

TAKING
COOPERATION
FORWARD



Operation and Optimization

train-the-trainer session - online 23.06.2021



Operation of biomass district heating plants



ENTRAIN | Klaus Gall, Gall+Gärtner architects an engineers

Introduction: Gall + Gärtner, freier Architekt und Ingenieure

- Office founded 1935, now 3rd. Generation:
- **Theo Gärtner:** Civil engineer
 - Planning of local heating networks locally and nationally
 - Planning of fiber optic and power networks
- **Klaus Gall:** structural architect
 - Planning of heating plants for local energy cooperatives and municipal institutions
 - Founder and for 12 years board member of „WeilerWärme eG“, a local cooperative who meanwhile supplies almost 75% of our town with local heating.



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Introduction: energy cooperative *WeilerWärme eG*

- founded 2008 as „energy-cooperative“
- now 975 members
- successively expansion of the local heating network
- meanwhile 37 km of local heating pipeline
- Approx. 665 connected buildings
- 26,000 MWh of heat sales annually



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Introduction: energy cooperative *WeilerWärme eG*

emerging with the gradual expansion of the heating network,
the heat supply also had to be expanded.

We have now set up 15 heating systems for *Year-round supply*



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Cascade structure of the local heating supply:

➤ **Base load supply in regenerative combined heat-and-power production:**

2 Organic Rankine Cycle powerplants, fired with wood chips

1 biogas plant

➤ Total output : 6.180 kW

➤ Share of annual heat supply: 83%

➤ **Medium load supply with renewable fuels**

➤ 5 heating systems for wood chips

➤ Total output: 4.200 kW

➤ Share of annual heat supply: 8%

➤ **Peak load / failure reserve with fossil fuels**

➤ 7 heating systems, fired with heating oil and natural gas

➤ Total output: 5.710 kW

➤ Share of annual heat supply: 9%



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Operation of biomass district heating plants

- Challenges in daily operation
 - Safety related issues
- Qualification of operating staff



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Challenges in daily operation



- Fuel purchasing
- Fuel supply
- Maintenance and operation
- Ash disposal



plus:

- Monitoring the heating network
- adjustment and troubleshooting for heat consumers
- Emergency operation and 24/7 standby



Challenges in daily operation

External service:

- Fuel purchasing
- Fuel supply
- Maintenance and operation
- Ash disposal

Internal administration:

- Monitoring the heating network
(Contact person for own customers:)
- adjustment and troubleshooting for heat consumers
- Emergency operation and 24/7 standby



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Safety related issues:

Protective Measures during construction work

- building laws
- occupational health and safety law

Responsibility for the architect and contractor!



OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Safety related issues:

Occupational health and safety measures in heat production:

- Noise, dust, heat and risk of fire in the boiler house
- Fall from great heights

Operator: individual risk analysis, Employee training
For external operators: transfer of responsibility

Challenge in Internal administration:

Legally obligation for heat supply

- computer system with emergency management
- Emergency operation with extra heating-systems as failure reserve

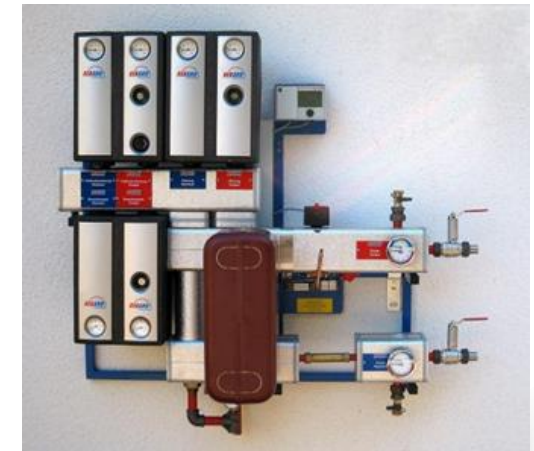


OPERATION OF BIOMASS DISTRICT HEATING PLANTS

Qualification of operating staff:

There is still no study or job title for:

“Operator of biomass district heating plants”



Qualification of operating staff:

Maintenance of the heating systems and the heating network

- Plumber
- Heating engineer with practical experience
- Construction company for civil engineering

Administration:

combined management trio consisting of:

- Planner and administrator
- Banking specialist
- Craftsman



Operation of biomass district heating plants

thank you for your attention, i wish you success:

- when planning
- when building, and
- when operating a local heating system!

