Energie din Deseuri (EfW)
Digestoare Anaerobice (AD)

Eficiență energetică – consum sustenabil prin automatizare, monitorizare și control

2019-07-02, Timișoara

Daniel Bertalan

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Control Point

- Companie romaneasca infintata in 2005
- Sediu in Brasov
- >20 angajati permanenti (inginieri automatisti, electrotehnisti, securitate si tehniceni)
- Peste 50 proiecte in mediu industrial realizate
- Piata: Romania, Austria, Grecia, Germania, Olanda, Norvegia, Finlanda, Franta, UK, Ungaria, La Reunion, Sudan, Iran
- Partener VALMET servicii de inginerie sofware si hardware
- Partener VAR VALMET Romania

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Proiectare – Instalare - Punere in Functiune – Mentenanta - Inspectii

Automatizari Industriale

Instalatii electrice Industriale

Servicii de Securitate

Termocentrale

Biomasa

Energie din deseuri

Fabrici de celuloza si hartie

Hidrocentrale

Industria alimentara

Silozuri

Industria chimica

Brutarii

Mori

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Samsun – Turkey (greenfield)
Combined cycle power plant

Ilarion – Greece (greenfield)
Hydroelectric power plant

Bergen – Norway (revamp)
Waste to energy power plant

Riverside – UK (greenfield)
Waste to energy power plant

Agios Dimitrios– Greece
Lignite power plant (revamp)

Dalkia projects – Biomass
power plant (greenfield)

Vaasa – Finland (greenfield)
Waste to energy power plant

Gent – Belgium (extension)
Paper mill

STV 4&5 – UK (greenfield)
Waste to energy power plant

Neste Oil – Netherlands
Bio fuel – (Service & Maintenance)

Sensus – Netherlands
Inulin (Service & Maintenance)

Sidec – CTG, CTM
Biomass power plant (revamp)

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Soluții: automatizări, tehnologie si servicii

Automatizari

- Sisteme control distribuit (DCS)
- Solutii de performanta
- Simulatoare de proces
- Solutii de securitate

Energie

- Cazane combustibil mixt 800MWth
- Gazificare biomasa si deseuri
- Sisteme de control emisii

Celuloză si hârtie

- Linii de productie fibre reciclate
- Solutii la comanda – carton si hartie
- Masini modulare – carton si hartie
- Fabrici de celuloza complet echipate

Focus pe beneficiile clientului

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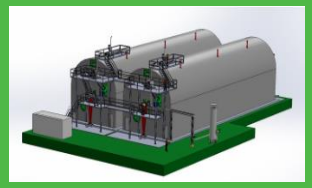
Solutii de automatizare si eficientizare

Energie

Turbine gaz

Biomasa

Hidrocentrale



Biogaz

Turbine abur

Deșeuri

Agro

Silozuri

Panificație, morărit

Tratarea apei

Ape uzate

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Valmet DNA pentru Managementul deseurilor

Un singur sistem de automatizare

Exemple bazate pe o tehnologie furnizata de Hitachi inova Zosen

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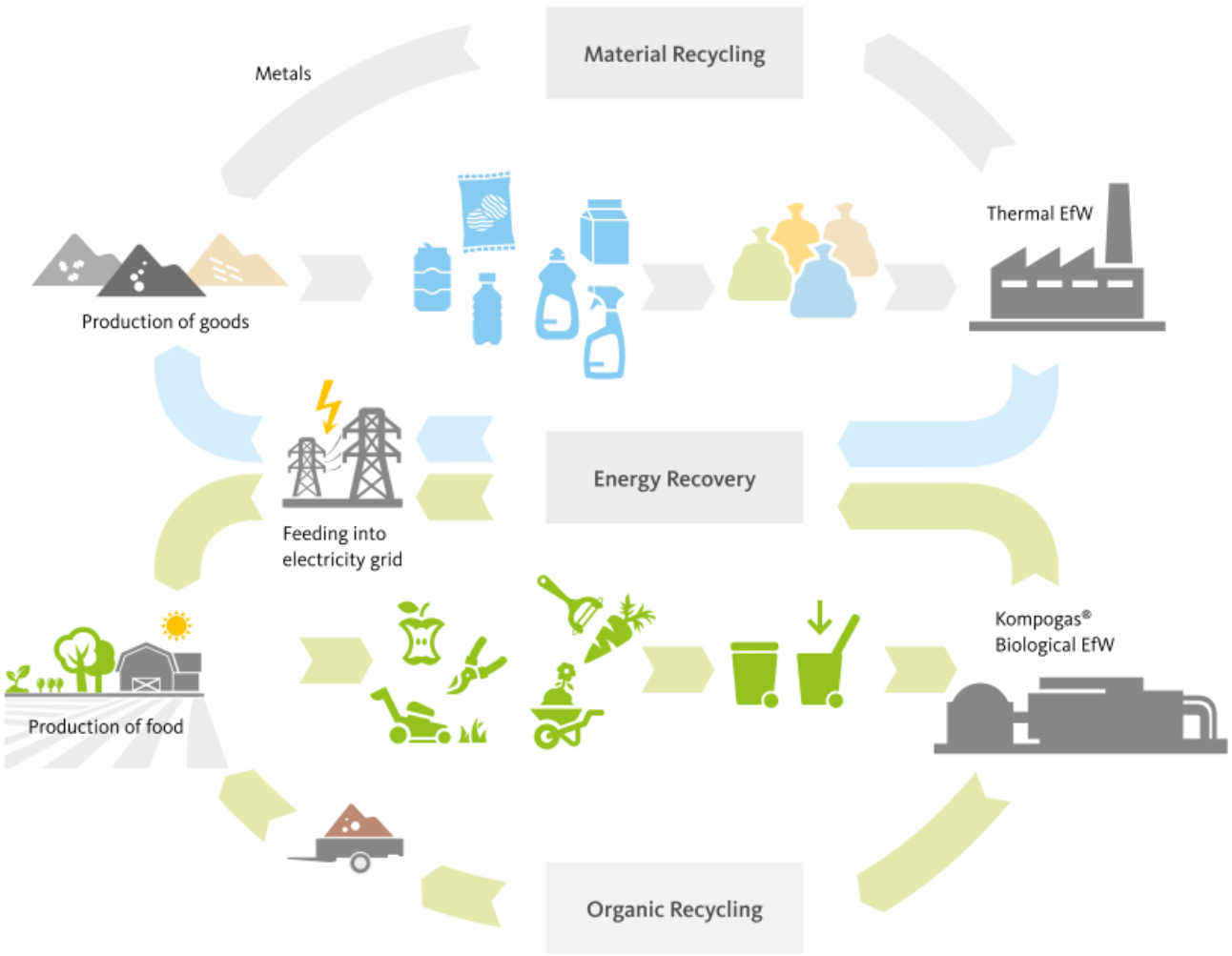
Economie Circulara pentru managementul deseurilor



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Managementul deseurilor

Tehnologii disponibile

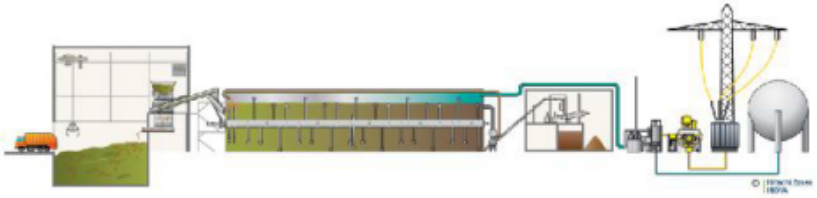
1. **Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)**
   - Soluție EfW veirificata pe termen lung, cu ardere pe grătar, utilizarea energiei, tratarea gazelor de ardere și recuperarea materialelor

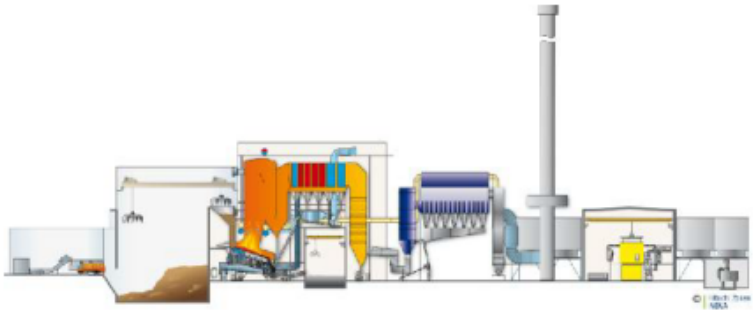
2. **Recuperarea energiei prin tratare biologica in mediu anaerob (AD)**
   - Fermentarea uscată in digestoare din oțel sau beton pentru recuperarea energiei și a materialelor și tratarea biogazului pentru a fii introdus în rețeaua de gaze naturale.

Managementul deseurilor

Energy & Compost
from biowaste with
anaerobic digestion

Energy & Material
from non recyclable waste
with thermal treatment





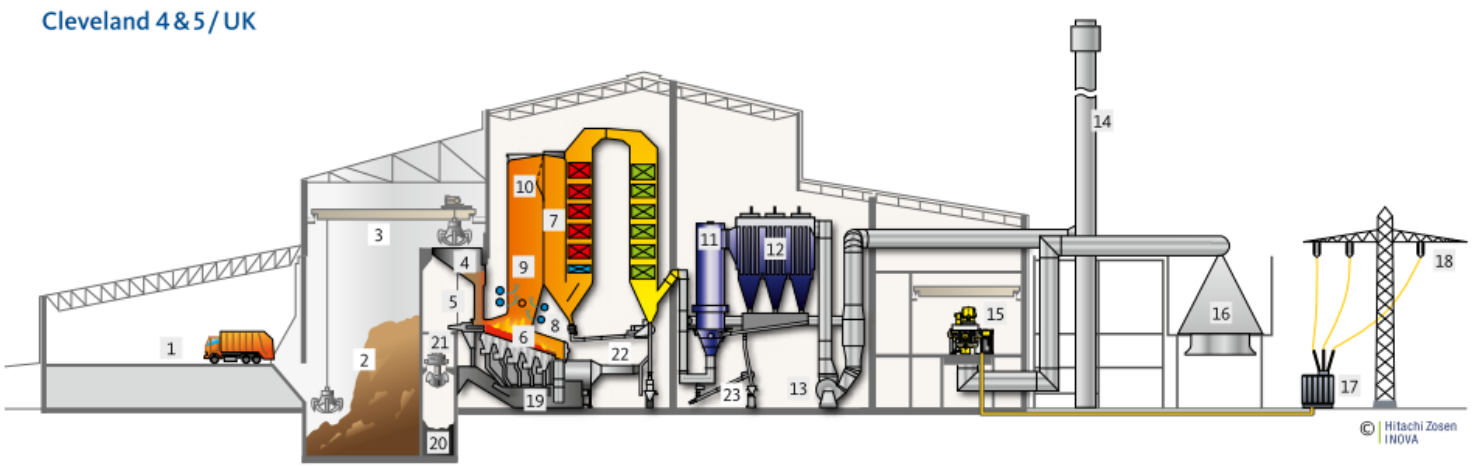
Recycling
- Compost & fertiliser
- Biogas, power & heat
- Carbon dioxide

Direct Recycling
- Glass
- Paper
- Metals

Recycling
- Metals & minerals
- Power, steam & heat
- Carbon dioxide

Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)



Waste Delivery and Storage	Combustion and Boiler	Flue Gas Treatment	Energy Recovery	Residue Handling and Treatment
1 Tiping hall	4 Feed hopper	10 SNCR injection levels	15 Extraction-condensation turbine	19 Bottom ash extractor
2 Waste pit	5 Ram feeder	11 Semi-dry reactor	16 Air cooled condenser	20 Bottom ash bunker
3 Waste crane	6 Hitachi Zosen Inova grate	12 Fabric filter	17 Trafo	21 Bottom ash crane
	7 Four pass boiler	13 Induced draft fan	18 Electricity export	22 Boiler ash conveying system
	8 Secondary air injection	14 Stack		23 Residue conveying system
	9 Start-up burner			

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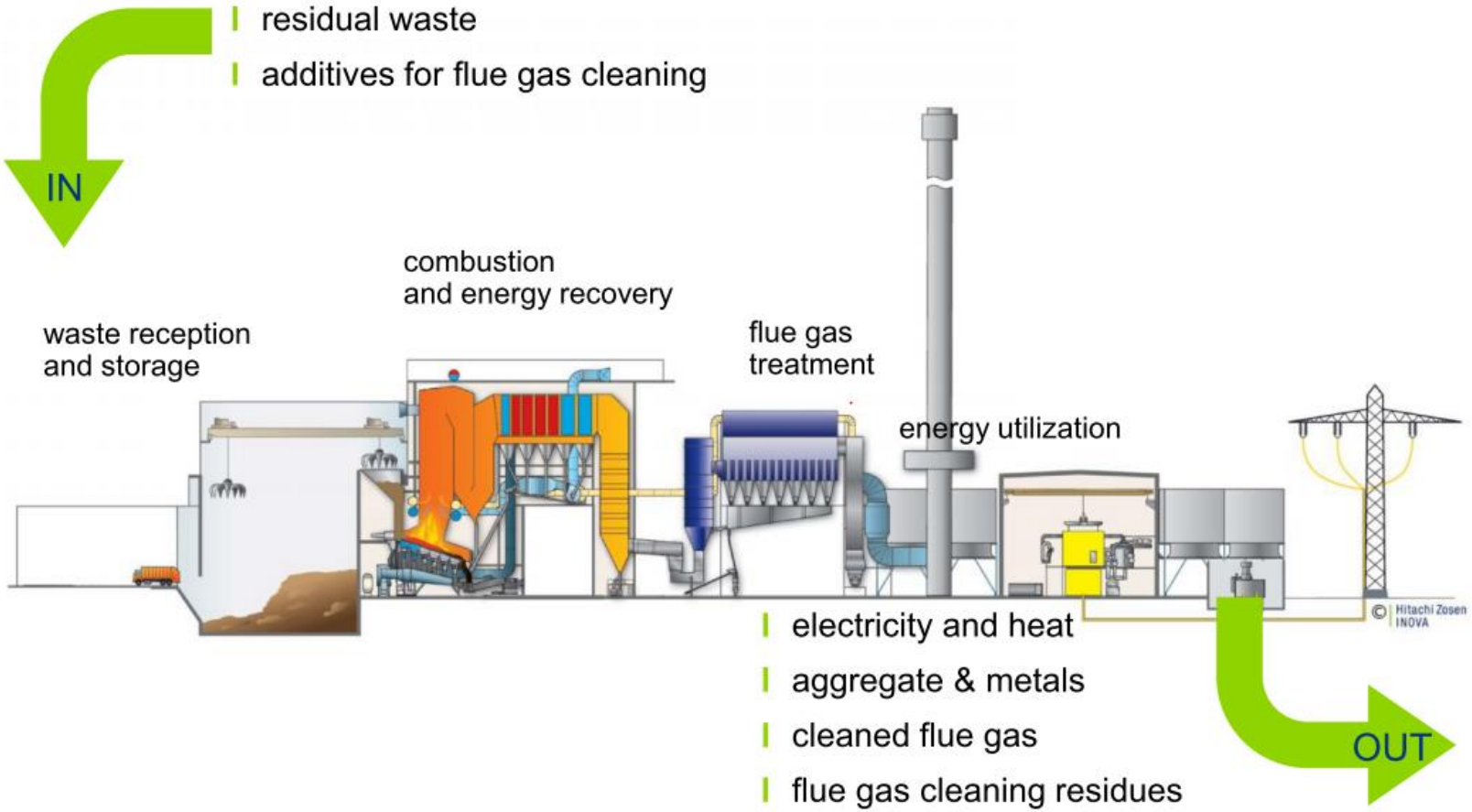
Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)



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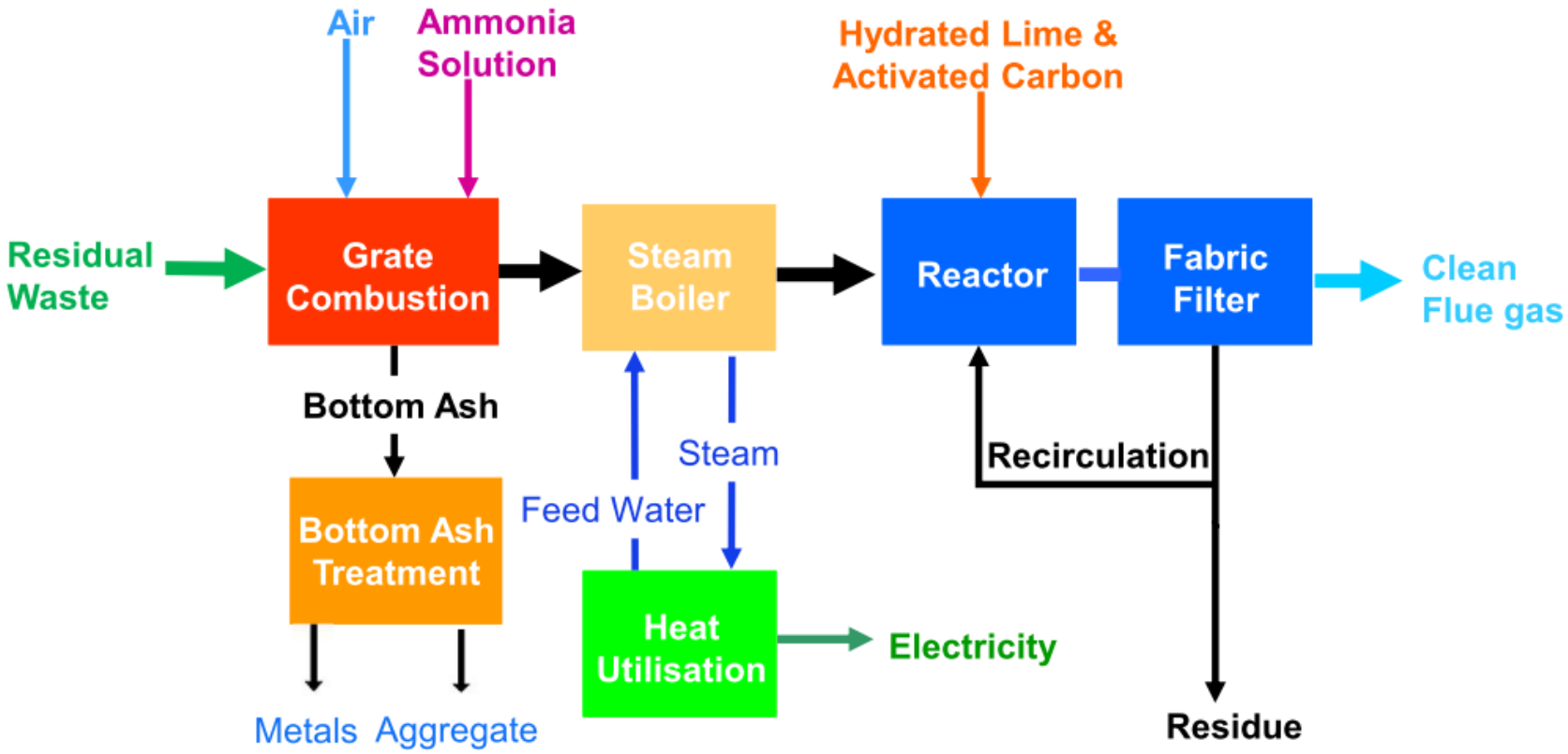
Managementul deseurilor

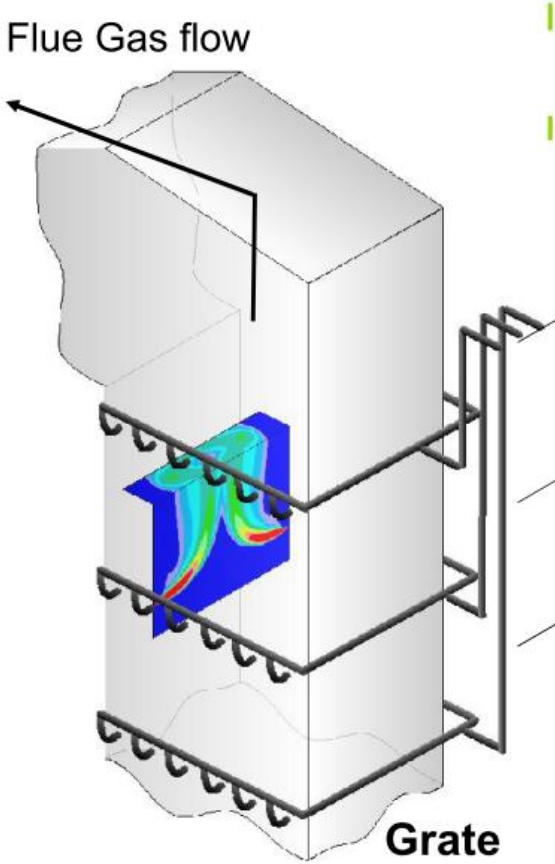
Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)



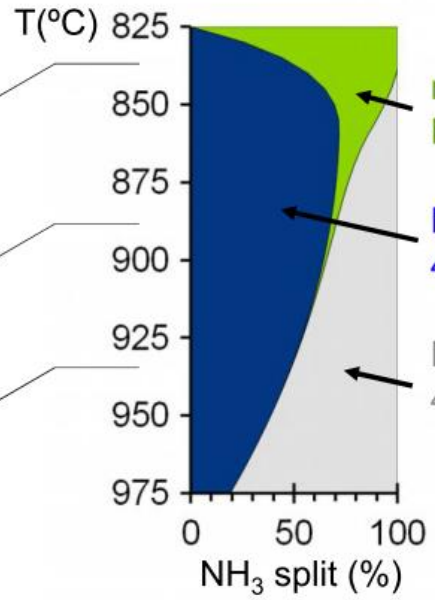
Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)

Fundamentals of Selective Non-Catalytical Reduction of Nox (Instalatia de denitrificare)



- The NOx concentration is reduced by the injection of NH_3 in the first boiler pass
- **Temperature window: 850 °C – 950 °C**
  ⇒ multiple injection levels



no reaction (NH_3 slip):
$NH_3 \rightarrow NH_3$

NO reduction:
$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$

NH_3 oxidation:
$4NH_3 + 3O_2 \rightarrow 4NO + 6H_2O$

Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)

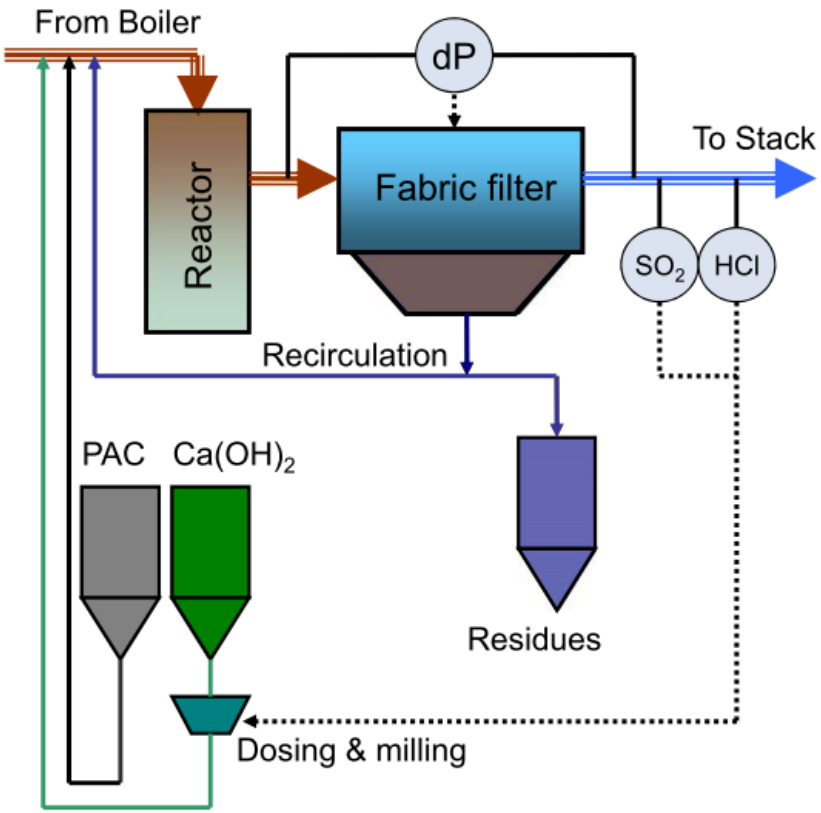
Dry Scrubbing with Hydrated Lime and Activated Carbon (Instalatia de Desulfurizare)

Principal:

- Neutralisation / absorption of HCl, SO_2, Mercury and Dioxins with dry powdered adsorbent (hydrated lime and powdered activated carbon PAC)

Main Control Loops:

- Hydrated dosing according mainly to HCl (SO_2) emissions
- Fabric filter pulse-jet cleaning according to differential pressure



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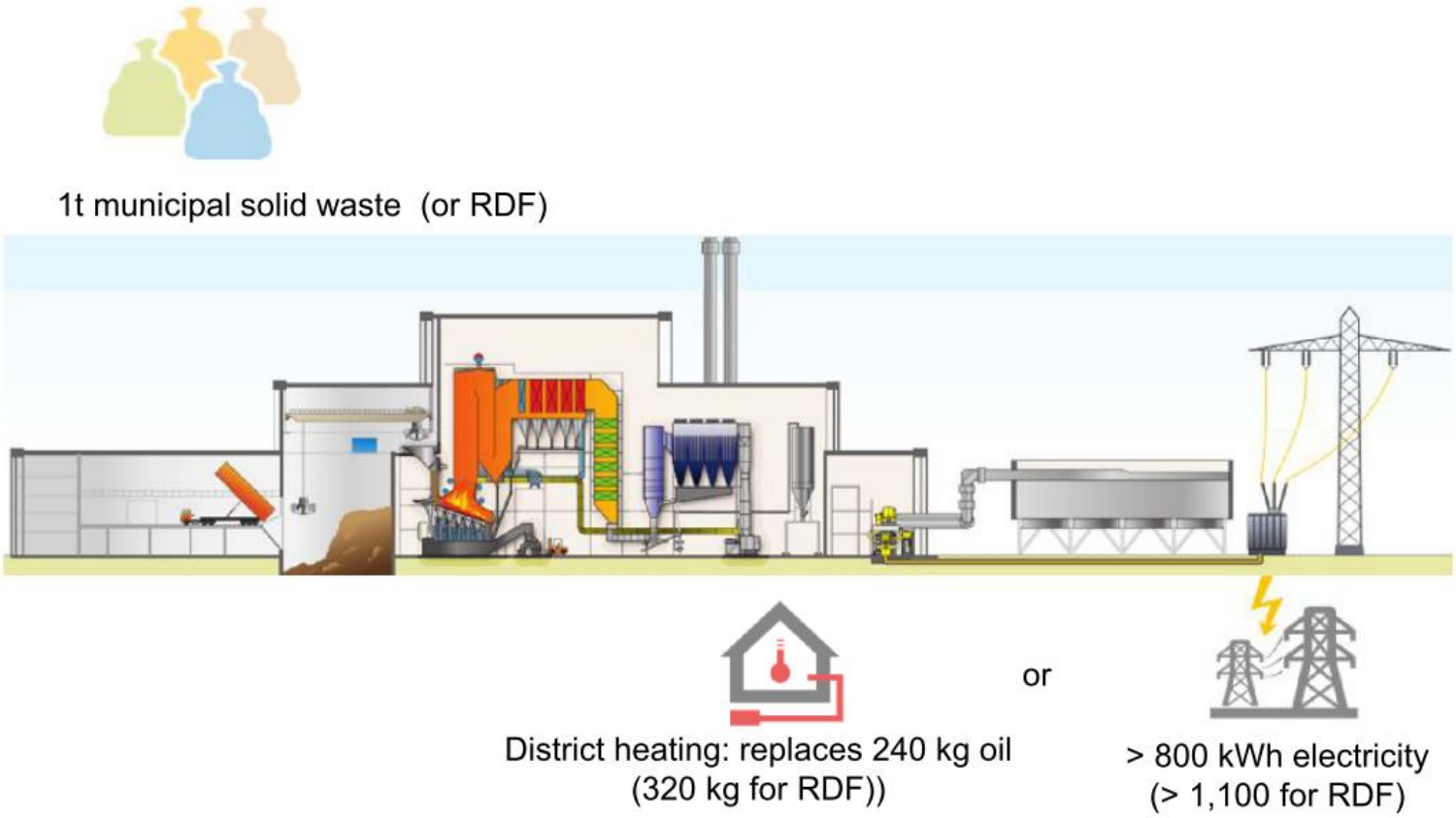
Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)

Caldura și energie



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Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)

Caldura, energie si reciclare

Electricity from waste

Metals and minerals for recycling recovered from bottom ash.

1 t of Waste

Up to 4.6 t steam

Up to 3.4 MWh heat

Up to 1.1 MWh electric power

Thermal energy can be converted into electricity
or extracted as steam or hot water for district heating.

1 t of Bottom Ash:

Up to 27 kg
of aluminum

Up to 12 kg
of nonferrous heavy metals

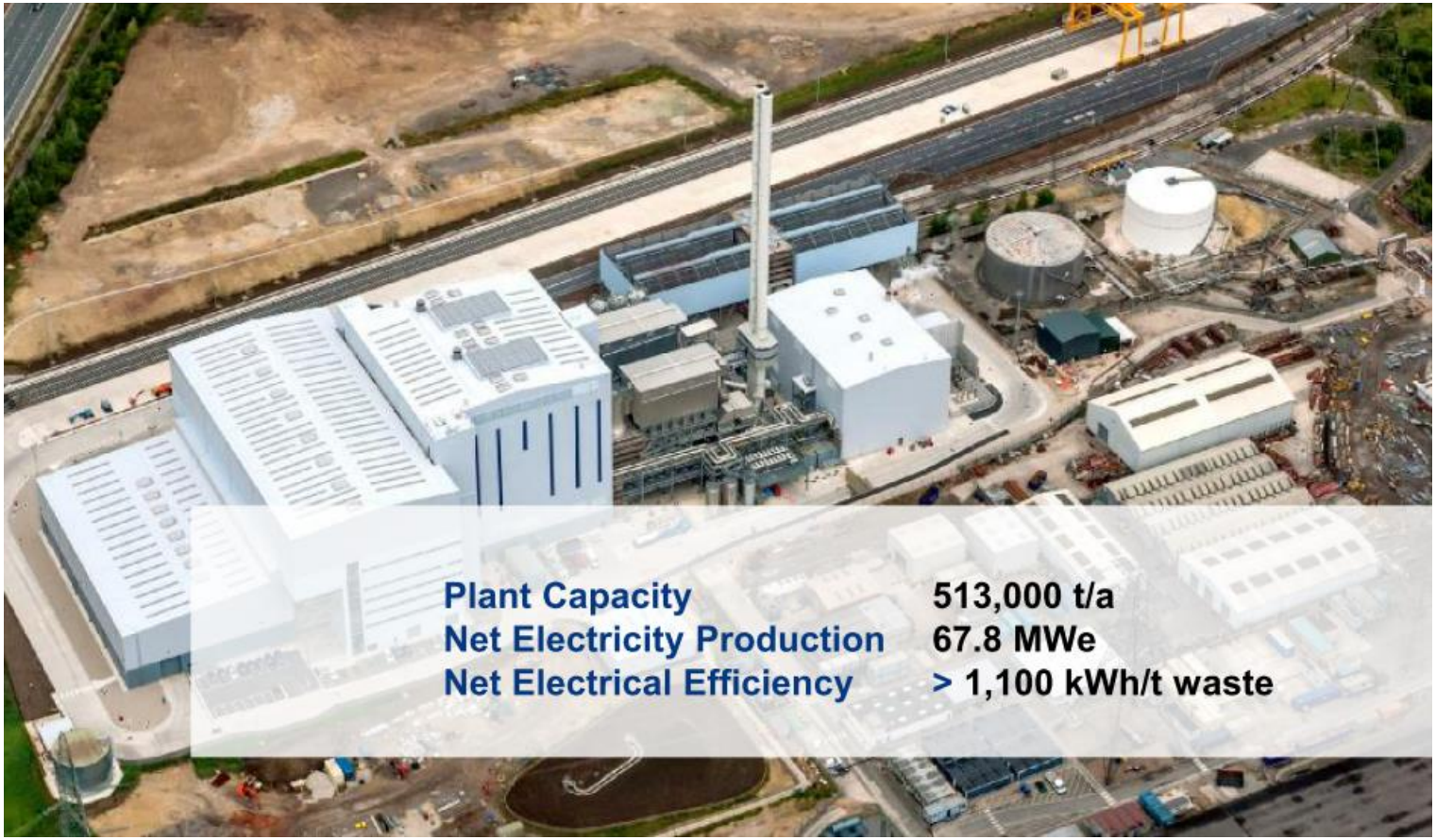
Up to 100 kg
of ferrous metals

Up to 150 kg
of inerts

Metals and inerts for reuse recovered from bottom ash.

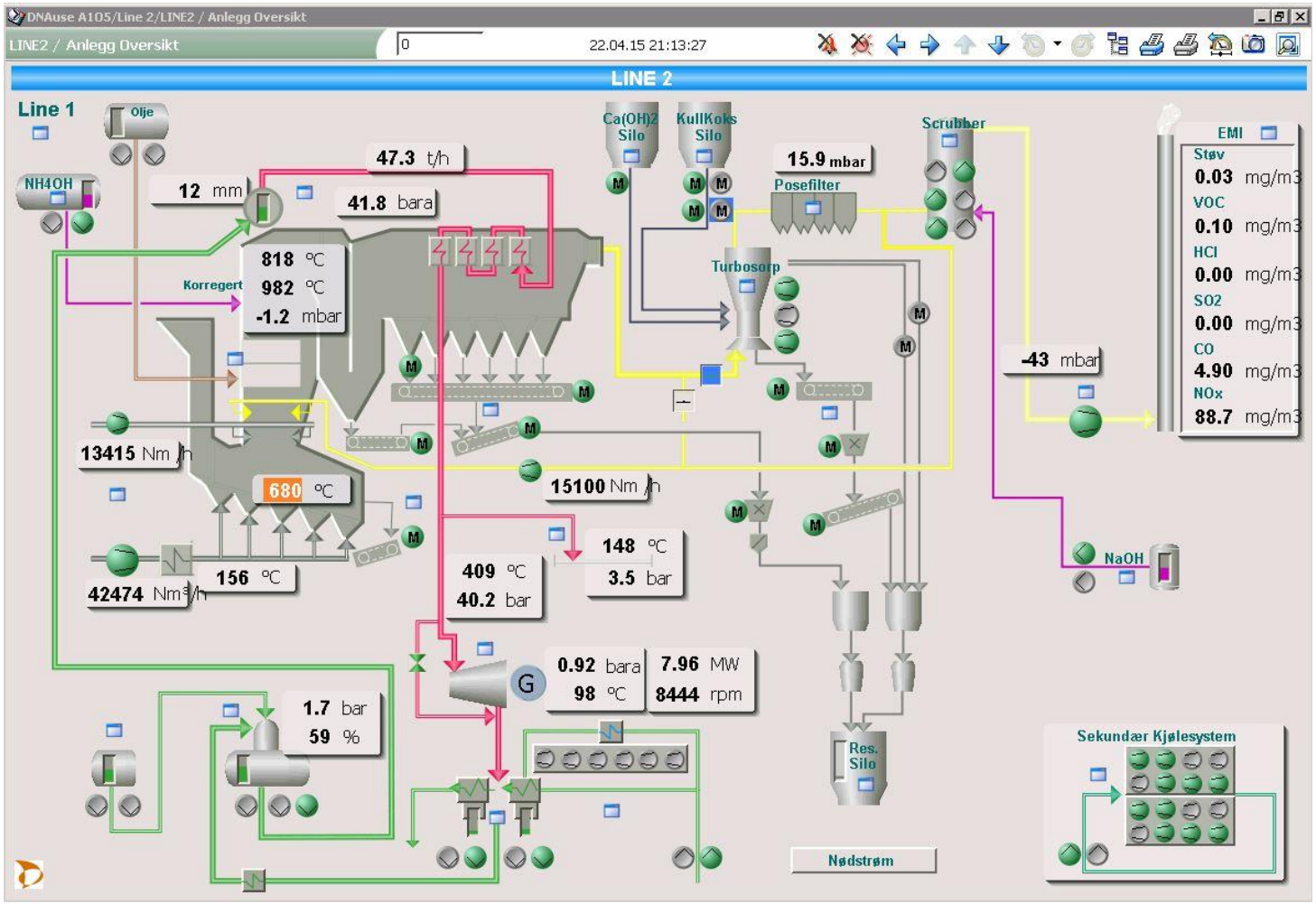
Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)



Managementul deseurilor

Incinerare cu recuperarea energie din deseuri municipale solide (MSW) si industrial (RDF)



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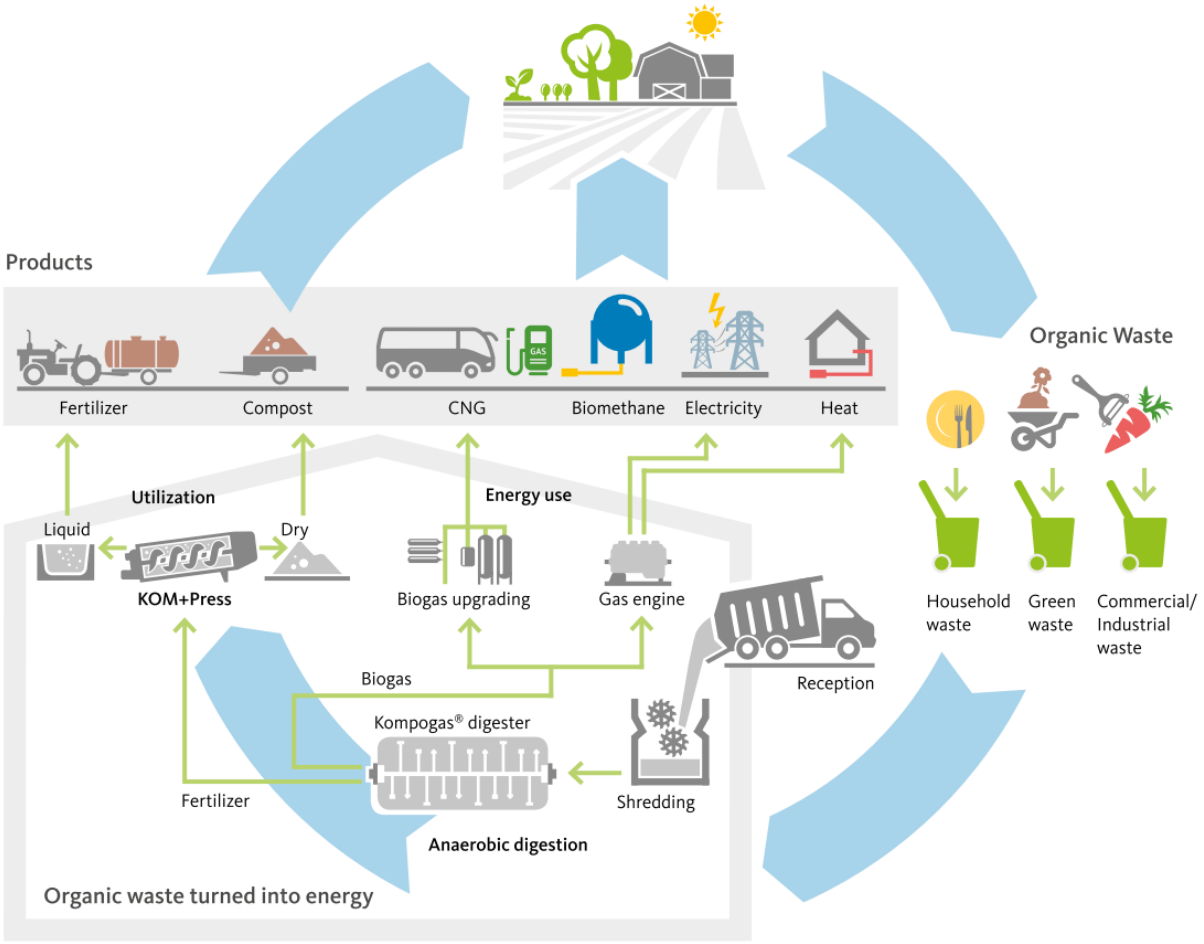
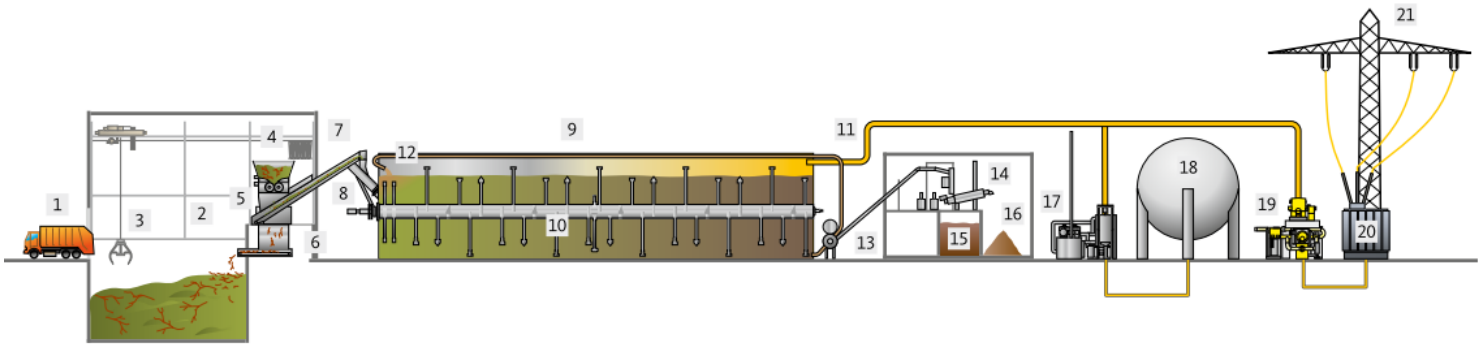
Managementul deseurilor

Recuperarea energiei prin tratare biologica – Ciclu Ecologic



Managementul deseurilor

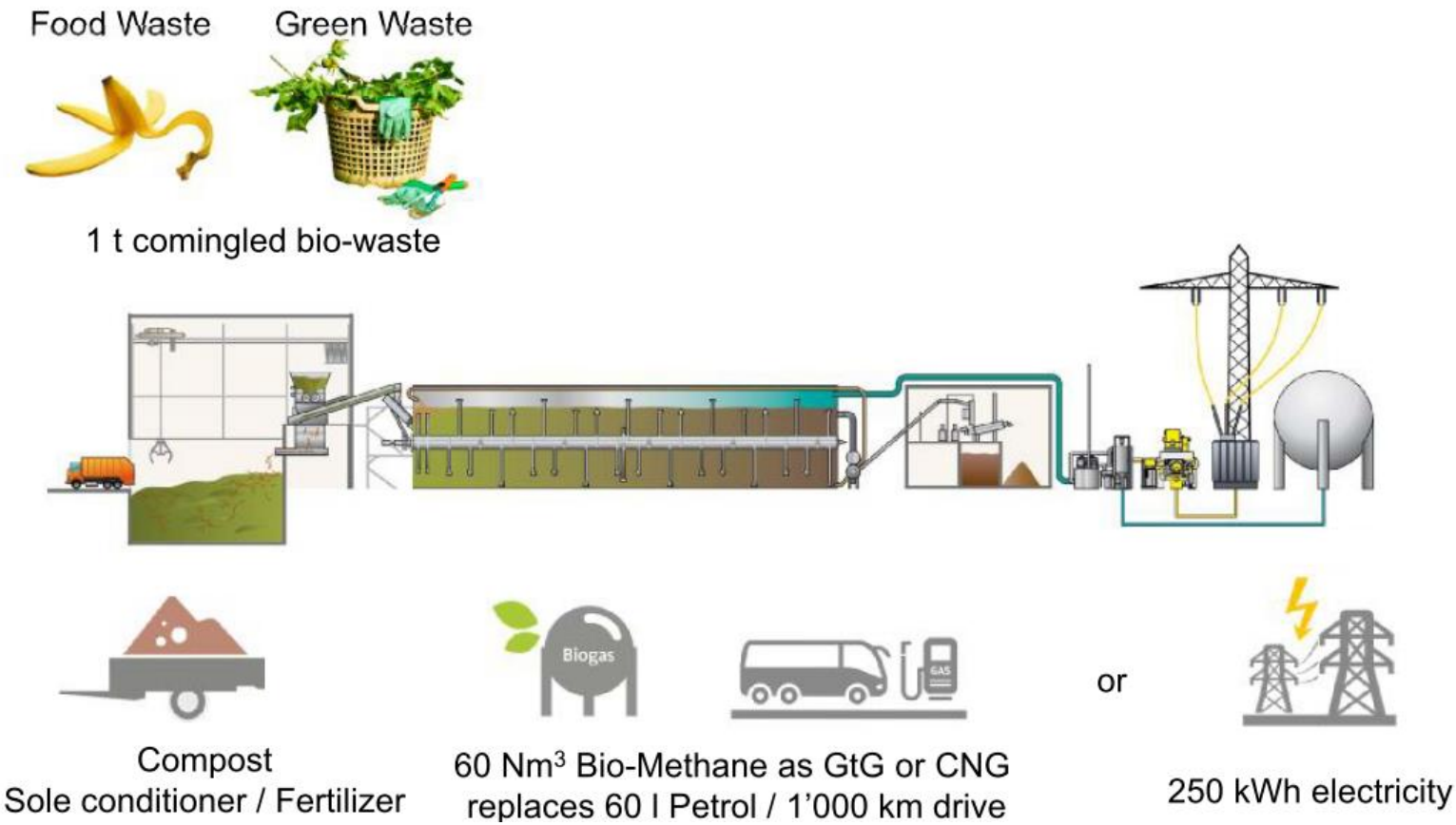
Recuperarea energiei prin tratare biologica



Waste Receiving and Storage	Anaerobic Digestion	Discharge	Energy Utilization
1 Waste receiving	4 Shredder	12 Inoculation pipe	17 Biogas upgrading HZI BioMethan®
2 Waste bunker	5 Sieve	13 Discharge system	18 Gas storage
3 Waste crane	6 Sieve rejects	14 Dewatering press	19 Combined heat and power plant
	7 Conveying system	15 Liquid digestate	20 Transformer
	8 Feeding system	16 Solid digestate	21 Electricity export
	9 Digester		
	10 Agitator		
	11 Biogas pipe		

Managementul deseurilor

Recuperarea energiei prin tratare biologica



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Managementul deseurilor

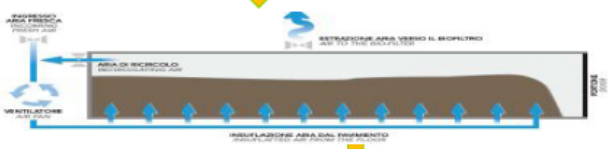
Recuperarea energiei prin tratare biologica

Composting or Dry AD

Bio Waste

40'000 t/a

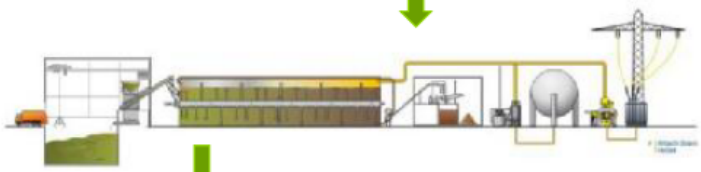
Compost
from bio-waste with
In-Vessel Composting (IVC)



Bio Methane production: 0 (no energy prod.)
Fertilizer production: 18,000 t/a compost

Energy consumption: 2,600 MWh_{el}/a

Energy & Compost
from bio-waste with
Dry Anaerobic Digestion



Bio Methane production: 31,000 MWh/a
Fertilizer production: 11,000 t/a compost
17,000 t/a liquids

Energy consumption: 2,900 MWh_{el}/a
1,600 MWh_{th}/a

Net difference: 29.000 MW Bio Methane
2.9 Million Nm3 Bio CNG /a

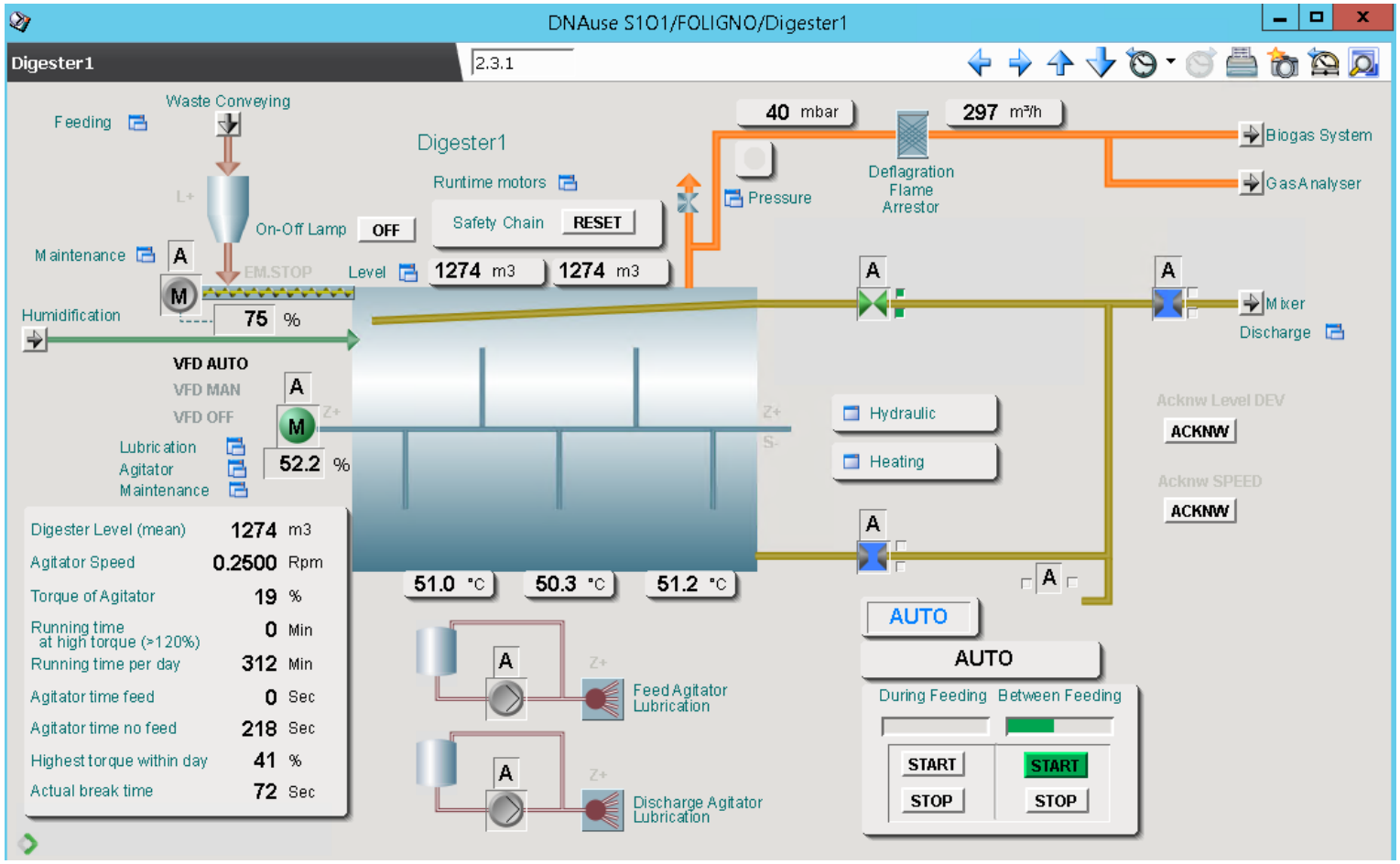
Fuel to drive 1,200 times around the globe.

Managementul deseurilor

Recuperarea energiei prin tratare biologica

Managementul deseurilor

Recuperarea energiei prin tratare biologica



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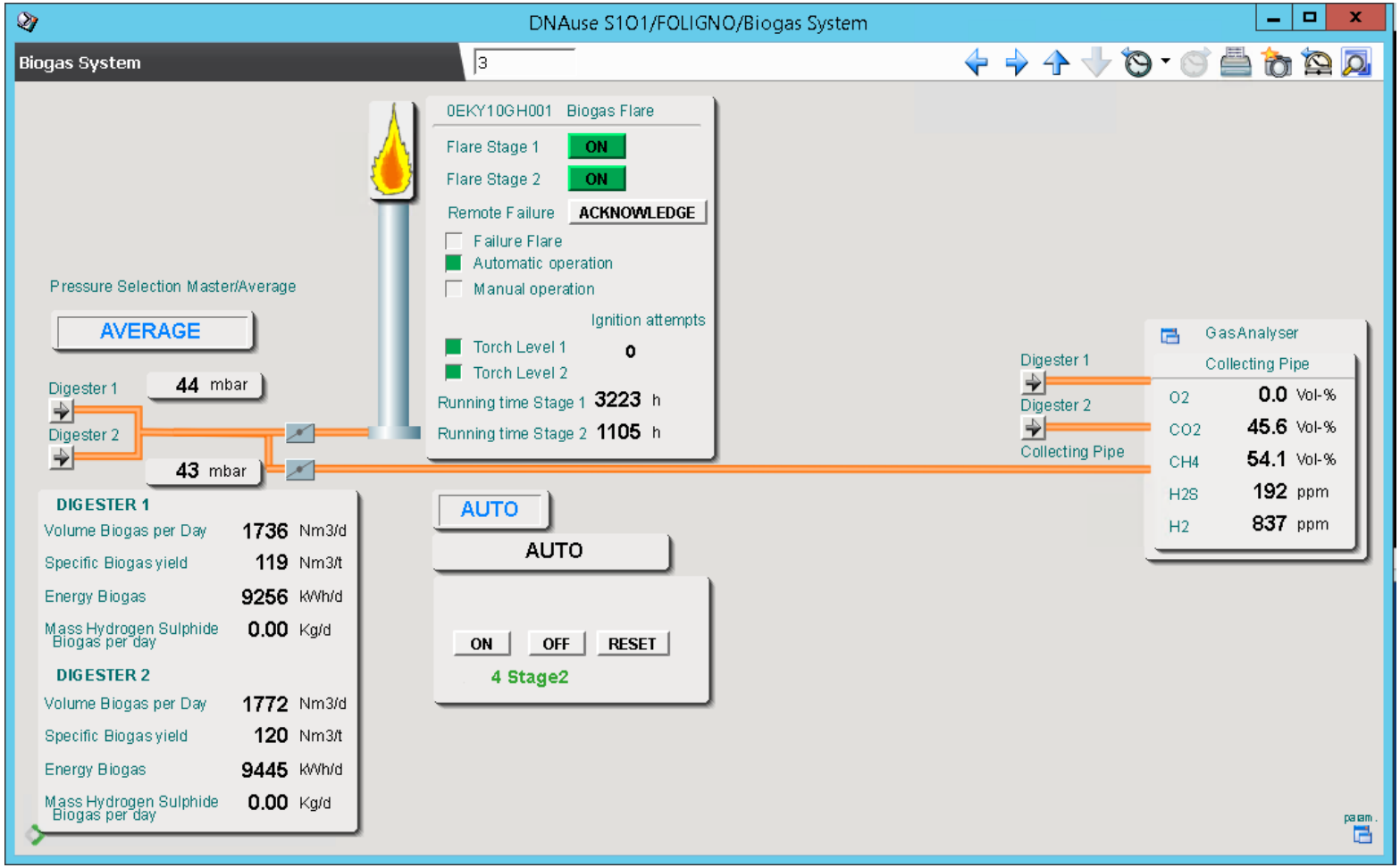
Managementul deseurilor

Recuperarea energiei prin tratare biologica



Portofoliu – Incineratoare cu recuperare de energie

An proiect	Proiect	Client
2016-2019	Ferrybridge2 - WtE power plant / UK	Hitachi Zosen INOVA
2015-2016	Hereford and Worcestershire - WtE power plant / UK	Hitachi Zosen INOVA
2015-2016	Buckinghamshire - waste power plant / UK	Hitachi Zosen INOVA
2014-2015	Ferrybridge WtE power plant / UK	Hitachi Zosen INOVA
2014	West Yorkshire Leeds - Energy from Waste / UK	CNIM
2014	Battelfield - Energy from Waste / UK	CNIM
2014	Estree-mons - WtE / Franta	CNIM
2014	Ridham Dock - BtE Plant / UK	CNIM
2013	Cardiff Trident - Energy from Waste Facility / UK	CNIM
2013	Staffordshire Four Ashe - WtE / UK	CNIM
2013	Suffolk - Energy from Waste Facility / UK	CNIM
2013	Vassa - WtE / Finlanda	Hitachi Zosen INOVA
2013	STV 4&5 WtE / UK	Hitachi Zosen INOVA
2012	Kogeban - WtE / Franta	CNIM
2012	Lincolnshire - WtE / UK	CNIM
2011	New Heaven - WtE Power Plant / UK	vonRoll INOVA
2010	Riverside - WtE Power Plant / UK	vonRoll INOVA

Portofoliu – Digestie Anaerobă

An proiect	Proiect	Client
2018-2019	Anaerobic Digester Chongqing / China	Hitachi Zosen INOVA
2018-2019	Anaerobic Digester Nanjing / China	Hitachi Zosen INOVA
2018	Anaerobic Digester Foligno / Italia	Hitachi Zosen INOVA
2018	Anaerobic Digester Epirus / Grecia	Hitachi Zosen INOVA

Clienți

Hitachi Zosen INOVA

CNIM Imaginer et Agir

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