

Carbon Capture and Storage Decarbonization

Gas & LNG Energy Investment Trends

Australia, New Zealand & Pacific Islands Europe

United Arab Emirates United States UK Canada

Carbon capture: a decarbonisation pipe dream

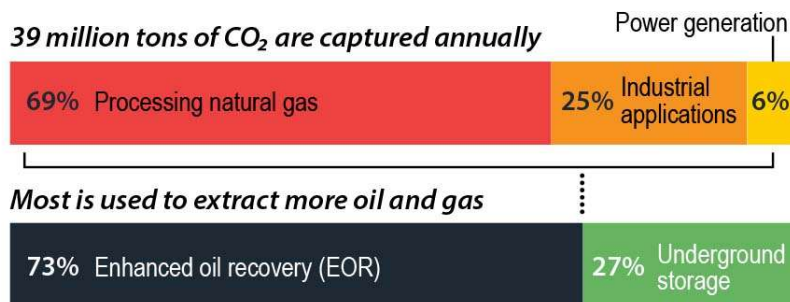
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Carbon Capture Efforts Are in Service to Big Oil

Nearly three quarters of CO₂ captured annually is reinjected into oil fields to push more oil and gas out of the ground

39 million tons of CO₂ are captured annually



Most is used to extract more oil and gas

Sources: Global CCS Institute, IEEFA analysis

IEEFA

Relearning lessons of the past

1 September 2022 (IEEFA): Underperforming carbon capture projects considerably outnumber successful projects globally, and by large margins, with both the

The report, [The Carbon Capture Crux – Lessons Learned](#), studies 13 flagship large-scale carbon capture and storage (CCS)/carbon capture utilisation and storage (CCUS) projects in the natural gas, industrial and power sectors in terms of their history, economics and performance. These projects account for around 55% of the total current operational capacity worldwide.

Author Bruce Robertson says seven of the thirteen projects underperformed, two failed, and one was mothballed

“CCS technology has been going for 50 years and many projects have failed and continued to fail, with only a handful working.

“Many international bodies and national governments are relying on carbon capture in the fossil fuel sector to get to Net Zero, and it simply won’t work.

“Although some indication it might have a role to play in hard-to-abate sectors such as cement, fertilisers and steel, overall results indicate a financial, technical and emissions-reduction framework that continues to overstate and underperform.”

IEEFA’s study found that Shute Creek in the U.S. underperformed its carbon capture capacity by around 36% over its lifetime, Boundary Dam in Canada by about 50%, and the Gorgon project off the coast of Western Australia by about 50% over its first five-year period.

environment for oil and gas companies," says co-author Milad Mousavian.

"Governments globally are looking for quick solutions to the current energy and ongoing climate crisis, but unwittingly latching onto CCS as a fix is problematic."

Last week the Australian government approved two new massive offshore greenhouse gas storage areas, [saying](#) CCS "has a vital role to play to help Australia meet its net zero targets. Australia is ideally placed to become a world leader in this emerging industry".

However, Robertson says, carbon capture technology is not new and is not a climate solution.

"As our report shows, CCS has been around for decades, mostly serving the oil industry through enhanced oil recovery (EOR). Around 80–90% of all captured carbon in the gas sector is used for EOR, which itself leads to more CO₂ emissions."

About three-quarters of the CO₂ captured annually by multi-billion-dollar CCUS facilities, roughly 28 million tonnes (MT) out of 39MT total capture capacity globally, is reinjected and sequestered in oil fields to push more oil out of the ground.

The International Energy Agency [says](#) annual carbon capture capacity needs to increase to 1.6 billion tonnes of CO₂ by 2030 to align with a net zero by 2050 pathway.

recovery," says Robertson.

History shows CCS projects have major financial and technological risks. Close to 90% of proposed CCS capacity in the power sector has failed at implementation stage or was suspended early — including Petra Nova and the Kemper coal gasification power plant in the U.S. Further, most projects have failed to operate at their theoretically designed capturing rates. As a result, the 90% emission reduction target generally claimed by the industry has been unreachable in practice.

Finding suitable storage sites and keeping it there is also a major challenge—the trapped CO₂ underground needs monitoring *for centuries* to ensure it does not come back to the atmosphere.

The report identifies interim considerations for CCS projects if no alternative solutions to emissions reduction are found.

- Safe storage locations must be identified, and a long-term monitoring plan and compensation mechanism in case of failure developed.
- The CCS project must not promote enhanced oil recovery.
- To avoid project liability being handed over to taxpayers, as is currently the situation with Gorgon, large oil and gas companies mainly benefiting from CCS at their gas developments must be liable for any failure/leakage and monitoring costs of CCS projects, specifically if

or extend the life of any type of fossil fuel asset as a climate solution.

Robertson says more research could be done on CCS applications in industries where emissions are hard to abate such as, cement, as an interim partial solution to meeting net zero targets.

“As a solution to tackling catastrophic rising emissions in its current framework however, CCS is not a climate solution.”

Read the report: [The Carbon Capture Crux – Lessons Learned](#)

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