September 2011

Fact sheet

Oilsands and climate change

How Canada's oilsands are standing in the way of effective climate action

by Marc Huot

At a glance

As the United States evaluates whether the proposed Keystone XL oilsands pipeline is in its national interest or not, there are important issues it must consider, such as the ability of Canadian provincial and federal climate policies to effectively address rising greenhouse gas emissions. The Final Environmental Impact Statement for the pipeline issued by the U.S. Department of State overlooked key information and context on greenhouse gas emission management in Canada. In fact, a close inspection of Canada's climate record illustrates key weaknesses at the federal level as well as in Alberta.

This fact sheet aims to supplement the dialogue by providing key information on oilsands emissions growth, future oilsands intensity improvements, and the climate policies in effect in Canada at the provincial and federal levels. For a more detailed analysis, please refer to the accompanying briefing note, "Oilsands and climate change: How Canada's oilsands are standing in the way of effective climate action."

Canada's emissions

Greenhouse gas (GHG) pollution from Canada's oilsands is growing rapidly, and existing climate policies are too weak to limit this growth

- Oilsands development is the fastest growing source of GHG pollution in Canada. In the last two decades, oilsands emissions have more than doubled.
- Government forecasts predict annual GHG emissions from oilsands will double again from 2009 to 2020 with current policies and practices; the Canadian Association of Petroleum Producers forecasts that GHG emissions from oilsands are likely to continue climbing well into the 2030s.
- GHG emissions are growing faster in the oilsands industry than any other sector or sub-sector in Canada.
- While the Government of Canada is talking about developing oil and gas regulations, the oilsands currently have no federal GHG regulations or limits.

Provincial climate policies

Alberta's climate targets are far below what is required, and the province's climate policies are far too weak to achieve their goals

Alberta's climate regulations are too weak to constrain the rapid growth in oilsands emissions.

- Alberta's climate policies are likely to achieve only about one-fifth of the emission reductions the province's climate plan calls for by 2020, due to weaknesses in the policies and the accounting for emissions reductions.
- Given the province's weak climate targets and severe shortcomings in provincial climate change policies, claims that the Alberta government is a climate policy leader cannot be supported. In fact, the current policies will fall far short of halting the growth in Alberta's GHG emissions, let alone reducing emissions overall.
- While the province's 2008 climate plan also calls for a 50 Mt reduction in annual emissions below business-as-usual by 2020, this weak target actually allows absolute emissions in Alberta to continue growing for another decade. Alberta's long-term climate target to achieve a 14% reduction below 2005 levels by 2050 lags significantly behind the effort being made by other countries, including the U.S. target to achieve an 83% reduction below 2005 levels by 2050.
- Alberta's plan commits to a number of specific policy actions, but it makes no attempt to show that the policies will be strong enough to achieve the objectives.

The policy actions in Alberta's climate change plan have many weaknesses.

- Alberta requires large emitters to make 12% reductions in the intensity of GHG emissions — however, much of the reductions are only "on paper" since facilities can comply by making payments of $15/tonne CO_2e into a climate fund rather than making on-site emission reductions.
- The $15/tonne compliance option essentially caps the price on carbon in the province at a rate far lower than the cost of achieving on-site reductions through CCS and other technologies, eliminating the incentive to invest in those technologies.
- The effectiveness of Alberta's carbon offset program has been grossly overstated, because it contains major loopholes that allow emitters to get credit for emissions reductions that likely would have happened without the policy.
- Alberta has committed $2 billion to support large-scale CCS projects in the province. However a recent proposal by the government to provide double offset credits for certain CCS projects distorts the accounting of emissions reductions and could substantially undermine any real emission reductions made under this program.

The oilsands challenge

Oilsands development is the **fastest growing source** of GHG pollution in Canada.

Yet Alberta's climate plan is likely to achieve **only about one-fifth of the reductions** the plan calls for, due to weaknesses in the policies and the accounting for emissions reductions.

Recent Pembina Institute analysis shows **Canada will have to increase its GHG reduction efforts tenfold** if it intends to curb the growth in oilsands emissions and reach its 2020 target.

Oilsands vs. conventional fuel

Producing fuel from the oilsands creates much more GHG pollution than conventional fuel production

The methods used to turn oilsands into transportation fuel create substantially more GHG pollution than is created when generating fuel from conventional sources.

- Oilsands are among the most emissions-intensive commercial fuel sources available — meaning that more GHG emissions are released per barrel of oilsands fuel, than per barrel of conventional fuel.
- On average, GHG emissions from oilsands extraction and upgrading are estimated to be 3.2 to 4.5 times higher per barrel than GHG emissions from conventional crude oil produced in Canada or the United States.

Emissions intensity

Oilsands intensity improvements are not guaranteed and are virtually certain to be outweighed by the rapid increase in emissions resulting from future oilsands expansion

Compared to oilsands surface mining, in situ oilsands extraction generates significantly more GHG emissions for every barrel of oil produced. On average, in situ oilsands production is 2.5 times more GHG-intensive than surface mining, yet it is expected to overtake mining as the main approach to oilsands production over the next decade. This shift will increase the overall intensity of GHG pollution from the oilsands industry.

- From 1990 and 2009, the GHG pollution per barrel of oilsands fuel produced declined by 29%. Industry advocates often use this statistic to suggest that substantial intensity improvements will continue in the future, but that is unlikely.
- The historical decline in GHG intensity now appears to have ended, with the intensity of emissions levelling off and increasing somewhat over the past four years.
- Future technologies may enable further reductions in the intensity of oilsands emissions, but those benefits may be diminished or cancelled out by other changes, including a decline in the quality of future oilsands reserves and an increased reliance on in situ oilsands extraction.
- There is generally a large lag time between the development of new technologies and their implementation on the commercial scale. Actual benefits from new technologies researched today may be 15-20 years away.

CCS and carbon pricing

Carbon capture and storage (CCS) is not likely to result in significant emissions reductions in the oilsands for at least the next two decades

The bulk of the attention paid to CCS has been superficial and has portrayed CCS as a done deal, glossing over both the very slow and limited deployment of CCS and the significant challenges in applying it to the oilsands sector.

- To date there are no CCS projects operating directly in the oilsands. There are two planned projects to store a portion of overall upgrader emissions, but they have yet to be built.
- In theory, CCS could be applied at several different stages in the bitumen extraction and upgrading phases. However, the cost of capturing emissions from many of the sources will

be prohibitive unless governments are willing to approve further massive public subsidies or implement far higher carbon prices than they have even considered to date.

- Capturing and storing carbon dioxide (CO_2) emissions from oilsands upgraders is estimated to cost at least $75 to $155 per tonne. CO_2 emissions from in situ oil sands have among the highest capture costs, estimated at $175 to $230 per tonne. Further costs are associated with transporting and storing the CO_2.
- In Alberta, the carbon price is capped at $15 per tonne of CO_2. At this price level there is essentially no financial incentive for oilsands producers to pursue CCS projects.
- Business-as-usual forecasts show CCS playing a minimal role in reducing oilsands emissions over the next quarter centrury, with an emissions reduction of only 11% and 14% (relative to business as usual) expected by 2035. This raises serious questions about Alberta's climate change plan, which relies on CCS to provide 139Mt of the planned 200Mt reductions from business as usual in 2050.

Implications for Canada's climate commitments

Canada's 2020 climate target will be out of reach if the federal government doesn't increase its effort tenfold

Current federal and provincial policies put Canada's GHG emissions on a path to reach seven per cent above the 2005 level by 2020, missing Canada's climate target by a wide margin.

- Based on Canada's projected emissions in 2020, the combined effect of all currently announced federal and provincial climate policies would accomplish just one quarter of the emissions reductions required by the 2020 deadline. In other words, Canada's 2020 target is to reduce emissions to 17% below the 2005 level, but current policies only get us a quarter of the way there. The Pembina Institute's analysis shows that meeting Canada's 2020 targets would require a tenfold increase in the GHG reduction effort made by the Harper government since it took office in 2006.
- According to forecast data, the projected increase in Canada's emissions between 2005 and 2020 will largely come from the oilsands.

New federal climate policies are weakened by loopholes and exceptions.

- A proposal to regulate emissions from coal-fired electricity generation, starting in 2015, will allow existing plants to operate for their full economic life (45 years) and will allow new plants to avoid capturing the majority of their emissions until 2025. Under these regulations, about two-thirds of currently operating plants will not be required to meet the standard until after 2020, and nine plants will operate past 2030 without constraint.

Canada is a climate follower, not a climate leader.

- Despite government claims committing Canada to harmonize its climate policies with the U.S., Canada is failing to match its southern neighbour on key climate policies.
- In the 2010/2011 fiscal year, the Obama administration proposed 18 times more new spending on renewable energy, per capita, than the Government of Canada.
- The Obama administration also began regulating GHG emissions from some industrial facilities in January 2011, under the Clean Air Act, but Canada's federal government is still at the stage of talking about such regulations, not implementing them.