

Oil Sands Needs \$100/t Carbon Tax

**Submission to Alberta's
Climate Change Advisory Panel**

Prepared by: Barry Rodgers
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SUMMARY: This article argues that Alberta should implement an Alberta Carbon Abatement Leadership levy of \$100/t CO₂ on oil sands emissions and that, at an equivalent USD \$1.00 per barrel, such a levy is affordable without hurting investment and jobs. In fact, in addition to creating new greener energy jobs, such a levy would contribute to protecting oil sands investment by helping maintain and expand market access.

INTRODUCTION: To help secure the future success of Canada's oil sands industry the government of Alberta needs to implement a carbon levy that sends a clear signal to citizens and to customers that the province is serious about doing its best to combat climate change.

Alberta's energy customers are demanding meaningful action on curbing CO₂ and other harmful emissions.

No-action will mean a continually eroding share for Alberta, both of the market and of the price. If Alberta wants to have a viable oil sands industry for decades to come it has no choice but to take meaningful action on climate change. Alberta, however, like all governments, does not want to hurt existing investment prospects and disadvantage its economy while other jurisdictions continue inaction. This reality however does not change the fact that inaction for Alberta with respect to large emitters will surely lead to the declining market share and netback prices already identified.

As the principle beneficiary from the oil sands, the world expects Alberta to take all reasonable action to do what it can to minimize the associated climate costs for consumers, and citizens generally. A carbon tax of \$100/t/CO₂ would show real leadership, and it would demonstrate that Alberta's world-class resource deserves leadership with a world-class vision. \$100/tCO₂ would equate to an after-tax cost to industry of USD 1.0/barrel. It would be a good first step and it is clearly doable without stalling competitive investment.

The industry, as represented by individual companies, argues that they can't afford a carbon levy because Alberta's other costs are simply too high. Even if this argument were factual, the consequences of the 'no-action' scenario still stand. The situation in which Alberta has placed itself through decades of market interference and policies that otherwise favor the short term over the long term is that costs seem to preclude action, while customers and economic survival demand it.

HISTORY: Industry's mantra has always been to support competitive markets. Indeed, this has always been the position of the government of Alberta. There is every evidence that the new Notley government will be no less supportive of competitive markets. As they should be.

The operative word here is competitive. While past Alberta governments have espoused the virtues of competitive markets, they have all (since Lougheed) followed protectionist policies when it comes to the oil and gas sector. This reality has originated from policy development based on the positions of individual companies rather than on a recognition that what is good for an individual company may not be at all good for the entire industry. Individual companies will always argue that costs are too high, or at least cannot be any higher, and therefore internalizing the costs of pollution or supporting a competitive royalty/fiscal share for resource owners is not sensible.

Acting on this advice governments have effectively decided to interfere in the market by not charging a competitive royalty share. Of all of the myriad of suppliers to the oil industry, Alberta's resource owners, through the decisions of government under pressure from industry lobbyists, is the only supplier to the upstream industry that does not charge a competitive price. Therefore, it is the only supplier that ignores competitive market principles.

There is ample evidence that Alberta's supply-caused cost escalation relates directly to the high activity levels in the oil and gas sector. These extreme levels of industry activity are the result of deliberate policy action to not charge competitive prices but rather to charge prices that are among the lowest. For evidence of this fact one need only look to the Province's Goal 1 as presented in the Ministry of Energy's Annual Report for 2015/16.

Goal 1 – Performance Target: Alberta will have a combined tax and royalty rate that is in the top quartile of investment opportunities compared to similar jurisdictions.

Notice that the target for the royalty share is investment opportunities; which, notwithstanding the confusing language, really translates into royalties being in the lowest quartile. Alberta is the only oil and gas producing jurisdiction in the world with a goal to effectively minimize the share to resource owners.

At the very least, the problem with this policy is that it is not sustainable. This policy is directly linked to run-away cost escalation, itself due to a desire to accelerate the pace of development beyond that which the economy can supply. When prices are low people buy or consume more. It is no different with investment. The oil sector inflation in Alberta is a clear sign that Alberta's price is too low for maximum long term benefits to Alberta, let alone to resource owners.

It is important also to recognize that even if some companies cannot compete in competitive markets, this does not mean that Alberta's production, and therefore tax and royalty revenue will decrease. Most companies are efficient and they are competitive. Those that cannot compete will simply be bought out by those that can.

With the decision to encourage development and thereby to interfere with the competitive market, Government then had to ask itself 'how low can the royalty be'?

By a deliberate policy to look to individual companies for the answer, without then exercising a check to recognize that what is good for an individual company is not necessarily good for the entire industry, Government deliberately lead itself to the lowest common denominator. The problem is that these companies represent the full range of economic efficiency from those with cost management programs to permit economic viability at \$40/bbl to those requiring \$80/bbl or even higher.

When Government decided to interfere in the market there was no mechanism to effectively say no, or not yet, to the inefficient or otherwise disadvantaged \$80 suppliers. This then led to the decision to have a royalty and tax system that would support these uncompetitive companies and prospects. What followed was:

1. a loss in Government share on all projects, not just the \$80 projects but the \$40 projects as well; and,
2. the removal of the incentive for the \$80-companies to innovate and control cost.

The result has been a bloated industry in Alberta with many elements that are simply unsustainable. Alberta has continued to lose to its competitors that do have to pay the full competitive royalty price for resource access and, as a result, they simply better Alberta when it comes to innovation and cost control.

This policy is characteristic of the entire history of Alberta's industry. For example, the Government share in 1997 for an infant oil sands industry was in the order of 58%. Essentially two decades later the share now ranges, at best, from 47% - 56%.

If current policies are allowed to continue they will continue to create an economic environment where Government will either have no choice but to lower its share once again or accept a situation where costs are so high the share will be applied to an ever diminishing net balance.

It is not government's responsibility to create a healthy petroleum industry. This responsibility rests entirely with industry. Government's role is to implement the appropriate competitive fiscal and regulatory environment.

The policy of not charging a competitive royalty price is not good for the industry and it is not sustainable. Alternatively, a competitive royalty and pollution pricing policy would show faith that companies can and will respond by creating a more competitive, and therefore sustainable, industry and economy.

REALITY, HOPE, and ENERGY SECURITY: The oil sands are undervalued. Doom and gloom naysayers on Alberta's oil sands industry are certainly premature, to say the least. The good news is that the problems currently being experienced are largely regulatory and they can be corrected.

The undeniable fact is that Alberta's oil sands reserves are enough to last well beyond the time when the world has transitioned away from fossil fuels. More importantly for the United States, Alberta's traditional and closest market, the oil sands will be here when the current tight oil glut begins its inevitable decline.

The shale/tight oil revolution has been amazing. It does not however rank with the oil sands in terms of long term security of supply. Writing for the Post Carbon Institute, David Hughes states:

*The analysis presented herein, which is based on one of the best commercial databases of well production information available, finds that **the longevity of U.S. tight oil production at meaningful rates is highly questionable**. Certainly production will rise in the short term, but with the very likely peaking of the Bakken and Eagle Ford plays (which provide 62% of current U.S. tight oil output) in the 2016-2017 timeframe, maintaining production or even stemming the decline will require ever greater amounts of drilling, along with the capital input to sustain it. This will require higher prices, for the nature of shale plays is that the sweet spots get drilled first and progressively lower quality rock gets drilled last. ... **Rather than viewing tight oil as an unlimited bounty, it should be viewed for what it is—a short term reprieve from the inexorable decline in U.S. oil production**. A sensible energy policy would be based on this prospect.*

J. David Hughes,

Drilling Deeper - Part II: Tight Oil, Post Carbon Institute, 2015

From a global perspective, it is increasingly necessary for oil producers to expand into more and more remote and harsh, and therefore costly, operating environments, including the Arctic. The oil sands however is already discovered; it is on land with easy access by road and rail, it is in a stable political environment, and it enjoys minimum costs in terms of exploration and geological risk.

The longer term competitor for the oil sands is the deep water offshore. A deep water search for oil might have a 20% to 25% chance of success. This contrasts with a success probability for oil sands that is in the order of 90% to 95%.

The biggest hurdle for the oil sands is development risk due to delays and cost overruns. While these risks might be 15% for a deep water case they could be 25% for the oil sands. Combined with the chance of exploration success this implies a 30% - 35% probability of failure, compared to 75% - 80% for deep water. The failure risk for oil sands can be easily improved by improving the incremental development risk which is primarily caused by an overheated oil sands supply sector.

Due largely to government policy, oil sands development has been incented to expand at a rate that is faster than Alberta's economy can supply the necessary factor inputs, particularly the management and engineering talent and experience to ensure that these projects can stay on time and on budget. This situation can easily be corrected.

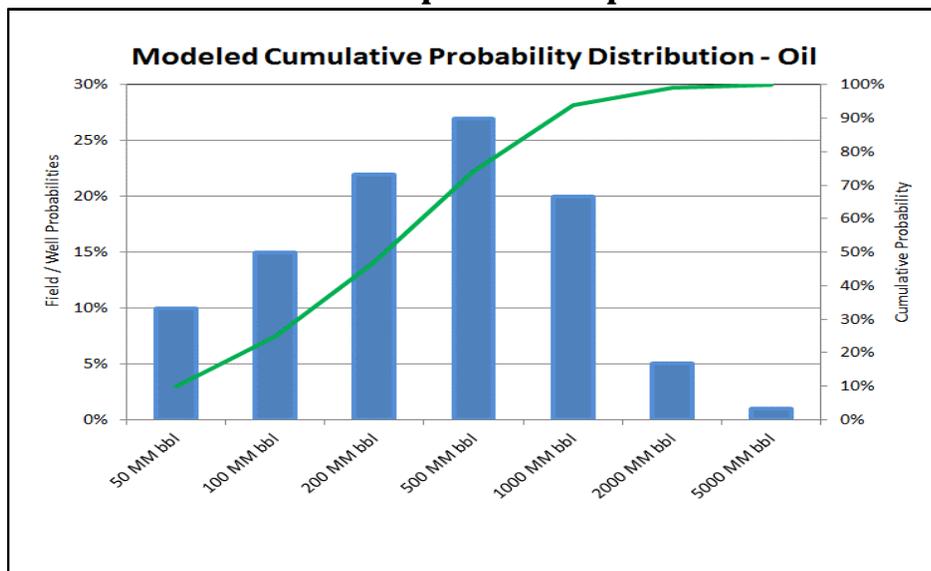
Faced with both runaway cost escalation and a loss of market share it is reasonable to expect that the new Alberta government will opt for a more measured pace of development.

Given Alberta’s support for market principles it is also likely that the pace of development will be measured through the royalty/fiscal price system than by government fiat. This was the mechanism chosen to speed up the pace of development; therefore it is reasonable to expect that it should be the mechanism that would best bring the pace of development more in line with the economy’s ability to supply, society’s ability to cope, and a more competitive share for resource owners.

Oil sands developments are largely manufacturing operations. This means that the recoverable reserves for a given project are largely known and determined by the development budget. By contrast, finding deep water reserves is very much an exploration play with success dependent on the likelihood of finding deposits of sufficient size to warrant commercial development. While a decision might be taken to develop a known 300 MM bbls oil sands deposit, a successful deep water operation would still be faced with a range of possible reserve cases, each with a different likelihood of occurring.

Chart 1 represents a range of possible deep water field sizes with their associated probabilities of occurring. The weighted average field size from this illustration would be 550 MMbbls. This might represent a minimum field size for many remote deep water operations.

Chart 1: Illustrative Offshore Deep Water Expectations



Applying these probabilities with the exploration and development risks yields the economic indicators presented in Table 1.

Table 1:

Oil Sands Economics Comparison							
	Oil Sands					Offshore Deep Water	
	OilSands CIT 25%	Oil Sands Fiscal w CIT @ 27% and ...				U.S.GoM	NOR
		CT15.12	CT30.20	CT30.100	CT100.50	no CT	CT65.100
CT/bbl (Before Tax)	0.09	0.09	0.33	1.66	3.64	na	1.02
EMV10	258	246	241	211	1.86	313	139
VRI	1.23	1.23	1.23	1.21	1.18	0.16	0.12
Base Case							
IRR	19.1%	18.8%	18.6%	17.8%	17.0%	18.3%	23.5%
IRR Change			-0.2%	-1.0%	-1.8%		
GS%	55.93	57.0%	57.4%	59.8%	61.8%	53.8%	75.4%
Notes: CT15.12 refers to \$15/tonne applying to 12% of the volumes							
The low per-bbl emissions cost for Norway results from a low emissions intensity for offshore operations							
Rodgers Oil & Gas Consulting							

The table compares the oil sands to deep water operations under two comparator fiscal systems – the USA Gulf of Mexico (GoM) and Norway. These offshore systems represent the government share extremes internationally. Given the importance of emissions abatement, the profitability measures for the oil sands are presented for four alternative carbon tax configurations: CT15.12 represents the historical case with the levy at \$15 per tonne of CO₂ produced but applied to only 12% of the production, CT30.20 reflects the recent interim change by the Notley government to increase the levy to \$30/t, and CT30.100 increases the applicable production under the Notley interim levy from 20% to include all volumes. The fourth carbon tax case (CT100.50) might be referred to as the Alberta Carbon Abatement Leadership Levy.

The first observation from the table is that the current carbon levy has minimal impact on the rate of return (IRR). To understand the reason for this result it is useful to express the levy in terms of dollars per bbl. For example Alberta’s CT15.12 translates into \$0.12 per bbl, on a nominal basis before tax. In real-dollar terms this is \$0.09/bbl.¹ With a government share under the oil sands regime in the order of 55%, the after tax cost to the producer is in the range of \$0.04/bbl. At current and more traditional exchange rates this reduces to approximately USD \$0.03/bbl.

¹ Environment Canada data show that SAGD oil sands operations produce 0.0728 tCO₂/bbl produced; therefore, 0.0728 x 15 x .12 = \$0.13/bbl. The phase-in allowance under this scheme reduces the charge to \$0.12/bbl, \$0.09 in \$Real terms.

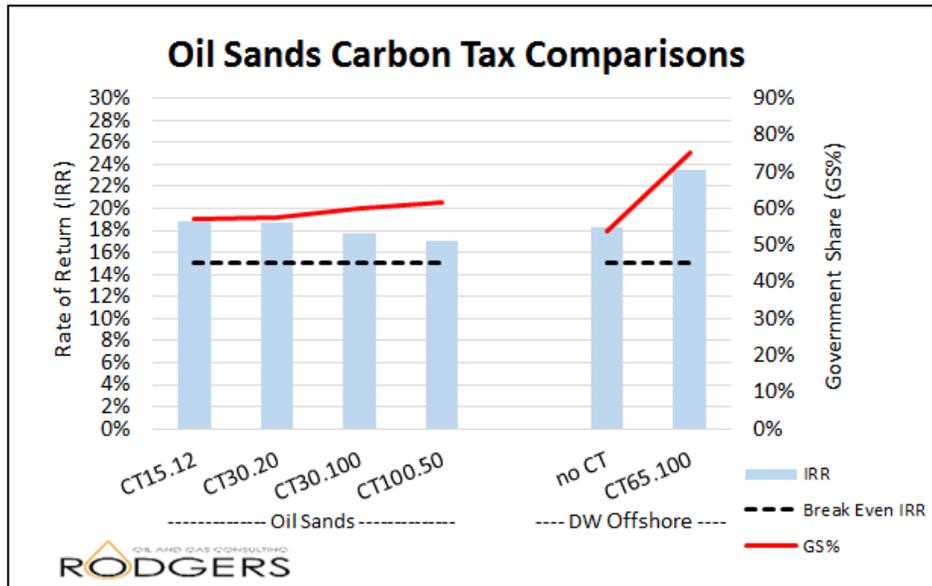
CURRENT SITUATION: Not enough has been done to recognize the associated incremental environmental costs and risks from oil sands production and to internalize these costs as legitimate costs of doing business. Continuing to ignore this responsibility may make sense from the perspective of an individual company; however it makes no sense when applied to the entire industry. This outcome is part of a broader unfettered market approach to development that has produced levels of pollution and cost escalation that now threaten the oil sands reliability as a long run source of supply.

At USD \$0.03/bbl it is little wonder that Alberta’s carbon levy has had little impact. What, however, may be a surprise is the industry furor that this levy has caused, particularly when one considers the lack of trust that such a low carbon abatement commitment has helped cause among Alberta’s customers and the corresponding threat to market access. This response from industry makes absolutely no sense, not even from an individual company perspective.

Even a carbon levy of \$30/t on all volumes (CT30.100) would translate into only USD \$0.50/bbl on an after tax basis. The impact on IRR would be in the order of one percentage point. Chart 2 shows the IRR and government share (GS%) from Table 1 in graphical form.

The fiscal design risk structure of the GoM limits the government share from this system. By contrast, both the government share and the investor rate of return are higher under the Norwegian system. This illustrates the opportunity for increased government share with better fiscal design.²

Chart 2



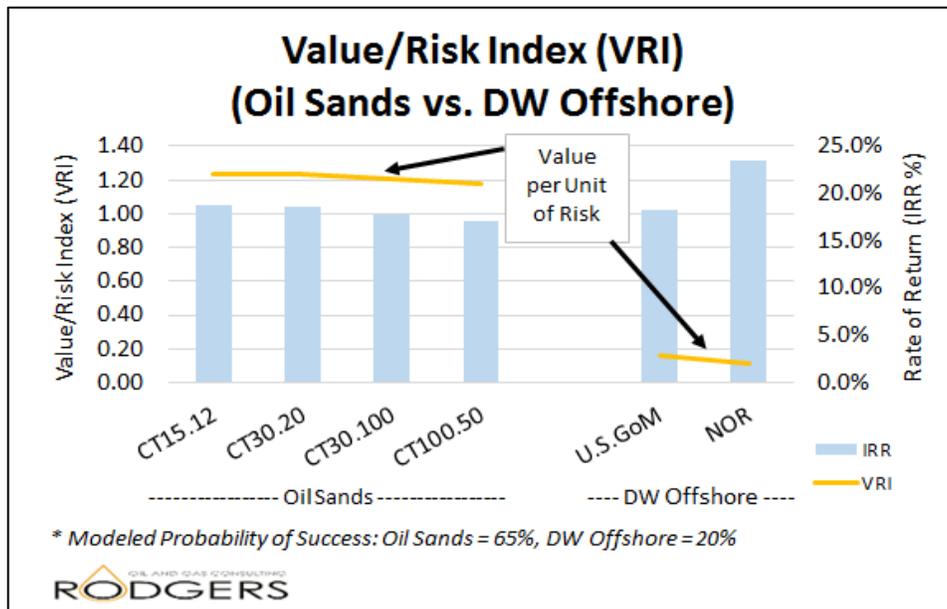
² Norway’s combined general corporate income tax (28%) and oil sector special tax (51%) means that Norway accepts 78% of the cost risk. This means that Norway’s USD-equivalent 65/tonne CO₂ levy represents \$14.3/t (\$0.23/bbl) on an after-tax basis.

While a representative case shows comparable ROR's, the VRI in Chart 3 shows dramatically different results, in favor of the oil sands.

The overall goal of investors is not so much to maximize value as it is to maximize value while taking into account the associated risks. The VRI – value to risk index - is used to indicate this balance. While the expected monetary value (EMV) shows the net present value (NPV) weighted by the perceived likelihood that the project will be profitable, the VRI indicates the range around the expected value. By dividing the EMV by the standard deviation of the various EMV outcomes investors get an appreciation of the value per unit of risk. It is on this measure that the oil sands really stand above as an internationally attractive investment.

Chart 3 reproduces the IRR comparison from Chart 2 with the associated VRI.

Chart 3



Because of the much higher risk associated with offshore exploration plays, the VRI for oil sands is shown to be seven to ten-times higher than that for the deep water offshore. The VRI for oil sands is in the order of 1.18 compared to 0.12 – 0.16 for the offshore.

Vast recoverable reserves (175 billion bbls), fundamentally attractive investment economics, and the ability to control and improve both pollution emissions and costs mean that Alberta's oil sands truly represent long term security of supply.

DIGRESSION ON COSTS AND RETURNS: What are companies saying about oil sands costs? – some examples:

SAGD bitumen - West Texas Intermediate (WTI) price required: \$40 - \$80/bbl
Scotiabank Equity Research and Scotiabank Economics, 2013 & Fall 2014

Cenovus – reporting a 30% decline in operating costs (\$5.0/bbl) for 2015/2014.
Cenovus, Investor Relations Presentation, August 2015

Canadian Oil Sands - expecting a \$9.00/bbl decline in operating costs for 2015/2014.
Canadian Oil Sands, Investor Relations Presentation, August 2015

Of utmost importance to keep in mind when looking at costs and supply prices in Alberta, particularly for the oil sands, is that current cost levels are hugely distorted by government's full-speed-ahead development policy. There is nothing peculiar about Alberta geology that dictates that costs need to be as high as they are. The primary cause of the Alberta cost increases compared to those for Alberta's competitors originates with royalty and tax policy specifically directed to maximizing the level of investment with little or no regard for the economy's ability to supply. Government policy is causing this cost increment and government policy can mitigate it.

Some will continue to argue that Alberta simply can't afford to increase royalty rates or internalize the environmental costs of oil production. If this were factual it falls to industry to provide proof to resource owners. Industry, not government, possesses the necessary direct cost information on which such proof would be based. Thus far this proof has not been forthcoming, with the evidence based on industry reports to investors pointing in the opposite conclusion.

With respect to overall returns, Table 1 above showed a rate of return under the Alberta Carbon Abatement Leadership case (ACAL - CT100.50) to be 17.0%. To put this in perspective, industry, world-wide, uses a 10% return to determine a project's economic viability. This is evidenced in any number of sources, including company reports to shareholders. In fact, one company in a recent presentation to Government Ministers confirmed this 10% rate as that used by industry for investment decision-making.³

ACTION: Alberta has the opportunity to gain the admiration of the entire world. With bold action, Alberta can regain lost respect internationally and nationally, be seen as responding to the wishes of its customers, and be welcomed as a champion for meaningful global action on climate change.

Premier Notley has an opportunity at the Paris talks in December to secure the respect and admiration of the entire world community. The cost to industry of doing

³ While a 10% minimum break even IRR is commonly used, Chart 2 illustrates a 15% IRR in order to reflect a conservative approach given the importance of these comparisons for Alberta decision-makers.

this would be in the order of USD \$1.00 per barrel - this is what CND \$100/tCO₂ represents.⁴

With the expected efficiency improvements and cost reductions from a more competitive fiscal pricing policy it is conceivable that there would, in the longer term, be no net cost at all, possibly even a net gain. Even without such gain, additional perspective on the affordability of this initiative can be gained by recalling that the recent improvement in the Canadian-United States exchange to 0.85 represents CND \$14 per bbl revenue increase when the products are sold in U.S. dollars. Using only half of this increase to conservatively reflect associated cost increases for U.S.-purchased goods and services gives a net gain of \$3.50 - \$7.00/bbl, \$1.4 - \$2.8/bbl on an after-tax basis.⁵

Combining the exchange rate improvements with the industry-identified operating cost improvements clearly demonstrates that an Alberta Carbon Abatement Leadership levy of \$100/t CO₂ is eminently reasonable. Further cost saving from a more efficient industry under a more competitive fiscal framework would reap additional benefits, including wider market access and higher industry profits.

Alberta's climate response for the Paris meetings in December can be meaningful. An Alberta Carbon Abatement Leadership levy of \$100/t CO₂ would certainly meet this goal; and it is clearly affordable.

Additional information and analysis can be found at [the following web address](#).

⁴ CND 100/tCO₂ x 0.0728 intensity x 0.50 intensity allowance x tax offsets at (1 - 0.60)/CND-USD exchange at 0.85 = USD \$1.23/bbl; adjustment for inflation = USD \$1.02/bbl.

⁵ Longer term USD \$80/bbl /0.85 = CND \$94/bbl. Using only half of this price increase for Canadian producers yields \$3.5 - \$7.0/bbl on a before tax basis, \$1.4 - \$2.8 after tax.

ABOUT RODGERS OIL & GAS CONSULTING

Rodgers Oil & Gas Consulting is a consultancy firm based in Edmonton Alberta. The firm's principal, Barry Rodgers, is an economist specializing in upstream oil and gas fiscal system design and evaluation, including international and inter-jurisdictional fiscal comparison. Rodgers Oil & Gas maintains an extensive up-to-date data base containing fiscal descriptions and related fiscal and economic assessments for some 500 fiscal regimes representing over 150 countries. More information can be found at: <http://www.bgroddgers.com/>

Contact Information

Barry Rodgers
10409 – 134th St.
Edmonton, Alberta, Canada
Office: (780) 634 – 3405
Cell: (780) 905 – 3622
Email: barry@bgroddgers.com
Website: <http://www.bgroddgers.com/>