Experiences with the fuel gas heat recovery in Budapest Hungary

Prepared by dr. Albin ZSEBIK
based on the presentation Mr. Balázs KURUCZ
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Outline

- Background information
- Introduction
- Consumption analysis
- Cost and sensitivity analysis
- Conclusion
- Large quantity of hot flue gases is generated from Boilers. This waste heat could be recovered and loss minimized by heat exchangers.
- Condensing technology is going to be basic requirement for households.
- FŐTÁV’s strategic goal is long-term improvement in energy efficiency and increasing competitiveness of district heating.
- The application of this technology was a huge question for decades, but it was the unrealized at FŐTÁV.
The Location

District Rákoskeresztúr:

- 46 MW rated thermal input of boiler
- 36 MW peak heat demand
- 9 MW heat from cogeneration
- 100 heat substations
- 7,000 households
- 1 swimming-pool
THE INVESTMENT

Important indicators of the investment:

- Investment cost: ~HUF 92 million = ~MDL 6 million
- Expected payback time: ~4 years (without project aid)
- Increasing of the boiler efficiency with 4%
- Cooling of flue-gas: 120-130 °C » 60-70 °C (partial condensation)
- Maximal thermal power at water-side: 1,1 MW
- Contract date: September 2011.
- Beginning of the construction: October 2011.
- Start of the test operation: December 20, 2011.
<table>
<thead>
<tr>
<th>Results</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Σ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of recovered heat, GJ</td>
<td>250</td>
<td>7,558</td>
<td>6,223</td>
<td>4,859</td>
<td>18,890</td>
</tr>
<tr>
<td>Reduction of gas consumption, GJ</td>
<td>281</td>
<td>8,492</td>
<td>6,992</td>
<td>5,460</td>
<td>21,225</td>
</tr>
<tr>
<td>Reduction of gas consumption, Nm³</td>
<td>8,216</td>
<td>248,304</td>
<td>204,444</td>
<td>159,649</td>
<td>620,614</td>
</tr>
<tr>
<td>(\text{CO}_2)-emission reduction, t/a</td>
<td>16</td>
<td>476</td>
<td>392</td>
<td>306</td>
<td>1,191</td>
</tr>
</tbody>
</table>
The consumption is decreasing

The ratio of the cogenetation is constant

The payback period will be higher than initially planned (current ~5 years)
Relation between operation and beneficial:

- Failure of the economizer has not an effect on the service
- Maintenance and repairing on the „ground”
- The economizer can be operated from each boiler
- Adjusting of the remote control is flexible
- Thermal output is higher than was planed (1,1 MW » 1,4 MW)

Maintenance:

- Maintenance within a short period of time (1-2 days) because of the beneficial design, the service is unaffected by maintenance
- Own staff after the guarantee period – except servicing of the vent
Secure operation in guarantee period:

- Number of leakages and failures of beacon decreased.
- Corrosion on the surface of the vent – repaired in guarantee (2014.)
- Corrosion of the steel structure – repaired in guarantee 2014.)
THANK YOU FOR YOUR ATTENTION!