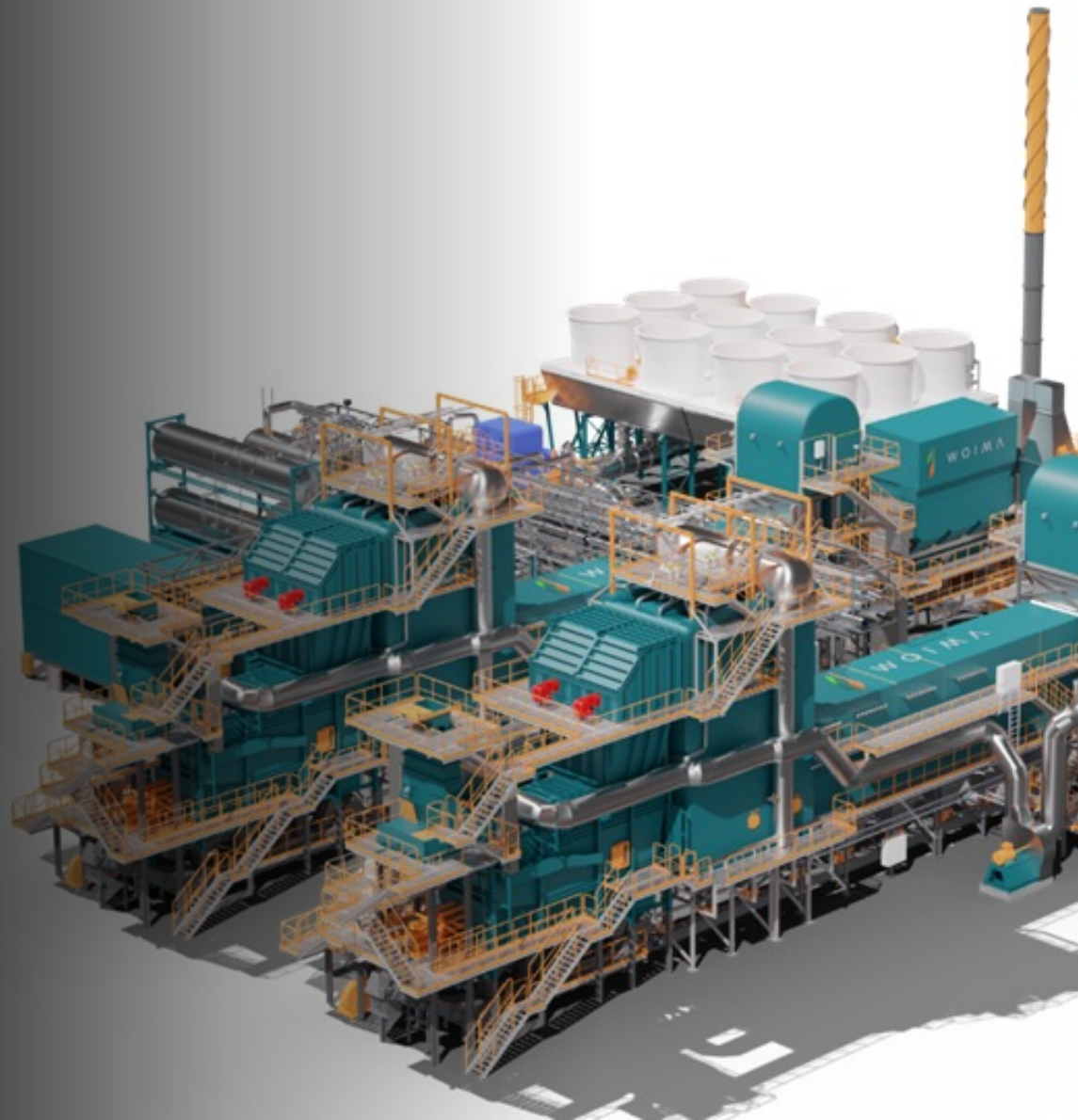
WOIMA

CORPORATION

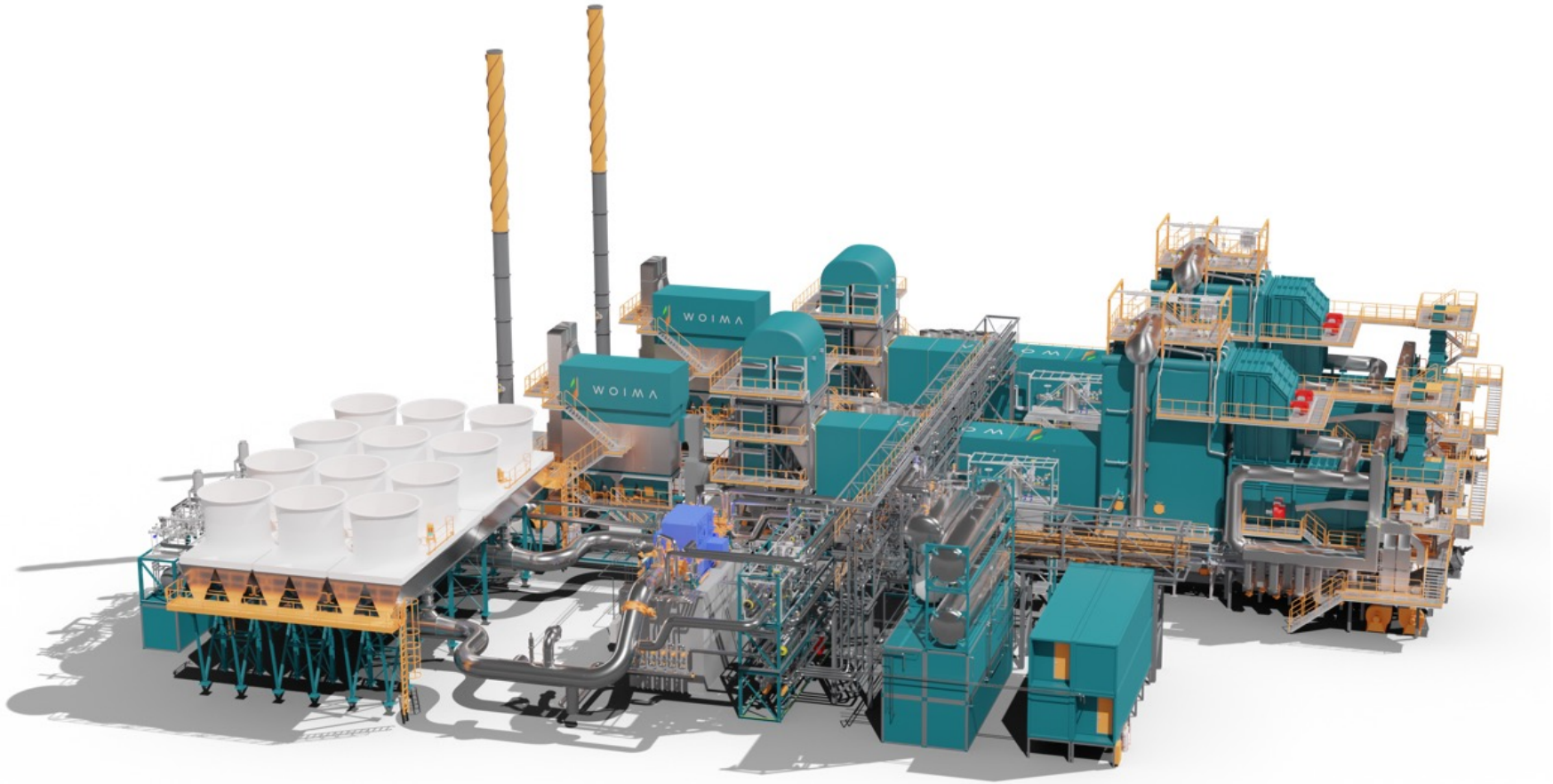
WOIMA PRESENTATION, ADB WEBINAR
17.6.2022

- Short introduction of WOIMA
- *waste*WOIMA concept in a nutshell
- ETS market in Europe and WOIMA value proposition
- *cc*WOIMA carbon capture technology
- Why hot potassium carbonate?
- Case study: Synthetic methane from waste to energy plant



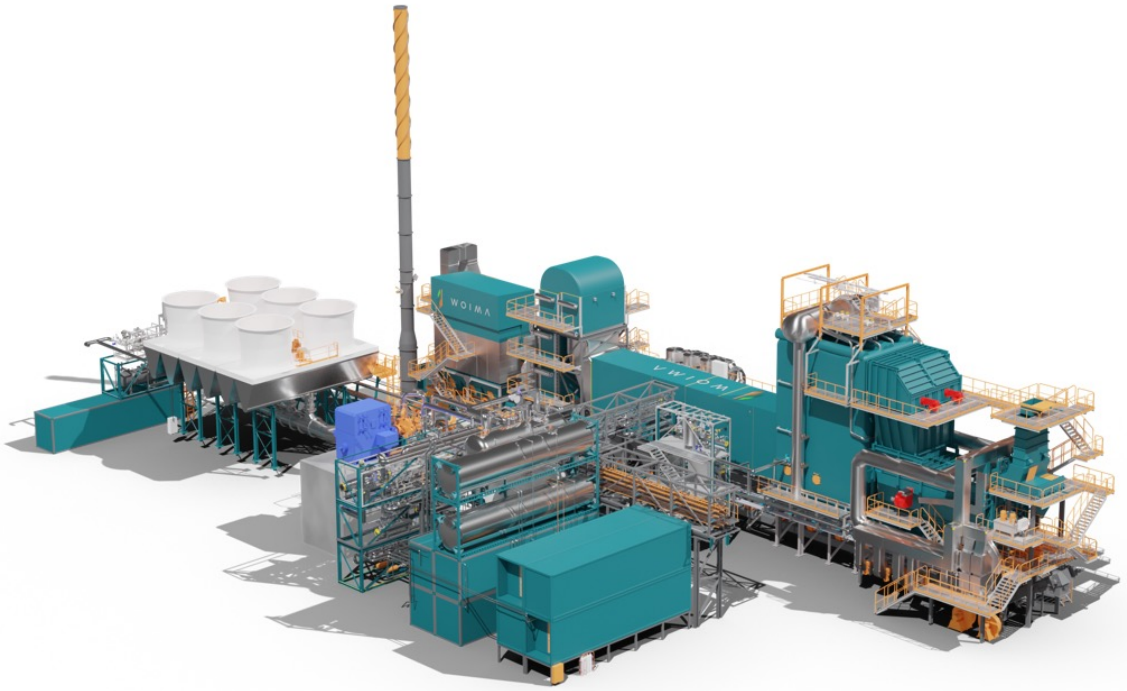
OVERVIEW

*waste*WOIMA® Waste-to-Energy Power Plant



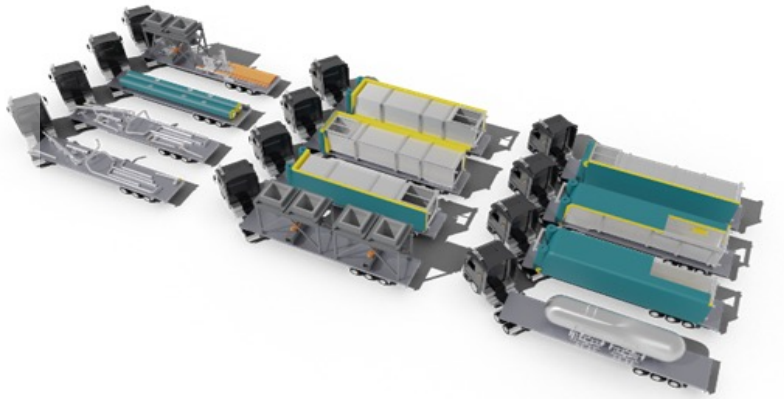
WHAT IS *WASTE*WOIMA®?

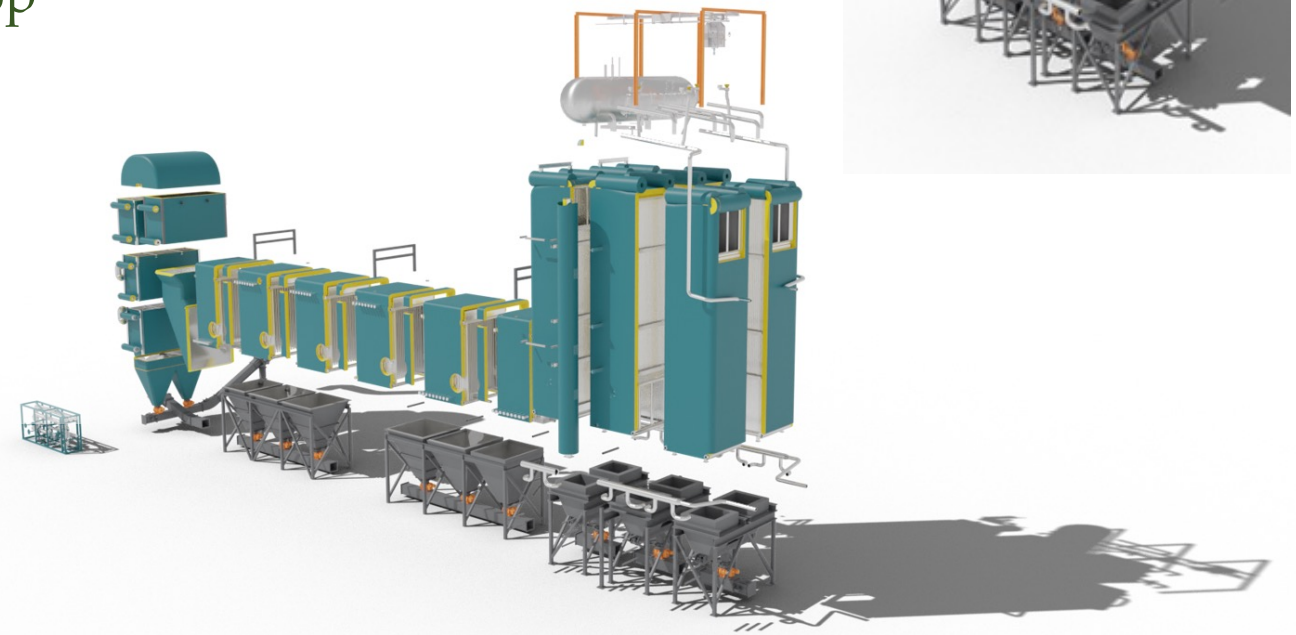
- Standardized Waste-to-Energy power plant with one to four combustion lines
- One combustion line can treat about 50 thousand tonnes per year of residual MSW
- Well-proven grate combustion for treatment of MSW, RDF and SRF
- Complete plant is pre-engineered and delivered as pre-fabricated and pre-tested container-size modules
- Easier, faster and more cost-efficient transport, installation and start-up anywhere in the world



THE MODULAR WAY

- Sea-container size modules (20 / 40 ft)
- Mechanical and electrical equipment and materials are pre-assembled and fixed into the modules
- Auxiliary equipment as modules or fit into containers
- Safe, fast and clean working conditions in the shop
- Modules are pre-tested in the shop
- Faster and cheaper installation at site
- Standardized connections between modules





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Carbon capture business opportunity and market data

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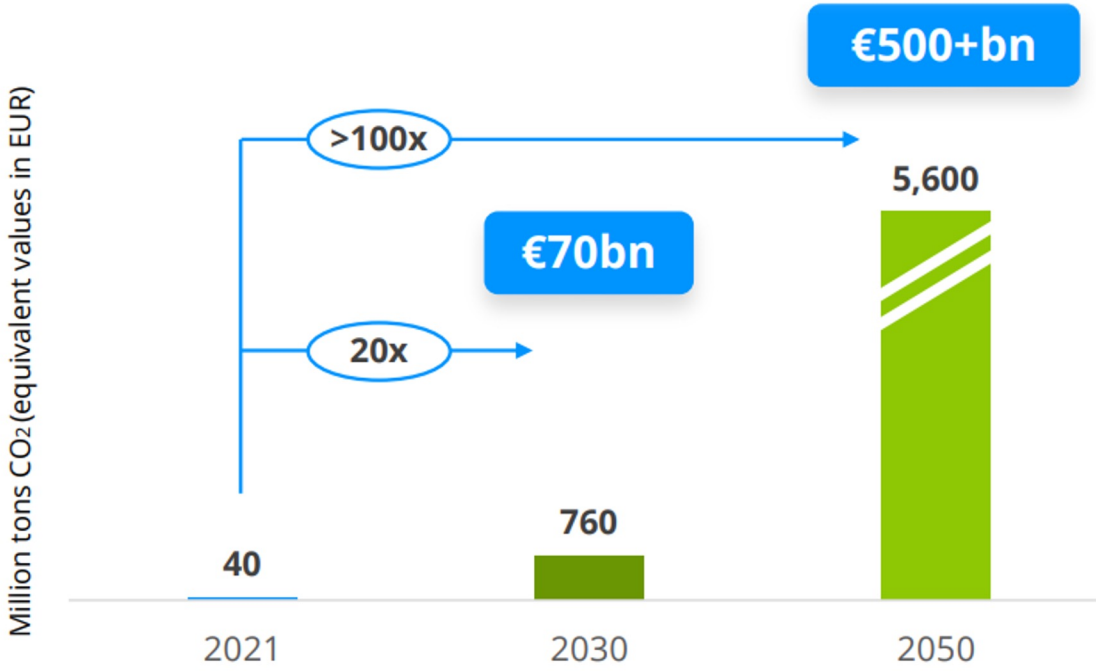
CCUS MARKET POTENTIAL

Recent UN and EU resolutions on climate change mitigation form the basis for huge growth in the carbon capture market

- The current market is small but growing (*40M tons in 2021*)
- UN's climate target requires capturing
  - *760M tons of CO_2 by 2030*
  - *5,600M tons by 2050*
- These figures represent an annual market value of
  - *€70B in 2030*
  - *> €500B in 2050*
- Both new and retrofit markets exist for the CCU / CCS technologies



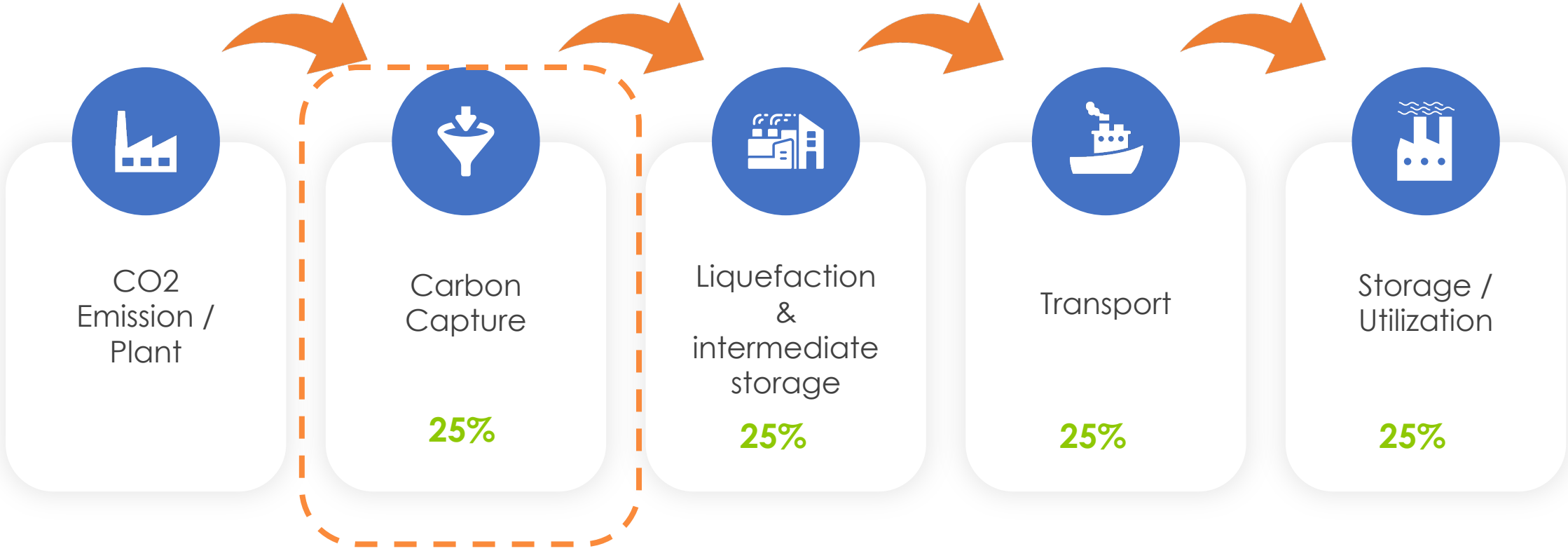
ETS PRICES

ETS Prices (EUR/ton)

(ETS – EU´s Emissions Trading System)

- Emission penalties moving projects into profitable execution
- Strong drive in US to increase tax credits to USD 85/ton captured. Canada is equally ambitious
- Local CO2 emission taxation increasing
- Tax incentives combined with direct funding and consumer/society pressure results in very strong drive and interest to deploy carbon capture solutions

CCUS MARKET AND VALUE CHAIN



- Capturing of CO2 represents roughly 1/4th of the total cost and market of CCUS

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*cc*WOIMA Carbon Capture Plant technology overview

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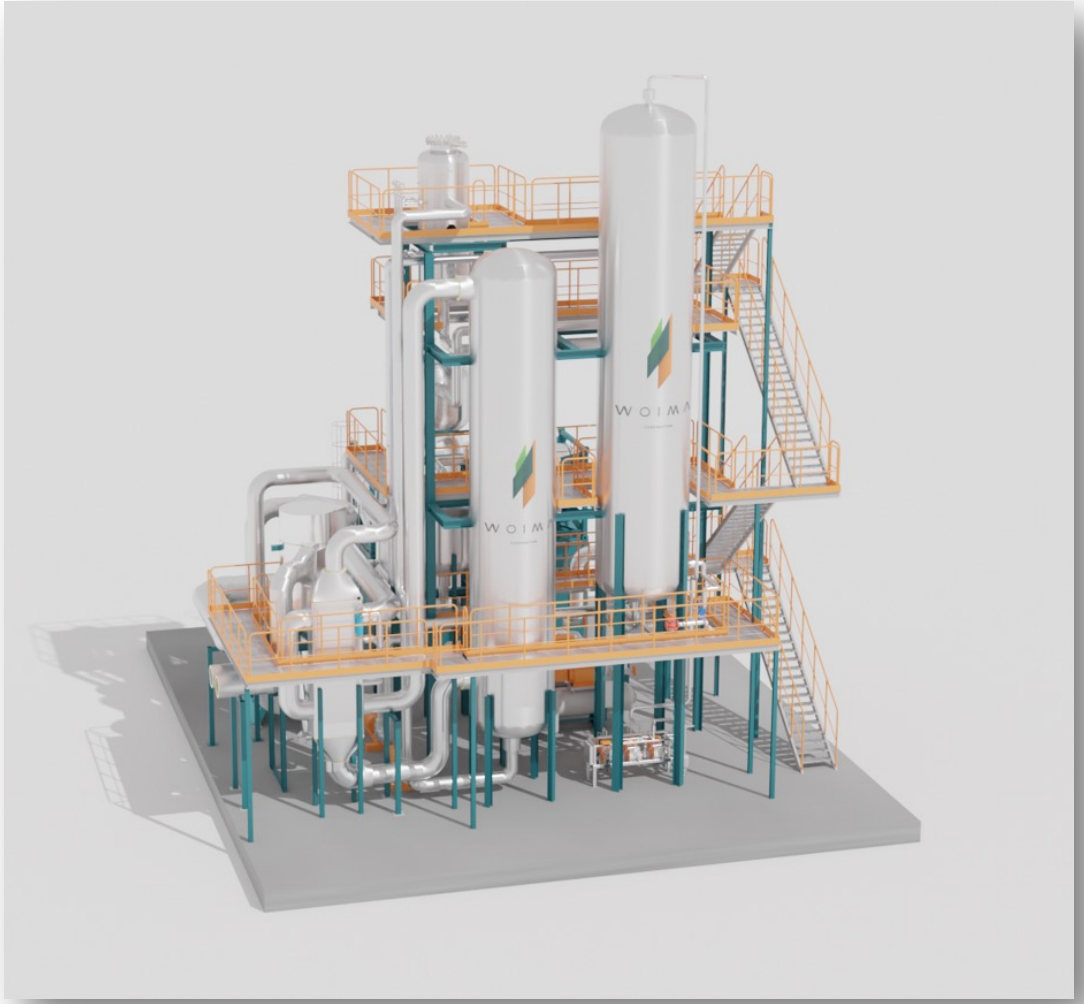
DESIGN PRINCIPLES

- Suitable also for other power plants than wasteWOIMA®
- Smallest economically viable size
- Robust design that fulfills all relevant EN standards and EU directives
- Pre-engineered and prefabricated modules
- Flexibility in terms of capacity
- Fast and cost-efficient logistics from manufacturing to site
- Minimized time spent on site erecting and commissioning the plant
- Easy maintenance and replacement of parts
- Capture rate over 90%



*waste*WOIMA CCUS

waste WOIMA® CCUS
THE ZERO CARBON EMISSION
WASTE-TO-ENERGY POWER PLANT

The *ccus*WOIMA supports the two different approaches to carbon capture

1. Carbon Capture and Storage (CCS), where CO2 is compressed or liquefied and transported to a geological storage

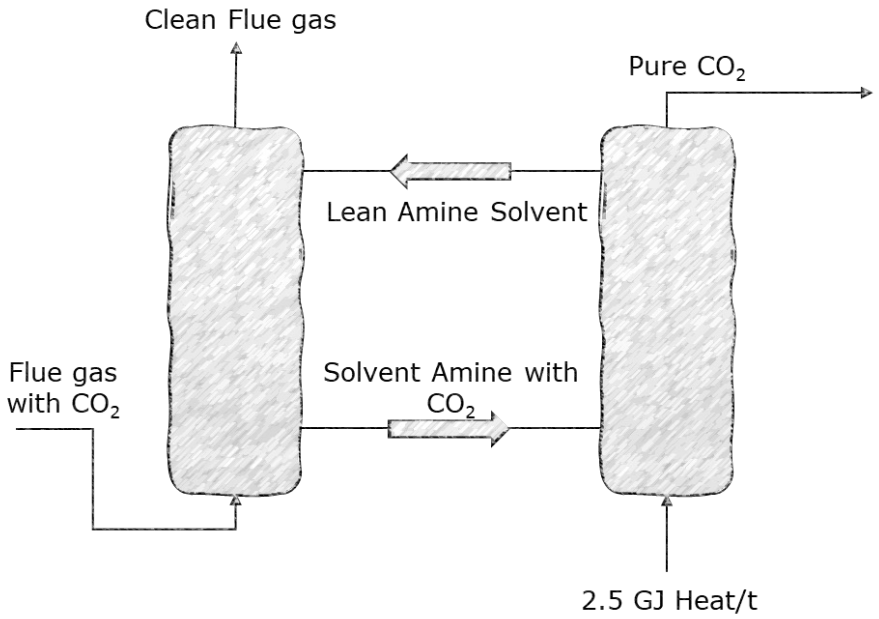
2. Carbon Capture and Utilization (CCU), where CO2 is recycled for further usage.

Our CO2 compression, liquefaction and methanation solutions enhance the economic feasibility of carbon capture, as well as support the European Green Deal.

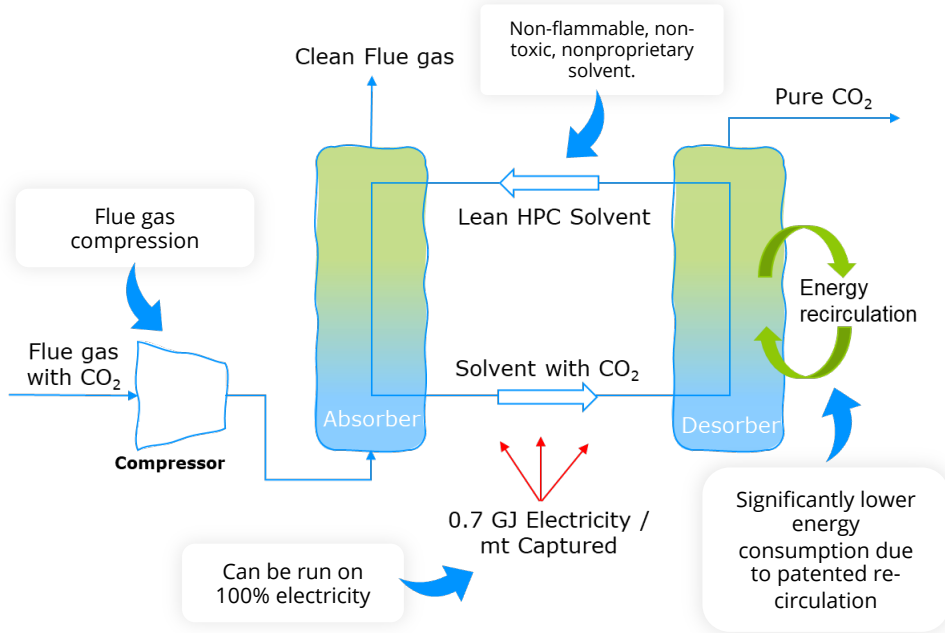
The *ccus*WOIMA solution is a stand-alone system that can also be installed to existing power plants without interruption to normal operations.

WHY HOT POTASSIUM CARBONATE?

A general amine-based technology



The Capsol EoP technology



Opex savings of up to ~15 EUR per ton CO2 mostly derived from patented solution to capture and recuperate energy in the capture process

WHY HOT POTASSIUM CARBONATE?

Proven	HPC as an absorbent is thoroughly documented and used in thousands of plants globally in multiple industries
Widely Available	Potassium carbonate is commonly used as an additive in food
Safe	No hazard to environment or people
Low Cost	Significantly less expensive than amines
Non-carcinogenic	Captured CO2 is totally free of degraded (potentially carcinogenic) amines

HPC Is a well documented Absorbent for Carbon Capture with Clear HSE and Cost Benefits

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Case: Westenergy

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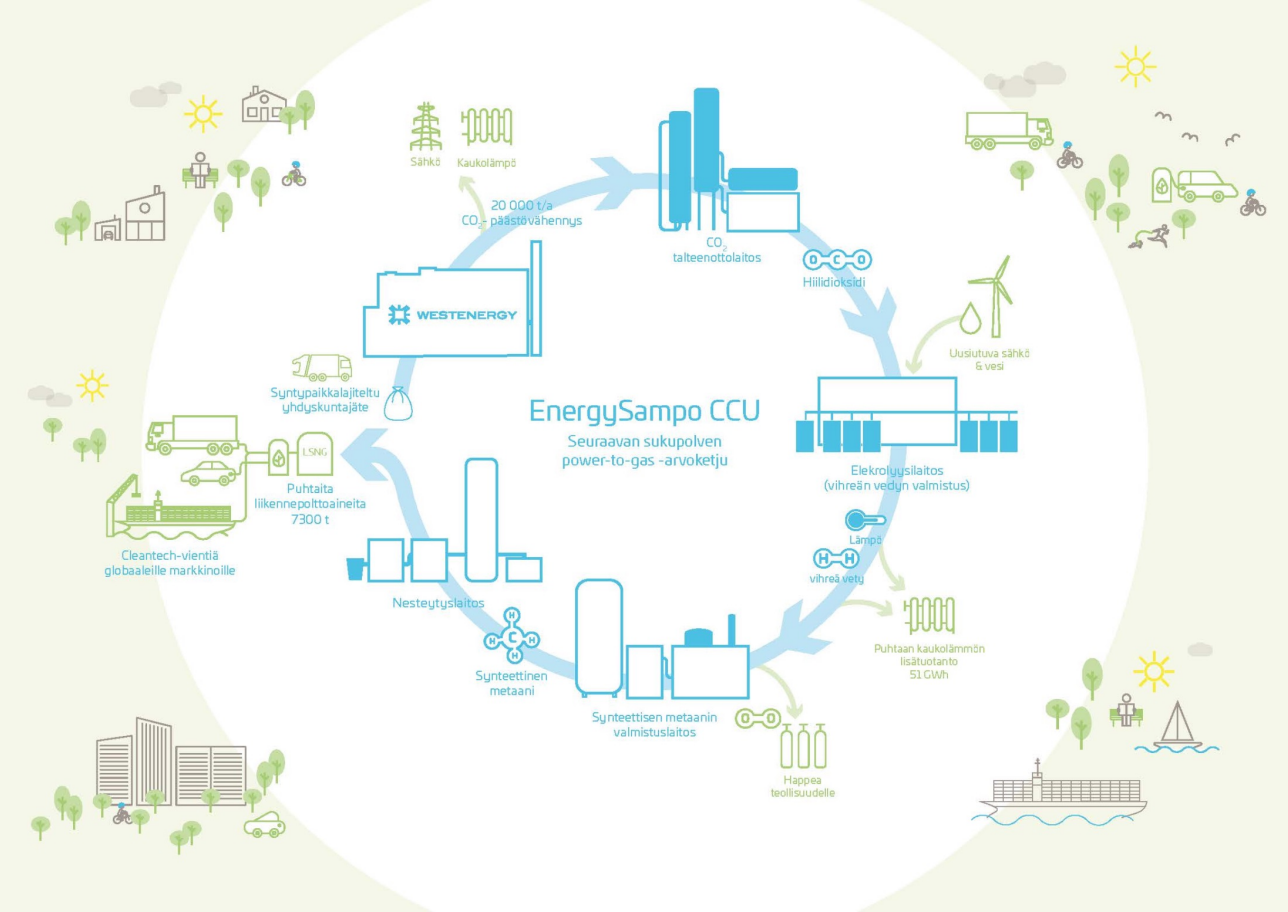
SYNTHETIC METHANE FROM WASTE TO ENERGY PLANT



More information: [EnergySampoCCU Project]

- The next phase in the Vaasa region energy cluster cooperation will be the construction of a next generation Synthetic Methane (LSNG) plant at the Westenergy WtE plant in 2023-2025.
- The key technologies in the LSNG production are carbon capture, hydrogen electrolyser and methanation.
- This ccWOIMA plant will capture and inject 20,000 tons of CO2 p.a. to the LSNG process and simultaneously cut 25% of the Westenergy's fossil carbon emissions.

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THANK YOU!