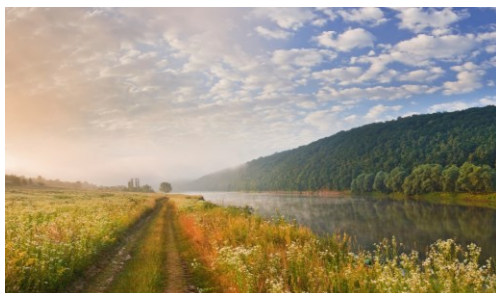




IEA Bioenergy
Technology Collaboration Programme



ITP BECCUS WP3 (UK)

Status, deliverables, what's next

Patricia Thornley; Paula Blanco

Aston University, EBRI,
Supergen Bioenergy Impact Hub
IEA Task Meeting 11th June 2024

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Technology Collaboration Programme
by **iea**

General Update

- Task 33 technology **WP3** is especially about the technology description, development status (and possible projects) of the biomass gasification technology combined with carbon capture and utilisation or storage. A **technology case description with process scheme and overview on the concept** is highly desirable.
- IEA tasks in UK co-ordinated by Supergen Bioenergy Hub (multiple university and industry partners)
- Gasification task input relies on direct funded hub research at Aston and Glasgow and industrial partners (Kew Technologies). Hub funded 2023-2027 to deliver impact via industry & policy engagement. 2 hub tasks on gasification. LCA expert working on Supergen activities.
- BECCUS task input (metrics) led by Aston

BECCUS Task Update

- Engaged with partners around metrics and subsequent 1:1 follow-ups. Fed into UK BECCS task and finish group. Clear(er) understanding of relevant metrics (dependent on objectives). Paper summarizing positions very overdue (comms challenges & staff illness)
- Website update material ongoing
- LCA research work dependent on other projects and therefore progressed and complete.
- Internal meeting (Thornley, Blanco-Sanchez, Paul, Roeder) to progress position paper, website, LCA report for IEA



LCA Gasification

Carbon dioxide removal potential from decentralised BECCS and the relevance of operational choices

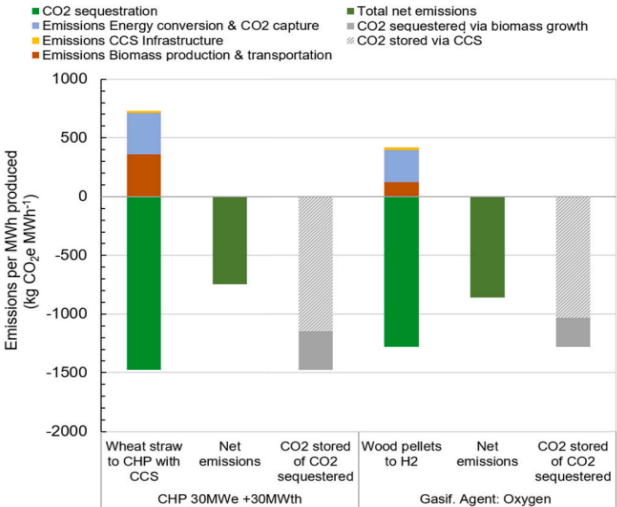
Biomass and Bioenergy 159 (2022) 106406

BECCS case studies:

- (a) Combined heat and power (CHP) generation with post-combustion CCS, and
- (b) Hydrogen production via gasification with pre-combustion CCS [only commercially demonstrated technologies].

Energy efficiency (10-48%; operational choice); Energy penalty by CC system could compromise economic performance of bioenergy production.

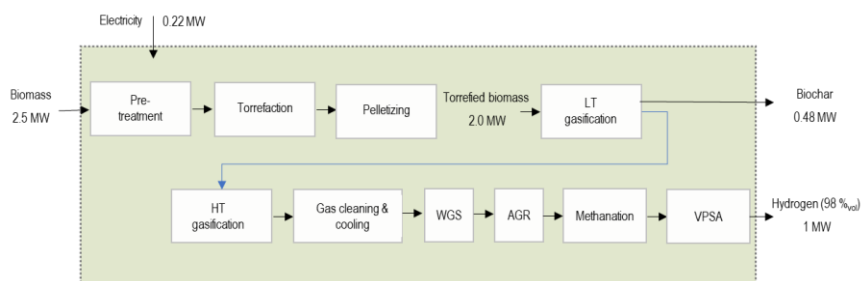
Using all wheat straw and waste wood in the UK, a joint CDR capacity for both systems could reach about 23% of the UK's CDR minimum target set for BECCS.



GHG emissions, net emissions and CO₂ storage efficiency per MWh of energy produced for the two alternative case studies

Example Case Study for ITP BECCUS (TorrGas)

“Gasification of biomass for hydrogen production” from the Synergies Hydrogen project. [LT: 700 °C; HT: 1200 °C; O₂ atmosphere]



Process scheme including energy balances across the system boundary for production of 1 MW of hydrogen gas.

DEVELOPMENT STATUS, APPLICATIONS, AND PRODUCTION SCALE
ASSESSMENT OF THE TECHNOLOGY READINESS
ECONOMIC AND ENVIRONMENTAL ASSESSMENT



https://www.torrGas.nl/torrGas/_sitefiles/file/torrGas-process.pdf

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IEA ITP BECCUS: what's next?

- Create/extract information for website (expected 1 month time)
- Progress on LCA case study as per template for ITP: using the model we have created to **adjust scope and indicators as necessary to be consistent with the other case studies and agreed benchmarks** (to be adjusted by new RA in LCA-Supergen)
- Next meeting: Thursday 11th July 2024 BECCUS WP Leader meeting
- Next few months the whole ITP BECCUS plan to have the draft technology case studies available for the technology WPs 2, 3 and 4.



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