CO_2 Removal and Gases: Greenhouse Gas Removal

Certain GHG removal methods are aimed at extracting CO_2 directly from the atmosphere as against capturing and storing it from point sources such as power plants, biomass plants, processing plants etc. before emission into the atmosphere. These methods include afforestation, direct air capture (DAC) and enhanced weathering (EW).

DAC uses an engineered mechanical system to capture CO_2 directly from the ambient air. It does this by pulling in atmospheric air, subjecting the air through a series of chemical reactions and extracting the carbon dioxide (CO_2) from it while returning the rest of the air to the environment. The captured CO_2 can be injected underground for permanent storage in certain geologic formations or used in various products and applications.

Certain types of rocks, especially silicates, can absorb CO_2 from the atmosphere but the rate of absorption is limited by the surface area of the exposed rocks, hence the process is naturally quite slow. Enhanced weathering technique is presently being explored as one of the possible means to speed up the CO_2 absorption process.

Typical enhanced weathering schemes involves distributing large amounts of crushed silicate materials on open land, which dissolve and, in doing so, take up CO_2. Over 2Gt CO_2 can be removed each year using this technique.

Level 1
No DAC systems are installed, and no EW techniques are applied in Nigeria.

Level 2
No DAC systems are installed, and no EW techniques are applied.

Level 3
Annual GHG removal of around one-sixth of Level 4 ambitions for DAC and EW techniques are envisaged.

Level 4
Annual GHG removal of around 63 $Mt.CO_2e/yr$ and 10 $Mt.CO_2e/yr$ for DAC and EW respectively are anticipated.

Key Interaction
Removal of CO_2 through these techniques require electricity. This electricity requirement can be provided by a renewable energy source to enhance emission reduction target.

Default Timing - Start Year: 2035, End Year: 2100

Carbon dioxide (CO_2) Captured

Sub-lever	Units	2015	Level 1	Level 2	Level 3	Level 4
Direct-Air Capture	$Mt.CO_2e/yr$	0	0	0	10	63
Enhanced Weathering	$Mt.CO_2e/yr$	0	0	0	2	12