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Achieving cost-effective CCS: the route forward

Westminster Energy, Environment & Transport Forum: *Future prospects for Carbon Capture and Storage in the UK*

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ETI10 | TEN YEARS
OF INNOVATION
2007—2017

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Overview

- What do we mean by cost-effective CCS?
- What does a good first project look like?
- How to make it happen?





Unpacking the notion of 'cost effective' CCS

- YES we can deliver CCS at much less than the dreaded £170/MWh figure
- BUT it is **ridiculous to judge the 'cost effectiveness' of the first CCS project by comparing its levelised cost to, say, offshore wind**

What CCS delivers	Cost impacts
Firm low carbon generation capacity before 2030	Electricity system cost savings (e.g. back up capacity & transmission assets)
Strategically valuable option to decarbonise industry, heat and transport in 2030s & beyond	Tens of £bns cost savings for UK decarbonisation (even if pessimistic about future CCS cost reductions)

- A gas CCS power project can probably be delivered at a £/MWh cost similar to HPC before 2030
- **But the industrial strategy case is still strong even if unit costs of a first project prove somewhat higher than HPC**
- We should be clear that the pressure to show a low/'competitive' £/MWh for the first CCS project is around **political acceptability rather than economic or industrial strategic logic**



Characteristics of a 'good' first project

Key characteristic	Practical implication	Rationale
Politically acceptable near term cost	£/MWh close to or <£100/MWh	In practice, HMT will prioritise near term impact on electricity bills over long term strategic/economic value. Strike prices for other (less flexible) generation technologies are falling. Without political acceptance, no CCS option will be developed.
Strategically valuable for development of CCS sector	Gas power project	Power sector – since this offers lowest market risk and opportunity to achieve scale and anchor infrastructure for a broader cluster Gas – cost analysis points to gas having cost advantage



First project: How to get unit costs down while retaining strategic value?

Characteristic	Practical implication	Rationale
Right location	Teesside or Humber	Close to best proven storage sites in southern North Sea, emissions clusters & demand for electricity
Large scale	GW scale	Enables lower unit costs and maximises strategic value
Low technology risk	Post-combustion capture	Proven technology, reduce avoidable risks while offering good performance
Shareable infrastructure	Oversized or expandable pipe & store	To support further unit cost reductions and development of CCS cluster (within predictable governance structure to enable cost sharing too)
Risk sharing	Government accepts uninvestible risks	To enable private financing at acceptable cost of capital, and limit policy-related risk exposure



How to make it happen?

Zero appetite for another lengthy competition

Oxburgh GoCo: logical but is it politically deliverable?

If not, we need a (timely) 'third way'

- Some form of market testing, but within a strongly shaped strategic framework?
- A public private partnership?
- A classic case study for 'industrial strategy' – a real conversation about 'whatever it takes' between govt and key industrial players

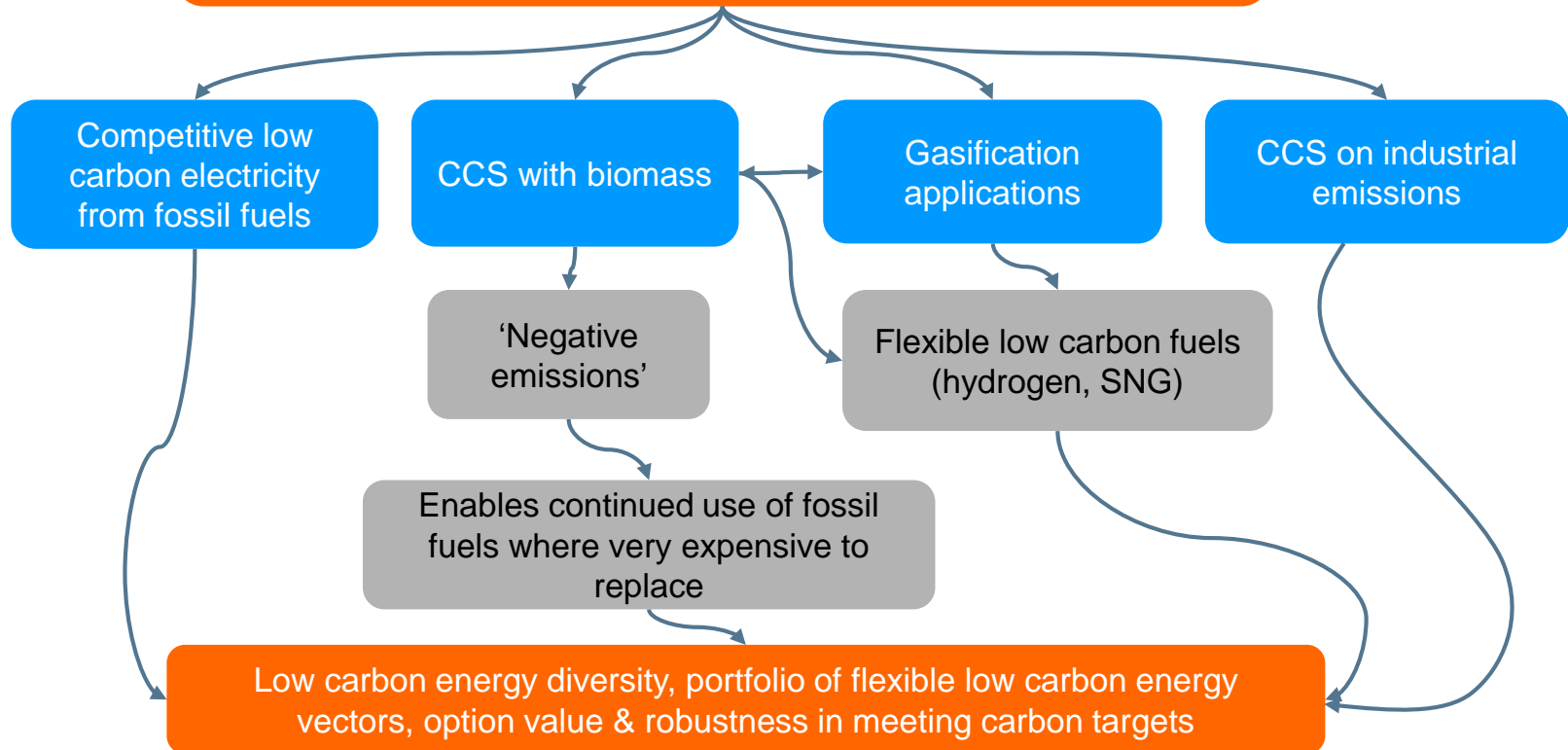
Process needs to:

- Be **politically deliverable** – in terms of cost and transparency
- Lead to a **strategically valuable** first project
- Be **timely**: a key option for mid/late 2020s (cf risks to nuclear delivery)
- Command sufficient **investor confidence** - ideally with broad participation of a range of parties with strategic interest in seeing UK CCS succeed
- Create a structure that **shares (unavoidable) risks** appropriately while maintaining commercial incentives and discipline



CCS remains of central strategic value!

ETI energy system modelling points to 'energy system-wide' value of CCS extending beyond low carbon electricity generation



ETI ESME analysis consistently shows doubling of cost of meeting 2050 targets without CCS: 1 – 2% GDP



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