

# Views to WtE processes

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## Contents

Valmet 2 Towards Circular Economy in waste management 3 Waste pre-treatment – key to success Special challenge with wet-high-organic MSW 4 5 Example of policy that worked

6 Some countries with policy-driven WtE-activity at the moment



Year 2020

✓ Net Sales: 3,7 bn€
✓ EBITA-%: 9,8
✓ Employees: 14 000

## Locations in India



Valmet

Leading process technologies, services and automation for the pulp, paper and energy industries

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## Examples of Valmet's recent deliveries

Valmet's Energy Business unit is focusing on Multifuel-fired Fluidized Bed boilers and gasifiers, Flue Gas cleaning systems and Fuel Upgrades for existing boilers

#### Waste-to-energy – RDF

#### Zibo Green Energy, China

- CFB boiler: 35 MWe, 80 bar, 520°C
- Fuels: 300 000 tpa RDF
- Start-up: 2018
- Driver: Reliability and high efficiency



#### Multifuel power

#### **Ofunato Power Inc, Japan**

- CFB boiler: 75 MWe reheat, 65/57 kg/s, 142/27 bar, 557/540°C
- Fuels: PKS, EFB pellets and coal
- Driver: FIT Renewable power to grid
- Start-up: June 2019



#### **Biomass conversion**

#### PT Cikarang Listrindo, Indonesia

- Converting existing coal fired CFB boiler to biomass-coal combustion
- Fuels: Palm Kernel Shell (PKS) + Coal
- Driver: Renewable power to customers
- Start-up: 2021









## Resource-efficient fuel sources





Waste processing gets more complicated when moving towards recovery of energy and chemicals – but it must be done!





# Typical Indian MSW is not applicable for incineration without pre-treatment

- Kitchen waste and trash get mixed
- Low calorific value and high moisture
- Seasonal variations



MSW composition	Mass-%
Kitchen, food and bio wastes	66.7
Wood	1.2
Paper & Cardboard	5.2
Textiles and fabric	2.6
Leather and rubber	0.4
Plastics	13.8
Metals	1.0
Glass, porcelain, stones, soil, ash, etc.	5.6
Other	3.4
Totals	100.0
Moisture 60 <sup>°</sup> Inerts (ash) 10 LHV 5.1	% .4% MJ/kg



# Solutions for wet and high-organic MSW

## DUO:

- Mechanical pre-treatment and mixing with industrial waste
- RDF-yield about 80%
- No nutrient recovery

### TRIO:

- Combined mechanical-wet-biological pre-treatment
- RDF-yield about 50%
- Recovery of nutrients in organic fraction







# TRIO – From 500 up to 3000 TPD MSW input

## Integrated solution

- Recyclable materials recovered for recycling
- Organic fraction turned into fertilizers and power with Anaerobic Digestion
- Combustible fraction refined to RDF-fuel for high-efficient CFB-boiler power plant





# Example of a powerful Policy

Japan shifting from Nuclear to Renewable electricity

- The first feed-in-tariff (FIT) system for renewable energy was enforced by Japanese government in 2012
  - Solid biomass fuels are included in this system
- Secured price for biomass electricity, 24 JPY/kWh
  - For twenty years starting from plant start-up
  - System allows to co-fire also fossil fuels but FIT is paid only for biomass portion
- FIT is applied at early stage of project development

This incentive system initiated numerous new projects

Renewable share in Japan increased from 9 to 15% in 5 years

Target by 2030 is to increase it to a range of 25% (low scenario) – 34% (high)





Active countries in waste-to-energy at the moment Feed-in-Tariff as common nominator in new waste-to-energy countries

New waste-to-energy countries triggering the market with FIT:

- Vietnam
- Malaysia
- Indonesia
- Australia
- United Arab Emirates

Mature waste-to-energy –countries renewing their policies:

- Taiwan: FIT for high-efficient plants only
- EU: Green Deal
  - 65% material recycling quota for each member country
  - Max 10% allowed to end up to landfills
  - → 25% available for Energy Recovery or for Chemical recycling



