Leverage research/laboratory infrastructure for upscaling and standardization of results from test facilities

- CCUS is considered generally effective at large scale (viewed as lumpy technology).
- CCUS Upscaling: Initial large-scale attempt observed after 2005, as researchers' community believed that CCUS projects should be delivered at meaningful scale.
- Significant financial risk associated with upscaling CCUS to commercial scale.
- The financial and political risks can be mitigated by endorsing smaller pilot scale facilities to accelerate broad deployment of CCUS.
- Leveraging research and laboratory infrastructure for upscaling will reduce the technology gap between R&D and D&D projects.
Leverage research/laboratory infrastructure for upscaling and standardization of results from test facilities

CCUS: Nascent Technology That’s Critical For Net Zero Low-Carbon Future

• Role of Research Facilities And Laboratory Infrastructure To Accelerate The Upscaling of CCUS Is Essential

• Opportunities
  • International Collaboration and Knowledge Sharing: Open access data
  • learning effects realized through a portfolio of pilot-scale
  • Support for RDD&D of Next Generation Technologies
  • Procedures for integrating and leveraging technology tools for common scenarios

• Challenges
  • A financial sustainability plan, and Investment strategies
  • Standardization of Laboratory Tests: How to do it
  • What type of data is needed; how it may be collected; and, how this data would help upscaling
• **ITCN**: Global coalition of facilities working to accelerate the research and development (R&D) of carbon capture technologies.
  - Since its launch, some of the world’s leading CCS test centres have been sharing knowledge of construction and operation of large test facilities in order to establish a level playing field for technology vendors to reduce costs, as well as the technical, environmental and financial risks currently associated with CCUS.

• **ECCSEL**: The European CCUS Research Infrastructure for CO₂ Capture, Utilisation, Transport and Storage (CCUS)
  - European Research Infrastructure Consortium (ERIC) is a distributed, integrated research infrastructure encompassing interlinked transnational scientific facilities and national nodes.
  - ECCSEL offers open access to over 80 world class CCUS research facilities across Europe
Recent UK-BEIS and EU Infrastructure Funding to Establish National pilot-scale facilities (2019-2023)

- **Total Investment £36.3M ($48M)**
- Pilot-scale facilities covering:
  - Carbon Capture, BECCS, CO\(_2\) Utilisation (Sustainable Aviation Fuels), Hydrogen (Green & Blue) Production, Next generation CO\(_2\) capture Technologies
  - CO\(_2\) capture capacity: 2.4T/day (via Solvent capture plant, Rotating Packed Bed, Molten Carbonate Fuel Cell and Direct Air Capture)
  - Hydrogen: 150Nm\(^3\)/h Production + 1500Nm\(^3\) storage (BECCS-To-H\(_2\) + Electrolyser)
  - SAF: 60L/day (expansion to 360L/day) via Power-To-Liquid, CO\(_2\) + H\(_2\) (RWGS+ FT)
  - A Unique centre to be able to capture CO\(_2\), produce green/blue H\(_2\), convert them into SAF and analyse their performance all in one single location.