Energy and Green Urban Transition in Oslo

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From Climate Ambitions to Implementation
Carbon Capture and Storage (CCS) on Klemetsrud Waste-to-Energy Plant

➢ The City of Oslo is competing to build a CCS-plant at Klemetsrud
➢ Capture of 400 000 tons CO2
  - fossil (40%) and renewable (60%)
➢ Oslo’s waste system will become CO2 negative when CCS implemented
➢ Klemetsrud plant:
  □ Waste 400 000 ton
  □ Electricity 150 GWh
  □ District heating 850 GWh

Fortum Oslo Varme AS - Klemetsrud plant
Owned by City of Oslo (50%) and Fortum (50%)
KLEMETSRUD PLANT WITH CO2 SEQUESTRATION

Transfer from Carbon Revenue

Waste Incineration

Various Types Of Waste

CO2 Capture

Energy Generation → EI Transm System → EI Market

Heat production → Pipeline System → Heating Market

CO2 Sequestration

CO2 Transport

CO2 Storage

Increase in Gate Fees

Waste transporters/ Brokers

Fly Ash → Deposit - €1.0m

Bottom Ash → Metal Recirculation Revenue from metals covers costs

Certificate market: De-carbonizing electricity

Implicit price uplift From el – certificate market

Household Waste
273,000 tonnes @ €70 per tonne

Imported Waste
91,200 tonnes @ €46 per tonne

Infectious Waste (hospitals, etc)
15,200 tonnes @ €308 per tonne

CO2 Capture

CO2 Transport

CO2 Storage
Norway full-scale CCS project

- Combines industrial sources of CO₂ from Norway and other countries with safe storage on Norwegian continental shelf

- Stimulates development of CCS so that long-term climate targets in Norway and EU can be reached at lowest possible costs

Source: Dr Per Sandberg, Equinor New Energy Solutions
Thank you for your attention

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