# BEIS Review of Next Generation Carbon Capture Technologies for Waste, Industry and Power

18 November 2021

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# Overview of Study

- Technical and performance review of state-of-the-art and next generation carbon capture technologies to inform future innovation spending programmes
- Particular focus on waste and industrial applications as well as power generation
- Main outputs will be:
  - Technology review of next-gen technologies with potential for commercial deployment by 2030-35
  - Develop concept for 100tpd mobile demonstration plant
  - Technoeconomic analysis of down-selected list of technologies for assessment against state-of-the-art benchmarks
- Stakeholder engagement and promotion of Innovation funding Call 2 in May 2022

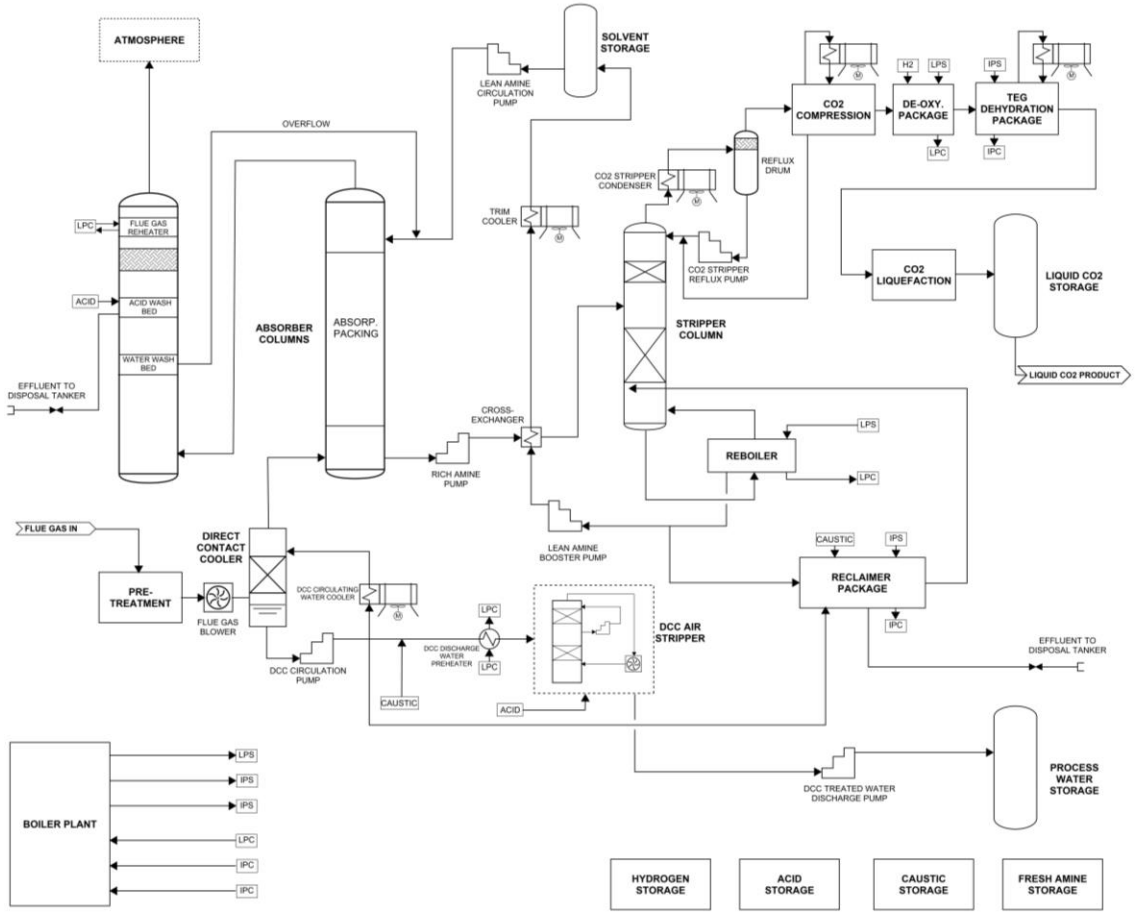
# 100tpd Mobile Demonstration Plant Concept

**Objectives**

- Proposal for a mobile demonstration plant to provide performance verification under realistic conditions
- Reference (capex and programme) for assessment of next-generation demonstration plants seeking BEIS funding

**Proposed Configuration**

- Amine solvent capture plant retrofit to existing EfW plant
- Selection of amine solvent is proposed to establish a “technology verification package” rather than pilot plant, targeted at residual gaps in test centre capabilities:
  - Full-chain to sales-grade liquid $CO_2$ product
  - Full reclaiming testing
  - Processing variety of real flue gases in situ (plant to be mobile)
  - Flexibility to modify ‘base design’ to meet site-specific requirements
- Assessment of additional flue gas pre-treatment to mitigate long-term degradation effects on solvent
- Single stage thermal reclaimer in default arrangement, fired by IP steam and running at stripper pressure.
- De-risk projects by long-term testing (c. 10,000 hours) at representative facilities and demonstrate reclaimer, waste stream and contaminant rates



# Benchmarks and TEA Configurations

A number of the selected configurations are based on EfW archetype

Capture processes to be assessed may include:

- Non-amine solvent
- Solid sorbent
- Rotating absorption / desorption
- Ammonia solvent
- Fuel Cell (MCFC as powered membrane)
- Improved amine solvent
- Polaris Polymeric Membrane

Currently engaging with technology providers to support evidence base for cost and performance assessment of these technologies

TEA will be based on high-level process and cost model for selected configurations

# Industry Participation

Stakeholder Engagement Workshop 1 – Opportunities and Barriers (30/9/21)

Stakeholder Engagement Workshop 2 – Technologies and Applications (20/1/22)

Review and input via ESA to support evidence base and shape outputs

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