

A group of four people and a dog are sitting on a hillside at dusk, looking out over a town. The scene is captured in a cinematic style with soft, low-angle lighting. The people are dressed in warm, outdoor clothing. A large dog is sitting on the left. The background shows a town with buildings and a river, all under a twilight sky.

# CCU: CO<sub>2</sub> valorisation into synthetic fuels for the aviation sector

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Vattenfall

# This is Vattenfall

One of Europe's largest producers and retailers of electricity and heat



**100%**

Owned by the Swedish State



**7.1 million**

Electricity customers



**1.0 million**

Electricity network customers



**1.8 million**

Heat customers



**2.4 million**

Gas customers



**~19 k**

Employees

Vattenfall

# Heat Sweden



Heating 3 TWh

Cooling 70 GWh

Electricity 250 GWh



100 % Fossil-free fuels  
2025 (More than  
95 % already today)



## Net Zero

Emissions in our  
full value chain by 2040



BIO CCX program target

# To build a full-scale BECCS plant at one of our sites

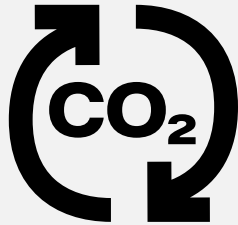
**Capturing at least  
100 kton  
CO<sub>2</sub>/year, latest  
2030**

**Commercially  
sustainable  
case by 2030**

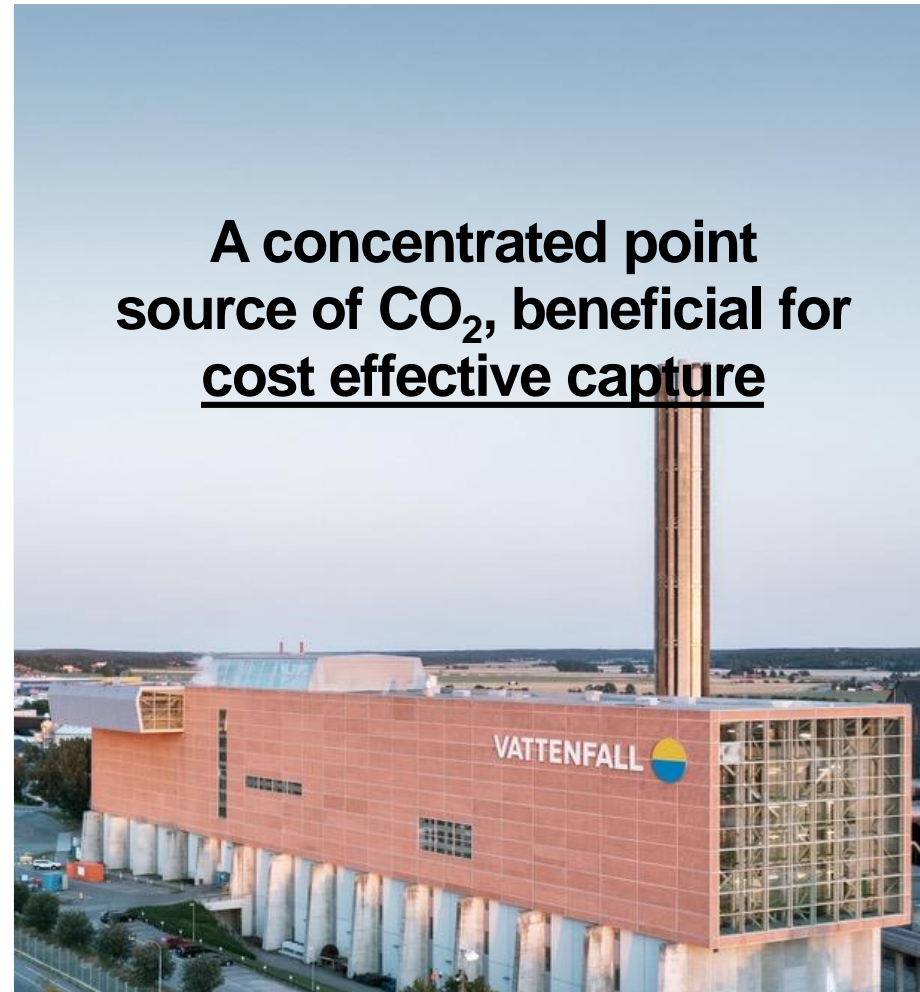
**No increased cost of  
district heating for  
our customers**

We take on the mission

# We found CCU to be an alternative for Uppsala



A concentrated point source of CO<sub>2</sub>, beneficial for cost effective capture



HySkies

# The HySkies project



VATTENFALL 



SAS

Investigate the prerequisites for production of Sustainable Aviation fuel at a site close to Forsmark

## Products:

50+ ktonnes/y of eSAF

Sustainable Naphta

~30% of Swedish domestic need of SAF or 10% of European need of eSAF in 2030



Abates approximately 200 000 ton of CO<sub>2</sub> per year



Timeline:  
Commission  
Aiming at 2030

# The value chain

BECCS

CCU

**Secure financing**



**Choice of technology**



**Choice of site**



**Logistics on site & transport to the harbor**



**Sea transport & permanent storage**



# CO<sub>2</sub> capture and liquification

## Selection criterion

- Maturity
- Operational experiences
- Steam & electricity demand
- Investment cost
- Heat recovery
- Footprint
- Turnkey supplier

## Short term

- Turnkey solution
- Amine, ammonia or HPC
- Open to technologies and choice of suppliers

## Long term

- Lower capex
- Smaller footprint
- Reasonable dimensions



# CCU in Uppsala Waste-to-Energy plant

- We investigate supplying captured CO<sub>2</sub> for production of synthetic aviation fuels
- Approximately 200 kton of CO<sub>2</sub> per year for re-use
- Operating time: 8 700 h/year
- Transport (Forsmark): 80 km by truck
- Technology: amin, but we keep open for other technologies
- Timeline: Commissioning aiming at 2030



## Challenges



### Regulation

Steer and drive demand  
on EU level



### Getting the whole value chain together

Need for new value  
chains that are cost  
efficient



### Reduce risk

Large investments that  
need long term  
preconditions



Contact

# Thank you!

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