Fortum Oslo Varme's CCS project

From waste-to-energy to negative emissions

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World's first full-scale CCS project on Waste-to-Energy

- Part of Longship CCS project; permanent geological storage below seabed
- 2 400 000 tons CO₂/year, 90% CO₂ capture
- Studies completed 2015-2019
- **Demonstrates truck transport of CO₂ to port**
- Successful pilot testing on real flue gas
- Relevant demonstration project for industrial emissions otherwise hard to abate
- **Partly financed, start of operations 2025**





Waste is one of the world's biggest climate challenges

- Waste amounts increasing
- Cities are growing
- Methane from landfills ~20% of global warming
- WtE best option to treat residual (non-recyclable) waste
- CCS on Waste-to-Energy provides 50 % CDR



The plastic problem

- **6.3 billion tons** of plastic waste produced globally until 2015
 - Only 9 % recycled
 - 12 % incinerated
 - 79 % dumped
- 12 billion tons of plastic waste lost in 2050 large parts end up as microplastics in the sea
- Only a small proportion of plastic can be reused;
 - It has been recycled several times already
 - it contains additives that make it unsuitable







The importance of BECCS/Carbon Removal

- Almost all IEA pathways to climate targets rely on carbon removal approaches great potential for **Waste-to-Energy** in Europe
- Carbon neutrality/net zero: Fossil CO₂ released = CO₂ removed
 - > Natural or technological removal methods (Forestry, BECCS, DAC)
- Carbon negativity: Fossil CO₂ released < CO₂ removed
 Climate Positive
- **BECCS** can neutralize or offset emissions that are currently challenging to abate, potential up to **8 Billion tonnes** per year
- Common framework and certification system lacking



CCS from Waste to Energy (WtE); key take-aways

- WtE is a **necessary addition** to sorting and recycling to handle real, residual waste
- CCS on WtE will give negative CO2-emissions (BIOCCS), and can neutralize other emissions that are difficult to reduce/remove
- **Cities** can cut emissions and mitigate climate change from waste handling, as part of sustainable city solutions



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