PGE Górnotwo i Energetyka Konwencjonalna S.A.
Oddział Elektrociepłownia Lublin Wrotków
- short introduction

Marek Mazur
The PGE Capital Group is Poland’s largest energy sector company with respect to sales revenues and net profit. Thanks to the combination of its own fuel resources, power generation and distribution networks, PGE guarantees a safe and reliable power supply to over 5 million households, businesses and institutions.

- Total capacities installed in PGE CG: 12.77 GW (2015)
- Sales to end-users: 39.00 TWh (2015)
- Electricity generated by PGE CG: 55.58 TWh (2015)
- Number of electricity consumers served by sales companies of PGE CG: ca. 5.26 m (2015)
- Total length of power lines operated by PGE CG: 283,804 km (2015)
- Production of lignite in PGE CG mines: 49.40 m tons (2015)
Simplified ownership structure of PGE Group
Lublin district heating system

Heat generation:

- 67% of total system heat production
- 33% of total system heat production

Heat distribution & supply:

- Required thermal power: 585 MWt
- Total length of piping: 435 km
- Number of citizens using system heating 250,000.
**Natural Gas**

- **G**
- **GT**
- **RB**
- **ST**
- **G**

**Coal**

- **K-1**: 81 MW<sub>t</sub>
- **K-2**: 81 MW<sub>t</sub>
- **K-3**: 140 MW<sub>t</sub>
- **K-4**: 140 MW<sub>t</sub>

**GSU**

- **Electric power**: 231 MW<sub>e</sub>
- **Thermal power**: 185 MW<sub>t</sub>

**Electrical energy**

- Municipal Heating System
  - **National Power System**
    - ca. 1 300 GWh / a
  - **Municipal Heating System**
    - ca. 3 000 TJ / a

**Heat**

- **86 %**
- **14 %**

**Water boilers**

- Thermal power: 442 MW<sub>t</sub>
### CHP unit

<table>
<thead>
<tr>
<th>Unit</th>
<th>Type</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. CHP unit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas turbine</td>
<td>V94.2</td>
<td><strong>ANSALDO / LURGI, 2002</strong></td>
</tr>
<tr>
<td>Generator GT</td>
<td>WY21Z</td>
<td>ANSALDO Genua</td>
</tr>
<tr>
<td>Boiler</td>
<td></td>
<td>ANSALDO Genua</td>
</tr>
<tr>
<td>Steam turbine</td>
<td>SCSF</td>
<td>STANDARDKESSEL Duisburg</td>
</tr>
<tr>
<td>Generator ST</td>
<td>WX18Z</td>
<td>ANSALDO Genua</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ANSALDO Genua</td>
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</tbody>
</table>
### Coal fired boilers

<table>
<thead>
<tr>
<th>Unit</th>
<th>Type</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Boiler no 1</td>
<td>WP-70</td>
<td><strong>RAFAKO Racibórz, 1976</strong></td>
</tr>
<tr>
<td>2. Boiler no 2</td>
<td>WP-70</td>
<td><strong>RAFAKO Racibórz, 1976</strong></td>
</tr>
<tr>
<td>3. Boiler no 3</td>
<td>WP-120</td>
<td><strong>RAFAKO Racibórz, 1979</strong></td>
</tr>
<tr>
<td>4. Boiler no 4</td>
<td>WP-120</td>
<td><strong>RAFAKO Racibórz, 1986</strong></td>
</tr>
</tbody>
</table>
Operational data

Demand of thermal power in 2015

- **Power [MWt]**
- **Hours**

- **coal fired boilers**
- **GSU / CHP**
DeSOx & deNOx project

- Project design
- Feasibility study
- Decision on environmental conditions
- Turnkey contractor tender

**Improvements of coal fired boilers WP-70 no 1 and WP-70 no 2 in 2017-2018.**

- New pressure parts
- Selective non-catalytic NOx reduction installation (SNCR)
- Semi-dry desulfurization installation (FGD)

**Coal fired boilers WP-120 no 3 and WP-120 no 4 will be decommissioned in 2023.**
### Biomass Unit – Basic Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Straw</th>
<th>Wood Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>0% - 100%</td>
<td>0% - 50%</td>
</tr>
<tr>
<td>Fuel Flow (straw)</td>
<td>Mg/a</td>
<td>150-275</td>
</tr>
<tr>
<td>Availability</td>
<td>h/a</td>
<td>7,896</td>
</tr>
<tr>
<td>Boiler Efficiency</td>
<td>%</td>
<td>91,0</td>
</tr>
<tr>
<td>Steam Temperature</td>
<td>°C</td>
<td>540</td>
</tr>
<tr>
<td>Steam Pressure</td>
<td>bar</td>
<td>112</td>
</tr>
<tr>
<td>Generator Power</td>
<td>MW</td>
<td>29</td>
</tr>
<tr>
<td>Max. Thermal Power</td>
<td>MW_t</td>
<td>45,0</td>
</tr>
</tbody>
</table>

### Biomass Unit Project
- project design
- feasibility study
- environmental report

? decision on environmental conditions
Thank you for your attention

Dziękuję za uwagę