Carbon Capture Usage and Storage (CCUS) policy: the Government's new approach

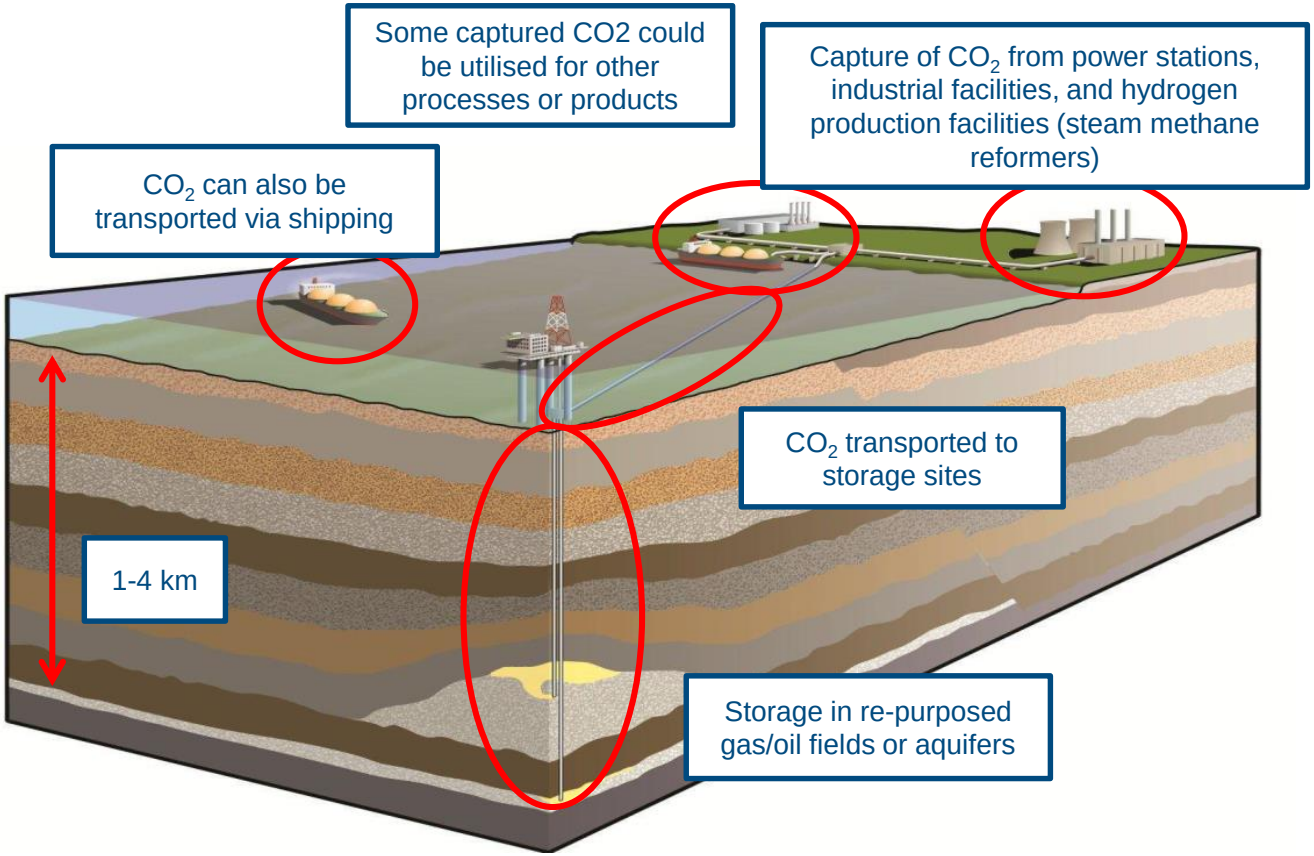
2 May 2018

Department for
Business, Energy
& Industrial Strategy

What is CCUS?

CCUS is the process of:

- Capturing carbon dioxide (CO_2) emissions from large-point sources (such as power stations and industrial facilities)
- Transporting CO_2 in pipelines or via ships to very deep subsurface rock formations, where it can be safely and permanently stored
- In some instances the CO_2 captured can be utilised.



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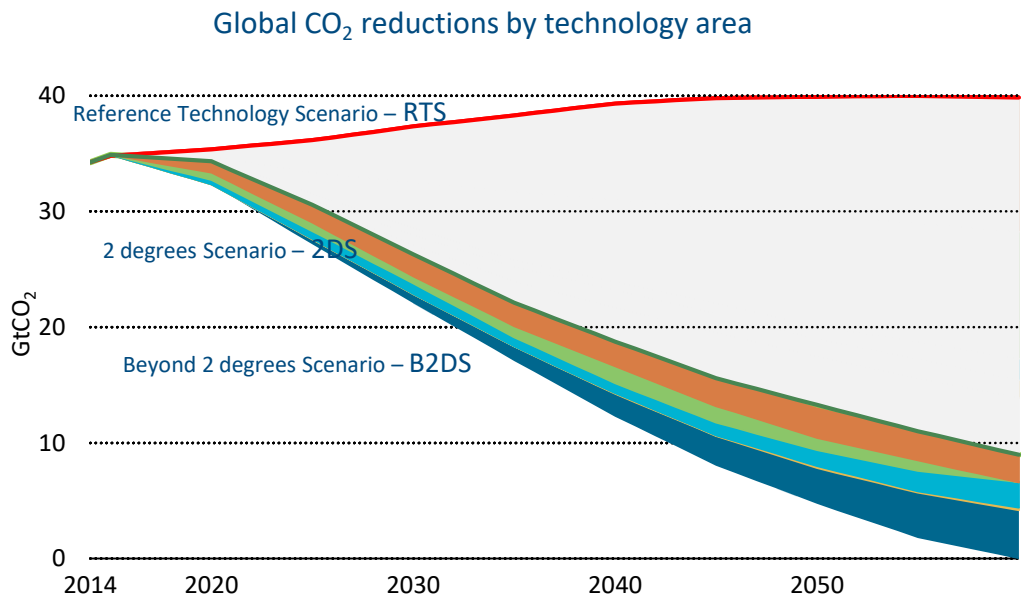
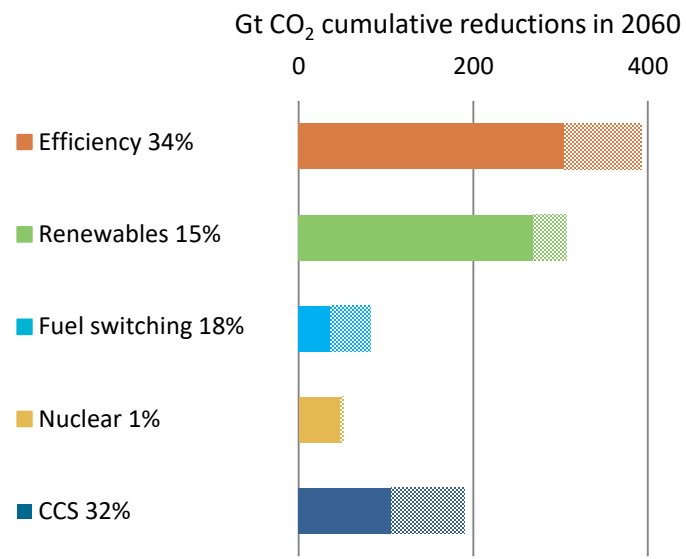
IEA and IPCC models indicate CCUS central to keeping temperatures to 2°C

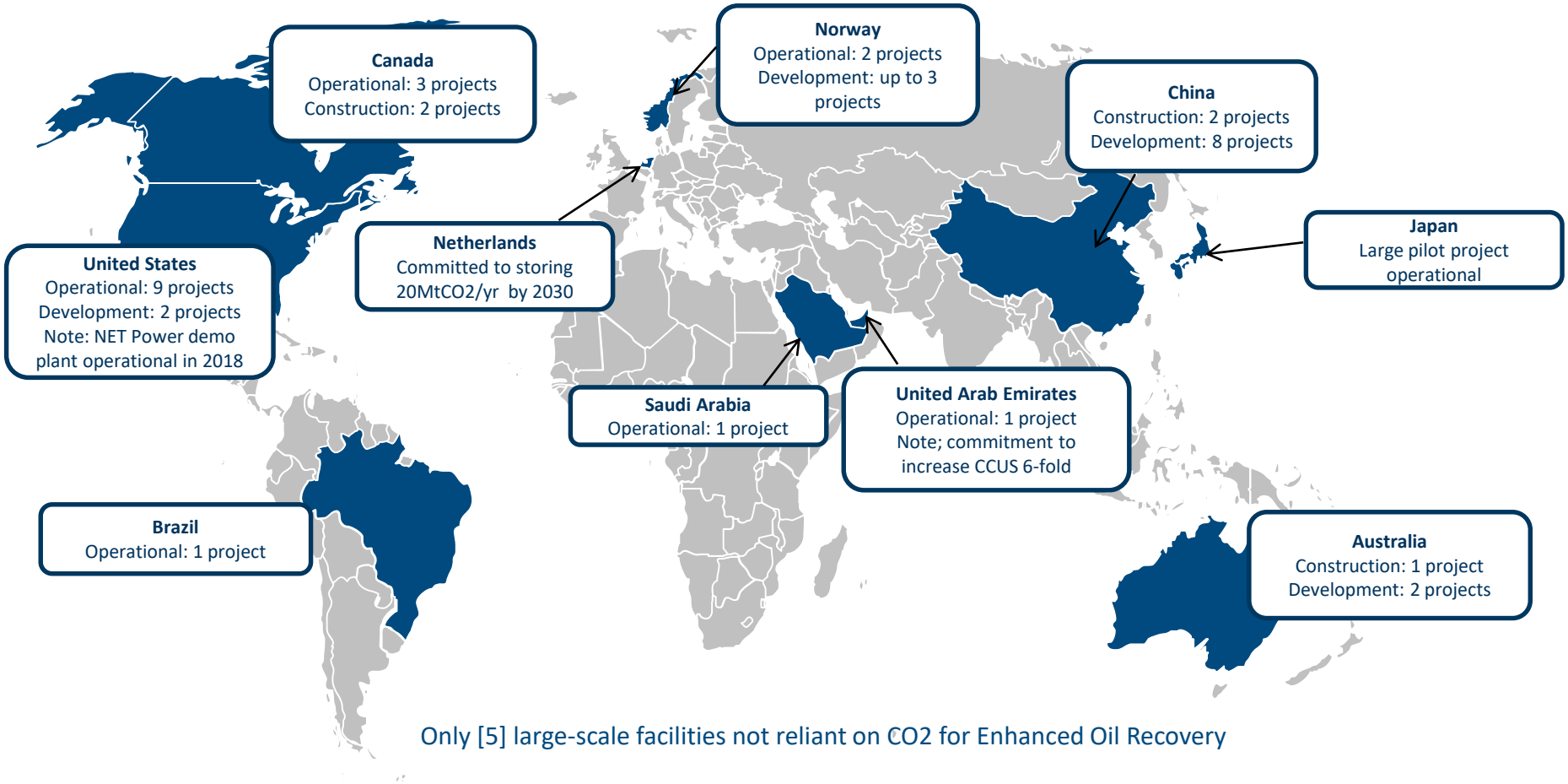


Source: IEA



Intergovernmental Panel on Climate Change
~70% of IPCC models require CCUS for 2°C
87% of IPCC models require carbon removal for 2°C (starting in 2030)
Will be an important feature in 2018 IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emissions pathways

22 projects globally*



Only [5] large-scale facilities not reliant on CO2 for Enhanced Oil Recovery

*in operation or construction as of February 2018 (GCCSI global database).

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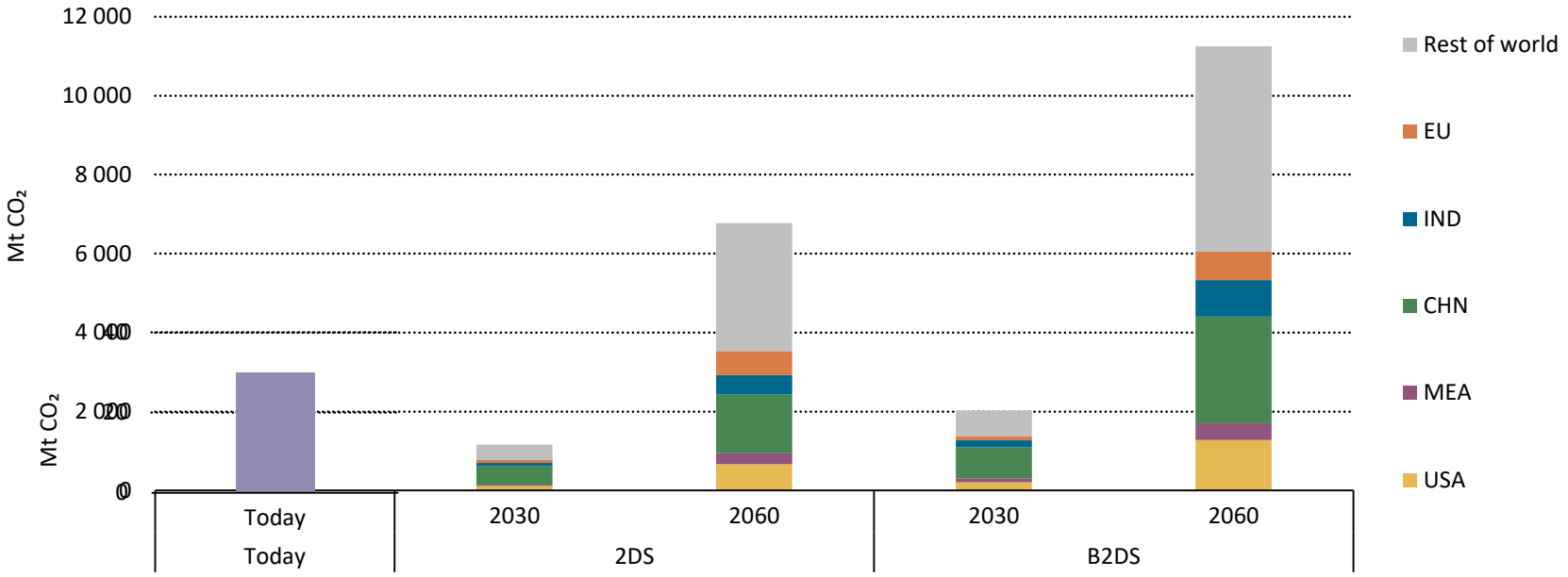
A significant scale-up of CCS efforts will be required globally

Cumulative CO_2 captured under various scenarios



Source: IEA

CCUS needs to be ramped up hundreds of times to achieve long-term goals

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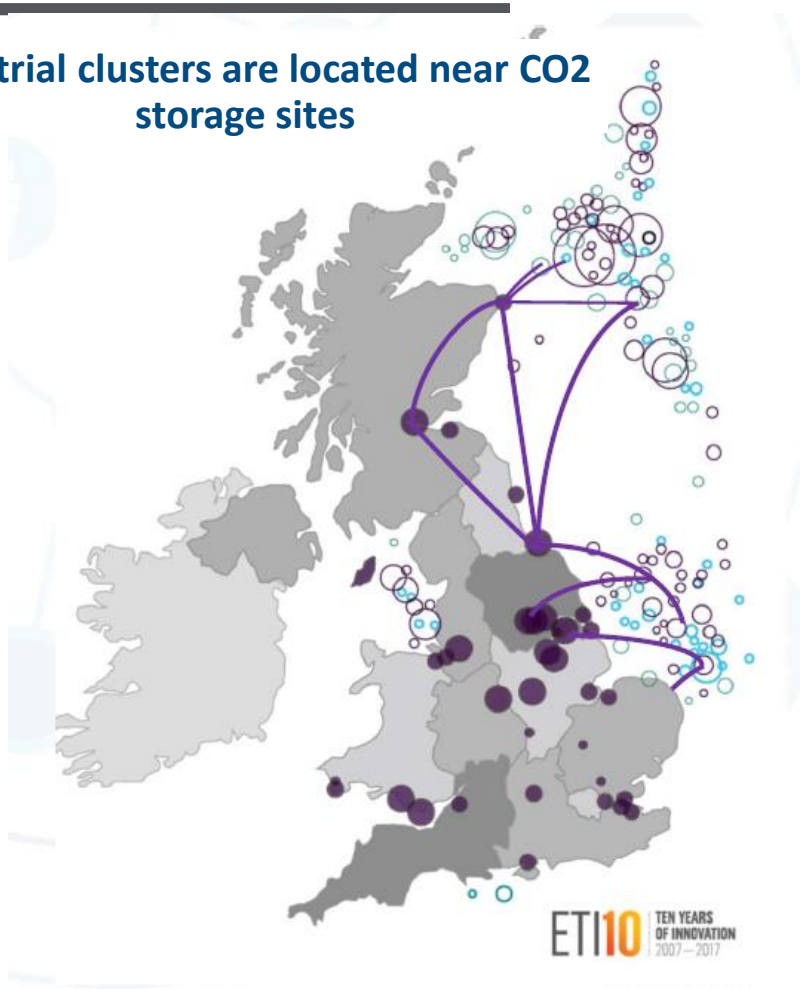
CCUS supports the Clean Growth Grand Challenge and least cost pathway to 2050

- Competitive clean UK **energy intensive industry**
- **Clean hydrogen** as an option for heat, transport and power
- A pathway for **negative emissions**
- **Clean and flexible power** to support renewable build-out
- **Using CO_2** for developing new markets and products

Industrial clusters are located near CO2 storage sites



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The Government's new approach to CCUS

- CCUS is an important part of the Clean Growth Strategy, supporting decarbonisation across the economy and maximising economic opportunities

- It is why the Government wants the UK to become a global technology leader in CCUS and work internationally with industry and governments to bring about global cost reductions

- Ambition is to have *"the option of deploying CCUS at scale during the 2030s, subject to costs coming down sufficiently"*

- Three themes:
  (1) Progress our commitment to deploying CCUS in the UK, subject to cost reduction;
  (2) Collaborate with international partners to drive down the cost and accelerate deployment of CCUS; and
  (3) Invest in CCUS innovation to support cost reduction and deployment in the UK.

Delivery theme 1: Re-affirming our commitment to deploying CCUS in the UK

CCUS Cost Challenge Taskforce to report to Ministers by middle of 2018 with a plan to reduce the cost of deploying CCUS in the UK

Deployment pathway for CCUS produced by end of 2018 on the steps Government intends to take to realise its ambitions for deploying CCUS in the UK

Review the delivery and investment models for CCUS in the UK covering industry projects; power projects; and CO2 infrastructure

Test the development of CCUS industrial decarbonisation clusters by working with ongoing initiatives in Teesside, Merseyside, South Wales, and Grangemouth

Establish a Ministerial-led CCUS Council to review our progress and priorities

CCUS Cost Challenge Taskforce

- Established February 2018, chaired by Charlotte Morgan from Linklaters.
- Four workstreams: (i) deployment options; (ii) delivery models; (iii) finance, risk and legal issues; (iv) innovation options.
- Report to be delivered to Government in summer 2018 to:
  - inform and propose a strategic plan for supporting the development of CCUS in the UK
  - focus on the value of CCUS to the economy and to wider society
  - cost reduction potential (through both commercial and technological changes) and opportunities for innovation
  - assess the impact of the future deployment of CCUS in the UK, including the potential consequences of not doing so

CCUS Council

- Will be the primary forum for engaging the CCUS sector on key strategic issues to enable the Government's ambition for CCUS to be achieved
- Co-chaired by Minister for Energy & Clean Growth and James Smith, chair of Carbon Trust
- The Council will:
  - Advise on CCUS progress and priorities
  - Review the work of the CCUS CCTF and the Government's implementation of the CCUS CCTF's plan delivered to Government (once published)
  - Monitor CCUS costs and deployment potential (including on the Government's ambition for deploying CCUS at scale during the 2030s)

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Delivery theme 2: International collaboration

The Government will work with industry and other governments to drive down the cost and accelerate deployment of CCUS, including by:

Continuing to participate in **Mission Innovation** and its Carbon Capture Challenge;

Working closely with **private sector-led initiatives** such as the Oil and Gas Climate Initiative;

Developing **closer collaborative working** with countries such as Norway, the US, Canada, and Australia, including joint working on CO_2 transport and storage solutions, and working multilaterally through the CSLF and NSBTF;

Continuing to be **a global leader in CCUS investments** through the UK's £60 million international CCUS programme which has been running since 2012, by investing a further £10 million in the programme; and

Holding a **Global Carbon Capture Usage and Storage Conference** in 2018, with international partners.

UK's International CCUS Programme

- Since 2012, our international CCUS programme has **invested £70 million** to support the development and deployment of CCUS in emerging economies and developing countries
- Funds are used to support capacity building activities, CCUS Centres of Excellence, feasibility studies and **pilot CCUS projects**
- **£35 million** is provided through the Asian Development Bank's CCS Trust Fund to support activities in Indonesia and China
- **£35 million** is provided through the World Bank's CCS Trust Fund to support activities in South Africa and Mexico. This includes a £10 million extension approved in 2017
- Possible future work with Asian Development Bank includes:
  - Engaging with additional countries such as Bangladesh, India, Vietnam and Kazakhstan
  - Currently funding a US $1 million feasibility study of CCUS in Pakistan
  - Focusing on CCUS in industry alongside the power sector

Delivery theme 3: Investing in CCUS innovation

The Government will spend **up to £100 million** from the BEIS Energy Innovation Programme to support industry and CCUS innovation and deployment in the UK, and support cost reductions.

£20 million of funding for a **CCU demonstration** programme

Supporting **next generation capture technologies**, with an aim to lower the cost of capture

Supporting **small-scale industrial capture demonstrations** to reduce the risks associated with CCUS on an industrial site

Supporting the application of CCUS in **low carbon hydrogen production**

Furthering our understanding of the **role of GGR technologies**, including BECCS

Supporting studies and technologies that **reduce costs of transporting and storing CO2**

2018 will be important in putting us on the path to realise the CCUS ambitions in Clean Growth Strategy

By the **end of 2018,** we will have:

- Received a plan of action from the **CCUS Cost Challenge Task Force**
- Progressed the **review of delivery and investment models**
- The **CCU demonstration programme running** and announced more detail on other CCUS innovation support programmes
- Established the Ministerial-led **CCUS Council**
- Continued working with **ongoing initiatives** in Teesside, Merseyside, South Wales, and Grangemouth
- Held a **Global CCUS Conference** with international partners
- Strengthened international collaboration through Mission Innovation, bi-lateral work with Norway, the US, Canada, and Australia and through multi-lateral organisations such as CLSF and IEA
- Published a **deployment pathway**