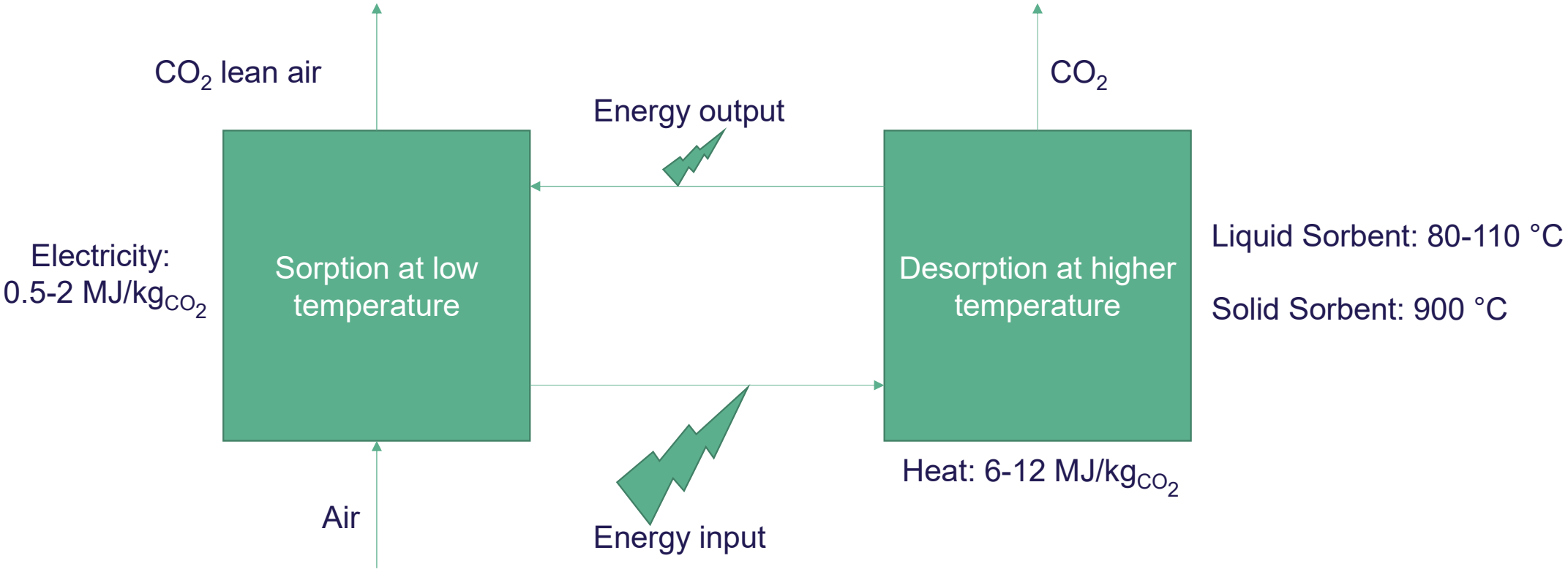
Assessing the integration potential of using direct air capture technologies as carbon source for P2X

25-04-2023

Direct Air Capture Technology



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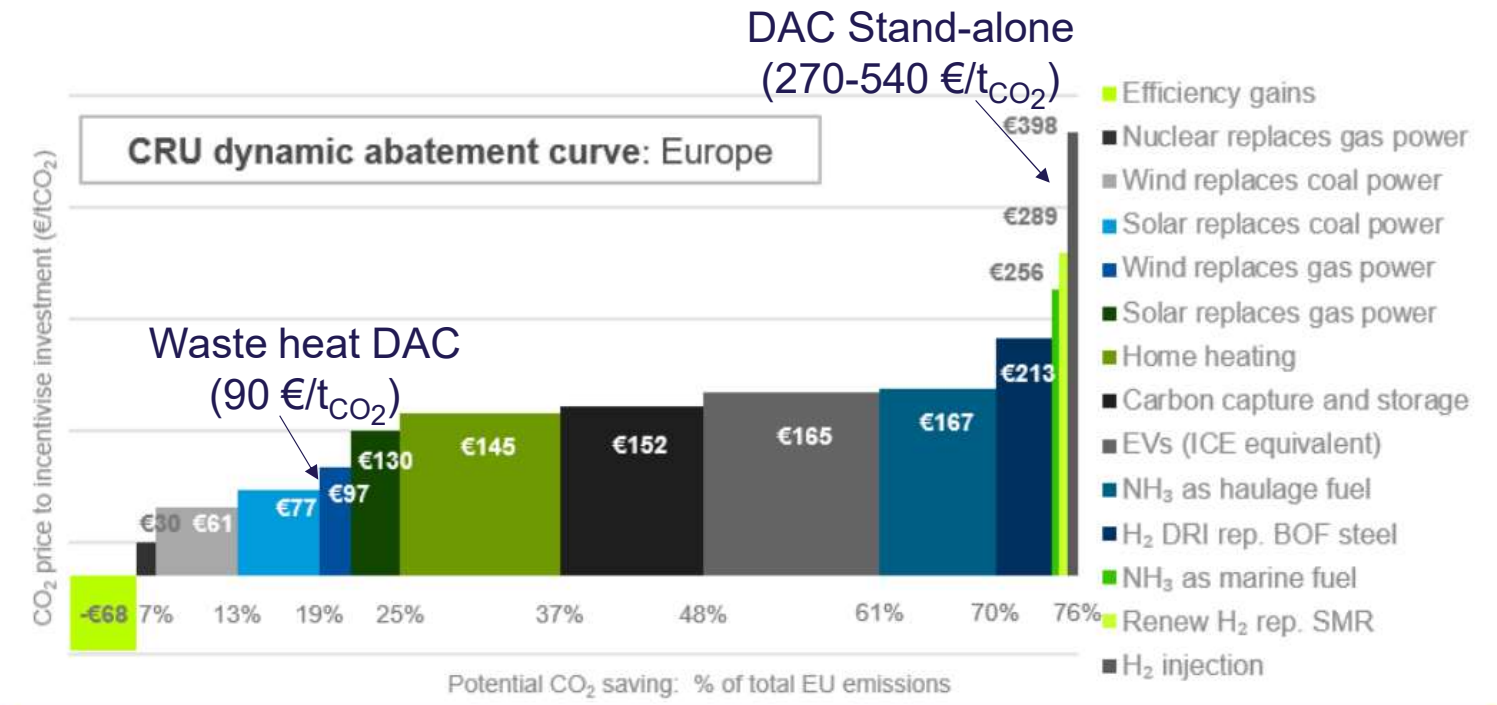
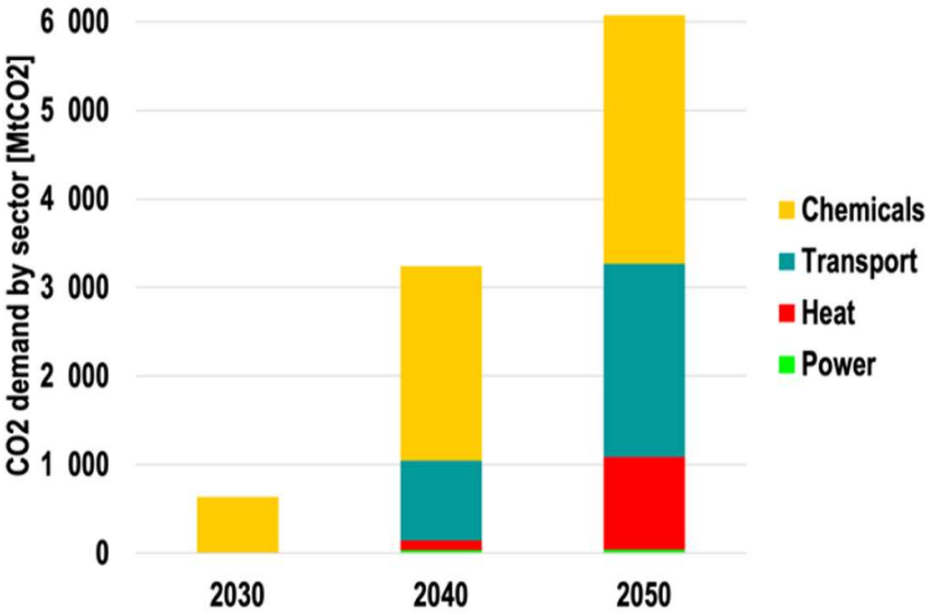
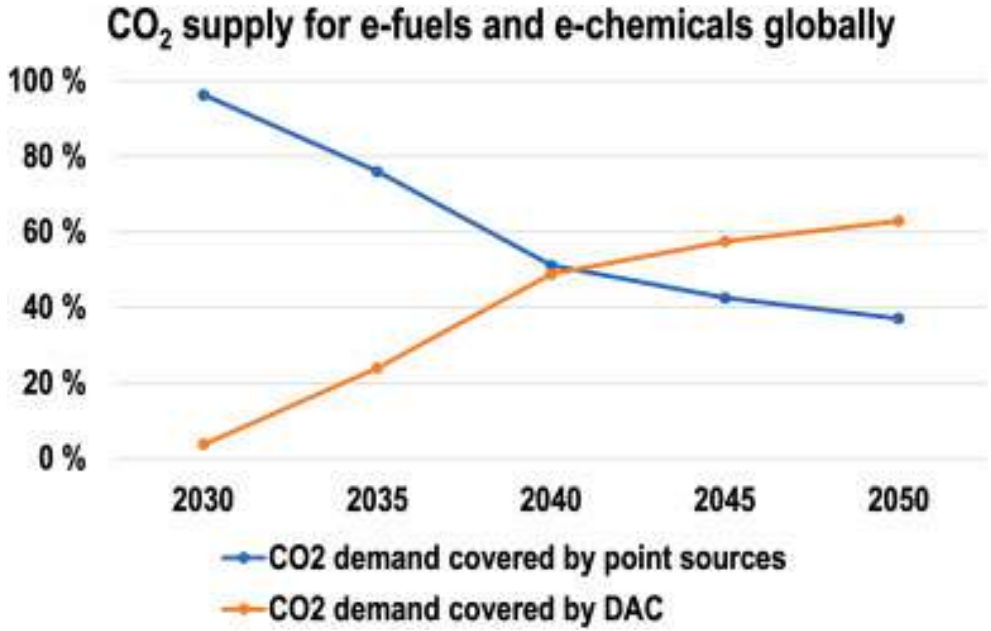
CO_2 Emission Savings: DAC Perspective



DATA: CRU Sustainability analysis; Note: abatement curve based on 2030 investment costs, steady-state fossil energy prices and reported on a real 2020 basis

Direct Air Capture: CO_2 Source





GALIMOVA, Tansu, et al, 2022: https://doi.org/10.1016/j.jclepro.2022.133920

DAC-P2X: Integration potential

Direct air capture

Electrolysis

Fuel synthesis

Solid Sorbent:
- Require heat (80-110 °C)
- Produce water
- Cyclic operation

Liquid Sorbent:
- Require heat (900 °C)
- Require water
- Run continuously

Alkaline:
- Generates heat (70 °C)
- Require water

Solid oxide:
- Temp. 500-900 °C
- Require steam
- Require water
- CO-SOEC → syngas

Methanol:
- Generates heat (200-300 °C)
- Produces water

Fischer-Tropsch:
- Generates heat (150-300 °C)
- Produce water
- Require syngas

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DAC-P2X: Current status and prospects

Kopernikus P2X project:

- 10 L/day, today
- 200 L/day, 2023

Karlsruher Institut für Technologie

Norsk e-fuel:

- 10 million L/year, 2023
- 100 million L/year, 2026

Pilot plant, 10 L/day: https://www.kit.edu/kit/english/pi_2019_107_carbon-neutral-fuels-from-air-and-green-power.php

DAC-P2X: Current status and prospects

Air-to-fuels plant, Canada:

- 100 million L/year, 2026

HURON CLEAN ENERGY

AtmosFUEL, United Kingdom

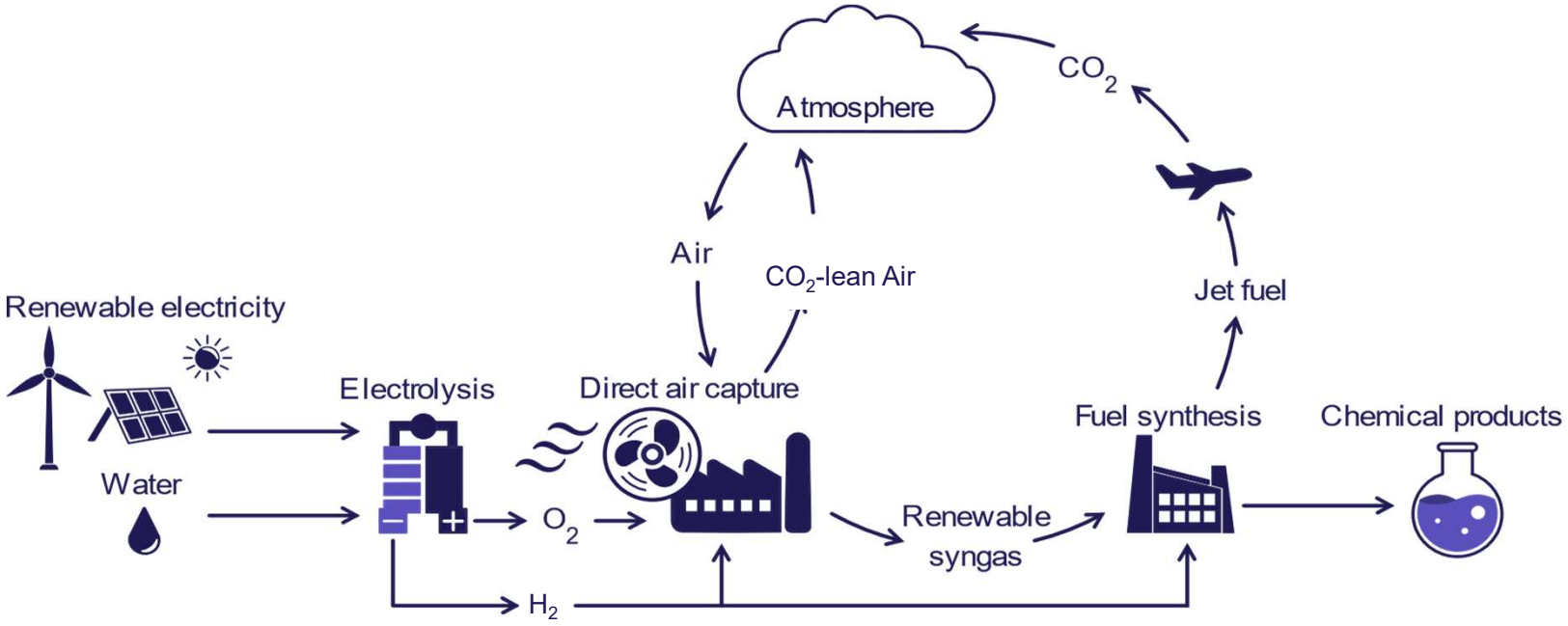
- 100 million L/year, 2029

LanzaTech

Carbon Engineering's pilot plant in British Columbia: https://www.ecowatch.com/renewable-energy-from-air-co2-2655915204.html

Carbon Engineering

Q&A



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