Integration of CCUS and hydrogen technologies for industrial decarbonisation

Prof Mercedes Maroto-Valer
Associate Principal (Global Sustainability)
Director RCCS

International expert workshop on deep decarbonisation in industry
Vienna
9-11th October 2019

www.rccs.hw.ac.uk

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UK Government committed to Net Zero for 2050

Around one-third of energy-related emissions currently have no economically viable options for deep decarbonisation.

UK Industrial Strategy 2018
Industrial decarbonisation

- Industrial decarbonisation requires the development of medium to longer term innovative low-carbon technologies.
- The UK low-carbon economy could grow ~11% per year in the period 2015 to 2030.
- Potential to deliver between £60 to £170 billion of export sales of goods and services by 2030.
- Sector roadmaps have identified six key technology groups, carbon capture and utilisation, biomass, electricity decarbonisation, energy efficiency/heat recovery, electrification of heat and industrial clustering.
- The first four technologies are expected to deliver the bulk of emissions reduction in achieving our UK target to reduce CO₂ emissions by 80% by 2050.

UK Industrial Strategy, 2018
The Research Centre for Carbon Solutions (RCCS) is an interdisciplinary world-leading engineering centre, inspiring and delivering innovation for the wider deployment of technologies needed to meet necessary carbon targets.

**Research Themes**

- **Carbon Capture and Storage**: Development of novel materials and processes for decarbonization of power and industrial sectors.
- **Carbon Dioxide Utilisation**: Solar and electrochemical conversion of carbon dioxide into chemicals and fuels.
- **Low Carbon Systems**: Process and systems integration combined with life-cycle analysis to develop sustainable energy solutions.
- **Negative Emission Technologies**: Assessing processes that remove carbon dioxide from the atmosphere.

**Key Facts**

- **10 Laboratories**
- **15 Projects**
- **20 PhDs**
- **18 Staff**
- **400 Outputs**
- **£17m Funding**

**Role of CCUS and H2**

- **Technologies for coupling CCUS and H2**
  - Combined Solid Oxide Co-electrolysis and Fischer-Tropsch
  - Hybrid system for on-site power generation of solar fuels

**Delivering down cost**

- Recognising the value and urgency of CCUS deployment.

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**Our Vision**

www.rccs.hw.ac.uk
Methanol production from CO$_2$: Chemical versus electrochemical

CCUS Deployment in UK: Delivering Clean Growth

Accelerating Low Carbon Industrial Growth through CCUS

Industrial Strategy for Decarbonisation in UK
Summary

We are developing medium to longer term innovative low-carbon technologies.

Industrial and transport decarbonisation can be achieved with integration of CCUS and H₂.

International collaborations are key to achieve industrial decarbonisation.

Thanks to all the Team, our Collaborators, Partners and Funders. Making It All Possible!!

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