CO_2 Removal & Gases: Hydrogen Gas Grid Share

This lever controls the sub-levers listed in the table, and ambition levels are for the end year shown on the right-hand side.

Hydrogen is a fuel that produces no CO_2 when combusted. It could be used for heating in buildings and industry and help to decarbonise the energy system if produced in a low-carbon way. Currently around 85% of homes are supplied by natural gas from the grid. Conversion of the gas grid to hydrogen would allow grid-connected buildings to be heated by hydrogen, therefore eliminating carbon emissions at the point of combustion.

In the Calculator, the hydrogen gas grid share represents the proportion of the grid that has been converted from natural gas to running on 100% hydrogen. In 2015, around 500TWh of gas was supplied through the distribution gas grid.

Processes currently running on natural gas such as residential boilers will require modification or replacement to run on hydrogen.

Key Interaction

H_2 production must be low carbon to derive benefits from switching to hydrogen. H_2 can be produced by biomass gasification with CCS, steam methane reformation with CCS, zero-carbon imports, or electrolysis.

If electrolysis is used to supply H_2, then enough low-carbon electricity is needed to ensure the H_2 conversion results in a reduction in emissions. If the electricity used is supplied from unabated natural gas, then overall emissions will increase. Hydrogen is above Biomethane in the priority order, should ambition for gas grid share exceed 100%.

Gas grid demand is affected by how we heat our buildings and power industry.

Level 1

None of the gas grid is converted to hydrogen.

Level 2

One third of the gas grid is converted to 100% hydrogen.

Level 3

Two thirds of the gas grid is converted to 100% hydrogen.

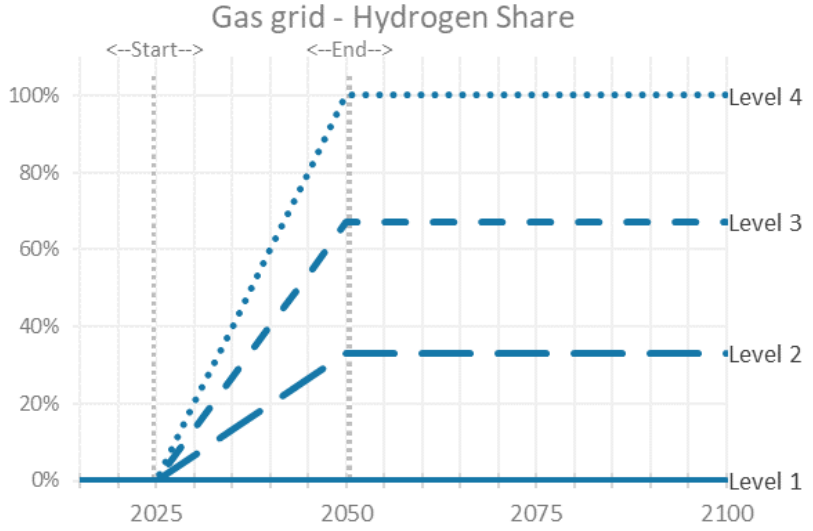
Level 4

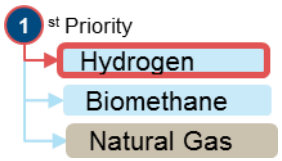
The entire gas grid in the UK is converted to 100% hydrogen.

Default Timing

Start year: 2025, End year: 2050

Sub-Lever	Units	2015	Level 1	Level 2	Level 3	Level 4
Hydrogen Gas Grid Share	share	0%	0%	33%	67%	100%





Lever Priority

Hydrogen is first in the priority order for decarbonising the gas grid.

Where supply would otherwise exceed demand, measures lower in the priority order will be superseded by those above them.

Natural gas will meet any shortfall in demand.