Seminar on Low Carbon Technologies, Szentendre,
11-12 October 2016
3 Times CO2 Reduction

✓ Energy from Waste
✓ Energy from Biomass
✓ Usage of residue fuels

By

JFE Engineering Group
Standardkessel Baumgarte
JFE – General Group Structure

**JFE Holdings**

Net Sales (billion €) 29.8
Employees 59,460

**Major Group Companies (Operating)**
- JFE Steel Corporation
- JFE Engineering Corporation
- JFE Shoji Trade Corporation

**JFE Engineering Corporation**

Net Sales (billion €) 3.46
Employees 9,000

**Standardkessel Baumgarte**

TurnKey Power Plants and Components for Municipal and Industrial energy supply.
Power Plant Services.
Standardkessel Baumgarte Group Organisation - Member of JFE Engineering Group

| NEW POWER PLANTS AND COMPONENTS | Standardkessel GmbH  
Duisburg, Hamburg |
|-------------------------------|----------------------|
|                               | Baumgarte Boiler Systems GmbH  
Bielefeld |
| POWER PLANT SERVICES          | Standardkessel Baumgarte Service GmbH  
Duisburg, Kuwait |
|                               | EPCO Ltd.  
Saudi Arabia |
| Key Figures                   | Net Sales*: 124 Mill. EUR |
|                               | Employees*: 262 |

* Average of the last 5 years
Standardkessel Baumgarte Group - Product Lines

Scope:

Boilers and Power Plants

Boilers for almost every kind of Fuel

Engineering and Contracting

Boiler Islands

Full EPC and EPCM

Power Plant Services
ENERGY FROM WASTE
Technologies for Waste Materials

Energy Sources
- municipal waste, industrial waste, RDF
- solid, liquid and gaseous industrial residues

Technologies
- with pusher type grate system, air-cooled and/or water-cooled
- fluidized bed

Energy Sources converted into
- electricity
- process heat
- district heating and cooling
Cycle for Waste to Energy Plant

- Fuel Reception
- Fuel Storage
- Combustion
- Steam Generation
- Power Generation
- Environmental Controls
Technologies for Waste Materials

Contribution to carbon reduction

Case
- 250.000 tons waste per year operating 8000 hr/yr
- Equivalent to waste production of city of approx. 350.000 population
- LHV of 10 MJ/kg

Resulting
- Electricity production 22 MWe or 173 GWhr
- Serving 24.000 house holds with electricity
- Fuel saving of 25.000 m3 natural gas per year or 65.000 ton coal per year
Country opportunites for Waste to Energy

Energy-from-Waste is the alternative to landfilling waste

Hungary
- Expected waste production in 2025 = 5,118,000 ton/yr (*)
- Increase of 8,6%

Poland
- Expected waste production in 2025 = 8,481,140 ton/yr (*)
- Increase of 12,6%

Ukraine
- No data available

(*) source = World Bank
Energie Anlage Bernburg, Germany

Rated Thermal Input
3 units each 70 MW
Steam Parameter
80.0 t/h - 410 °C - 41 bar
Fuel
Domestic / Industrial Waste
Year of Commissioning
2010
Scope of Supply
Turn Key Plant
Energy from Biomass
Technologies for Biomass

Energy Sources
- fresh wood, wood dust and waste wood
- other biogenic residues like olive residues, rice husks

Technologies
- grate system
- fluidized bed

Energy Sources converted into
- electricity
- process heat
- district heating and cooling
Contribution to carbon reduction

Case
- Bio mass plant of 30 MWe and 8000 hr/yr
- LHV of 10 MJ/kg (typical mixture of fresh and waste wood)

Resulting
- Serving 30,000 house holds with electricity and district heating
- Fuel saving of 32,000 m³ natural gas per year or 65,000 ton coal per year
Country opportunities for Biomass

Hungary, Poland and Ukraine:

- Forestry
- Wood production companies
- Demolition wood
- Power production
- District heating systems

Fresh Wood - UK Speyside
HOKAWE Eberswalde, Germany

Rated Thermal Input

**68.3 MW**

Steam Parameter

**68 t/h - 482 °C - 82 bar**

Electrical Output

**20 MW**

Fuel

**Wood**

Year of commissioning

**2006**

Scope

**Turn Key Plant**
Energy from Residue Fuels
Technologies for Residue fuels

Energy Sources
- Blast Furnace gas
- Coke oven gas
- Refinery gasses
- Liquid production residues

Technologies
- Industrial Low NOx burner systems

Energy Sources converted into
- electricity
- process heat
- district heating and cooling
Contribution to carbon reduction

Case
- BFG and COG fired boiler to generate 125 MWe

Resulting
- Fuel saving of 160,000 m3 natural gas per year or 300,000 ton coal per year
Country opportunities

Hungary
- General industry → plant efficiency upgrading by using residue fuels

Poland
- Plant upgrading for (Petro) chemical plants and general industry

Ukraine
- One of biggest iron ore reserves in the world
- Among top 10 global steel producers → utilize BFG and coke gas
- (Petro) chemical industry is outdated → upgrading opportunities
Alstom Power for Dunkerque, DK6, France

Electrical Power Output of GT

2 x 160 MW_{el}

Steam Parameter for each Boiler

HP 535 t/h - 566 °C - 144 bar
RH 530 t/h - 566 °C - 31 bar

Operation Mode

Flying Take Over
Aux. Fuel
Coke Oven Gas, Blast Furnace Gas, Natural Gas

Year of Commissioning

2004

Scope
Boiler Island, 2 Lines
CO2 Reduction is Awareness

✓ Waste is a valuable product
✓ Biomass is also available in your country
✓ Residues fuel is also fuel. Don’t waste it.

Thank you!