

Unlocking the hydrogen value chain

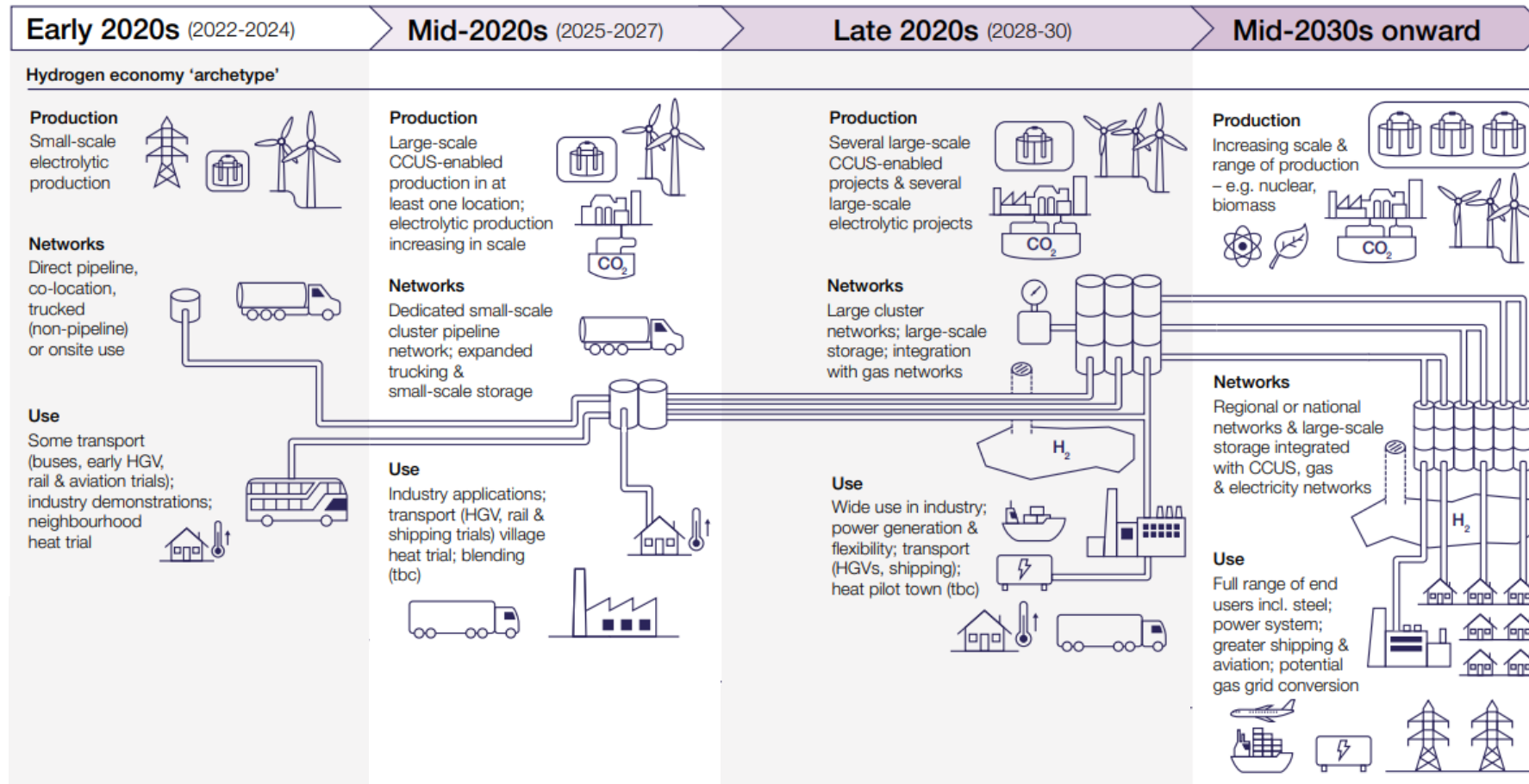
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UK Hydrogen Strategy

A whole system approach



2GW of hydrogen production in **construction or operation** by 2025

Up to **10GW** low-carbon hydrogen production by 2030

At least **5GW** of 2030 target from **electrolytic** production

Four CCUS Clusters operational by 2030

*UK Government Hydrogen Strategy, August 2021

PRESENCE ACROSS UK INDUSTRIAL CLUSTERS



KEADBY

- Carbon Capture Power Station
- Hydrogen Power Station



PETERHEAD

- Carbon Capture Power Station

ALDBROUGH

- Aldbrough Hydrogen Pathfinder
- Aldbrough Hydrogen Storage

SALTEND

- Hydrogen blending at existing power station

Bacton
Thames
NetZero.



INDIAN QUEENS
POWER STATION

SEABANK
POWER STATION

MARCHWOOD
POWER STATION

MEDWAY
POWER STATION

SALTEND
POWER STATION

ALDBROUGH
& ATWICK
GAS STORAGE

EAST COAST
CLUSTER

DEESIDE
POWER STATION

KEADBY 1
& KADBY 2
POWER STATIONS

HyNet
North West

THE SCOTTISH
CLUSTER

PETERHEAD
POWER STATION

Leading the way in the Humber

Power CCS & H2 production, storage and offtake in the Humber



Keadby CCS **first** power CCS project in the UK to gain planning permission



The **world's first major 100%-hydrogen-fired power station** – Keadby Hydrogen



One of the world's largest hydrogen storage facilities at Aldbrough site



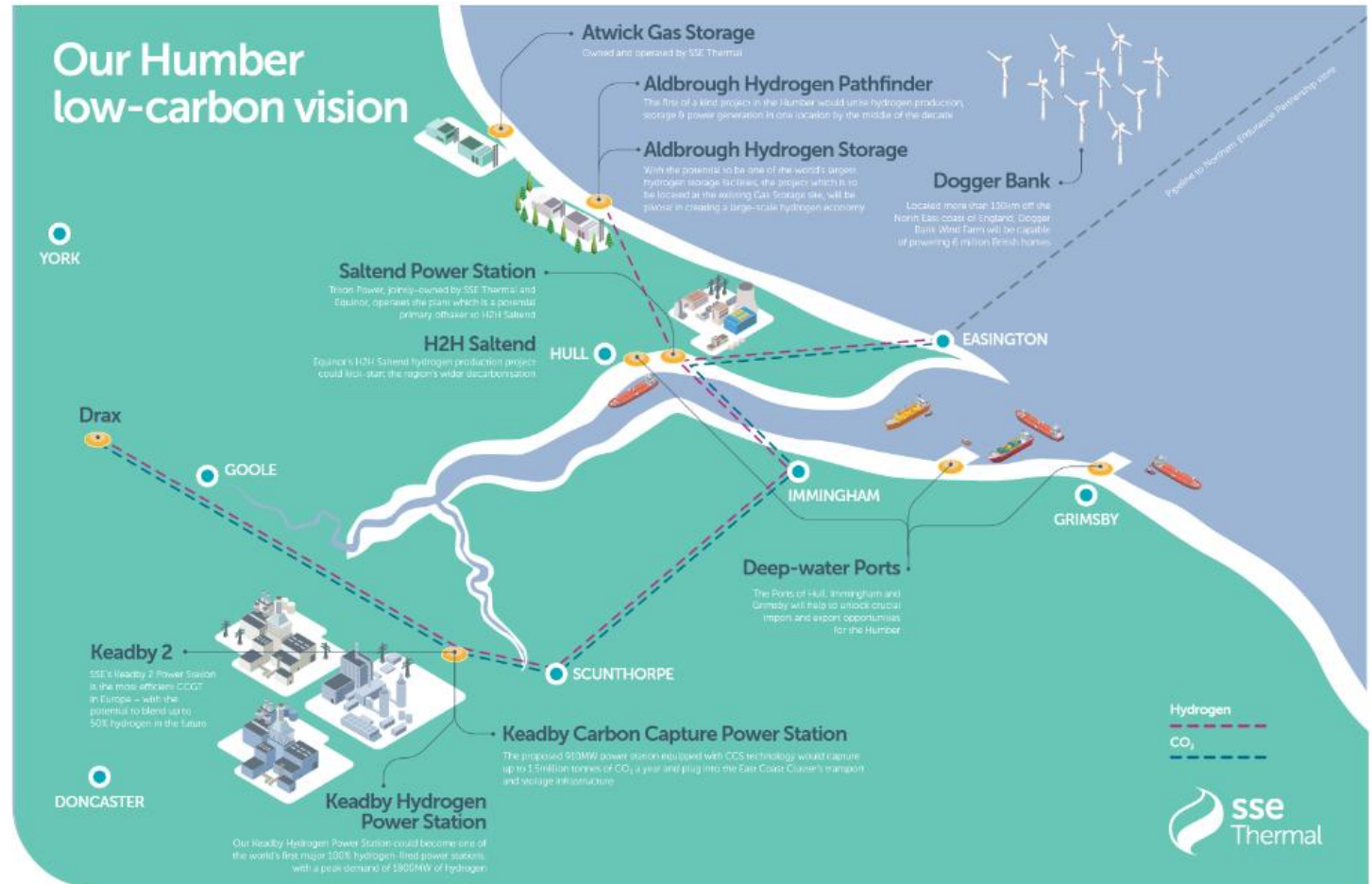
Aldbrough Pathfinder – across hydrogen value chain



Hydrogen blending options at existing power generation sites – Keadby 2 and Saltend (Triton Power)



Hydrogen electrolysis projects



Aldbrough Hydrogen Pathfinder

- First-of-a-kind project in the Humber which unites hydrogen production, storage and power generation in **one location by mid-2020s**
- Located at our existing Aldbrough Gas Storage site on the East Yorkshire coast, designed to demonstrate the interactions between **electrolysis, cavern storage and 100% hydrogen dispatchable power**
- Supports evidence base for **wider deployment of flexible hydrogen** power in the UK's net zero journey and major enabler of our wider Humber ambitions
- Project seeking support in the UK Government's **Net Zero Hydrogen Fund**



Hydrogen Production

Produced via a 35MW electrolyser, using electricity from the grid backed by a renewable PPA



Hydrogen Storage

Stored in a converted salt cavern – currently used for natural gas – with a capacity of c.20GWh



Hydrogen Power Gen

Used in a 50MW OCGT operating on 100% hydrogen, exporting flexible green power back to grid

Low-carbon hydrogen growth

What enablers will make the market take-off?

Technology

- While SMR for blue Hydrogen is an established technology, **electrolysers are still in the early stages of development.**
- While globally targets are much higher, **the largest operational electrolyser projects installed to date are ~20MW.**

Infrastructure

- **No current transportation/storage infrastructure.** Cannot use current gas grid.
- **Storage required to enable economy,** both small and large-scale.

Policy

- Clear **policy direction needed to encourage demand switching and grow supply.**
- **Industry is working to find decarbonisation solutions,** but clarity through policy would encourage greater investment.

Cost Support

- Low-carbon H2 **significantly more expensive** than Grey, or fuels it is replacing.
- **Cannot be used instead of other fuels – processes / technology / infrastructure needs to be completely replaced.**