Possibilities of the use of solid biomass in Romania

German Chamber of Foreign Trade Romania
20th May 2014
Gábor Nemes
Klaus Seeger's engineering office is founded.

1979

1990
Foundation of the succession plan - Thomas Krause becomes a partner in the company.

1993
Seeger-Krause GbR becomes SEEGER ENGINEERING GmbH.

2000
Seeger Engineering GmbH becomes a public company: SEEGER ENGINEERING AG.

2003
Next step of the succession plan - Frank Huckschlag becomes a partner in the company.

2010
Well development - Kleinkauf GmbH becomes shareholder in the company.

Chairman of the board: Dipl.-Ing. Frank Huckschlag

Supervisory board: Dr. jur. Thomas Berg, Dr.-Ing. Bernd Krautkremer, Univ. Prof. Dr.-Ing. M. Norbert Fisch, Thomas Reimann, Prof. Dr.-Ing. em. Werner Kleinkauf, Dipl.-Ing. Klaus Seeger

Future
Growth and internationalization.
Our projects have many faces.

- Project Design
  - Establishing the Basis of the Project
  - Preliminary Design
  - Final Design
  - Permission Application
  - Execution Drawings
  - Preparation of Contract Award
  - Assisting Award Process
  - Project Supervision
  - Project Control and Documentation

- Concepts

- Project Development
  - Combined Heat and Power Plants
  - Biomass Heat Plants
  - Biofuel Production Plants
  - Local and District Heat Systems
  - Decentralized Energy Systems
  - HVAC Engineering
  - Raw Material and Fuel Preparation

- Plant operation

- Financial Management
SEEGER ENGINEERING AG world wide
You will find us here…
World energy demand until 2060

(Quelle: Shell)
Global vs. local

Centralised, conventional, fossil energy systems:

- Unidirectional flow of energy and financial resources (purchasing power)
- Less added value, ecologically disadvantageous
- Unequal and unfair distribution of wealth (for example Dubai) – negative social effects

Decentralised, renewable energy systems:

- Regional flow of energy and financial resources (local purchasing power)
- More added value, ecological advantage
- Equal and fair distribution of wealth - positive social effects
- Personal participation, stronger community
Circumstances in Romania
District heating density

Source: EUROHEAT
Circumstances in Romania
Forest areas

Source: AEBIOM
Circumstances in Romania
Feed-in tariff for electricity from biomass

Bandbreite der möglichen Vergütungssätze der untersuchten Staaten (2011)
„Ready for the market“ technologies - solid biomass based heat supply

Solid biomass based heat supply

Biomass CHP plant (combined heat and power plant)
- Water – steam cycle
  - 10 MW\textsubscript{th} – 40 MW\textsubscript{th}
  - 3 MW\textsubscript{el} – 20 MW\textsubscript{el}
- ORC cycle
  - 1 MW\textsubscript{th} – 12 MW\textsubscript{th}
  - 300 kW\textsubscript{el} – 2,5 MW\textsubscript{el}

Biomass heat plant (only heat production)
- 200 kW\textsubscript{th} – 20 MW\textsubscript{th}
“Ready for the market“ technologies - solid biofuel production

Solid biofuel production

Pellet production

- Standard pellets (quality requirement DIN, ÖNORM, EN)
- Industrial pellets (quality requirement by client)

Briquette production

- Standard briquettes (quality requirement DIN, ÖNORM, EN)
- Industrial briquettes (quality requirement by client)
Project flow sheet

- evaluate client’s requirements
- evaluate approaches
- realization of the project
- installation start up production

Optimization:
- Phase 1: 100%
- Phase 2: 50%
- Phase 3: 0%

- Level of influence regarding the production cost
- Cost for modifications regarding the optimization of the production

- Project development
- Idea / project draft of biomass heat plant
- Feasibility study
- Overall planning
- Approval procedure
- Phase of advertisement
- Production and delivery
- Assembling and commissioning
- Instruction of the operating personnel

Plant operation

Duration:
- 0 - 24 month
- 12 - 36 month
- 20 years
Reference example: biomass heating plant
Loburg (Germany)

Technical data
Combustion heat performance  1.8 MW
Boiler capacity           1.5 MW
Reference example: biomass heating plant
Eslohe (Germany)

Technical data
Combustion heat performance 1.5 MW
Boiler capacity 1.3 MW
Reference example: biomass CHP plant Kufstein (Austria)

<table>
<thead>
<tr>
<th>Technical data</th>
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<tbody>
<tr>
<td>Combustion heat performance</td>
<td>28.4 MW</td>
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<tr>
<td>Annual fuel demand</td>
<td>86,000 t/a</td>
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<tr>
<td>Electric power</td>
<td>6.5 MW</td>
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<td>District heat output</td>
<td>18 MW</td>
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</tbody>
</table>
Reference example: biomass CHP plant
Brunsbüttel (Germany)

Technical data
Combustion heat performance 29.6 MW
Steam capacity (66 bara, 485 °C) 33 t/h
Electric power 7.5 MW
Reference example: biomass CHP plant
Bad Arolsen (Germany)

Technical data
Combustion heat performance  20.5 MW
Steam capacity (66 bara, 485 °C)  22t/h
Electric power  4.9 MW
Reference example: biomass CHP plant
Dinslaken (Germany)

Technical data
Combustion heat performance 12.6 MW
Steam capacity (465 °C) 12 t/h
Electric power 2.6 MW
Reference example: biomass CHP plant
Neustrelitz (Germany)

Technical data
Combustion heat performance 29.3 MW
Electric power 7.5 MW
District heat output 17 MW
Reference example: biomass CHP plant
Salgótarján (Hungary)

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<td>Combustion heat performance</td>
<td>44 MW</td>
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<tr>
<td>Steam capacity (66 bara, 485 °C)</td>
<td>47 t/h</td>
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<td>Electric power</td>
<td>12.5 MW</td>
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<td>District heat output</td>
<td>24 MW</td>
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</table>
Reference example: biomass CHP plant
Kaposvár (Hungary)

Technical data
Combustion heat performance 38 MW
Steam capacity (66 bara, 485 °C) 40 t/h
Electric power 10.4 MW
District heat output 17 MW
Reference example: biomass CHP plant
Drobeta Turnu Severin (Romania)
Reference example: pellet production plant  
Baust Eslohe (Germany)

<table>
<thead>
<tr>
<th>Technical data</th>
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<tbody>
<tr>
<td>Dryer</td>
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<tr>
<td>Water evaporation</td>
<td>1.60 t/h</td>
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<tr>
<td>Heat capacity</td>
<td>1.8 MW</td>
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<td>Annual heat amount</td>
<td>14,400 MWh/a</td>
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<td>Wood chip drying</td>
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<tr>
<td>Water content</td>
<td>approx. 20%</td>
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<tr>
<td>Capacity</td>
<td>15,000 m³/a</td>
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<td>Pellet production</td>
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<tr>
<td>Capacity</td>
<td>2 – 2.5 t/h</td>
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<td>6 mm pellets</td>
<td>16,000 t/a</td>
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Reference example: pellet production plant
German pellets Wismar (Germany)

Technical data
Capacity 36 t/h
Annual amount 250,000 t/a
Number of pellet mills 8 pieces
Number of hammer mills 2 pieces
Storage capacity 10,500 t
Reference example: pellet production plant
German pellets Herbrechtingen (Germany)

Technical data
- Capacity: 36 t/h
- Annual amount: 250,000 t/a
- Number of pellet mills: 8 pieces
- Number of hammer mills: 2 pieces
- Storage capacity: 7,500 t
Thank you for your attention!

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