



Dialogkonferanse Grenland Vestfold Bestiller AS

March, 2020

WAI Environmental Solutions AS

WAI Company Introduction

Company

- WAI Environmental Solutions AS; Based in Horten, Norway
- Subsidiary in China

Distribution

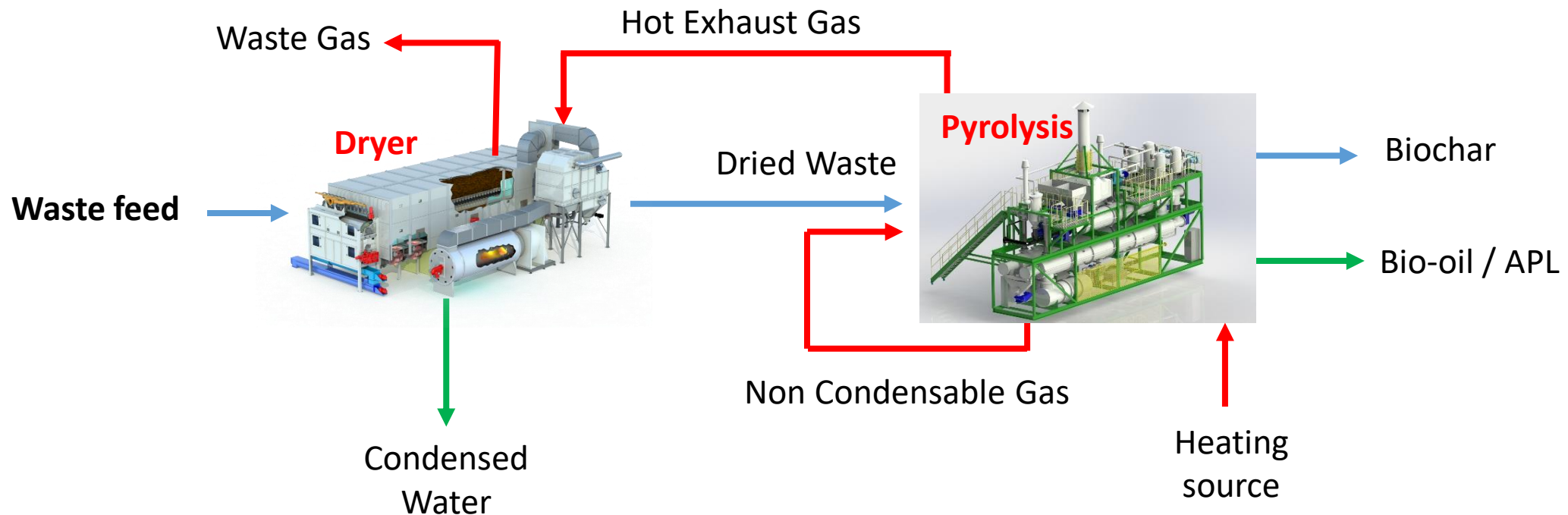
- European markets: Nordic countries
- East Asia: China and Southeast Asia

Business Models

- Technology package provider; Deliver wastewater, biosolids, sludge and soil remediation system solutions
- Exclusivity agreements with cooperating partners in China for belt dryers and pyrolysis treatment plants
- Turn-key package plants and Joint Venture operation with customers
- Consulting services and training

The **WAI** solution for the following Industries

- Sewage sludge
- Food waste digestate
- Biochar production
- Chemical/Oily Sludge
- Contaminated Soil
- Agriculture Waste



Sewage sludge belt dryer

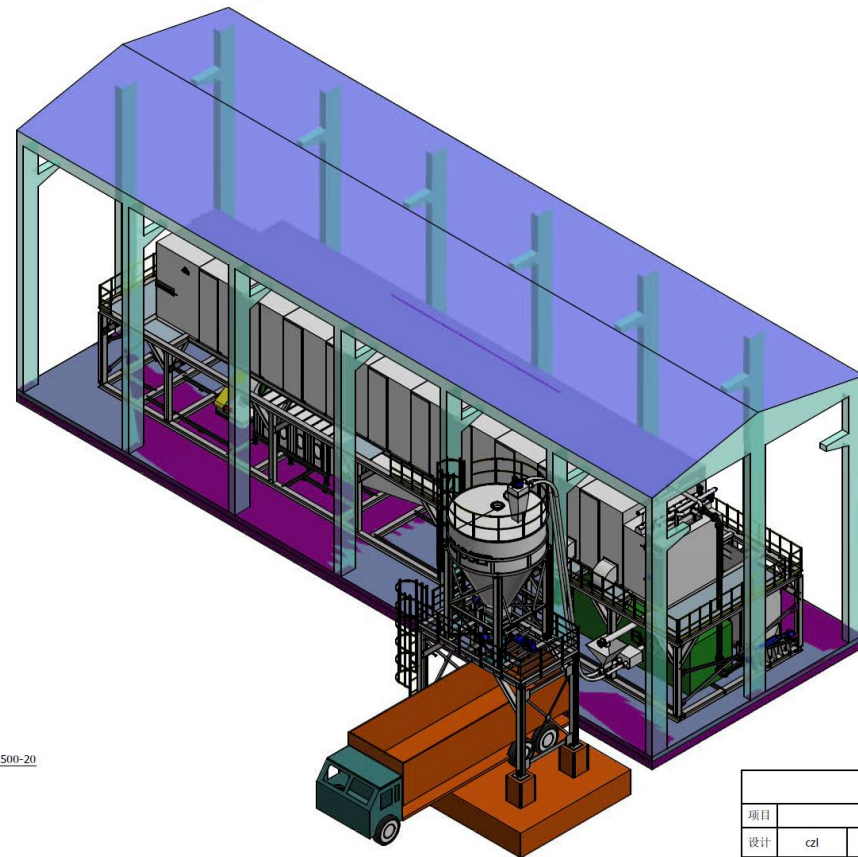
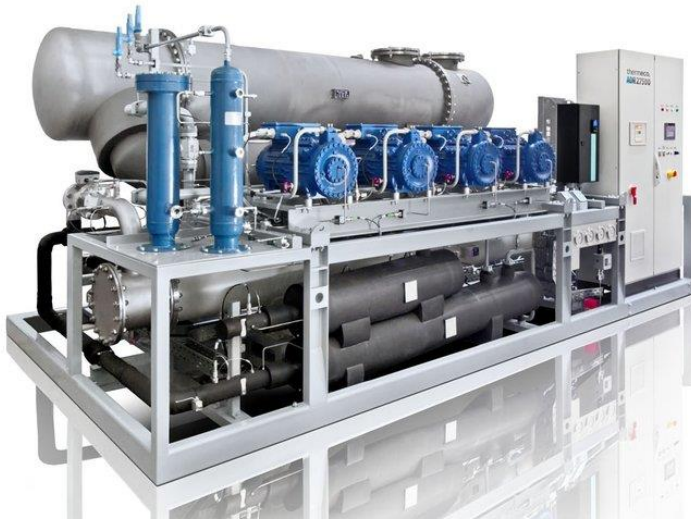


- Feeding 4 x 125 ton/day.
- Evaporate 3700 kg/hr each.
- Largest dryer installation in China installed in 2019.
- Over 10 years operational experience
- Large and medium size dryers
- Special feeding device for sludge
- Low temperature
- Multiple heating sources
- Low dust formation and
- No material movement
- Low energy consumption
- Very low maintenance cost
- Safe and stable operation
- 24/7 continuous automatic process

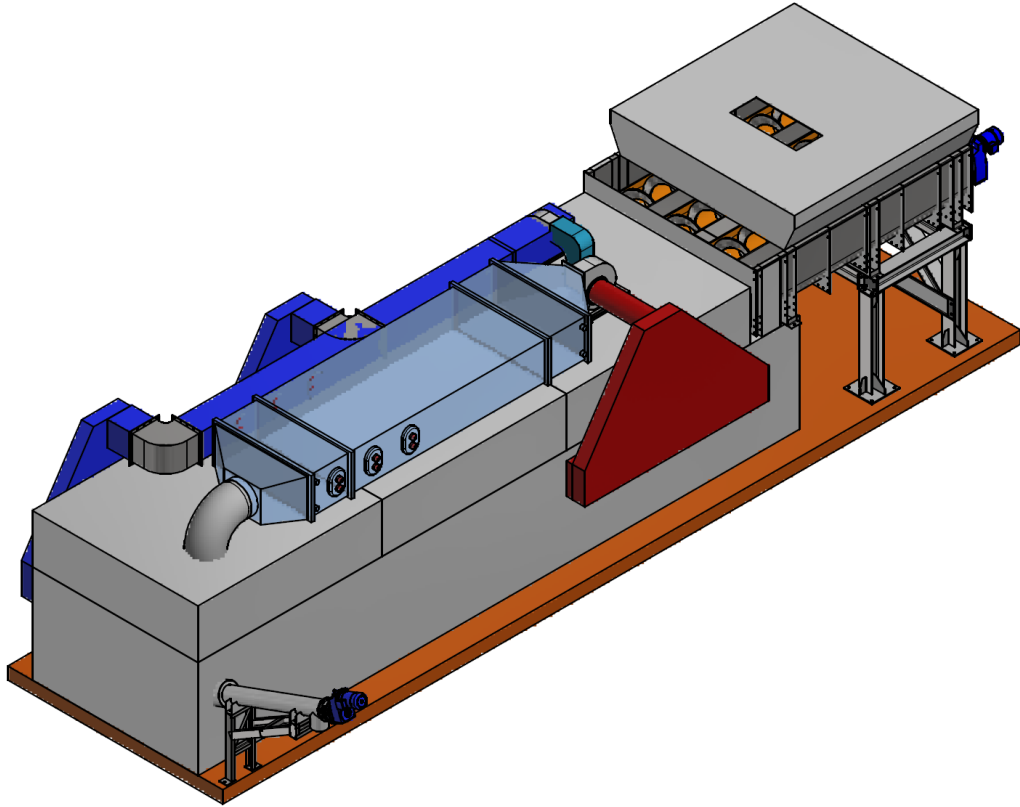
Sludge feeding distributor



CO₂ heat pump dryer



- 318 kWh overall consumption per ton water evaporated
- Verified in 2 full-scale installations, 40 ton/d and 16 ton/d sludge



Biomass dryer

Pyrolysis plants, feeding 5 – 150 ton/day



Our pyrolysis technology is operated at moderate temperatures (450-650°C), under absolute anaerobic environment, converting organics to synthesis gas (CO, H₂, CH₄, CO₂), bio-oil and biochar.

Indirect heating, syngas separate from exhaust gas

Double decker design to reduce energy inputs and footprint

Dual auger self-cleaning system

High efficiency syngas and bio-oil recovery systems

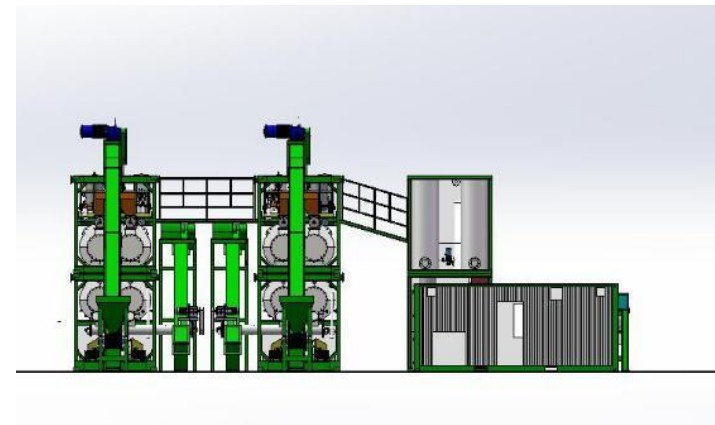
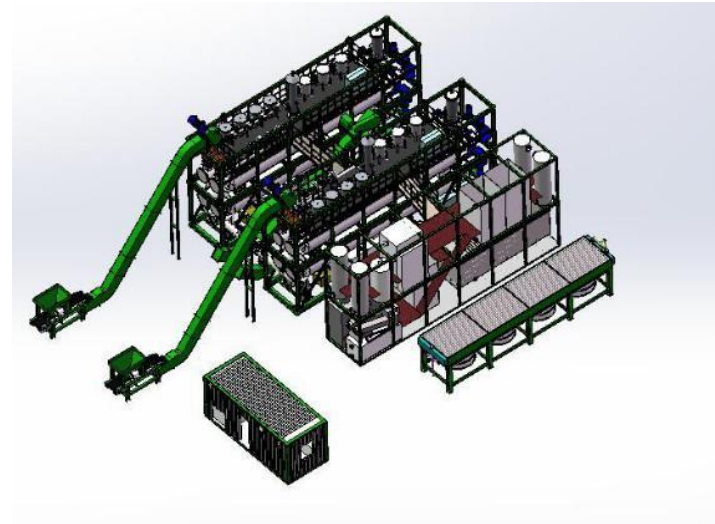
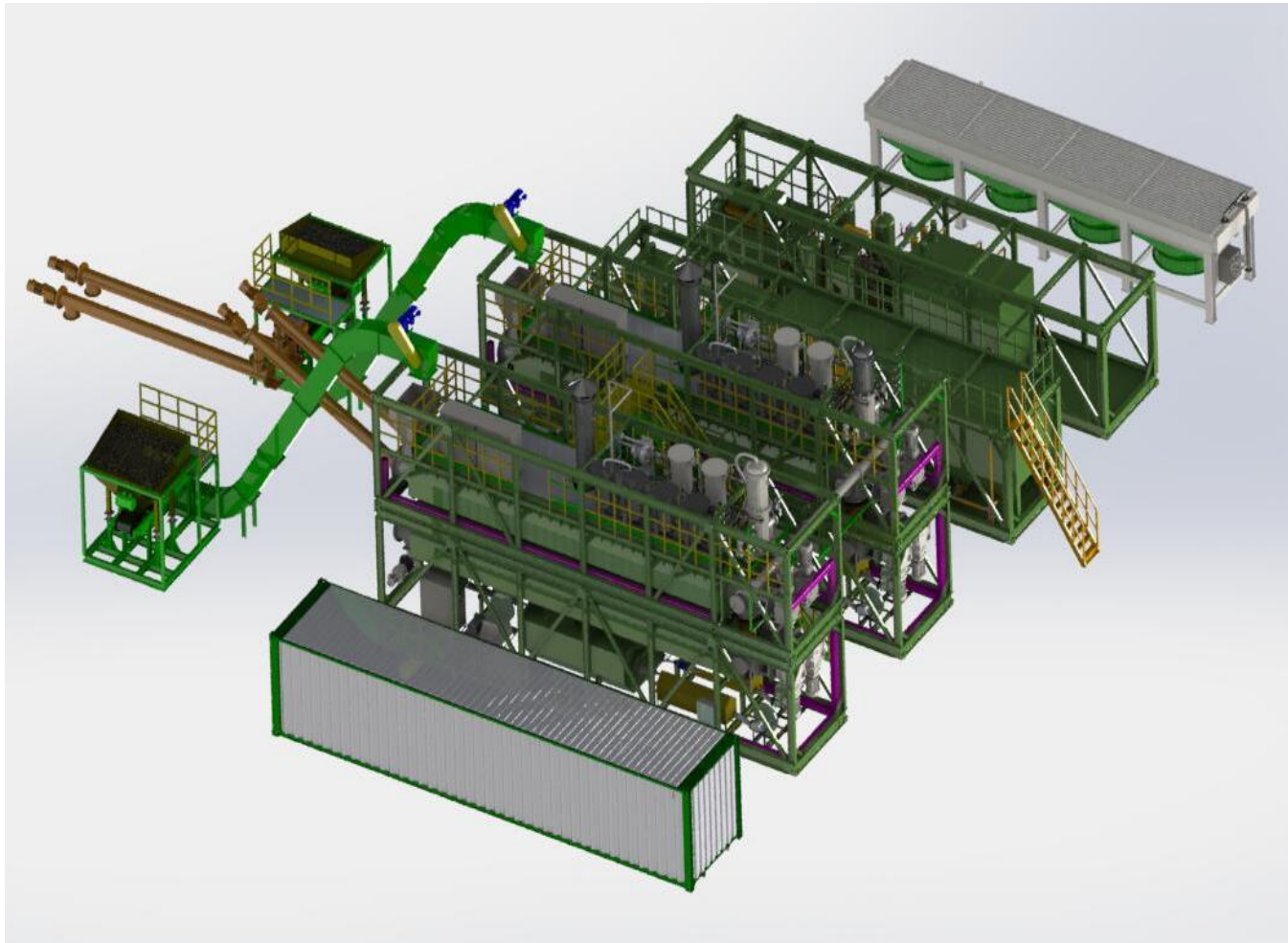
Excellent anti-corrosion material under high temperatures

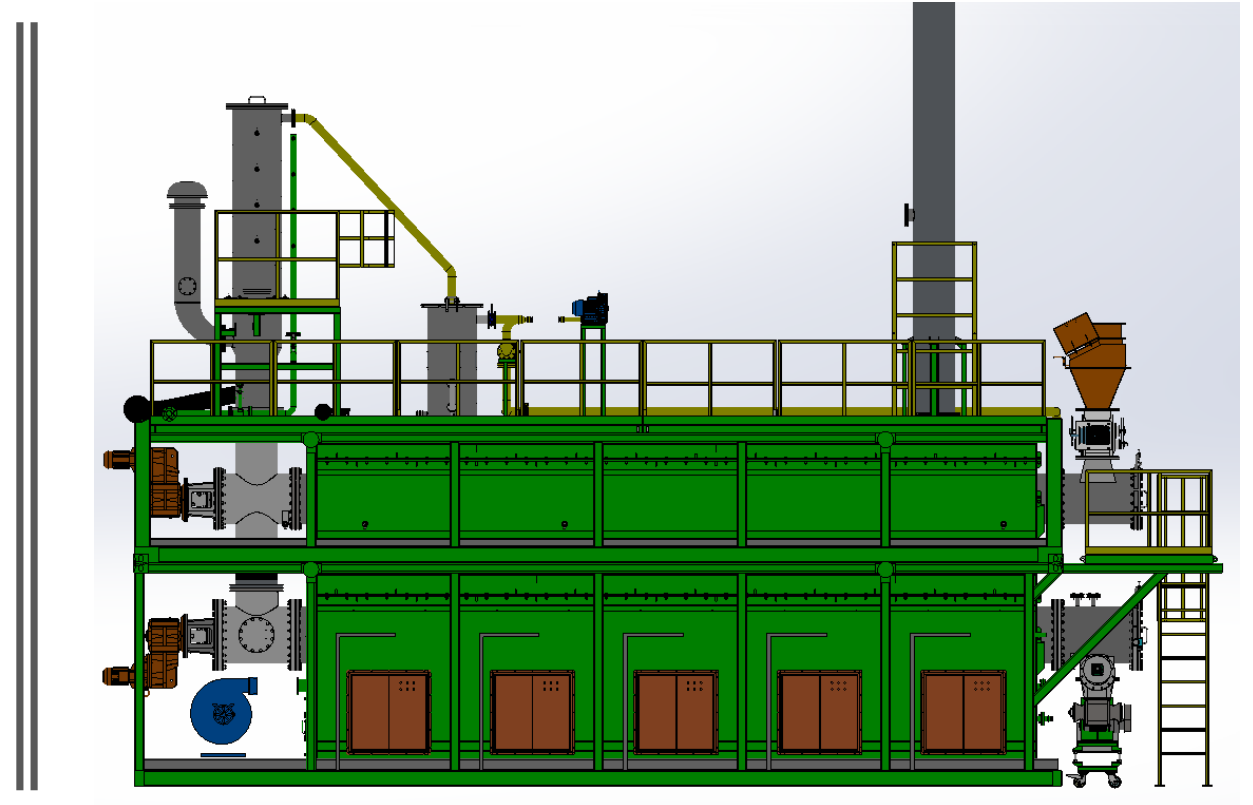
Containerized design, easy to transport



24 ton/day Pyrolysis Skid for Hazardous Waste Treatment

Pyrolysis series for soil and oily sludge treatment

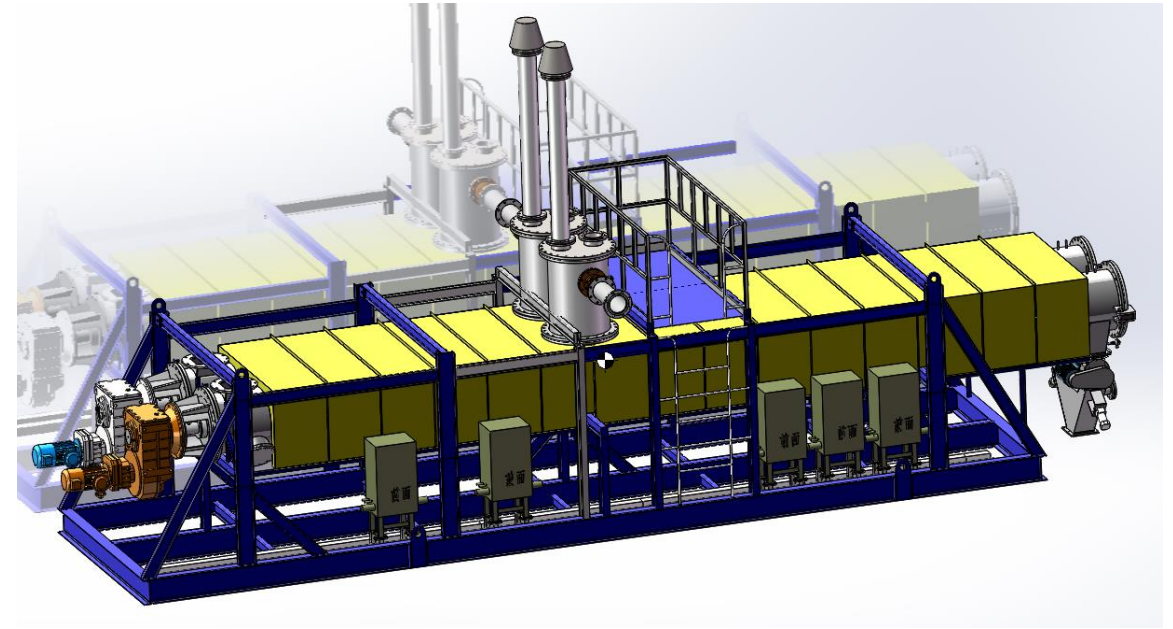




New generation system for soil and oily sludge treatment

Pyrolysis series for soil and oily sludge treatment

Parameters	Compact	Standard	Plus	Flagship
Capacity	0.5-1 t/h	2-3-1 t/h	4-6 t/h	8-10 t/h
Electricity consumption	35 kW/t	35 kW/t	30 kW/t	30 kW/t
Natural gas consumption	45 Nm ³ /t	35 Nm ³ /t	30 Nm ³ /t	30 Nm ³ /t
Water consumption	1 m ³ /t	1 m ³ /t	1 m ³ /t	1 m ³ /t
System foot print	15m*10m	15m*20m	20m*20m	20m*30m



48 ton/day Pyrolysis with Electrical Heating

Biochar – a valuable product

Charcoal fuel



Biogas booster in anaerobic digester



Phosphorus salts



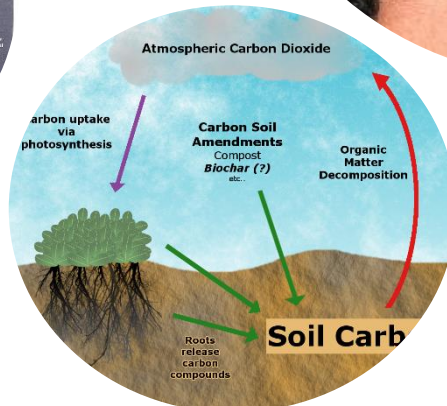
Animal feed additive



Soil conditioner



Soil carbon storage



Activated carbon



WAI pilot unit available in Norway



Pilot unit with up to 20 kg/h capacity, 27 kW installed power, dimension 3.1*1.4*2.4m.

Hazardous waste pilot study



Pyrolysis test for: carwash sludge, evaporator concentrate and chemical sludge in Norway.

Biomass pilot study



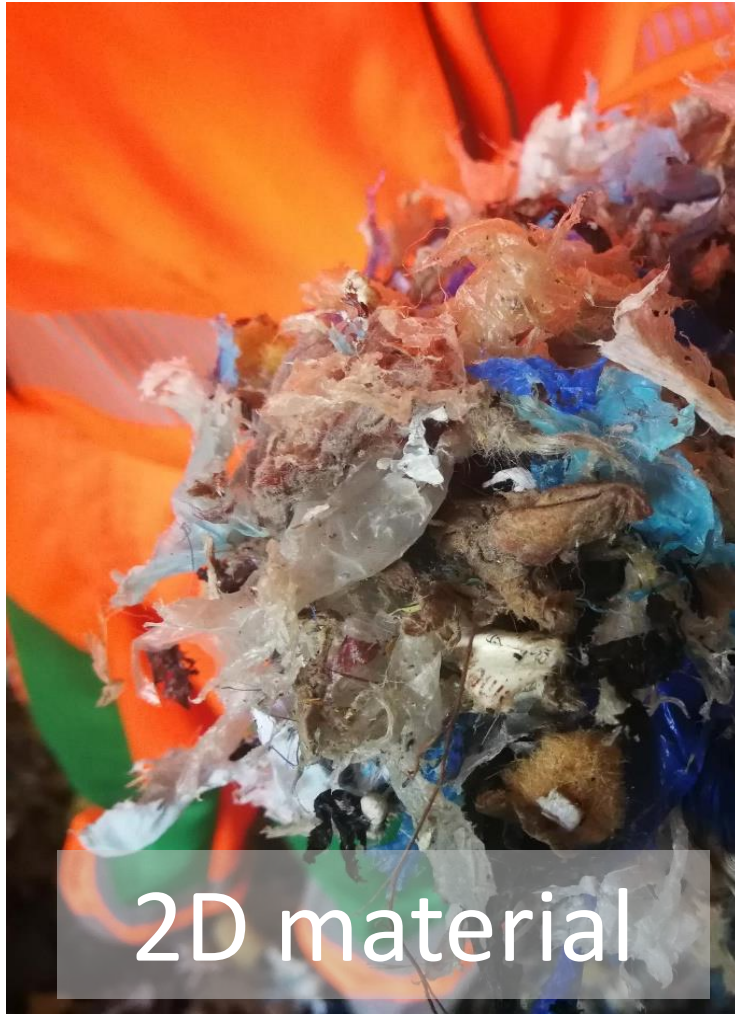
Pyrolysis of peat, garden waste, rice husks and seaweed.

Sludge pilot study



Pyrolysis test for food waste digestate, sewage digestate and salmon farm sludge.

Plastic-containing waste pilot study



Pyrolysis test for food waste reject and 2-dimension material.



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