

EUROPEAN HEAT PUMP SUMMIT

POWERED BY CHILLVENTA

SYMPOSIUM + EXPO
NUREMBERG, 20–21.10.2015

Industrial | Commercial | Residential
Heating & Cooling | Components & Equipment

hp-summit.de

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**Title: Multi biomass energy driven
absorption heat pump in Hjorring, Denmark**

**EUROPEAN
HEAT PUMP
SUMMIT**

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BROAD Group is an enterprise based on the vision of unique technologies and the tenet of preserving life. All BROAD products and services are subversions of traditional industries, and are essentially optimizing human life and earth's environment.

BROAD Air Conditioning Co. Ltd. supplies non-electric central air conditioning powered by natural gas and waste heat with cooling, heating and hot water functions, and packaged water distribution system.

BROAD Energy Service Co. Ltd. provides investment, construction and operation of district combined cooling-heating-power (CCHP) projects, as well as design, operation and energy saving management with market mechanism.

BROAD Air Quality Co. Ltd. supplies clean fresh air systems that can filter PM2.5 by 99.9%, a complete series of air purifiers from commercial to domestic ones and wearables, and air quality monitors.

BROAD Sustainable Building Co. Ltd. provides factory-made sustainable buildings featuring 90% pre-fabrication, 5 times more energy efficiency, 100 times cleaner air as well as no collapse in 9- magnitude earthquake.

BROAD Group was established in 1988, headquartered in Changsha, China and has products in more than 80 countries [Link video](#)



Developing Milestones of BROAD Air Conditioning

- First direct-fired chiller manufactured in China (1992)
- World's first exhaust chiller which recovery the exhaust from gas turbine directly for the cooling (1999)
- World's first multi-energy chiller which can recovery exhaust and jacket water from gas engine simultaneously (2001)
- World's first exhaust fired heat pump (2009)
- World's biggest hot water driven heat pump. (2013)
- 25,000+ installations in 80 countries (2015)



BROAD Non-electric chiller/heat pump model from the 1st generation to 11th generation.



Heat Pump (R1) Heating Solution

Low Temp. Heat input:

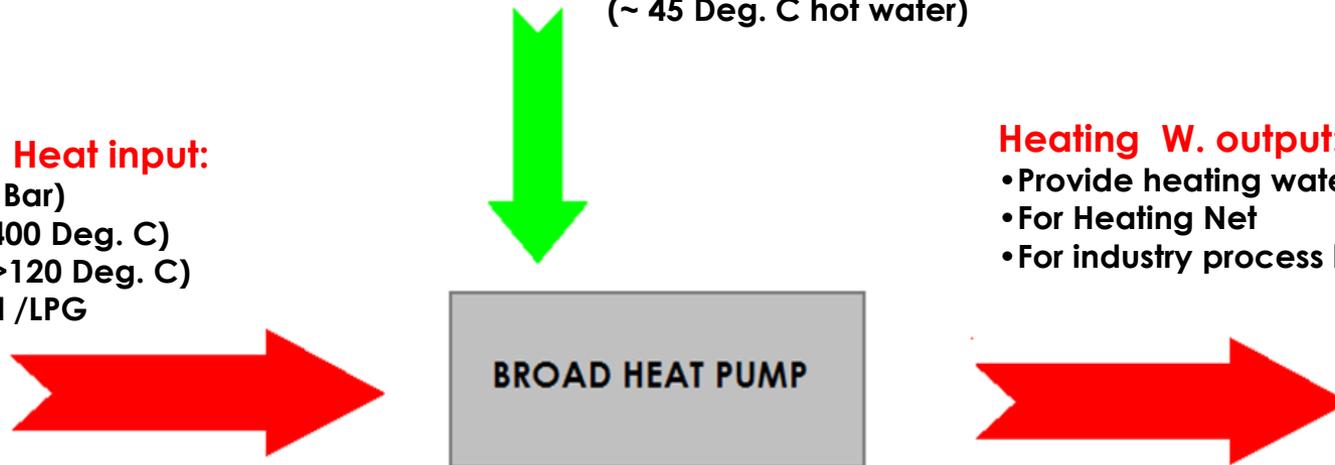
- Waste hot water from steam turbine condenser (~ 40 Deg. C hot water)
- Waste hot water from dyeing factory (~ 30 Deg. C hot water)
- Hot water from engine low temp jacket water (~ 45 Deg. C hot water)

High Temp. Heat input:

- Steam (3~7 Bar)
- Exhaust (>400 Deg. C)
- Hot water (>120 Deg. C)
- N.G./ Diesel /LPG

Heating W. output:

- Provide heating water (<85 Deg. C)
- For Heating Net
- For industry process heating



Heating efficiency > 170%

Increase heating capacity



Broad absorption heat pump in Hjørring, Denmark



The biggest biomass heat pump project in Europe.

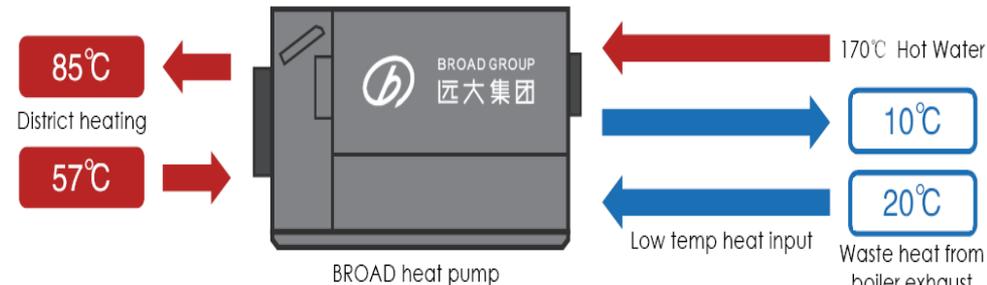


Factory witness test before shipment.

- **BROAD** heat pump recycles the waste heat from the flue gas of biomass boiler to provide district heating and lower the flue gas temp.
- Heating capacity 13,000 kW
- Heating efficiency 130%
- Cooling capacity 3,000 kW
- Payback period 3.0 years
- Yearly energy saving 697,800 m3 NG
- Yearly CO2 cutting 1,800 ton
- Equivalent of planting 98,000 trees

BROAD Hot Water Driven Heat Pump

Energy Efficiency: Heating + Cooling 160%





Broad absorption heat pump in Hjørring, Denmark

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Hjørring District Heating A.m.b.a. supplies electricity, heating and cooling to commercial industries and private homes in northern Jutland, Denmark. Hjørring District Heating aims for top reliability and low heating prices, and is amongst the 8% most inexpensive district heating suppliers nationwide. In April 2014 the world's biggest hot water fired absorption heat pump from BROAD Air Conditioning has been finished the commissioning in Hjørring District Heating plant in Denmark.



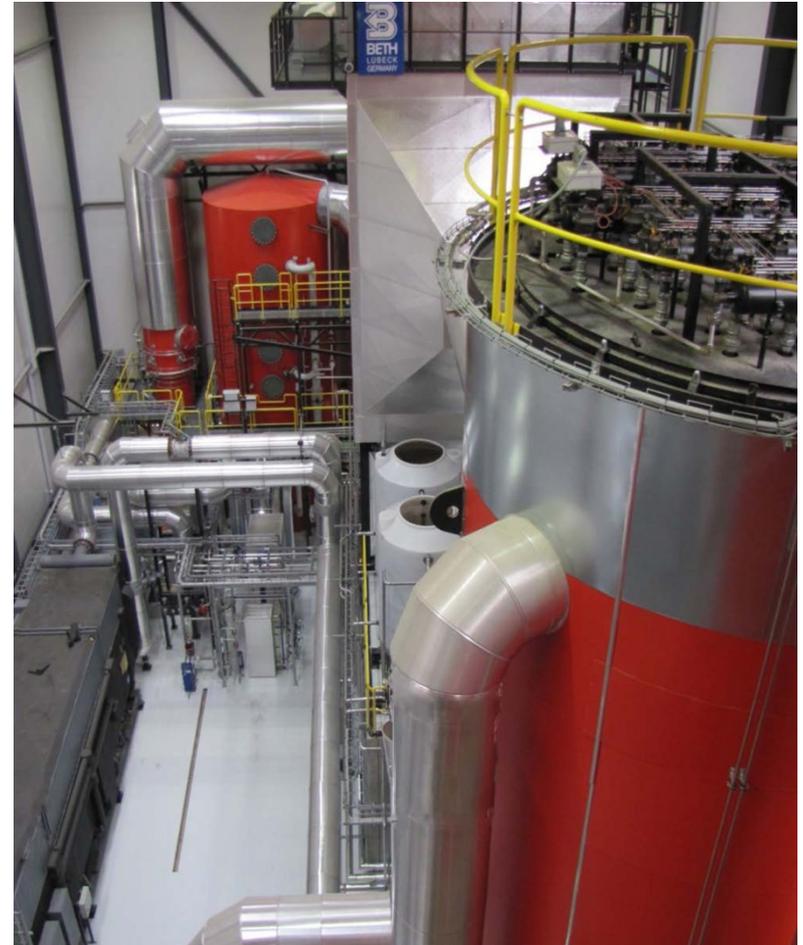
Hjørring heat pump installation at job site.





Broad absorption heat pump in Hjørring, Denmark

BROAD heat pump recycles the waste heat from the flue gas of the biomass boiler (as the low temperature heat source water to the heat pump) and provide 13 MW high temperature heating water to the district heating network. The advantage of this absorption heat pump system is recycle the waste heat from the flue gas of the biomass boiler, decrease the flue gas temperature to environment, which can save energy and also help to keep the emissions at the lowest level. This is the first absorption heat pump which can achieve the high temperature difference (75 °C) between chilled water and cooling water cycle. This is one of the typical cases to utilize the absorption heat pump in district heating and improve the final efficiency of the whole heating system.



The biomass boiler in job site



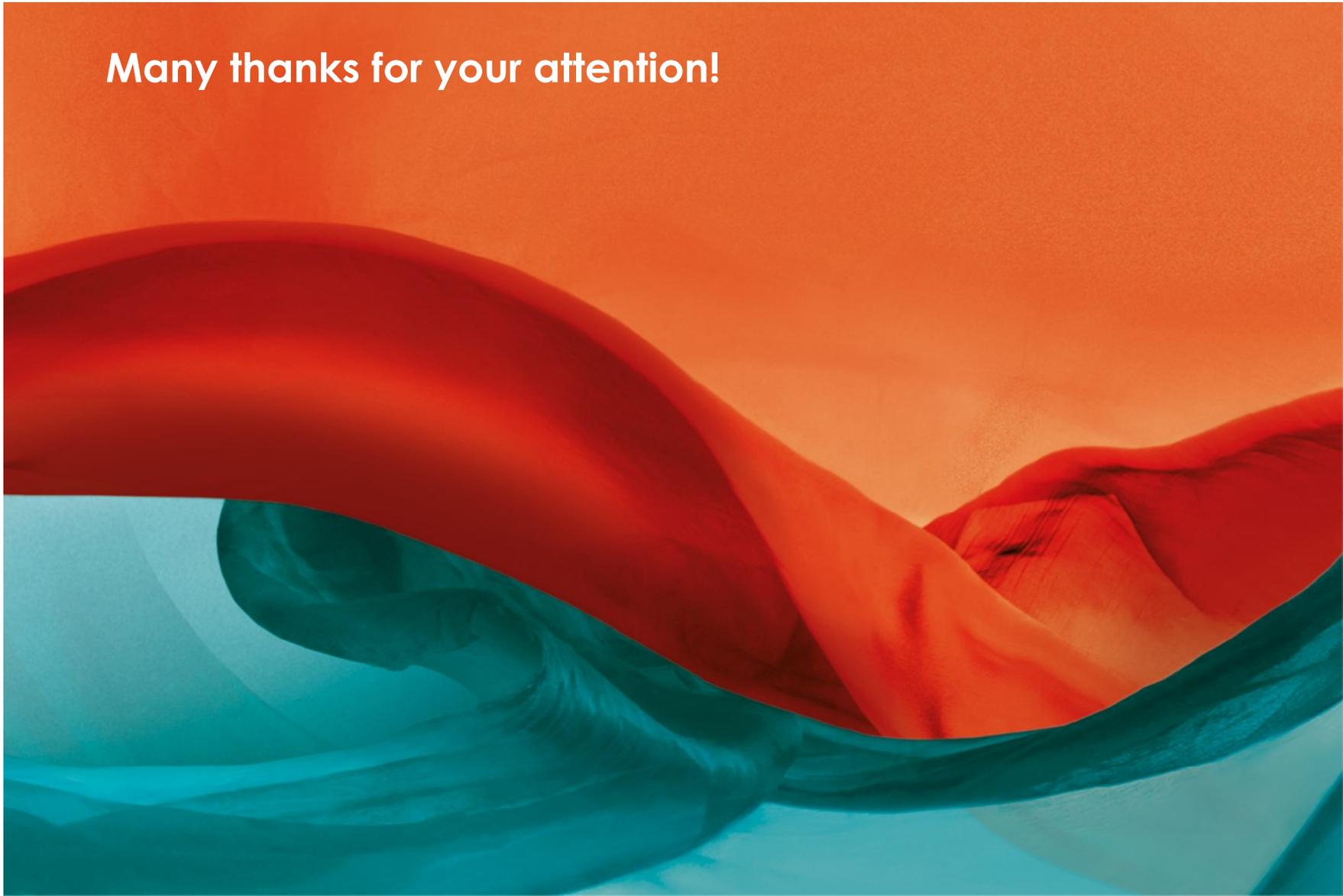
Applications:

1. Recover the waste heat of steam turbine condenser, engine jacket water for district heating----power plants.
2. For preheating of makeup water to boiler----power plants, boilers.
3. Recover the process waste heat for district heating----all kinds of industrial processes.
4. Recover the low temp. heat source from solar energy or geothermal energy for heating.
5. Recycle the waste heat of boiler's flue gas or other low temp. heat for district heating.

EXACTLY ABSORPTION CHILLER IS A HEAT PUMP



Many thanks for your attention!



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