Torrefaction of biomass
ANDRITZ torrefaction technologies
## ANDRITZ Torrefaction technologies

### Two main technology platforms

<table>
<thead>
<tr>
<th>Large plants: 700,000 t/a or more per line</th>
<th>Small / medium plants: 50,000 – 250,000 t/a</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANDRITZ/ECN</strong> Torrefaction design</td>
<td><strong>ANDRITZ ACB Torrefaction design</strong>*</td>
</tr>
<tr>
<td>Industrial demo plant (1 t/h) in Denmark started up in fall 2012</td>
<td>Industrial demo plant (1 t/h) in Austria in operation from 4th quarter 2011.</td>
</tr>
<tr>
<td>Pressurized, moving bed reactor</td>
<td>Rotating, indirectly heated drum reactor</td>
</tr>
<tr>
<td>ANDRITZ/DTI** Pelleting plant</td>
<td>Briquetting plant</td>
</tr>
<tr>
<td><strong>Key features:</strong></td>
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</tr>
<tr>
<td>Scale up to huge capacities possible</td>
<td>Simple process concept specially developed for decentralized plants</td>
</tr>
<tr>
<td>(experience from Pulp &amp; Paper)</td>
<td>Flexibility in feed material</td>
</tr>
<tr>
<td>Feed material: Wood chips/forest residuals</td>
<td></td>
</tr>
</tbody>
</table>

*ACB Process is developed by the ACB Entwicklungs GmbH with support from the ACB consortium consisting of

**ECN = Energy Center of the Netherlands**
**DTI = Danish Technological Institute**
Torrefaction of biomass
Showcase

Sdr.Stenderup, Denmark

Highlight

ANDRITZ Torrefaction technology demonstration plant
for large plants: 700,000 t/a or more per line

ANDRITZ/ECN torrefaction design
ANDRITZ/DTI pelleting plant

- Pressurized, moving bed reactor
- Scale up to huge capacities possible
  - Experience from pulp & paper
- Feed material:
  - Wood chips
  - Forest residuals
**Torrefaction of biomass**

**Showcase**

**Frohnleiten, Austria**

**Highlight**

ANDRITZ Torrefaction technology demonstration plant for small / medium plants: 50,000 - 250,000 t/a

ANDRITZ ACB Torrefaction design

Briquetting plant

- Rotating, indirectly heated drum reactor
- Simple process concept specially developed for decentralized plants
- Flexibility in feed material