

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

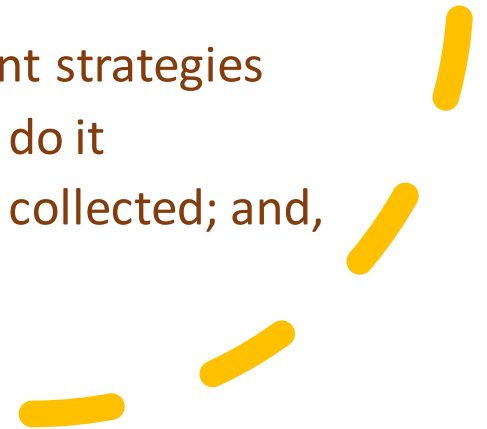
- CCUS is considered generally effective at large scale (viewed as lumpy technology).
- CCUS Upscaling: Initial large-scale attempt observed after 2005, as researchers' community believed that CCUS projects should be delivered at meaningful scale.
- Significant financial risk associated with upscaling 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.



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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, CO₂ Utilisation (Sustainable Aviation Fuels) , Hydrogen (Green & Blue) Production, Next generation CO₂ capture Technologies
 - CO₂ capture capacity: 2.4T/day (via Solvent capture plant, Rotating Packed Bed, Molten Carbonate Fuel Cell and Direct Air Capture)
 - Hydrogen: 150Nm³/h Production + 1500Nm³ storage (BECCS-To-H₂ + Electrolyser)
 - SAF: 60L/day (expansion to 360L/day) via Power-To-Liquid, CO₂ +H₂ (RWGSR+ FT)
 - A Unique centre to be able to capture CO₂, produce green/blue H₂, convert them into SAF and analyse their performance all in one single location.

