Waste to Energy Solution

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Stefan Krech – Outotec GmbH & Co.KG
Bülent Aksu – Outotec Engineering DMCC
Local operations, global presence

Sales
1.2bn
EUR in 2015

4,200
employees

Deliveries
to more
than
80
countries

R&D, sales
and service
centers in
34
countries

Experts of
over
60
nationalities

Listed on Nasdaq Helsinki since 2006

Wide supplier network with established long-term relationships
A century of accumulated expertise

1881
Metallgesellschaft established

1920
Lurgi Gesellschaft für Chemie und Huttenwesen GmbH established

1910
Outokumpu Oy founded in Finland

1980–2000
Growth through acquisitions

2001
Merger of two major players

2003
Boliden Combust was joined to Outokumpu Technology

2004
Filter businesses sold to Larox (Ceracell, Hoesch and Fannen)

2006
Independent company

2007
Name changed to Outotec Oyj

2008
Acquisition of Auburn Group

2011
Acquisition of Kristin Services, Energy Products of Idaho, ASH DEC and Vertical Pressure Filter Technology

2012
Acquisition of Backfill Specialists, TME Group and Demi Manutenção

2013
Acquisition of Scania
e

2014
Acquisition of Republic Alternative Technologies

2010
Sustainable use of Earth’s natural resources defined as Outotec’s mission. Acquisition of Larox, Millteam, Ausmelt, and Edmeston.
60 years of Outotec fluidized bed technology

- Alumina calcining
- Iron ore reduction
- Gold roasting
- Zinc roasting
- Combustion
- Gasification
Thermal processing in Outotec’s fluidized bed

Tailored design:
- Bubbling or circulating FB
- FB thermal oxidizers
- FB advances stage gasifier
- FB gasifiers

... and others
Thermal processing of RDF-type fuels

Features of Outotec's proprietary solution for burning RDF in FB boiler:

- Fully refractory lined combustion chamber
- Open nozzle grid with bed cleaning and recycle remove non-combustables
- Waterwall to protect the superheaters from chlorine corrosion
- Partly coated inbed / vapor space tubes (no hot spots in the bed area)
Thermal processing of sludge-type fuels

Features of Outotec’s proprietary solution for burning sludge in FB boiler:

- Self sustainable combustion without support fuel (no natural gas, no oil)
- Cylindrical refractory lined and insulated steel shell
- Ceramic nozzle grid for equal combustion air distribution
- Pre-heated combustion air
- Sand bed on top of nozzle grid:
  - Serves as heat reservoir
  - Shreds inserted fuel
Sample of fuels and fuel mixes

Almond Shells, Apple wood, Barley straw, Bean straw, Cherry Pits, Coffee Grounds, Corn Cobs, Corn Stalks, Cotton Seed Hulls, Cubed Garlic, Garlic Skins, Onion Skins, Nectarine Wood, Oat Straw, Olive Pitts, Peach Pits, Prune Wood, Rice Hulls, Rice Straw, Sunflower Stalks, Sunflower Hulls, Tobacco Sludge, Tomato Pomace, Walnut Shells, Wheat Straw,

Chicken Litter, Turkey Litter, Paunch Manure, Cow Manure, Horse Manure, Race Track Shavings, Sewage sludge,


Coal, Lignite, Petroleum Coke

Over 250 fuels / fuel mix used
Residues from paper industry, Turkey

Fuel: Rejects and sludge
Throughput: 400,000 t/a
Steam: 95 t/h, 530 °C, 60 bar
Turbine: 28 MW<sub>el</sub>
Completion: 2015
Municipal sewage sludge, Swiss

Fuel: Sewage sludge
Throughput: 100,000 t/a
Steam: 9 t/h, 450 °C, 60 bar
Turbine: 900 kW_{el}
Completion 2016
RDF incineration plant, UK

Fuel: RDF

Throughput: 100,000 t/a

Steam: 54.6 t/h, 400 °C, 46 bar

Turbine: 12.6 MW\text{el}

Completion: 2017

http://lrel.levenseat.co.uk/wp-content/uploads/2015/11/levenseat_37-768x768.jpg

http://www.zontainfratech.com/sites/default/files/images/sortingmachine22.jpg
Latest Waste to Energy orders received

WtE orders from RDF, wood waste and industrial waste in UK and Canada

- 12.5 MW$_{el}$ from RDF + 12-year O&M
- 6 MW$_{el}$ from RDF
- 21 MW$_{el}$ from wood waste
- 28 MW$_{el}$ from RDF
- 10 MW$_{el}$ from RDF / wood waste + 12-year O&M
- 10 MW$_{el}$ from RDF / wood waste + 12-year O&M
- 10 MW$_{el}$ from RDF / wood waste + 12-year O&M
- 55 MW$_{th}$ synthetic gas from mixed industrial waste

Total output 90 MW$_{el}$ + 55 MW$_{th}$

Order intake value approx. 180 Mio€
Sustainable use of Earth’s natural resources