



# Advanced Biomass CHP Plant

## Energa, Elblag, Poland

### Introduction



Source: Energa

The city of Elblag is a regional urban centre located on the River Elblag, in Northern Poland. The city itself has shipping, brewing and metallurgical industries, but is situated within a predominantly rural hinterland. The agricultural straw residues from this area are used for the CHP biomass heat and power plant owned and operated by Energa Kogeneracja Sp. z o.o., part of the Energa Group, whose core business is the generation, distribution and sales of electricity and heat.

The 25Mwe plant was originally commissioned in 2014 and was co-financed by the EU to increase the security of the municipal heat supply; upgrade the local infrastructure and increase installed capacity. However, the plant subsequently experienced operational problems which compromised the boiler availability and stability, thereby reducing steam production capacity and overall efficiency.

DP was appointed as a technical consultant to work with the Energa team and identify the underlying issues. The study was followed by a public tender for a solution, and DP's proposal met the technical, economic and minimal installation downtime requirements. DP's solution involved reconstruction of key components of the plant, effectively a full renovation.

#### Performance Requirements

Minimum main steam flow	75t/h
Main steam temperature	525°C
Main steam pressure	90 bar
Boiler efficiency	>90.6 %
Boiler availability	>92 %
Emission of NOx	<200 mg/m <sup>3</sup> n
Emission of SO <sub>2</sub>	<200 mg/m <sup>3</sup> n
Emission of dust	<20 mg/m <sup>3</sup> n

#### Design Data

Fuels	Straw pellet, wood chips
Nominal main steam flow	75t/h
Maximum steam flow	85t/h
Main steam temperature	525°C
Main steam pressure	92 bar
Thermal output	57.1MWth
Boiler efficiency	90.6 %
Emission of NOx	<200 mg/m <sup>3</sup> n
Emission of SO <sub>2</sub>	<200 mg/m <sup>3</sup> n
Emission of dust	<20 mg/m <sup>3</sup> n

## The Solution

- A complete exchange of the combustion system
  - Feeding system
  - Grate
  - Grate drive
  - Slag conveyor
- A modification of the boiler 2nd pass to increase the overall heating exchange surface by 25%
- Change of control system and software (DPAAC)

Work on the EPC project commenced in September 2017. In order to meet EU deadlines and regulations, the schedule required completion of the milestone tests by the end of 2018. This schedule was highly challenging but the tests were successfully completed on time, and the 24 month O&M period commenced in December 2020.



Source: Energa

## Performance



Source: Energa

The plant was originally designed as a 135,000 ton per year CHP facility operating on straw pellets. Prior to refurbishment, the plant was barely delivering 40 t/h, with weekly stoppages required. After renovation, the plant is operating at steam capacity of around 75t/h, is highly stable and with higher than contracted output levels. The plant is the largest source of heat and electricity in Elblag and fulfils approximately 80% of the district heating system requirement.

The implementation of complex projects such as Elblag showcases the strengths of DP's global execution model, which is unique in the industry. DP's organization structure and business systems are fundamental in the resourcing, knowledge sharing, and teamwork needed to complete such projects.

## Contact Us

DP has 7 offices around the world in 6 countries – China, Denmark, Poland, Thailand, UAE and UK.

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