Policy Options for Alaska Oil and Gas

Pedro van Meurs

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Van Meurs Corporation
Nassau, Bahamas
Tel: (242) 324-4438
e-mail: info@vanmeurs.org

Introductory Comment

The objective of Governor Parnell is to achieve a TAPS throughput of 1 million barrels per day.

Can this objective be achieved from State of Alaska resources by 2025? Yes

How?

It will require major policy and fiscal changes as will be discussed during the seminar.

These changes need to induce an increase in investment of about $ 7.5 billion per year over current levels.

Introductory Comment

Such major policy and fiscal changes could also induce significant exports of LNG prior to 2025.

Four Sessions

The seminar will develop in four sessions:

1. **New policy framework required**
2. **International competitive environment**
3. **Proposed terms for existing and new light oil**
4. **Proposed terms for heavy oil, shale oil and natural gas**

Session 1

New policy framework required

World Rating of Oil and Gas Terms

Much of the material to be presented during the seminar is derived from a large international study being done by Van Meurs Corporation entitled:

World Rating of Oil and Gas Terms

In this study oil and gas fiscal systems of more than 140 countries and jurisdictions, such as Alaska, are being compared and analyzed in order to determine their favorability for investors.

Information about the study is available on:

www.petrocash.com

World Rating of Oil and Gas Terms

The 2011-2012 ratings of fiscal terms will cover 6 volumes.

Four volumes have been completed:

- **North American wells and shale plays**
- **Deep water**
- **Arctic**
- **Shallow water**

Two volumes still to be completed:

- **Onshore fields and shale plays**
- **Summary**

Alaska fiscal terms

During the seminar specific new fiscal terms will be proposed for Alaska oil and gas.

The purpose of these terms is to demonstrate how a new fiscal system can be created and to indicate the order of magnitude of the amounts and rates that would need to be adopted.

Concept of Government Take

During the seminar the concept of "government take" will be used frequently. Following is an example of the calculation of the government take for a 10% royalty.

Gross Revenues	**$ 100 per barrel**
Costs	**$ 20 per barrel**
Divisible Income	**$ 80 per barrel**
Royalty 10%	**$ 10 per barrel**

Government Take: ($ 10 / $ 80) x 100% = 12.5%

The Government Take in this seminar is presented on an undiscounted and real basis using an escalation and inflation rate of 2% and is based on price and cost data as contained in Volume 3 of World Rating of Oil and Gas Terms.

Policy Change required

Alaska will not be able to reverse the decline in oil production from State of Alaska leases unless Alaska encourages major investment in:

- **Heavy oil,**
- **Potentially Shale Oil, if technically and economically viable, and**
- **Maybe some GTL production**

Policy Change required

If Alaska wants to attract investment in a major way for the important new resources (heavy oil, gas and potentially shale oil), significant political change is required in Alaska.

These changes are:

1. **Alaska has to define competitive fiscal terms for the entire range of oil and gas resources, so investors know what the terms are.**
2. **Alaska has to offer fiscal stability on these terms for large new projects, so investors know that Alaska will honor these terms for a significant duration.**

Policy Change required

Alaska is only jurisdiction in the world without defined fiscal terms for major oil and gas resources within its jurisdiction.

Alaska has no fiscal terms designed for heavy oil.

Alaska has no fiscal terms designed for shale oil.

Alaska has no implementable fiscal terms for natural gas.

This is a major obstacle for new investment.

Alaska political climate

It will be very difficult to introduce such changes in the current somewhat unfavorable political climate in Alaska.

The unfavorable political climate in Alaska is "structural"; in other words it is unlikely to change.

It is created by two factors:

- **The small size of the Alaska population creates a particular way of developing fiscal policy, and**
- **An dependency relationship of Alaska on three major oil companies for most of their government budget, which creates resentment among some Alaskans. "Standing up for Alaska" is politically popular.**

Political climate:

Small size of population

Jurisdictions with small populations (<2 million) develop oil and gas fiscal systems differently than jurisdictions with large populations (> 2 million) .

Small jurisdictions are often "project driven". They tend to wait for someone to propose a project before deciding on detailed terms. Often terms are complex because many local interests need to be dealt with and terms are tailored for specific conditions.

Examples with population in millions: Alaska (0.7), Newfoundland & Labrador (0.5), Trinidad and Tobago (1.3), Equatorial Guinea (0.7) and Qatar (1.7).

Political climate:

Large populations

Jurisdictions with large populations of have generic petroleum codes and tax laws which deal with all petroleum resources. Terms are identical for all investors. Terms may be adjusted for each bid round. Often petroleum fiscal terms are relatively simple.

Examples with population in millions: United States (Federal onshore and OCS) (312.1), Norway (5.0), Alberta (3.7), the United Kingdom (62.3) and Australia (22.8).

Competitive Framework for Alaska: 1997

Petroleum economic environment:

- Oil price low
- European and Asian gas prices low
- LNG trade limited
- Focus on conventional oil and gas
- Conventional oil production in US declining

Competitors of Alaska:

- Latin American, African and Asian developing countries
- Main LNG competitor: Qatar

Method of determining fiscal terms by competitors:

- Negotiations of production sharing contracts resulting typically in tough terms

Competitive Framework for Alaska: 2012

Petroleum economic environment:

- High oil prices
- High European and Asian gas prices
- Booming LNG trade
- Focus on unconventional oil and gas
- Oil production in US and Canada increasing

Competitors of Alaska:

- Lower 48 USA, Canada, Russia and Brazil
- Main LNG competitor: Australia

Method of determining fiscal terms by competitors:

- Fixed and usually attractive fiscal terms.

Alaska Political climate:

Negative experience

The fact that fiscal terms in Alaska are being defined once a project is identified has already resulted twice in the loss of a major gas export project:

- **Under Governor Knowles in 1996 there were realistic opportunities for LNG exports to Asia. Yet, the process of having first to develop the "Stranded Gas Development Act" in order to enter in negotiations resulted in a situation where Asian buyers went elsewhere.**
- **Under Governor Murkowski in 2003 there was a significant opportunity to built a gas line to Alberta. Yet, strong opposition within government and from Alaskans delayed negotiations and resulted in a disapproval of the project.**

These experiences create a negative environment for the proposal of new projects by major companies in Alaska.

Policy change required

If Alaska wants to attract major new investment in the new competitive environment of 2012 and achieve a million bopd target and LNG exports, it has to establish competitive and fixed terms for all its resources:

- **Existing light oil**
- **New light oil**
- **Heavy oil**
- **Ultra heavy oil**
- **Shale oil**
- **New natural gas**
- **Associated natural gas**

What Alaska needs is a "we are open for business" brochure that sets out all terms for investing in oil and gas in Alaska.

Implementation of new terms.

With respect to light oil for existing and new production it seems that no particular implementation measures need to be taken. It is likely that investors will respond positively to the new terms and make the necessary investments, unless the project involves major new investments, such as the development of Point Thomson.

With respect to heavy oil, shale oil, natural gas and GTL it is unlikely that investors will commit to large multi-billion dollar programs unless there is a degree of fiscal stability in a contractual framework.

Contractual relationship.

If investors feel that fiscal stability is required for their investments, the Government of Alaska should be authorized to sign contracts, without further legislative approval. In other words the process would be similar to the approval of an oil sands plant in Alberta.

The fiscal stability period could range from 10 – 25 years from the start of the contract, depending on the nature of the investment.

In exchange for being offered fiscal stability, the investor would have to commit to a substantive work program.

It is understood that the matter of whether or not Alaska can offer fiscal stability, is an issue to be decided by the Alaska Supreme Court.

Difficulties in achieving Alaska production increases

Increasing Alaska oil production and initiation of gas exports will face other major difficulties.

The main difficulty is that the three major oil companies are in a "harvesting mode", which means their main objective is drawing cash out of Alaska to invest elsewhere. The reasons for this are:

- **No large and attractive projects available in Alaska under current fiscal terms for major oil companies**
- **Attractive opportunities outside Alaska.**

No attractive projects in Alaska
for major oil companies

Current fiscal terms are designed for *low cost light oil*.

There is possibly about one billion barrels of new *high cost light oil* production available through:

- **Discoveries as a result of new exploration**
- **Small discovered fields, which have not yet been brought on stream**
- **Infill drilling of existing fields.**

Major oil companies are already infill drilling, other projects do not compare well in attractiveness with international opportunities.

As a result, the main focus of major oil companies is to draw cash out of Alaska for investment elsewhere.

Session 2

International competitive framework

Attractive terms outside Alaska
for major oil companies

In the following slides the international competitive position for Alaska will be evaluated for the following resources:

- **Existing light oil production**
- **New light oil production**
- **Heavy oil**
- **Shale oil, and**
- **Natural Gas**

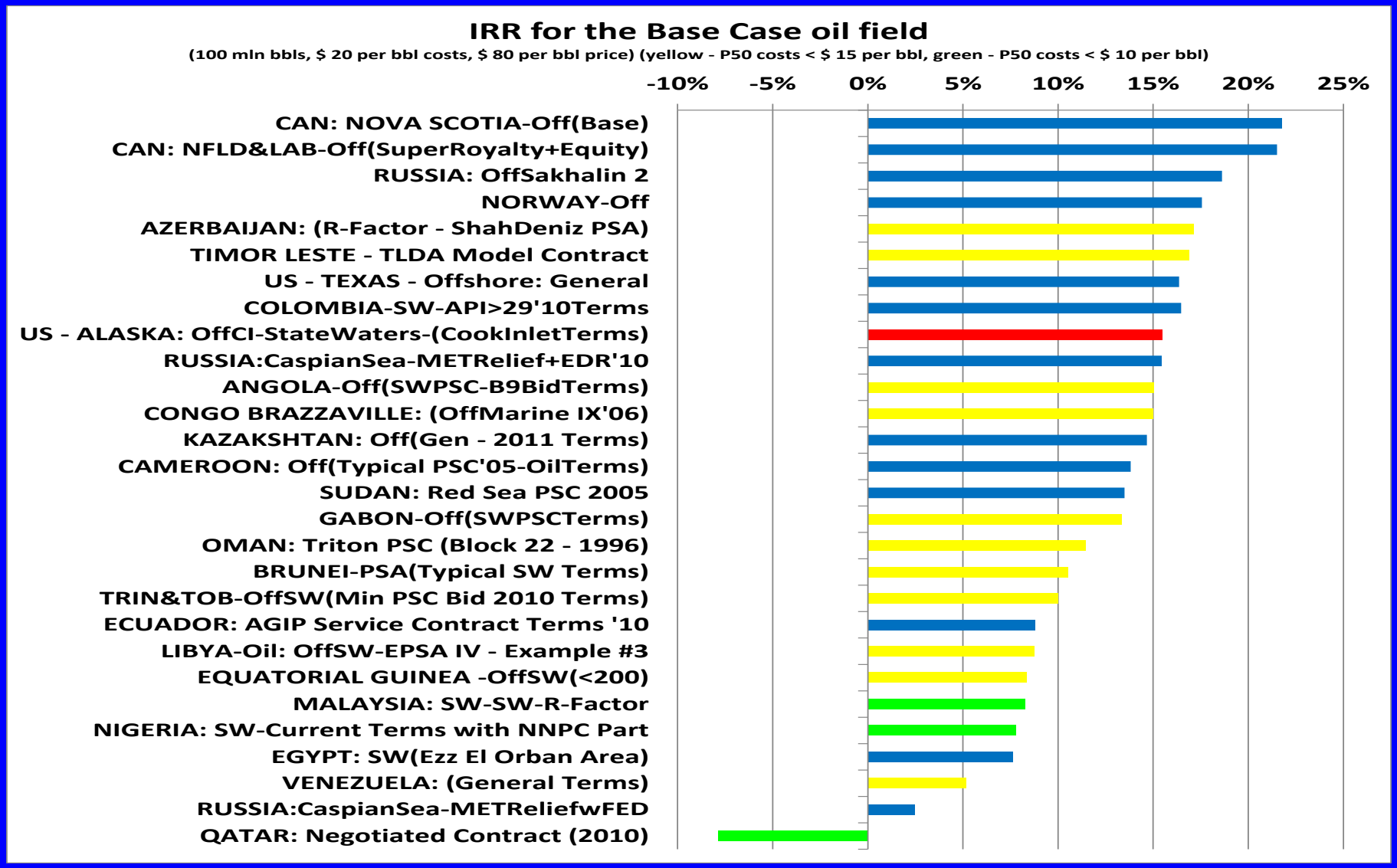
International competition:
Existing oil production

The Shallow Water results of World Rating of Oil and Gas Terms permit a comparison with the largest "peer group". The largest peer group for Alaska are the exporting jurisdictions. The following charts provide the results for a selection of 28 exporters of oil.

The Arctic Report permits a comparison with other Arctic jurisdictions.

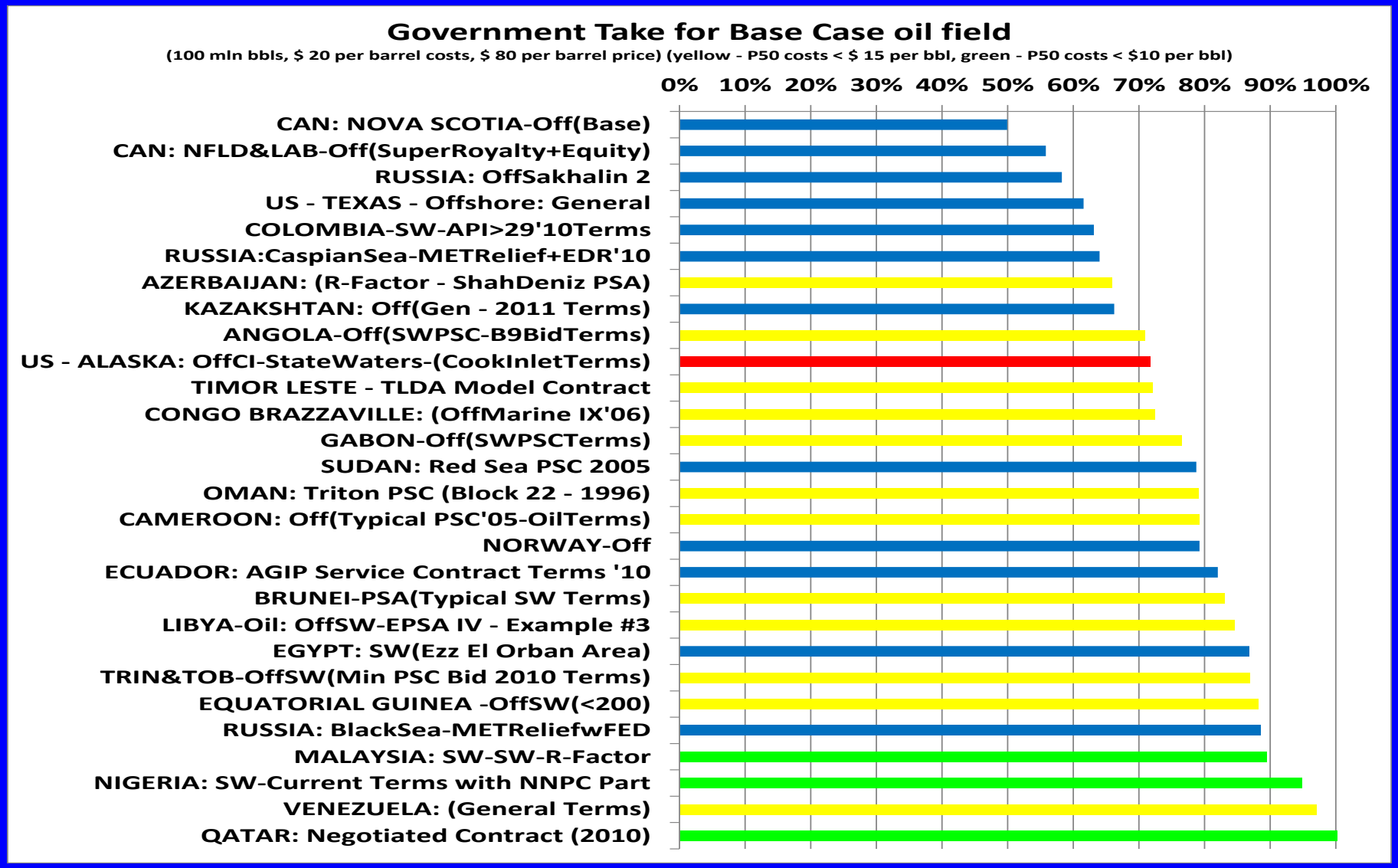
Following is an overview of the results.

Shallow water exporters (Oil)



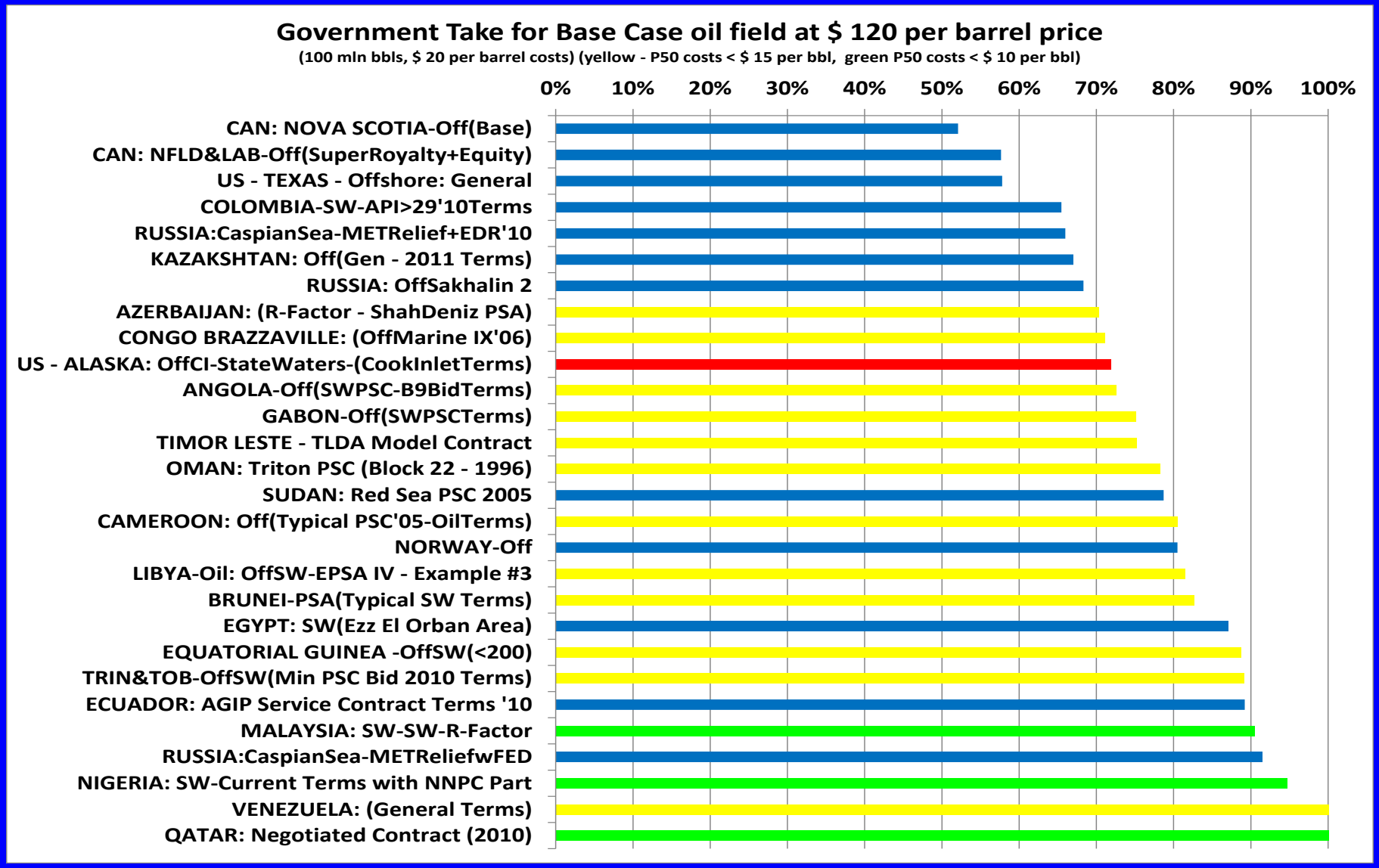
IRR: Alaska terms rate # 9 out of 28 exporters.

Shallow water exporters (Oil) - $ 80



Undiscounted Government Take: Alaska terms rate # 10 out of 28 exporters.

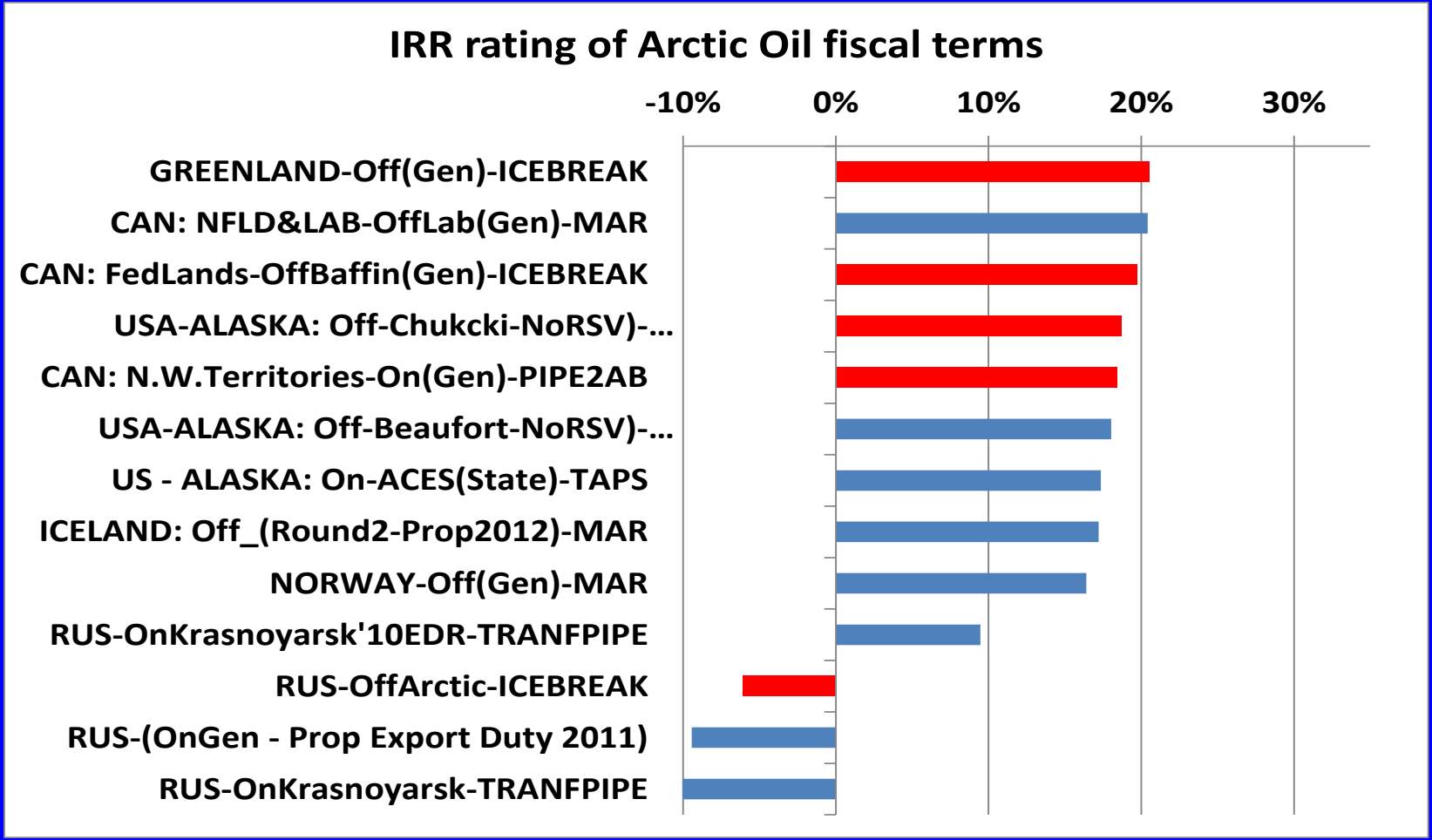
Shallow water exporters (Oil) - $ 120



Undiscounted Government Take at $ 120 per barrel: Alaska terms also rate # 10 out of 28 exporters.

Arctic (Oil)

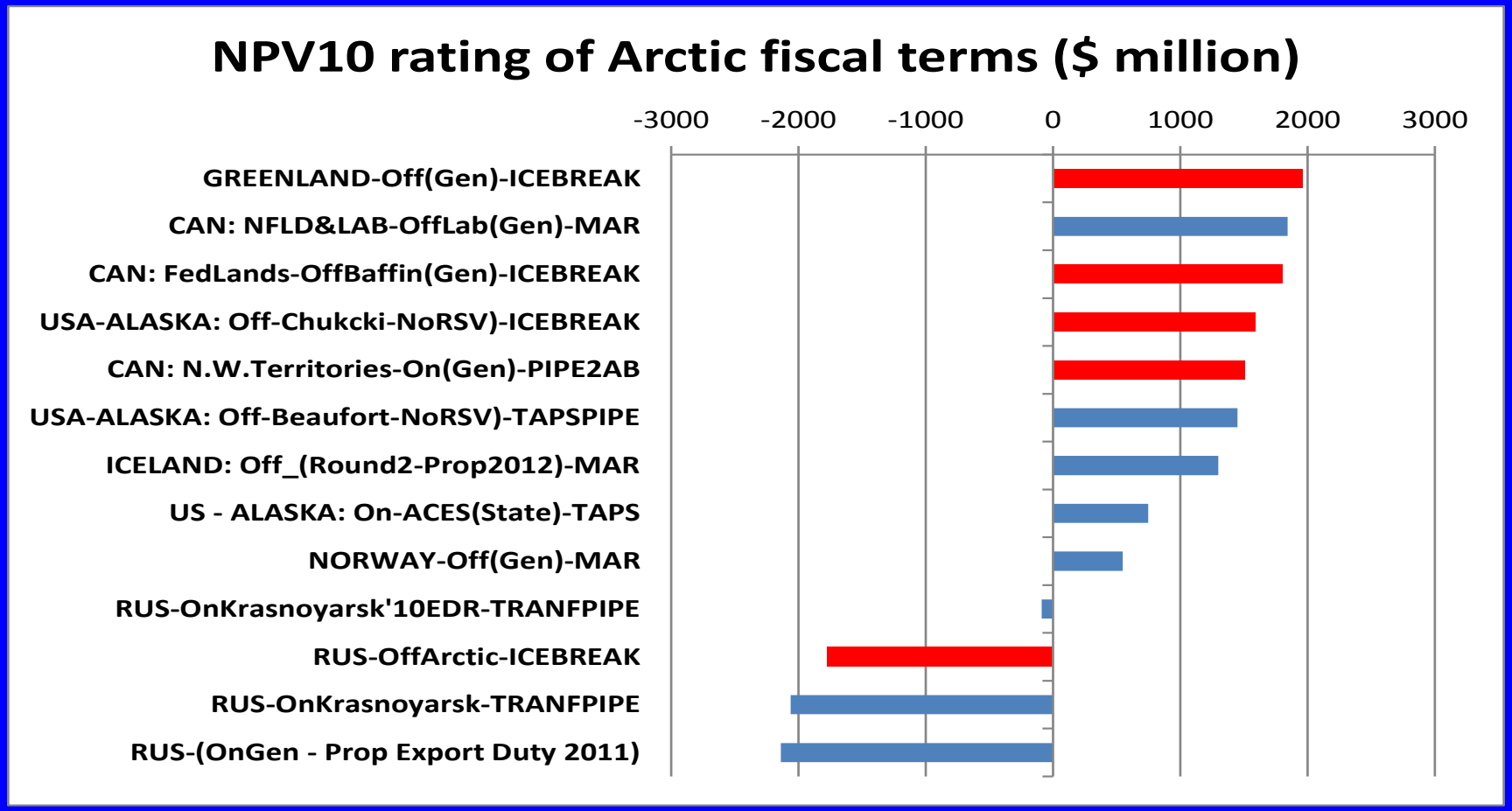
(red – no transport system available)



Alaska ACES IRR compares favorably with other Arctic jurisdictions. Russia still very tough under high cost and slow development conditions. Russian terms are rather attractive under lower cost conditions.

Arctic (Oil)

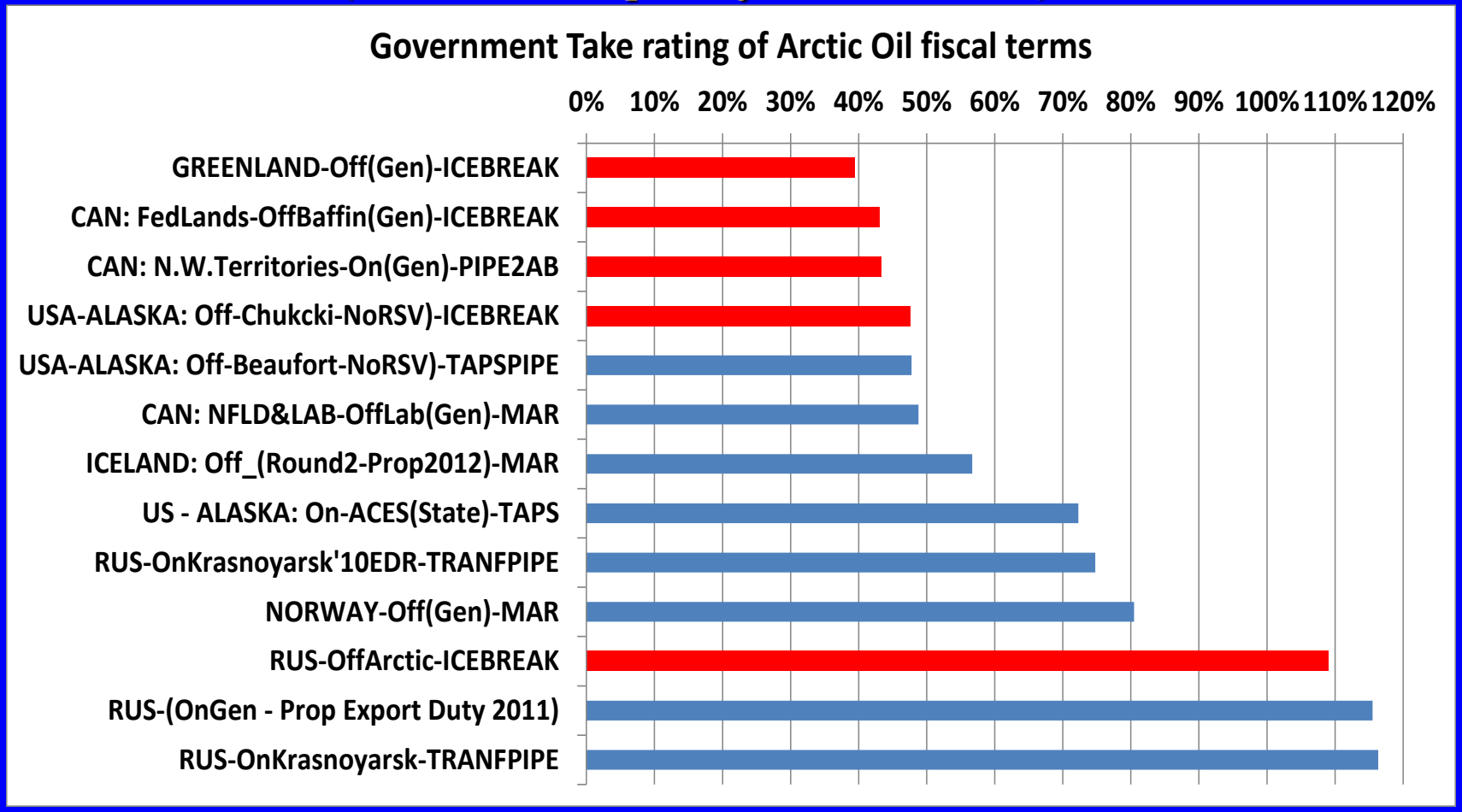
(red – no transport system available)



Alaska ACES NPV10 seems OK compared to other jurisdictions, but is somewhat meager. Note how Federal Beaufort and Chukchi acreage is attractive. Russia still very tough.

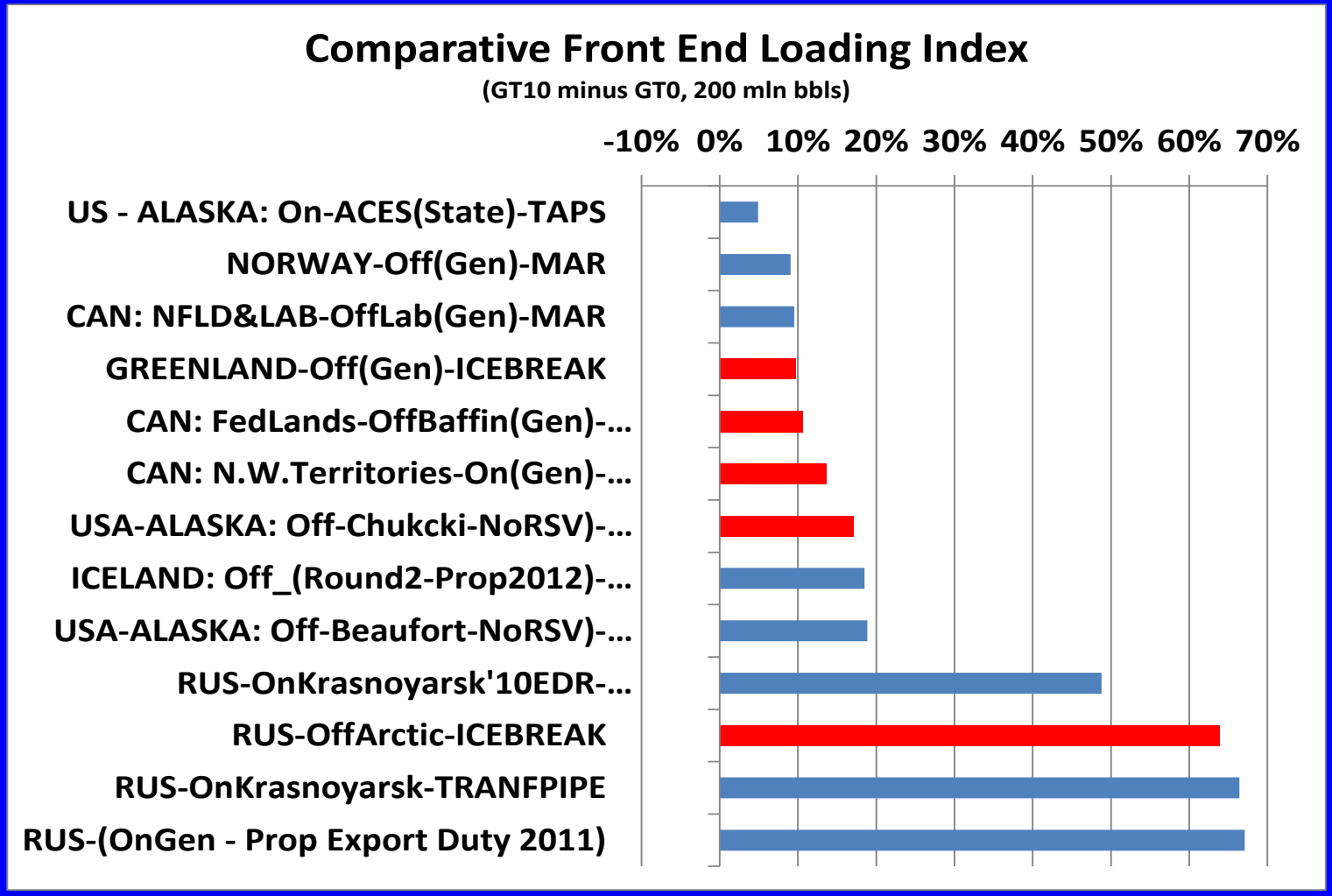
Arctic (Oil)

(red – no transport system available)



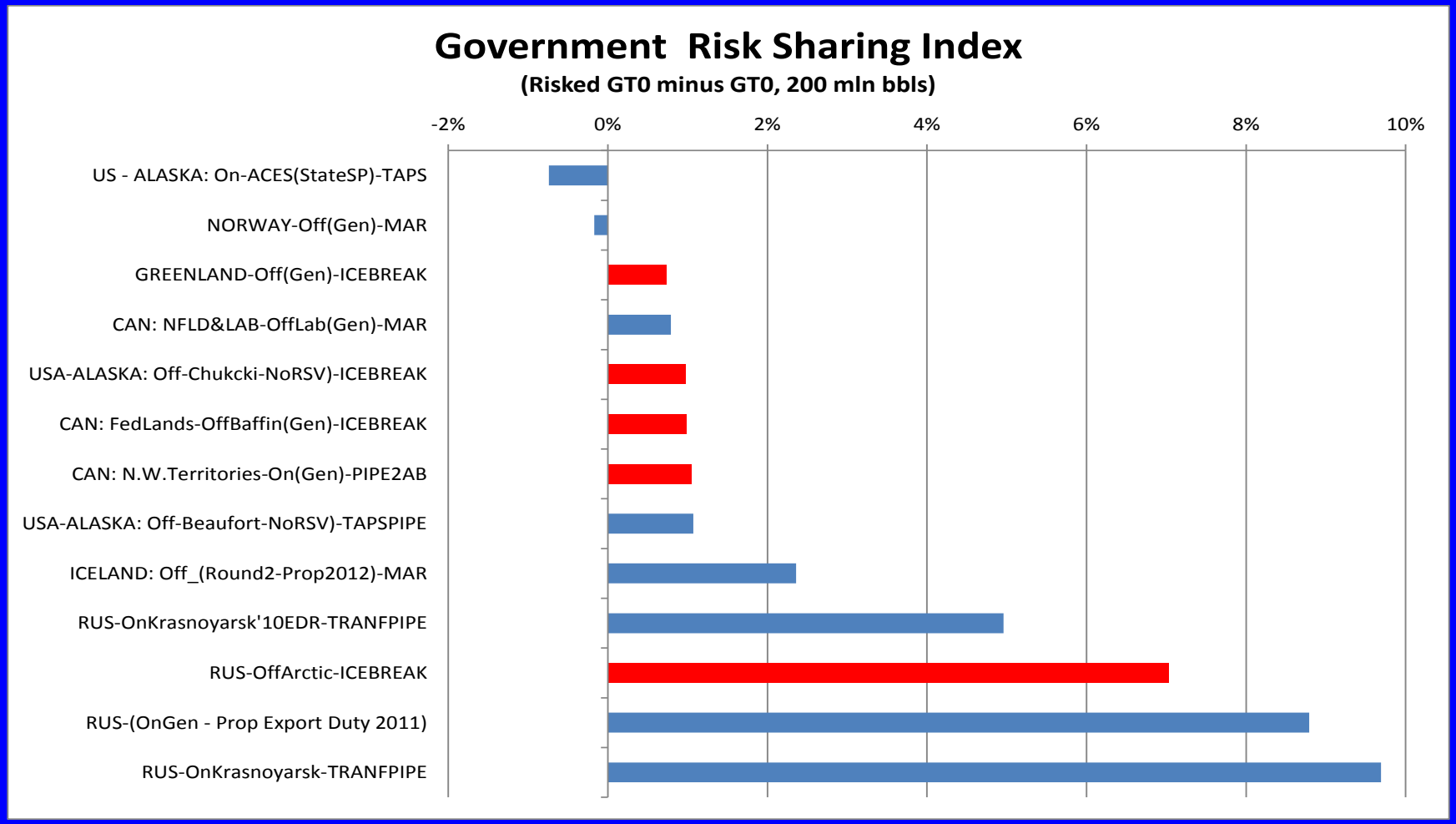
Alaska ACES government take is attractive from a government point of view and approximately at the right level for existing operations for investors. Interestingly new Russian terms compare with Alaska and Norway government take.

Arctic (Oil)



Alaska ACES government take is relatively well balanced compared to other Arctic jurisdictions in terms of the time distribution of the government take.

Arctic (Oil)



Under Alaska ACES the Alaska government is one of the few governments which shares disproportionately in the geological risk, indicating very strong support for exploration. In fact, with South Africa, Alaska rates the highest in the world in this respect.

International competition
Existing Production

The government take of about 70%-75% for Alaska is reasonable compared to the other exporters for existing operations. It is maybe slightly on the high side.

Alaska also offers a favorable time distribution of the government take and very favorable sharing of geological risk.

International competition
Existing Production

Both House Bill proposals lower the government take below 65% for existing as well as for new operations.

Although some improvements could be made in the existing terms, the results of the reports indicate that a significant lowering of government take (below the 70 – 75% range) for existing operations is not necessary.

SB 192 retains significant revenues on existing production in the 74 – 76% government take range.

International competition
New Production

The Alaska light oil production is rapidly declining at about 5% per year.

As stated earlier, there may be about one billion barrels of possible new production under more favorable fiscal terms. The production costs of this new oil is likely high on a per barrel basis.

The World Rating for Oil and Gas Terms provides information as to a reasonable government take for new production from the Deep Water report and the North American report.

Deep Water results

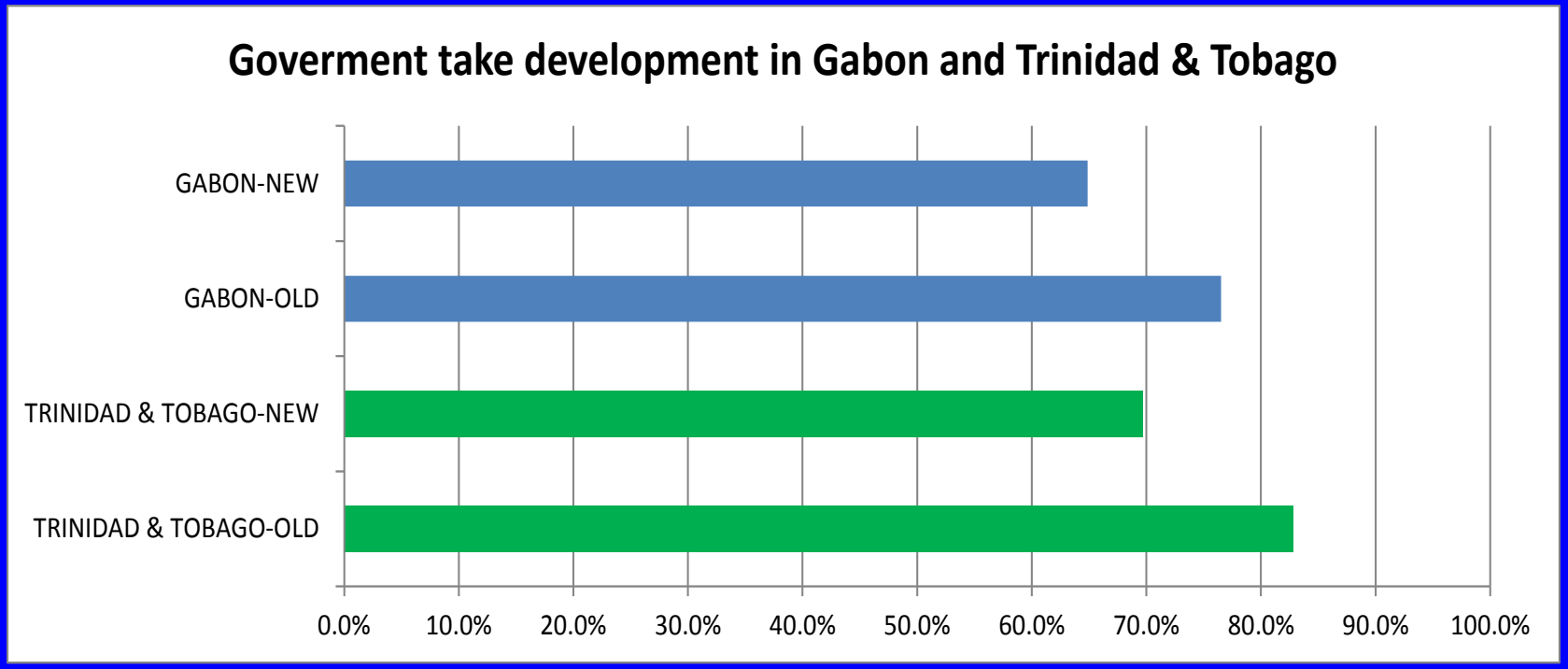
An important "peer group" for Alaska would be exporting jurisdictions with a declining conventional oil production.

There are not many jurisdictions in this group, but examples are Alberta, Gabon, Trinidad & Tobago, Malaysia.

Both Gabon and Trinidad applied about a 12 percent drop in order to attract new investment in an effort to offset declining production.

Both in Gabon and Trinidad this only applies to new blocks. Terms and conditions on old blocs remain unchanged.

Deep Water results



Gabon and Trinidad and Tobago are exporters with a declining oil production and have recently reduced their terms by about 12 percentage points.

North American Wells

Fiscal terms

Another way of competing with a fiscal system is to design the system for a wide range of economic conditions.

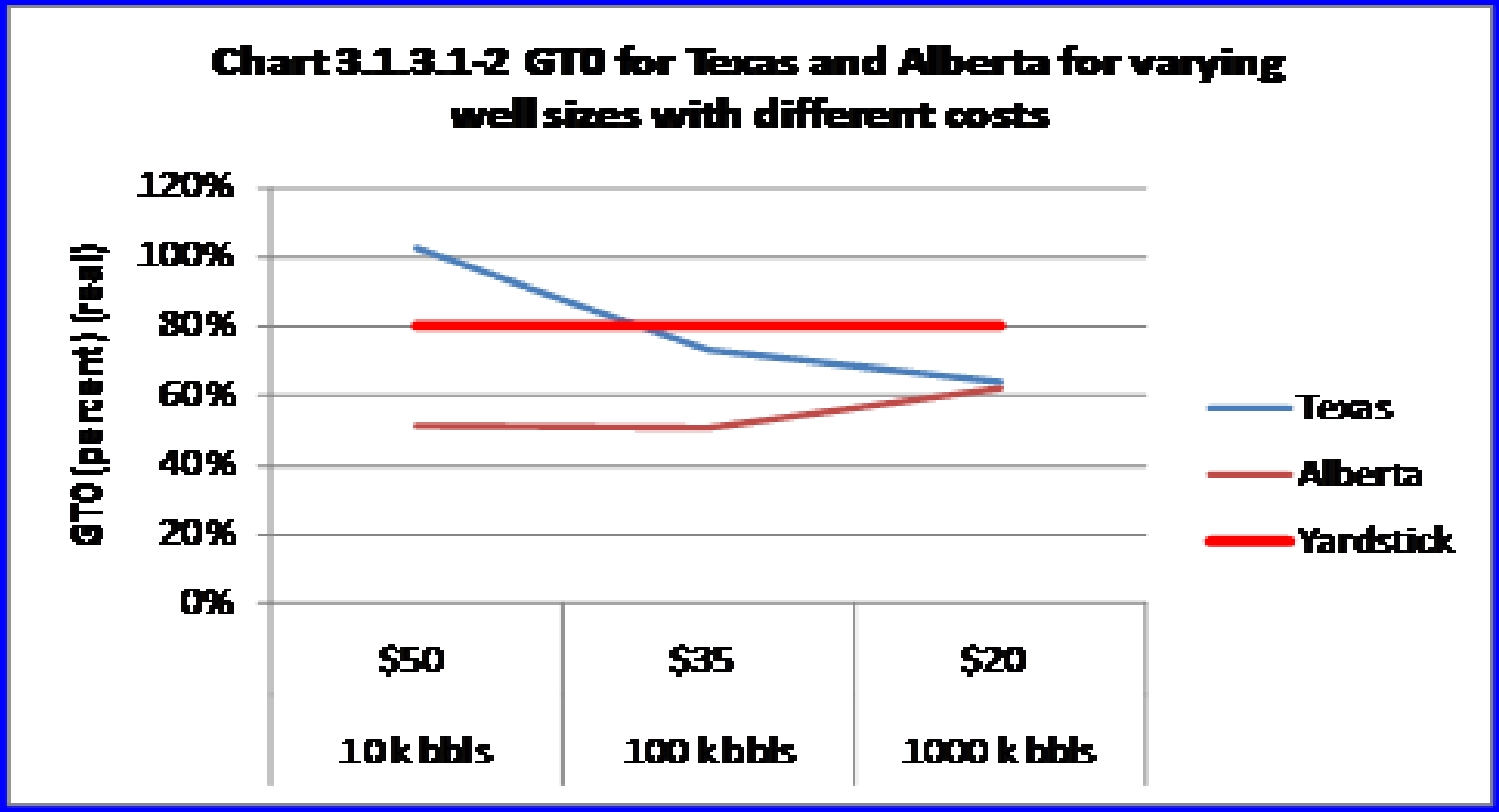
In Canada the fiscal systems consist of:

- **Royalties, based usually on formulas**
- **Federal and provincial corporate income tax**

In the United States the fiscal systems consist of:

- **Royalties, usually a fixed percentage**
- **Federal and often state corporate income tax**
- **Severance (production) taxes**
- **Property taxes**

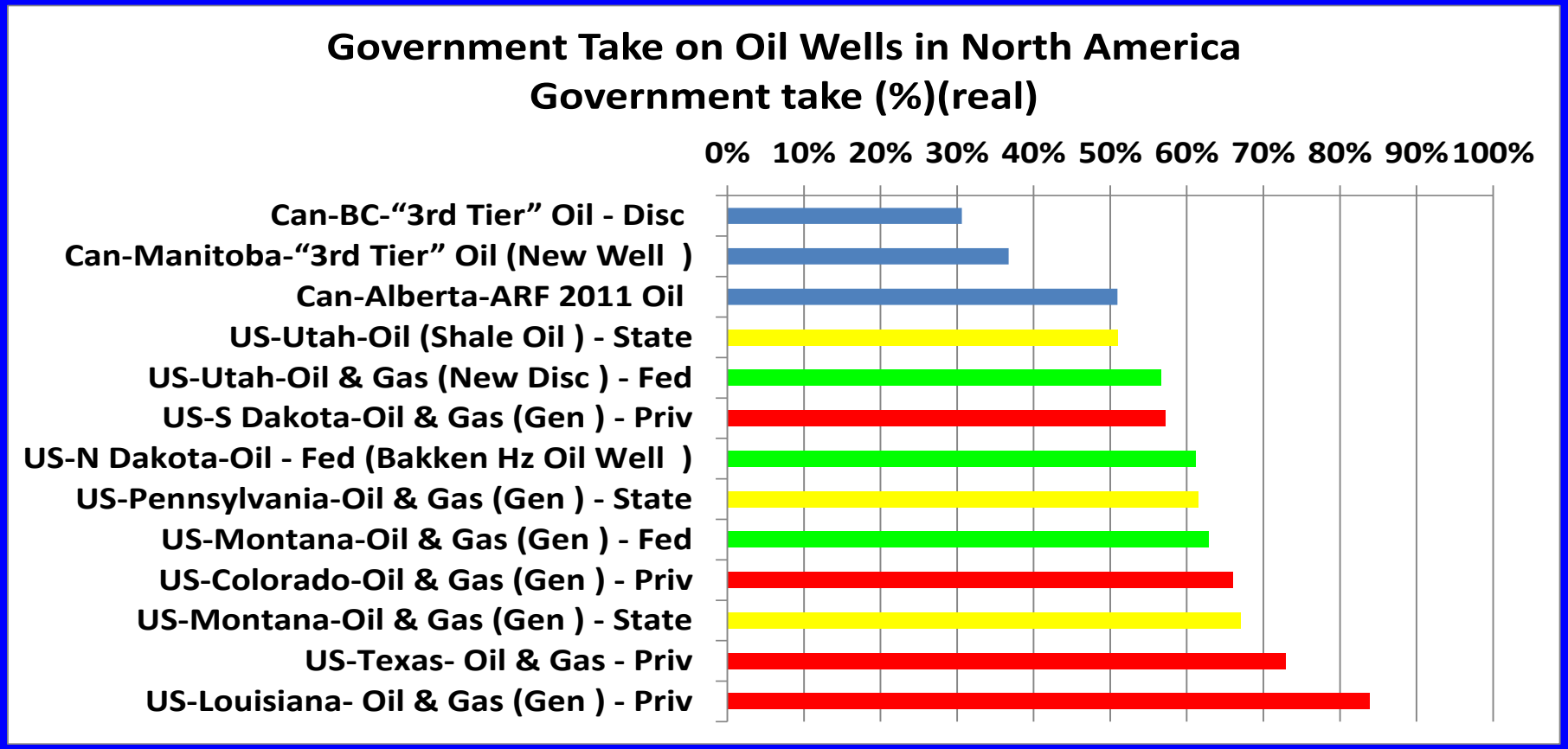
North American Wells (Oil)



In Canada the government take usually goes up and in the United States the government take goes down with higher level of production per well or with higher prices (or both).

North America Wells (Oil)

Typical Well: 100,000 barrels, $ 35 costs, $ 80 price



The government take on oil wells varies between 30% and 83% in North America and depends very much on the resource owner: Canadian provinces (blue), US Federal lands (green), US State lands (yellow) and US private lands (red)

North American Wells

Fiscal terms

Since 1997 Canada has lowered government take considerably, while the government take in the United States stayed the same.

The combined federal- provincial tax rate in Canada declined from about 45% to 25%.

Due to declining conventional oil production, the major Canadian oil producing provinces promote strongly new activity with more attractive royalties formulas which compete over a wider cost range.

International competition
New Production

International examples indicate that dropping the government take by about 10% for new production is reasonable once the jurisdiction faces a declining production.

The experience of Alberta, which faces a declining conventional oil production, indicates that designing lower fiscal terms in the 50 to 65% range of government take for higher cost resources is a viable strategy to increase investment.

International competition
New Production

The 60 – 65% government take for more costly "new" light oil resources as proposed in HB 110 and HB 17 is a reasonable level from an international perspective.

SB 192 terms are to tough to encourage costly new production.

International competition
Heavy Oil

Heavy Oil can be separated in two groups:

- **Heavy Oil: 15 – 22 degrees API. This oil can typically be produced with conventional production methods, since oil flows to the wells. The oil can also be transported by pipeline and in marine tankers**
- **Ultra Heavy Oil or Bitumen: 8 – 15 degrees API. This oil which needs to be produced with special production methods. The oil cannot be transported by pipeline or marine tanker. It needs to be mixed with condensate or it needs to be converted in an upgrader to synthetic crude oil.**

Heavy Oil

Alaska has significant heavy oil potential, probably in excess of 5 billion barrels. Alaska heavy oils range from 10 to 22 degrees API.

The most important deposits are:

- **Heavy Oil - 15 – 22 degrees API – West Sak, Schrader Bluff, Orion, Polaris, Nikaitchuq.**
- **Ultra Heavy Oil – 10 – 15 degrees API – Ugnu**

Separate fiscal terms are required for these two groups.

Alberta Oil Sands

The most important competitor for heavy oils in North America is Alberta with the oil sand deposits which may well contain in excess of 500 billion barrels of recoverable oil.

For Alberta oil sands, at 10 degrees API, government takes are in the range of 43% - 55% depending on the oil price.

In order to compete the government take for ultra heavy oil in Alaska may has to be similar to Alberta.

For heavy oil the terms could be between ultra heavy oil and new light oil production.

International competition
Heavy Oil

In order to be competitive Alaska would have to offer the following government takes for heavy oil:

- **Heavy oil: 55 – 60%**
- **Ultra heavy Oil: 45 – 55%**

International Competition
Shale Oil

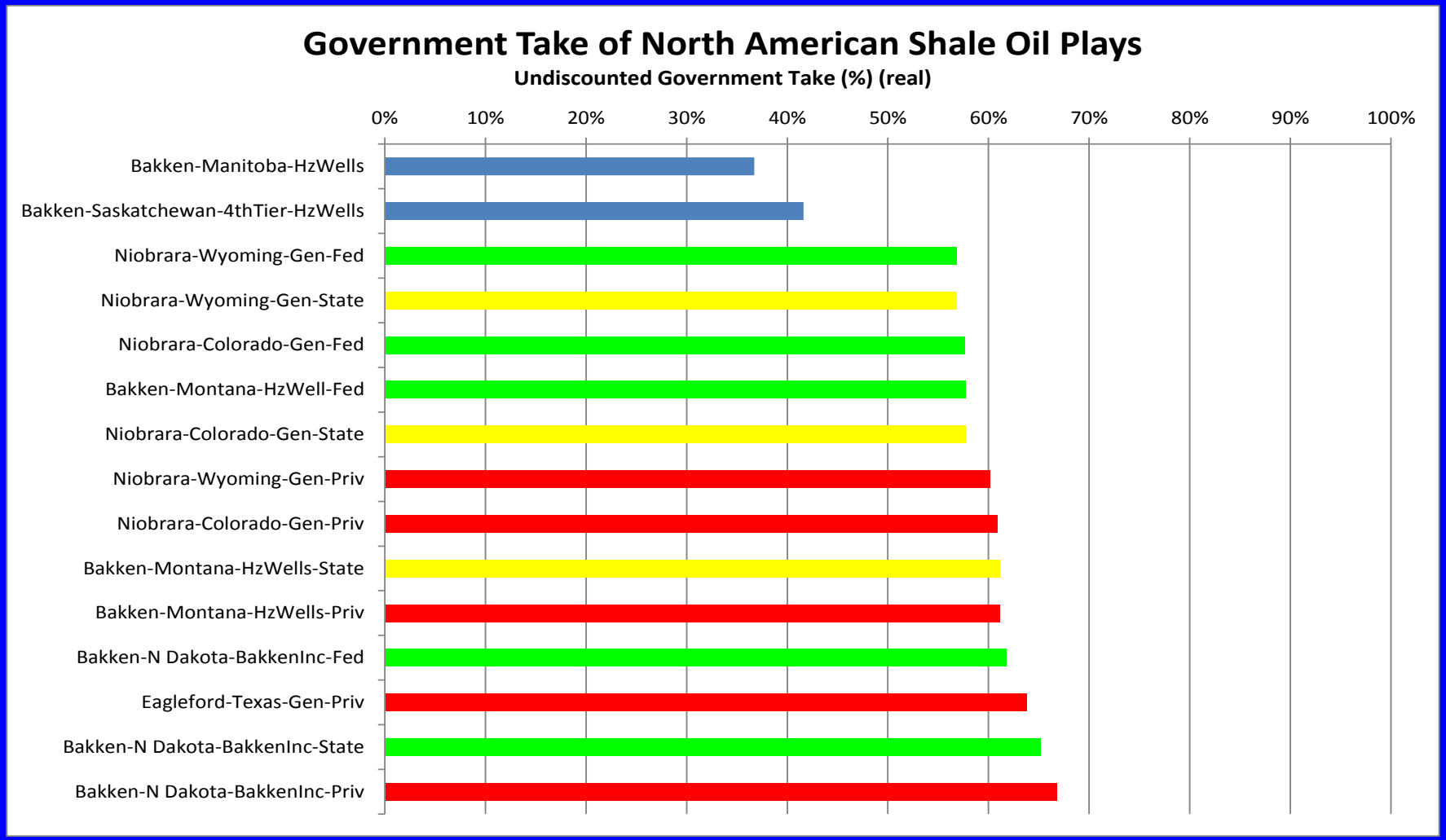
At this time it is not known whether shale oil production will be possible in Alaska. Pilot projects will be required to identify whether reservoir characteristics are of a nature that would permit fracking and would result in a sufficient flow of oil to make shale oil economic.

If shale oil would be economic, the resources may be quite considerable, for instance, in excess of several billion barrels. It is therefore very important for Alaska to identify whether shale oil is economic or not.

New shale oil developments will likely require major new infrastructure. The Federal permitting of this infrastructure and related environmental concerns could be a major stumbling block.

North American Wells (Shale Oil)

Government Take



Shale Oil plays in the United States are typically subject to a government take of about 60% and in Canada 40%.

International competition
Shale Oil

Alaska may have significant shale oil potential.

However, given the fact that the formations are relatively deep, operating conditions are severe and infrastructure is lacking, the costs per barrel would very likely be higher than in Canada and the Lower 48 States.

It is unlikely that large capital investments can be attracted unless the government take is in the 45 – 55% range.

International competition
Natural Gas

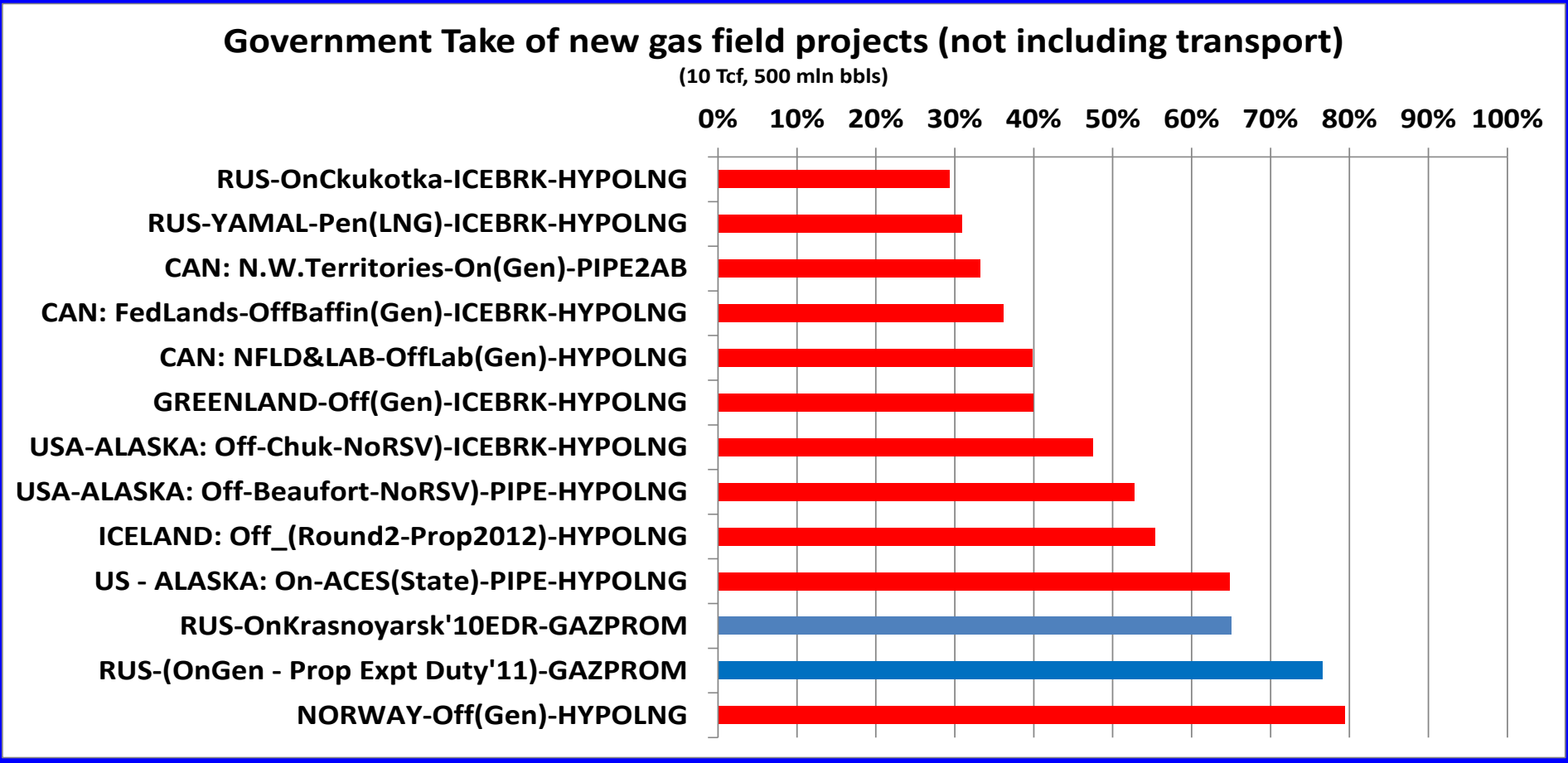
The Pacific market is very competitive

Current major *new* LNG suppliers in the Pacific LNG market are Australia and Papua New Guinea. Government take is less than 50% for dry gas.

Offshore and onshore conventional gas production in China is also significant. Chinese owned companies often benefit from a system where China does not participate on a carried basis, resulting in a government take of 42% for dry gas.

In addition to the conventional gas resources, China has in situ 1300 Tcf of coal bed methane gas and 1100 Tcf of shale gas.

Arctic (Gas)



Alaska government take for gas aimed at Pacific LNG markets is about 25% to 30% too high compared to strong Russian competition.

International competition
Natural Gas

Given the strong challenges of Russia, Australia, PNG and Chinese producers themselves, Alaska would have to offer a government take in the range of 45-55% in order to be competitive for the production of gas from new gas fields such as Point Thomson.

For gas from Prudhoe Bay, whereby most of the production costs have already been absorbed by oil production, a government take in the range of 55 – 60% may be appropriate.

International competition
Summary

In order to be competitive, Alaska needs to develop a fiscal system that offers the following government takes for the various resources:

- **Existing light oil production: 70 – 75%**
- **New light oil production: 60 – 65%**
- **Heavy Oil: 55 – 60%**
- **Ultra Heavy Oil: 45 – 55%**
- **Shale Oil: 45 – 55%**
- **Natural Gas – new gas fields: 45 – 55%**
- **Natural Gas – Prudhoe Bay: 55 – 60%**

Session 3

Proposed terms for existing and new light oil

Overall framework for a new PPT

A new PPT should preferably structured in such a manner that it deals with the following important issues:

1. The current ACES system has serious deficiencies. A new PPT should remove these problems.
2. A new "architecture" for the PPT needs to be created to permit a greater variety of terms for the different oil and gas resources.
3. The system should be made simpler.

Complexity

An important other issue is complexity.

The production tax is far too complex - The current complexity of the production tax is a strong disincentive for investment.

It can be strongly recommended to review the tax to see what changes can be made to reduce complexity.

Deficiencies in the current ACES system

The current ACES system has five main deficiencies:

1. **PPT tax rates up to 75% in addition to 41% corporate income tax are too high to stimulate efficiency in operations.**
2. **The price based sliding scales and result in a situation where under high prices the producer is actually better off with a lower price.**
3. **The excessive tax credits result in a situation where Alaska may pay all of the costs of a well.**
4. **The BOE concept results in a situation where new gas production could lead to massive losses of oil based revenues.**
5. **Under marginal circumstances the ACES system actually creates a negative PPT, in other words the government will loose PPT on certain fields.**

Deficiencies
Excessive Tax rates

The combination of the maximum ACES rate of 75% and the normal corporate income tax rate (state and federal) of 41% creates a combined tax rate of 85.25% under high prices.

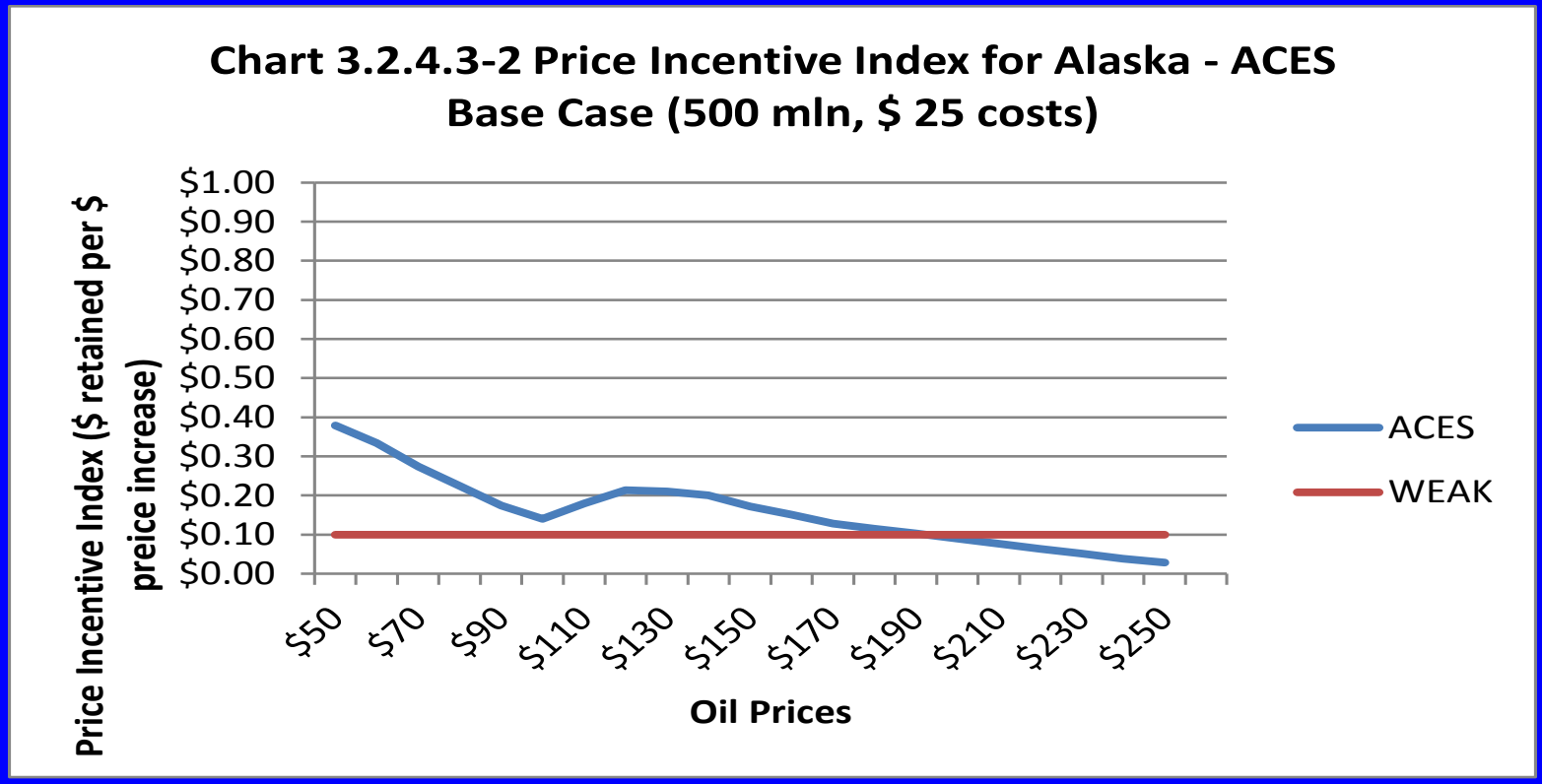
Such an excessive tax rate reduces significantly the incentive for companies to be efficient because they can only keep $ 0.1475 of every dollar saved. This means the cost savings index is only 14.75%.

This is well below the cost savings index of most countries. Usually, it is recommended to have a cost savings index well over 20%.

It should be noted that the combined tax rate of 85.25% is in addition to the regular royalties.

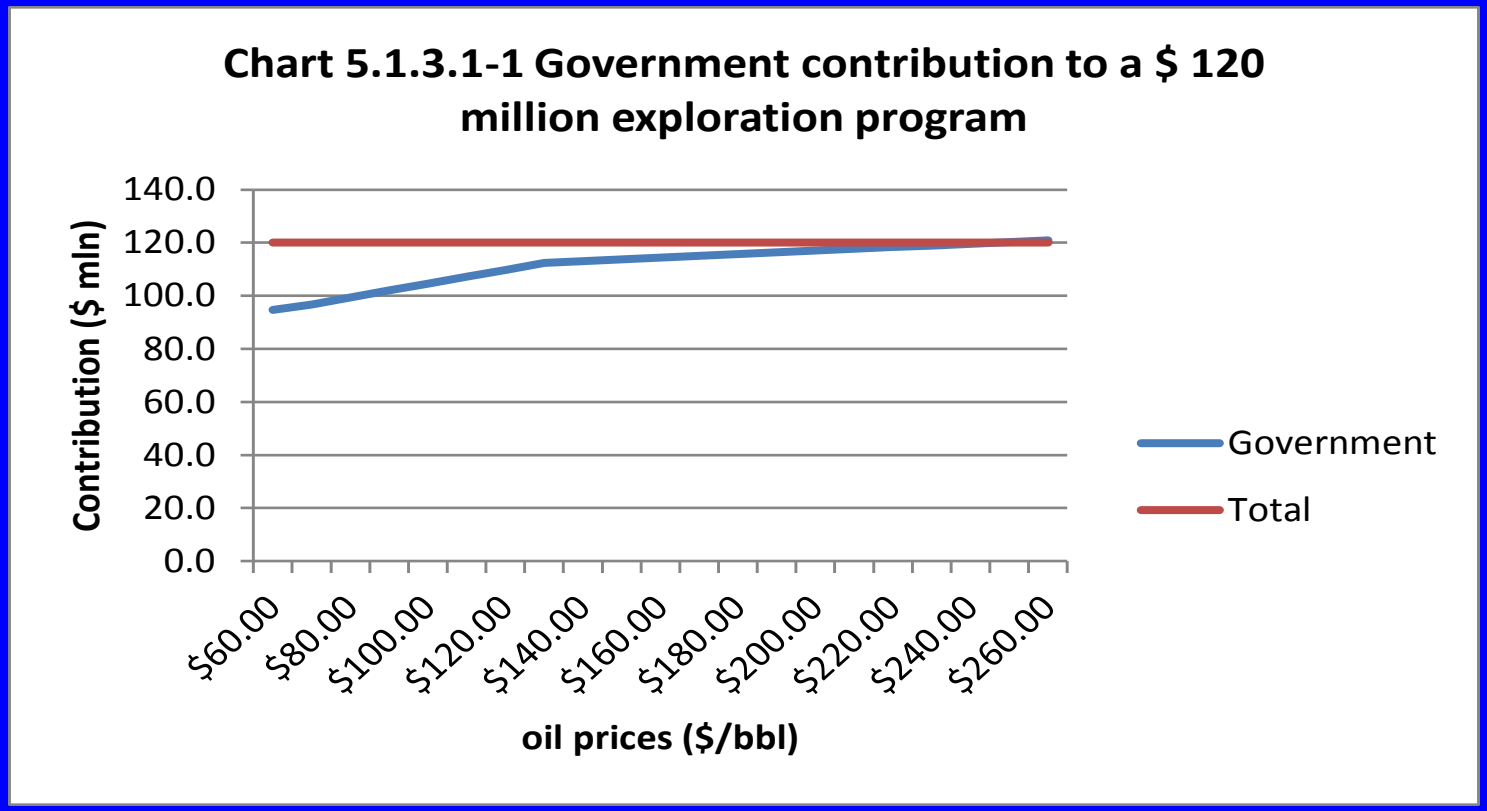
Deficiencies

Excessive price progressivity



For ACES, at high prices, the combined tax rate becomes so high that there is the price incentive performance becomes very weak by international standards. This leads to lack of interest in achieving the highest prices on an arms length basis and strong incentives to try to "transfer price".

Deficiencies
Excessive exploration support



Existing producers under ACES are entitled to the 40% tax credit as well as all normal deductions of the exploration expenditures. This means that at $ 111 per barrel, the Alaska contributes 90% of the exploration costs. At $ 245 per barrel Alaska contributes 100%.

Deficiencies

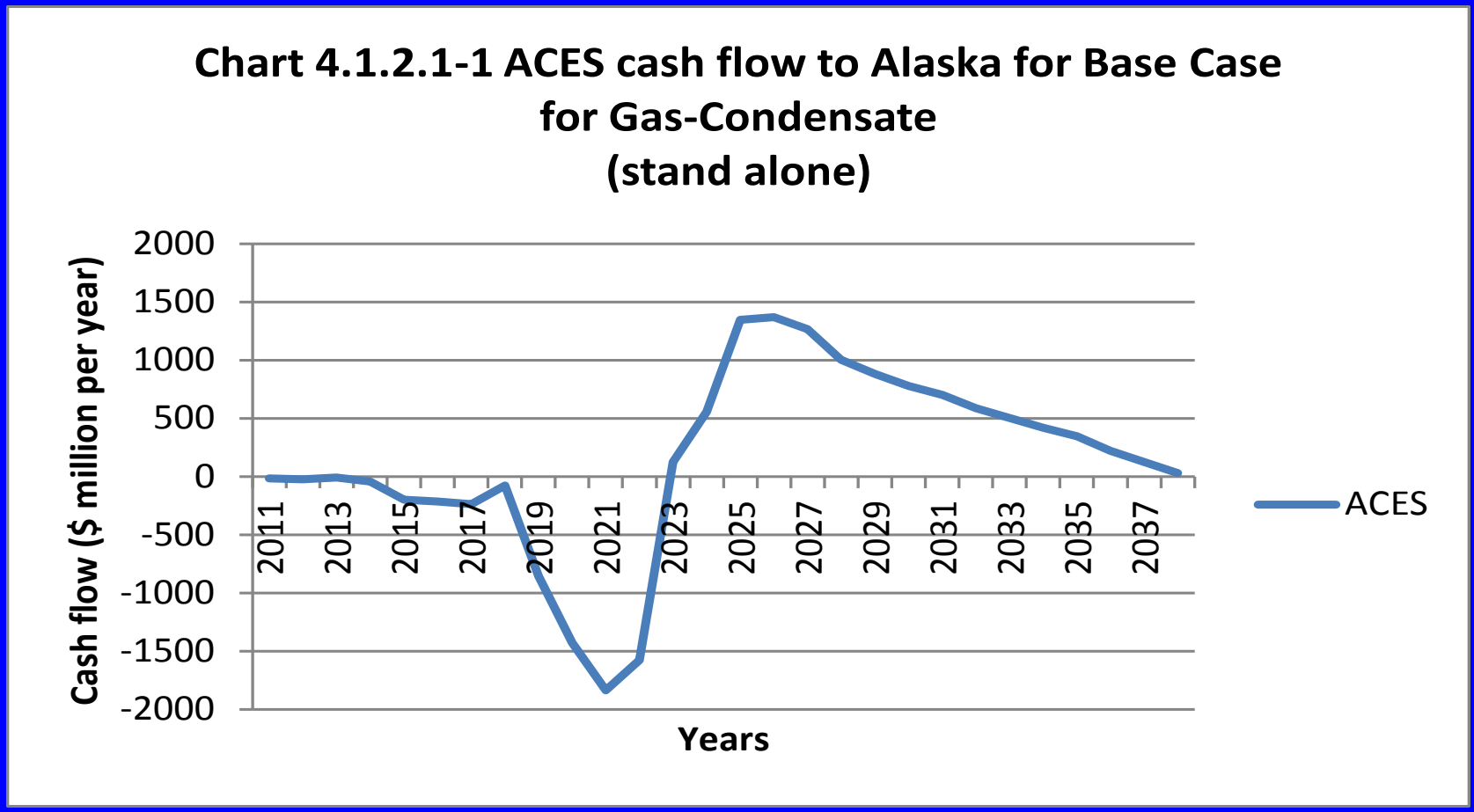
Nonsensical cross subsidization of gas

Table 5.1.3.1-1 Incremental Gas Economics for ACES in Alaska
(Country Incremental, Real)

	Oil only	Oil + Gas	Incremental
Oil production (mln bbls)	500	500	0
Gas production (Bcf)	0	10000	10000
Oil price ($/bbl) North Slope	100	100	100
Gas Price ($/MMBtu) North Slope		1.0	1.0
Gross Revenues ($ mln)	50000	60000	10000
Total Production (Mln BOE)	500	2167	1667
Capital Expenditures ($ mln)	7500	11000	3500
Operating Expenditures ($ mln)	5000	7500	2500
Divisible Income ($ mln)	37500	41500	4000
Royalties ($ mln)	6250	7500	1250
Property Tax, other	852	1504	652
Production Tax Value	30398	32496	2098
Production Tax Value per BOE	60.80	15.00	-46
PPT ($ mln)	15186	6900	-8286
Corp Income Tax (State) ($ mln)	1466	2474	1008
Total State Revenues ($ mln)	23754	18378	-5376
Corporate Income Tax (Fed) ($ mln)	4942	8340	3398
Total Government Revenues ($ mln)	28696	26719	-1977
Undiscounted Government Take	76.50%	64.40%	-49.3%
IRR	21.10%	19.30%	17.3%

The BOE concept would result in massive government revenue losses on oil production if incrementally also gas would be developed. This does not make any sense. It is clear that Alaska would not accept such unnecessary losses. This in turn impedes gas project development.

Deficiencies
Negative PPT



By definition, for a marginal project the total negative ACES cash flow to government as a result of tax credits and tax deductions becomes (almost) identical to the positive cash flow. In other words the net government receipts are low or even negative.

Deficiencies
Negative PPT

With the existence of a tax credit, there are always economic conditions under which the government may loose more in credits and deductions than it receives in income.

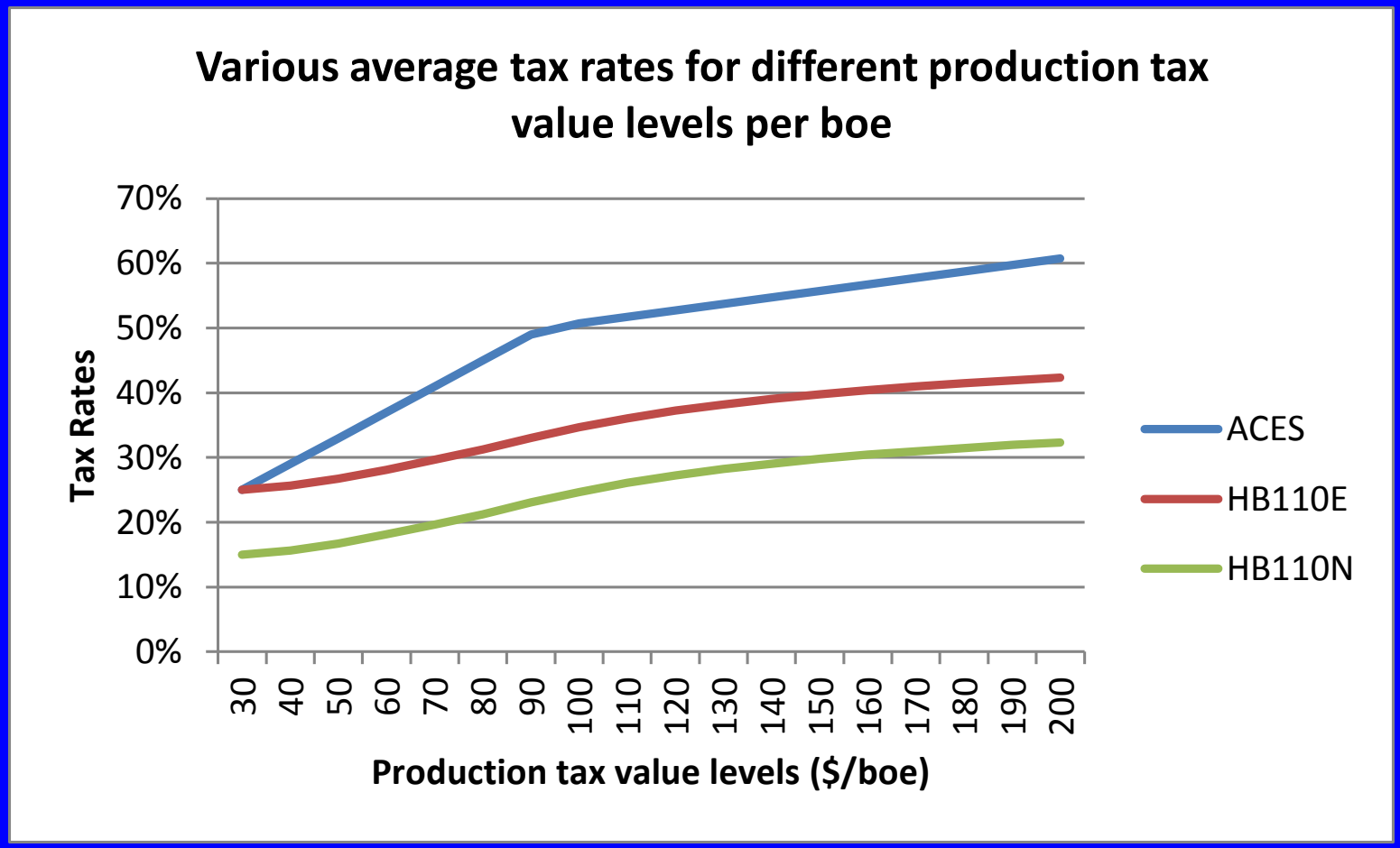
However, this effect should be minimized in the fiscal design. This is not done under ACES.

Proposals for light oil

Proposals for light oil production will be discussed first, based on this discussion the variation for other resources can be introduced

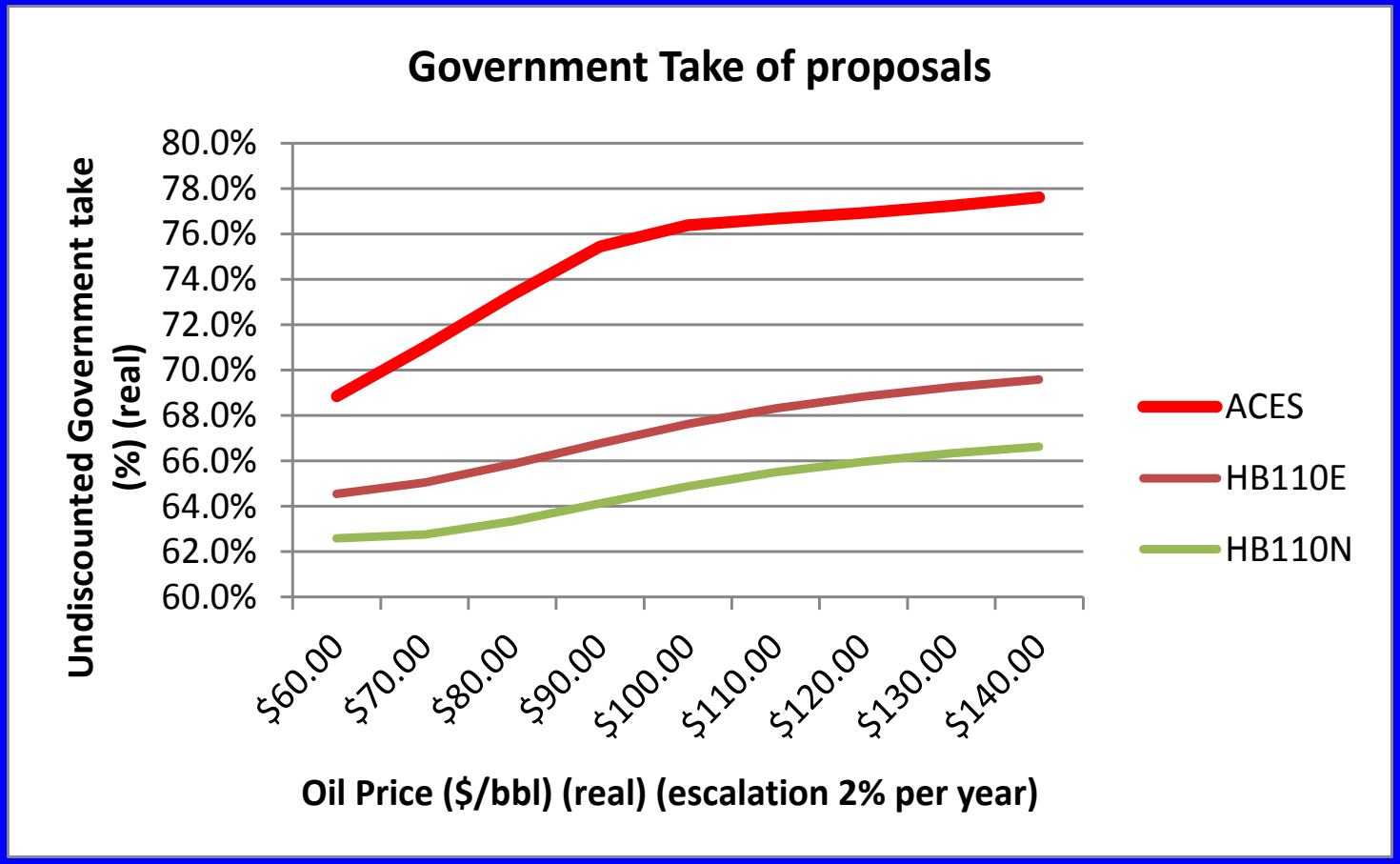
HB 110 has been introduced modify ACES.

Proposals for light oil: HB110Analysis: PPT rates



The bracketing procedure creates a significant lowering of the average PPT rates. The HB 110 N rates apply only for 7 years from the start of production for new production.

Proposals for light oil: HB110 Analysis: Government take



At $ 100 per barrel, the government take of ACES would be 76.4%, HB 110 (Existing) 67.6% and HB 110 (New) 64.9%

HB 110: Existing Production

The HB 110 proposal is relatively complex. It is based on so-called "bracketing". Following is the scale:

< $ 30.00	25.0%
< $ 42.50	27.5%
< $ 55.00	32.5%
< $ 67.50	37.5%
< $ 80.00	42.5%
< $ 92.50	47.5%
> $ 92.50	50%

Bracketing means that the final average rate is based on the weighted average of all the brackets. This means the rate will never be 50%.

HB 110: New production

For new production the rates will be lowered by 10% for the first 7 years of production.

This means that new production has to be “ring fenced”. All production and all revenues and costs will have to be allocated to “existing” and to “new” production.

This is complex from an administrative point of view.

Deficiencies in HB 110

HB 110 deals with only two of the deficiencies of ACES:

1. **PPT tax rates up to 75% in addition to 41% corporate income tax are too high to stimulate efficiency in operations.**
2. **The price based sliding scales and result in a situation where under high prices the producer is actually better off with a lower price.**
3. **The excessive tax credits result in a situation where Alaska may pay all of the costs of a well.**
4. **The BOE concept results in a situation where new gas production could lead to massive losses of oil based revenues.**
5. **Under marginal circumstances the ACES system actually creates a negative PPT, in other words the government will loose PPT on certain fields.**

Deficiencies in HB 110

In addition HB 110 creates an entirely new problem.

Specifying different tax rates for Existing and New Production requires tax payers to submit different tax returns for these two classes of production. This is called ring fencing.

This in turn means that all revenues and costs need to be allocated to "existing" and "new". This is complex to administer and could lead to significant revenue losses for the State. HB 110 does not specify how this process would have to take place.

HB 110 is therefore not a viable alternative to ACES.

BOE complications

An important drawback of ACES is the BOE problem.

This means that in case major oil companies would propose a new Alaska LNG export project to the Pacific, the entire fiscal system has to be revised again. This is an unnecessary obstacle to the introduction of a new gas project.

It is therefore essential that in any revision of ACES this problem is also dealt with in advance. This would permit to add gas terms to the package later (or immediately) without having to change oil terms again.

PVM Proposal: Existing and New Production

The PVM Proposal is going further than merely creating new levels of government take for existing and new production. The proposal also:

- **Creates a new "architecture" to which terms for heavy oil , shale oil and natural gas can be easily added, and**
- **Resolves <u>all</u> the deficiencies associated with ACES.**

PVM Proposal for New Production

At $ 100 per barrel, the HB 110 for New Production is equal to a much simpler concept, which is:

- **25% flat PPT**
- **20% tax credit, plus a**
- **2.25% severance feature.**

The severance tax feature is no different from the way the severance tax used to be calculated in Alaska. The severance tax is a percentage of the value of the gross production less the royalty. For instance, with a royalty of 12.5% and an oil price of $ 100, a 2.25% severance feature would be equal to:

2.25% * 87.5% * $ 100 = $ 1.96875 per barrel

PVM Proposal for New Production

In order to make the severance feature match the government take of HB 110 for new production, the following price sensitive sliding scale is proposed:

- **The sliding scale starts at an oil price of $ 60 per barrel,**
- **Between an oil price of $ 60 and $ 180 per barrel, the severance feature would increase with 0.05% per dollar increase, reaching a value of 6% at $ 180 per barrel**
- **Thereafter, the sliding scale would increase 0.1% in order to reach a maximum of 15% at $ 270 per barrel.**

New "architecture"

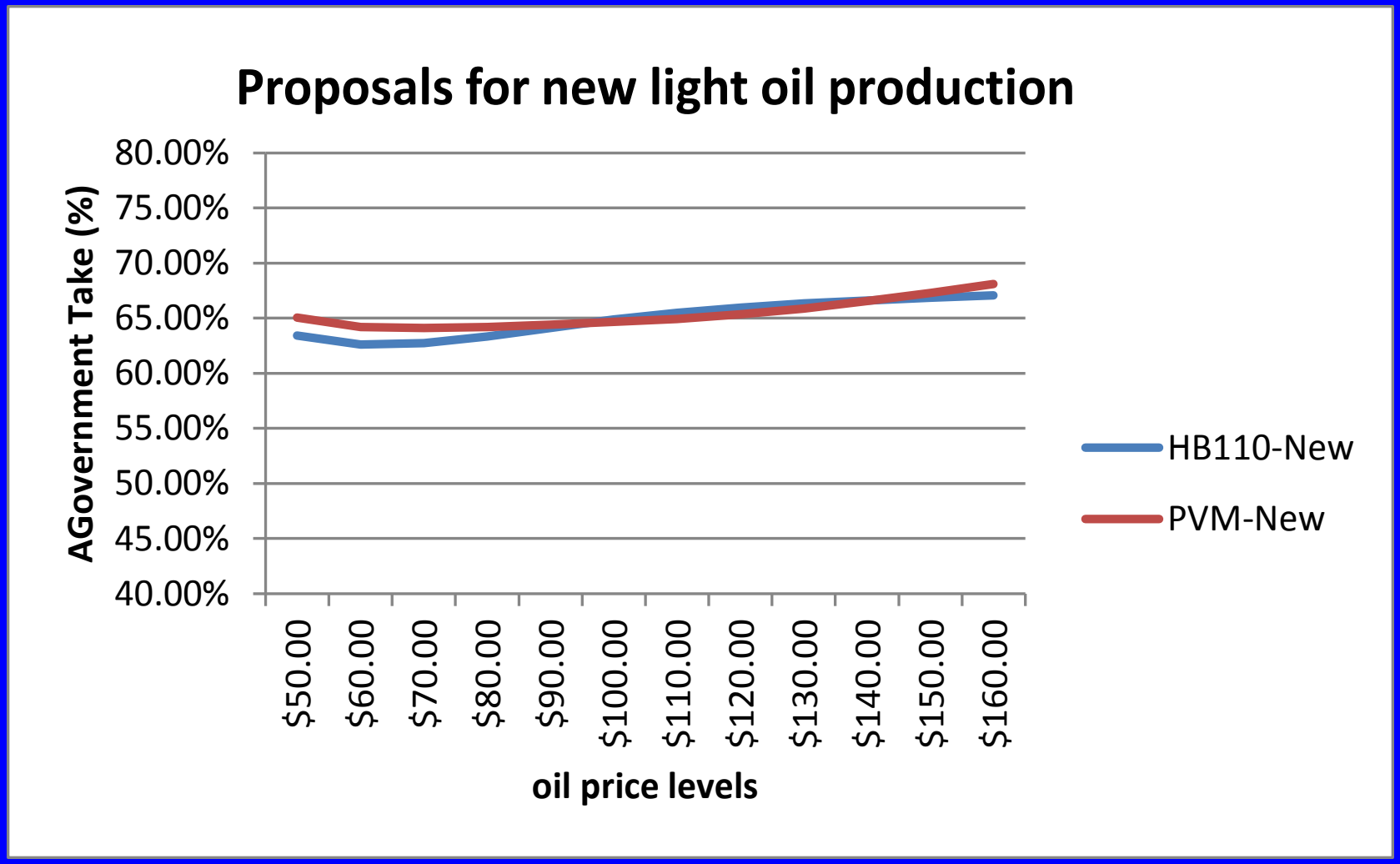
The PVM Proposal creates a new "architecture" which is not BOE based. The severance feature is simply gross revenue based for oil (after the royalty) and therefore it does not apply to gas.

As a result PPT revenues from oil remain the same if also gas is produced. This solves a major deficiency of ACES.

Also excessive exploration support is eliminated because:

- **It is proposed to limit tax credits to 20% and not increase tax credits to 40% for certain exploration expenditures, and**
- **By creating a maximum PPT tax rate of 25% and corporate income tax rate of 41.1%, for a total maximum of 55.75%.**

PVM Proposal for New Production



The PVM proposal results in almost exactly the same government take as HB 110 for new production for the entire price range from $ 60 to $ 160.

PVM Proposal for New Production

The main advantages of the PVM Proposal are:

- **Much easier to administer**
- **Can be consolidated with existing production, so no need for ring fencing**
- **An "architecture" which permits other resources to be added to the fiscal terms**
- **No excessive tax rates, in fact a combined rate of 55.75%.**
- **No excessive price progressivity**
- **No excessive exploration support**
- **No nonsensical cross subsidization of gas based on BOE values**
- **Reduced negative PPT characteristics**

Alternative Proposal for Existing Production

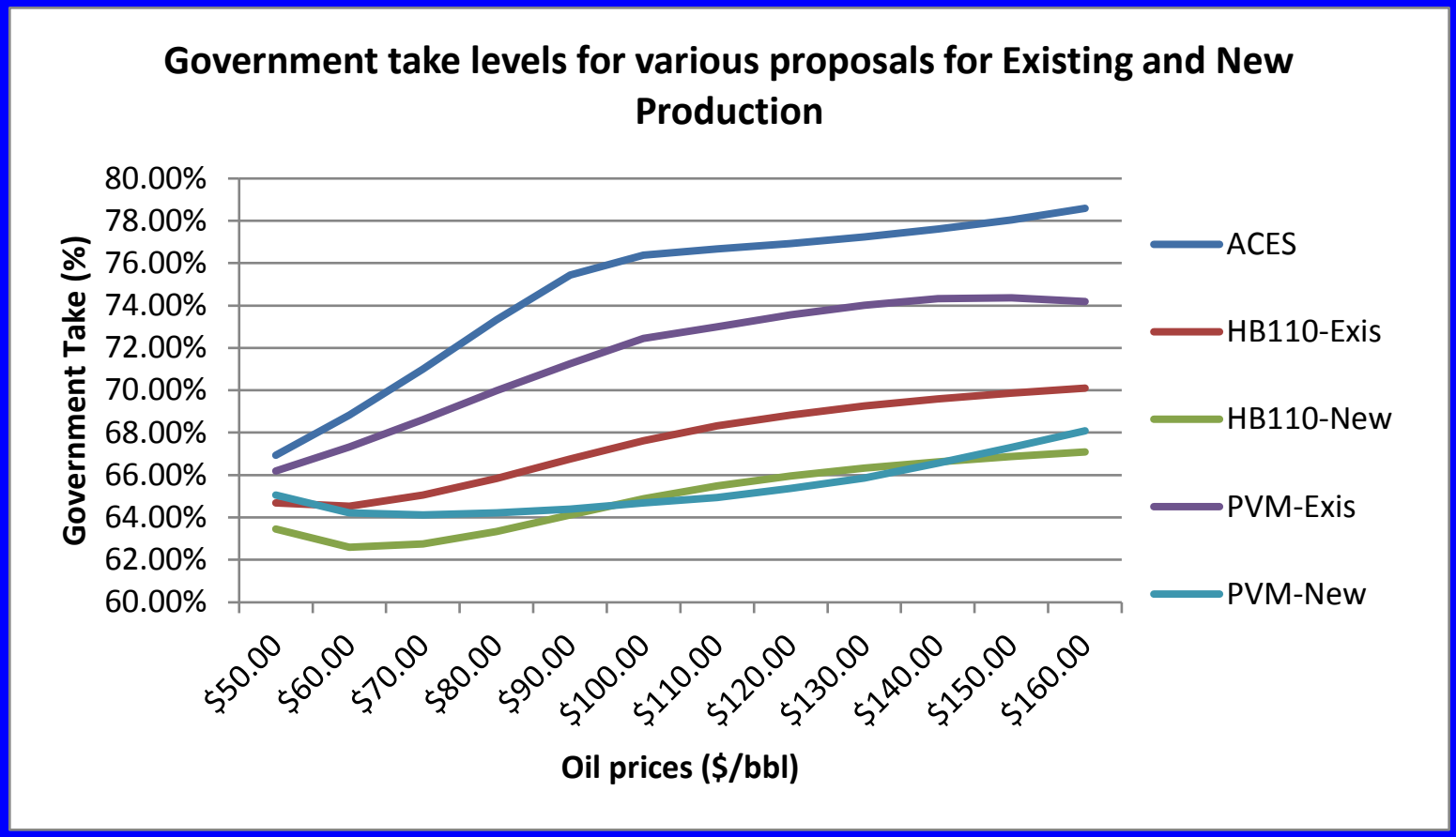
It is now easy to add a proposal for existing production.

Terms for existing production could be close to the current government take levels of ACES. It is not necessary to give up significant revenues.

Existing production terms could also be based on:

- **A flat 25% PPT**
- **20% tax credits**
- **A severance feature starting a $ 60 with 0.2% increases per dollar increase in price up to $ 130 per barrel and from there 0.1% up to a maximum of 20%.**

All Proposals for Existing and New Production



The PVM Proposal for existing production would be result in a much higher government take than HB 110 for existing production. The PVM proposal for new production is about equal to HB 110 for new production.

Old and New Production

HB 110 does not determine how to distinguish between new oil and existing oil. It is proposed to use the following methods:

Decline curve method.

With the decline curve method Alaska would establish the average production for each company in 2011. An exponential decline curve would be established per company. For instance one could use 6% per year for all companies for light production. Any production over the decline curve per company would qualify as "new".

The main advantage of the method is that is goes to the essence of the problem in Alaska. It also strongly stimulates investment by new companies. It is easy to administer. The main disadvantage is that existing companies may be rather differently affected. Therefore, this method needs to be complemented with other options.

Old and New Production

New non-producing lease method.

Another simple method is to consider "new" production, as production from leases which were not in production prior to December 31, 2011.

The main advantage of the method is that it is easy to administer and is a well established international practice. It would encourage new investment in new leases with fields which maybe more expensive.

New approved program method.

In principle it is possible for existing producers to make specific comprehensive proposals to the Alaska Government for new investments that will increase production from existing fields. This would relate to programs that would be in excess of ongoing investments.

Old and New Production

These programs could include:

- **The drilling of new more expensive deeper or shallower reservoirs,**
- **Enhanced recovery projects**
- **Horizontal well drilling projects in thin reservoirs,**
- **Extensive new infill drilling beyond current rates, or**
- **Any application of new technology.**

DNR would establish the base line production above which production would be considered “new” on a year by year basis, based on reservoir and other studies.

Old and New Production Summary

"New" light oil production (higher than 22 degrees API) would be:

- **the higher off:**
  - **New production from programs specifically approved by the administration, and**
  - **New production above a pre-determined decline curve for light oil production of 6%.**
- **production from non-producing leases.**

Based on these definitions it is easy to apply the differences in the severance features between existing and new production.

Session 4

Proposed terms for heavy oil, shale oil and natural gas

Terms for Heavy Oil
General

Major heavy oil development may face significant challenges, since a mixture in the TAPS line of too much heavy oil may cause operational problems.

Major heavy oil development may have to be stimulated in conjunction with expansion of light oil projects, with possible condensate and liquid stripping projects from gas fields (such as Point Thomson) and/or a construction of GTL plant(s) (with subsequent cracking of waxy components).

Alternatively, one could build upgraders fueled by cheap natural gas on the North Slope in order to upgrade heavy crudes to lighter crudes. It is not known at this time whether construction of upgraders would be a viable possibility.

Terms for Heavy Oil
Proposed Terms

With the new "architecture" in place for light oil production it is now easy to add terms for heavy oil.

At this point in time only 40,000 bopd of heavy oil is being produced.

It is not recommended to divide heavy oil in "existing" and "new".

Firstly, because it would be difficult to determine a fair decline curve at this time.

Secondly, the volume is too small to make unnecessary complications in the fiscal terms.

Terms for Heavy Oil
Proposed Terms

For heavy oil the fiscal system could be based on the same PPT as follows:

- **PPT based on a flat rate of 25%**
- **20% tax credit**
- **A 15% allowance based on the gross value of the heavy oil as special deduction for the determination of the PPT**
- **A severance feature starting at $ 160 per barrel at 0.05% per barrel increase up to $ 200 and thereafter 0.1% per barrel increase up to a maximum of 10%**
- **A floor price for the purpose of calculating PPT of $ 55 per barrel escalated with inflation.**

Terms for Ultra Heavy Oil
Proposed Terms

For heavy oil the fiscal system could be based on the same PPT as follows:

- **PPT based on a flat rate of 25%**
- **20% tax credit**
- **A 25% allowance based on the gross value of the heavy oil as special deduction for the determination of the PPT**
- **A severance feature starting at $ 160 per barrel at 0.05% per barrel increase up to $ 200 and thereafter 0.1% per barrel increase up to a maximum of 10%**
- **A floor price for the purpose of calculating PPT of $ 55 per barrel escalated with inflation.**

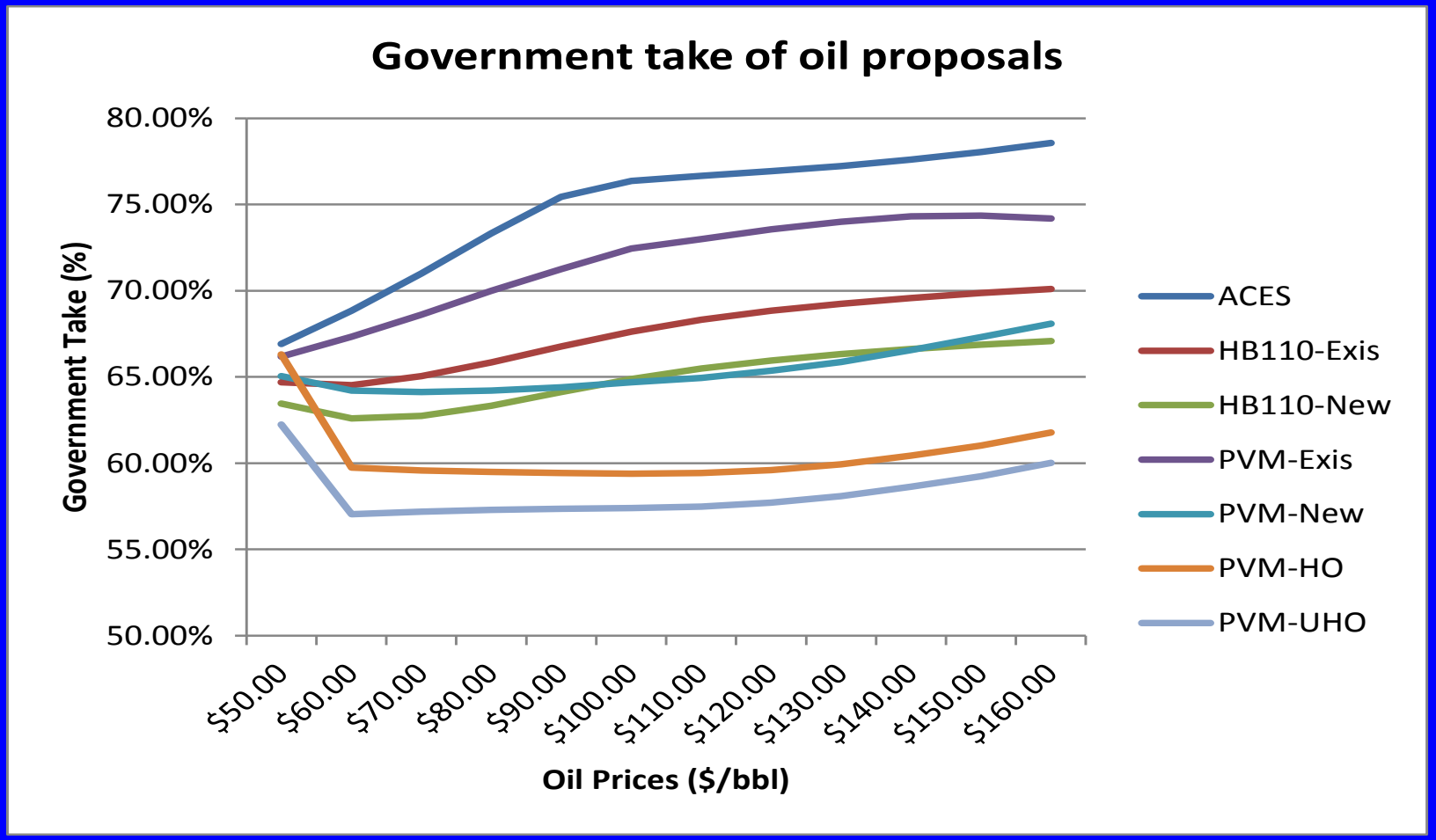
Terms for Ultra Heavy Oil
Proposed Terms

It is very important for Alaska to upgrade ultra heavy oil. This would create additional value added in the State and would make the operations of the oil line much easier.

It can therefore be suggested that producers are given the option to have a "feed price" into the upgrader for ultra-heavy oil which would be equal to 65% of the value of the synthetic oil that would be produced. The feed price would be the basis for royalties and PPT.

It would allow companies to only pay corporate income tax on the upgrader, since this is in fact a mid-stream type operation. This same concept is applied in Alberta for oil sands or refineries in Alaska.

Terms Overview



The PVM terms for existing light oil, new light oil, heavy oil and ultra heavy oil would be a simple overall scheme that would be easy to administer and implement and would not have the deficiencies of the current ACES system.

Terms for Shale Oil

The Shale Oil terms could be the same as the terms for ultra heavy oil.

However, there is a small probability that the shale oil operations may turn out to be rather profitable if fracking operations are very successful and primarily light oil is being produced.

So, it is possible to make the allowance of 20% more flexible and reduce the percentage in case shale oil production proves to be rather profitable.

This can be done with a so-called R-factor. The 20% could be reduced if the ratio between cumulative revenues and cumulative costs for a project become very profitable.

Terms for Natural Gas
New Gas Fields

Any condensates and other liquids from natural gas production could be dealt with as new light oil production.

For gas the fiscal package could be:

- **Flat 25% PPT**
- **20% tax credit**
- **25% allowance of the gross value of the gas revenues**
- **Severance feature starting at $ 8/MMBtu at 0.05% per $1 per MMBtu, and after $ 20/MMBtu at 0.1% (which means that on a Btu equivalent the severance feature is much stronger for gas than for oil)**
- **A floor net back gas price of $ 3.00 per MMBtu for PPT purposes and a floor price for liquids and condensates of $ 70 per barrel.**

Terms for Natural Gas
Gas from fields with existing oil production

Any condensates and other liquids from natural gas production could be dealt with as new light oil production.

For gas the fiscal package could be:

- **Flat 25% PPT**
- **20% tax credit**
- **15% allowance of the gross value of the gas revenues**
- **Severance feature starting at $ 8/MMBtu at 0.05% per $1 per MMBtu, and after $ 20/MMBtu at 0.1% (which means that on a Btu equivalent the severance feature is much stronger for gas than for oil)**
- **A floor net back gas price of $ 3.00 per MMBtu for PPT purposes and a floor price for liquids and condensates of $ 70 per barrel.**

Government Take issues

As a first step it can be recommended to bring the government take down to higher levels than indicated by international competition for:

- **Ultra heavy oil**
- **Shale oil**
- **Natural gas**

The reason is that international competitive levels cannot be reached unless Alaska would lower the royalties. It seems prudent to first "test the market" on the packages proposed in this seminar.

New fiscal terms

	Light-Exist	Light-New	HO	UHO	Shale Oil	Gas-Exist	Gas-New
PPT Rate	25%	25%	25%	25%	25%	25%	25%
Tax Credit Rate	20%	20%	20%	20%	20%	20%	20%
Sev Feature - Base Price	$60	$60	$160	$160	$160	$8	$8
Sev Feature - Initial Increment	0.20%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
Sev Feature - Change Price	$130	$180	$200	$200	$200	$20	$20
Sev Feature - Increment 2	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Sev Feature - Max Rate	20%	15%	10%	10%	10%	15%	15%
Allowance - % gross rev	0	0	15%	25%	25%	15%	25%
Floor price - oil	no	no	$55	$55	$55	$70	$70
Floor price - gas	no	no	no	no	no	$3	$3
R-factor	no	no	no	no	yes	no	no

The proposed fiscal terms would provide for a simple to administer overall system and would set terms for all possible oil and gas investments. Significant investment may occur as a result of these terms.

Failure to achieve goals

What would happen if Alaska adopts these terms and no significant new investment takes place in Alaska, while oil production continues to decline:

1. **Alaska would not have lost anything compared to the current situation.**
2. **A very valuable benchmark would be established as to how fiscal terms may have to be changed further in order to eventually attract the investment in these resources.**

Summary

With the appropriate fiscal and contractual framework Alaska can achieve:

- **1 million barrel per day throughput through the TAPS line, and**
- **Significant LNG exports to the Pacific market**

However major political and fiscal change is required.

The sooner the process starts to encourage these changes the better the future of Alaska will be secured.