

Understanding the impacts of oilsands production

Six key barriers to achieving responsible oilsands development

At a Glance

As the debate over oilsands development has become increasingly polarized, misinformation about the impacts of oilsands production abounds. This backgrounder provides a brief overview of six key facts related to the environmental impacts of oilsands development and the ongoing challenges industry faces in improving environmental performance. Together, these facts represent significant barriers to achieving responsible oilsands development.

The facts highlighted below are drawn from a much longer list of oilsands impacts that are examined in detail in the Pembina Institute report, *Beneath the Surface: a review of key facts in the oilsands debate*. The full report is available online at: www.pembina.org/pub/2404

Fact #1: Oilsands emissions are a growing problem.

The emissions intensity of oilsands production, or the amount greenhouse gases emitted per barrel produced, improved quite dramatically over the period of 1990 to the mid 2000s as the industry matured. This point is often emphasized by industry proponents as evidence of the progress that has been made in reducing emissions from oilsands production.¹ In recent years, however, emissions intensity has actually worsened as more greenhouse gas-intensive methods of extraction expand.

Unfortunately, although emissions per barrel did improve in the oilsands for a period of time, absolute emissions (total emissions per year) across the industry have been steadily increasing. Emissions from oilsands upgrading and processing in Canada nearly tripled between 1990 and 2010, and government projections show emissions are likely to double again between 2010 and 2020.

Fact #2: Oilsands emissions are a significant barrier to meeting Canada's 2020 climate commitment.

While other sectors across Canada are making progress on reducing greenhouse gas emissions, the rapid growth in emissions from the oilsands is set to undo the progress that is being made in other sectors.

¹ Nathan Vanderklippe, "Rick George: The reincarnation of Mr. Oil Sands," *Globe and Mail*, October 13, 2012. <http://www.theglobeandmail.com/report-on-business/careers/rick-george-the-reincarnation-of-mr-oil-sands/article4610663/?page=all>

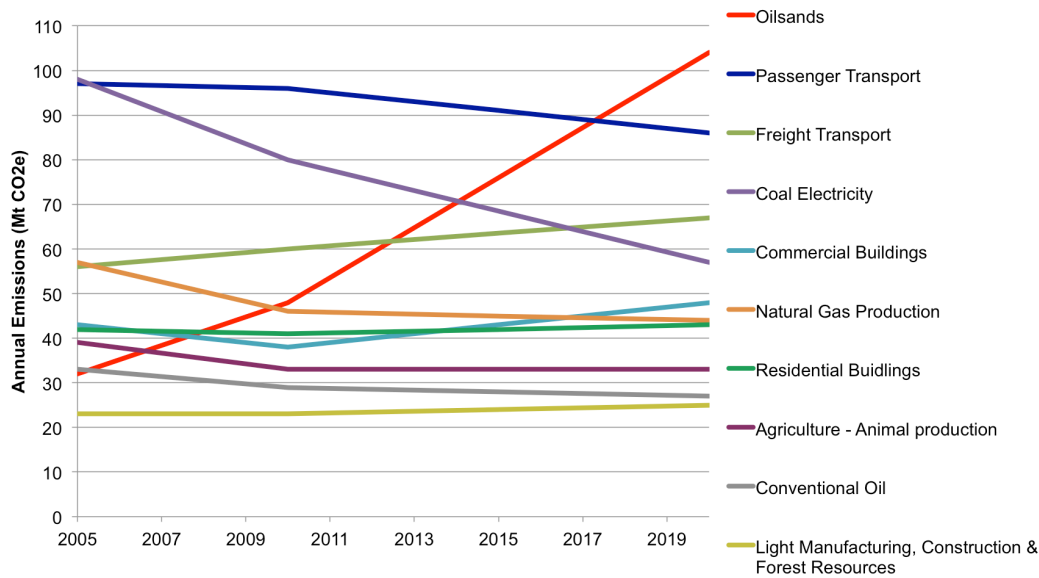


Figure 1: Oilsands greenhouse gas emissions (past and forecast) under existing policies

Data source: Environment Canada²

Despite assurances from the federal government that Canada is making significant progress on cutting greenhouse gas emissions,³ closing the gap between current emissions and our 2020 target will require slowing the planned growth of oilsands emissions substantially. Accomplishing that will require a significant increase in effort from industry, as well as all levels of government.

Fact #3: Land reclamation is not keeping pace with disturbance.

The rapid expansion of oilsands development and a lack of a regulatory requirement for oilsands operators to promptly reclaim has led to poor reclamation performance overall. To date, of the land impacted by oilsands mines, only Syncrude’s Gateway Hill has been certified as reclaimed. Gateway Hill, the remnants of an overburden dump that was never actually mined or polluted by tailings, represents 0.1 per cent (1.04 square kilometres) of the total area disturbed by oilsands mining.

Restoration of wetlands continues to be a major challenge and may never occur. Peatlands, the primary kind of wetland habitat throughout the northeastern part of Alberta where oilsands development occurs, cannot feasibly be replaced using current reclamation techniques. Reclamation efforts so far are replacing valuable peatlands with very different landscapes, which a series of television and print advertisements for the Canadian Association of Petroleum Producers highlights as evidence that reclamation has been successful.⁴

² *Canada’s Emissions Trends* (2012), 24. Note: This includes the 25 Mt reduction contributed by the reporting of the Land Use, Land-Use-Change and Forestry sector (LULUCF).

³ “Kent says Canada ‘Halfway’ to 2020 emissions targets,” *CBC News*, August 8, 2012. <http://www.cbc.ca/news/canada/sudbury/story/2012/08/08/pol-emissions-report-kent.html>

⁴ Patrick Moore, in television and print ads for Canadian Association of Petroleum Producers. <http://www.capp.ca/canadaIndustry/oilSands/Innovation/media/Pages/PatrickMoore.aspx>

Unlike many jurisdictions, Alberta has no policy that requires protection of wetlands on public lands in northern Alberta. A promised wetland policy that would require avoidance of wetlands and compensation for wetland loss is more than five years overdue.⁵

Fact #4: The volume of oilsands tailings will continue growing until 2060 because of inadequate regulations and enforcement.

For the first 40 years of oilsands operations, tailings treatment and management was conducted on a largely voluntary basis. As a result, vast lakes of polluted wastewater accumulated on the landscape in Northern Alberta. In 2009, the provincial regulator introduced a new policy, Directive 074, that aimed to establish a more consistent and comprehensive approach to dealing with tailings waste, with the aim of eventually reducing the volume of tailings waste on the landscape.⁶

Oilsands proponents often point to the existence of Directive 074 as evidence that the industry is taking tailings management seriously. Since the directive was introduced, however, it has not been enforced, and most projects are not meeting the standards it established.

Because it is not being enforced and because its design was limited to only require operators to reduce a portion of the volume of future tailings waste, tailings volumes continue to grow today, as illustrated in the figure below.



Figure 2. Growth of tailings lakes by surface area since 2005

Data source: Peachey; Pembina Institute; Alberta Environment & Sustainable Resource Development⁷

Even if Directive 074 were fully enforced, it would not result in absolute reductions of tailings, as it does not address the “legacy tailings” that have been allowed to accrue over the past 45 years.⁸ There are still no regulations in place to address legacy tailings. Under the current tailings policies, even with some of the companies making progress in reducing future production of liquid tailings, tailings lakes on the surface will grow until 2060 when the volume will finally stabilize and potentially trend downwards.⁹

⁵ Pembina Institute, “Oilsands Industry Blocks New Wetland Protection Rules,” media release, September 16, 2008. <http://www.pembina.org/media-release/1697>

⁶ Government of Alberta, “Alberta’s Oil Sands: Tailings” (2012). <http://www.oilsands.alberta.ca/tailings.html>

⁷ *Strategic Needs for Energy Relate Water Use Technologies; Clearing the Air on Oilsands Myths*; “Total Tailings Ponds Surface Area.”

⁸ Energy Resources Conservation Board, *Directive 074 Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes* (2009). ercb.ca/directives/Directive074.pdf

⁹ R.H. Houlihan and C. E. Hale, “Alberta mine reclamation and abandonment requirements,” in *Mine Closure 2011, Proceedings of the Sixth International Conference on Mine Closure*, September 18 to 21, 2011, Alberta, Canada, vol. 2, 13. (Based on data from 2009 ERCB Directive 74 submissions.)

In the meantime, toxic wastewater seeps out of tailing lakes at an estimated rate of more than 11 million litres per day.¹⁰ While the public is assured that industry is monitoring and capturing seepage,¹¹ there is little publicly available information that could substantiate these claims.

Fact #5: In situ developments may affect a much larger land area than oilsands mining.

While the direct area cleared for in situ development is currently less than for mining, in situ developments also result in additional impacts from habitat fragmentation and through greater natural gas use, not to mention the potential scale of future in situ developments. Production from in situ development is projected to surpass that of bitumen from mining projects by 2015.¹²

Oilsands producers claim that in situ has a much lower impact on the landscape than surface mining,¹³ yet the accumulation of impacts means the potential area affected by in situ development is actually about 30 times larger than the area that could be mined.¹⁴

In situ development disturbs and fragments the land in a variety of different ways including the extensive networks of pipelines, roads, power lines, seismic lines and well pads that are required to extract and transport the resource to upgrading and refining. The wildlife populations in fragmented landscapes are susceptible to isolation and various features of the local ecosystem can be adversely impacted, including a shift in predator–prey dynamics.¹⁵ Species that require intact habitats, like woodland caribou, are most likely to be adversely affected by habitat fragmentation.¹⁶

Fact #6: Undue reliance on the economic rollercoaster of oilsands development puts Canada's economy at risk.

Relying on the volatile profits from oilsands projects to fund government and social programs creates both immediate and long-term financial risks for both the private and public sector. Yet that message has yet to sink in among decision makers in Ottawa and Alberta, where relying on revenues from resource development — primarily oil and gas — is a common practice, and one that can lead to economic challenges when revenues fall short of expectations.

¹⁰ Royal Society of Canada Expert Panel, *Environmental and Health Impacts of Canada's Oil Sands* (2010), 123. <http://rsc-src.ca/en/expert-panels/rsc-reports/environmental-and-health-impacts-canadas-oil-sands-industry>

¹¹ Canadian Association of Petroleum Producers, “Environment: Water,” *Upstream Dialogue: The Facts on Oil Sands*. <http://appstore.capp.ca/oilsands/page/tailings-ponds-2012-01-23-03-01-23>

¹² Energy Resources Conservation Board, *Alberta's Energy Reserves 2011 and Supply/Demand Outlook—Overview* ST98-2012 (2012).

¹³ “Environment: Land,” *Upstream Dialogue: The Facts on Oil Sands*.

¹⁴ Pembina Institute, *Mining vs. In Situ Fact Sheet* (2010). <http://www.pembina.org/pub/2017>

¹⁵ Sarah M. Jordan, David W Keith and Brad Stelfox, “Quantifying Land Use of Oil Sands Production: A Life Cycle Perspective.” *Environmental Resource Letters*. (2009), 3. http://iopscience.iop.org/1748-9326/4/2/024004/pdf/1748-9326_4_2_024004.pdf

¹⁶ S.J. Dyer, J.P. O'Neill, S.M. Wasel and S. Boutin, “Avoidance of Industrial Development by Woodland Caribou.” *Journal of Wildlife Management* (2001).

The federal government regularly emphasizes the economic benefits of oilsands production,^{17,18} however, others have cautioned against betting too heavily on the current boom while ignoring the perils of the “roller coaster.”^{19,20}

Alberta’s experience with oil price volatility stands as a cautionary tale. Alberta’s GDP growth exceeded all other provinces from 2003 to 2007 but experienced the largest drop in GDP growth during the recent recession when it went from plus 6.5 per cent in 2006 to minus 4.8 per cent in 2009.²¹ Between 2008 and 2009, oilsands investments in Alberta dropped by nearly 50 per cent, or \$10.1 billion.²²

Analysis from the C.D. Howe Institute found that, from 1981 to 2007, the volatility of Alberta’s government revenues was twice that of B.C., Saskatchewan or Ontario. However, when resource revenue is excluded from revenue calculations, Alberta’s income is no more volatile than that of other provinces — a clear indication that Alberta’s revenue volatility comes from its oil and gas revenue,²³ which is increasingly dominated by oilsands revenues.

Among natural resource production in Canada, the dominance of the oilsands sector magnifies the risk of relying too heavily on resource revenues. Over the past 15 years, oil has risen from 18 per cent to 46 per cent of total Canadian commodity production — nearly as much as forestry, mining, agriculture and natural gas development combined.²⁴

The growth in oilsands development represents another risk to Canada’s economy, in that the costs and benefits of oilsands expansion are not distributed evenly across the country. In 2008, the OECD said that oilsands development is “generating large regional disparities” and that Canada’s system of equalization payments among provinces may be inadequate to address the growing gaps.²⁵ These disparities are particularly noticeable in Ontario and Quebec, where the manufacturing sector has gradually declined while the natural resource industry has boomed. Consequently, resource-rich provinces like Alberta have increased their dominance of Canadian exports, outperforming the traditionally strong manufacturing base. This does not mean that the oilsands are entirely responsible for the decline of manufacturing in central Canada,²⁶ rather, it indicates that clear winners and losers are being established in the Canadian economy.

¹⁷ Joe Oliver, “Forging New Paths Toward Canada’s Energy Future,” speech, Calgary Chamber of Commerce, January 25, 2012. <http://www.nrcan.gc.ca/media-room/speeches/2012/13/3703>

¹⁸ Joe Oliver, “Announcement: Completion of an Important Milestone for the Joslyn North Mine Project,” speech, Ottawa, Ont., December 8, 2011. <http://www.nrcan.gc.ca/media-room/speeches/130/3360>

¹⁹ Paul Boothe, “The natural resources economy is a roller-coaster ride,” *Canada.com*, November 22, 2012. <http://o.canada.com/2012/11/22/opinion-the-natural-resource-economy-is-a-roller-coaster-ride/>

²⁰ Richard Blackwell, “Alberta Finance Minister warns on overspending,” *Globe and Mail*, February 15, 2012.

²¹ Statistics Canada, CANSIM Table 379-0025.

²² Alberta Energy, “Facts and Statistics,” *About Oil Sands*. <http://www.energy.alberta.ca/oilsands/791.asp>

²³ Stuart Landon and Constance Smith, *Energy Prices and Alberta Government Revenue Volatility*, Commentary 313 (C.D. Howe Institute, 2010), 20. www.cdhowe.org/pdf/Commentary_313.pdf

²⁴ Mark Carney, “Dutch disease,” Speech, Spruce Meadows Round Table, September 7, 2012. <http://www.bankofcanada.ca/wp-content/uploads/2012/09/remarks-070912.pdf>

²⁵ OECD, *OECD Economic Surveys: Canada* (2008), 109. http://www.oecd.org/document/3/0,3746,en_2649_34111_40732867_1_1_1_1,00.html

²⁶ A struggling American and global economy as well as a shift in manufacturing to developing nations has also reduced the competitiveness of Canada’s exporting sector.