Committee on Climate Change

Carbon Capture and Storage in the 2020s

Westminster Energy, Environment and Transport Forum.

CCS is a vital part of the low-cost path to decarbonisation in the UK.

- The cost of meeting 2050 target without CCS nearly doubles[1].
- Large scope for abatement across power, industry, negative emissions.
- Potential to provide backup variable renewables technologies & manage seasonal swings in demand

The near term (pre-2030) goal is cost-reduction. Policy question: How to reduce costs down with minimum public spend?

1 CCC(2012) http://archive.theccc.org.uk/aws/IA&S/CCC_IAS_Tech-Rep_2050Target_April2012.pdf

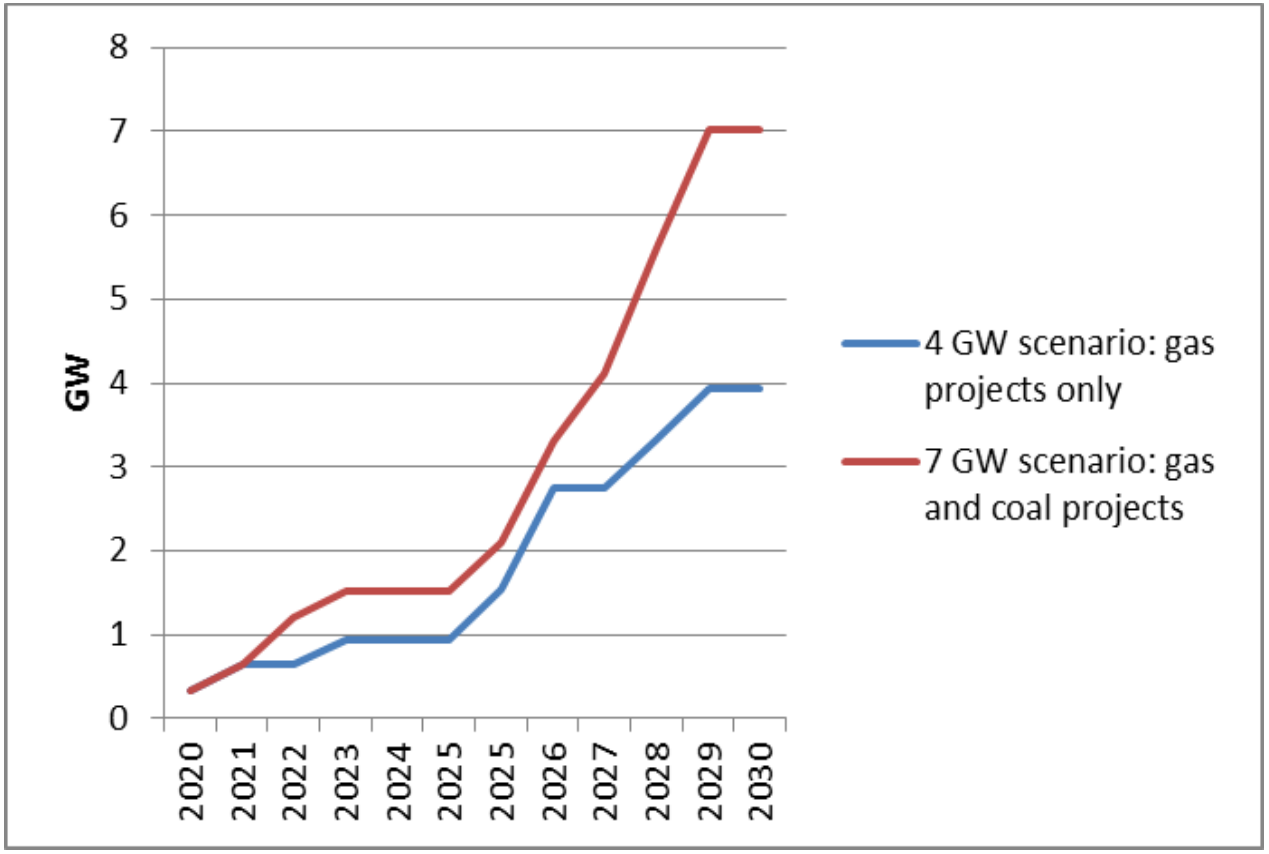
Progress on CCS to date: approx 5-6 years delay compared to our indicators

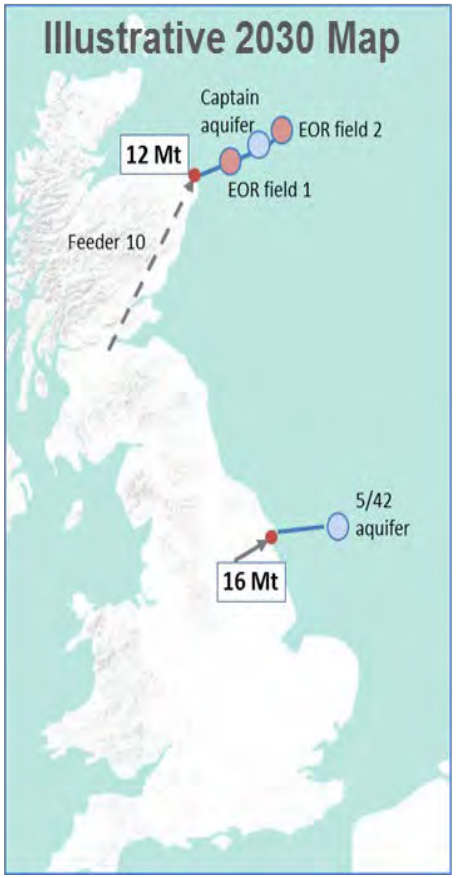
There are **5 year delays** compared to our original (2009) indicators which suggested multiple demonstrations coming online from 2014.

Government now has **2 preferred bidders**, with earliest date online 2019/20.

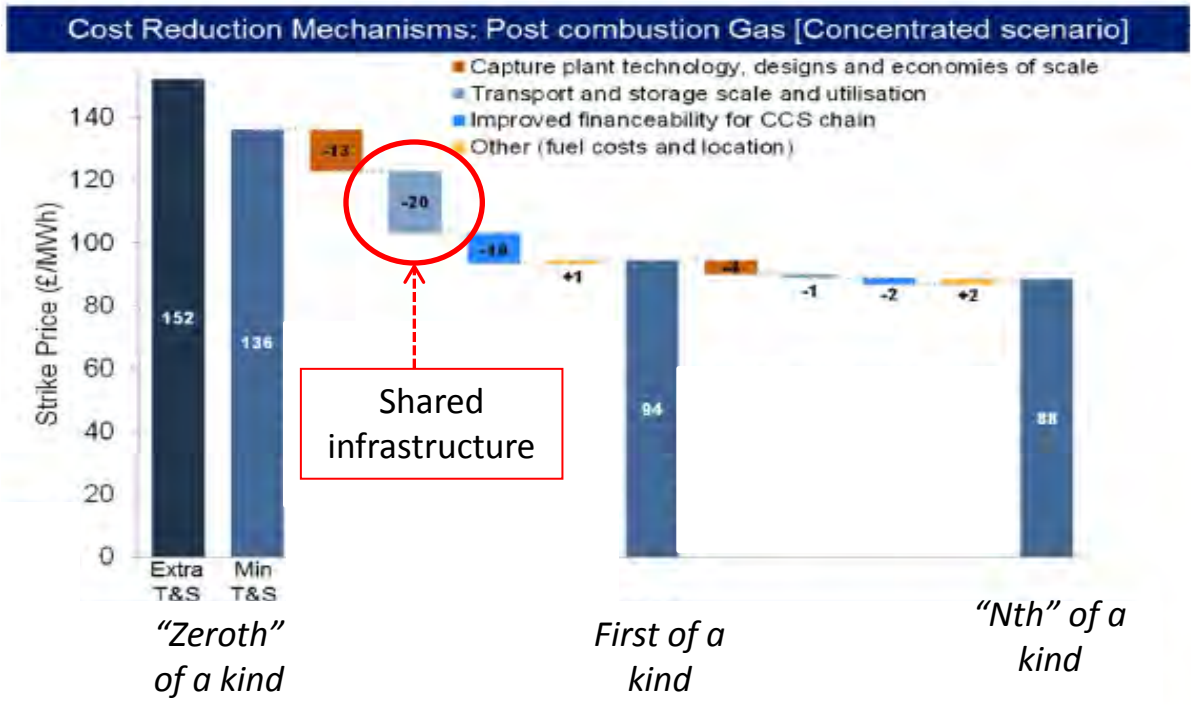
- White Rose in Yorkshire (300MW on coal)
- Peterhead in Scotland (340MW on gas)

Potential UK based CCS programme to 2030





Opportunities: CCS could fall below £100/MWh in 2030 if deployed in clusters through a program of 4-7 GW in 2030



What is the role of government in unlocking these opportunities?

Pursue cheapest technologies and fuels, taking account of trade off between increased optionality and cost.

- Unclear which techs/fuels will come in cheapest
- More techs/fuels Increases optionality but also financial commitment.
- Leave to market to decide (expect that this is likely to mean mostly gas).
- Gas may offer additional advantages

Large scale international projects (for pre-2020)

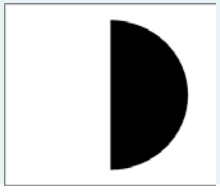
Project Name	Year	Location	Capture Type	MTPA	Capacity (Gross)*
Boundary Dam	2014	Saskatchewan, Canada	Post-combustion Coal	1.0	139MW
Kemper County Energy Facility	2015	Mississippi, US	IGCC coal	3.0	582MW
Petra Nova	2016	Texas, US	Post-combustion Coal	1.4	250MW
Rotterdam (ROAD)	2017	Zuid-Holland, Netherlands	Post-combustion Coal	1.1	250MW
Sinopec Shengli Power Plant	2017	Shandong Province, China	Post-combustion Coal	1.0	250MW
Sargas Texas Point Comfort Project**	2017	Texas, US	Post-combustion Gas	0.8	500MW
Hydrogen Energy California Project	2019	California, US	IGCC Coal	2.7	405MW
Texas Clean Energy Project	2019	Texas, US	IGCC Coal	2.7	400MW

*https://sequestration.mit.edu/tools/projects/index_capture.html

**http://www.globalccsinstitute.com/projects/sargas-texas-point-comfort-project

Source: GCCSI, 2014, Global Status of CCS

To 2030, the majority (~75%) of cost-reduction opportunities rely on UK roll-out

Cost reduction category	% opportunity in UK (black)	Notes
Innovation and capture plant technology		Largely at international level, some elements of supply chain will be GB specific
Infrastructure economies of scale		Reusing existing infrastructure, economies of scale in storage and transport GB specific
Falling cost of capital		Capture plant risk international, storage/transport/policy risk GB focussed

A steady, UK program in the 2020s would capture economies of scale, learning, trigger private investment, engage financial sector.

Conclusions & recommendations

- CCS vitally important to low-cost decarbonisation path
- Priorities for UK:
  - Reach FID on the two proposed projects & move quickly towards follow-on projects that connect to the same clusters.
  - Provide guidance on infrastructure
  - Address financing needs

Set out an approach to commercialise CCS through the planned clusters: including a strategic approach to transport and storage infrastructure, completing the two proposed projects and contracting for at least two further 'capture' projects this Parliament.