

# CO<sub>2</sub> Removal & Gases: Hydrogen Gas Grid Share

Hydrogen gas is a versatile energy carrier that has potential for extensive use in electricity generation for the industrial, building, transport and agricultural sectors. It is a gas with almost three times the energy contained in natural gas, and produces no emissions when burnt. Nigeria is yet to express serious interest in transiting to an hydrogen - fuelled economy,. This energy carrier is believed to hold the key to weaning the country of its over-dependence on carbon-intensive hydrocarbons.

The electricity sector in Nigeria is mainly based on natural gas plants. Approximately 85% of the grid-connected power plants are fossil fuel (natural gas) fired while the remaining 15% are hydro-electric power plants. This presumes that the conversion of the gas delivered from the distribution grid to hydrogen would allow all thermal plants connected to the grid to be powered by hydrogen, thus eliminating the emissions released from the combustion of fossil gas by these plants.

Hydrogen gas grid share in the present context describes the proportion of the gas grid that has been converted and re-purposed from natural gas to run on 100% hydrogen.

According to Nigeria Power Baseline report of 2015, about 292 BSCF of gas was delivered through the gas grid for power generation.

**Level 1**  
Present business-as-usual scenario continues up to 2050. That is, no portion of the gas grid is converted to deliver hydrogen gas.

**Level 2**  
About 10% of the gas grid is re-purposed to deliver 100% hydrogen

**Level 3**  
Around 45% of the gas grid is re-purposed to deliver 100% hydrogen

**Level 4**  
Entire gas delivery network in Nigeria is re-purposed to deliver 100% hydrogen.

**Key Interaction**  
Existing thermal plants running on natural gas will have to undergo some modifications that will enable them run on hydrogen gas. In the priority order for decreasing the carbon-intensity of the gas grid, hydrogen is considered as the first option .

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

| Sub-lever               | Units | 2015 | Level 1 | Level 2 | Level 3 | Level 4 |
|-------------------------|-------|------|---------|---------|---------|---------|
| Hydrogen Gas Grid share | Share | 0%   | 0%      | 10%     | 45%     | 100%    |

