CORPORATE PRESENTATION

- Group
- Expertise
- Segments
- Fuel range
- Technology
- References
EXPERTS IN BIOMASS BOILER SYSTEMS

**Linka Energy**
Est. 1978 - 41 years of experience in biomass combustion
+3,500 biomass plants installed worldwide
50+ employees
➔ Engineering, Sales, Project Management, Construction, Production, Installation, Service and Administration

**Jernforsen Energy**
Est. 1984 - 35 years of experience in biomass combustion
+1,000 biomass plants installed worldwide
35+ employees
➔ Engineering, Sales, Project Management, Installation, Service and Administration
➔ In-house experts in control systems (automation)

+ 60% export
EXPERTISE

Linka Energy
Supply of fully automated quality biomass boiler systems – built on modular, scalable and patented unique technology
Product range btw. 100 kW - 15 MW\(^{th}\)
Hot water to steam, CHP
Supply of machinery to turnkey solutions
Speciality: dry and complex biomass waste fuels

Jernforsen Energy
Supply of fully automated quality biomass boiler systems – designed uniquely to the customer requirements
High performance standards, strong devotion and knowhow ensures high quality delivery in all plants
Product range btw. 2 MW – 35 MW\(^{th}\)
Hot water to steam, CHP
Supply of machinery to turnkey solutions
Speciality: wet and complex fuels, waste wood, RDF/SRF
SEGMENTS

District heating
Central heating supply for residential areas.

Industry
Dairies, coffee industry, military camps, etc.

Wood industries
Saw mills, pellet production, paper industry, kitchen manufacturers, etc.

Agriculture
Poultry farms, pig farms, estates, nurseries, etc.

Institutions
Schools, dormitories, campsites, etc.
A broad range of waste products can be used for fuel in a Linka Group boiler system.

Turn your biowaste into a heat and power resource through our systems.
Linka’s boilers are developed from our own design, based on 40 years of experience

► In close collaboration with our Danish boiler supplier
► Efficient and reliable fire extinguishing system to prevent backfire
► Boilers are prepared for installation of SNCR system, to reduce NOx emissions by adding chemicals during the combustion process.

World patented combustion technology

► Ensures total combustion of the fuel and minimal development of clinker
Combustion system with low emissions

→ Due to sizeable grates, the development of our air system combined with a long combustion time.

Moving grate system - grates are controlled by a forward movement.

Final combustion of the ash prior to being transported to the ash container.
Pre-manufactured boiler plant

→ The boiler system is delivered as ”plug and play” including feeding- and de-ashing systems.

Turnkey solution - delivered directly on site

→ Operational soon hereafter

Mobile plants are built from 250 kW - 5,000 MW.
2MW STEAM - SWEDEN
Designed to handle the stringent requirements and extreme fuel qualities that may occur

→ When burning waste materials the boiler and economizer is combined. Tiles are mounted inside the boiler to maintain the high temperatures.

The flue gas' retention time inside the combustion chamber is min. 2 seconds at 850°C.

→ Ensures burnout of toxic content
→ Complies with IED directive (EU reg.)

By burning waste materials like RDF, SRF and waste wood we exploit our resources SUSTAINABLY and reduce landfill.
Combustion system with low emissions

- Due to sizeable grates, the development of our air system combined with a prolonged combustion time (+2 sec. @ 850° C)
- Supporting burner to ensure temperature level
- Water tube boiler to ensure durability

Moving grate system – each grate bar row moves individually and is designed for waste products (waste grate system)

Final combustion of the ash prior to being transported to the ash container
REFERENCES

A small selection of our projects.
Main data:
Turnkey delivery, commissioned in 2013
Staged combustion principle
27MW\textsuperscript{th}, 79 Bar g, 500\textdegree{}C
System supports
\begin{itemize}
  \item Hot water for district heating
  \item Process steam
  \item Power production 7MWel
  \item Using waste wood as fuel – previously also mixed with plastics
\end{itemize}
Small scale waste incineration system

The delivery content technical equipment from fuel storage to chimney:

Steam system, 40 bar (o) – 6,5t/h

CHP ready

Fuel handling, IED-combustion, steam boiler, SNCR system for de-Nox, bag filter with additive (SO2 control), steam system and control system
Aneby, Sweden

Mobile boiler system with 4 x 3 MW boilers as containerized solutions. Feeding system includes 2 silos and 2 wood chip pits.

- Estimated payback time: 4 years
- Savings on district heating: 8%
- Efficiency: Up to 91.9%
Bardufoss, Norway
4.3 MW wood chips system for Norwegian military base, installed in 2016. Fuel is fed from a walking floor system.

- Fifth Linka system for the Norwegian Defence
- Designed for burning wood chips with up to 40% water
- Burns wood chips every year
Holbæk, Denmark
4.5 MW turn-key straw system, built in 2013. Scope of supply included a straw cutter, filter and storage tank.

- **5-pass boiler** for more efficient use of the heat
- Efficiency: **93.4%**
- Savings on straw: **10%**
Hjallerup, Denmark
3 MW turn-key straw system with an automated crane system and TWIN shredder.

- String remover is installed for higher automation
- Efficiency: 93.17%
- Customer savings on heat: 30 DKK/MWh
## References on demand

<table>
<thead>
<tr>
<th>Opført</th>
<th>MW</th>
<th>Kunde</th>
<th>Brændsel</th>
<th>Land</th>
<th>Projektnr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>2,0</td>
<td>Danish Agro - Skamby</td>
<td>Kornafrens</td>
<td>Danmark</td>
<td>32231</td>
</tr>
<tr>
<td>2019</td>
<td>3,2</td>
<td>Banak - Lakselv</td>
<td>Flis</td>
<td>Norge</td>
<td>32226</td>
</tr>
<tr>
<td>2019</td>
<td>2,0</td>
<td>Porsangmoen</td>
<td>Flis</td>
<td>Norge</td>
<td>32225</td>
</tr>
<tr>
<td>2018</td>
<td>4,0</td>
<td>Graphite Resources</td>
<td>RDF</td>
<td>UK</td>
<td>32219</td>
</tr>
<tr>
<td>2018</td>
<td>4,0</td>
<td>S J Sleath - rebuild</td>
<td>Affaldstræ</td>
<td>UK</td>
<td>32210</td>
</tr>
<tr>
<td>2018</td>
<td>2,0</td>
<td>Ward</td>
<td>Affaldstræ</td>
<td>UK</td>
<td>32206</td>
</tr>
<tr>
<td>2018</td>
<td>2,0</td>
<td>Gjerlev Fjernvarme</td>
<td>Halm/flis</td>
<td>Danmark</td>
<td>32214</td>
</tr>
<tr>
<td>2017</td>
<td>2,0</td>
<td>Grønhøj Biogas</td>
<td>Flis</td>
<td>Danmark</td>
<td>32158</td>
</tr>
<tr>
<td>2016</td>
<td>5,0</td>
<td>Danspin - Sindi Lanka (damp)</td>
<td>Pellets</td>
<td>Estland</td>
<td>32057</td>
</tr>
<tr>
<td>2015</td>
<td>3,0</td>
<td>Bioenergy - Tine Mejeri (damp)</td>
<td>Flis</td>
<td>Norge</td>
<td>32010</td>
</tr>
<tr>
<td>2014</td>
<td>4,0</td>
<td>Bioenergy - Skioll (norsk militærlejr)</td>
<td>Flis</td>
<td>Norge</td>
<td>31955</td>
</tr>
<tr>
<td>2014</td>
<td>5,0</td>
<td>Klm Energi - Arvidsjaur</td>
<td>Pellets</td>
<td>Sverige</td>
<td>31938</td>
</tr>
<tr>
<td>2014</td>
<td>4 x 3,0</td>
<td>KLM Energi - AMAQ</td>
<td>Pellets</td>
<td>Sverige</td>
<td>31919</td>
</tr>
<tr>
<td>2014</td>
<td>3,0</td>
<td>Jordberga Gårdf AB</td>
<td>Halm</td>
<td>Sverige</td>
<td>31912</td>
</tr>
<tr>
<td>2014</td>
<td>3,0</td>
<td>KLM Energi - Västerbotten</td>
<td>Pellets</td>
<td>Sverige</td>
<td>31909</td>
</tr>
<tr>
<td>2013</td>
<td>5,0</td>
<td>Aabenraa-Rødekro Fjernvarme - GI. Stubbæk</td>
<td>Pellets</td>
<td>Danmark</td>
<td>31903</td>
</tr>
<tr>
<td>2013</td>
<td>5,0</td>
<td>Aabenraa-Rødekro Fjernvarme - Rådsmandslokkener</td>
<td>Pellets</td>
<td>Danmark</td>
<td>31902</td>
</tr>
<tr>
<td>2013</td>
<td>6,5</td>
<td>Lollands Forsyning - Drammenvej</td>
<td>Halm</td>
<td>Danmark</td>
<td>31889</td>
</tr>
<tr>
<td>2017</td>
<td>3,0</td>
<td>Ølgod Fjernvarme</td>
<td>Flis</td>
<td>Danmark</td>
<td>31877</td>
</tr>
<tr>
<td>2013</td>
<td>3,0</td>
<td>Bioenergy - Høybuktmoen (norsk militærlejr)</td>
<td>Pellets</td>
<td>Norge</td>
<td>31870</td>
</tr>
<tr>
<td>2013</td>
<td>3,0</td>
<td>Danstoker</td>
<td>Pellets</td>
<td>Norge</td>
<td>31860</td>
</tr>
<tr>
<td>2013</td>
<td>3,0</td>
<td>Klm Energi - Norrsjø</td>
<td>Pellets</td>
<td>Sverige</td>
<td>31858</td>
</tr>
<tr>
<td>2013</td>
<td>4,0</td>
<td>Bioenergy A/S - Avantor</td>
<td>Pellets</td>
<td>Norge</td>
<td>31849</td>
</tr>
<tr>
<td>2013</td>
<td>4,5</td>
<td>St. Merløse Halmvarmeværk</td>
<td>Halm</td>
<td>Danmark</td>
<td>31829</td>
</tr>
<tr>
<td>Client</td>
<td>City</td>
<td>Country</td>
<td>Year</td>
<td>Capacity (kW)</td>
<td>Type of plant</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------</td>
<td>-------------</td>
<td>------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Moelven Sokna AS</td>
<td>Sokna</td>
<td>Norway</td>
<td>2019</td>
<td>2x12,000</td>
<td>Pellet plant</td>
</tr>
<tr>
<td>Hälsandens Sågverk AB</td>
<td>Dalstorp</td>
<td>Sweden</td>
<td>2018</td>
<td>4,000</td>
<td>Sawmill</td>
</tr>
<tr>
<td>Derome Timber AB</td>
<td>Derome</td>
<td>Sweden</td>
<td>2018</td>
<td></td>
<td>Sawmill</td>
</tr>
<tr>
<td>E.On Lokala Energlosningar AB</td>
<td>Hasselfors</td>
<td>Sweden</td>
<td>2018</td>
<td></td>
<td>Sawmill</td>
</tr>
<tr>
<td>VIDA Hästveda</td>
<td>Hästveda</td>
<td>Sweden</td>
<td>2018</td>
<td></td>
<td>Sawmill</td>
</tr>
<tr>
<td>Trelleborgs fjärrvärme AB</td>
<td>Trelleborg</td>
<td>Sweden</td>
<td>2018</td>
<td>District Heating</td>
<td>Flue gas cleaning</td>
</tr>
<tr>
<td>Mariehamn Bioenergi AB</td>
<td>Mariehamn</td>
<td>Finland</td>
<td>2018</td>
<td>District Heating</td>
<td>Flue gas cleaning</td>
</tr>
<tr>
<td>Ronneby Energi AB</td>
<td>Ronneby</td>
<td>Sweden</td>
<td>2017</td>
<td>6,000</td>
<td>District Heating</td>
</tr>
<tr>
<td>ATA Timber AB</td>
<td>Sandsjöfors</td>
<td>Sweden</td>
<td>2017</td>
<td>6,000</td>
<td>Sawmill</td>
</tr>
<tr>
<td>Bergs Timber AB</td>
<td>Mörlunda</td>
<td>Sweden</td>
<td>2017</td>
<td>6,000</td>
<td>Sawmill</td>
</tr>
<tr>
<td>Gislaved Energi AB</td>
<td>Gislaved</td>
<td>Sweden</td>
<td>2017</td>
<td>7,000</td>
<td>District Heating</td>
</tr>
<tr>
<td>Alingsås Energi AB</td>
<td>Alingsås</td>
<td>Sweden</td>
<td>2017</td>
<td>14,000</td>
<td>District Heating</td>
</tr>
<tr>
<td>Argent Energy</td>
<td>Ellesmere Port</td>
<td>UK</td>
<td>2017</td>
<td>4,000</td>
<td>Process Industry</td>
</tr>
<tr>
<td>Solöf Bioenergi AB</td>
<td>Strömsnasbruk</td>
<td>Sweden</td>
<td>2016</td>
<td>4,000</td>
<td>District Heating</td>
</tr>
<tr>
<td>Raisio OY</td>
<td>Åbo</td>
<td>Finland</td>
<td>2016</td>
<td>9,500</td>
<td>District Heating</td>
</tr>
<tr>
<td>Eidsiva Bioenergi AS</td>
<td>Elverum</td>
<td>Norway</td>
<td>2015</td>
<td>10,000</td>
<td>District Heating</td>
</tr>
<tr>
<td>University of St Andrews</td>
<td>St Andrews</td>
<td>UK</td>
<td>2015</td>
<td>6,500</td>
<td>District Heating</td>
</tr>
<tr>
<td>Höglunds Såg och Hyvleri AB</td>
<td>Domojo</td>
<td>Sweden</td>
<td>2015</td>
<td>5,000</td>
<td>Sawmill</td>
</tr>
<tr>
<td>VIDA Borgstena AB</td>
<td>Borgstena</td>
<td>Sweden</td>
<td>2015</td>
<td>12,000</td>
<td>Sawmill</td>
</tr>
<tr>
<td>ATA Timber AB</td>
<td>Mheda</td>
<td>Sweden</td>
<td>2015</td>
<td>5,000</td>
<td>Sawmill</td>
</tr>
<tr>
<td>E.On Värme Sverige AB</td>
<td>Arninge</td>
<td>Sweden</td>
<td>2015</td>
<td>16,000</td>
<td>District Heating</td>
</tr>
</tbody>
</table>
Thank you for your attention!