

Q&As
Life Cycle Analysis of North American and Imported
Crude Oils Reports
Alberta Energy Research Institute (AERI)

1. What is Life Cycle Analysis?

Life Cycle Analysis (LCA) is a technique for estimating greenhouse gas (GHG) emissions of transportation fuels that takes into account its life cycle from resource production, transportation, refining and end-use.

These reports assessed the “Well-to Wheel” impact of crude oils, which is the evaluation of greenhouse gas emissions (GHG) released from production (i.e. the "well") to the use of fuel in a vehicle (i.e. the "wheels").

2. Why was this research conducted?

The reports compared, in a fair and transparent manner, the life cycle GHG from Alberta’s oil sands with emissions from other major crude oil imports and domestic production in the U.S.

This is the first scientific comparison of GHG emissions from domestic, imported and oil sands oils processed in U.S. refineries, where individual energy pathways were modeled in detail.

3. What are the reports about?

The reports are made up of two independent studies that examined the life cycle of GHG emissions from Alberta’s oil sands crude oil with other crude oils that are produced or imported into the U.S. for refining.

The studies were funded by the Government of Alberta through the Alberta Energy Research Institute (AERI). The research was conducted over the past year by U.S.-based consulting companies, Jacobs Consultancy and TIAX LLC.

4. Did the reports focus on direct or indirect emissions?

Both reports focused on direct emissions only, not indirect. Direct emissions include emissions released during production and indirect emissions are emissions released indirectly, for example, in land use, exploration, production and waste streams.

5. **What are some of the key findings within the reports?**

The study found that GHG emissions for oil production, transportation and will depend on several factors including location, reservoir depth and oil quality. In addition, emissions from conventional oil will continue to grow as we progress from primary to secondary and tertiary recovery and will produce in many of the world's oil-producing regions.

The reports also found that direct emissions from the oil sands are generally about 10% higher than direct emissions from other crudes in the U.S. refineries but, when cogeneration is taken into consideration, it is likely that oil sands crudes are on par with conventional crudes in terms of GHG emissions.

6. **What is cogeneration?**

Cogeneration is the use of a power source to simultaneously generate both electricity and heat.

The heat is used to generate steam. In order to meet the steam demand, cogeneration results in surplus power that is either used in oil sands operations or sent to the power grid.

7. **Did the study solely focus on the production of conventional and oil sands crude oil?**

These studies did not focus on production only. The research examined the entire spectrum of GHG emissions from oil production to transportation and refining. GHG emissions are based upon several factors, such as the location, reservoir depth and quality, technology and the water-to-oil ratio utilized during production.

8. **Will this study help improve Alberta's reputation in the global community in terms of energy development?**

These reports enhance and strengthen Alberta's global position and demonstrate that the province is on the right track when it comes to advancing technologies like carbon capture and storage, gasification and novel bitumen upgrading.

These studies provide a rational approach for decision makers and establish a basis for the next phase of work to evaluate technology pathways that reduce GHG emissions.

With conventional oil production becoming more difficult and resulting in higher GHG emissions, Alberta's commitment to technology is helping lower the greenhouse gases produced by the oil sands. Alberta is positioned to be a leader in responsible and environmentally sustainable energy

development based on our collaborations with industry on advancements in technology and innovation.

9. **Are there plans to share the results of these reports internationally?**

These studies were always intended to be publicly available, including the assumptions, data sources and models. Open presentations were made at the final stage of the studies to an international audience of industry and government stakeholders.

10. **The Government of Alberta has committed to a number of energy related studies over the past number of years. How are the findings of these studies being applied in the field?**

The Government of Alberta, through the Alberta Energy Research Institute, has commissioned or supported several technology roadmaps, such as Clean Coal, Carbon Capture and Sequestration, and the Alberta Chamber of Resources “Oil Sands Technology Roadmap”.

Past reports have identified the technological challenges and gaps that need to be addressed in order to accelerate their commercial deployment. These latest reports are intended to keep the debate on the continued production of clean fossil fuels at a scientific level.

11. **Will the findings of these independent studies result in more industry investment in technologies?**

These studies have addressed public perceptions of oil sands development and were not intended to absolve industry in its commitment to clean energy production. They have generated significant interest from industry and other stakeholders.

However, markets and economic conditions drive industry investment. Alberta has been successful in terms of energy development because of industry’s dedication to exploring new and innovative technologies.

12. **If conventional oil production is becoming more difficult and oil sands production is increasing, can Alberta realistically meet its targets to reduce greenhouse gas emissions?**

In its updated Climate Change Action Plan, the Government of Alberta made a commitment to reduce its greenhouse gas emissions by 50 percent from projected 2050 levels.

Alberta will be able to achieve this target, with the commercial deployment of new technologies such as Carbon Capture and Storage, improvements in

energy efficiencies, energy conservation and the development of renewable and alternative energy sources.

13. Do the Jacobs and TIAX reports represent a new standard for the analysis of GHG emissions from oil production and use across the world?

Alberta's intention through the Life Cycle Analysis is the pursuit of facts and ensuring that all jurisdictions have access to strong baseline data that focuses on scientific facts and research.

These reports are about enhancing the ability to make strategic decisions with respect to sustainable energy development across the world based upon scientific and technical analyses. The two reports allow the debate about addressing climate change to continue at a scientific and technical level.