Small-and-medium-scale woody-biomass-boiler technology for thermal usage: Experiences in Japan

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Development of Nolting boilers in Hokkaido

Hotel Meguma (Wakkanai-city)
LCS-RV Type (Moving Bed)
Output: 450 kW  Fuel: Chip
Set-up: 2011

Kyowa-spa (Aibetsu-town)
LCS-RV Type (Moving Bed)
Output: 450 kW  Fuel: Chip
Set-up: 2011

B&G Marine Center (Bihoro-town)
NRF-RU Type (Underfeed)
Output: 350 kW  Fuel: Pellet
Set-up: 2010

Teshiogawa-Spa (Otoineppu-Village)
LCS-RV Type (Moving Bed)
Output: 350 kW  Fuel: Chip
Set-up: 2013

COOP Sapporo Store (Sapporo-city)
LCS-RU Type (Underfeed)
Output: 350 kW  Fuel: Pellet
Set-up: 2012

Teine Junior High School (Sapporo-city)
LCS-RU Type (Underfeed)
Output: 350 kW  Fuel: Pellet
Set-up: 2012

Tate Ikoi-no-ie (Assabu-town)
NRF-RU Type (Underfeed)
Output: 150 kW  Fuel: Chip
Set-up: 2009

Toge-no-yu (Bihoro-town)
NRF-RU Type (Underfeed)
Output: 720 kW  Fuel: Chip
Set-up: 2010

Yu-no-sawa spa
(Simupappu-Village)
UV-200 Type
Output: 200 kW  Fuel: Firewood
Set-up: 2013
## Nolting-boiler-type set-up in Hokkaido and characters

### Efficiency 90% / fully-automatic / Sixty-five-years time-proven
World market share 20-thousand boilers / All products made-to-order
Licensed assembling, manufacturing and selling

<table>
<thead>
<tr>
<th>Type</th>
<th>LCS-RU</th>
<th>LCS-RV</th>
<th>NRF</th>
<th>VRF</th>
<th>UV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity (kW)</td>
<td>150, 350 One of each type</td>
<td>350, 450 Two of each type</td>
<td>350, 720 One of each type</td>
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<td>350, 720 One of each type</td>
</tr>
<tr>
<td>Sum</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Character</td>
<td>Underfeed</td>
<td>Moving bed</td>
<td>Underfeed</td>
<td>Moving bed</td>
<td>Firewood</td>
</tr>
<tr>
<td>Fuel</td>
<td>Pellet, Chip</td>
<td>Chip</td>
<td>Chp</td>
<td>Chip</td>
<td>Firewood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High water content</td>
<td></td>
<td>High water content</td>
<td></td>
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</tbody>
</table>
Tasks and overcoming-direction of woody-biomass-boilers

- Creation of local cycling structure based on regional industrialization -

1. Quality and stable supply of fuels
   Quality: size < 50mm, water content < 40%
   - Construction of woody-chip fuel-factory
     * Creation of local cycling structure: from upper stream (raw material procurement) to down stream (thermal usage)
     * Fuel-factory becomes central to creation of local cycling structure.

2. Offering of high-performance boilers
   Efficiency > 90%
   - Licensed assembling, manufacturing and selling of Nolting boilers
     * Why did we decide to choose “licensed assembling, manufacturing”?*
       a) “To make regional area energetic” —— to settle in regional area
          —— to create jobs in regional area —— to establish regional industries
          Cannot do through “import and sell”
       b) Acquisition of technological know-how and sophistication of technological level —— cannot accomplish them unless assembling and manufacturing

Now, we reached a stage of offering high-performance boiler.
“Stable supply of fuels” remains as a big issue to be solved.
Vision of construction of woody-biomass fuel-factory in Hokkaido

- Construction of fuel-chip factory
- Model project of Ministry of Internal Affairs and Communications
- Demonstration of local economic cycling

Ashibetsu-city

- Employment creation effect: 139 peoples

Ashoro-town

- Construction of fuel-pellet factory
- Employment creation effect: 139 peoples

Bihoro-town

- 2 Nolting boilers simultaneous introduction
- Stabilization of pellet production and reduction of town finance
Woody-biomass fuel-factory realizes local economic cycling

* Amount of woody-biomass fuel is huge quantities for alternating heating oil demands!
* Employment creation effect: 100 thousand peoples in Hokkaido and 2 million peoples over the country based on the case of Ashoro-town (Hokkaido).

<table>
<thead>
<tr>
<th>Expected factory</th>
<th>Possible factories in Hokkaido</th>
<th>Possible factories over the country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass-fuel (wooden chip) production factory</td>
<td>More than one in each local community</td>
<td>- 750 factories</td>
</tr>
<tr>
<td></td>
<td>- 180 factories in Hokkaido</td>
<td></td>
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<td></td>
<td>- 180 factories in Hokkaido</td>
<td></td>
</tr>
<tr>
<td>Maintenance and repair workshop</td>
<td>More than one in each local community</td>
<td>- 1,700 factories</td>
</tr>
<tr>
<td></td>
<td>- 180 factories in Hokkaido</td>
<td></td>
</tr>
<tr>
<td>Components and parts factory</td>
<td>Reconstruction of existing small factory in local community</td>
<td></td>
</tr>
<tr>
<td>Technical training school</td>
<td>Establishment of Natural energy school in each local community</td>
<td></td>
</tr>
</tbody>
</table>

Join in assembling, manufacturing and selling of Nolting boilers.
Join in construction of fuel factory in every community.