Driving the market through standards

Fuel
• early standardisation of pellet fuels: a important reason for Austria's pioneering role
• highly standardised fuel allows for high efficiency and low emission combustion technologies were developed based on and optimised for the standardised fuel
• warranty of the boilers only if standardised pellets are used
• European pellet fuel standard

Equipment standards (Upper Austria)
• efficiency and emission standards
• regularly up-dated to drive innovation
Driving the market through standards: Fuels & Equipment

Example: Emissions & efficiency of biomass boilers: results from 1,000+ boiler tests

Efficiency factor of tested biomass boilers

CO emissions of tested biomass boilers

Source: FJ-BLT Wieselburg; Bioenergy 2020+
Raising awareness & skills

• end consumers, e.g.:
  - costs (higher investment costs, lower fuel costs, public support)
  - where to install (storage), how to operate
  - fuel supply (availability, price stability)

• installers, building professionals, e.g.
  - technical know-how to plan & install & service, storage solutions

• stakeholders, media, authorities e.g.
  - sustainability of biomass
  - costs
Biomass heating in Upper Austria
clean, efficient, fully automated

- 15% of total energy consumption
- 41,000 biomass heating installations
  (20,000 automatic pellet heating systems)
- 310 biomass district heating plants
# Biomass heating technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Automatic pellet heating</th>
<th>Modern firewood boilers</th>
<th>Automatic wood chip boilers</th>
<th>District heating</th>
<th>Combined heat &amp; power stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>Pellets</td>
<td>Firewood</td>
<td>Wood chips</td>
<td>Wood chips</td>
<td>Whole trees</td>
</tr>
<tr>
<td>Typical installed capacity</td>
<td>5-15 kW</td>
<td>20-40 kW</td>
<td>50-150 kW</td>
<td>100 kW-3 MW</td>
<td>&gt;1 MW &lt;sub&gt;el&lt;/sub&gt;, &gt; 10 MW &lt;sub&gt;th&lt;/sub&gt;</td>
</tr>
<tr>
<td>Users, Customers</td>
<td>Single-family homes</td>
<td>Farm buildings</td>
<td>Public &amp; commercial buildings</td>
<td>All buildings</td>
<td>All buildings</td>
</tr>
<tr>
<td>Fuel supply</td>
<td>Bulk delivery</td>
<td>Usually from own forest</td>
<td>Often by local farmers-forest owners</td>
<td>Cooperative members &amp; form sawmills</td>
<td>Farmers &amp; other channels</td>
</tr>
</tbody>
</table>
Product and service innovation

- **Home-scale pellet CHP plants**
  - Ökofen
  - Pellematic
  - Smart-e

- **Advanced wood-chip boilers**
  - ETA 340 Hack

- **Boilers for low energy/passive buildings**
  - Guntamatic THERM wall-mounted

- **Industrial biomass heating systems**
  - Fröling Lambdamat

- **Innovative stoves**
  - Rika Evo Aqua

- Integrated de-dusting, monitored combustion, improved fuel feed
- 2-7 kW
- Also: Guntamatic Pro (up to 1000 kW)
- Hydronic heat distribution, high-efficiency
## Product and service innovation

<table>
<thead>
<tr>
<th></th>
<th>Modern log wood boilers</th>
<th>Boiler integrated into the buffer storage</th>
<th>Dual fuel boilers and stoves</th>
<th>New solutions for pellet storage</th>
<th>Advanced transport systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hargassner MV</td>
<td>Solarfocus octoplus</td>
<td>Fröling SP-Dual</td>
<td>Ökofen textile tank Flexilo</td>
<td>Windhager &quot;1 probe&quot;</td>
<td></td>
</tr>
<tr>
<td>logwood pieces up to 1 meter</td>
<td>also Fröling P1, ÖkoFEN Pellematic Smart</td>
<td>also Rika Induo</td>
<td></td>
<td>also Solarfocus probe switching device</td>
<td></td>
</tr>
</tbody>
</table>

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**Image:**
- Modern log wood boilers: Hargassner MV with images of logwood pieces up to 1 meter.
- Boiler integrated into the buffer storage: Solarfocus octoplus with images of integrated systems.
- Dual fuel boilers and stoves: Fröling SP-Dual with images of dual fuel systems.
- New solutions for pellet storage: Ökofen textile tank Flexilo with images of pellet storage solutions.
- Advanced transport systems: Windhager "1 probe" with images of advanced transport systems.

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**Logo:**
- OÖenergie Cluster (green and white logo)
Product and service innovation

<table>
<thead>
<tr>
<th>User-friendly control systems (e.g. apps for smartphones)</th>
<th>Reduced electricity consumption</th>
<th>Air collectors for wood chip drying</th>
<th>Heat contracting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilles</td>
<td>Hargassner ECO HK 20 - 55 kW</td>
<td>CONA patented solar air collector</td>
<td>Aigner Energie Contracting</td>
</tr>
<tr>
<td>All other boiler and stove manufacturers</td>
<td>75% reduction in el. consumption (ignition, fuel feed)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How to get a biomass heating market started

• take a "package approach" (regulatory, financial & training/awareness programmes)

• communicate the benefits (not "just" climate protection)

• allow for a learning curve across the value chain (demonstration programmes & pellets campaigns & training)

• identify most promising markets (often new construction)

• understand progress & communicate success & take corrective action (market intelligence)

• take a longer term perspective
Report & video available at

www.oec-en.at
International Training Seminar on Biomass Heating
9 – 12 September 2013, Linz/Austria

- 3-day training seminar with technical training sessions & site-visits
- biomass heating technologies & market development (wood pellets & wood chips)
- in English
- www.oec-en.at

Scholarships available

- The latest on policy, market & technology trends, innovation, sustainability
- World Pellet Business & Technology Forum
- Pellet Networking Platform
- Pellet News Worldwide
- Biomass next - conference for young researchers
- Site-visits
- Trade show: 100+ biomass-related exhibitors
- held in Wels/Austria

Get involved:
Call for Papers, Projects & Speakers
Deadline: October 10, 2013
www.wsed.at
Economic impact of biomass heating in Upper Austria

- Total employment in biomass heating: 4,500 jobs
- Annual revenue of biomass boiler/stove industry in Upper Austria (production, sales, installation): 750 million US$
- Annual investments in new biomass heating systems: 150 million US$
- Annual sales of biomass heating fuels: 130 million US$
The end of the oil-era?

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>oil-heating</td>
<td>36%</td>
<td>&lt;0.01%</td>
</tr>
<tr>
<td>renewable energy</td>
<td></td>
<td>&gt;85%</td>
</tr>
<tr>
<td>technologies</td>
<td>32%</td>
<td></td>
</tr>
</tbody>
</table>

OEC CLUSTER
Thank you very much for your attention!

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