

MAKING PROGRESS ON CANADIAN OIL SANDS CO₂ EMISSIONS INTENSITY

Average CO₂ emissions per oil sands barrel has declined by over 32 percent since 2000

Overview

As news reports and interest about the Canadian oil sands continues, it is a good time to evaluate the sector's progress in reducing carbon dioxide (CO₂) emissions intensity.

In this CEC Fact Sheet, we use data on projected direct upstream CO₂ emissions intensity drawn from Rystad Energy's UCube and EmissionsCube to assess trends in the CO₂ emissions intensity of Canada's oil sands sector between 2000 and 2022.

Background on Rystad Energy's UCube and EmissionsCube

Rystad Energy is an independent energy research company providing data, analytics, and consultancy services to clients around the globe.¹

UCube is Rystad Energy's global upstream database. It includes production and economics (costs, revenues, and valuations) for more than 85,000 assets covering the portfolios of more than 3,500 companies. Policymakers use the UCube dataset to study all parts of the global exploration and production (E&P) activity value chain, including operational costs, investment (capex and opex), fiscal terms, and net cash flows for projects and companies, both globally and by country (Rystad, 2023b).

Rystad's EmissionsCube enables the study of CO_{2e} emissions from upstream activity down to the asset level.

Through the EmissionsCube, countries, companies, assets, basins, and fields can be compared with each other on their upstream emissions and emissions intensity. Specifically, EmissionsCube can help policymakers:

- Compare companies in order to understand their emission performance and assess risks.
- Understand the relative ranking of countries, operators, and companies (taking ownership into account) globally, and the changes or initiatives that will improve emission performance.
- Identify the high-emitting parts of an operation and, from that, develop ESG strategies to both meet increasing demands for disclosure and emission reduction goals.
- Assess the impact of emissions on various companies' competitiveness (Rystad, 2023a).

Examining oil sands CO₂ emissions intensity

This Fact Sheet defines upstream CO₂ emissions as those originating from on-site emissions, both extraction and flaring. Extraction includes production drilling; all emissions related to on-site processing; and gathering and boosting.

This Fact Sheet defines CO₂ emissions intensity as the amount of CO₂ emitted, expressed in kilograms (kg), per barrel of oil equivalent (boe) produced (i.e., kg CO₂ per boe produced). A declining CO₂ emission intensity figure means that less CO₂ is being created per boe produced.

¹ The written content in this report was prepared by the authors at the Canadian Energy Centre (CEC) and does not represent the views of Rystad Energy

Focusing on emissions per boe produced is a realistic means of establishing a meaningful target for the oil sands industry in Canada.

Average CO₂ emissions per oil sands barrel produced in Canada has declined by over 32 percent since 2000

Canada's oil sands sector has made considerable progress in reducing its CO₂ emissions intensity since 2000.

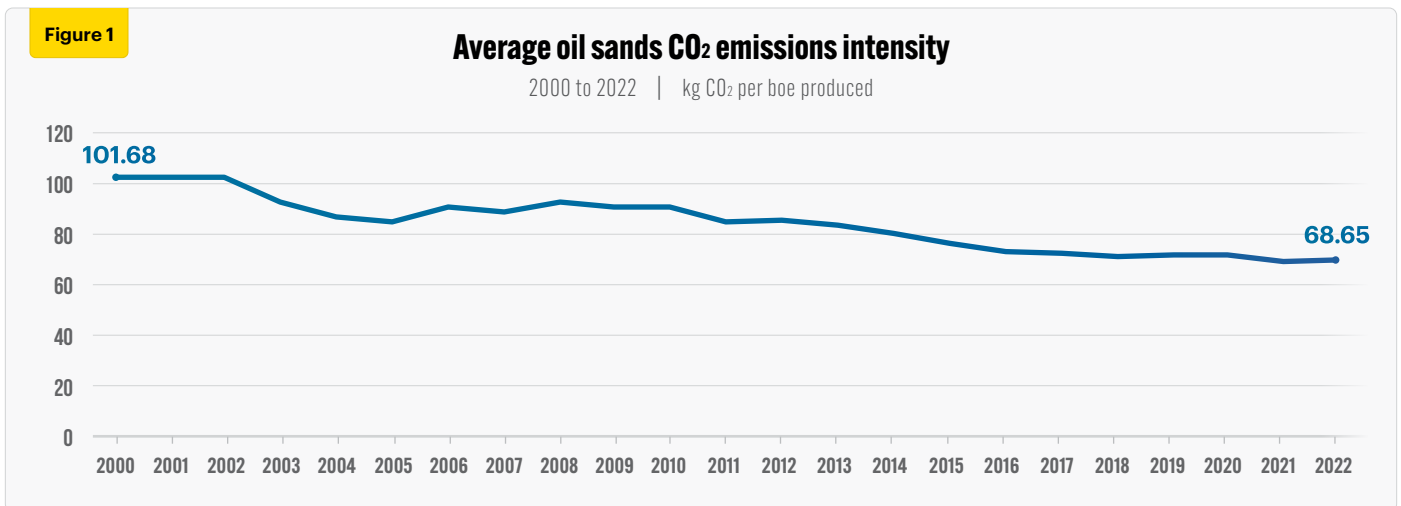
The overall rate fell from 101.7 kg CO₂ per boe produced in 2000 to 68.7 kg CO₂ per boe produced in 2022, a decline of 32.4 percent (see Figure 1).

Average oil sands (mining) CO₂ emissions per barrel produced in Canada declines by over 40 percent since 2000

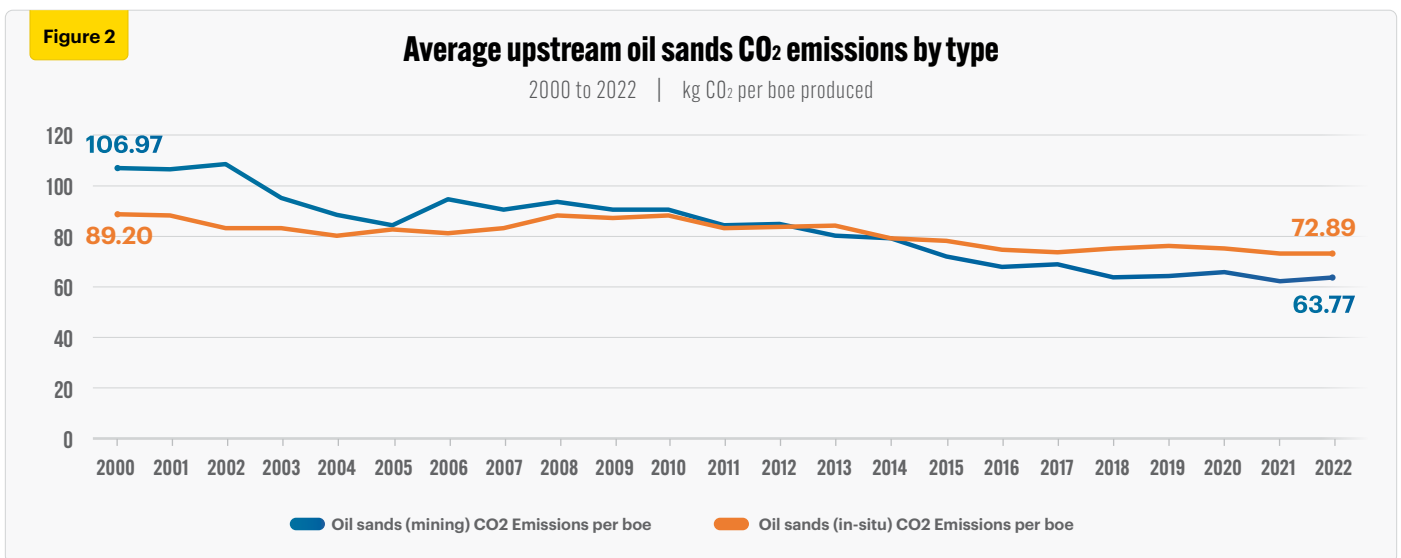
An examination of upstream oil sands CO₂ emissions intensity by type reveals some interesting trends.

The average emissions intensity of oil sands (in-situ) fell from 89.2 kg CO₂ per boe produced in 2000 to 72.9 kg CO₂ per boe produced in 2022, a decline of 18.3 percent.

Meanwhile, the average emissions intensity of oil sands (mining) fell from 107.0 kg CO₂ per boe produced in 2000 to 63.8 kg CO₂ per boe produced in 2022, a decline of 40.4 percent (see Figure 2).



Source: Derived from the Rystad Energy UCube and EmissionsCube.



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Notes

This CEC Fact Sheet was compiled by Lennie Kaplan at the Canadian Energy Centre (www.canadianenergycentre.ca). The author and the Canadian Energy Centre would like to thank and acknowledge the assistance of two anonymous reviewers in reviewing the original data and research for this Fact Sheet. Photo credit: Courtesy Imperial Oil. Haulers at the kearl oil sands project.

References (All links live as of August 28, 2023)

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