

CO₂ Removal and Gases: CCS Capture Rate

Carbon dioxide capture and storage (CCS) is gradually and steadily becoming an important concept to reduce greenhouse gas emissions from energy generation and transformation processes. This technology holds great promise for capturing up to 90% of the CO₂ emissions produced from the combustion of fossil fuels.

In CCS, CO₂ is extracted at some point in the energy conversion train, depending on the type of energy technology used. It is then prepared for transport and stored in a suitable geological sink, where it is kept for a sufficiently long period. Thus, CCS functions to limit or altogether prevent the release of CO₂ into the atmosphere as a result of combustion processes.

The capture rate of a process fitted with CCS indicate what proportion of the total CO₂ emitted by the process can be captured. That is , a capture rate of 100% means that all off the CO₂ emitted by the CCS-fitted process is captured.

In Nigeria, interest in the application of CCS technology for CO₂ removal is abysmally low at the moment but this scenario could change in the future.

Key Interaction

The application of CCS to a process can reduce overall efficiency since the process of capturing and storing carbon is energy-intensive. Thus, higher capture rates results in a greater loss of efficiency. Degree of deployment also impinges on the CCS capture rate. If no CCS is deployed, capture rate is unnecessary.

Level 1

CCS capture rate of up to 77% is attained for most applications in the country.

Level 2

CCS capture rate of up to 86% is attained for most applications .

Level 3

CCS capture rate of up to 93% is attained for most applications

Level 4

CCS capture rate of 100% is attained for all applications. That is, all emissions from CCS fitted processes are captured.

Default Timing - Start Year: 2035, End Year: 2050

Share of CO₂ Captured by CCS

Sub-lever	Units	2015	Level 1	Level 2	Level 3	Level 4
Metal Production	Share	0%	70%	84%	93%	100
Cement, Ceramics, Glass	Share	0%	74%	86%	90%	100
Chemicals	Share	0%	70%	80%	89%	100
Other Industry	Share	0%	72%	86%	92%	100
Refineries	Share	0%	73%	81%	88%	100
Biomass Gasification	Share	0%	68%	74%	82%	100
Bio liquid production	Share	0%	75%	82%	87%	100
Energy from waste	Share	0%	70%	85%	90%	100
Hydrogen from biomass	Share	0%	71%	80%	87%	100
Hydrogen from SMR	Share	0%	76%	83%	91%	100
Electricity from biomass	Share	0%	77%	81%	89%	100
Electricity from gas	Share	0%	70%	80%	92%	100

