

Fact Sheet:

Carbon Capture and Storage (CCS) has a poor track record

IEEFA found that CCS has a long history of failure and underperformance:

- Three projects have failed
- Five projects underperformed materially compared to their own targets
- Two projects refused to publish data

Only three projects were performing close to capacity (though two of these have faced problems - see overleaf)

Carbon Capture and Storage (CCS) projects' poor report card

Project	Capacity (MtCO ₂ p.a.)	Performance
Natural Gas processing		
 1986 Shute Creek	7	Lifetime under-performance of 36%
 1996 Sleipner	0.9	Performing close to the capture capacity
 2004 In Salah	1.1	Failed after 7 years of operation
 2007 Snøhvit	0.7	Performing close to the capture capacity
 2019 Gorgon	4	Lifetime under-performance of ~50%
Industrial sector		
 2000 Great Plains	3	Lifetime under-performance of 20-30%
 2013 Coffeyville	0.9	No public data was found on the lifetime performance.
 2015 Quest	1.1	Performing close to the capture capacity
 2016 Abu Dhabi	0.8	No public data was found on the lifetime performance.
 2017 Illinois Industrial (IL-CCS)	1	Lifetime under-performance of 45-50%
Power sector		
 2014 Kemper	3	Failed to be started
 2014 Boundary Dam	1	Lifetime under-performance of ~50%
 2017 Petra Nova	1.4	Suspended after 4 years of operation

In Australia, the Gorgon CCS project has failed to deliver, underperforming its targets for the first five years by about 50%. In FY2022-23, it injected just 34% of the 5 million tonnes of CO₂ (MtCO₂) it captured. The Gorgon partners have spent more than A\$3 billion on the CCS facility since it started seven years ago. Globally, the maximum capture rate achieved by CCS to date appears to be 83%, well below the 90%-95% presented as feasible by the oil and gas industry.

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The Carbon
Capture Crux-
Lessons Learnt



Norway's Sleipner
and Snøhvit CCS:
Industry models or
cautionary tales?



Norwegian ‘success stories’ demonstrate material ongoing risks of CCS

Sleipner

- CO₂ migrated upwards faster than expected
- Unexpectedly large quantities moved into a previously unidentified shallow layer (Layer 9)
- Had Layer 9 not been geologically bounded, CO₂ may have escaped
- Layer 9’s horizontal boundaries remain unknown

Snøhvit

- The targeted formation was supposed to have 18 years capacity
- Only 18 months into operations, pressure rose precipitously, risking geologic failure
- Storage needed to be suspended
- The operators had to conduct remedial actions and seek alternative storage at great cost

CCS will only play a small role in achieving global climate goals

CCS sequestered about 0.1% of global energy-related CO₂ emissions in 2022. According to the Intergovernmental Panel on Climate Change (IPCC), CCS will account for an average of 2.4% of CO₂ mitigation by 2030, even if implemented at its full planned potential. Renewables, efficiency, electrification, and reducing fugitive methane emissions can address more than 80% of the world’s decarbonisation needs by 2030, according to the International Energy Agency (IEA) and IPCC.

CCS only deals with a fraction of oil and gas projects’ emissions, as it ignores the emissions when oil and gas is burned by the consumer, which represent 85%-90% of total emissions. In addition, about three quarters of CCS projects are engaged in enhanced oil recovery, which creates more emissions, negating the initial reduction.

Australia is financially exposed to CCS projects failure



Australia has limited protection against CCS projects failure. Longer-term bonding provisions are required to cover the cost of monitoring, maintenance and intervention post well closure.



About IEEFA

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