by the tax rate. Higher tax credits result only in a modest reduction of these overall revenues. This required a new look at the PPT tax rate and tax credit rate. Therefore, more sensitivity analysis was done on higher tax rates with higher tax credit rates. This indicated that a 25% tax rate with a 20% tax credit was a better combination for the State. The rating analysis for new investors also indicated that such a system would be even more attractive for new investors. This chapter discusses the rating of this new package for new investors.

9.2. IRR rating

Table 9.1 and 9.2 summarize the IRR results that were obtained.

Table 9.1

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	4.54%	15.47%	9.69%	20.67%	22.76%	36.00%
Alaska PPT	12.16%	24.58%	16.18%	27.40%	30.95%	45.01%
Norway	11.75%	17.98%	15.38%	21.47%	26.06%	33.54%
UK	13.50%	22.17%	18.81%	28.12%	37.13%	48.90%
US GOM	15.51%	23.84%	21.04%	30.47%	38.26%	49.52%
Nigeria	13.73%	21.76%	19.12%	27.99%	35.45%	45.82%
Alberta-Oil Sands	12.84%	21.21%	19.07%	28.50%	37.75%	48.91%
Angola	6.46%	16.68%	13.08%	22.80%	30.67%	40.80%
Russia-Sakhalin	3.02%	10.30%	12.69%	20.40%	26.98%	32.49%
Azerbaijan	3.79%	13.72%	11.21%	21.84%	28.71%	39.85%

Table 9.2

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	14.75%	26.91%	19.92%	32.93%	35.07%	50.47%
Alaska PPT	24.39%	36.99%	27.37%	40.74%	44.53%	60.49%
Norway	19.22%	26.48%	22.79%	30.17%	35.20%	44.27%
UK	23.99%	34.01%	30.16%	41.32%	51.42%	64.73%
US GOM	25.83%	34.93%	32.83%	43.48%	52.26%	64.49%
Nigeria	23.13%	31.51%	29.49%	39.30%	47.59%	59.20%
Alberta-Oil Sands	22.15%	31.09%	29.74%	40.20%	50.07%	61.77%
Angola	18.26%	27.44%	24.39%	34.47%	42.38%	52.36%
Russia-Sakhalin	8.21%	15.91%	19.70%	25.58%	31.90%	38.34%
Azerbaijan	11.95%	22.34%	20.70%	31.69%	38.90%	49.49%

As can be seen by comparing this table with the one in Chapter 7, the 20% tax credit has a very favorable impact on the rate of return.

Tables 9.3 and 9.4 rank these results again from “1” to “10”.

Table 9.3

IRR	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	10	8	**53**
Alaska PPT	5	1	5	5	5	5	**26**
Norway	6	6	6	8	9	9	**44**
UK	3	3	4	3	3	3	**19**
US GOM	1	2	1	1	1	1	**7**
Nigeria	2	4	2	4	4	4	**20**
Alberta-Oil Sands	4	5	3	2	2	2	**18**
Angola	7	7	7	6	6	6	**39**
Russia-Sakhalin	10	10	8	10	8	10	**56**
Azerbaijan	9	9	9	7	7	7	**48**

Table 9.4

IRR	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	9	7	9	7	**47**	**100**
Alaska PPT	2	1	5	3	5	4	**20**	**46**
Norway	6	8	7	9	8	9	**47**	**91**
UK	3	3	2	2	2	1	**13**	**32**
US GOM	1	2	1	1	1	2	**8**	**15**
Nigeria	4	4	4	5	4	5	**26**	**46**
Alberta-Oil Sands	5	5	3	4	3	3	**23**	**41**
Angola	7	6	6	6	6	6	**37**	**76**
Russia-Sakhalin	10	10	10	10	10	10	**60**	**116**
Azerbaijan	9	9	8	8	7	8	**49**	**97**

It can be seen how the overall IRR ranking improves from 58 on Table 7.4 to 46 on the above table. By international standards the IRR would be highly attractive for small and new investors.

9.3. NPV @10% rating

Tables 9.5 through 9.8 provide the same analysis for the NPV@10%. It can be seen how the NPV@10% only modestly improves relative to table 7.8 from 82 to 79.

Table 9.5

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-48.6	57.8	-7.1	281.2	589.0	1390.5
Alaska PPT	14.0	114.4	103.0	328.9	707.4	1376.5
Norway	11.0	56.5	90.4	214.9	590.9	970.4
UK	35.5	139.0	220.5	503.5	1365.4	2228.0
US GOM	71.4	205.8	322.6	677.8	1667.2	2685.6
Nigeria	45.3	151.0	245.7	519.0	1273.8	2045.1
Alberta-Oil Sands	30.3	135.5	220.0	504.3	1338.6	2201.0
Angola	-45.2	98.6	97.1	391.2	1003.0	1420.6
Russia-Sakhalin	-119.8	5.7	95.6	366.0	797.5	1023.3
Azerbaijan	-91.5	59.3	38.4	409.1	990.2	1476.6

Table 9.6

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	33.2	139.7	172.9	461.2	885.4	1687.0
Alaska PPT	74.2	167.9	222.0	445.2	903.1	1568.9
Norway	44.5	90.0	163.2	287.7	709.3	1088.8
UK	109.1	212.5	381.8	664.8	1628.0	2490.6
US GOM	163.5	297.8	522.4	877.6	1993.5	3012.0
Nigeria	114.0	210.0	381.0	641.2	1465.5	2232.0
Alberta-Oil Sands	102.6	206.2	372.3	655.6	1580.3	2439.5
Angola	81.3	164.1	290.3	493.5	991.6	1176.3
Russia-Sakhalin	-25.9	95.5	260.0	379.8	729.2	1026.7
Azerbaijan	22.2	155.6	256.8	511.3	1023.5	1312.7

Table 9.7

NPV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	10	9	9	7	**51**
Alaska PPT	5	5	5	8	8	8	**39**
Norway	6	9	8	10	10	10	**53**
UK	3	3	3	4	2	2	**17**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	2	2	2	4	4	**16**
Alberta-Oil Sands	4	4	4	3	3	3	**21**
Angola	7	6	6	6	5	6	**36**
Russia-Sakhalin	10	10	7	7	7	9	**50**
Azerbaijan	9	7	9	5	6	5	**41**

Table 9.8

NPV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	8	9	7	8	5	**45**	**96**
Alaska PPT	6	5	8	8	7	6	**40**	**79**
Norway	7	10	10	10	10	9	**56**	**109**
UK	3	2	2	2	2	2	**13**	**30**
US GOM	1	1	1	1	1	1	**6**	**12**
Nigeria	2	3	3	4	4	4	**20**	**36**
Alberta-Oil Sands	4	4	4	3	3	3	**21**	**42**
Angola	5	6	5	6	6	8	**36**	**72**
Russia-Sakhalin	10	9	6	9	9	10	**53**	**103**
Azerbaijan	9	7	7	5	5	7	**40**	**81**

9.4. EMV @10% rating

Tables 9.9 through 9.12 provide the analysis for the EMV@10%. Relative to Table 7.12, it can be seen how the EMV improved from 63 to 56. This indicates that the 25% tax rate resulting in a 25% loss carry forward credit plus the 20% investment credit rate, would be an unusual strong incentive to explore in Alaska.

Table 9.9

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	-29.3	-2.7	-18.9	53.2	130.1	330.5
Alaska PPT	-5.9	19.2	16.3	72.8	167.4	334.7
Norway	-3.7	7.6	16.1	47.2	141.2	236.1
UK	-6.0	19.9	40.3	111.0	326.5	542.2
US GOM	-12.7	20.9	50.1	138.9	386.2	640.8
Nigeria	-17.8	8.6	32.3	100.6	289.3	482.1
Alberta-Oil Sands	-15.7	10.6	31.7	102.8	311.4	527.0
Angola	-40.4	-4.5	-4.9	68.7	221.6	326.0
Russia-Sakhalin	-90.1	-58.7	-36.2	31.4	139.2	195.7
Azerbaijan	-68.9	-31.2	-36.4	56.2	201.5	323.1

Table 9.10

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	-3.1	23.5	31.8	103.9	209.9	410.3
Alaska PPT	12.3	35.7	49.2	105.0	219.5	385.9
Norway	6.8	18.2	36.4	67.6	173.0	267.9
UK	17.3	43.2	85.5	156.2	397.0	612.7
US GOM	20.0	53.6	109.7	198.5	477.5	732.1
Nigeria	9.1	33.1	75.8	140.9	347.0	538.6
Alberta-Oil Sands	8.8	34.7	76.2	147.1	378.2	593.0
Angola	0.9	21.6	53.1	103.9	228.5	274.6
Russia-Sakhalin	-56.9	-26.5	14.6	44.5	131.9	206.3
Azerbaijan	-30.8	2.6	27.9	91.5	219.5	291.8

Table 9.11

EMV @10%	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	7	7	8	8	10	6	**46**
Alaska PPT	2	3	5	5	7	5	**27**
Norway	1	6	6	9	8	9	**39**
UK	3	2	2	2	2	2	**13**
US GOM	4	1	1	1	1	1	**9**
Nigeria	6	5	3	4	4	4	**26**
Alberta-Oil Sands	5	4	4	3	3	3	**22**
Angola	8	8	7	6	5	7	**41**
Russia-Sakhalin	10	10	9	10	9	10	**58**
Azerbaijan	9	9	10	7	6	8	**49**

Table 9.12

EMV @10%	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	6	8	7	8	5	**42**	**88**
Alaska PPT	3	3	6	5	6	6	**29**	**56**
Norway	6	8	7	9	9	9	**48**	**87**
UK	2	2	2	2	2	2	**12**	**25**
US GOM	1	1	1	1	1	1	**6**	**15**
Nigeria	4	5	4	4	4	4	**25**	**51**
Alberta-Oil Sands	5	4	3	3	3	3	**21**	**43**
Angola	7	7	5	6	5	8	**38**	**79**
Russia-Sakhalin	10	10	10	10	10	10	**60**	**118**
Azerbaijan	9	9	9	8	7	7	**49**	**98**

9.5. Government Take rating

Tables 9.13 through 9.16 show the attractiveness of the government take to investors. In comparison with Table 7.16 the government take is actually more attractive in the rating despite the higher tax rate. The rating drops from 69 to 63. This is directly due to the fact that on the 50 MM barrel field the tax credits are very important and actually lower the government take.

Table 9.13

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high
Alaska Current	71.03%	56.57%	61.48%	54.67%	59.25%	56.37%
Alaska PPT	42.26%	47.64%	51.84%	55.92%	59.64%	60.36%
Norway	75.65%	76.74%	75.17%	76.33%	76.43%	76.97%
UK	51.25%	50.67%	50.50%	50.30%	50.15%	50.10%
US GOM	35.16%	35.13%	41.41%	40.40%	43.91%	43.27%
Nigeria	39.27%	46.92%	45.97%	49.82%	53.66%	54.74%
Alberta-Oil Sands	48.60%	49.53%	49.13%	49.70%	49.86%	49.98%
Angola	68.24%	50.31%	53.43%	58.26%	63.10%	71.29%
Russia-Sakhalin	82.36%	63.79%	54.26%	59.16%	72.42%	77.81%
Azerbaijan	65.76%	47.07%	44.81%	41.94%	51.62%	66.24%

Table 9.14

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low
Alaska Current	57.70%	53.13%	55.54%	52.52%	57.00%	55.23%
Alaska PPT	47.29%	50.29%	54.02%	56.78%	59.79%	60.43%
Norway	77.13%	77.47%	76.59%	77.09%	77.08%	77.38%
UK	50.90%	50.55%	50.41%	50.26%	50.14%	50.09%
US GOM	35.14%	35.12%	40.24%	39.76%	43.16%	42.79%
Nigeria	47.64%	50.58%	50.23%	51.99%	54.87%	55.47%
Alberta-Oil Sands	49.76%	49.98%	49.81%	49.97%	50.01%	50.10%
Angola	51.17%	60.31%	59.41%	63.53%	72.15%	80.94%
Russia-Sakhalin	70.12%	59.47%	58.68%	69.84%	78.00%	79.51%
Azerbaijan	50.60%	45.56%	42.90%	53.99%	64.20%	73.44%

Table 9.15

Gov Take	50MM $26 high	50MM $36 high	150MM $26 high	150MM $36 high	500MM $26 high	500MM $36 high	Subtotal
Alaska Current	8	8	9	6	7	5	**43**
Alaska PPT	3	4	6	7	6	6	**32**
Norway	9	10	10	10	10	9	**58**
UK	5	7	5	5	3	3	**28**
US GOM	1	1	1	1	1	1	**6**
Nigeria	2	2	3	4	5	4	**20**
Alberta-Oil Sands	4	5	4	3	2	2	**20**
Angola	7	6	7	8	8	8	**44**
Russia-Sakhalin	10	9	8	9	9	10	**55**
Azerbaijan	6	3	2	2	4	7	**24**

Table 9.16

Gov Take	50MM $26 low	50MM $36 low	150MM $26 low	150MM $36 low	500MM $26 low	500MM $36 low	Subtotal	TOTAL for high and low
Alaska Current	8	7	7	5	5	4	**36**	**79**
Alaska PPT	2	4	6	7	6	6	**31**	**63**
Norway	10	10	10	10	9	8	**57**	**115**
UK	6	5	5	3	3	2	**24**	**52**
US GOM	1	1	1	1	1	1	**6**	**12**
Nigeria	3	6	4	4	4	5	**26**	**46**
Alberta-Oil Sands	4	3	3	2	2	3	**17**	**37**
Angola	7	9	9	8	8	10	**51**	**95**
Russia-Sakhalin	9	8	8	9	10	9	**53**	**108**
Azerbaijan	5	2	2	6	7	7	**29**	**53**

9.6. Overall rating

It can be seen in comparing with the tables in Chapter 7 that that the Alaska PPT with a 25% tax rate and 20% tax credit rate strongly boosts the IRR and the EMV@10%. The NPV@10% is less strongly affected but the Alaska PPT still provides an improvement. The Government Take also shows a slight improvement on small fields.

Table 9.17 provides the overall ranking. Relative to a 20/15 system the 25/20 system improves the competitiveness index improves from 272 to 244.

This indicates that the improvement in competitiveness of the Alaska PPT with a 25% tax rate and 20% tax credit rate is more attractive to new and small investors than the option to have a 20% tax rate and 15% tax credit rate.

Table 9.17

Overall	IRR Subtotal	NPV Subtotal	EMV Subtotal	GOV TAKE Subtotal	SUM TOTAL	Ranking
Alaska Current	**100**	**96**	**88**	**79**	**363**	**#8**
Alaska PPT	**46**	**79**	**56**	**63**	**244**	**#5**
Norway	**91**	**109**	**87**	**115**	**402**	**#9**
UK	**32**	**30**	**25**	**52**	**139**	**#2**
US GOM	**15**	**12**	**15**	**12**	**54**	**#1**
Nigeria	**46**	**36**	**51**	**46**	**179**	**#4**
Alberta-Oil Sands	**41**	**42**	**43**	**37**	**163**	**#3**
Angola	**76**	**72**	**79**	**95**	**322**	**#6**
Russia-Sakhalin	**116**	**103**	**118**	**108**	**445**	**#10**
Azerbaijan	**97**	**81**	**98**	**53**	**329**	**#7**

The following table summarizes the total competitiveness index from attractive to unattractive for new investors in Alaska.

Table 9.18
COMPETITIVENESS INDEX

Hypothetical best	**48**	
US GOM	**54**	**#1**
UK	**139**	**#2**
Alberta-Oil Sands	**163**	**#3**
Nigeria	**179**	**#4**
Alaska PPT	**244**	**#5**
Angola	**322**	**#6**
Azerbaijan	**329**	**#7**
Alaska Current	**363**	**#8**
Norway	**402**	**#9**
Russia-Sakhalin	**445**	**#10**
Hypothetical worst	**480**	

9.7. Tide water analysis

9.7.1. New Investors

An important issue is whether the 25% tax rate and 20% tax credit rate would be a reasonable system from an overall word wide government take point of view.

In order to analyze this matter it is important to “filter out” the low net back value of the Alaska crude oil.

This can be done by taking the transport costs of $ 5 per barrel and converting this to an equivalent government take. At $ 40 per barrel there is really no difference between an extra 12.5% royalty on tide water or the lower net back. In other words it is possible to analyze Alaska by simply not deducting the $ 5 transport charge, but instead assuming that the royalty is 25%. Based on this high royalty, the overall government take can then easily be compared with other countries. In other words it is the same as placing the Alaska North Slope in Texas and assuming a 25% royalty.

The following table displays these “tide water” government takes for the high cost scenarios.

Table 9.19.
Undiscounted Government Take on "tide water" basis of the 25% tax and 20% tax credit system
High Cost Scenarios (with low and high well productivities)

	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
$22.00	65.57%	65.25%	68.32%	62.77%	63.59%	67.52%
$24.00	63.37%	64.95%	68.09%	61.60%	63.72%	67.41%
$26.00	62.01%	64.90%	67.94%	60.78%	63.90%	67.32%
$28.00	61.08%	64.92%	67.82%	60.18%	64.02%	67.26%
$30.00	60.40%	64.92%	67.73%	60.04%	64.14%	67.23%
$32.00	60.00%	64.94%	67.66%	60.11%	64.28%	67.21%
$34.00	59.92%	65.00%	67.59%	60.24%	64.42%	67.18%
$36.00	60.07%	65.07%	67.54%	60.38%	64.57%	67.16%
$38.00	60.31%	65.15%	67.48%	60.54%	64.72%	67.15%
$40.00	60.58%	65.26%	67.42%	60.72%	64.86%	67.13%

The table shows how the overall government take would range from about 60% to 67%. This is a world average government take. The table shows how the government take would be rather progressive with field size for a new investor. This is primarily due to the tax free allowance of $ 73 million and the tax credits. Otherwise the government take is relatively flat with price, because the progressive PPT compensates for the regressive royalties and property taxes.

A very important question is whether the Alaska resource base is sufficiently attractive to have a 60 – 67% government take. It is therefore interesting to search for jurisdictions with similar government takes. The Van Meurs Corporation rating of 2001 can be used in this respect. A search of this data base indicates that the following jurisdictions would have a government take in this range for approximately a $ 30 price level:

- Denmark
- Albania
- Azerbaijan, some onshore PSC's
- Newfoundland offshore
- British Columbia onshore
- Nova Scotia offshore
- Trinidad and Tobago
- Guatemala
- Peru
- Jordan
- Egypt Deep Water
- Nigeria, about 500 m water depth
- Cote d'Ivoire
- Cambodia
- Joint Development Area between Thailand and Malaysia
- Thailand offshore
- Nepal
- Bangladesh
- Timor Gap (joint offshore area between Australia and East Timor)

It would be difficult to argue that all or most of the above areas would have more attractive petroleum resource conditions than Alaska in terms of costs, oil field sizes or exploratory risk. In fact it can be easily seen that most areas would have less attractive resource conditions.

Therefore, Alaska would compete very well with these areas on the basis of a "tide water" government take of 60% - 67%.

In summary the overall Federal and Alaska government take that results from a PPT with a 25% tax rate, a 20% tax credit rate and a 73 million tax free allowance would clearly be attractive to new and small investors.

9.7.2. New Investors

The following table shows the same results for large producers which cannot benefit on an incremental basis from the tax free allowance.

Table 9.20.
Undiscounted Government Take on a "tide water" basis of the 25% tax and 20% tax credit system
High Cost Scenarios (with low and high well productivities)
Undiscounted Government Take

	50MM-LOW	150MM-LOW	500MM-LOW	50MM-HIGH	150MM-HIGH	500MM-HIGH
$22.00	79.29%	74.47%	71.92%	74.41%	71.42%	70.47%
$24.00	76.39%	73.16%	71.19%	73.08%	70.79%	70.03%
$26.00	74.60%	72.23%	70.64%	72.15%	70.32%	69.69%
$28.00	73.37%	71.55%	70.22%	71.47%	69.95%	69.42%
$30.00	72.49%	71.02%	69.88%	70.94%	69.65%	69.20%
$32.00	71.81%	70.60%	69.61%	70.52%	69.40%	69.01%
$34.00	71.29%	70.25%	69.38%	70.18%	69.20%	68.85%
$36.00	70.86%	69.97%	69.19%	69.90%	69.03%	68.71%
$38.00	70.51%	69.73%	69.03%	69.67%	68.88%	68.59%
$40.00	70.22%	69.52%	68.88%	69.47%	68.75%	68.49%

As can be seen, the “tide water” government take would range from about 68% to 75%.

The following jurisdictions would be in this range:

- Albania onshore
- Turkmenistan
- Azerbaijan, some onshore PSC’s
- Alberta Conventional Oil
- Newfoundland – Hibernia
- Venezuela Heavy Oil (prior to the recently imposed increased take)
- Trinidad and Tobago
- Egypt Onshore
- Egypt Gulf of Suez
- Syria
- Yemen, revised PSC terms
- Equatorial Guinea
- Cameroon
- Congo – offshore
- Namibia
- Nigeria – shallow water
- Indonesia – general frontier terms
- Vietnam
- China offshore
- Thailand onshore
- Myanmar
- India

Most of these jurisdictions would have a resource attractiveness that is less than Alaska. Therefore, Alaska seems very well competitive with these areas.

9.7.3. Conclusion

It can be concluded that the 25% tax rate and 20% credit rate would be competitive from an international point of view and the overall government take would be similar to countries that have an equal or lesser resource quality. Therefore this is a fair and reasonable system.

10. ANALYSIS OF POSSIBLE HEAVY OIL INCENTIVES

10.1. Introduction

Heavy oils and viscous medium gravity oils play an important role in the future of Alaska. These resources are relatively expensive and in some cases not economic.

The potential of these oils is very considerable. The following table displays the two broad types of heavy oils that are available on the North Slope.

Table 10.1

	"West Sak"	"Ugnu"
Gravity (API)	**14 - 26**	**8 - 15**
Viscosity	**"Olive Oil"**	**"Molasses"**
Oil in Place (billion bbls)	**6 - 12**	**16-24**
Recoverable	**10% - 25%**	**4% - 8%**
Recoverable Oil (billion bbls)	**1 - 3**	**0.5 - 2**
Current Fields	**West Sak, Orion Polaris, Milne Schrader**	**none**

For simplicity the heavy oils will be grouped as “West Sak” and “Ugnu”. The West Sak group stands for a variety of heavy oils from different fields and reservoirs. Ugnu is largely from the Ugnu reservoir. The Ugnu reservoir is typically shallower than the West Sak Group of reservoirs.

In the Alaska Arctic shallow reservoirs are relatively cold, which in turn creates problems with viscosity. Therefore, in general, the shallower the reservoirs are, the more viscous the oil is and the more difficult the oil is to produce.

Apart from the heavy oils, there is relatively viscous medium gravity oil present in some fields, such as the Polaris field. Similar reservoirs will for simplicity called “Polaris” type crudes.

Heavy oils are difficult to produce because of their viscosity.

The importance of these resources to Alaska can not be under-estimated as can be seen from the large possible recoverable resource estimates. It is not impossible that over the next three decades as much as 4 billion barrels will be produced.

Because of the high costs to produce heavy oils and the large potential resource base on the North Slope it is important to evaluate whether special incentives relative to the terms proposed in Chapter 9 might result in an accelerated development.

Therefore, special incentives were analyzed in terms of lower tax rates and/or lower tax credit rates.

The special incentives were analyzed separately for “West Sak” and “Ugnu” reservoirs.

10.2. Net back value

An important reason why heavy oils are less attractive to produce is because these crude oils sell for a lower price in the market.

Some of the Kern River heavy crude oils of California have a gravity of 14 degrees API. Currently, these crude oils sell at about $ 10 to $ 12 less than WTI crude.

It should be noted, however, that this quality differential is sensitive to the oil prices. Typically, when the WTI price goes down the quality differential becomes less. Heavy oils produce large volumes of heavy fuel oil or so-called bunker fuel. This is fuel used for marine transportation, for heating in industrial processes as well as power generation. At low oil prices, heavy fuel oil becomes more competitive with other energy sources, such as coal and gas. This reduces the quality differential. It is difficult to make exact estimates of this.

However, the following table illustrates the assumptions that were made about the quality plus transport differential differentials between WTI and the well head values at the North Slope for heavy oils.

The average gravity for West Sak was assumed to be 19 degrees API and for Ugnu it was assumed 14 degrees API.

Table 10.2
WELL HEAD VALUES

WTI	West Sak Diff	West Sak Well head	Ugnu Diff	Ugnu Well head
$20.00	$9.00	**$11.00**	$10.00	**$10.00**
$25.00	$9.00	**$16.00**	$11.00	**$14.00**
$30.00	$10.00	**$20.00**	$12.00	**$18.00**
$35.00	$10.00	**$25.00**	$12.00	**$23.00**
$40.00	$10.00	**$30.00**	$13.00	**$27.00**
$45.00	$11.00	**$34.00**	$13.00	**$32.00**
$50.00	$11.00	**$39.00**	$13.00	**$37.00**
$55.00	$11.00	**$44.00**	$14.00	**$41.00**
$60.00	$12.00	**$48.00**	$14.00	**$46.00**
$65.00	$12.00	**$53.00**	$15.00	**$50.00**
$70.00	$12.00	**$58.00**	$15.00	**$55.00**
$75.00	$12.00	**$63.00**	$15.00	**$60.00**

10.3. Field and cost assumptions

In order to do economic analysis certain assumptions were made about the fields and the costs.

A 100 million barrel field was assumed, which would be developed with an equal number of water injectors and producers. The wells would be horizontal multilateral wells. At initial maximum production the the number of producers was assumed to be 17 for West Sak and 34 for Ugnu. The total number of wells was assumed to be 32 and 64.

A relatively aggressive production and abandonment program was assumed with a total field life of 23 years.

Each producers and injector was assumed to be $ 5 million. In addition facilities costs were assumed. This brings the total capital expenditure costs to $ 8 per barrel for West Sak and $ 12 per barrel for Ugnu.

The following table provides the overview of these assumptions.

Table 10.3
Technical and Economic Assumptions

	West Sak	Ugnu
Field size (million barrels)	100	100
Maximum production (bopd)	16,500	16,500
Producers at maximum production	17	34
Injectors at maximum production	17	34
Maximum producers	32	64
Maximum injectors	32	64
Total wells at abandonment	30	60
Duration of production (years)	23	23
Costs per producer and injector ($ million)	5	5
Exploration ($ million)	30	30
Total well costs ($ million)	320	640
Total facilities costs ($ million)	450	530
Total Capex per barrel	8	12
Total Opex per barrel	6	7

Based on all these data it is possible to calculate WTI break even prices for the various North Slope crude oils. For information a typical Prudhoe Bay and Polaris were also included. Quality differentials were based on the above table on the basis of $ 40 per barrel WTI for simplicity.

Table 10.4 shows these break even prices for new investments with respect to four different types of crudes on the North Slope.

Table 10.4
BREAK EVEN WTI PRICE

	Prudhoe Bay	"Polaris"	"West Sak"	"Ugnu"
API		23	19	14
WTI quality diff	$2.00	$3.00	$5.00	$8.00
Transport	$5.00	$5.00	$5.00	$5.00
Capital Costs	$4.00	$6.00	$8.00	$12.00
Operating Costs	$3.00	$4.00	$6.00	$7.00
Subtotal	$14.00	$18.00	$24.00	$32.00
Property tax	$0.50	$0.50	$0.50	$0.50
Royalty (12.5%)	$16.57	$21.14	$28.00	$37.14

These break even prices show that the economics of the Polaris, West Sak and Ugnu type crudes is primarily determined by the oil price projections and cost assumptions.

If long term oil price projections of the major and large oil companies shift upwards and further technological developments shift the costs downward than heavy oils of the West Sak and even Ugnu types may come in economic range.

The economics are only modestly affected by fiscal terms. No matter what fiscal incentives are provided, under current conditions of typical long term price forecasts Ugnu developments are uneconomic.

To a lesser degree the same is true for West Sak. With respect to "West Sak" much, however, depends on the detailed circumstances.

The developments of Polaris, Orion and Milne Schrader are economic under current conditions, as is evidenced by the investments that are being made in these fields by the major oil companies. It should be noted that these developments are typically taking place in deeper and therefore "warmer" reservoirs which are less viscous. Also the crude oils are lighter than for the West Sake economics to be discussed below.

An important aspect is that the current field developments are taking place in areas where oil production is already taking place and where therefore facilities costs are less because existing facilities can be used. All that is required is some upgrades of these facilities.

However, it is important to stimulate small possible independent developments outside the area which is currently controlled by the major oil companies. Therefore, the West Sak and Ugnu economics will be studied on the basis that new facilities will be required.

10.4. Fiscal incentives

In principle, fiscal incentives could be provided by offering a lower tax rate and higher tax credit rate for heavy oils.

The economic analysis of heavy oil economics is based on large producer economics, which means without taking into account the $ 73 million tax free allowance.

In order to evaluate fiscal incentives two different alternative fiscal packages were evaluated:

- a 20% tax rate with a 25% tax credit, and
- a 15% tax rate with a 25% tax credit.

It should be noted that under the Current System, the ELF would be essentially 0. This is due to the small field size. Despite the relatively attractive well productivities at maximum production, the small field size creates a very high exponent which brings the ELF to near 0.

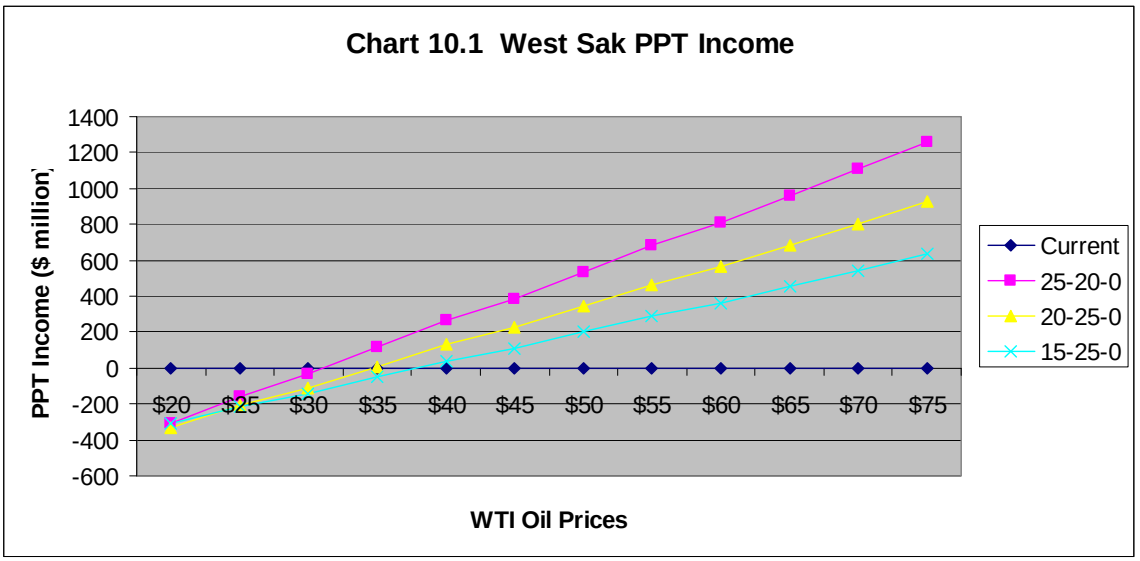
10.5. West Sak economics

Chart 10.1 indicates how the PPT would vary considerably with the fiscal terms.

At a WTI of $ 20, the project would run a severe loss and therefore the investor would be able to recover 45% of this loss under the systems with a 25% tax rate and 20% tax credit rate or 20% tax rate and a 25% tax credit rate.

With a 15% tax and a 25% tax credit, the recovery would be 40%.

The results of the loss carry forward credits and the tax credits is that the PPT would be negative. For the three fiscal systems it would be about $ 300 million negative. This means that the investor can trade his tax credits to other producers. It should be noted that under such low prices, all producers will have a negative PPT and therefore the tax credits can not be taken against PPT payable. In Chapter 11 the DOR results will be presented which illustrate that the PPT credits are really capped by this mechanism.



Of course, under such low prices, investors would not invest further in heavy oil and therefore, it is unlikely that many fields would create such a loss. Only fields for which the development was started under much higher long term oil price predictions would be caught in this situation.

All three fiscal options provide therefore considerable downside price protection for heavy oil projects and will therefore be a significant stimulus for such developments.

From an Alaska perspective, the 25/20 system would have a WTI cross over point of $ 32 per barrel. The other two fiscal options would have higher cross over points: the 20/25 system would have a $ 35 per barrel cross over and the 15/25 system a $ 38 cross over.

Under high prices, the government revenues are substantially more for the 25/20 options as can be expected. The 20/25 and 15/25 options do not seem to provide a reasonable balance between downside and upside from a government perspective. The downside price risk to government of being faced with a negative PPT is not adequately compensated by the upside benefits of a high PPT in case of high prices.

This matter can be studied in more detail in Chart 10.2, which displays the overall Alaska income (State and municipalities). This chart shows at about $ 23 per barrel the total government take from the project becomes negative. As explained before, this risk would only related to heavy oil projects that were started under high oil forecast but would then be faced with low prices.

The graph clearly shows that under downside conditions the State of Alaska would provide very considerable price support and therefore a significant reward to Alaska is also reasonable in case prices are high. Therefore the 25/20 system is the best. It provides strong downside risk protection for heavy oil projects, but at the same time rewards Alaska with significant revenues if prices are high.

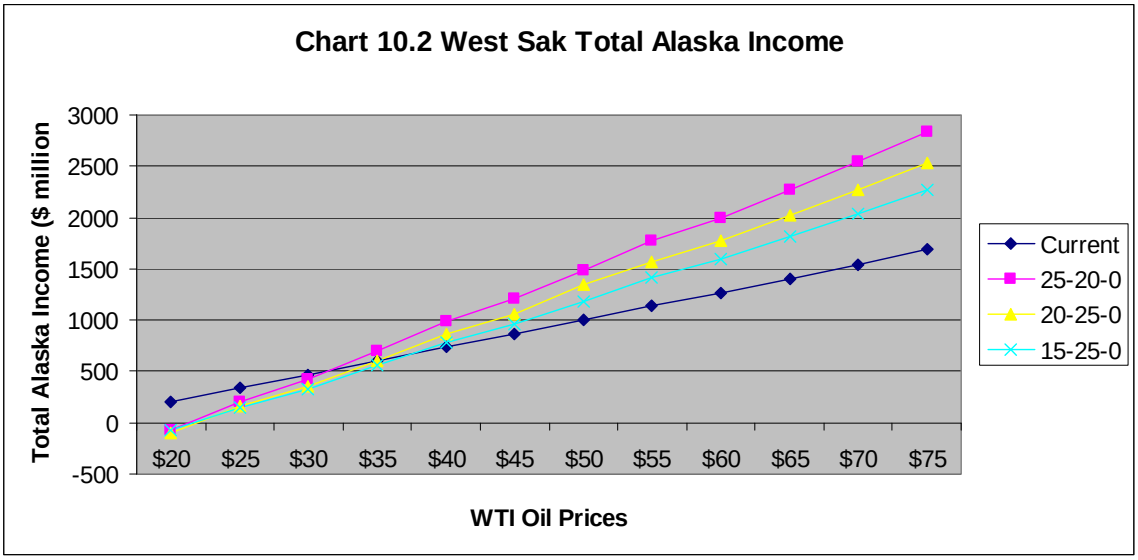


Chart 10.3 shows how all fiscal options result in a very considerable improvement of the IRR for all price levels. This constitutes major support for heavy oil developments. Under the current system a nominal IRR of 15% would be obtained under a WTI price of

$ 42 per barrel. Under any of the PPT proposals this price level shifts down to $ 37 per barrel.

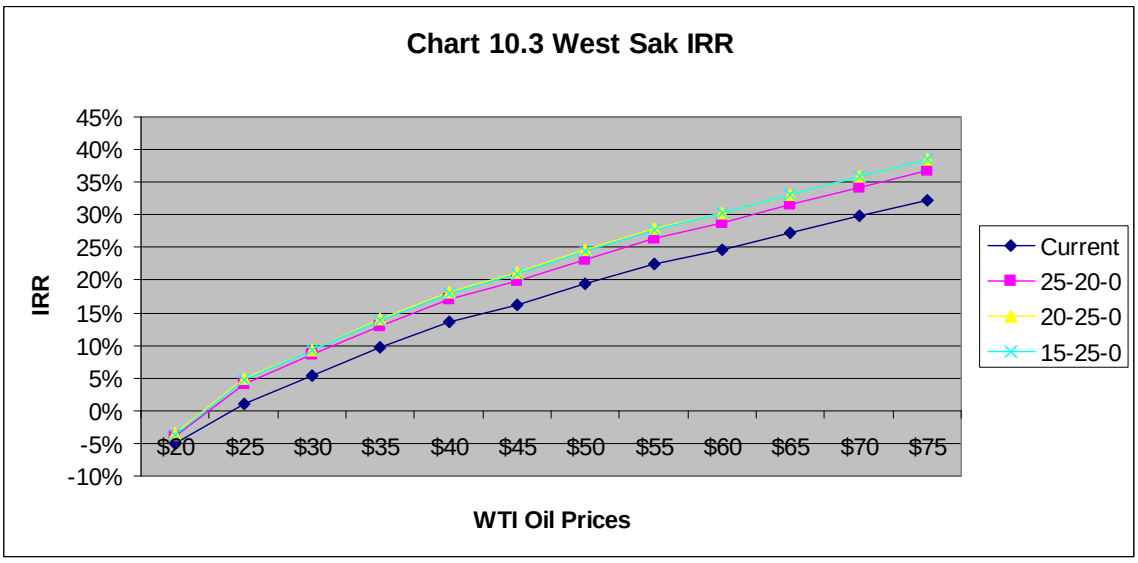
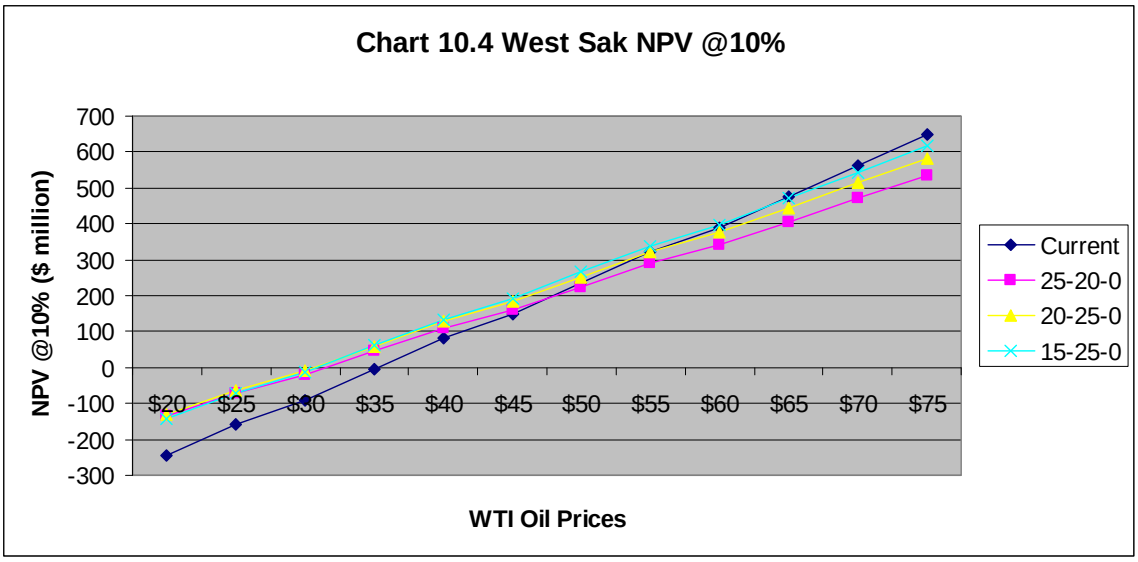


Chart 10.4 shows how the NPV@10% would also improve the economics of the heavy oil projects considerably in the current long term price forecast range of major and large oil companies of $ 25 to $ 35 per barrel. The break even point at an NPV@10% of zero is shifted down from $ 35 to $ 30 per barrel.



At about $ 50 per barrel the NPV@10% values are about the same for the Current system and the three PPT alternatives. At high prices the higher tax rate of 25% starts to "bite" and therefore the NPV becomes less for the 25/20 system. However, the total NPV is extremely attractive at these price levels and therefore the progressive nature of the 25/20 system does not affect in a serious negative way investment decisions.

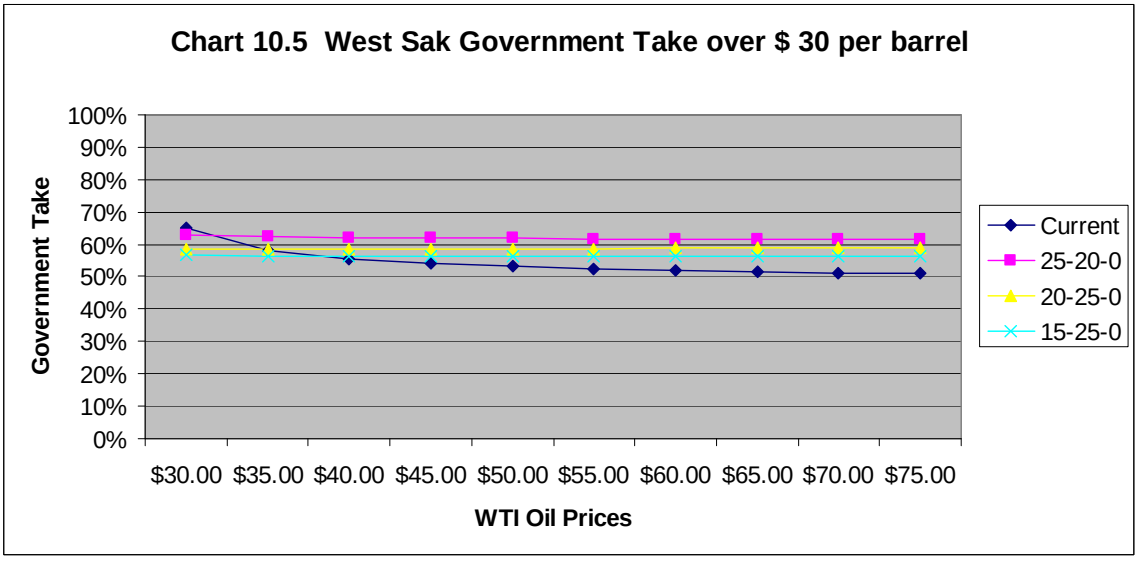


Chart 10.5 illustrates the overall combined government take of Alaska and the Federal Government. The progressive nature of the PPT turns the current regressive system of

Alaska in a neutral system. The regressive royalties and property taxes are balanced by the progressive PPT. Therefore the PPT creates an overall flat government take over $ 30 per barrel. This is the price level at which the project has a positive NPV@10%.

Obviously, the 25/20 results in the highest government take and the 15/25 system in the lowest.

Conclusion. The fiscal proposal of a 25% tax rate and a 20% credit rate will provide a strong stimulus for heavy oil developments through the considerable downside price risk protection this system provides and the significant improvement in IRR and NPV@10% under current long term price projections. There is no need for further incentives. Such incentives would unreasonably lower the revenues of Alaska for no significant added benefit in economic stimulus.

10.6. Ugnu economics

As was discussed earlier, the Ugnu reservoirs are currently uneconomic. In order to become economic perceptions of long term oil prices have to shift upward and further technology has to shift the development costs downward.

Therefore, the following economic analysis does not represent conditions that could occur today.

However, if in the future prices shift up and costs shift down, it would represent a case where despite these developments, the oil price would crash and the investor would incur significant cost overruns.

The following tables provide the overview of the economics.

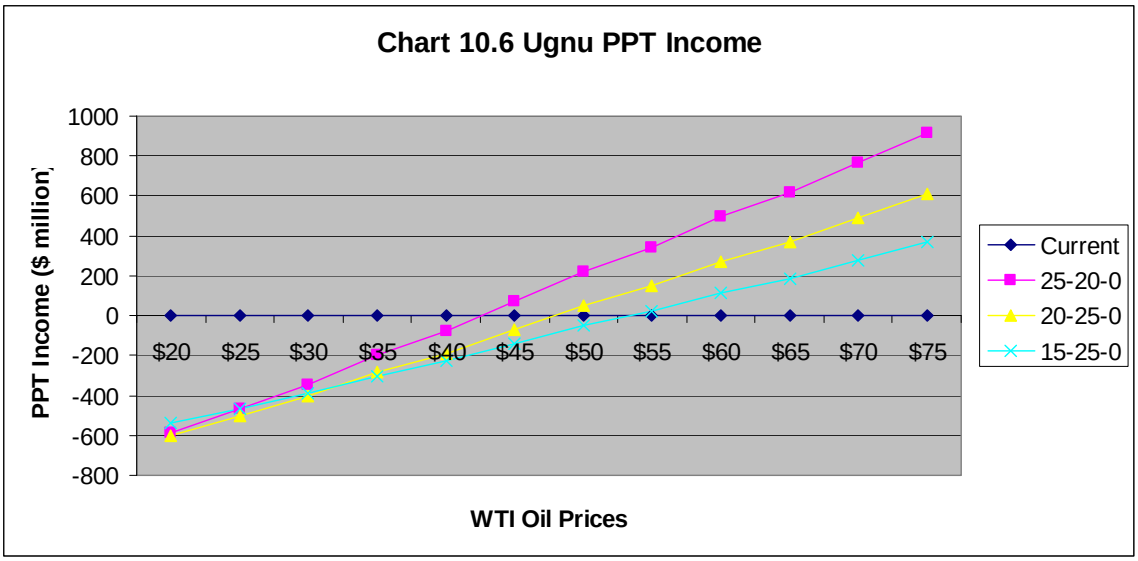


Chart 10.6 Ugnu PPT Income
PPT Income ($ million)
1000
800
600
400
200
0
-200
-400
-600
-800
$20
$25
$30
$35
$40
$45
$50
$55
$60
$65
$70
$75
WTI Oil Prices
Current
25-20-0
20-25-0
15-25-0

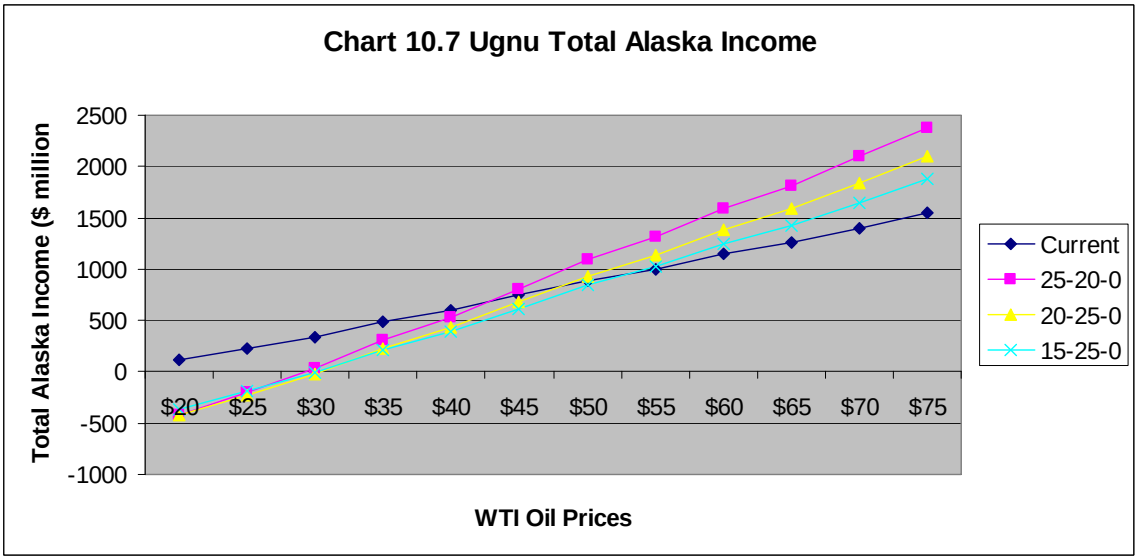


Chart 10.7 Ugnu Total Alaska Income
Total Alaska Income ($ million
2500
2000
1500
1000
500
0
-500
-1000
$20
$25
$30
$35
$40
$45
$50
$55
$60
$65
$70
$75
WTI Oil Prices
Current
25-20-0
20-25-0
15-25-0

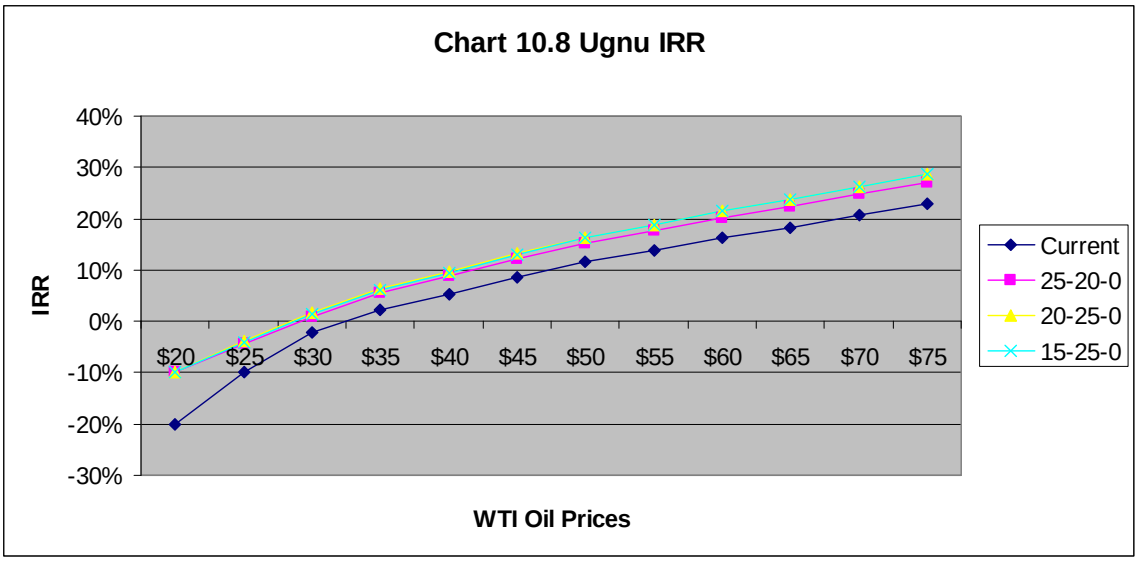


Chart 10.8 Ugnu IRR
40%
30%
20%
10%
0%
-10%
-20%
-30%
IRR
$20
$25
$30
$35
$40
$45
$50
$55
$60
$65
$70
$75
WTI Oil Prices
Current
25-20-0
20-25-0
15-25-0

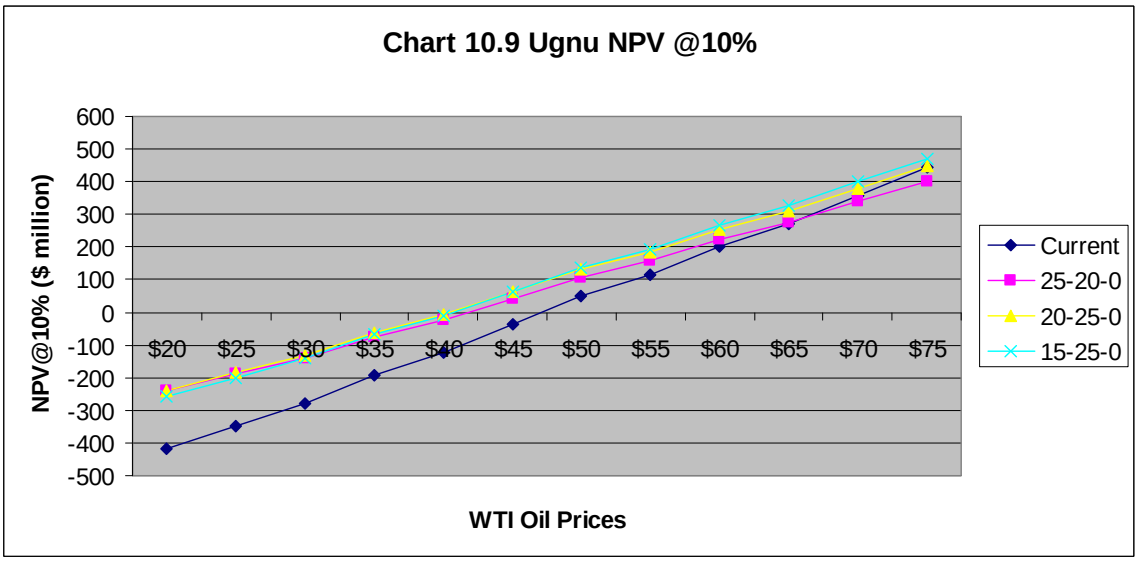
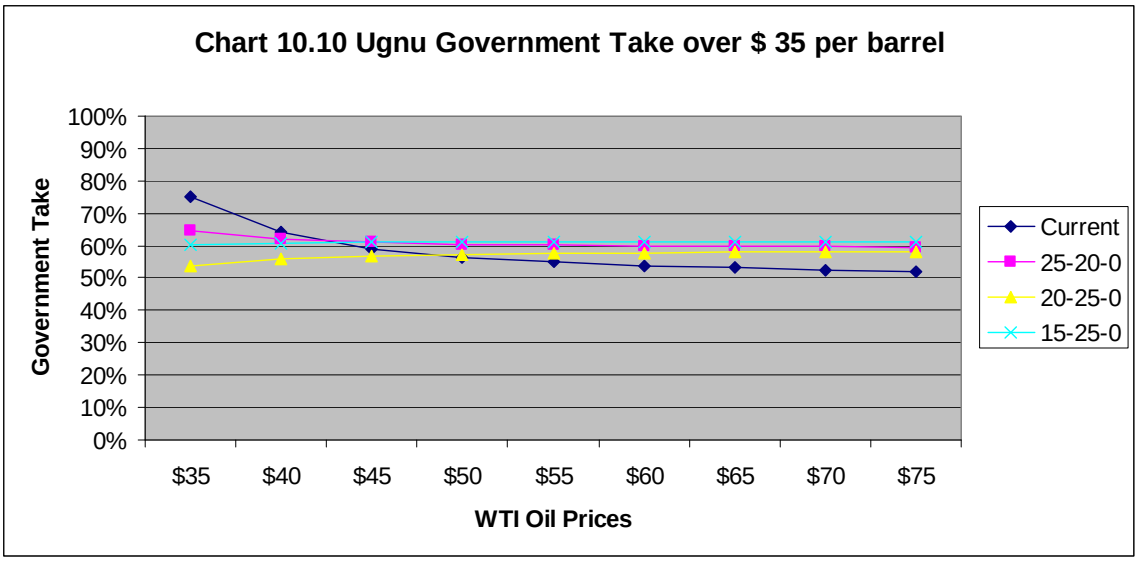


Chart 10.9 Ugnu NPV @10%
600
500
400
300
200
100
0
-100
-200
-300
-400
-500
NPV@10% ($ million)
$20
$25
$30
$35
$40
$45
$50
$55
$60
$65
$70
$75
WTI Oil Prices
Current
25-20-0
20-25-0
15-25-0



As can be seen from the above graphs, the results are very similar as the West Sak economics.

However, as can be expected the downside price protection is even stronger. The State would be rather exposed under low prices and cost overruns.

Despite the PPT, Ugnu developments remain clearly uneconomic and therefore such developments cannot be expected.

However, the PPT would bring the day closer that Ugnu developments may take place and it might also encourage the development of some small pilot projects in order to evaluate whether costs can be reduced with new technology.

Even more than for West Sak, the higher government take under the 25/20 system under high prices seems justified.

11. REVIEW OF THE RECOMMENDED PROFIT SHARING PRODUCTION TAX

11.1. Description of recommended profit sharing production tax

It may be useful to provide a review of the economics of the recommended profit sharing production tax ("PPT").

The PPT would have the following features:

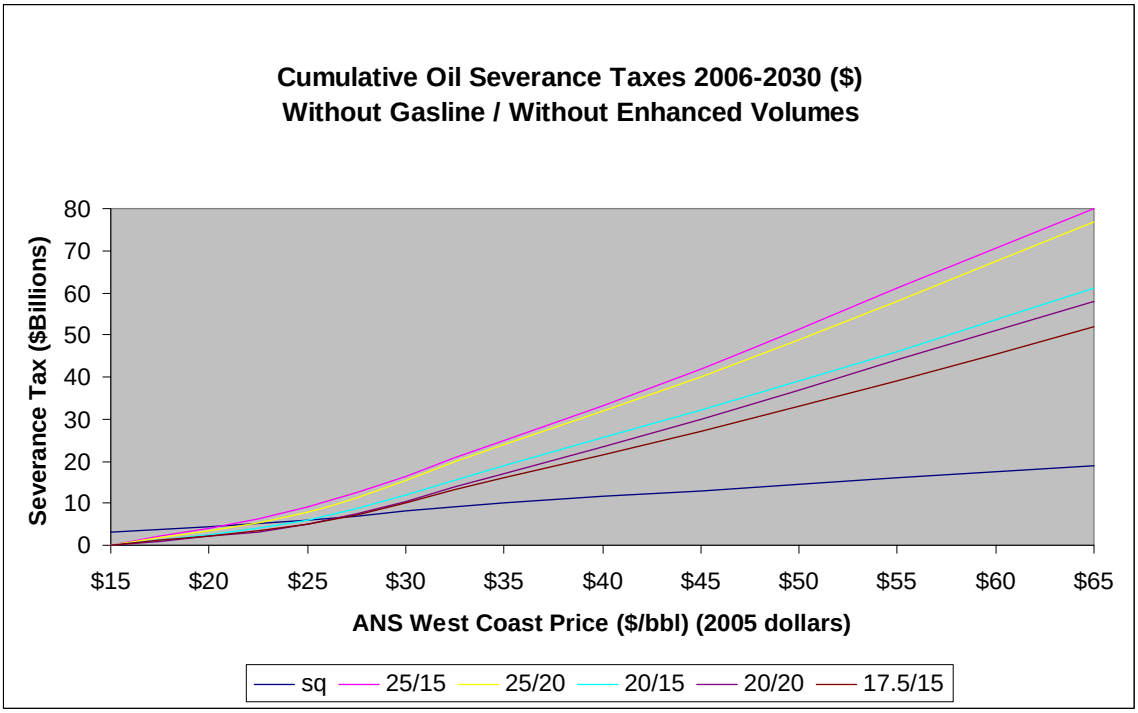
- The tax would be a monthly tax on net revenues. The net revenues will be determined as the gross revenues at the point of production less lease expenditures and exploration costs. Capital expenditures can be fully deducted in the year these costs are incurred.
- The PPT will be a consolidated tax on all net revenues of the corporation with respect to Alaska petroleum production and exploration.
- The tax rate will be 25%.
- Losses can be carried forward indefinitely, but the tax payer can obtain a certificate for a tax credit for 25% of the amount of the loss. Such certificates can be traded. This means that 25% of the loss can be recovered in the year following the year in which the expenditures were incurred.
- Furthermore, there will be a tax credit of 20% on all qualified capital expenditures. These are typically all expenditures which are capital for IRS purposes, intangible drilling expenditures and exploration expenditures, including geological and geophysical costs.
- Up to $ 73 million per year will be tax free. However, if the net revenues are less, the tax free amount is equal to the net revenues. This means that small producers will not pay tax.

11.2. Rationale for the selection of 25/20.

Various options were studied and selected. The selection of the 25% tax rate and 20% credit rate was largely based on the results of the DOR model, which indicated that the tax rate is the most important determinant of the Alaska government revenues. The tax credit rate is a lesser factor.

Following are some of the results of the study.

The following graph illustrates the cumulative revenues to the State from the production tax for a conservative scenario involving a remaining production of 5.8 billion barrels of oil for different price levels.



The graph illustrates how the 25/20 (25% tax and 20% tax credits) scenario generates considerably more revenues for the State than the 20/15 scenario. The tax credits play a relatively minor role in the reduction of the State revenues. It means that relative to the scenario of 20/15 which was the main focus of the earlier studies, the 25/20 scenario:

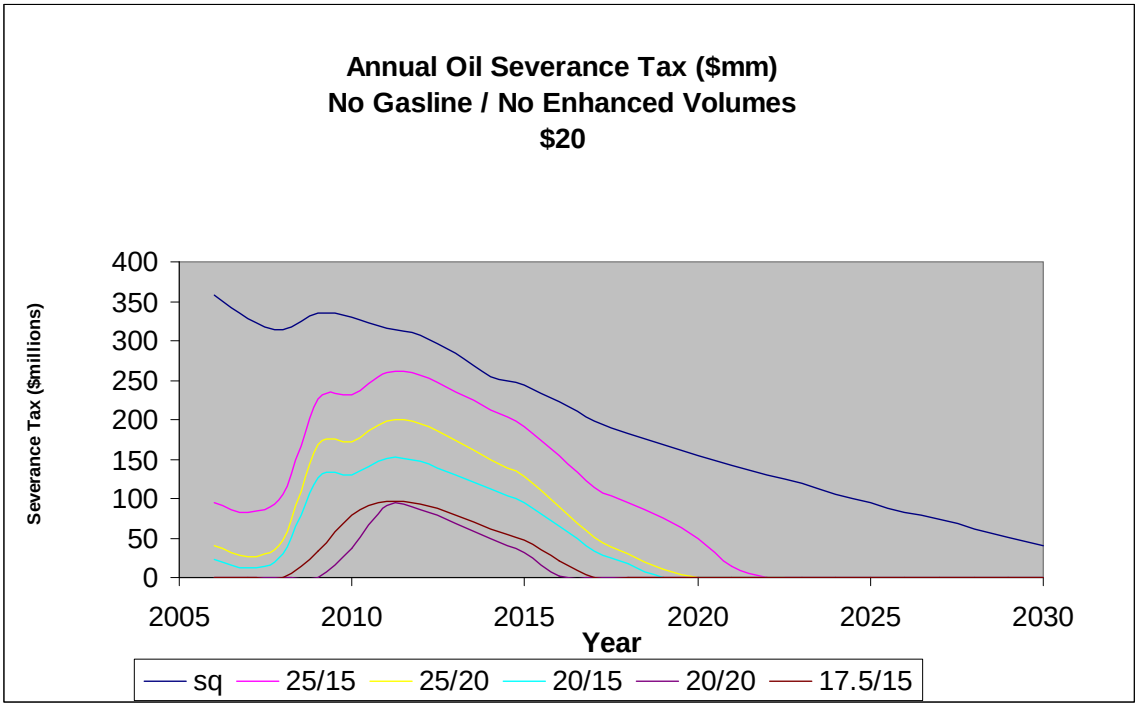
- Is a more progressive system
- Results in more revenues for the State
- Results in a stronger stimulus for re-investment
- Creates a better protection of marginal fields.

The stronger credits were a concern, since at low prices, it could lead to a more rapid erosion of the government revenues.

The following graph shows the year to year revenues under an ANS price of $ 20 per barrel.

The graph shows how for a tax rate of 25%, a tax credit of 20% compared to 15% indeed results in lower revenues. However, the entire revenues of Alaska would be very modest and therefore, even if extraordinary tax credits would occur as a result of major earlier investments, the exposure of the State to income loss is not more than a maximum of about $ 200 million per year around the year 2010. Compared with the billions that might result under high prices, this seems very much an acceptable exposure.

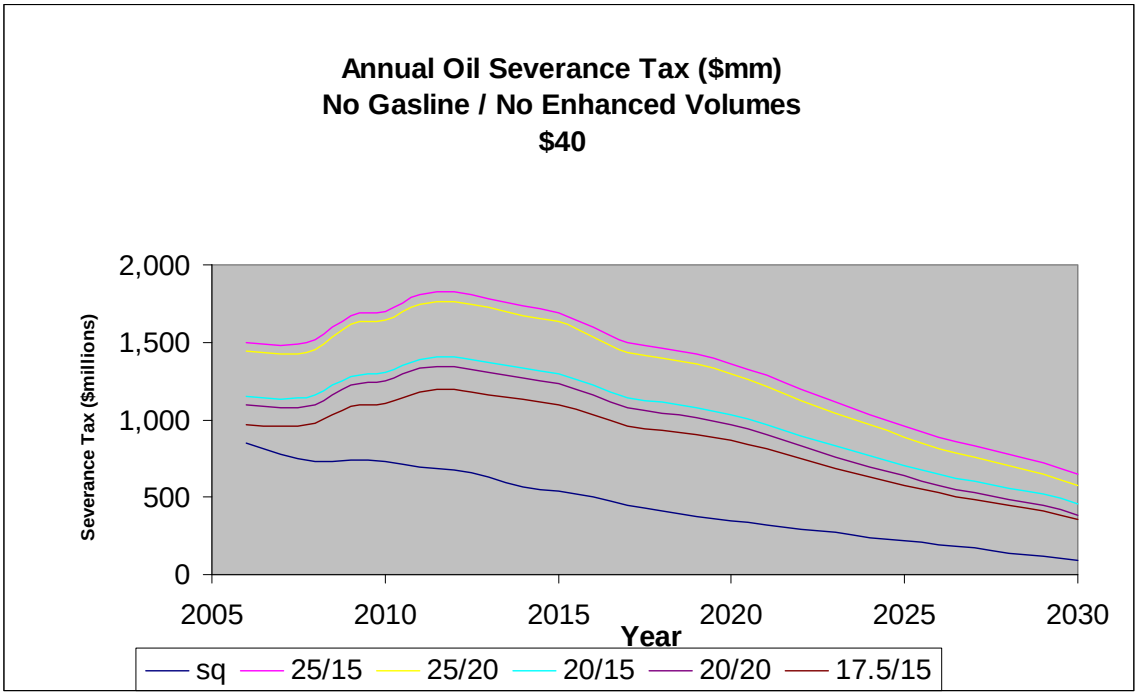
For this reason, the DOR study indicated that the income loss exposure as a result of higher than expected investment and low prices is modest. This resulted in the conclusion that a 25/20 combination is better for the State than the 20/15 combination.

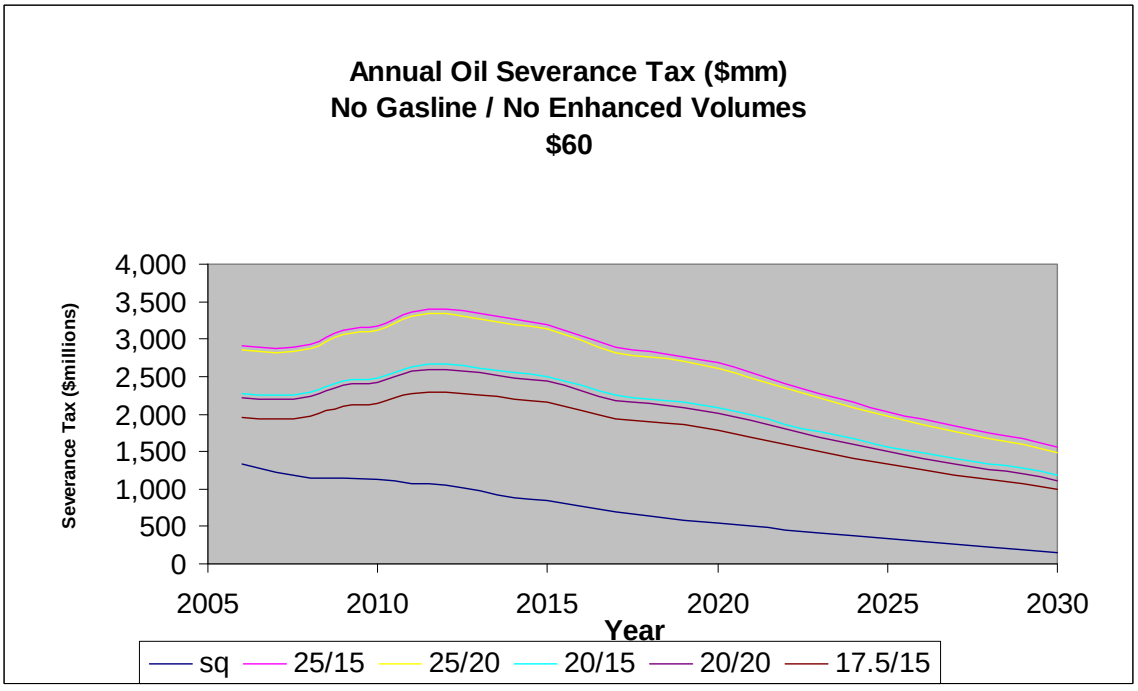


The "negative PPT's" which were identified in the previous chapters are really capped by the fact that the overall PPT will be low anyway under an ANS price of $ 20 per barrel and therefore these negative PPT cannot really be traded to a large extent under these conditions. Since PPT credits can only be taken against PPT payable this creates an automatic protection for Alaska.

Under low prices the royalties, property taxes and state corporate income tax remain unaffected.

Of course under high prices the income to the State of the new PPT is very considerable as can be seen from the following two graphs.

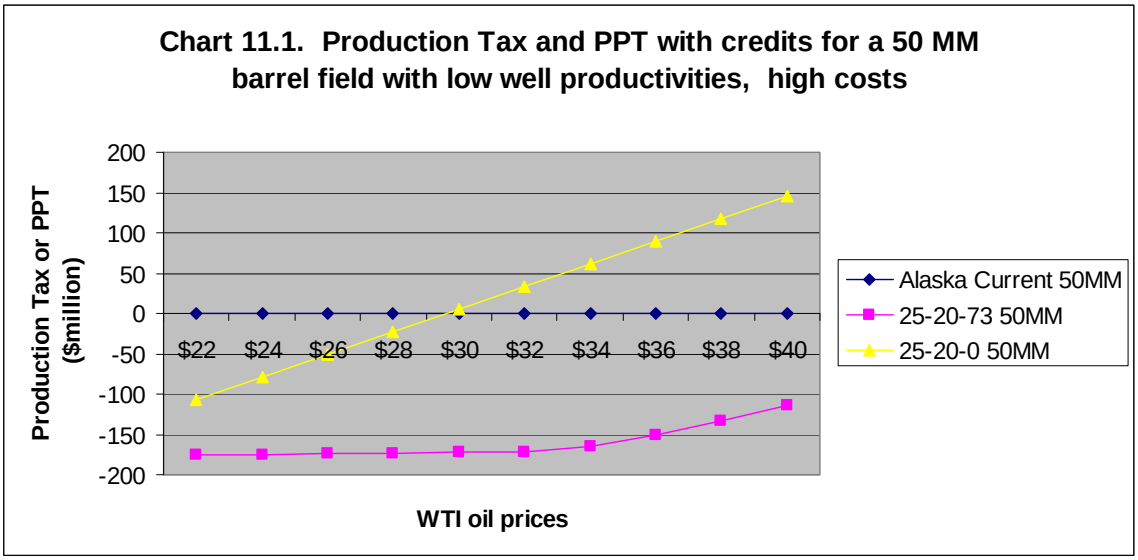

Annual Oil Severance Tax ($mm)
No Gasline / No Enhanced Volumes
$40
Severance Tax ($millions)
2,000
1,500
1,000
500
0
2005
2010
2015
2020
2025
2030
Year
sq
25/15
25/20
20/15
20/20
17.5/15

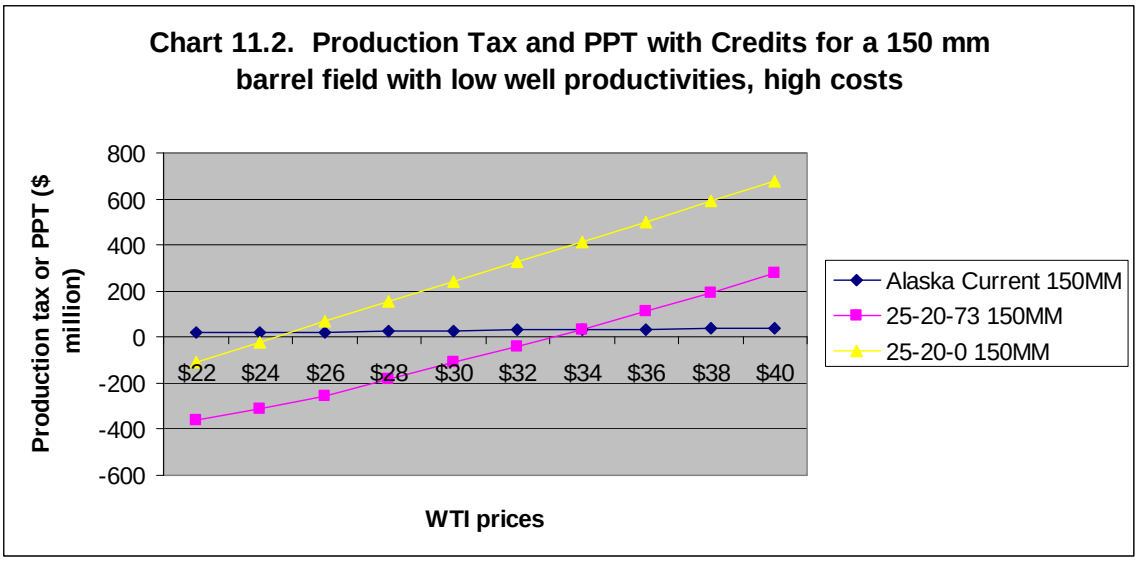

Annual Oil Severance Tax ($mm)
No Gasline / No Enhanced Volumes
$60
Severance Tax ($millions)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2005
2010
2015
2020
2025
2030
Year
sq
25/15
25/20
20/15
20/20
17.5/15

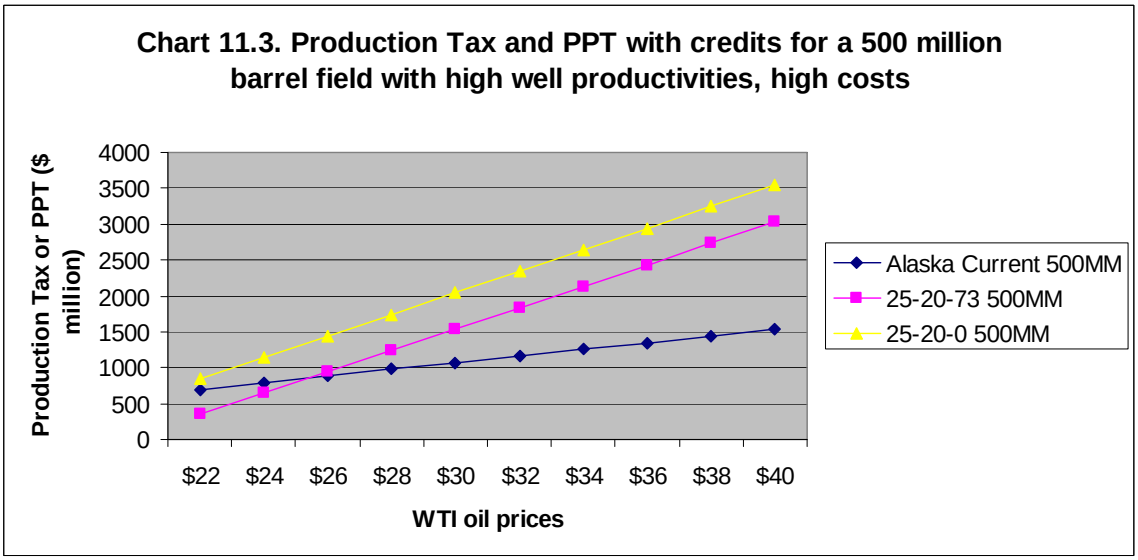
11.3. PPT income on new investments

11.3.1. Field size and price sensitivity

The following graphs show the PPT income for the 25-20-73 scenario and the 25-20-0 scenario. This means the 25% PPT with a 20% tax credit, with or without the $ 73 million tax free allowance. The scenario with the tax free allowance illustrates the economics of a first investor or small company. The scenario without the tax free allowance illustrates the economics of a large producing company.







The results of the charts are very similar to charts 4.1 through 4.3.

For first investors there will be tax credits, but no tax on a 50 million barrel field. On the 150 million and 500 million fields first investors will pay tax over $ 34 and $ 26 per barrel respectively. Below these levels the undiscounted value of the tax credits will exceed the tax payable and a “negative PPT” is created. The degree to which these negative PPT’s can be traded depends on the availability of buyers for these credits.

The current large producers will have a zero PPT on a high cost 50 million barrel field at a WTI price of about $ 30 per barrel. Below this price there is a negative PPT because of the significant tax credits. These credits can be used against the PPT payable. Above this price there is a positive PPT.

For larger fields which were assumed to be less costly per barrel, the break even price is less.

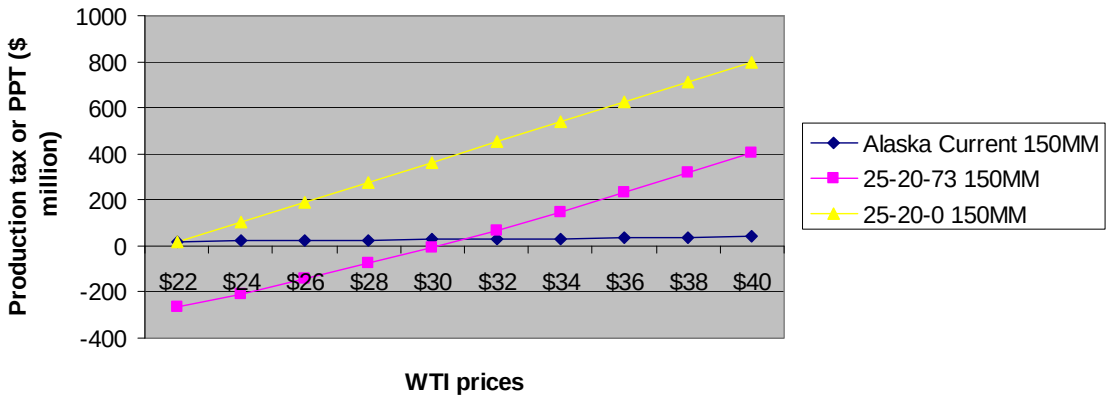
11.3.2. Cost sensitivity

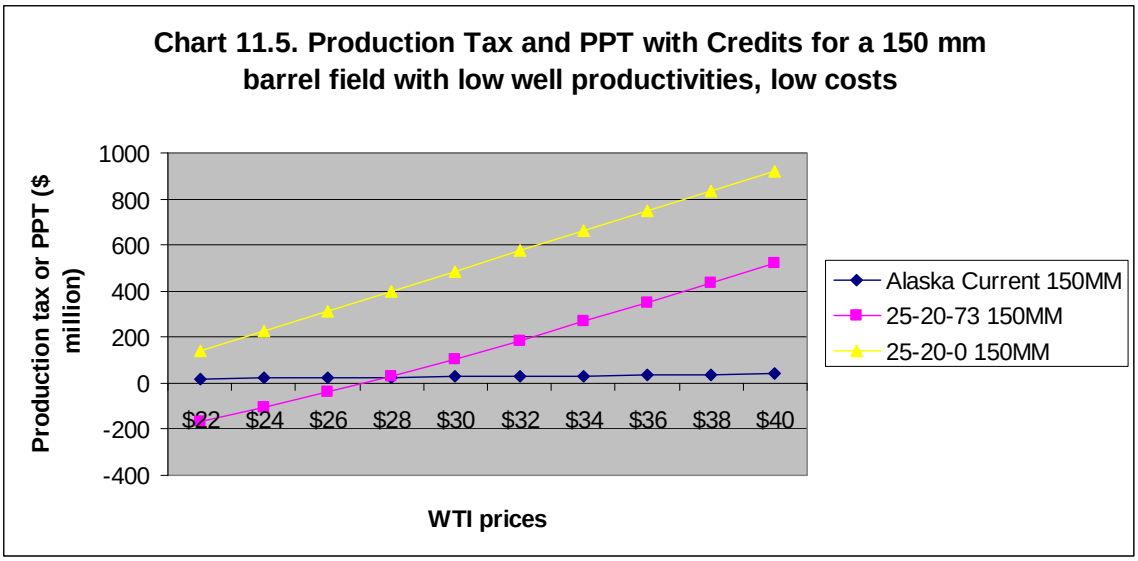
The following two charts show the same 150 million barrel field, but with lower costs.

As can be easily seen the WTI break even point shifts to lower levels as a result. In other words, the effect of lower costs is:

- A lower WTI break even price
- A higher tax
- A lesser probability for "negative PPT" and a higher probability for "positive PPT".

Chart 11.4. Production Tax and PPT with Credits for a 150 mm barrel field with low well productivities, average costs





11.3.3. Conclusion

As can be clearly seen from the information in this chapter so far, the PPT is primarily a tax on existing production in terms of additional revenues for the State under average or high prices.

With respect to production from fields as a result of new investments, the PPT modifies the overall corporate PPT payable either negative or positive. Under low prices and high costs, the PPT lowers the overall PPT payable, with a State wide "floor" of zero. Under high prices and low costs, the PPT increases the overall PPT payable.

11.4. Profitability of new investments

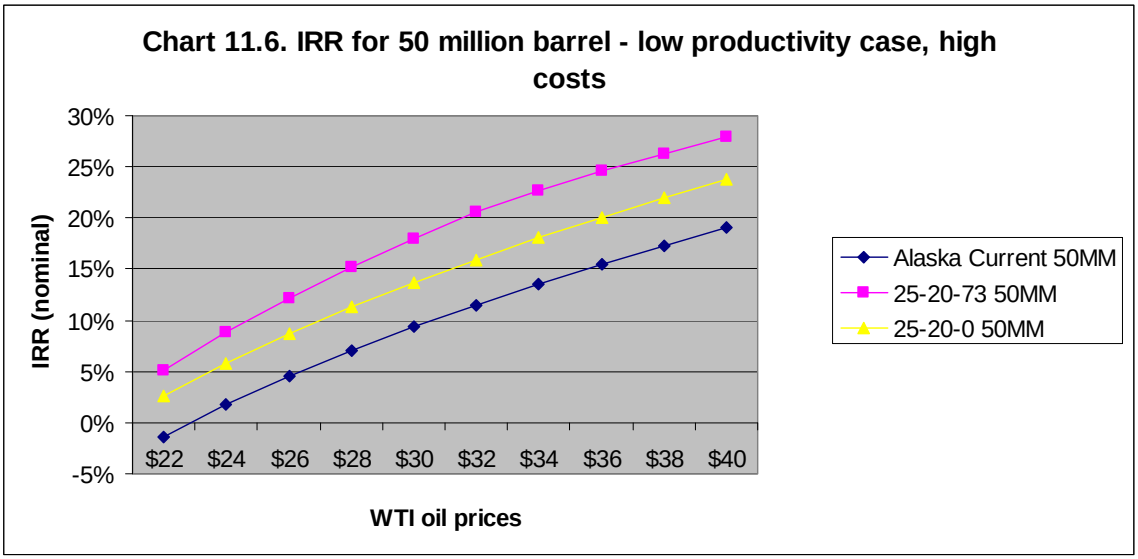
11.4.1. Profitability Indicators

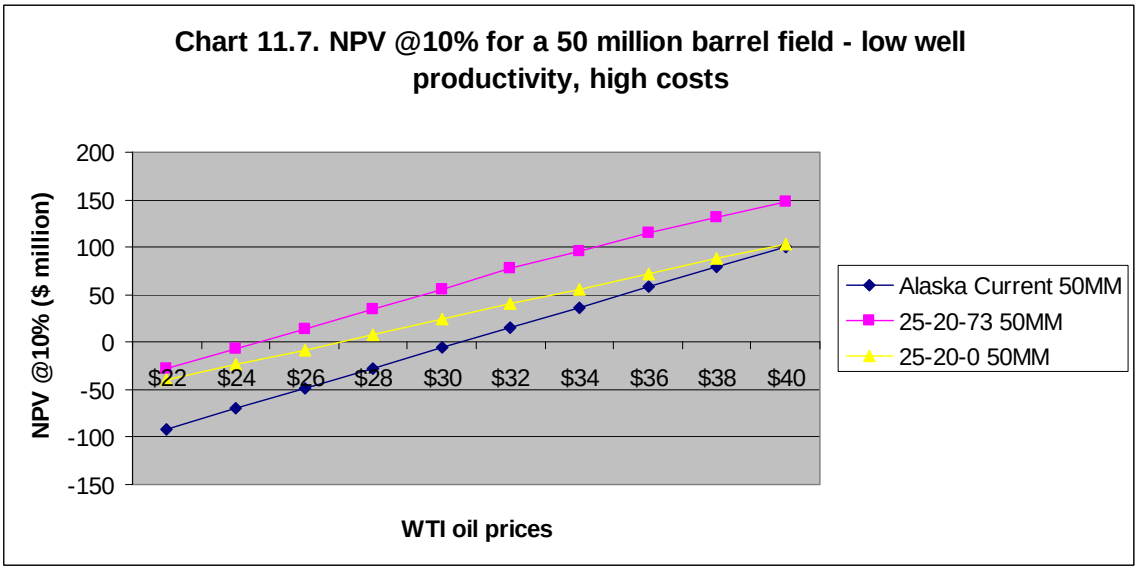
The following graphs repeat the graphs shown in Chapter 4 for high cost conditions.

Charts 11.6, 11.9 and 11.12 show clearly that irrespective of field size, costs or prices, the PPT system improves the rate of return (IRR) of the investments considerably.

Charts 11.7, 11.10 and 11.13 show how the NPV@10% at low prices is always favorably affected by the PPT. At higher prices, the NPV is less attractive as a result of the higher tax rate, but the level of NPV is under these conditions very attractive in any case.

Charts 11.8, 11.11 and 11.14 show how the EMV@10% is more favorable over a wide low and average price range. This indicates that the PPT will stimulate exploration considerably.





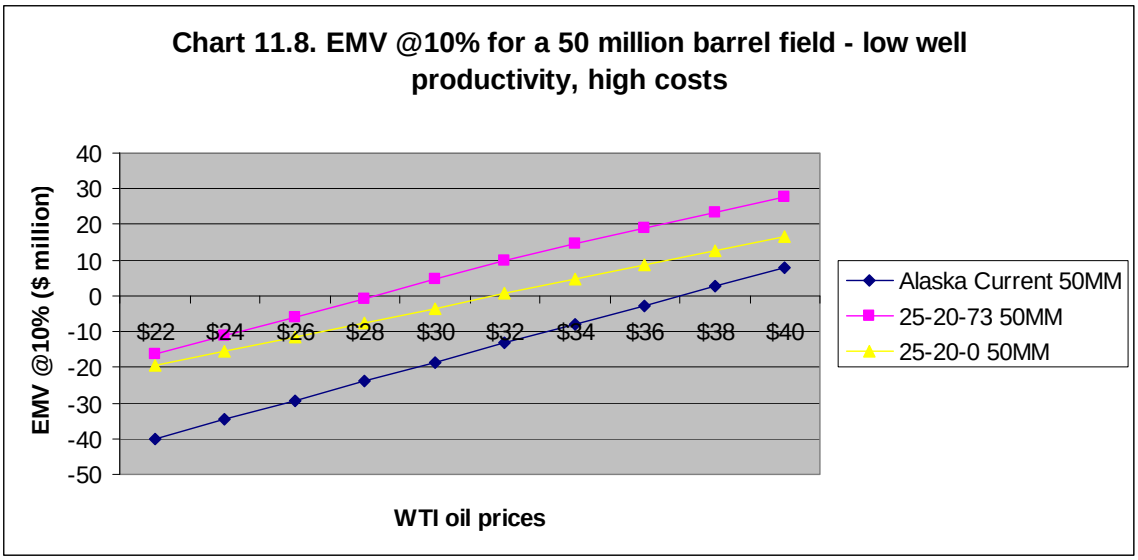


Chart 11.8. EMV @10% for a 50 million barrel field - low well productivity, high costs
EMV @10% ($ million)
40
30
20
10
0
-10
-20
-30
-40
-50
$22
$24
$26
$28
$30
$32
$34
$36
$38
$40
WTI oil prices
Alaska Current 50MM
25-20-73 50MM
25-20-0 50MM

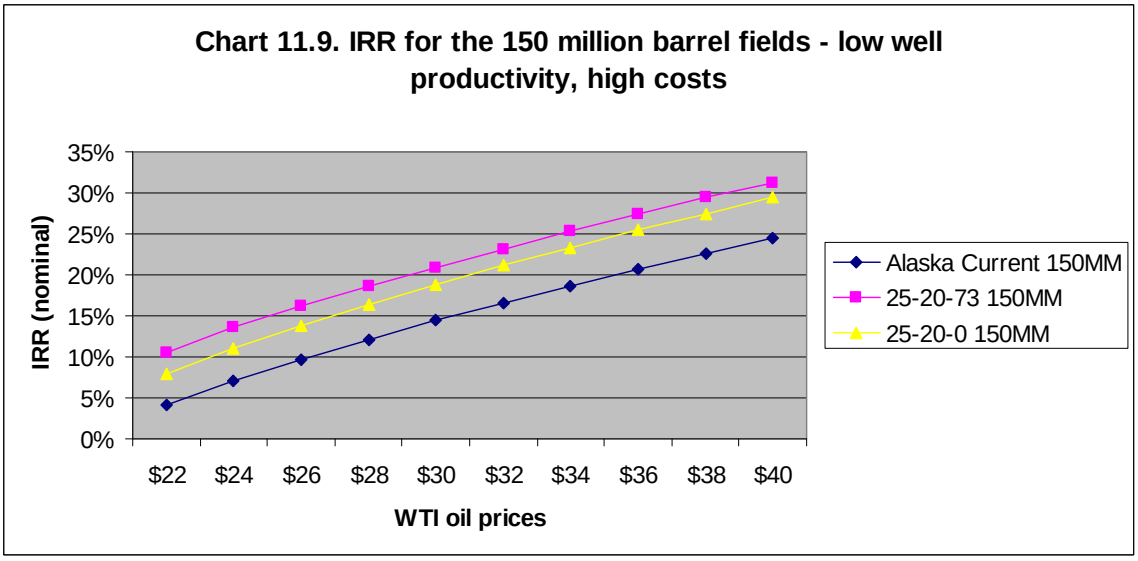


Chart 11.9. IRR for the 150 million barrel fields - low well productivity, high costs
IRR (nominal)
35%
30%
25%
20%
15%
10%
5%
0%
$22
$24
$26
$28
$30
$32
$34
$36
$38
$40
WTI oil prices
Alaska Current 150MM
25-20-73 150MM
25-20-0 150MM

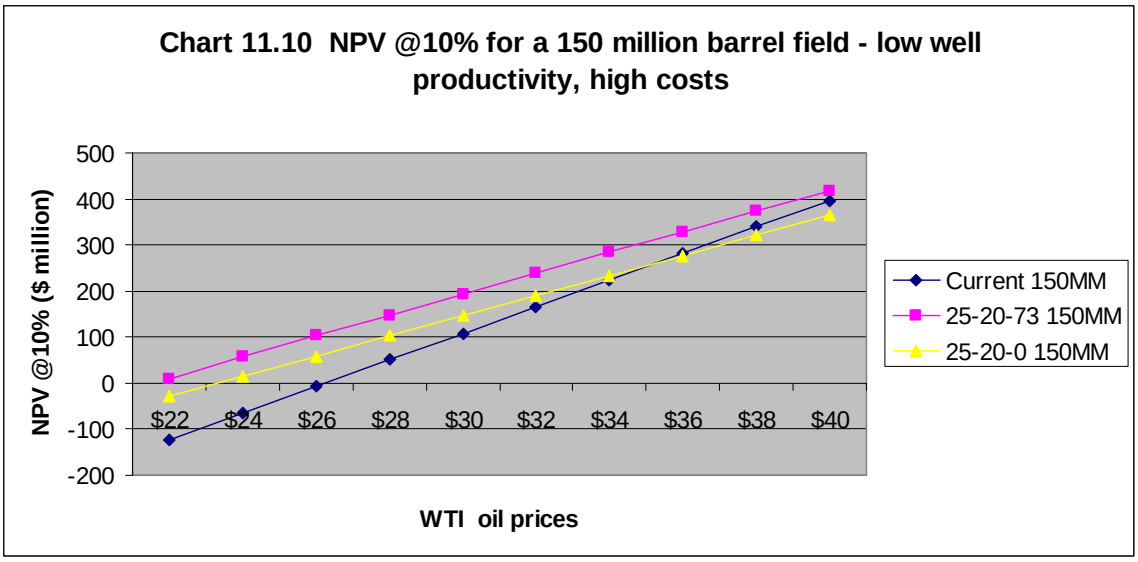


Chart 11.10 NPV @10% for a 150 million barrel field - low well productivity, high costs
NPV @10% ($ million)
500
400
300
200
100
0
-100
-200
$22
$24
$26
$28
$30
$32
$34
$36
$38
$40
WTI oil prices
Current 150MM
25-20-73 150MM
25-20-0 150MM

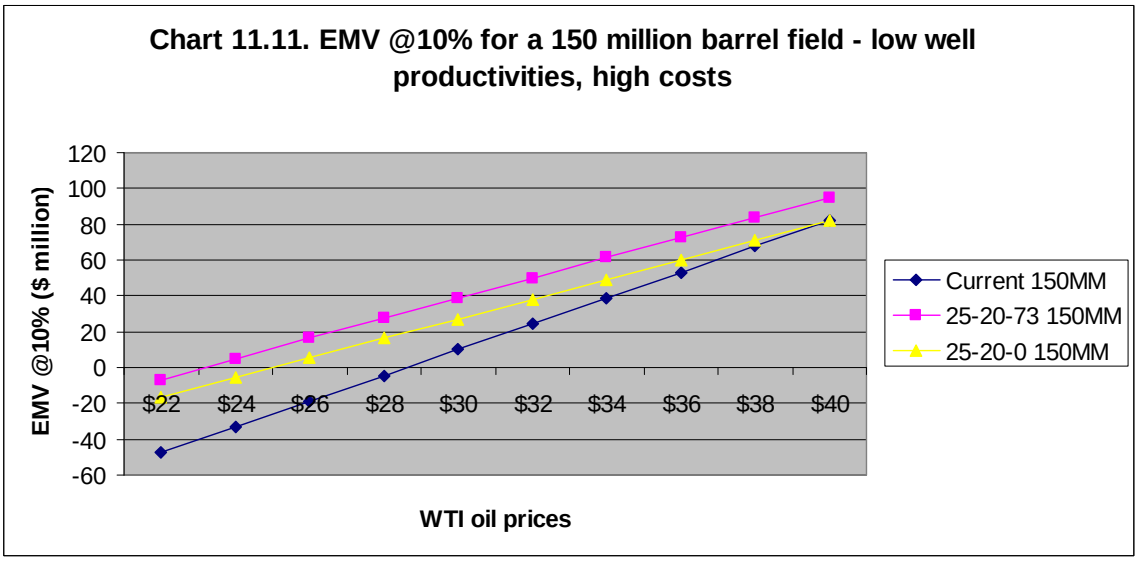


Chart 11.11. EMV @10% for a 150 million barrel field - low well productivities, high costs
EMV @10% ($ million)
120
100
80
60
40
20
0
-20
-40
-60
$22
$24
$26
$28
$30
$32
$34
$36
$38
$40
WTI oil prices
Current 150MM
25-20-73 150MM
25-20-0 150MM

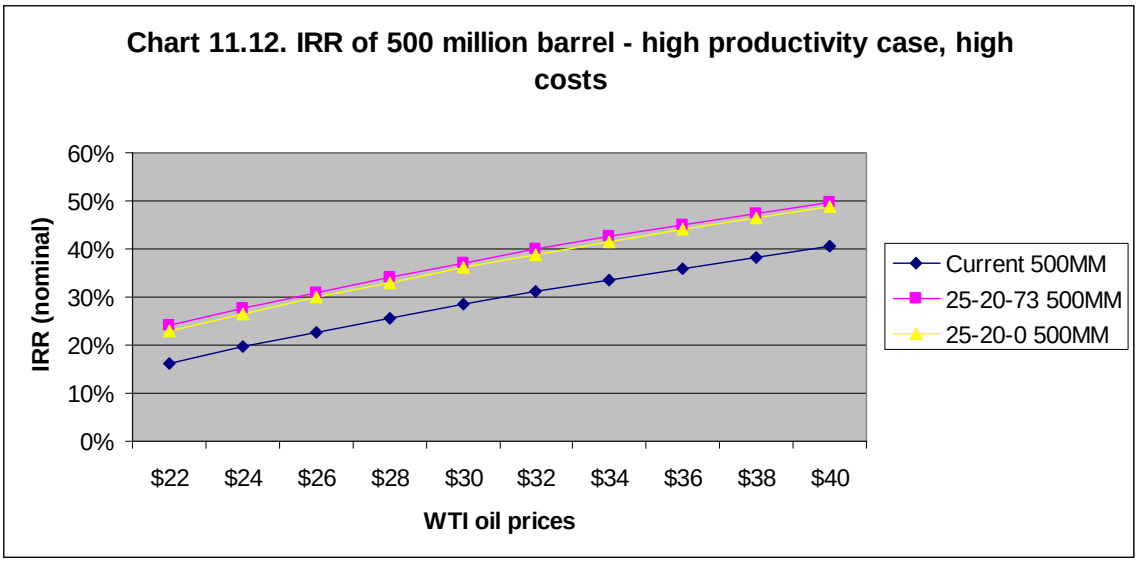


Chart 11.12. IRR of 500 million barrel - high productivity case, high costs
60%
50%
40%
30%
20%
10%
0%
IRR (nominal)
$22
$24
$26
$28
$30
$32
$34
$36
$38
$40
WTI oil prices
Current 500MM
25-20-73 500MM
25-20-0 500MM

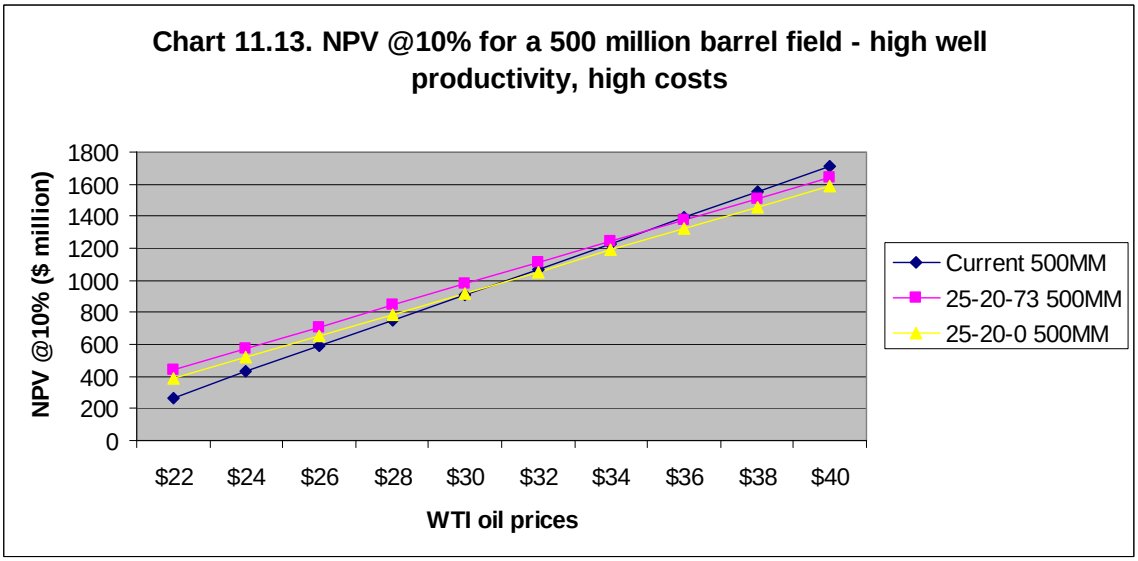
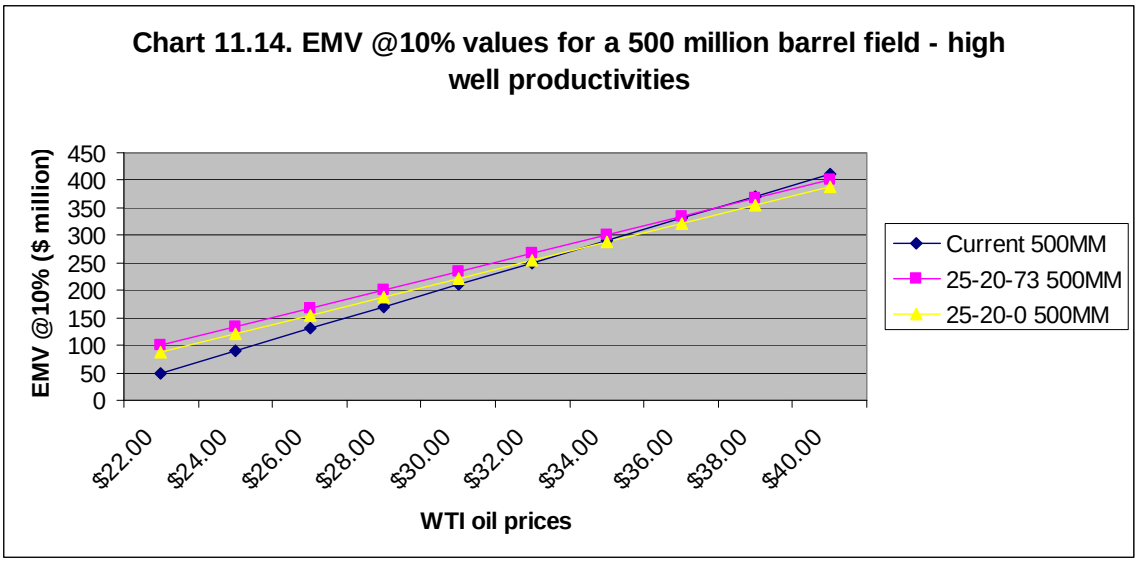


Chart 11.13. NPV @10% for a 500 million barrel field - high well productivity, high costs
1800
1600
1400
1200
1000
800
600
400
200
0
NPV @10% ($ million)
$22
$24
$26
$28
$30
$32
$34
$36
$38
$40
WTI oil prices
Current 500MM
25-20-73 500MM
25-20-0 500MM



11.4.2. Government Take

The following three charts provide for the overall Federal and Alaska government take.

It can be seen how in all cases the current regressive system is converted to a neutral or even somewhat progressive system, whereby the regressive royalty and production tax are compensated by the progressive PPT.

The government take is typically less than the current system at low prices and for small and high cost fields and is more than the current system at high prices and low cost.

Chart 11.15. Overall Government Take for a 50 million barrel field with low well productivities

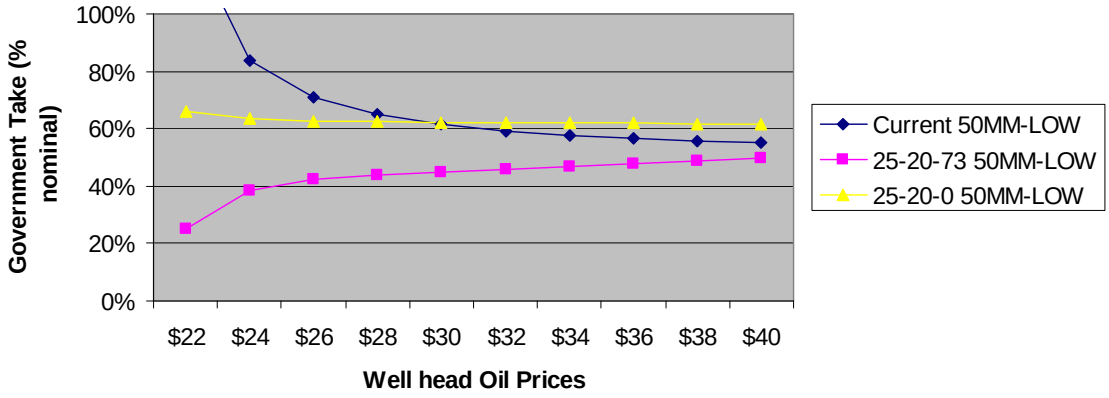
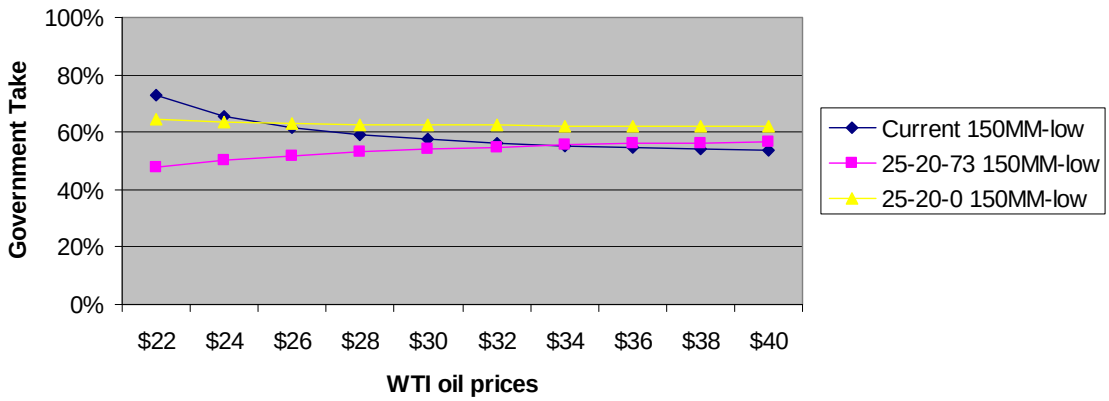
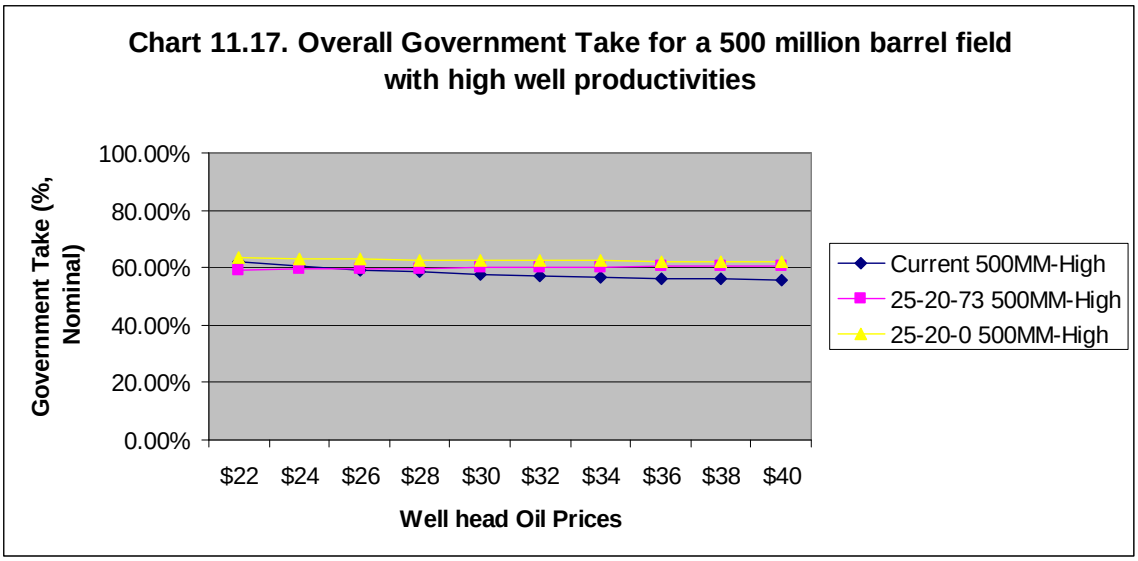


Chart 11.16. Overall government take for a 150 mm barrel field with low well productivities





11.4.3. Conclusion

The recommended PPT system will strongly encourage new investment through a higher rate of return and a better overall project value at low or average prices. The system also strongly encourages exploration. The overall government take is either less or more depending on the price and cost conditions.