



HyStorPor-Introductory remarks

Courtney West

12th July 2023

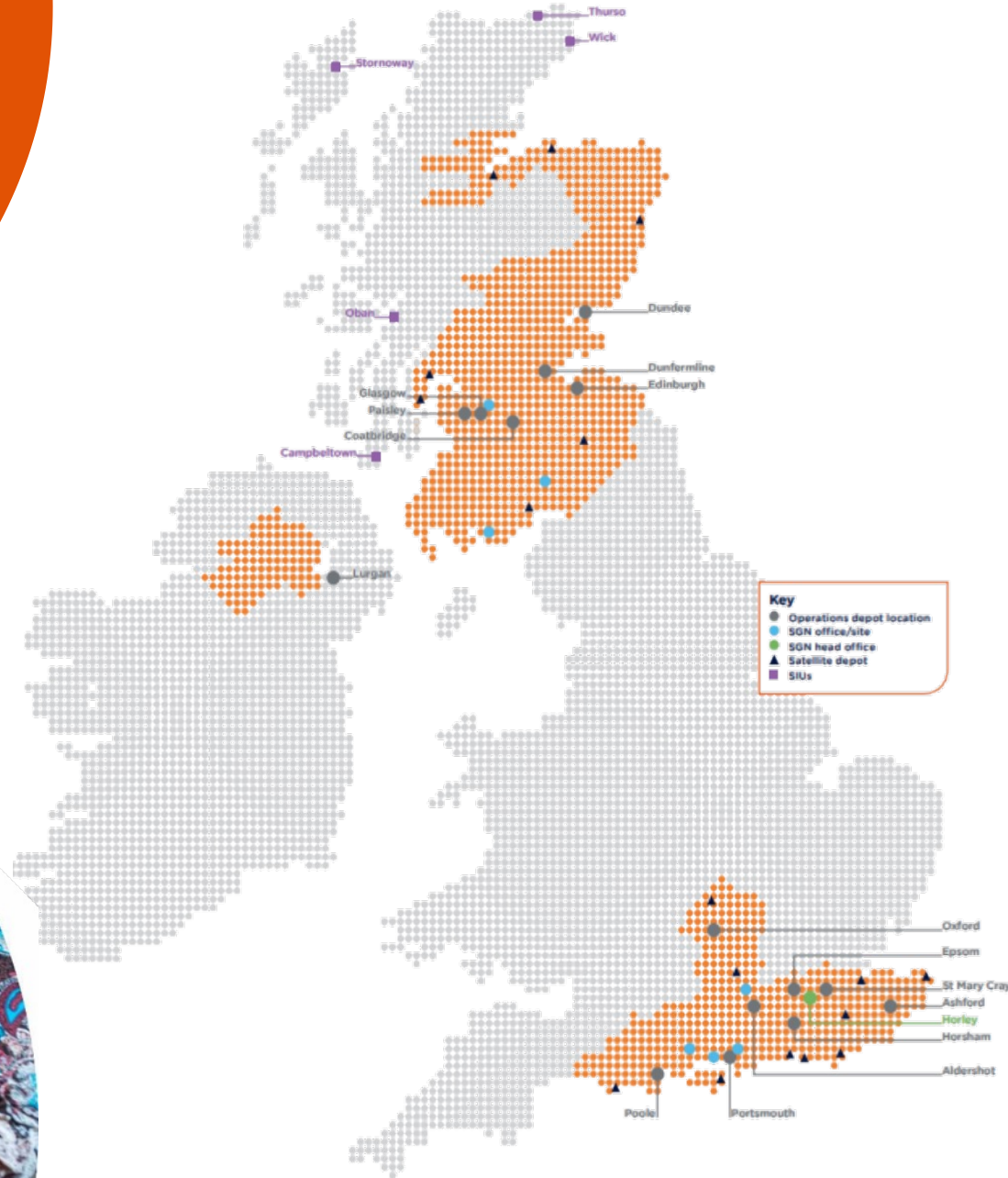


SGN

Your gas. Our network.

About SGN

We manage the gas networks in the south of England, Scotland and Northern Ireland.



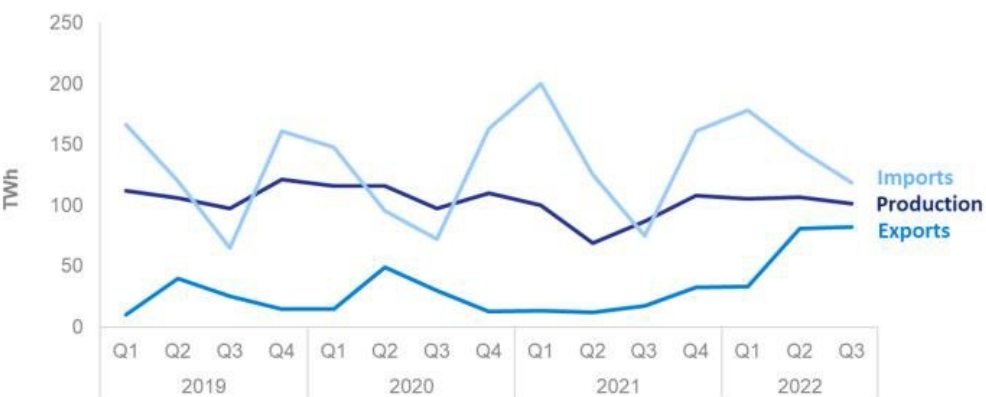
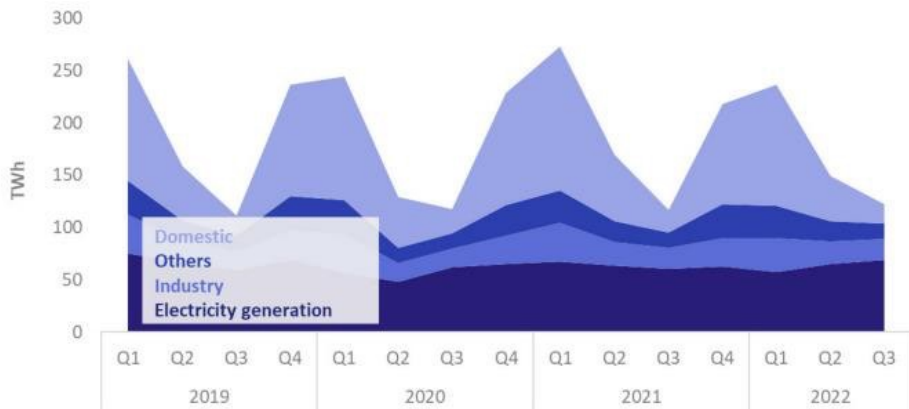
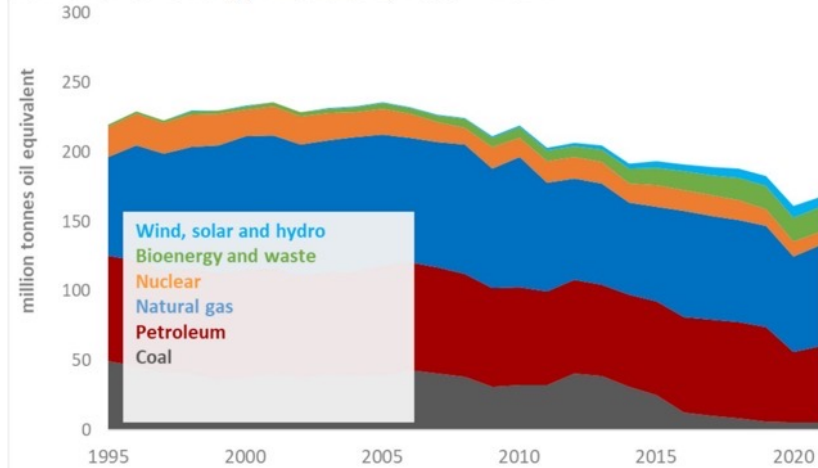
Our 75,000km network of pipes delivers gas to 5.9 million homes, with 2 million of them in Scotland. We serve 14 million people and businesses, all day, every day.

We manage the gas emergency service, a major gas mains replacement programme, including new connections, reinforcements and diversions on our networks.

We're here to keep our customers safe and warm.

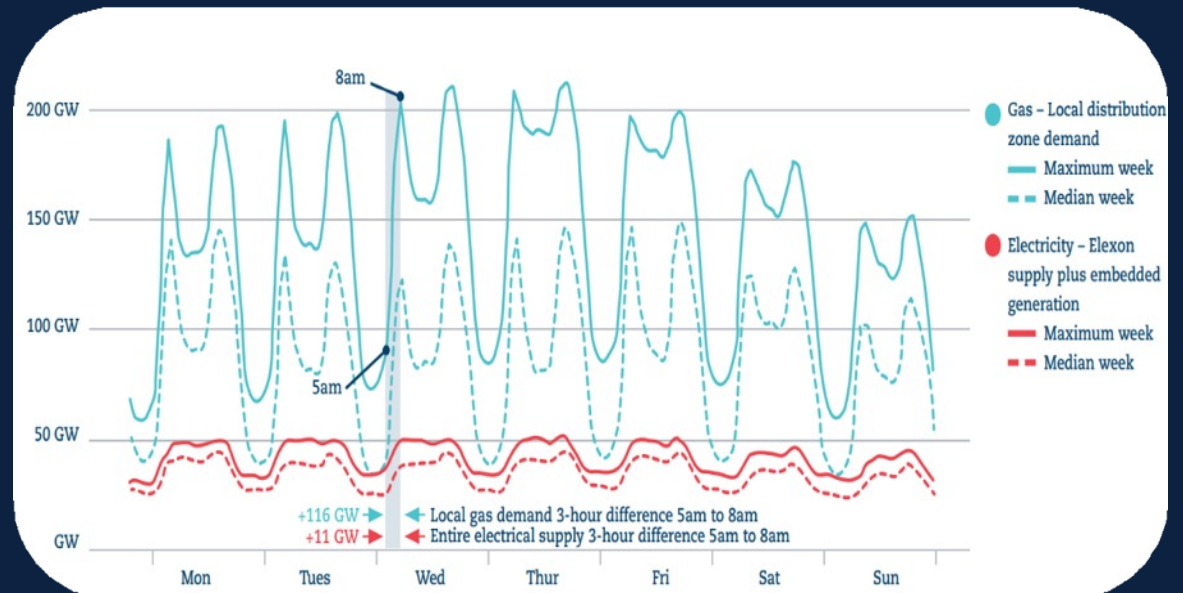


Demand for energy in the UK, 1995 – 2021



UK energy & gas demand

- Energy system relies on three primary energy vectors electricity, natural gas and petroleum to satisfy energy needs.
- There is a strong dependence on natural gas for security of supply, with majority of demand through domestic heat.
- Imports to the UK provide resilience and security of supply correlating with domestic heat demand peak in winter months.
- Gas demand has a complex profile with extreme ramps up in demand in morning and evening due to customer behaviours



UK and Scottish Government decarbonisation targets

Heat

- Hydrogen ready boiler consultation
- Decision on hydrogen blending by end of 2023
- UK Government decision on hydrogen for heat in 2026
- Ambition for 600,000 heat pumps/year by 2030
- Biomethane could treble from current levels by 2030
- Heat networks 5% by 2030 and 20% by 2050

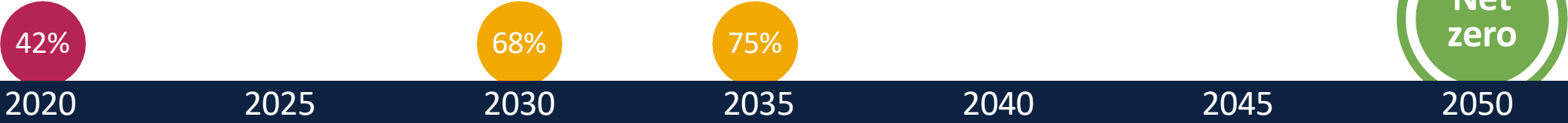


H2

- UK production 10GW by 2030 (with at least half green hydrogen)
- UK Government supporting the development of hydrogen for domestic heat evidence base



UK



2020

2025

2030

2035

2040

2045

2050

42%

75%

Net zero

42%

75%

Net zero

Scotland

Heat

- 1 million homes and 50,000 non domestic buildings equivalent by 2030
- 20% blended hydrogen by 2030, 5% biomethane
- No natural gas in new homes consented from 2024
- 64,000 homes a year being converted to net zero by 2025 – the focus is on heat pumps and heat networks



H2

- Hydrogen Action Plan targeting Scottish production 5GW by 2030 and 25GW by 2045 and 12 Regional Hydrogen Hubs
- Energy Strategy & Just Transition Plan
- Scottish Government supporting the development of hydrogen for domestic heat evidence base



Scotland's Renewable Resources

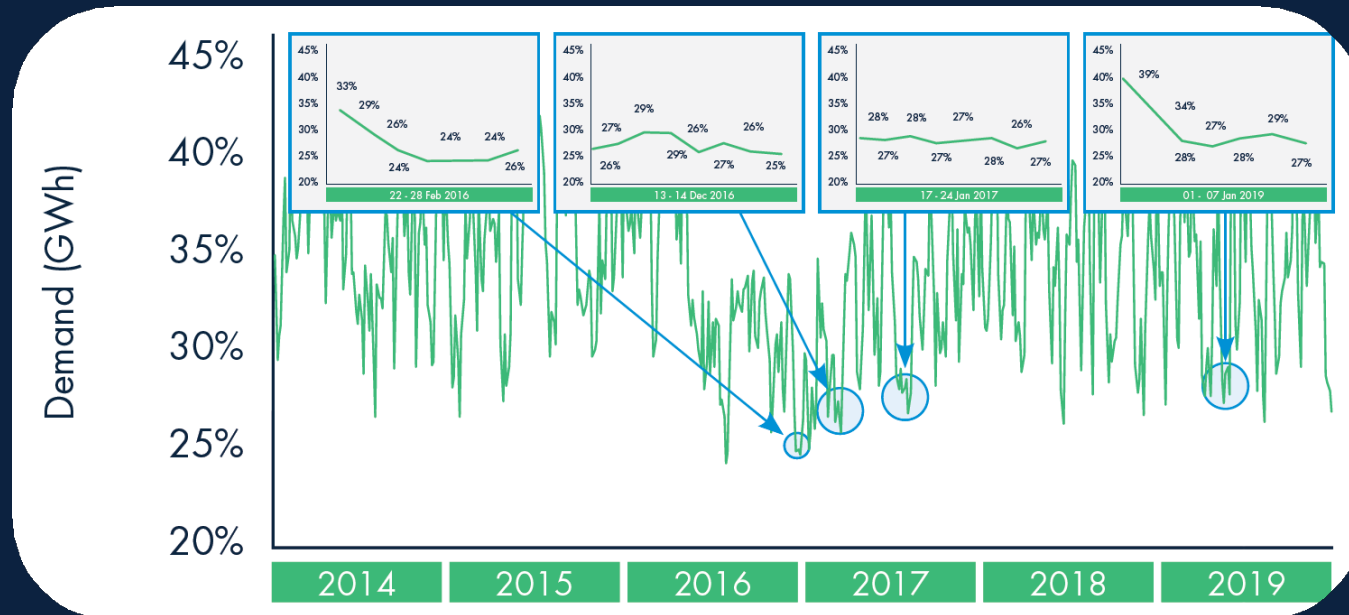
- 9GW operational onshore wind
- 20GW target by 2030 supported by existing pipeline of 12GW in development
- 10GW of offshore wind projects operational, under construction or in development
- 28GW in Scotwind leasing round, with Innovation and Targeted Oil & Gas (INTOG) leasing round underway
- Growing renewable energy generation presents challenges:
 - Low supply of energy in high demand
 - High supply of energy in low demand



Energy storage required to meet net zero

- Renewable energy constraint payments are forecast to rise to £1-2.5 bn/year peak in the mid-2020s.
- Grid constraints act as a barrier to the UK's 100 GW offshore wind pipeline.
- Energy storage at scale is needed to maximise energy recovery from the UK's vast wind and other variable renewable resources.

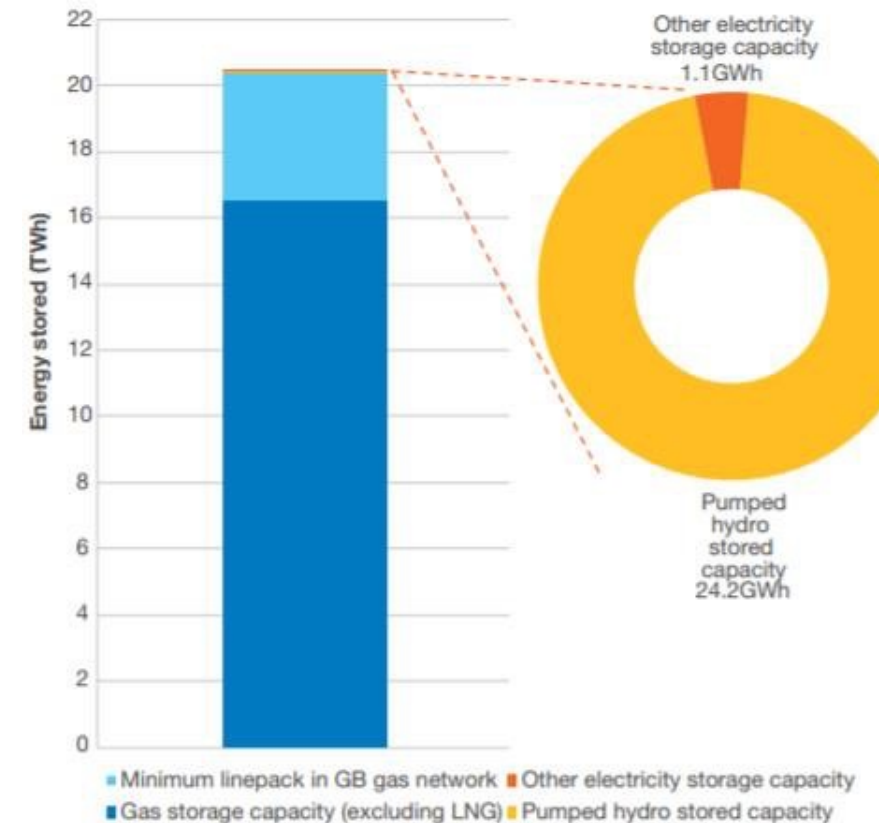
- Following rapid expansion of offshore wind, there will continue to be periods of time with almost no wind generation and very high electricity prices.
 - For example, on 12 December 2022, with very low temperatures, wind generation was only around 1 GW (compared to peak wind output of over 20 GW)



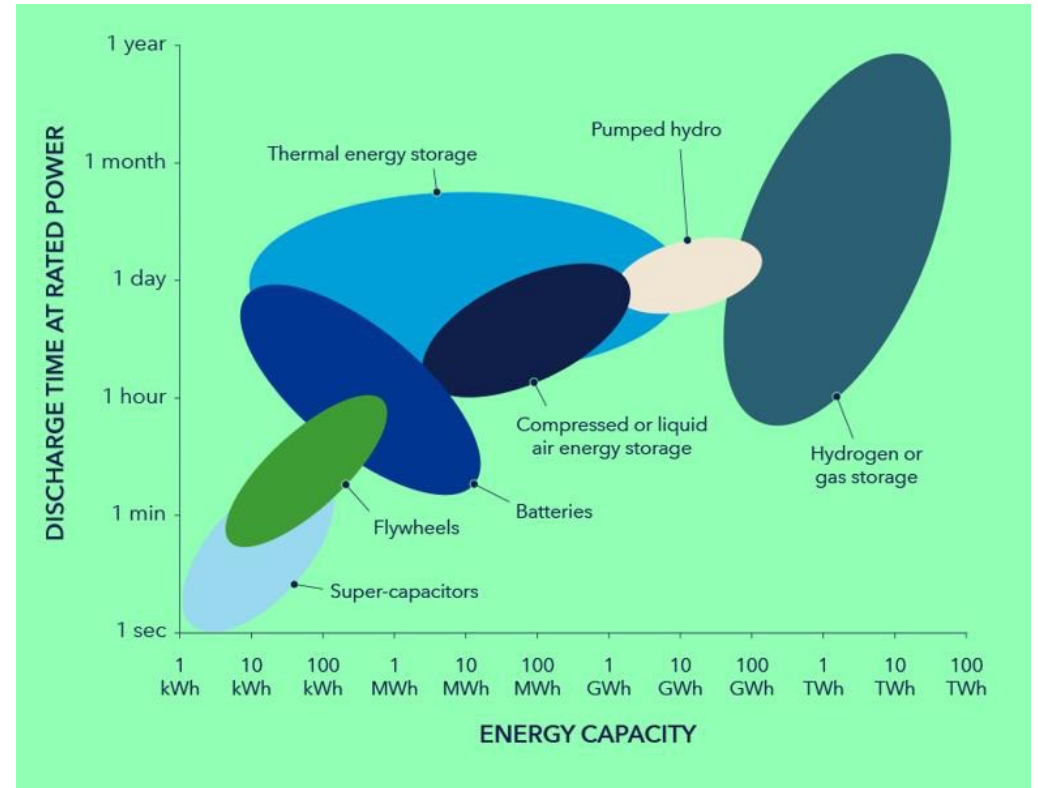
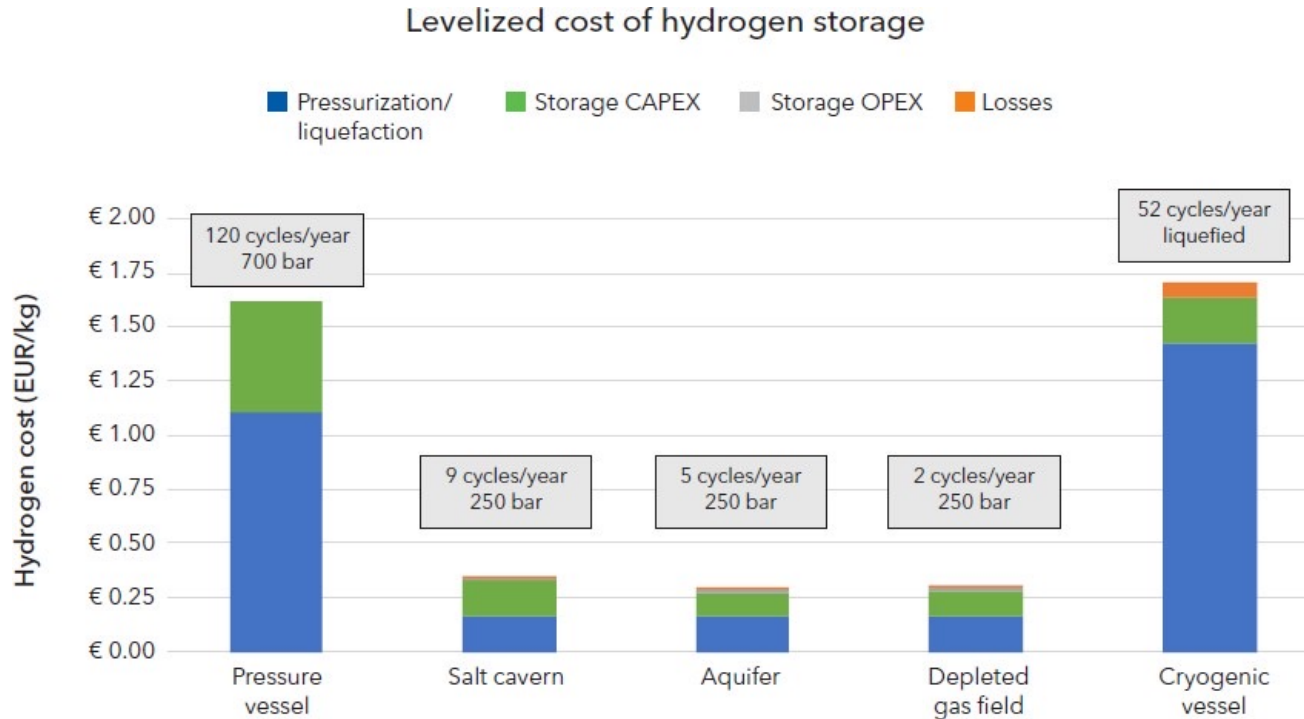
Physical hydrogen storage needed in the UK

- Of main electricity storage options, batteries are short duration and not at sufficient scale and there are limited pumped hydro sites
- Hydrogen storage offers a solution to electricity grid constraints enabling renewable capacity installation and maximum use of capacity
- Long Duration Energy Storage report for BEIS concluded longer duration storage solutions reduce net zero system costs by £13-24 billion a year
- As for natural gas, a level of indigenous hydrogen production and storage is needed to support energy security, particularly in times of turbulent geopolitics, as Europe is experiencing today.

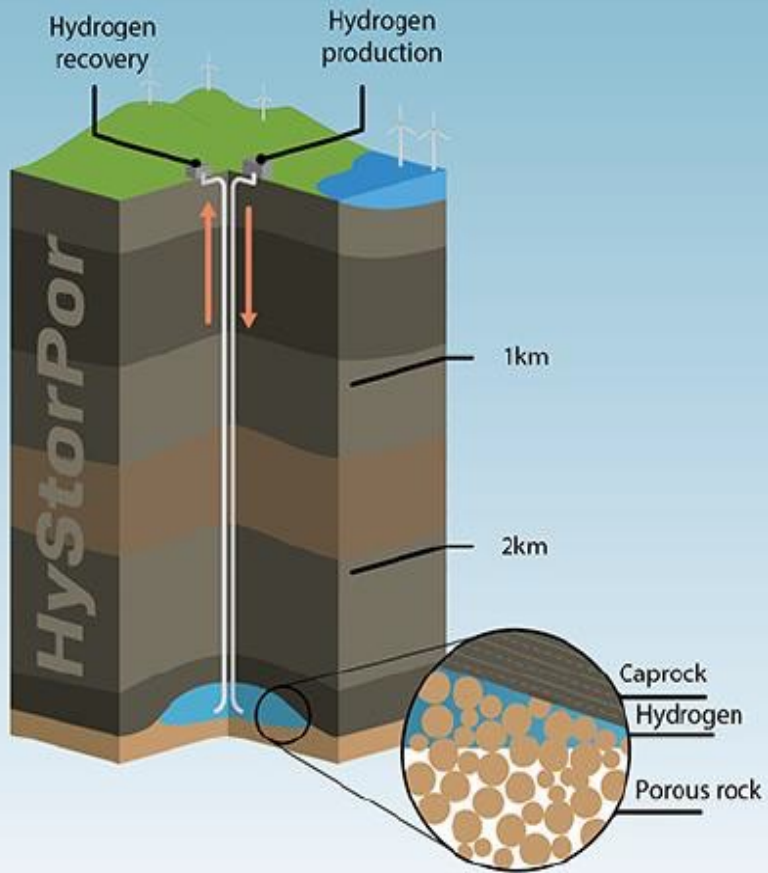
Figure FL.1: Electricity and gas storage capacity in 2020



Geological storage at scale required



- Geological storage is cheaper, more energy efficient, and at the scale required
- In the case of salt caverns, it is a mature technology but work into depleted fields and aquifers is vital providing the scale for large scale seasonal storage for UK resilience



**Advanced Hydrogen Research
in Scotland:**
Investigating factors influencing
inter-seasonal storage of
hydrogen in porous reservoirs.

Thank you

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