CARBON CAPTURE, UTILIZATION AND STORAGE (CCUS) WILL SPEARHEAD ENERGY TRANSFORMATION

Global CCUS spending projected at over US \$256 billion to date between 2023 and 2030

Overview

There has a lot of discussion about the role that carbon capture, utilization and storage (CCUS) will play in reducing global greenhouse gas emissions.

In this Canadian Energy Centre (CEC) Fact Sheet, using the Rystad Energy CCUS Solution, we examine projected trends in global and Canadian carbon capture capacity and spending to date between 2023 and 2030.

The written content in this report has been prepared by the CEC and does not represent the views of Rystad Energy.

Background on the Rystad Energy CCUS Solution

The Rystad Energy CCUS Solution provides data covering carbon capture, transportation, and storage for both commercial and pilot projects, including analysis of such key indicators as carbon capture capacity and spending to date on CCUS.

These capabilities allow us to analyze short- and long-term CCUS capacity and spending to date under various global decarbonization scenarios, including net zero (Rystad Energy, 2023).

Potential for CCUS to capture 623 mtpa of CO₂ globally through 2030

According to Rystad Energy, at the end of 2022, there were 65 commercial CCUS projects in operation globally capable of capturing nearly 41 million tonnes per annum (mtpa) of CO_2 across various industries, including the oil and gas sector.

There are another 478 projects in various stages of development in the global pipeline that will be capable of capturing roughly another 559 mtpa. Some of these projects are currently in various stages of development, including in the feasibility stage, while others are in the concept and construction phases (Rystad Energy, 2023).

Figure 1 breaks down global carbon capture capacity by sector. By 2030, it is estimated that nearly 500 CCUS projects could be operation worldwide, having the ability to capture 623.0 mtpa of CO₂, if all projects move ahead as scheduled (see Figure 1).

In fact, between 2023 and 2030, global carbon capture capacity could grow from 43.5 mtpa to 623.0 mtpa, an increase of over 1,332 percent.

Oil and gas sector global carbon capture capacity will reach over 140 mtpa by 2030

Beyond carbon capture capacity that is still being evaluated, the sectors which are expected to experience the greatest growth between 2023 and 2030 are hydrogen production (5.5 mtpa rising to 98.7 mtpa); gas processing (24.7 mpta rising to 110.0 mtpa); and coal power generation (3.0 mtpa rising to 55.0 mtpa).

Carbon capture capacity in oil refining is anticipated to grow from 1.4 mtpa in 2023 to 30.4 mtpa in 2030, meaning that carbon capture capacity in oil refining and gas processing combined will grow from 26.1 mtpa to 140.4 mtpa (see Figure 1).

Global spending on CCUS could reach over \$256 billion to date through 2030

Projected spending to date on CCUS is set to expand significantly between 2023 and 2030, increasing from \$4.7 billion in 2023 to \$37.7 billion in 2030, an increase of about 702 percent. In fact, cumulative spending to date on CCUS between now and 2030 is projected at over \$256 billion (see Figure 2).

About 52 percent of cumulative CCUS spending to date between 2023 and 2030 (about \$133 billion) will go towards the CO₂ capture segment. Spending on CO₂ capture rises from \$2.6 billion in 2023 to \$14.4 billion in 2030, an increase of nearly 4,539 percent (see Figure 2).



Source: Derived from the Rystad Energy CCUS Solution

Transport is the second largest segment of projected CCUS spending between 2023 and 2030, at about 28 percent of total spending, or \$72.5 billion cumulative.

The storage segment will see projected spending of 20 percent, or \$51.0 billion cumulative through 2030 (see Figure 2).

According to Rystad Energy, North America and Europe are expected to continue to dominate the global CCUS market through 2030 (see Figure 3).



Source: Derived from Rystad Energy CCUS Solution



Source: Rystad Energy research and analysis, CCUS Market dashboard

*Based on announced commercial projects

Implications for Canada

Global carbon capture capacity and worldwide spending to date trends underline the fact that the future is bright for Canadian investments in CCUS. Assuming that appropriate government policies and regulations are put in place, Canada can expect to see further project announcements and increased investment. In fact, according to Rystad Energy, "Canada will likely emerge as a CCUS heavyweight given the prevailing policy environment and the existential need for oil sands players to decarbonize. Rystad Energy estimates that Canada alone could account for around 20% of cumulative carbon capture demand between 2023 and 2030" (see Figure 4).



Notes

This CEC Fact Sheet was compiled by Lennie Kaplan at the Canadian Energy Centre (<u>www.canadianenergycentre.ca</u>). The author and the Canadian Energy Centre would like to thank and acknowledge the assistance of two anonymous reviewers in reviewing the data and research for this Fact Sheet. Image credits: The Glacier gas plant near Grande Prairie, Photograph supplied for Canadian Energy Centre.

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References (links live as of March 8, 2023)

Rystad Energy (2023a). CCUS Solution. 2023. <<u>http://bit.ly/3YT5Hlu</u>>. Rystad Energy (2023b). Five key trends to watch in Canada's upstream oil and gas sector in 2023. <<u>https://bit.ly/3YT5Hlu</u>>.

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