

CO₂ Removal and Gases: Bio-Conversion with CCS

The production of various fuels through conversion of biogenic sources and wastes uses up energy and leads to the emission of CO₂ into the atmosphere. The organic materials used in the production of these fuels contains carbons, which are released as CO₂ on combustion or during the transformation process. Likewise, the direct combustion of wastes to generate electricity also releases CO₂.

When CCS is applied to bioconversion processes, the potential to effectively remove CO₂ from the atmosphere is heightened, resulting in a net zero emission of CO₂. The reason for this stems from the fact that biomass, from which the biofuels or electricity is derived, serve as a carbon sink during its growth. Combustion or processing of the biomass during bioconversion, re-release the CO₂ into the atmosphere, resulting in a net zero emission of CO₂. Thus, application of CCS prevents the CO₂ emissions from finding it way back to the atmosphere.

Presently, the level of bioconversion processes taking place in Nigeria is quite minimal and low-scale at the moment. At all locations where bioconversion is occurring, there is no CCS facility applied.

Level 1

Business-as-usual scenario continues i.e. no bio-conversion processes in Nigeria have CCS applied

Level 2

One-third of bio-conversion processes in Nigeria have CCS applied

Level 3

Two-thirds of bio-conversion processes in Nigeria have CCS applied

Level 4

All bio transformation processes in Nigeria have CCS applied.

Key Interaction

This lever controls how much CCS is applied across bio-conversion processes. The amount of CO₂ captured and stored is dependent on the capture rate and the demand for bio-methane and liquid biofuels.

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

Share of Bio-conversion Processes with CCS

Sub-lever	Units	2015	Level 1	Level 2	Level 3	Level 4
Bio-gasification	Share	0%	0%	33%	67%	100%
Bio liquid Production	Share	0%	0%	33%	67%	100%
Energy from Waste	Share	0%	0%	33%	67%	100%

