



- Analysis
- Carbon Capture and Storage
- Decarbonization
- Gas & LNG
- Coal
- Energy Investment Trends
- Australia
- UK
- United States
- United Arab Emirates
- Europe

Carbon capture remains a risky investment for achieving decarbonisation

September 02, 2022
Bruce Robertson

[View Press Release](#)

Key Findings

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.

The 90% emission reduction target generally claimed by the industry has been unreachable in practice

Underperforming carbon capture projects considerably outnumber successful projects globally, and by large margins.

First commercialised in the 1970s, carbon capture technology has predominantly been used by gas companies to separate CO₂ from the raw gas drawn from wells. This creates the product we know -- 'natural gas'.

Today, over 70 percent of carbon capture projects are used for enhanced oil recovery. Oil and gas companies driven by the need for profit use the captured CO₂ to pump more oil and/or gas out of depleted wells, resulting in yet more greenhouse gas emissions.

So, is the global push for new carbon capture projects an emissions-reduction solution, or is it greenwash and a subsidy harvesting exercise to extend the life of fossil fuel assets?

A new [study](#) by the Institute for Energy Economics and Financial Analysis (IEEFA) reviewed 13 carbon capture projects from around the world, accounting for around 55% of the total current operational capacity worldwide, has found both the technology and regulatory framework wanting.

The carbon capture and storage/carbon capture utilisation and storage projects (CCS/CCUS) projects stemmed from the natural gas, industrial and power sectors, and were reviewed in terms of their history, economics and performance.

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.

Of the 13 large-scale projects, seven underperformed, one was questionable, and only two projects in the gas processing sector in Norway demonstrated what could be called success, which was mostly due to the country's unique regulatory environment for oil and gas companies.

The power sector had the worst results, with two failing,

The power sector had the worst results, with two failing, and one that was mothballed

and one that was mothballed. There is not one successful project in this sector.

Although there was some indication in the review that carbon capture technology 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.

The Australian government in August 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, carbon capture technology is not new and is not a climate solution. CCS has been around for decades, mostly serving the oil industry through enhanced oil recovery.

About nearly three-quarters of all 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.

Many international bodies and national governments are relying on carbon capture in the fossil fuel sector to get to Net Zero.

This is unfortunate, because at this stage of the game, it simply won't work.

At this stage of the game, it simply won't work

The quick fix isn't there without massive government investment and regulatory frameworks being established, and even then, fossils fuels will still be releasing more emissions than are being captured.

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.

In addition to being wildly unrealistic as a climate solution, based on historical trajectories, much of this captured carbon will be used for enhanced oil recovery.

At a local level, it is simply not possible to put CCS on domestic gas usage. The very concept of having CCS mechanism on your gas stove, hot water system or heating is absurd.

Up to 90% of all emissions from gas usage occur when the gas is actually burnt. CCS is incapable of addressing the lion's share of emissions that occur from natural gas usage.

CCS technology has been going for 50 years and many projects have failed and continued to fail – like Western Australia's Gorgon -- with only a handful working.

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.

Governments must look at 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 they get subsidies, grants and tax credits for capturing the carbon.

- It must not be used by governments to greenlight or extend the life of any type of fossil fuel asset as a climate solution.

While 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, CCS is not a climate solution.

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.

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

This analysis first appeared in [Renew Economy](#)



Bruce Robertson

Bruce Robertson has been an investment analyst, fund manager and professional investor for over 36 years. He has worked with Perpetual Trustees, UBS, Nippon Life Insurance and BT. He has appeared as an expert witness before a number of government enquiries into energy issues.

[Go to Profile](#)

Analysis

Analysis

Re



Relief in sight from Australia's skyrocketing electricity prices

December 16, 2022
Johanna Bowyer



الشرق الأوسط وشمال أفريقيا - مركزًا جديدًا محتملاً للصلب الأخضر والمواد الخام الحديدية

December 15, 2022
Soroush Basirat

46
45
44
43
42
41
40
39
38
37
36
35

Join our newsletter

Keep up to date with all the latest from IEEFA

Subscribe

Newsroom

- All News
- Press Releases
- World Energy News
- IEEFA in the Media
- Media Inquiries

Research

- All Research
- Reports
- Analysis
- Explore

About

- What We Do
- Who We Are
- Conference
- Employment

Get in Touch

- Contact Us
- Feedback
- Subscribe

Contact us

INSTITUTE FOR ENERGY ECONOMICS AND FINANCIAL ANALYSIS

14900 Detroit Avenue Suite 206
Lakewood, OH 44107

T: 216-712-6612
E: staff@ieefa.org



