

---

# SPECIAL REPORT

TD Economics



November 22, 2016

## WHAT DOES THE CARBON TAX MEAN FOR THE CANADIAN OIL SANDS?

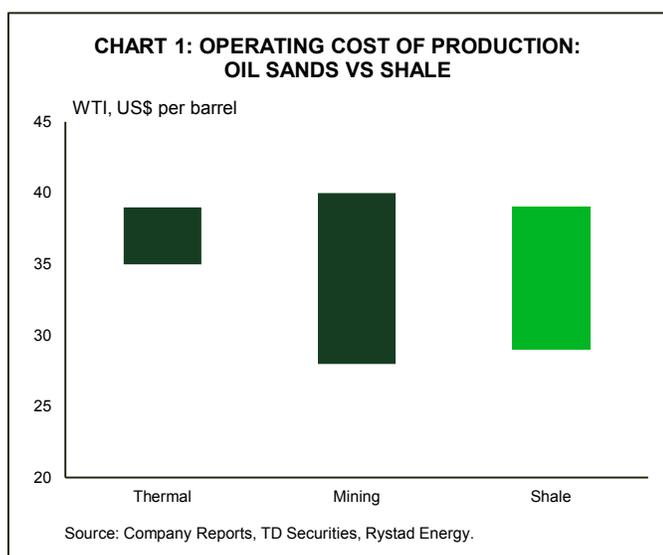
### Highlights

- The Canadian oil sands have long been criticized for their large carbon footprint. The Alberta government's climate change plan will limit emissions in the sector and put a price on carbon, set to begin in January 2017. Details of the plan that have been released suggest that cleaner producers will be better off, at the expense of those with higher carbon intensities.
- In October, the federal government introduced a national carbon-pricing plan, set to come into effect in 2018, with a higher price tag post-2020 than under the provincial plan. Few details are known and the impact will depend on how the province chooses to incorporate the federal tax.
- However, we estimate that if oil prices are above roughly US\$60 per barrel, the carbon price is unlikely to make or break a new investment decision. Below that threshold, the analysis becomes murky, as the carbon price wouldn't be the only factor deterring new investment – greater advances in productivity and cost reduction would likely be required in order to make new projects economical.
- All told, the price of oil, combined with other factors such as market access, will be the key determinants of new investment in oil sands projects over the medium-to-longer term.

Canada's oil sands have long been criticized for their large carbon footprint. There has been a lot of talk in recent years surrounding the fight against climate change, but little in the way of a comprehensive strategy. With oil extraction from the oil sands already one of the higher cost practices, any additional costs imposed on the sector elicit worries surrounding its competitiveness in the global market.

That said, it appears as though genuine steps are being taken to reduce and limit emissions from the oil sands sector. A year ago, the Alberta provincial government announced a climate change plan that would cap emissions in the sector and put a price of \$20 per tonne on carbon, set to begin at the start of 2017. While full details have yet to be disclosed, many in the industry are supportive of the plan, as it provides some clarity on policy direction and how the sector will be impacted.

The recent carbon plan announced by the federal government on October 3<sup>rd</sup>, has triggered another bout of uncertainty. That policy would cause the price on carbon post-2020 to be higher than the Alberta plan. All else equal, a higher price on carbon would typically mean a greater impact on large emitters such as the oil sands. The impact of the carbon tax on investment in the sector will depend largely on the price of oil. However, we estimate that if oil prices are roughly US\$60 per barrel or higher, the carbon price is unlikely to make or break an investment decision. Below that threshold, the analysis becomes murky, as the carbon price wouldn't be the only factor deterring new investment – greater advances in productivity and cost reduction would likely be required in order to make new projects economical. Moreover, regardless of price, increasing Alberta's ability to move oil out of the province will also be a crucial element impacting the future of the industry. Hence, the price of oil, in addition to other factors such as market access, will likely remain the key drivers behind new developments in the oil sands over the medium-to-longer term.



### Cost of production in oil sands vs shale

The cost of oil production differs by project and type of production. Oil sands projects tend to be one of the most expensive types of extraction, particularly the upfront development costs that are required before production even starts. Hence, the marginal cost of production in the oil sands – the cost to get another barrel of oil out of the ground – is much lower than the full-cycle cost of the project. Oil sands projects have a long life span so producers have much longer to recoup costs than other types of extraction such as shale, which has steep decline rates of the wells.

In general, production costs across the board are lower now relative to 2014 when oil prices collapsed. Lower prices have prompted producers to make their operations more efficient, structurally reducing the cost of production at all stages. Much of these productivity-enhancing cost reductions can be sustained. Other costs that are more cyclical in nature – such as labour and energy – have also come down over the last two years; however, sustainability is more questionable. Already, some of the cyclical costs have risen in recent months, in line with the near-doubling in oil prices. As such, trying to assess costs relative to prices has proven difficult given that they have been a moving target.

Many of the break-even costs for oil production that are often cited for the industry refer to the operating or marginal cost of production, rather than full-cycle costs. While every project is different, making it impossible to paint each extraction type with the same brush, there are some estimates that we can use as a gauge. For example, the average break-even operating cost for Alberta's oil sands is sitting at roughly US\$35 or US\$38 per barrel depending

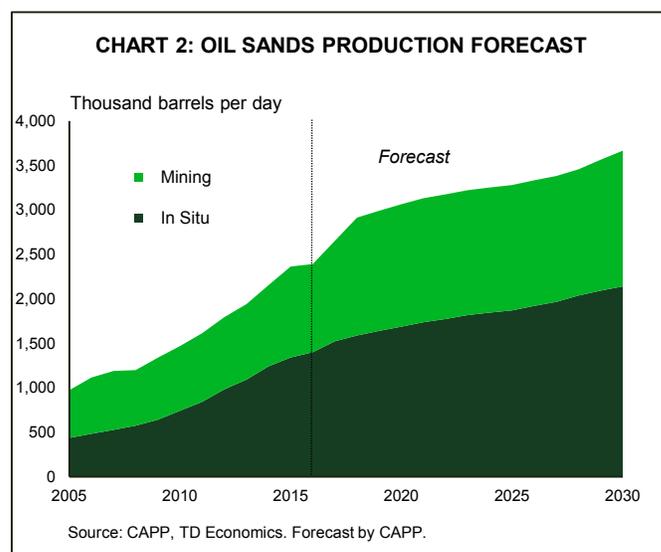
on whether the project is mining or thermal. Meanwhile, the average breakeven price for shale oil in the US ranges from US\$29-\$39 per barrel. As such, it would seem that, in general, oil sands operating break-even costs are still slightly higher than that for shale (See Chart 1).

It is important to note that these breakeven estimates don't take into account sustaining capital – spending needed to maintain facilities and keep existing operations running smoothly. In the oil sands, sustaining capital is necessary over the life of these massive projects. In contrast, these costs are not as essential for shale plays given that the wells are independent of each other. Hence, oil sands projects are likely less competitive than the above comparison would suggest.

### Alberta's carbon tax

In November, the Alberta government announced a new climate change plan, which includes an economy-wide carbon tax that will be implemented in January 2017. The price will be \$20 per tonne of carbon, rising to \$30 per tonne in January 2018, and by 2% plus inflation per year thereafter. Oil sands emissions will be capped at 100 MT of carbon per year. Currently, the sector is producing 70 MT, which leaves some room for growth. Based on current oil production projections, estimates on when the sector will hit that cap range from the early 2020's to 2030. Hence, production currently in the pipeline will go ahead as planned, allowing output to rise. But, over the longer term, the sector will have to continually reduce emission intensities in order to grow output.

Under the climate change plan, large emitters will pay the carbon price, but will also receive a subsidy. The subsidy



will be based on a performance-based standard for carbon pricing. This means that the price will be applied to facilities based on their relative performance from an intensity perspective. In other words, the cleanest projects within the oil industry will set the bar against which all projects are measured. This is different from the current system in which carbon costs are based on an individual project's performance relative to its improvement target.

Details on where the bar will be set, or how the rebates will be allocated have yet to be disclosed. However, under the new system, less carbon intensive projects could actually be better off, while highly intensive projects will see an increase in carbon costs. Based on the recommendations made by the review panel, Alberta Environment and Parks estimates suggest that most projects will incur a cost in the range of  $-\$0.50$  to  $+\$0.75$  per barrel. That said, some highly carbon intensive projects could see a cost of over  $\$4$  per barrel (See Chart 3).

Alberta's recently announced carbon tax will add to the cost differential that may already be in place for oil sands projects relative to shale. But, many producers in the industry are supportive of the plan, as it provides some clarity on the pricing structure and is expected to help increase market access through better environmental credibility. Indeed, with the unfavourable reputation that the oil sands has for 'dirty oil', many feel that having a plan in place to reduce the carbon footprint should help to remove some of the negative stigma associated with the sector.

### Federal carbon tax

In addition to the plan laid out by the Alberta government,

the federal government has recently announced a nationwide plan to reduce emissions that will also impact oil producers. The federal plan consists of a carbon tax of  $\$10$  per tonne beginning in 2018, rising to  $\$50$  per tonne by 2022. Provinces can implement their own plan, or will be subject to the tax at the federal level, with all revenues earned returned to the province in which they were generated. Details of the federal plan are scarce, and the impact on each province will depend on how the province implements its carbon pricing system (ie. carve outs, revenue recycling, etc.).

Given that Alberta already has a plan, it provides some indication of the path the province will follow and the potential impact that the federal plan could have on the oil sands. Under the federal plan, the price of carbon will be  $\$30$  per tonne in 2020. Alberta will have that price in place as of 2018, with an increase of 2% plus inflation per year thereafter. Using 2% as an estimate for inflation, the price of carbon under Alberta's current plan in 2020 will be slightly higher than the  $\$30$  federal price. However, in 2021 and 2022, it would fall short of the federal government's  $\$40$  and  $\$50$  price for each of those years (see Table 1). So, post 2020, the price in Alberta would have to be increased.

If Alberta were to implement a carbon tax of  $\$50$  per tonne rather than  $\$30$  as in the current plan, the cost for oil sands producers would range from roughly  $-\$0.84$  to  $+\$1.25$  per tonne, all else equal (recall the range was  $-\$0.50$  to  $+\$0.75$  under a  $\$30$  tax scenario). We caution that these estimates are based on what has been recommended, and will change depending on how the province ultimately sets the emissions standard and works in the federal government's tax rate.

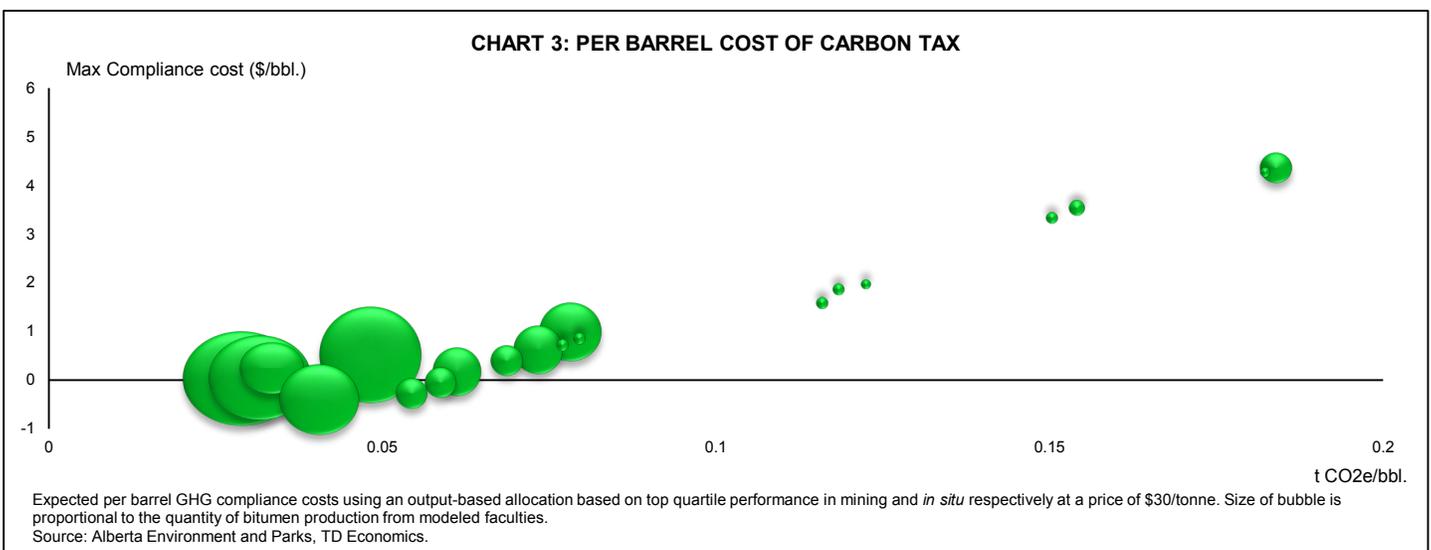


Table 1: Carbon pricing under current Alberta plan vs Federal plan			
	Alberta Carbon Price Under Current Plan*	Federal Carbon Price	Difference
\$ per tonne of carbon			
2017	20.00	N/A	N/A
2018	30.00	10.00	20.00
2019	31.20	20.00	11.20
2020	32.45	30.00	2.45
2021	33.75	40.00	-6.25
2022	35.10	50.00	-14.90

\*An inflation rate of 2% was used to calculate prices in 2019 and beyond.  
Source: Alberta Government, Federal Government, TD Economics.

Following the announcement by the federal government, the Alberta government indicated that it supports a nationwide carbon price in principle. However, it will not support the current proposal without serious concurrent progress on energy infrastructure. It is likely looking for federal support on new pipelines in order to increase market access for Alberta's oil. A decision by the federal government on the Kinder Morgan Trans Mountain pipeline expansion – which would triple current capacity carrying oil from Alberta to Burnaby BC – is expected by December 19th. From the federal government's perspective, having a carbon price in place could perhaps build the case in support of a pipeline, suggesting that it could be leaning toward an approval. This is the final step of the approval process, but the project could still be subject to legal challenges, given that there is significant opposition in Vancouver and Burnaby.

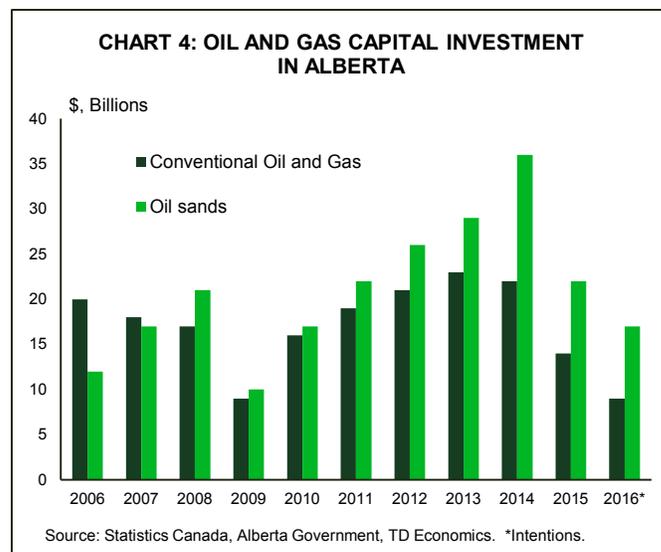
### Impact of the carbon price on investment

Given the importance of the oil sector to the provincial economy, sustaining investment within the industry is key. With prices sitting so low over the past two years, investment has certainly taken a hit – down by over 50% since 2014 (see Chart 4). But, even before prices plunged, investment in the oil sands was expected to taper off due to a number of reasons, chief among them being limited market access. Indeed, while construction of projects that were underway prior to the price collapse will drive growth through 2020, investment is likely to be limited thereafter unless new ways are found to move oil outside the province – regardless of the price. The outcome of the U.S. presidential election may help in this regard, as President-elect Trump has indicated that he would approve the Keystone XL pipeline. Other reasons for expectations of slower investment growth include rising costs, cost and completion time overruns and competition from U.S. shale, which has the advantage of both shorter lead times and being cheaper to produce.

Going forward, in addition to market access, the outlook for prices will play a vital role in any investment decision for oil sands producers. At current prices of US\$45-\$50 per barrel, total full-cycle project economics are challenged. Indeed, a price of around US\$60 per barrel is likely the minimum threshold needed to spur any new investment in the oil sands. And, producers must believe that the price will be sustainable above that threshold at the time production is expected to come online. Already, the oil sands are a higher cost resource. Hence, even with a rebound in oil prices, it is unlikely that oil sands will be the first place new investment flows into. Instead, investment will be dominated by sustaining capital to keep existing operations running, which at least puts a floor under total investment in the sector.

The carbon tax will add another layer to production costs. And, given President-elect Trump's anti-climate change stance, it is unlikely that a similar policy will be put in place in the U.S. anytime soon to help level the playing field. Still, on the surface, the actual cost per barrel associated with the announced plans does not seem to be exorbitant if producers are compensated as expected. However, the overall impact on investment would likely depend on the level of prices. In a low oil price environment where margins are already squeezed, it could reduce profitability further, limiting additional investment. Granted, little investment would occur at these prices without a carbon tax as well. If prices were to rise to the US\$60-70 per barrel range – which is entirely possible by 2020 – the carbon price will not likely be a deal breaker on investment in any project.

While the carbon price itself may not deter investment, there has been some criticism surrounding the emissions



cap of 100 MT, with worries that it will hinder growth and investment in the sector. But, that is more of a long term story, and may only be an issue if there is enough market access to demand higher production. Moreover, the oil sands sector does have a history of innovation and improved efficiencies, and there is still a great deal of optimism that it will continue to do so in order to allow production to rise, while keeping carbon emissions contained. Of course, innovation and new technologies also come with a cost, although this is something that would likely be done to some extent, regardless of the carbon policy, as has been seen in recent years. Moreover, the government may choose to spend some of the carbon revenues on developing (or have a program in place to help fund) such technologies.

### Bottom line

The bottom line is that the oil sands need to reduce their carbon footprint, and Alberta's climate change plan is a step in the right direction. While projects already underway will allow overall production to grow in the coming years, obtaining clarity on the path toward fighting climate change is important for producers on the investment front, as they will be reluctant to begin or expand projects if they cannot gauge the impact it will have on their industry. The recently announced federal carbon tax muddies the water with regard to the anticipated impact on the industry, as Alberta's plan will likely need to be tweaked accordingly.

Until further details are known on how the province will incorporate the federal mandates, producers are likely to hold off on any ambitious plans for the future. As such, it is important for the province to telegraph its carbon strategy as soon as possible so that businesses can plan accordingly. This is unlikely to happen before there is more certainty on the upcoming December decision regarding the pipeline.

That said, assuming the basic structure of the provincial plan is implemented as expected, the cost to the oil sands sector is unlikely to be excessive enough to reject a project that would otherwise go ahead if prices were to rise sustainably above full-cycle costs – estimated to be \$60 per barrel at a minimum. It is entirely possible that prices will reach that minimum within the next five years, but producers will need to feel confident that prices will remain that high once any new project hits the production stage. As such, carbon prices are unlikely to be a driving force behind lower investment and production in the Canadian oil sands. In fact, oil prices, efficiencies and market access will remain the largest determinants of investment in the sector over the medium-to-longer term.

*Dina Ignjatovic, Economist*  
416-982-2555

This report is provided by TD Economics. It is for informational and educational purposes only as of the date of writing, and may not be appropriate for other purposes. The views and opinions expressed may change at any time based on market or other conditions and may not come to pass. This material is not intended to be relied upon as investment advice or recommendations, does not constitute a solicitation to buy or sell securities and should not be considered specific legal, investment or tax advice. The report does not provide material information about the business and affairs of TD Bank Group and the members of TD Economics are not spokespersons for TD Bank Group with respect to its business and affairs. The information contained in this report has been drawn from sources believed to be reliable, but is not guaranteed to be accurate or complete. This report contains economic analysis and views, including about future economic and financial markets performance. These are based on certain assumptions and other factors, and are subject to inherent risks and uncertainties. The actual outcome may be materially different. The Toronto-Dominion Bank and its affiliates and related entities that comprise the TD Bank Group are not liable for any errors or omissions in the information, analysis or views contained in this report, or for any loss or damage suffered.