
Annual Energy Security and Markets Review

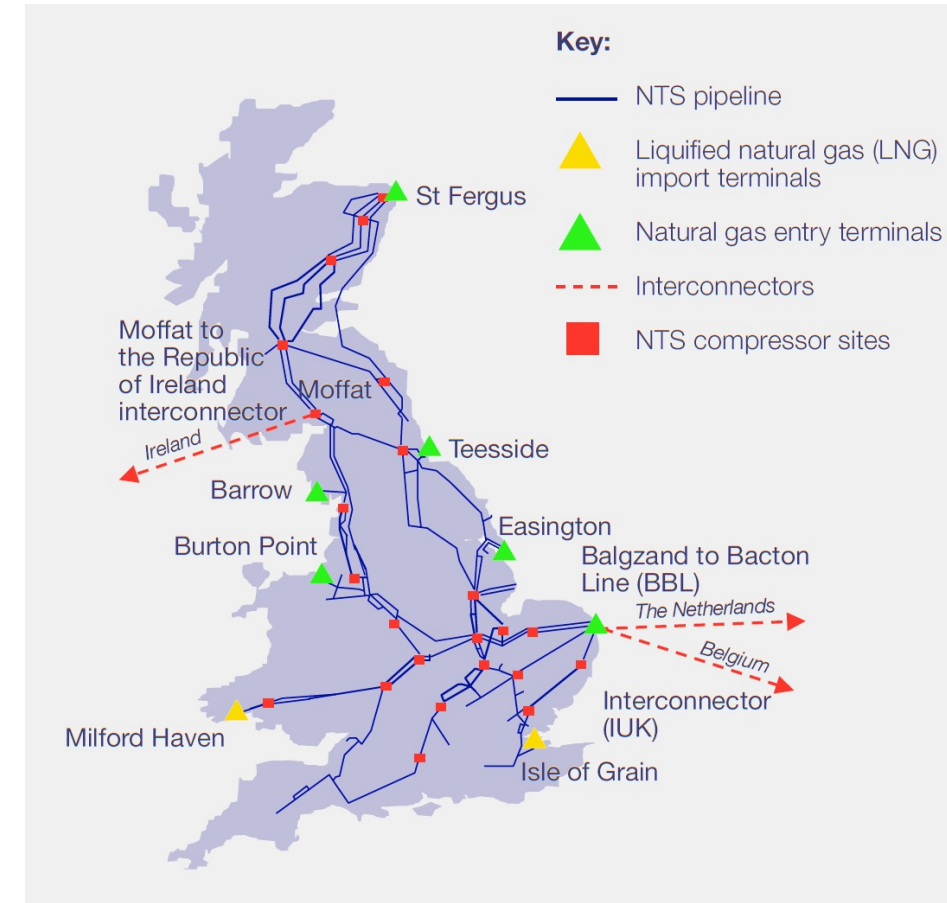
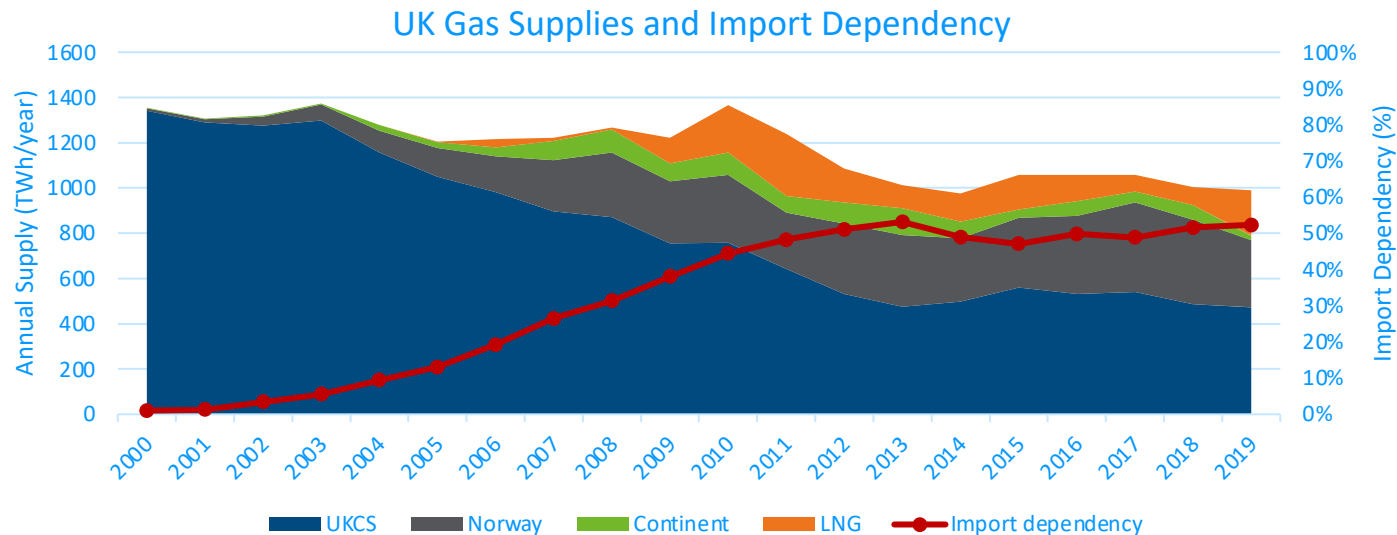
Winter 2022 BEIS energy security review, and energy security in the context of Net Zero requirements

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History of Gas Security

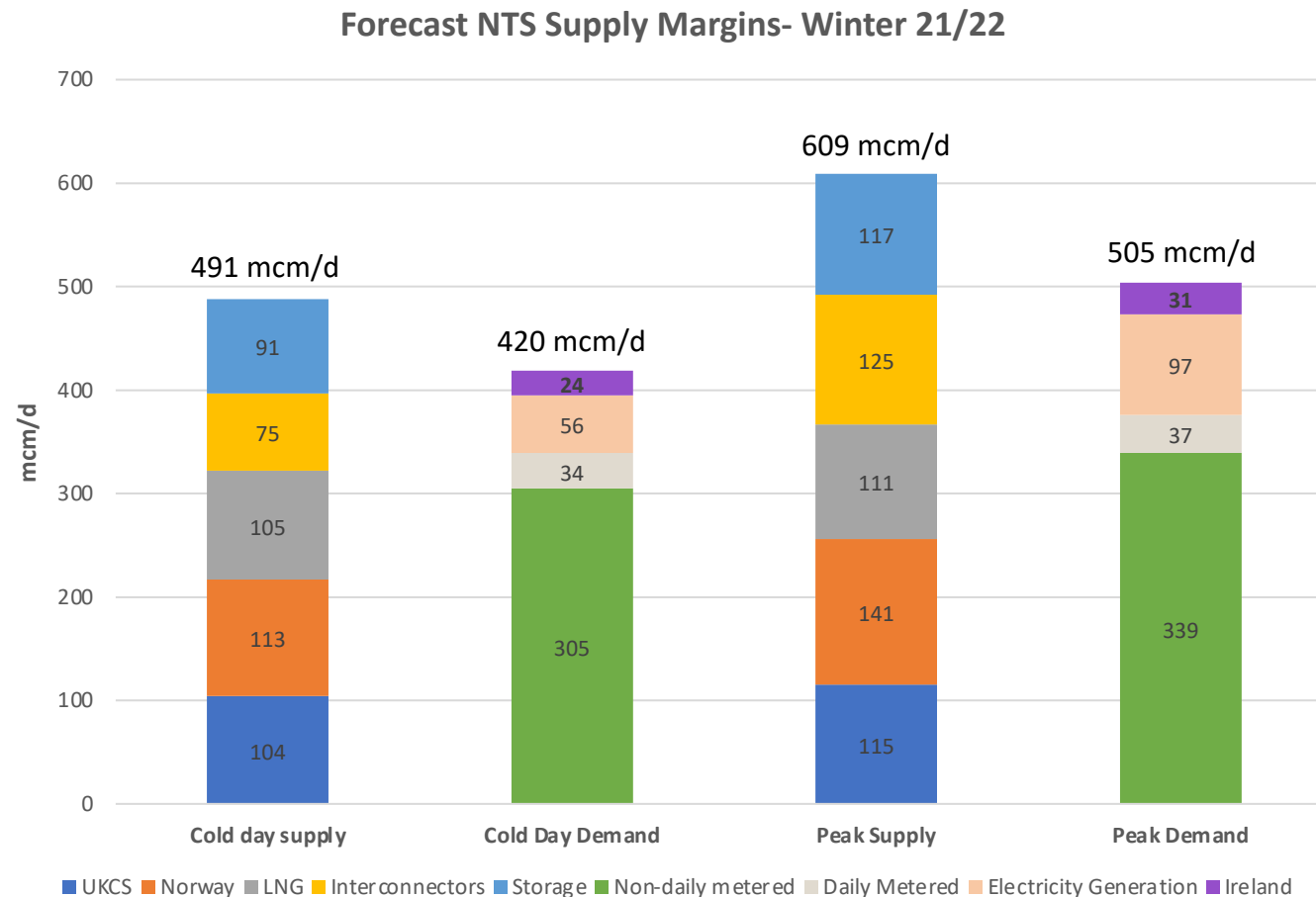
- The National Transmission Network transports gas from processing centres to Local Distribution Zones, Power Stations and Industry.
- Since peak UK Continental Shelf natural gas production in 2000, the UK is supplied through additional supply routes from-
 - 2 gas pipelines from Norway
 - 3 LNG terminals
 - 2 bi-directional interconnectors (Netherlands & Belgium)



Source- National Grid

History of Gas Security

- The UK supply of gas has proven to be secure at times of stress with the market responding when required.
- National Grid annually publishes a winter outlook forecasting the margin for
 - **Cold day** is representative of the coldest day in an average winter.
 - **Peak day** is a 1 in 20 demand that statistically would not be exceeded in 1 out of 20 winters



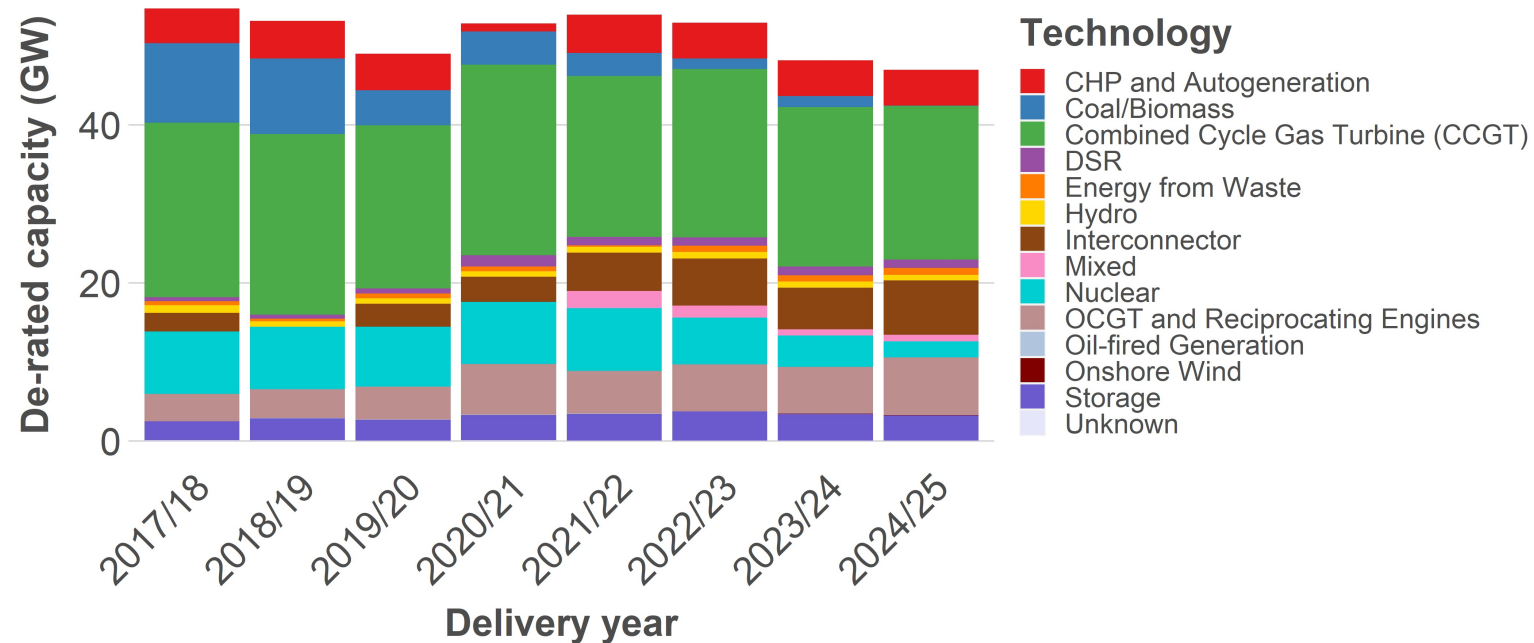
History of Electricity Security

- Capacity Market launched alongside CfD in 2014 as part of EMR
 - Complements wholesale and other markets
- Technology neutral
- Rewards availability, not delivery



De-rated capacity procured per delivery year and technology

Note that not all capacity has been procured for delivery years 2023/24 onwards.



Source: Capacity Market registers, terminated capacity removed.
Technology types were not included on the registers until 2017,
therefore values included here are estimates.

Electricity Security – ‘Trilemma’ Trends

Price/Cost

Affordable so far

Security of Supply

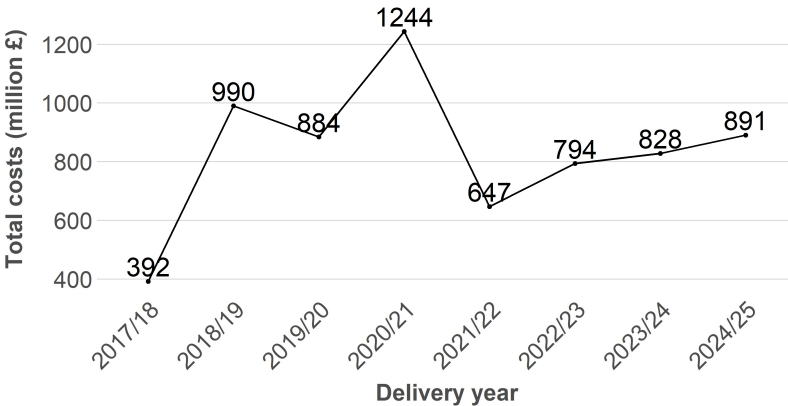
Continual improvement needed

Decarb/Net Zero

Major updates needed

Total costs of all auctions per delivery year

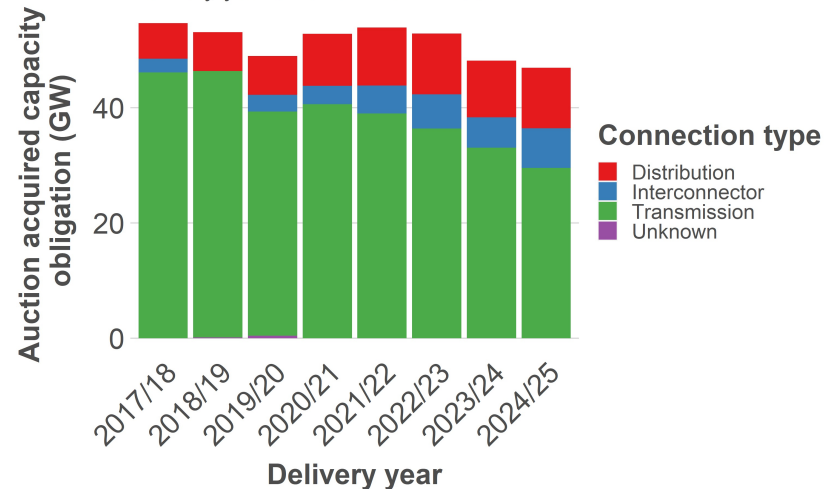
Not all capacity has been procured for delivery years 2023/24 onwards.



Source: Capacity Market registers
Costs have not been adjusted for inflation. Does not include this week's T-4 results or future costs of long-term agreements beyond 2024/25.

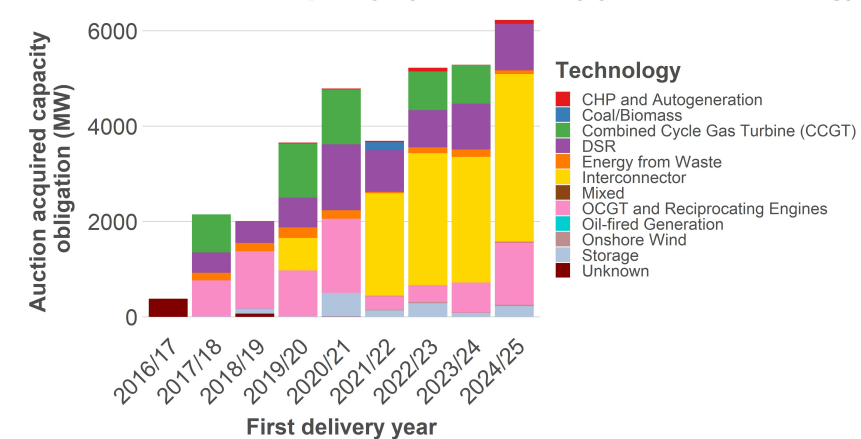
Capacity by delivery year and connection type

Note that not all capacity has been procured for delivery years 2023/24 onwards.



Source: Capacity Market registers.

New build capacity by first delivery year and technology

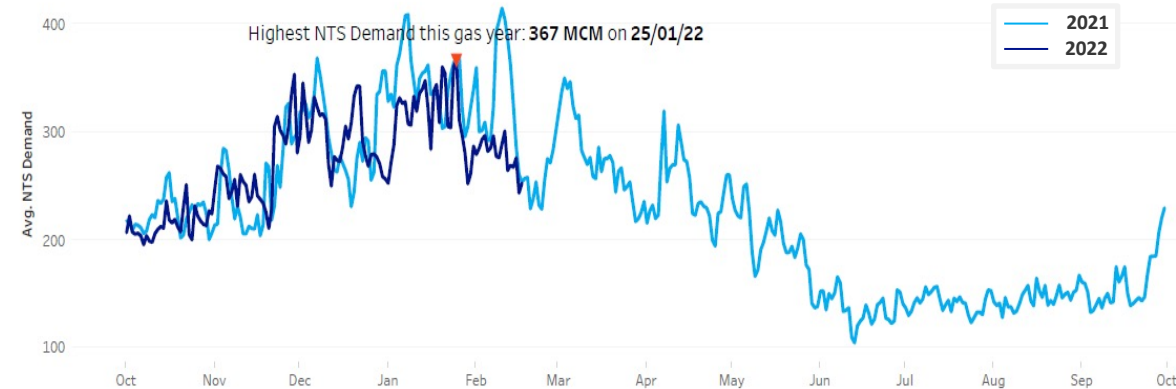


Source: Capacity Market registers. Note that some new build capacity may be double counted.

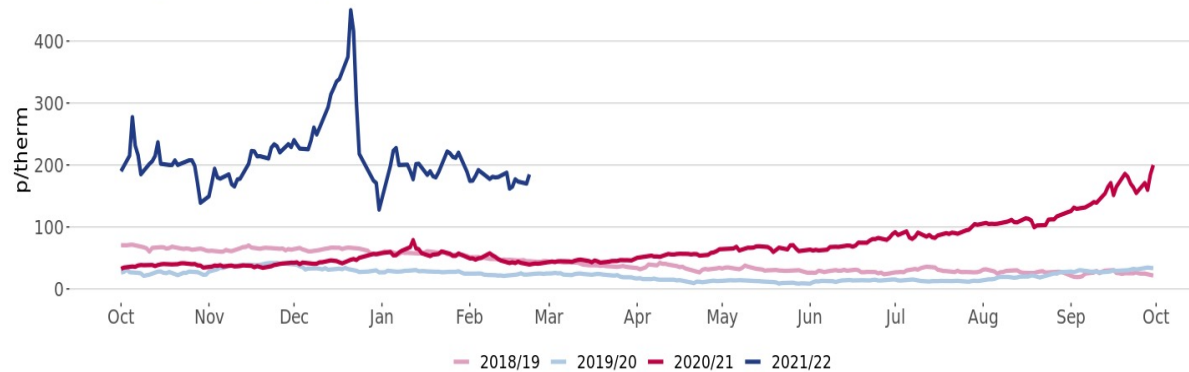
Natural Gas - This Winter... and Next?

NTS Demand vs previous year

End of day values (mcm)



NBP Day-ahead price, p/therm

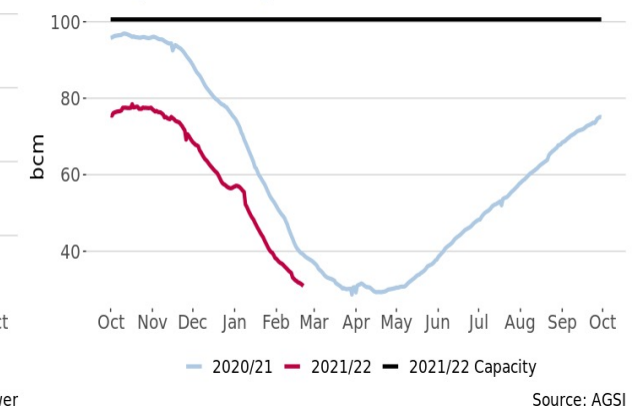


Source: ICIS

UK Storage, bcm



European Storage, bcm



LNG

- January 2021 saw record 37 LNG tankers off loaded at UK ports.
- Expecting more than 20 to dock in February

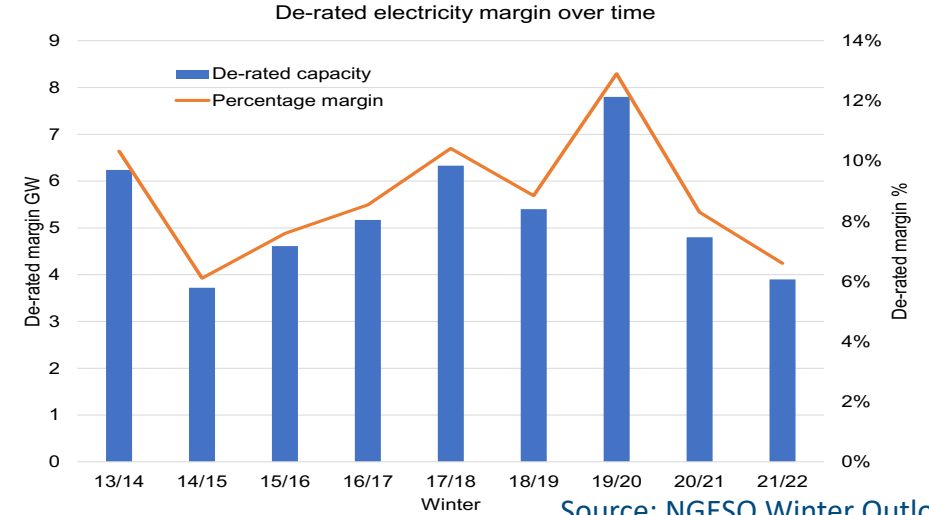
Interconnectors

- Recent trends for this week include exports of gas through interconnectors to Europe due over supply in the UK

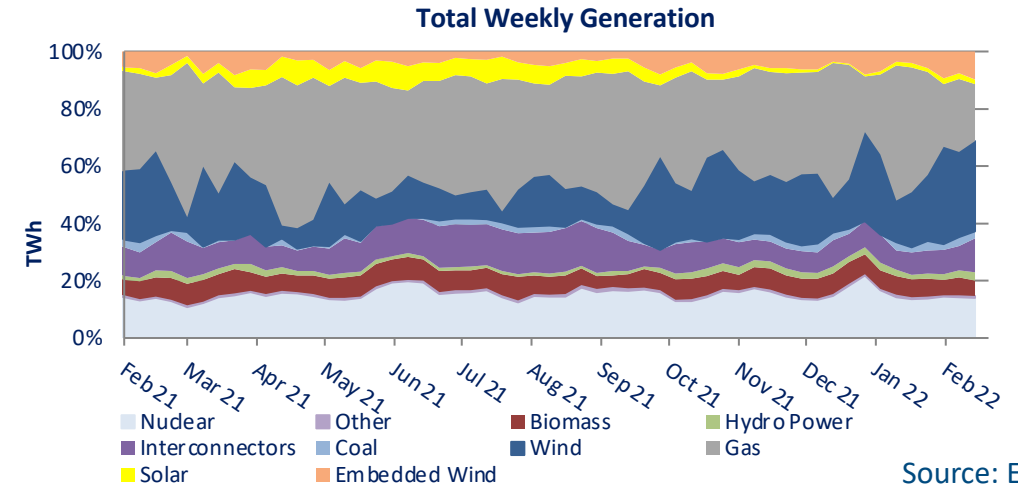


Electricity - This Winter... and Next?

- Capacity margins remain adequate, but reliant on sensitivities around winter availability.
- New Security of Supply risks, unforeseen in forecasts:
 - Certain: French nuclear fleet outages
 - Uncertain/escalating: GeopoliticalHow reliable will interconnector flows be?
- A difficult year for markets:
 - High prices: Marginal price is still primarily set by gas, which can still be up to 50% of generation.
 - Balancing mechanism volatility: cost surged to £979m between September- November 2021, an increase of 294% compared to the same period last year. (Source: LCP & Elexon)



Source: NGESO Winter Outlook report



Source: Elexon

Markets & Financial Stress

Energy Retail Market

- The Energy Retail Market has lost 27 suppliers since Summer 2021 with one additionally placed in special measures.
- Government and Ofgem have focused on ensuring supplier exits are orderly and that customers are protected.
- Retail Market Reform underway

Electricity

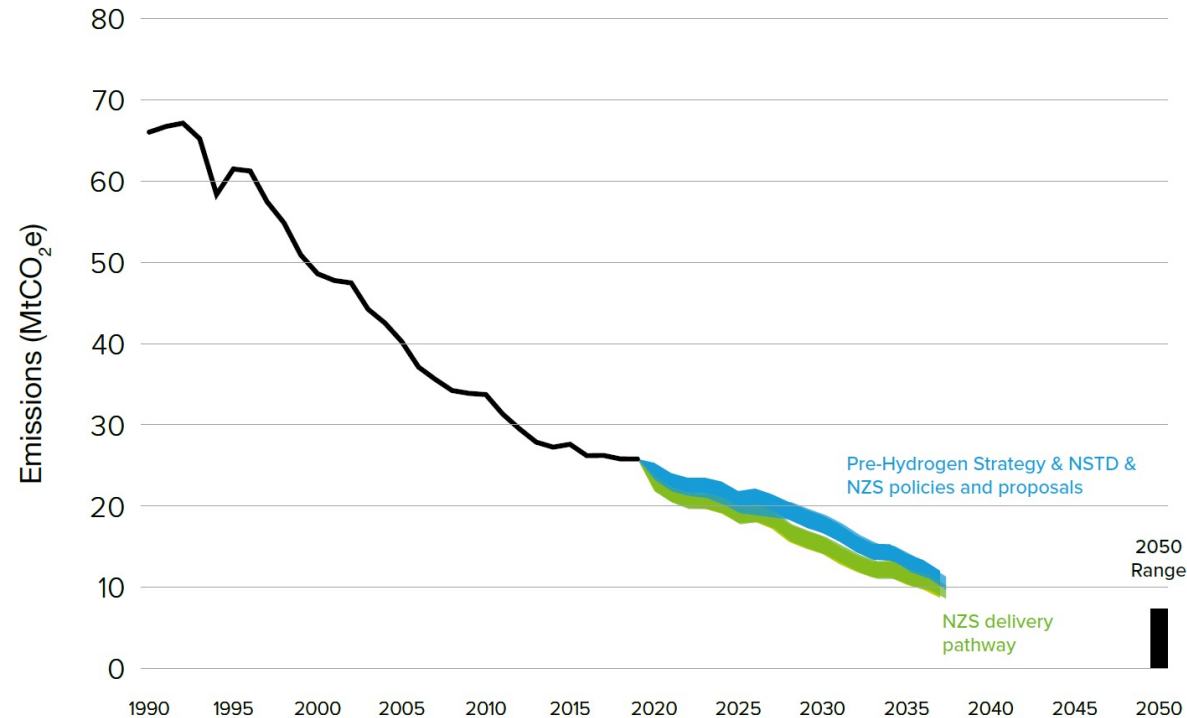
- Financial impacts on generators: held up well under stress, but high margin calls eg. Uniper 11B margin call (Bloomberg, 4 Jan)

Gas

- Companies operating in gas distribution have coped with the high prices. One Gas Shipper exited the market.

Gas Security of Supply and Net Zero

Figure 18: Indicative fuel supply emissions pathway to 2037



Source: BEIS analysis

Net Zero strategy 2021

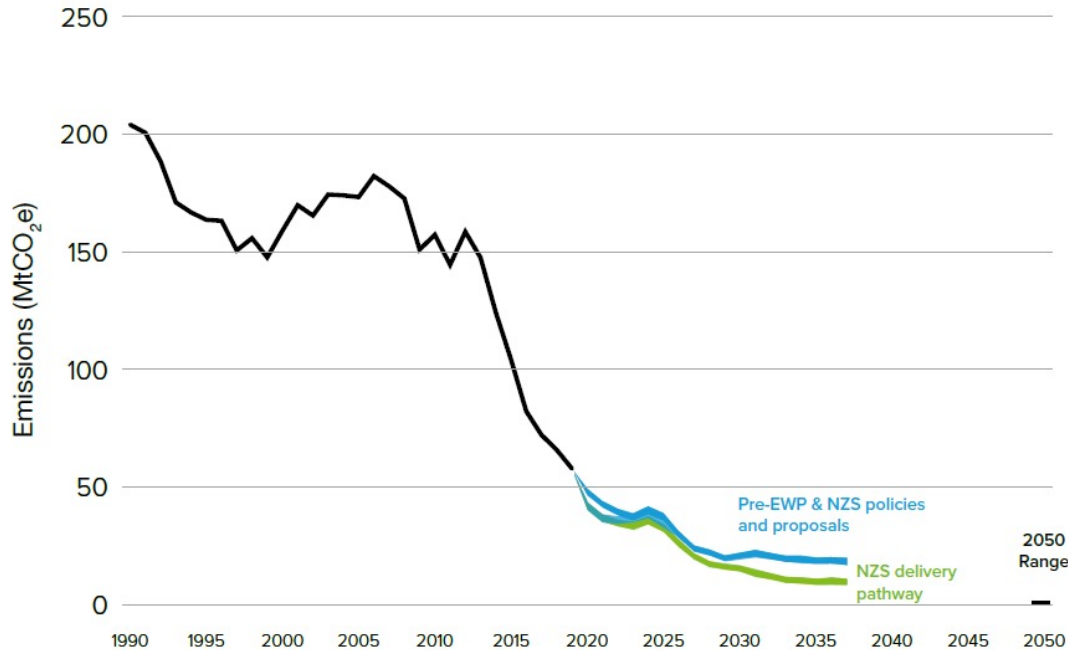
Fuel supply will look very different by 2050:

- Oil and gas production will contract significantly as the UK Continental Shelf matures and investment in the North Sea pivots to new opportunities from CCUS and hydrogen.
- Accelerated by widespread electrification and low carbon fuel switching.
- Shift away from fossil fuels will protect consumers from volatile gas prices.
- Remaining oil and gas installations will use low carbon power, with residual emissions minimised.

Electricity Security of Supply & Net Zero

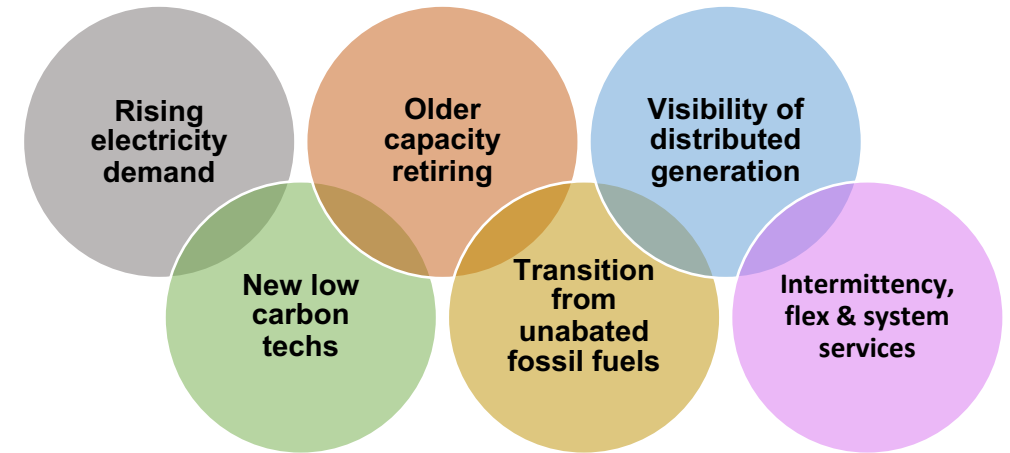
Challenges and opportunities for Electricity Security

Figure 17: Indicative power emissions pathway to 2037



Source: BEIS analysis

Net Zero Strategy 2021



Considering design changes to the Capacity Market to:

- Strengthen incentives for capacity to deliver in times of system stress.
- Address barriers to entry for low carbon capacity in the CM and consider how to adapt design for future low carbon technologies.
- Encourage existing plant to abate and avoid locking carbon intensive capacity into the CM for the longer term.
- Improve visibility of capacity to provide a more accurate picture of supply and demand.