SBEng in brief

- International company for plant construction in the field of environmental and energy technology
- More than 150 years of tradition and know-how
- Worldwide more than 1,600 reference plants
- EPC-Contractor for turnkey plants
- Member of the Nippon Steel & Sumitomo Metal Corporation

www.steinmueller-babcock.com
Ownership structure

* all information for the financial year 2016
Global network

- Headquarter
- Branch
- Cooperation partner
- Licensees
- Representatives

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Your partner along the plant life-cycle

Concepts, Feasibility Studies
- Basic Engineering
- Detail Engineering
- Project Management
- Quality / HSE-Management

E
- Procurement
- Logistics
- Construction
- Commissioning

P
- Operational Support
- After Sales Service
- Decommissioning

C
Energy from Waste
Reference projects - Energy from Waste

(as at December 2015)
A solution for every kind of waste

Incineration and co-incineration of:

- Municipal solid waste
- Refuse derived fuels
- Industrial waste
- Bulky waste
- Biomass
- Sewage sludge
- Shredder light fraction
- Tyres
- Animal waste
- Hospital waste
- Hazardous waste – solid
- Hazardous waste – pasty
- Hazardous waste – liquid
Process of waste incineration

1) Waste bunker
2) Waste feed hopper
3) Feeder
4) Slag bunker
Process of waste incineration

5) Grate
6) Furnace/waste fire
7) Slag extractor
8) Evaporator
9) Boiler drum
10) Superheater
11) Turbine
12) Economiser
13) Feedwater tank
Process of waste incineration

14) Spray absorber
15) Flow reactor
16) Silos
17) Fabric filter
18) ID-Fan
19) Stack
Process of Direct Melting System (DMS/Gasification)

Gasification + Melting of waste in a shaft furnace at up to 1,800°C

- **Drying and preheating zone** (300 – 400°C)
- **Thermal decomposition zone** (300 – 1,000°C)
- **Combustion zone** (1,000 – 1,700°C)
- **Melting zone** (1,700 – 1,800°C)

Air + O₂

Removal of slag and metal at the bottom of the furnace
**Reference plant**  
**EfW plant Herten / Germany**

<table>
<thead>
<tr>
<th>Client:</th>
<th>RZR Herten II GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel:</td>
<td>Municipal and commercial waste</td>
</tr>
<tr>
<td>Capacity:</td>
<td>2 x 52 MWth; 2 x 17 t/h; 10,800 kJ/kg</td>
</tr>
<tr>
<td>Grate system:</td>
<td>Forward moving grate</td>
</tr>
<tr>
<td>Commissioning:</td>
<td>2008</td>
</tr>
<tr>
<td>Scope:</td>
<td>General contractor → Enlargement of the existing plant by two incineration lines for municipal waste on a turnkey basis (incl. grate, boiler, flue gas cleaning, turbine, erection, commissioning)</td>
</tr>
</tbody>
</table>
| Special features: | Facility consists of 6 lines (2 x hazardous waste and 4 x municipal waste)  
Municipal waste: line 3 & 4 → general contractor; line 1 → grate, boiler, flue gas cleaning  
Hazardous waste: line 1 & 2 → rotary kiln, boiler, flue gas cleaning |
Reference plant  
EfW plant Acerra / Italy

<table>
<thead>
<tr>
<th><strong>Client:</strong></th>
<th>Fibe S. p. A.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel:</strong></td>
<td>Refuse derived fuel</td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
<td>3 x 113 MWth; 3 x 27 t/h; 15,070 kJ/kg</td>
</tr>
<tr>
<td><strong>Grate system:</strong></td>
<td>Forward moving grate (water-cooled)</td>
</tr>
<tr>
<td><strong>Commissioning:</strong></td>
<td>2009</td>
</tr>
<tr>
<td><strong>Scope:</strong></td>
<td>Member of general contractor consortium for the construction of turnkey plant incl. grate, boiler, flue gas cleaning, turbine, erection, commissioning</td>
</tr>
<tr>
<td><strong>Special features:</strong></td>
<td>660,000 tons throughput capacity per year, optimised energy efficiency, turbine/generator with 120 MWel</td>
</tr>
<tr>
<td><strong>Client:</strong></td>
<td>Berliner Stadtreinigungsbetriebe</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td><strong>Fuel:</strong></td>
<td>Municipal waste</td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
<td>90 MWth; 1 x 36 t/h; 9,000 kJ/kg</td>
</tr>
<tr>
<td><strong>Grate system:</strong></td>
<td>Forward moving grate</td>
</tr>
<tr>
<td><strong>Commissioning:</strong></td>
<td>2012</td>
</tr>
<tr>
<td><strong>Scope:</strong></td>
<td>General contractor → turnkey construction of line A incl. grate, boiler, flue gas cleaning, civil works, control and monitoring system, electrical systems</td>
</tr>
<tr>
<td><strong>Special features:</strong></td>
<td>One of the largest MSW grates worldwide, replacement of 4 old lines by 1 new line</td>
</tr>
</tbody>
</table>
**Reference plant
EfW plant Klaipeda / Lithuania**

<table>
<thead>
<tr>
<th><strong>Client:</strong></th>
<th>Fortum Baltic Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel:</strong></td>
<td>Municipal waste, biomass</td>
</tr>
<tr>
<td><strong>Capacity:</strong></td>
<td>85 MWth; 1 x 34 t/h; 9,000 kJ/kg</td>
</tr>
<tr>
<td><strong>Grate system:</strong></td>
<td>Forward moving grate</td>
</tr>
<tr>
<td><strong>Commissioning:</strong></td>
<td>2013</td>
</tr>
<tr>
<td><strong>Scope:</strong></td>
<td>Engineering, delivery, installation and commissioning of grate, boiler and boiler house</td>
</tr>
<tr>
<td><strong>Special features:</strong></td>
<td>Co-incineration of biomass (up to 50 %), first EfW plant in Lithuania</td>
</tr>
</tbody>
</table>
**Reference plant**

**DMS plant Sin-Moji / Japan**

<table>
<thead>
<tr>
<th>Client:</th>
<th>Kitakyushu City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel:</td>
<td>Municipal waste, sewage sludge</td>
</tr>
<tr>
<td>Capacity:</td>
<td>3 x 10 t/h; 9,100 – 12,000 kJ/kg</td>
</tr>
<tr>
<td>Commissioning:</td>
<td>2007</td>
</tr>
<tr>
<td>Scope:</td>
<td>Turnkey plant incl. operation and maintenance</td>
</tr>
<tr>
<td>Special features:</td>
<td>World's biggest plant with gasification process based on Direct Melting System (DMS), melting of slag from other plants</td>
</tr>
</tbody>
</table>
WE MAKE THE WORLD A CLEANER PLACE

Let’s work it out together