

# Bio**st**oom

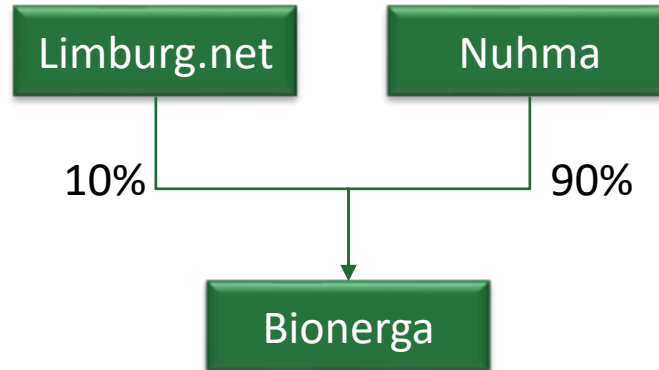
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## Beringen

BESWA: 23 november 2022

# Structure above Biostoom Beringen

→ Limburg.net: Minority shareholder with veto rights

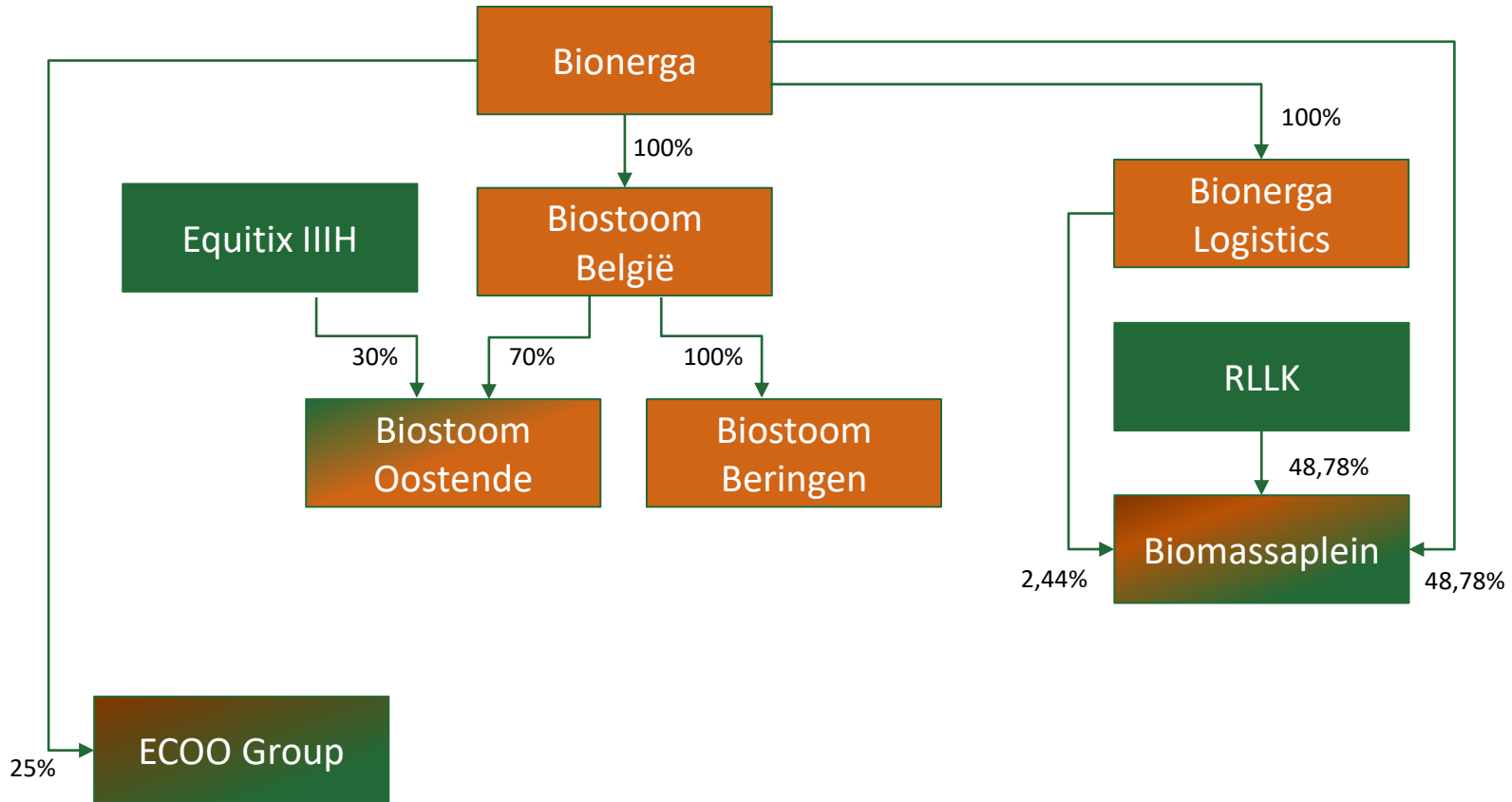


→ Nuhma: Municipal holding company

Responsible for:

- Defining policy
- Communication & sensibilisation
- Recycling parks
- Collection

Nuhma: works on behalf of the Limburg municipalities on sustainability, energy and innovation through smart participations.

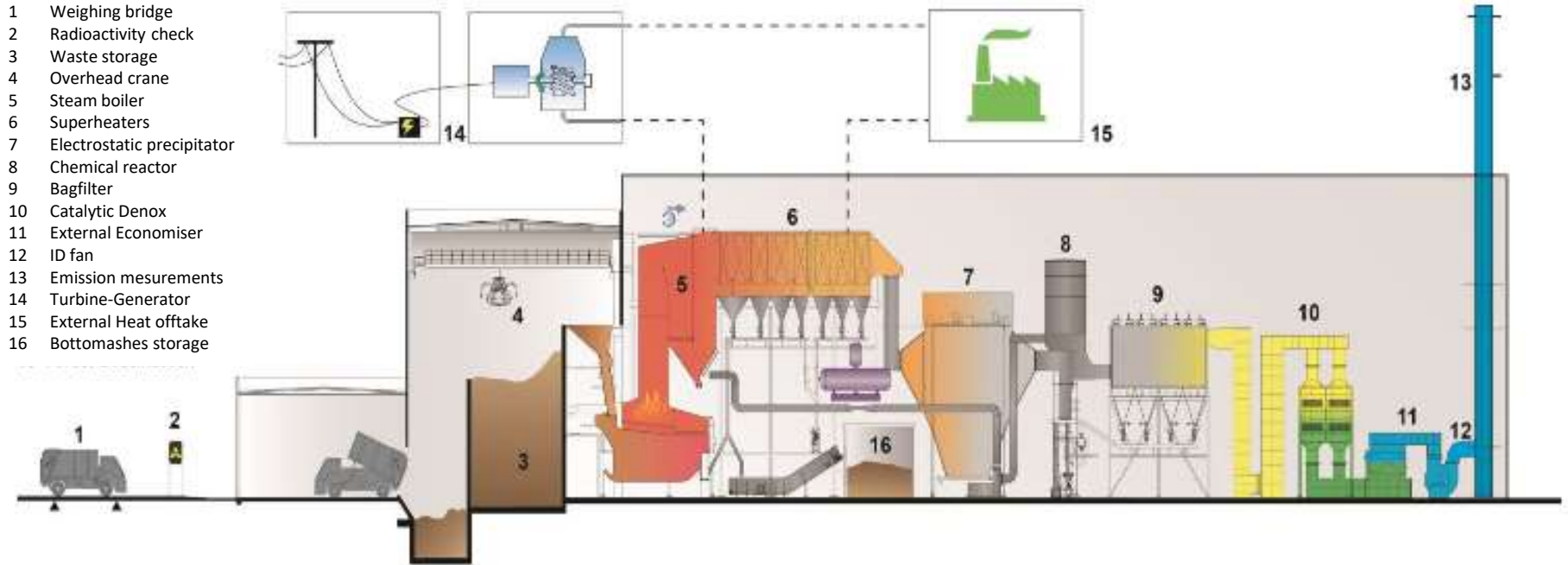


As a reliable, customer-oriented and socially responsible company, we strive to optimally recover energy and raw materials from non-recyclable materials.

**Biostoomcentrale**



# Procesflow



# Reception and RA control (1 & 2)

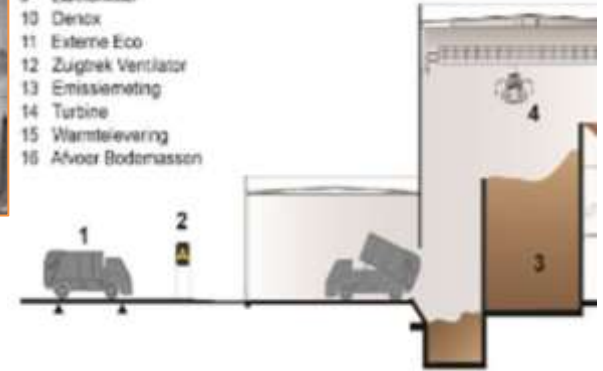


- Automatic truckflow management system (TFMS)
- Incineration capacity: 230.000 ton/year
- Automatic Radioactivity-detection

# Storage & crane (3 & 4)



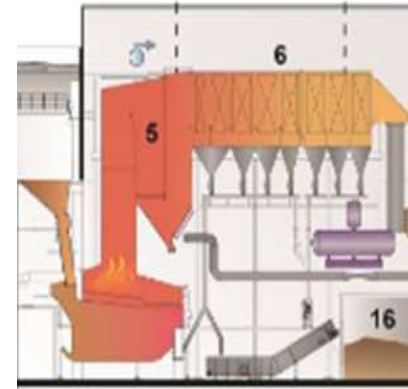
- 9 Zakkenfilter
- 10 Denox
- 11 Externe Eco
- 12 Zugtrek Ventilator
- 13 Emissiemeting
- 14 Turbine
- 15 Warmtelevering
- 16 Afvoer Bodemas



- 7 gates of which 4 with direct access to storage and 1 fed by conveyor belt
- 1 full automatic crane
- 1 manual backup crane
- Grab: 6 ton

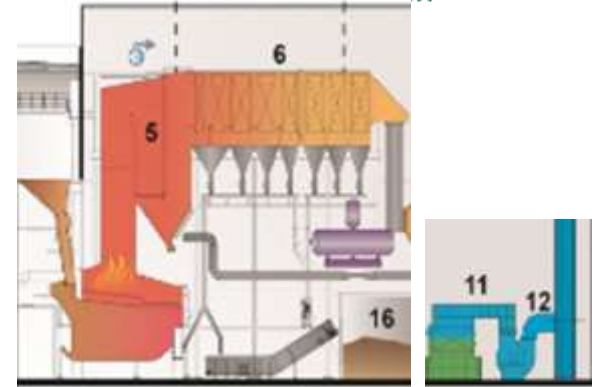


# Fire grate



- Dimensions grate: 11m x 11m
- Zone 1: drying zone, water-cooled
- Zone 2: combustion zone, water-cooled
- Zone 3: burn-out zone, air-cooled

# Steam boiler (5, 6 & 11)



- 3 empty, vertical passes (5)
- Superheater & economiser (6)
- External economiser (11)
- Steam: 43 bar, 420°C

# Control room/DCS



- Permanently staffed control room
- DCS Siemens T3000 (power plants)
- DCS on redundant servers
- Extensive camera supervision

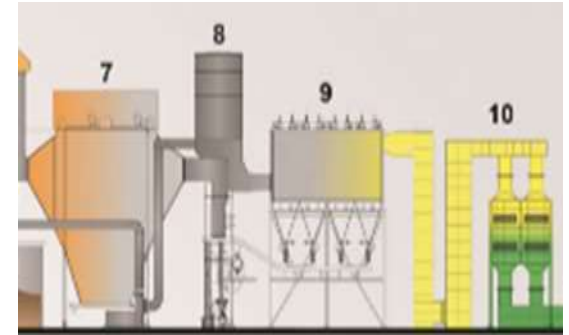
# Turbine & generator (14)



- Siemens turbine-generator (package incl. supervision & control)
- Redundant cooling circuit

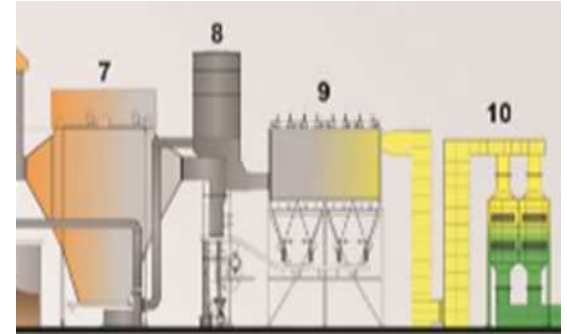


# Fluegas treatment ESP (7)



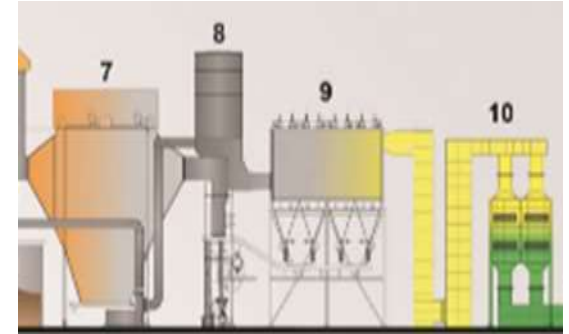
- Electrostatic precipitator
- 2 field-system
- Extra redundancy by bag filter

# Fluegas treatment bagfilter (8 & 9)



- Activated carbon and bicar injection in reactor (8)
- Capture of residu in 8-chamber bag filter (9)

# Fluegas treatment SCR (10)

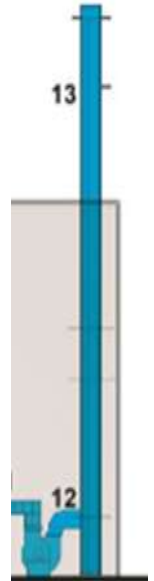


- Injection of ammonia (24,5% solution)
- 4-chamber catalysts
- In-line regeneration system

# Fluegas extraction fan (nr. 12)



- Main engine (690V)
- Support engine for controlled shut down in case of emergency (400V)

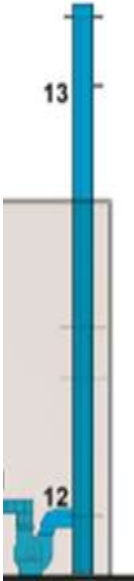




# Emission control (nr. 13)



- Composition of flue gasses are continuously monitored:
  - Nitrogen oxide ( $\text{NO}_x$ )
  - Hydrogen chloride ( $\text{HCl}$ )
  - Carbon monoxide ( $\text{CO}$ )
  - Sulfur dioxide ( $\text{SO}_2$ )
  - Organic compounds (TOC)
  - Fine dust
  - Dioxins and furans (*continuous sampling system*)



# **Energy and material hub**

# Heat deliveries “Site Biostoom”



A. OPTIMO

B. Biostoomcentrale

1. Borealis: HPS

2. Ecoo Beringen: MPS

3. GRL: MPS and water transport

4. Aquafin: hot water

5. MPS or hot water

6. MPS and water transport