Welcome to ABioNova
MAKE IT HAPPEN !!!

CATCH THE FISH !!!
Renewable Energy…

…does not give any addition of carbon dioxide at combustion.
Swedish Fuel Sources

Share of fuel usage of total in Sweden

- **Biomass**, 115.6 TWH; 31.7%
- **Oil**, 112.2 TWH; 30.8%
- **Hydro power**, 61.3 TWH; 16.9%
- **Nuclear**, 46.9 TWH; 12.9%
- **Wind power**, 2.4 TWH; 0.7%
- **Heatpumps**, 3.4 TWH; 0.9%
- **Natural gas**, 10.5 TWH, 2.9%
- **Coal**, 12.0 TWH, 3.3%
Economic Impact

With usage of oil and gas 3-5% of the cost stays in the local economy.

With usage of local biomass fuels 75-80% of the cost stays in the local economy.
BIOMASS A BETTER WAY TO HEAT

Scott Nichols
Cherry School, MN

HeatCabin in Cherry MN 785.000 Btu for a school.
Babbit School, MN

Babbit School in Minnesota
Low pressure steam 1,7 MMBTU
Babbit / Cherry projects

• Babbit / Cherry school, first contact 2009
• Approved grant for biomass 2009 $600,000
• Babbit / Cherry school, startup late 2013 & 2014
  • Extended grant 4 times
  • Downsized equipment 3 times
Midwest commercial projects since 2009

- Prairie Woods ELC, MN  2009
- Northwest Manufacturing, MN  2010
- Wolf Ridge ELC, MN  2011
- Babbit School, MN  2013
- Cherry School, MN  2013
- Northeast Regional CC, MN  2013
- Sunview Center, MN  2013

7 projects in 5 years
Average lead time 3 years !!!

How can we shorten the lead time?
Critical elements to make it happen and to shorten the lead time.

Grants

Engineering

Fuel supply
Only we can do it and make it happen!

Questions / discussion
Swedish market – District Heating

Share of fuel usage of total district heat production in Sweden 1970-2007
Swedish market

Tonnes of sold pellets to residential houses 1997-2007
What Is District Heating?

Thermal production in only one plant for the entire city
District Heating How It Works
District Heating

District Heating vs Small Scale District Heating

District Heating

Small Scale District Heating
## ABioNova Target Groups

<table>
<thead>
<tr>
<th>Small scale</th>
<th>Medium scale</th>
<th>Large scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 340.000 BTU</td>
<td>340.000-3.500.000 BTU</td>
<td>&gt; 3.5 MBTU</td>
</tr>
</tbody>
</table>

### ABioNova

- Schools
- Churches
- Hotels
- Town hall
- Resorts
- Small district heating
Biomass boiler with NovaReg control both from ABioNova
ABioNova HeatCabin with biomass boiler on the road!
ABioNova HeatCabin system description.
ABioNova HeatCabin

Nursing home in Hagfors 340,000 Btu.
ABioNova HeatCabin in Halmstad 1,020,000 Btu for 36 houses.
HeatCabin in Hjortkvarn 445,000 Btu for a school.
ABioNova HeatCabin environmental friendly.
ABioNova Biomass Boiler

Biofuel boiler in Stockholm 3.400.000 Btu for 200 apartments.
Delivery of fuel wood pellet
Small Scale DHP

Pellet DHP in Gislaved 17,000,000 Btu for a school, sport arena and community district heating.
Small Scale DHP 20 MMBTU
USA Potential

District Heating vs Small Scale District Heating

District Heating

Small Scale District Heating
USA Potential

With usage of oil and gas, 3-5% of the cost stays in the local economy. With usage of local biomass fuels, 75-80% of the cost stays in the local economy.
USA Potential – Wolf Ridge ELC
ABioNova
Per Carlsson / CEO
info@abionova.se - www.abionova.com