CCUS ZEN (Zero Emission Network)
Presentation at CCS4CEE – final regional conference

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https://www.ccusnetwork.eu/

- HORIZON-CL5-2021-D3-02-12 . CCUS in hubs and clusters
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A.SPIRE

Aker Carbon Capture

Associació Empresarial Química de Tarragona

BASRECCS network of Carbon Capture and Storage

BELLONA

BGR

Carbfix

Carbon Capture & Storage Association (CCSA)

Carbon Capture Cluster Copenhagen (C4)

Carboncause

DNV

ECCSEL ERIC

Endrava

ENeRG

Eni

Equinor

Gassnova

Heidelberg Materials

Holcim Innovation Center

Latvenergo

Lhoist

NEOCUS

Noble Corp

Pentair

Piicto by Marseille Fos

Port of Antwertp-Bruges

Process4Planet

Repsol

Scwhenk Latvija

Shell

Storegga

Technology Centre Mongstad

Total Energies

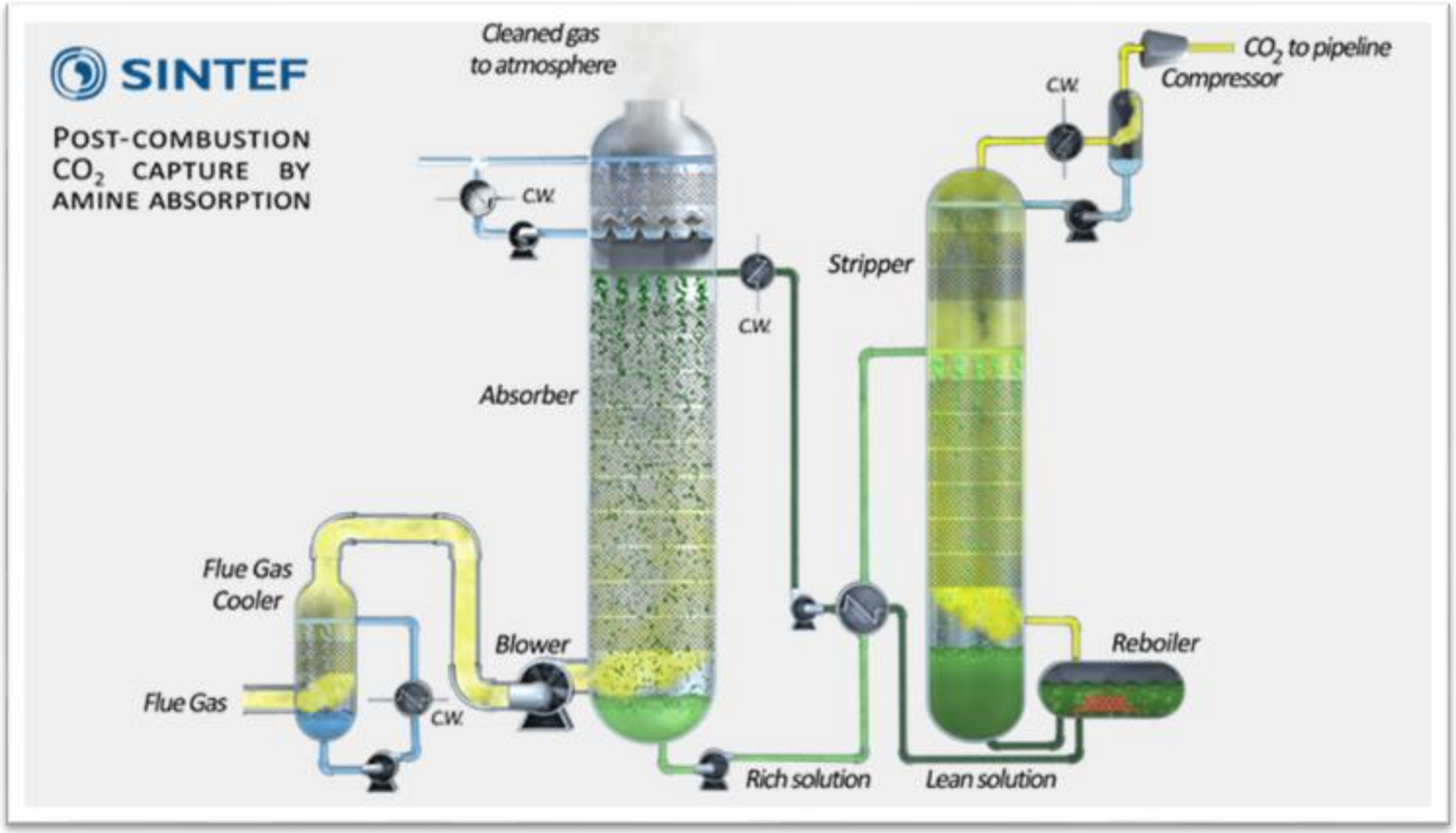
Tupras

Vallourec

CCUS ZEN Networking Partners

CO_2 Capture

- Post-combustion CO_2 capture based on absorption with amine solvents has been commercially available for at least 30 years.
- A number of vendors are ready to offer capture technology today
- Other capture technologies are also available*



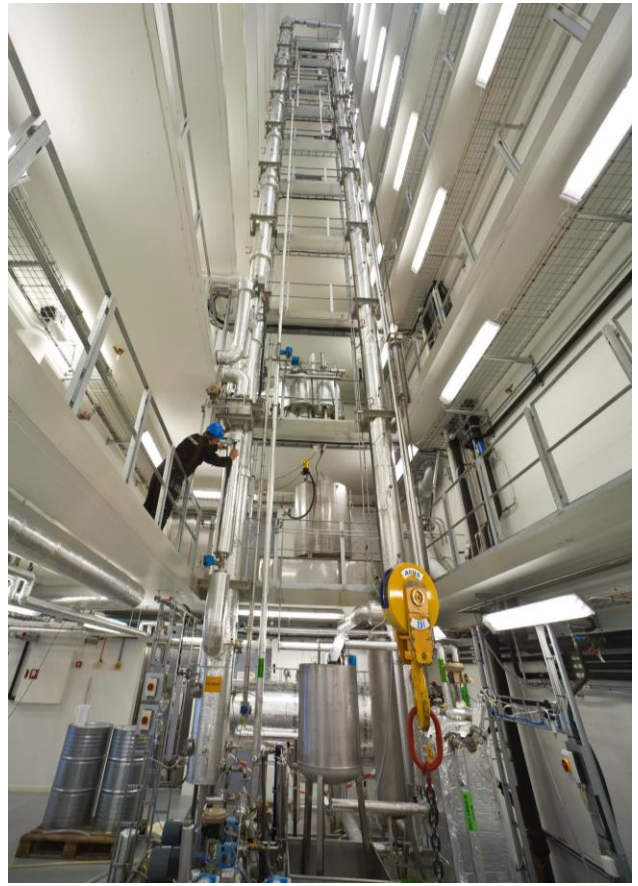
CO_2 Capture-basics

- CO_2 capture does require substantial energy. Either in the form of heat or electricity
  - Numbers can be around 2.5 GJ/ton CO_2.
- Capture plants tend to have significant plot space requirements
- The CO_2 does also need to be compressed for transport and storage

Experience with CO_2 capture

- Boundary Dam and PetraNova CCS plants

Experience with CO_2 capture

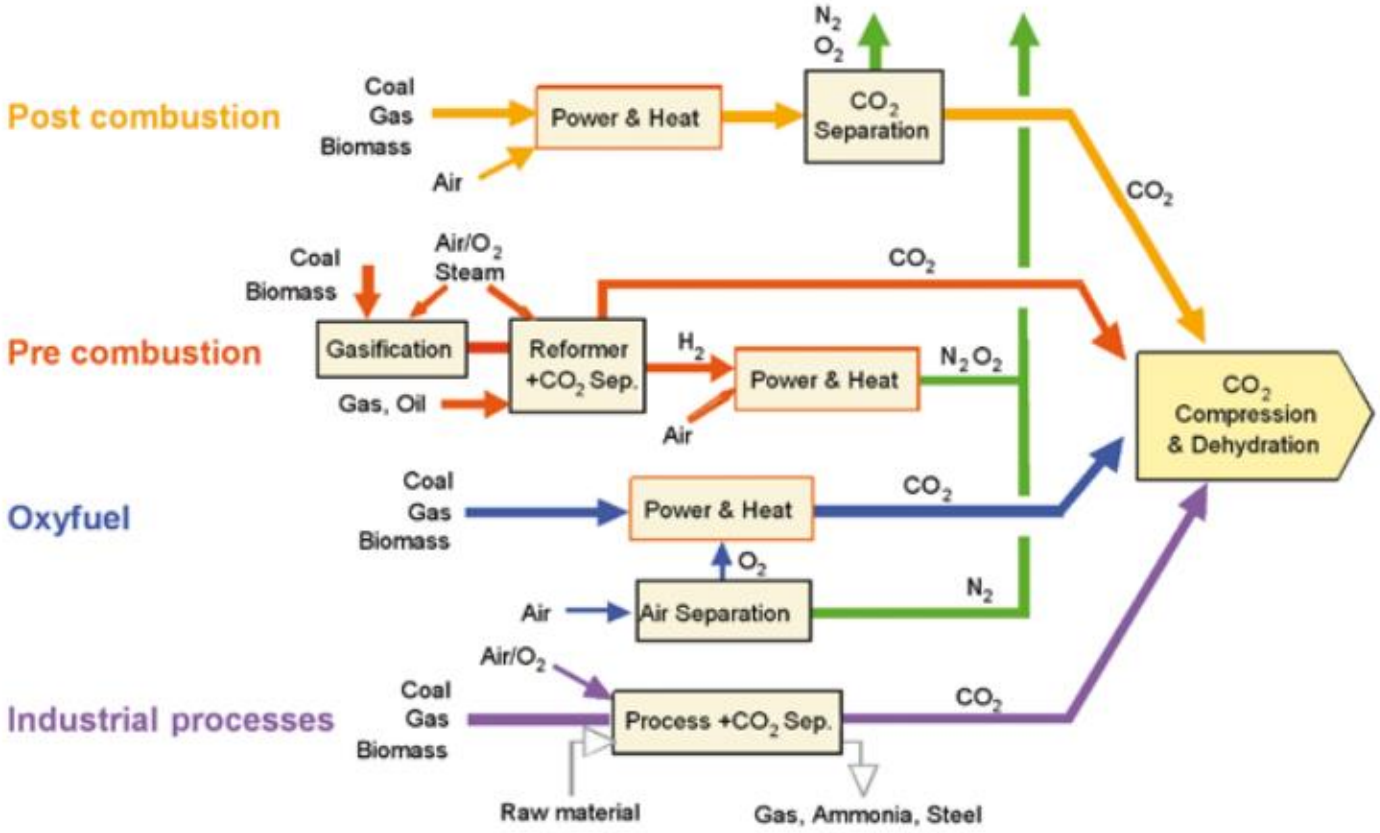


- Technology Centre Mongstad: Continuous testing of capture technologies for over 10 years
- SINTEFs Tiller pilot is example of smaller pilot plant. A lot of data has been published from such units

Where is the technology today

- Capture plants work
- The current plants are first of a kind
  - There are likely to be technical improvements over time
- There are technical risks that must be managed
  - This includes issues relating to flue gas impurities and emission permitting
- Managing of technical risk for capture plants has not been standardized yet

Technology options



Post-combustion technologies:

- ❑ Absorption (solvent based capture)
- ❑ Membranes
- ❑ Adsorption (based on solid materials)
- ❑ Cryogenic separation

- ❑ Different technologies have different pros and cons. Some are suited for brownfield applications, while others are only for Greenfield deployment. View on best capture technologies may depend on industry and site specific KPIs.
- ❑ In my opinion one should not expect major technology breakthrough

Where is capture developing

From Jen Wilcox, US Department of Energy (8th June 2023)

Point Source Capture Focus

- Develop capture technologies for the power and industrial sectors
- Reduce CAPEX/OPEX under a wide range of feed conditions
- Achieve high capture efficiencies (>95%)
- Maximize co-benefit pollutant removal
- Create low-carbon supply chains (i.e., cement, steel, hydrogen, etc.)

I think these focus areas are in line with general interests in the field

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Thank you for your attention!

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