

Renewing district heating

Optimisation of Biomass District Heating and their Economy in Austria

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DISTRICT HEATING IN AUSTRIA

- 2400 District Heating Systems
- 28 % use DH as primary heating system
- DH market is growing
- Lots of small scale biomass DH in rural areas





- 100 % renewable by 2040
- Optimising existing plants &
- Using:
 - Biomass
 - Heat pumps
 - Excess heat
 - Green gas







- Operating since: **1986**
- Ownership: private/community
- Grid: **4810 m**
- Customers: **138**
- Connected load: 2880 kW
- Boiler output: **2500 kW** (2 boilers)
- Type of DHS: hot water
- Current fuel: wood chips



Source: Biomasse Heizgemeinschaft Ligist

- Challenges:
- Old boilers
- Low grid density
- High grid losses



OPTIMISATIONS OF DHS LIGIST

Actions:

- New Customers & Grid Expansion
 - 610 kW additional connection power
 - 550 m additional grid length
- Boiler Replacement
- Total Investment: **1.4 Million Euros**

Results:

- Total Efficiency increase by **6%**
- Increase of annual profit by **30%**
- Increase of grid density by 15%
- Annual primary energy savings: 540
 MWh
- Additional annual CO2 savings: **330 Tons**



- Operating since: **1993**
- Ownership: farmers cooperative
- Grid: **10600 m**
- Customers: **150**
- Connected load: 5800 kW
- Boiler output: **4870 kW**
- Type of DHS: hot water
- Current fuel: wood chips, thermal solar (2500m²), oil (peak load & back-up)



- Challenges:
- Old boilers & installations
- Low profitability



OPTIMISATIONS OF DHS EIBISWALD

Actions:

- Building of a new Boiler house with new boilers and installations
- Take over of nearby DHS Aibl (Grid connection)
- New Customers & Grid Expansion in Eibiswald
- Total Investment: 7 Million Euros

Results:

- Increase of customers by **100%**
- Increase of sold heat by 62%
- Additional **9km** of grid length
- Increased profitability
- Additional use of wood chips: 8600 m³
- Additional annual CO2 savings: 1760
 Tons



return flow Flue Gas Inlet

Source: Heger Edelstahl



OPTIMISATION WITH FLUE GAS CONDENSATION

Renewing district heating

Rauchgaseintrittstemperatur 170°C, Rest-O2= 8Vol%tr



Flue gas outlet temperature

Optimisation with Absorption Heat Pumps

Renewing district heating

KeepWarm

1 Austreiber, Condenser r Generator ► 83°C boiler 150°C----1 MW 135°C 🗲 **Heat delivery** 1,7 MW ልቆቆል **** *** 40°C Low temp. 0,7 MW **Return flow** 55°C 28°C < ----Absorber temperature Evaporator

(single stage, COP 170 %)





THANK YOU FOR YOUR ATTENTION!

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