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ALASKA'S OIL & GAS FISCAL DESIGN

Alaska Senate Resources Committee

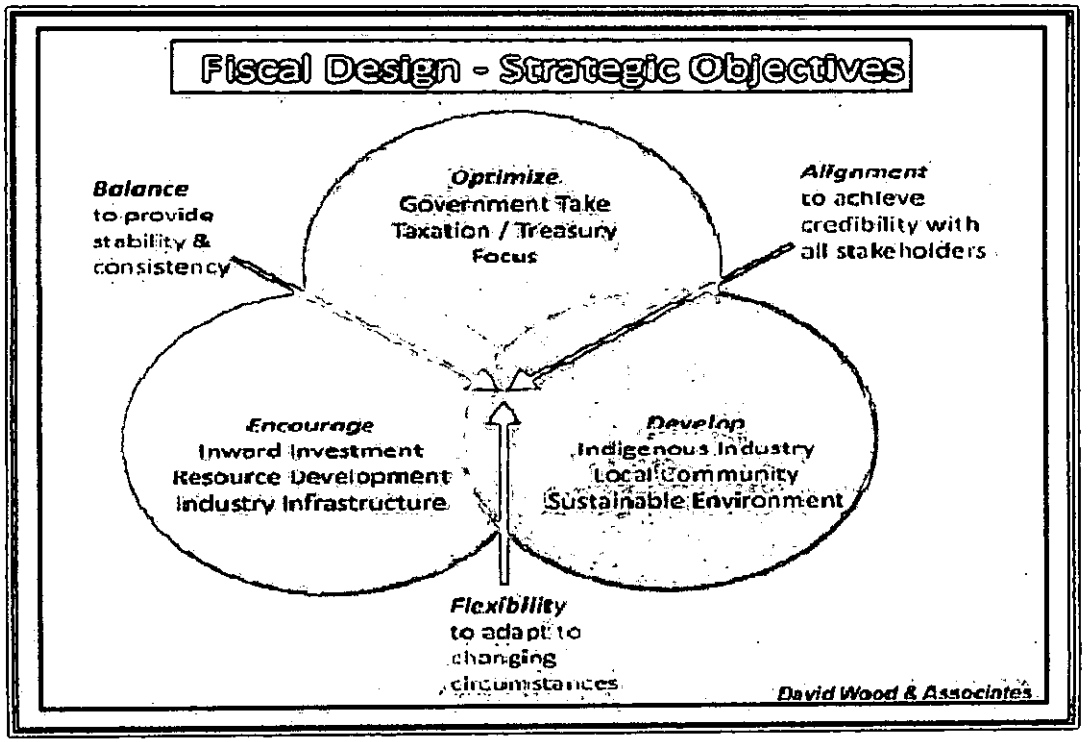
David Wood
2nd February 2009

Presented on David Wood's behalf by Dan Dickinson

Alaska: Fiscal Design Issues for Natural Gas
Overview of December 2008 Report for
Legislative Budget and Audit Committee

Fiscal Designs are Best Driven by Clear Fiscal Objectives & Strategies

Most countries are trying to balance all three objectives.



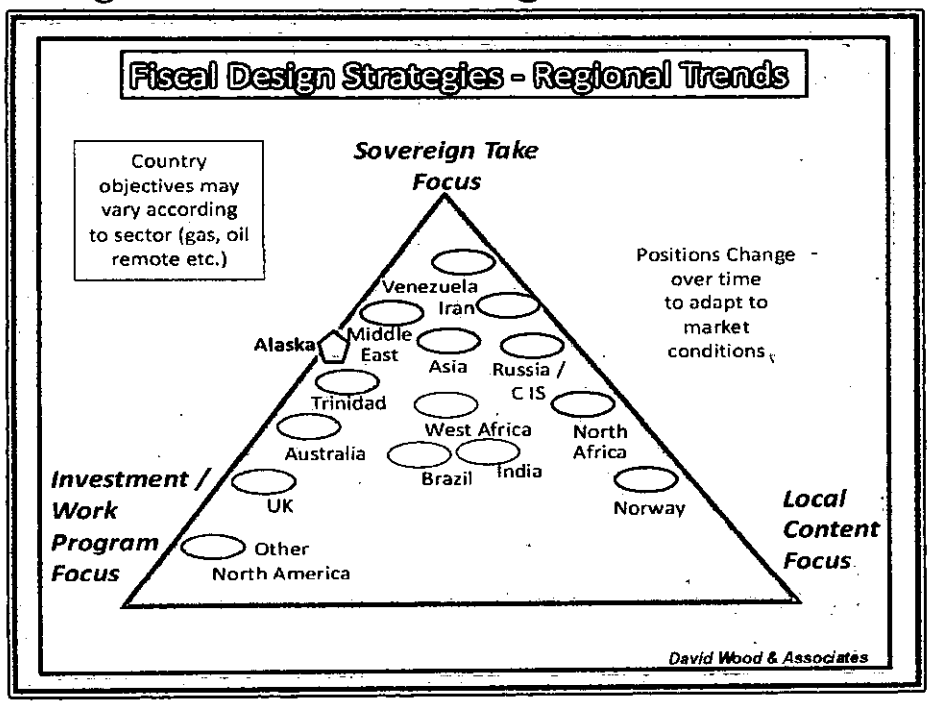
Approaches to Fiscal Design that can Improve Performance & Credibility

The following are selected recommendations for Alaska from the report:

- Develop a clear statement of fiscal strategy and objectives
- Focus on a simple, flexible and progressive fiscal design
- Some level of fiscal stability important to secure investment
- Such designs could be more effective than contractual guarantees
- Drive progressivity fiscal elements for gas with gas PTV (not boe)
- Consider return on investment drivers for progressivity taxes
- Consider offering allowances focused to offset regressive elements
- Aim to clarify and optimize fiscal revenue streams from NGLs
- Consider state equity involvement in infrastructure projects
- Involve cost control components to some fiscal incentives
- Apply time constraints to new leases to develop resources

Fiscal Design Strategies
Regional Trends

Upstream fiscal designs should reflect the broader strategies and objectives that governments are striving to achieve.



A clear statement of fiscal design strategy by a government can help to enhance its fiscal credibility.

Alaska Fiscal Take in a Global Context

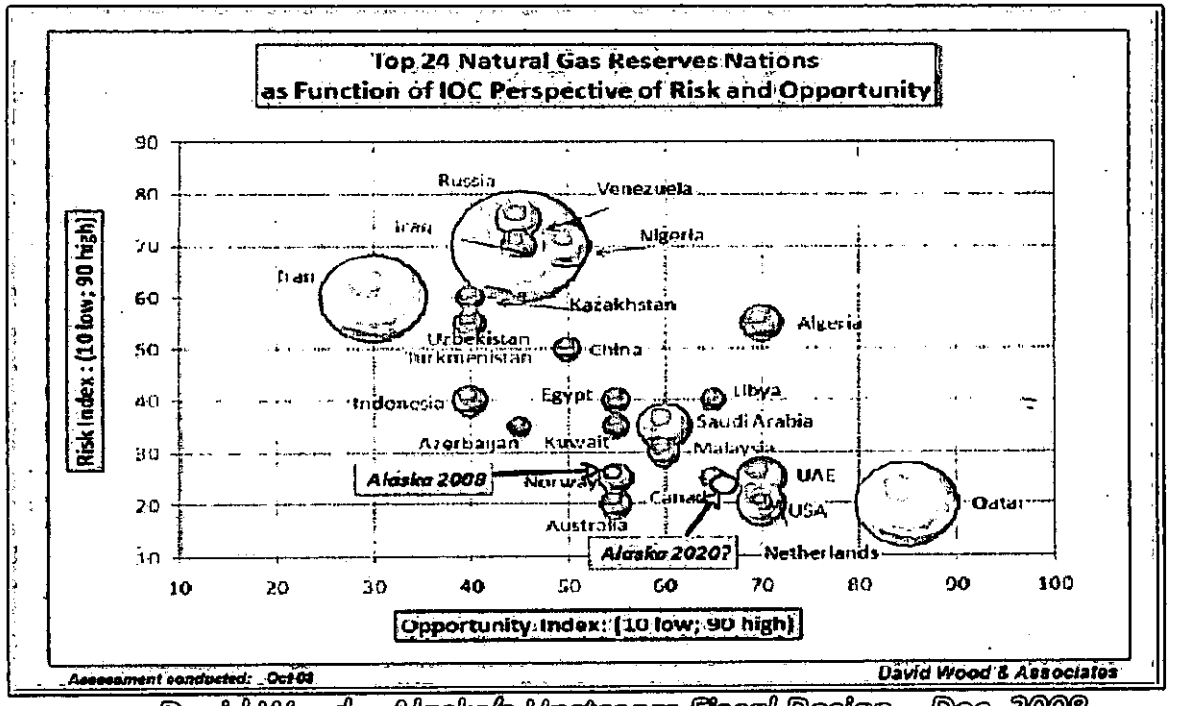
The report reviews the fiscal designs of a number of gas producing countries in some detail and reveals that a diverse range of fiscal designs and contractual structures are exploited.

- Total government takes (at assumed price) of some 67% or two-thirds of divisible profits for natural gas make Alaska:
  - harsher in terms of fiscal take than other U.S. states and large OECD gas producers and reserves holders (e.g. Australia, Canada and U.K.);
  - but more lenient in terms of fiscal take than countries in which IOCs are able to explore and produce gas in North Africa, West Africa, Caspian, and Asia.

- However, percentage fiscal takes (at assumed price) are only one issue considered by IOCs when making investment decisions. Fiscal stability, risk and progressive versus regressive tendencies are also important.

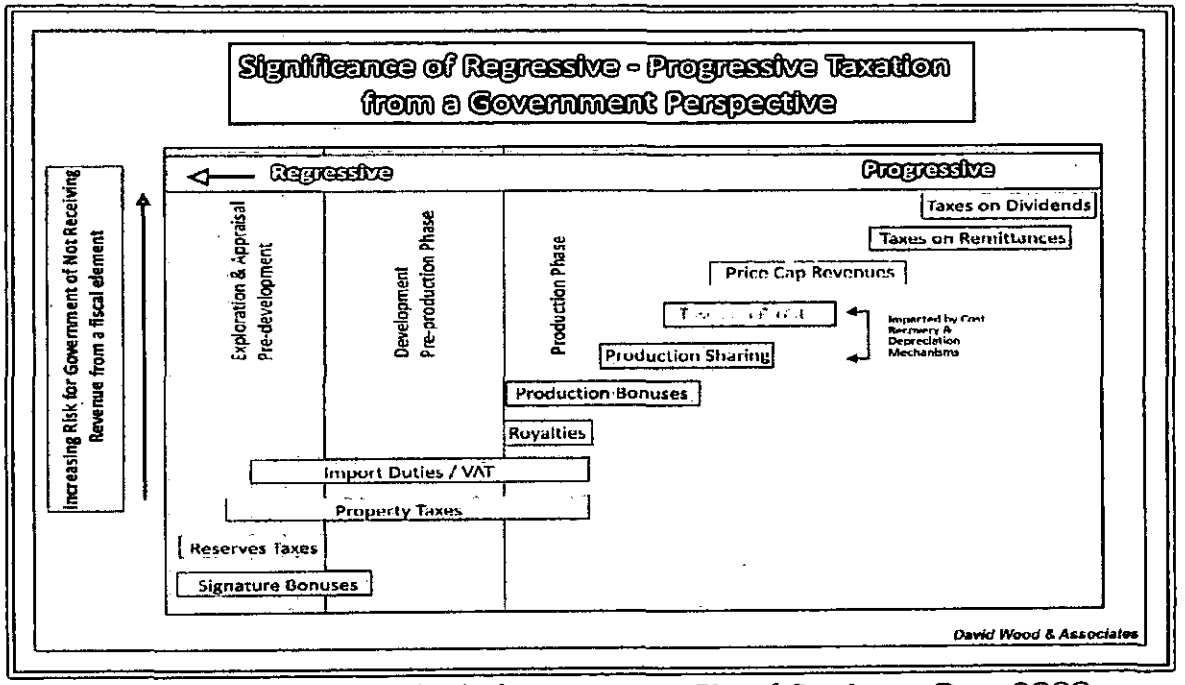
Alaska Gas Compared on International Scale of Risk versus Opportunity

The diameters of the bubbles are proportional to proved natural gas reserve holdings as reported by BP Statistical Review (June 2008).



Progressive & Flexible Fiscal Designs Help to Promote Investment

The stronger the commitment made by governments to promote a commercially attractive environment, the more likely investors are to commit investments without guarantees of fiscal stability.



Detailed Analysis of Large and Small Hypothetical Gas and Oil Fields

The report includes detailed multiple-year analysis of a wide range of gas and oil field sizes under the prevailing Alaska fiscal design with sensitivity analysis covering a wide range of prices, costs and production scenarios.

- Base case destination market price assumptions were $7.5 /mmbtu (gas) and $80/bbl (oil).

- Applying those assumptions *total government take (Alaska + FIT) of destination value* varied from 25% to 32% for gas fields versus 55% to 60% for oil fields. The main difference being due to the higher costs (TT&T) for the gas cases.

- At base case price assumptions *total government share of divisible profits* are 66% to 68% for gas fields and 74% to 76% for oil fields. Progressivity tax provided a significant contribution for oil fields, but very little progressivity paid by gas fields.

Multi-year Fiscal Model Used to Test Alternative Gas Progressivity Mechanisms

An Excel model was developed as part of this work to test alternative mechanisms for a distinct gas progressivity tax (GPT).

- Ten mechanisms evaluated (prevailing plus nine alternatives)
- Benefits of separating gas and oil production tax streams identified
- Alternative drivers, thresholds and gradients evaluated for GPT
- Each mechanism tested by sensitivity analysis using 10 field (gas and oil) and multi-year analysis at a range of prices and costs
- Analysis reveals that overall (despite progressivity mechanisms) the Alaska fiscal design has a regressive behavior due to the impact of the royalty, property tax and production tax floor in low gas price or high-cost situations.

Impact of Natural Gas on Combined Oil & Gas Production Tax

David Wood

2nd February 2009

Reponses to Questions from LB&A asked on December 9 and 10th, 2008 & presented 9th January 2009

Impact of Natural Gas on Combined Oil & Gas Production Tax

Analysis has identified that three factors are relevant to the dilution effects under prevailing production tax paid by an existing oil- only case with the addition of gas production (and vice versa – i.e. oil added to a gas-only case). These factors are:

1. Magnitude of value differential between oil and gas streams (high oil value minus low gas value, or high gas value minus low oil value);

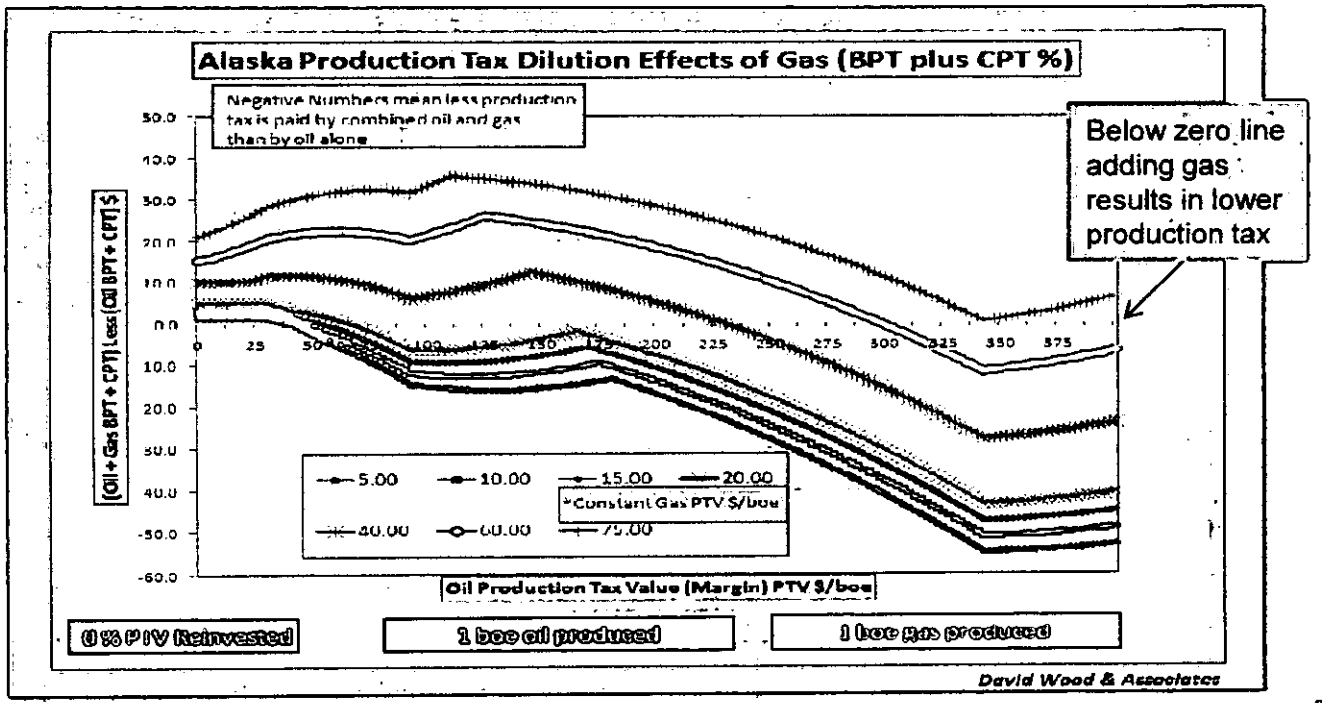
2. Relative volumes of oil and gas produced contributing to combined production tax boe stream.

3. Amount of PTV reinvested, which depending on the PTVs of each stream can have a significant impact

An Excel computer model has been developed to test these three factors.

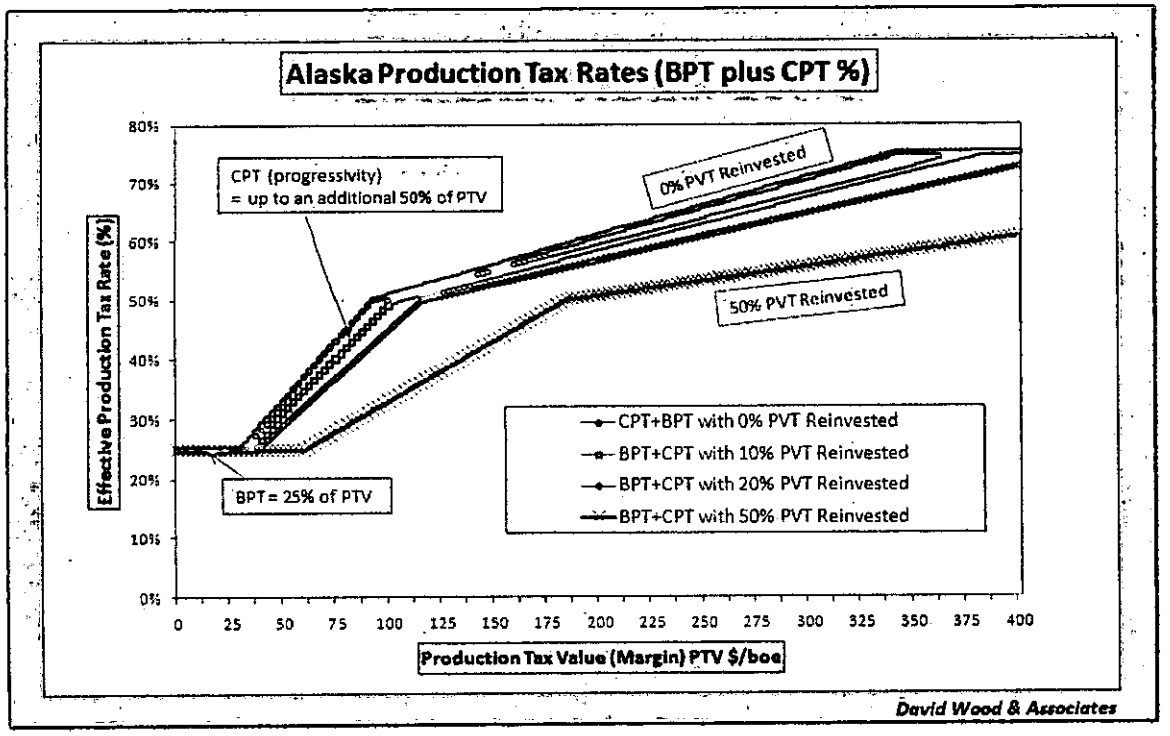
Natural Gas Dilution Effects on Combined Oil & Gas Production Tax

The trends are non-linear with slope changes because of the changing gradients of the production tax progressivity mechanism (i.e. 0.4/boe to 0.1/boe) and the threshold values at which those changes occur.



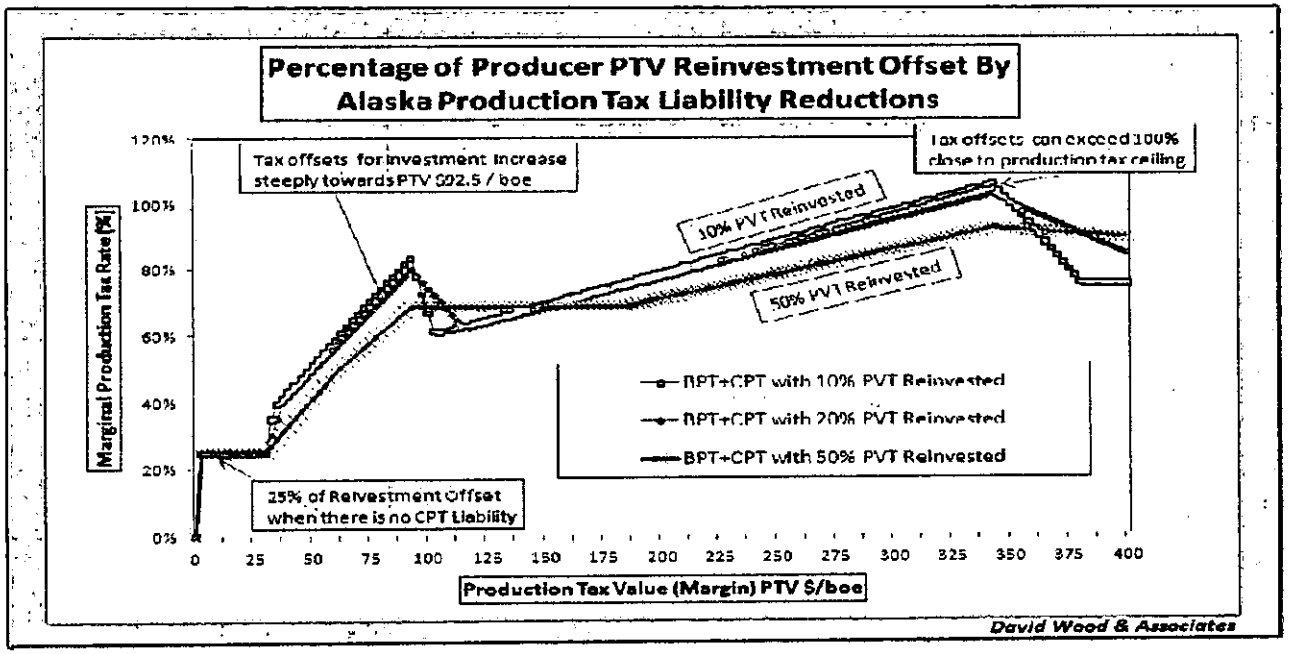
Natural Gas Production Tax Dilution
Different Reinvestment Scenarios

The impact of several reinvestment scenarios – 0% , 10%, 20% and 50% of PTV - on production tax rates are illustrated in this graphic.



Marginal Production Tax Rates Seen by a Producer for Reinvestment Dollars

The vertical axis shows the percentage tax reduction associated with the incremental re-investment (or the marginal tax rate offset by the producer by its reinvestment). Note the peak around PTV$90/boe and values above 100% at PTV $350/boe plus multiple crossover points.



Conclusions

These complications lead to the following general conclusions:

1. Under the current combined progressivity tax (CPT) rules the impact of gas revenue on the magnitude of combined production taxes is difficult to predict making tax planning difficult (for both state and producers).

2. This is likely to render the production tax structure unstable in the long term and to require future adjustments by the legislature to progressivity rates and thresholds according to prevailing conditions.

3. Such adjustments would have significant impacts on investors and risk undermining fiscal stability and credibility over the long term.

4. By separating CPT into GPT and OPT these problems are removed and incentives can be structured in a transparent way. Under separate oil and gas taxation streams the combined production taxes become more predictable, stable and flexible.

Useful Analysis to Aid Natural Gas Fiscal Design Yet to be Conducted

The dilution effect of production tax is one of several issues that suggest that the natural gas fiscal design requires some adjustment. A first step is to establish a strategy for what a revised fiscal design should achieve. In order to help this process the following analysis could be conducted.

1. Establish and compare multi-year cash flow models for Prudhoe Bay and Point Thomson fields to evaluate from a natural gas perspective the taxation outcomes a range of scenarios: 1) gasline alternatives; 2) LNG plant at Valdez; GTL plant on the slope; and others.

2. Use the information from 1. together with the ten hypothetical yet-to-find fields (presented in December Report) to test alternative gas fiscal designs.

3. Evaluate the fiscal designs and specific fiscal instruments applied in the main oil and gas producing states of the Lower 48. Alaska may be competing for investment with large-scale unconventional gas projects (e.g. shale gas). It is important to understand the incentives being offered by such projects.

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Combined Oil and Gas Progressivity in Alaska's Production Tax

Dan E. Dickinson, CPA

Senate Resources Committee
Alaska State Legislature

Feb. 2, 2009

Rear View Mirror: 5 fold increase in Production Tax 2004 - 2008

	Production Taxes				X Check					Royalty	
Fiscal Year	Prod Tax Rev ($ 000 000)	Less CI gas ($000 000)	Apples to Apples Rev ($000 000)	2008$ / 2004 $	WC Price	Million bbls daily Prod	Million bbls annual Prod	Price times volume	2008$ / 2004 $	Royalty Rev ($ 000 000)	2008$ / 2004 $
	(A1)	(A2)	(A)	(B)	(C)	(D)	(E) = (D) * 365	(F) = (C) * (E)	(G)	(I)	(J)
2004	651.9	(24.7)	627.2		31.74	0.999	364.6	11,573.5		1,056.1	
2005	863.2	(24.4)	838.8		43.44	0.931	339.8	14,761.6		1,419.9	
2006	1,199.5	(33.2)	1,166.3		60.80	0.858	313.2	19,040.7		1,784.1	
2007	2,208.4	(6.0)	2,202.4		61.83	0.750	273.8	16,926.0		1,613.0	
2008	4,940.5	(6.0)	6,879.0	11.0	96.51	0.730	266.5	25,715.1	2.2	2,446.1	2.3

Tax Increase attributable to changes in rules= 11.0 /2.2 = 5

*Note: Tax revenues from some North Slope gas sales will be included in revenues with no corresponding volume effect. That adjustment (adding .004 to the daily volume) will not materially affect the outcome. NS NGL are in both vols and $.
Data from Fall 2008 Revenue Sources Book, from Appendix A-4a (royalty sum of royalty & Bonuses etc.), C-2a and B-1a.
Cook Inlet Gas adjustment from Fall 2007 RSB, Appendix A-5a (CI data not broken out in Fall 2008 RSB)
Note: Historical volume and price data in Fall 2008 RSB differ from same historical data series in Fall 2007 RSB and earlier.

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Rear View Mirror: Changes in State Take 2004-2008

Fiscal Year	State Take in $ A	Prod Value (Vol x Val) B	Upstream Costs* (used '07 in 04-06) C	Transport-ation Costs D	Prod Value less Costs E= (B-C-D)	State % F= (A/E)	Federal % G= (E-A)*.35)/E	Prod % H= (1-F-G)
2004	2,426.8	11,799.6	*3,659.0*	1,783.1	6,357.5	38.2%	11.7%	50.2%
2005	3,395.1	15,240.7	*3,659.0*	1,603.9	9,977.8	34.0%	15.1%	50.9%
2006	4,358.9	19,454.1	*3,659.0*	1,700.5	14,094.6	30.9%	17.5%	51.6%
2007	5,141.7	16,863.0	3,659.0	1,478.3	11,725.8	43.8%	13.7%	42.5%
2008	11,255.0	25,715.1	3,848.0	1,612.0	20,255.1	55.6%	12.2%	32.2%
	all $ figures in millions							
What if 2004 upstream costs a billion less?								
2004	2,426.8	11,799.6	*2,659.0*	1,783.1	7,357.5	33.0%	14.6%	52.4%

Source: State take, volumes, $/bbl destination value, transportation charges and 2008 Upstream Cost from Fall 2008 DOR Revenue Sources Book; 2007 Upstream cost from Fall 2007 RSB

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Looking Forward: TransCanada's AGIA application suggestion:

- "TransCanada would rely on the State of Alaska to take all feasible actions exclusively within its authority as a sovereign power to ensure a favorable economic environment for potential Shippers on the Project. Those actions include:
  - engaging with the ANS producers to reach agreement on a commercially reasonable and predictable upstream fiscal regime that balances the needs of the state and the ANS producers;
  - and encouraging robust exploration for and development of new natural gas resources and the commitment of such resources to the Project."

Source: TransCanada, Application for License, Alaska Gasline Inducement Act (November 30, 2007) page 2.5-52

Looking Forward: ConocoPhillips' Proposal

- ConocoPhillips' Proposal (ConocoPhillips current owner with BP of Denali Project)

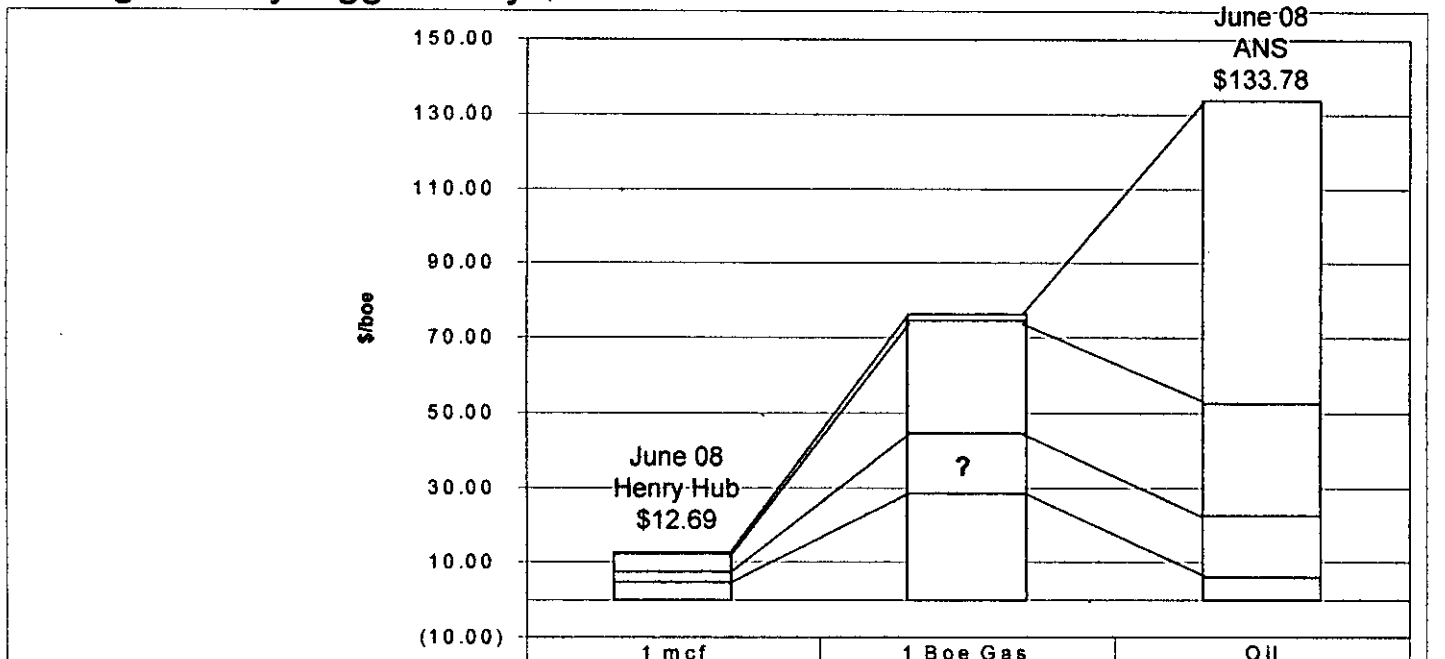
  "The predominant lessee risk that should be the focus of discussion with the State is the risk of unclear, unpredictable State taxes and royalties. In order to enable shippers to make long term shipping commitments, prospective shippers need clearly defined natural gas fiscal terms and an understanding of the period during which these terms will apply. Addressing these issues remains a critical component necessary to develop ANS natural gas resources and make this Project a reality."

Source: ConocoPhillips, ANS Natural Gas Pipeline Proposal to the State of Alaska, (November 30, 2007) section IV page 5

Looking Forward: Combined Progressivity Tax (CPT)

Gas exported from state and oil taxed at same rate – both part of combined progressivity calculation.

- Prices swings in one can effect tax on the other
- Gas converted to oil on Btu basis (roughly 6:1)
- Progressivity triggered by $30 boe PTV



	1 mcf	1 Boe Gas	Oil
Subject to progressivity June 2008	0.25	1.50	81.25
$30 no Progressivity zone	5.00	30.00	30.00
Upstream Costs ?	2.71	16.26	16.26
Downstream costs	4.73	28.38	6.27

Sources: Oil data from Spring 2008 RSB, Upstream Gas Cost is oil data on boe basis, Gas Downstream cost is Black & Veatch Estimate from Appendix G Alaska Gasline Determination. Oil price from DOR website, Gas Price from St Louis Fed Reserve website

Looking Forward: Combined Progressivity Example 1

	Oil Only
Daily Vol	0.7 mmbbls
	365
Annual Volume	255.5 mmbbls
Annual Barrel Equivalents	255.5 Annual Boe
ANS Price	$ 79.72
Transportation to Market	(6.34)
Gross Value at Point of Production	73.38
Value times Volume	$ 18,749
Non Royalty %	87.5%
Taxable Wellhead	$ 16,405
US Costs (millions $)	4,337
Taxable Value or PTV (millions $)	$ 12,068
Non Royalty Fraction	87.5%
Taxable volumes	223.6
Prog Base (taxable value/volume)	$ 53.98
Less $30	30.00
Starting Point	$ 23.98
Rate per dollar	0.4000%
Prog rate	9.5922%
base rate	25.0000%
Total Rate	34.5922%
Total (Tax Rate * PTV)	4,174.6

Source: Oil & Gas prices from 1/26/08, equal volumes, US from DOR 2008 Revenue Sources Book. Gas tariff and adj to Alberta from TC 2007 AGIA Proposal. Tariff is "nominalized levelized toll including fuel"

Looking Forward: Combined Progressivity Example 2

	Oil Only		Incremental Gas
Daily Vol	0.7 mmbbls		4.2 bcf
	365		365
Annual Volume	255.5 mmbbls		1533 bcf
		Convert to boe	6
Annual Barrel Equivalents	255.5 Annual Boe		255.5 Ann B/e
ANS Price	$ 79.72	Henry Hub Price	6.08
		Adj to Alberta	(0.75)
Transportation to Market	(6.34)		(2.88)
Gross Value at Point of Production	73.38		2.45
Value times Volume	$ 18,749		3,756
Non Royalty %	87.5%		87.5%
Taxable Wellhead	$ 16,405		3,286.4
US Costs (millions $)	4,337		
Taxable Value or PTV (millions $)	$ 12,068		3,286.4
Non Royalty Fraction	87.5%		87.5%
Taxable volumes	223.6		223.6
Prog Base (taxable value/volume)	$ 53.98		$ 14.70
Less $30	30.00		30.00
Starting Point	$ 23.98		NO PROG
Rate per dollar	0.4000%		
Prog rate	9.5922%		
base rate	25.0000%		
Total Rate	34.5922%		
Total (Tax Rate * PTV)	4,174.6		

Source: Oil & Gas prices from 1/26/08, equal volumes, US from DOR 2008 Revenue Sources Book. Gas tariff and adj to Alberta from TC 2007 AGIA Proposal. Tariff is "nominalized levelized toll including fuel"

Looking Forward: Combined Progressivity Example 3

	Oil Only		Incremental Gas	Combined
Daily Vol	0.7 mmbbls		4.2 bcf	
	365		365	
Annual Volume	255.5 mmbbls		1533 bcf	
		Convert to boe	6	
Annual Barrel Equivalents	255.5 Annual Boe		255.5 Ann B/e	511.00 Ann B/e
ANS Price	$ 79.72	Henry Hub Price	6.08	
		Adj to Alberta	(0.75)	
Transportation to Market	(6.34)		(2.88)	
Gross Value at Point of Production	73.38		2.45	
Value times Volume	$ 18,749		3,756	
Non Royalty %	87.5%		87.5%	
Taxable Wellhead	$ 16,405		3,286.4	
US Costs (millions $)	4,337			
Taxable Value or PTV (millions $)	$ 12,068		3,286.4	15,354.4
Non Royalty Fraction	87.5%		87.5%	87.5%
Taxable volumes	223.6		223.6	447.1
Prog Base (taxable value/volume)	$ 53.98		$ 14.70	34.34
Less $30	30.00		30.00	30.00
Starting Point	$ 23.98		NO PROG	4.34
Rate per dollar	0.4000%			0.4000%
Prog rate	9.5922%			1.7361%
base rate	25.0000%			25.0000%
Total Rate	34.5922%			26.7361%
				(Smaller rate times larger base)
Total (Tax Rate * PTV)	**4,174.6**		**(69.4)**	**4,105.2**

Source: Oil & Gas prices from 1/26/08, equal volumes, US from DOR 2008 Revenue Sources Book. Gas tariff and adj to Alberta from TC 2007 AGIA Proposal. Tariff is "nominalized levelized toll including fuel"

Model Screen Shot

	Oil Only		Incremental Gas		Combined	
Daily Vol	0.700	mmbbls/day	4.2	bcf/day		
days per year	365		365			
Annual Volume	255.5	mmbbls/yr	1533	bcf/yr		
Convert to boe	1		6			
Annual Barrel Equivalents	255.5	boe/yr	255.5	boe/yr	511.0	boe/yr
ANS WC Price/ Henry Hub Price	$ 80.00		$ 6.00			
Adj to Alberta			(0.75)			
Transportation to Market	(6.00)		(2.75)			
Gross Value at Point of Production	74.00		2.50			
Value times Volume	$ 18,907		$ 3,833			
Non Royalty %	87.5%		87.5%			
Taxable Wellhead	$ 16,544		$ 3,353			
US Costs (millions $)	4,300		-			
Taxable Value or PTV (millions $)	$ 12,244		3,353		$ 15,597	
Non Royalty Fraction	87.5%		87.5%		87.5%	
Taxable volumes boe	223.6		223.6		447.1	
Prog Base (taxable value/volume)	$ 54.77		$ 15.00		$ 34.88	
Less $30	30.00		30.00		30.00	
Starting Point	$ 24.77		$ -		$ 4.88	
Prog rate (.4% or .1% per dollar)	9.91%		0.00%		1.95%	
base rate	25.00%		25.00%		25.00%	
Total Rate	34.91%		25.00%		26.95%	
	Stand Alone Oil		Stand Alone Gas		Combined	
Total Tax (Tax Rate * PTV)	**$ 4,274**		**838.4**		**$ 4,204**	

Sum of stand alone oil & gas: **5,112.17**

Gain (loss) in production tax from using current law vs stand alone: **(908.3)**

Gain (loss) in production tax from adding gas stream under current law: (69.9)

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DAN E.
DICKINSON CPA

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Model Screen Shot – 350 K bbls oil/day

	Oil Only	Incremental Gas	Combined
Daily Vol	0.350 mmbbls/day	4.2 bcf/day	
days per year	365	365	
Annual Volume	127.8 mmbbls/yr	1533 bcf/yr	
Convert to boe	1	6	
Annual Barrel Equivalents	127.8 boe/yr	255.5 boe/yr	383.3 boe/yr
ANS WC Price/ Henry Hub Price	$ 80.00	$ 6.00	
Adj to Alberta		(0.75)	
Transportation to Market	(6.00)	(2.75)	
Gross Value at Point of Production	74.00	2.50	
Value times Volume	$ 9,454	$ 3,833	
Non Royalty %	87.5%	87.5%	
Taxable Wellhead	$ 8,272	$ 3,353	
US Costs (millions $)	3,300	-	
Taxable Value or PTV (millions $)	$ 4,972	3,353	$ 8,325
Non Royalty Fraction	87.5%	87.5%	87.5%
Taxable volumes boe	111.8	223.6	335.3
Prog Base (taxable value/volume)	$ 44.48	$ 15.00	$ 24.83
Less $30	30.00	30.00	30.00
Starting Point	$ 14.48	$ -	$ -
Prog rate (.4% or .1% per dollar)	5.79%	0.00%	0.00%
base rate	25.00%	25.00%	25.00%
Total Rate	30.79%	25.00%	25.00%
	Stand Alone Oil	Stand Alone Gas	Combined
Total Tax (Tax Rate * PTV)	$ 1,531	838.4	$ 2,081

Sum of stand alone oil & gas: 2,369.24

Gain (loss) in production tax from using current law vs stand alone: (287.9)

Gain (loss) in production tax from adding gas stream under current law: 550.4

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Model Screen Shot - $135 oil and $6 gas - Tax Falls

	Oil Only	Incremental Gas	Combined
Daily Vol	0.350 mmbbls/day	4.2 bcf/day	
days per year	365	365	
Annual Volume	127.8 mmbbls/yr	1533 bcf/yr	
Convert to boe	1	6	
Annual Barrel Equivalents	127.8 boe/yr	255.5 boe/yr	383.3 boe/yr
ANS WC Price/ Henry Hub Price	$ 135.00	$ 6.00	
Adj to Alberta		(0.75)	
Transportation to Market	(6.00)	(2.75)	
Gross Value at Point of Production	129.00	2.50	
Value times Volume	$ 16,480	$ 3,833	
Non Royalty %	87.5%	87.5%	
Taxable Wellhead	$ 14,420	$ 3,353	
US Costs (millions $)	3,300	-	
Taxable Value or PTV (millions $)	$ 11,120	3,353	$ 14,473
Non Royalty Fraction	87.5%	87.5%	87.5%
Taxable volumes boe	111.8	223.6	335.3
Prog Base (taxable value/volume)	$ 99.48	$ 15.00	$ 43.16
Less $30	30.00	30.00	30.00
Starting Point	$ 69.48	$ -	$ 13.16
Prog rate (.4% or .1% per dollar)	25.70%	0.00%	5.26%
base rate	25.00%	25.00%	25.00%
Total Rate	50.70%	25.00%	30.26%
	Stand Alone Oil	Stand Alone Gas	Combined
Total Tax (Tax Rate * PTV)	$ 5,637	838.4	$ 4,380
Sum of stand alone oil & gas	6,475.84		
Gain (loss) in production tax from using current law vs stand alone		(2,095.7)	
Gain (loss) in production tax from adding gas stream under current law:		(1,257.3)	

Model Screen Shot - $180 oil and $13 gas - Taxes Rise

	Oil Only	Incremental Gas	Combined
Daily Vol	0.350 mmbbls/day	4.2 bcf/day	
days per year	365	365	
Annual Volume	127.8 mmbbls/yr	1533 bcf/yr	
Convert to boe	1	6	
Annual Barrel Equivalents	127.8 boe/yr	255.5 boe/yr	383.3 boe/yr
ANS WC Price/ Henry Hub Price	$ 80.00	$ 13.00	
Adj to Alberta		(0.75)	
Transportation to Market	(6.00)	(2.75)	
Gross Value at Point of Production	74.00	9.50	
Value times Volume	$ 9,454	$ 14,564	
Non Royalty %	87.5%	87.5%	
Taxable Wellhead	$ 8,272	$ 12,743	
US Costs (millions $)	3,300	-	
Taxable Value or PTV (millions $)	$ 4,972	12,743	$ 17,715
Non Royalty Fraction	87.5%	87.5%	87.5%
Taxable volumes boe	111.8	223.6	335.3
Prog Base (taxable value/volume)	$ 44.48	$ 57.00	$ 52.83
Less $30	30.00	30.00	30.00
Starting Point	$ 14.48	$ 27.00	$ 22.83
Prog rate (.4% or .1% per dollar)	5.79%	10.80%	9.13%
base rate	25.00%	25.00%	25.00%
Total Rate	30.79%	35.80%	34.13%
	Stand Alone Oil	Stand Alone Gas	Combined
Total Tax (Tax Rate * PTV)	$ 1,531	4,562.0	$ 6,046
Sum of stand alone oil & gas		6,092.90	
Gain (loss) in production tax from using current law vs stand alone		(46.7)	
Gain (loss) in production tax from adding gas stream under current law:		4,515.3	

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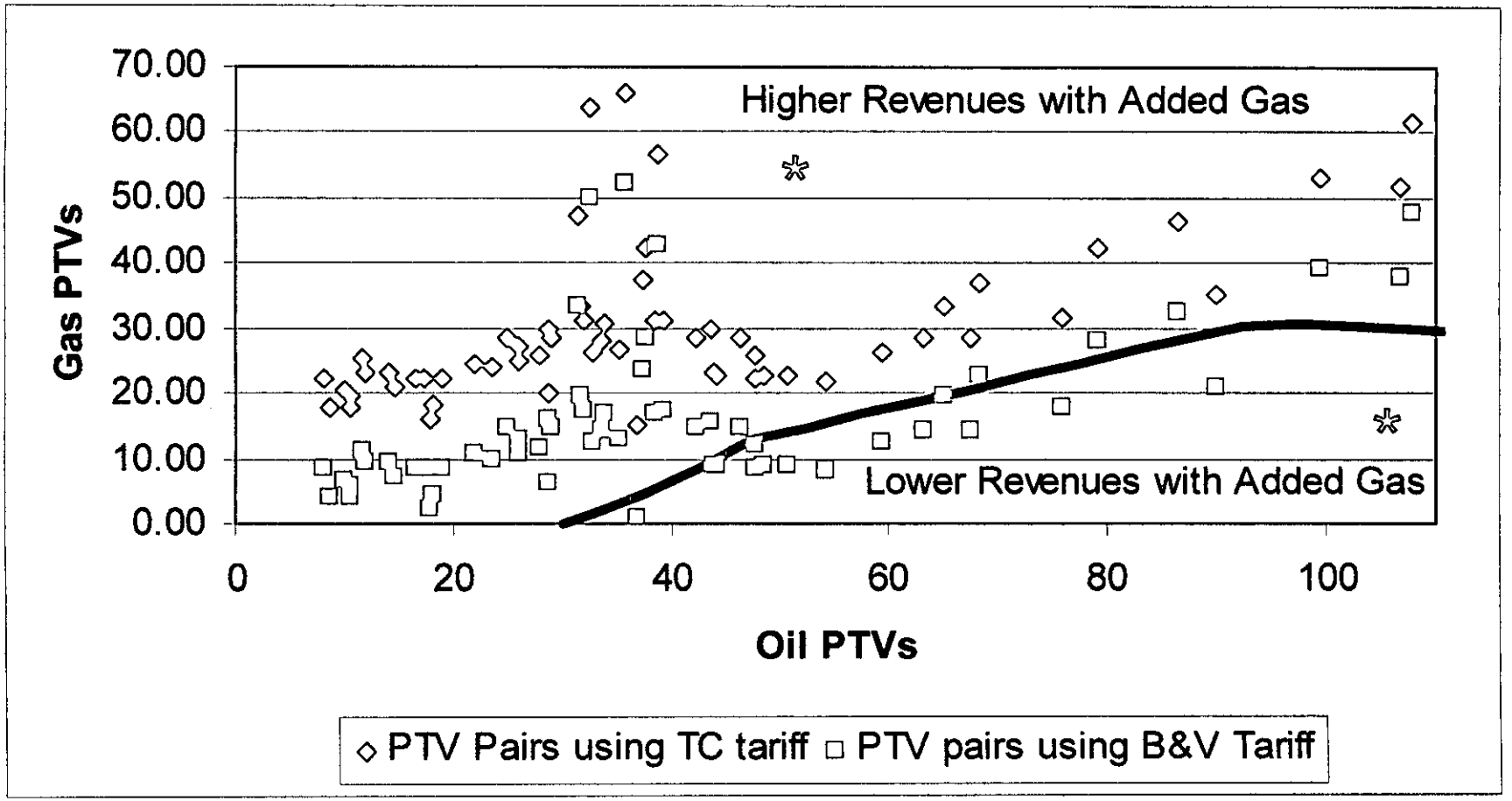
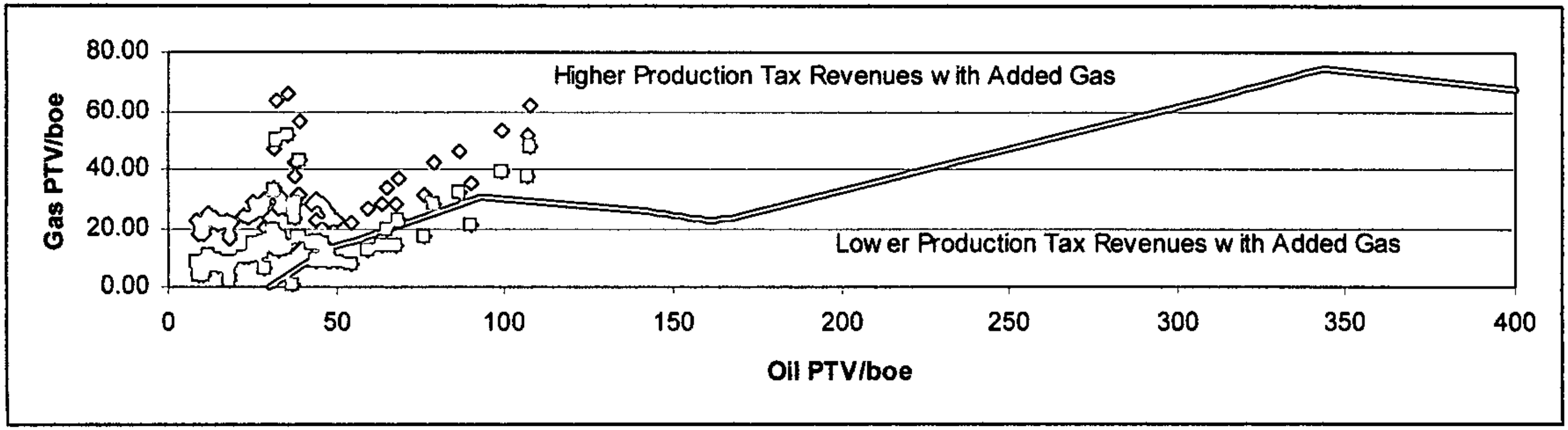
Oil and Gas PTVs 2004 - 2008



Source: Oil Prices and Costs from DOR 2007 RSB and website. Gas Prices from St. Louis Federal Reserve Web Site
TC Tariff from January 15, 2008 revision of November 2007 AGIA Application, page 2.10-4, Black & Veatch Tariff from
From May 2008 AGIA NPA Analysis Report page 121.

Oil and Gas PTVs 2004 - 2008



Source: Oil Prices and Costs from DOR 2007 RSB and website. Gas Prices from St. Louis Federal Reserve Web Site TC Tariff from January 15, 2008 revision of November 2007 AGIA Application, page 2.10-4, Black & Veatch Tariff from From May 2008 AGIA NPA Analysis Report page 121.

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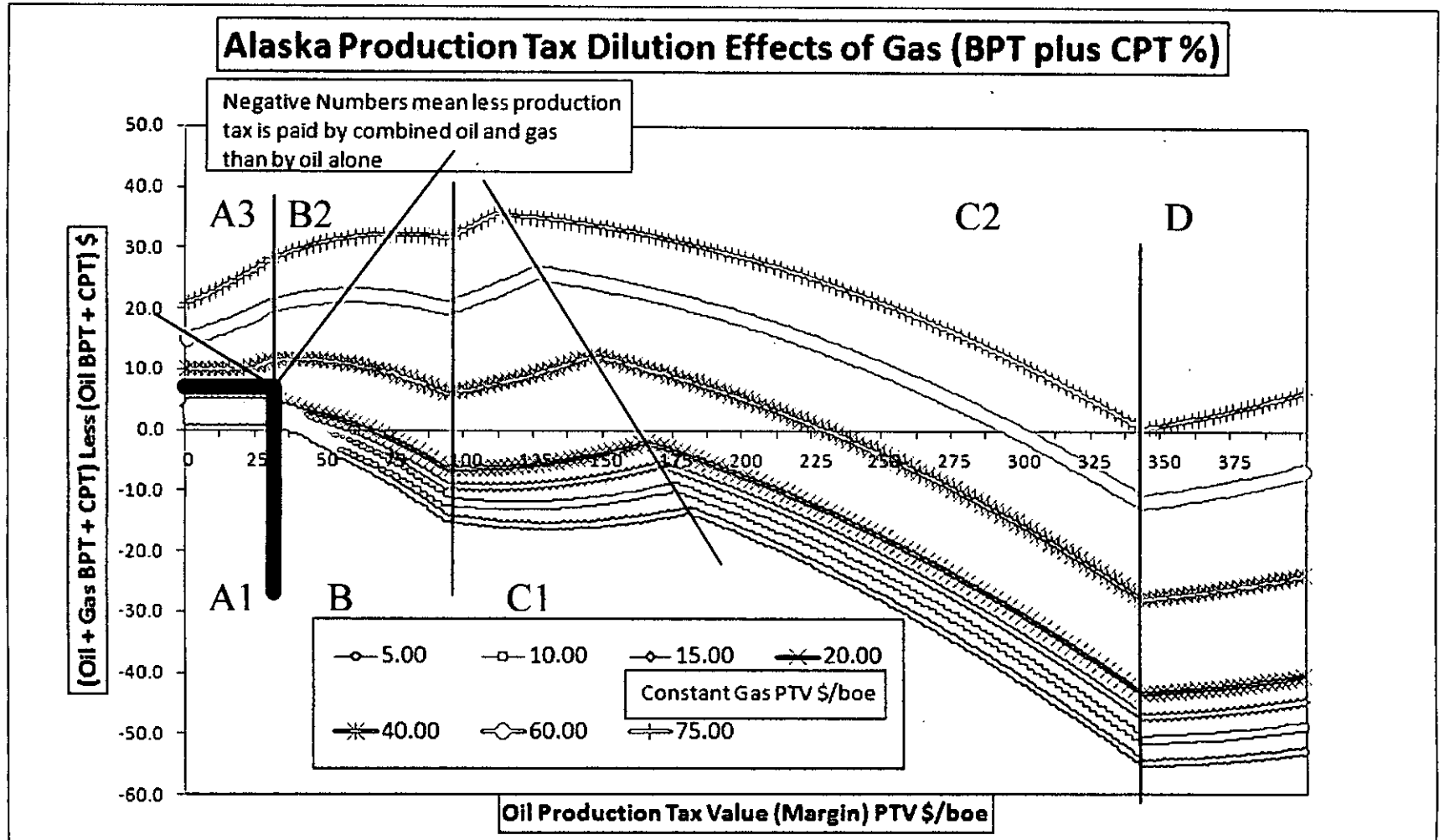
Dr. Wood's Illustration Divided into Zones



2.2.2009

DAN E. DICKINSON CPA

Senate Resources Committee, Alaska State Legislature

Thank You

Dan E. Dickinson CPA
Anchorage, AK
ddickinsoncpa@gci.net
907 301 1565