

Market Uptake of Renewable Energies for Heating and Cooling

Christian Doczekal, Güssing Energy Technologies, Austria

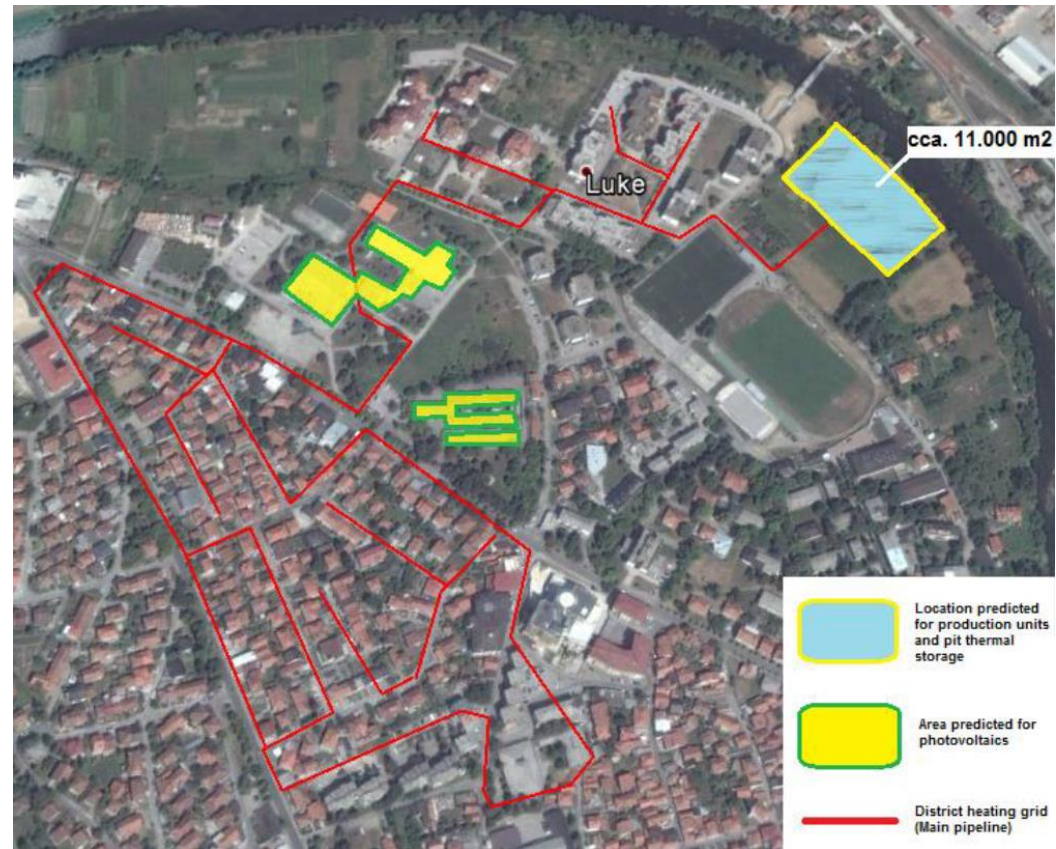


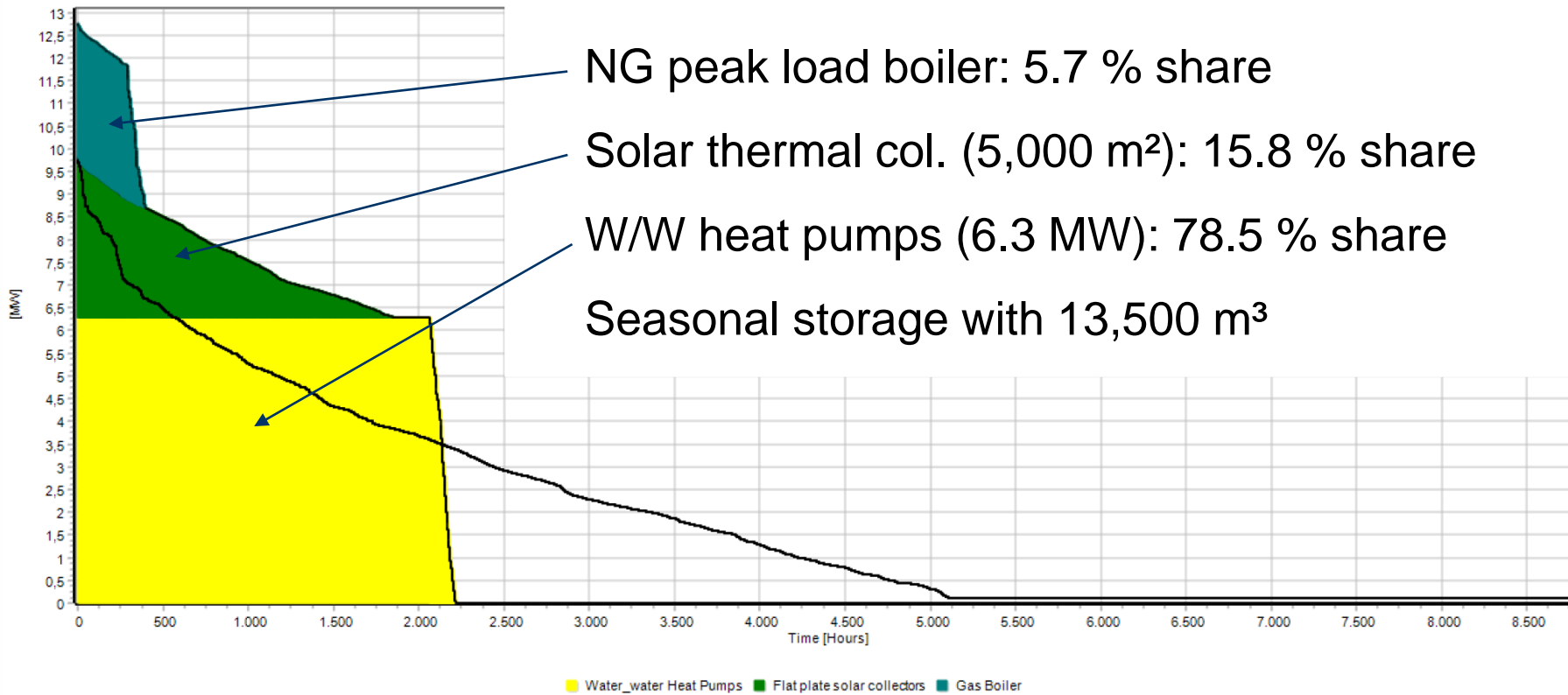
Planning of small district heating grids:
technical concepts for heating with biomass,
solar thermal, heat pumps

- ◆ Cheap fuel (coal, electricity, wood,...)
- ◆ Build new district heating grids (infrastructure)
- ◆ High investment costs
- ◆ Low or no subsidies
- ◆ Legal barriers
- ◆ High flow temperatures needed
- ◆ Night setback (switch off heating at night)



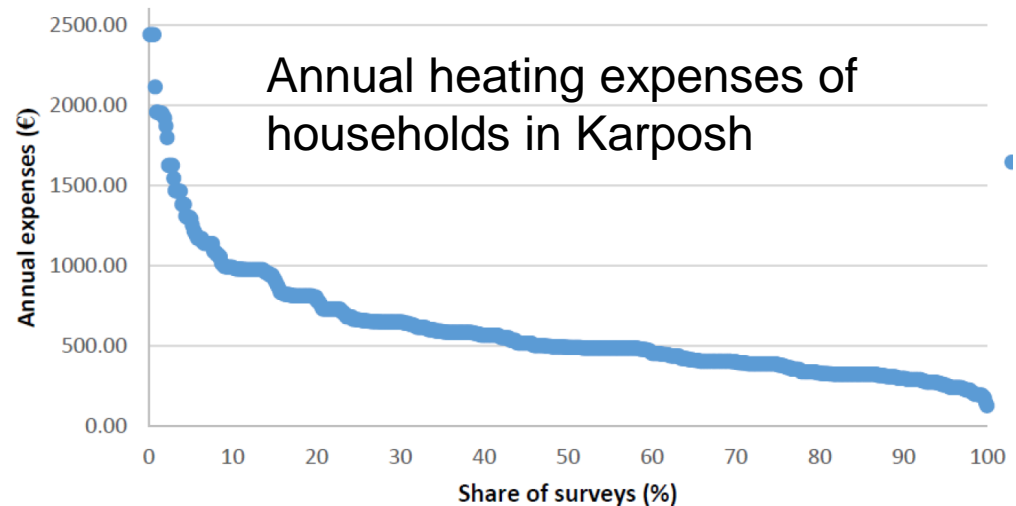
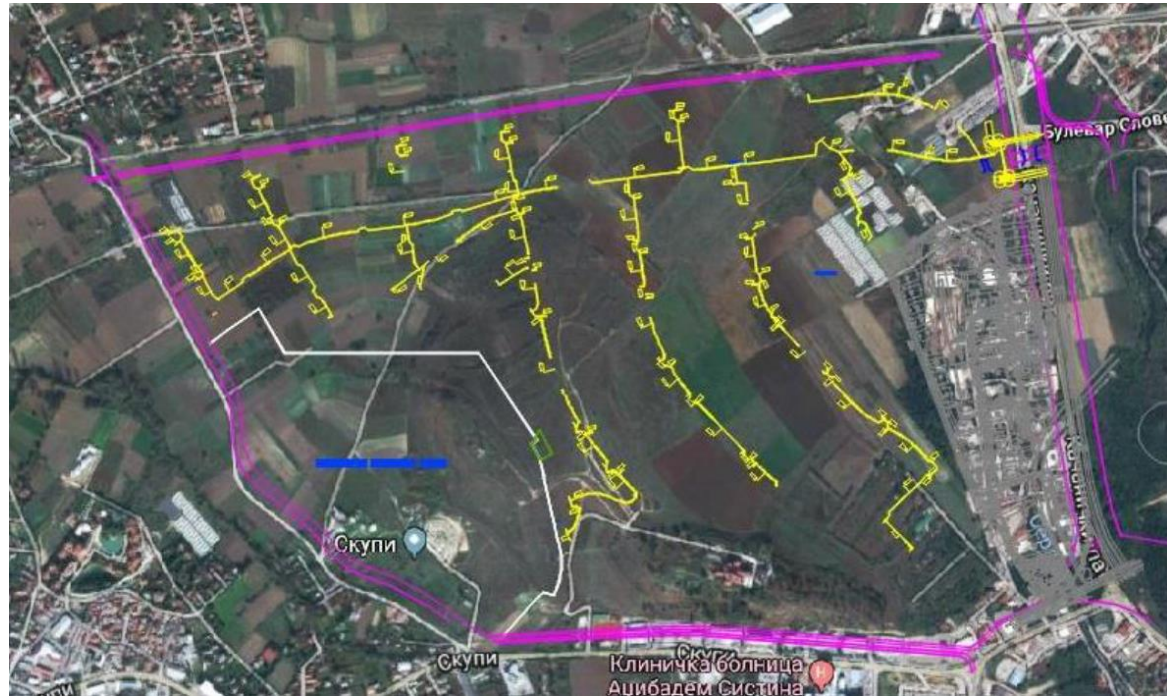
- ◆ Bad air quality
- ◆ 47% brown coal
- ◆ 40% biomass
- ◆ DH grid
 - 5.5 km
 - 80% connection rate needed
 - 3,500 kWh/m/a grid density
 - Up to 80°C flow



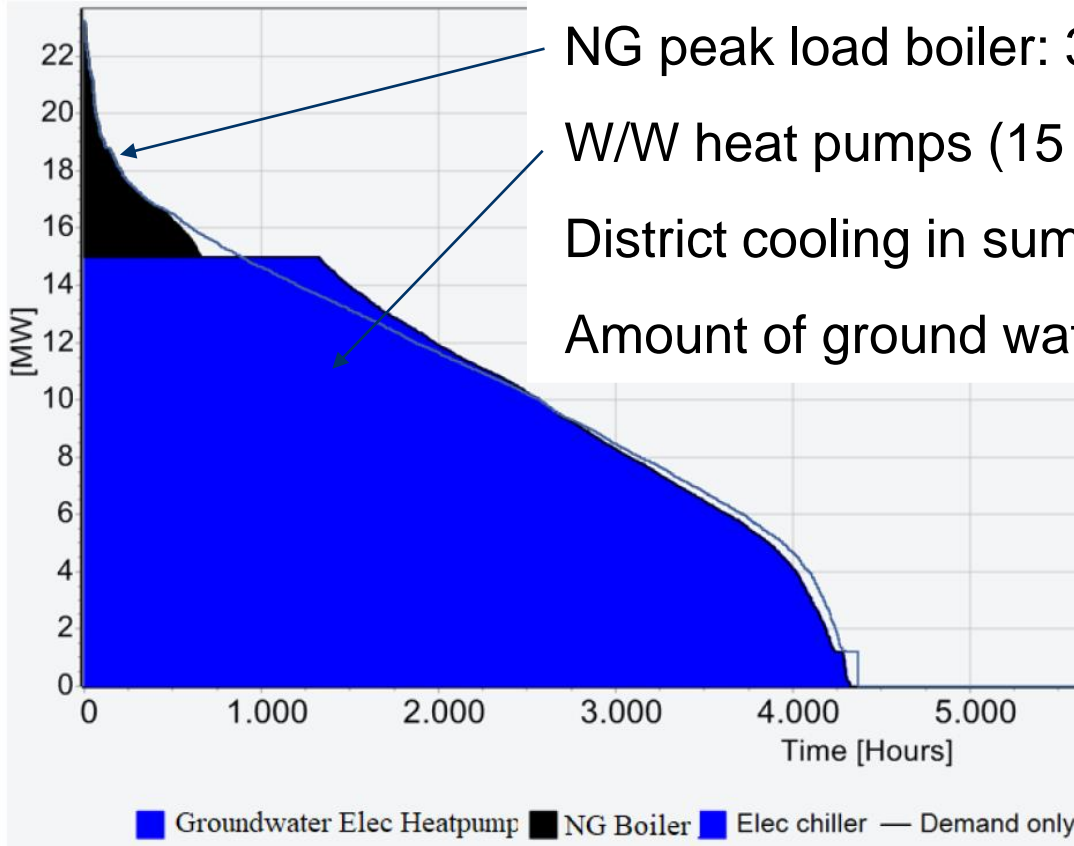


- ◆ Proposed heat price: 45 €/MWh
- ◆ Potential for realisation

- ◆ New settlement
- ◆ 44% electricity
- ◆ 28% DH
- ◆ 25% logwood
- ◆ DH grid
 - 9.5 km
 - 80% connection rate needed
 - 4,466 kWh/m/a grid density
 - Up to 60°C flow

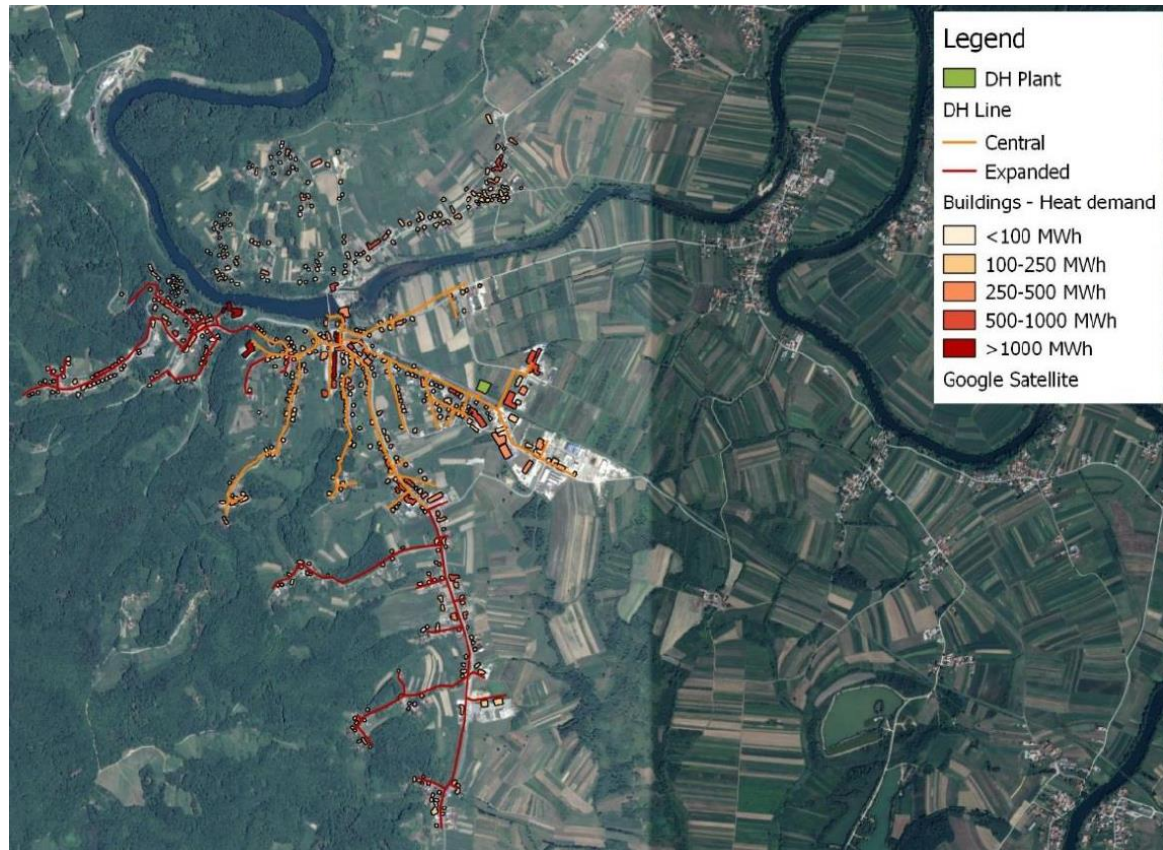


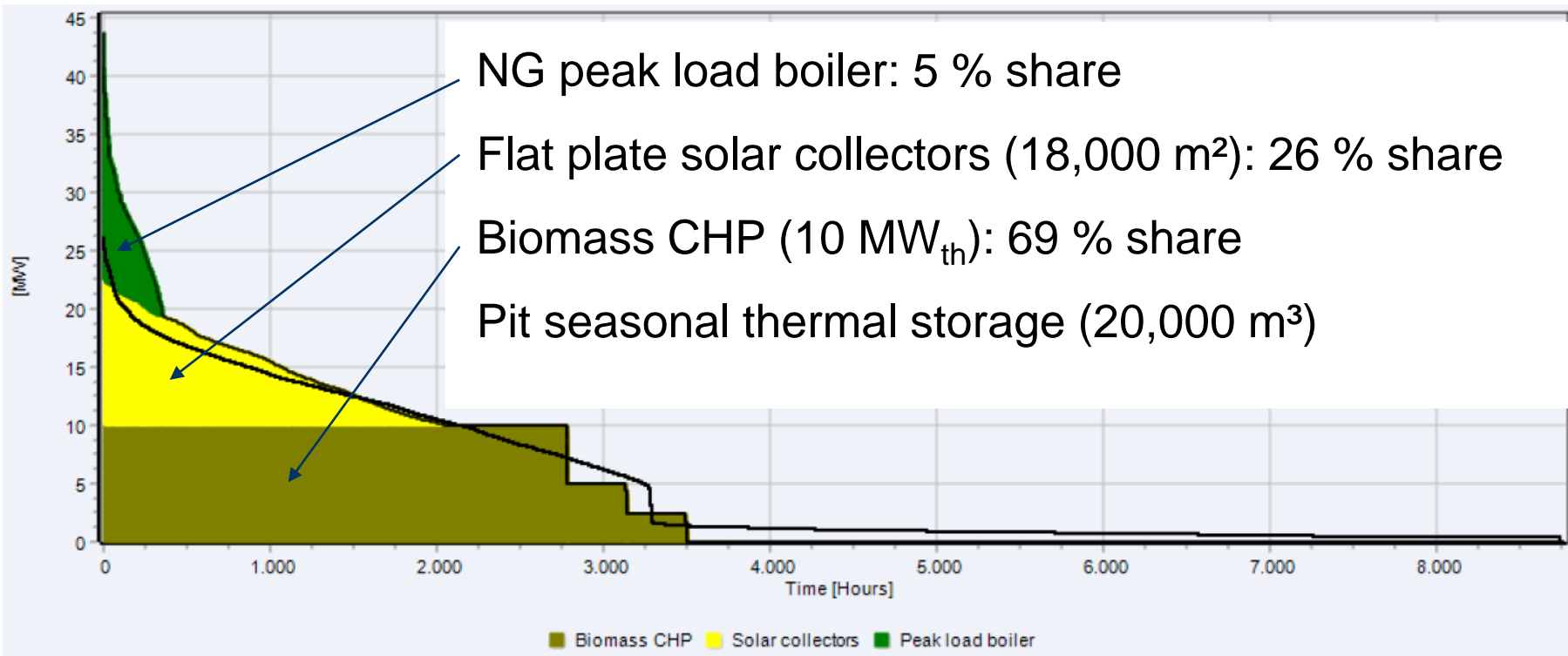
- ◆ First draft of concept
 - Ground water heat pumps **OK**
 - 5,000 m² solar thermal collectors **X**
 - Oil peak load boiler **OK**
 - 55,000 m³ seasonal thermal storage **X**
- ◆ No domestic hot water production in summer
 - No heat consumption in summer → large seasonal storage
→ canceled solar thermal col. and seasonal storage



- ◆ Proposed heat price: 50 €/MWh (39 €/MWh breakeven)
- ◆ Potential for realisation

- ◆ 71% logwood
- ◆ 14% fuel oil
- ◆ 6% logwood+oil
- ◆ DH grid
 - 8.8 km
 - >80% connection expected
 - 4,594 kWh/m/a grid density

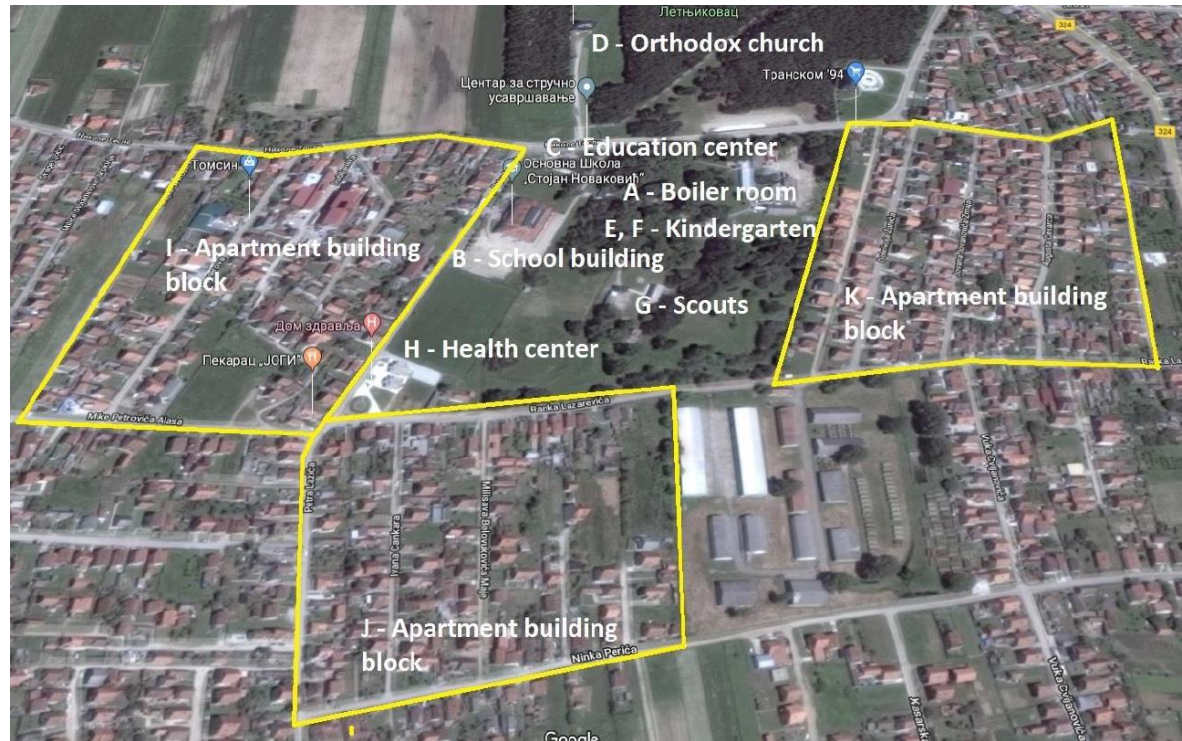




- ◆ Proposed minimum heat price:
 63 €/MWh breakeven
 (fuel oil heat price ~105 €/MWh)
- ◆ Potential for realisation



- ◆ Letnjikovac, a suburban settlement of Šabac
- ◆ 54% logwood
- ◆ 17% district heating
- ◆ 16% electricity
- ◆ DH grid
 - 7.6 km
 - ~248 households
 - >80% connection rate needed
 - 462 kWh/m/a grid density



Biomass boiler (1.5 MW): 91 % share

Oil peak load boiler (3.5 MW): 9 % share

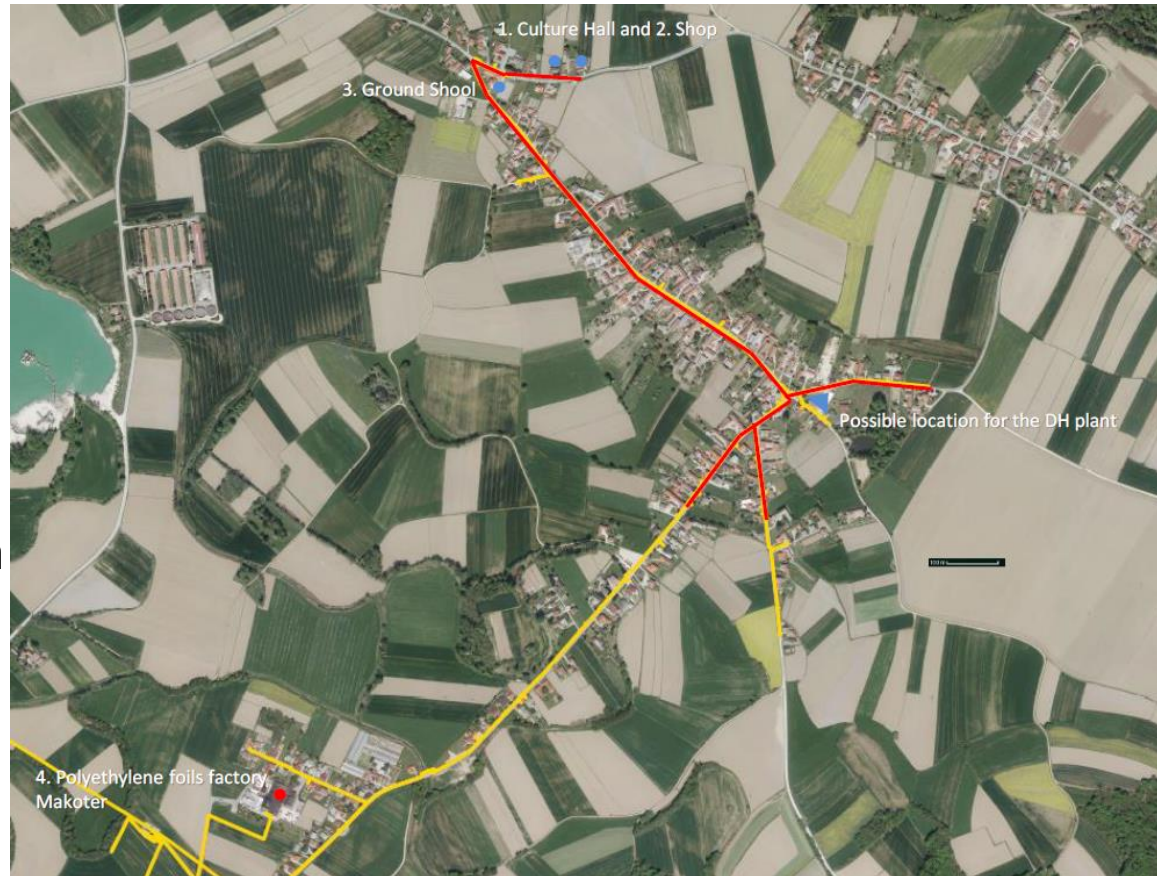
Implementation started!

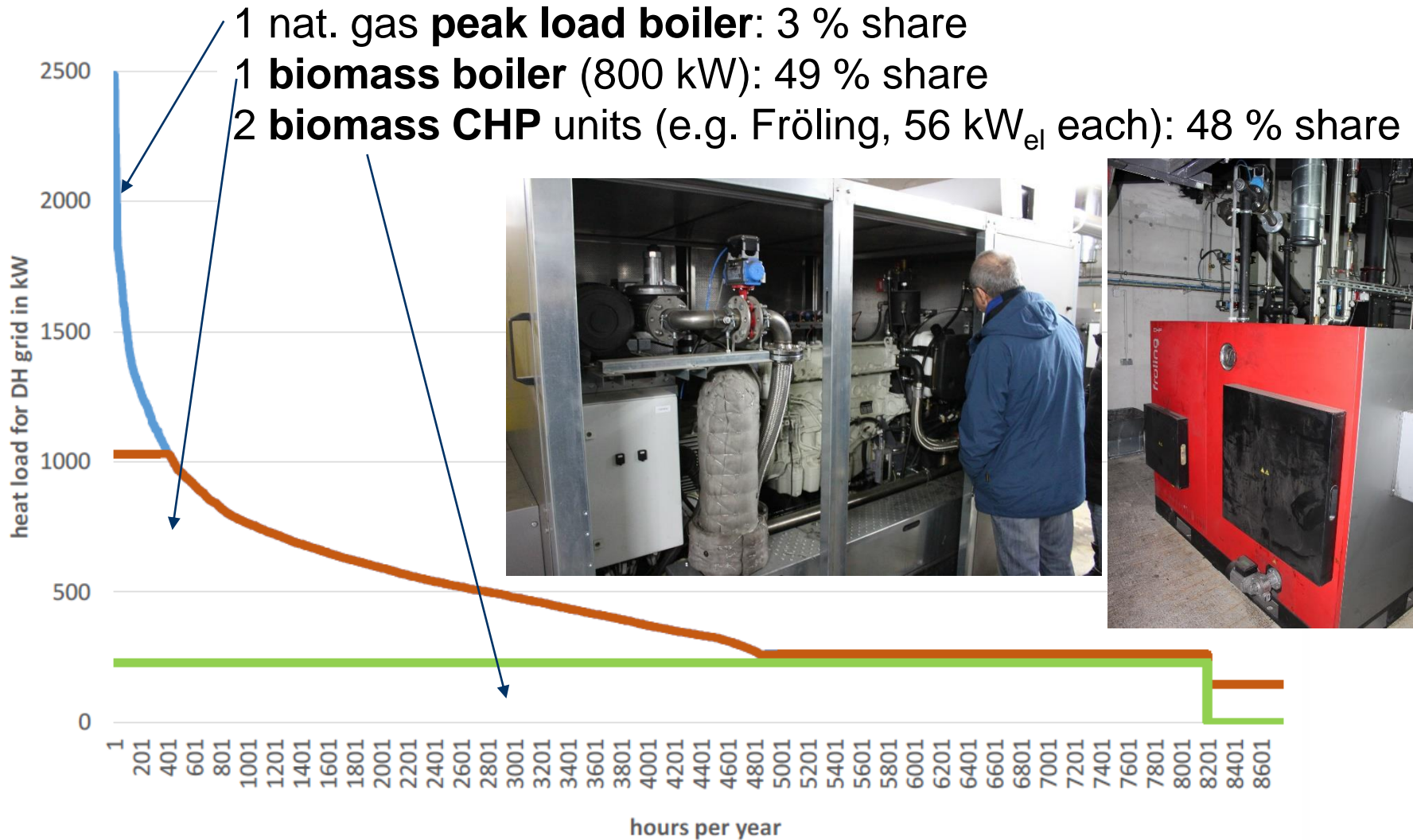


<http://www.sabac.tv/vesti/24554/vesti-tv-sabac-30-10-2018->

- ◆ Proposed minimum heat price: 78 €/MWh

- ◆ Small village
- ◆ 40% logwood
- ◆ 15% nat. gas
- ◆ 13% wood+oil
- ◆ DH grid
 - 3.4 km
 - >80% connection rate needed
 - 937 kWh/m/a grid density





- ◆ Proposed heat price: 80 €/MWh (62 €/MWh minimum)
- ◆ Potential for realisation

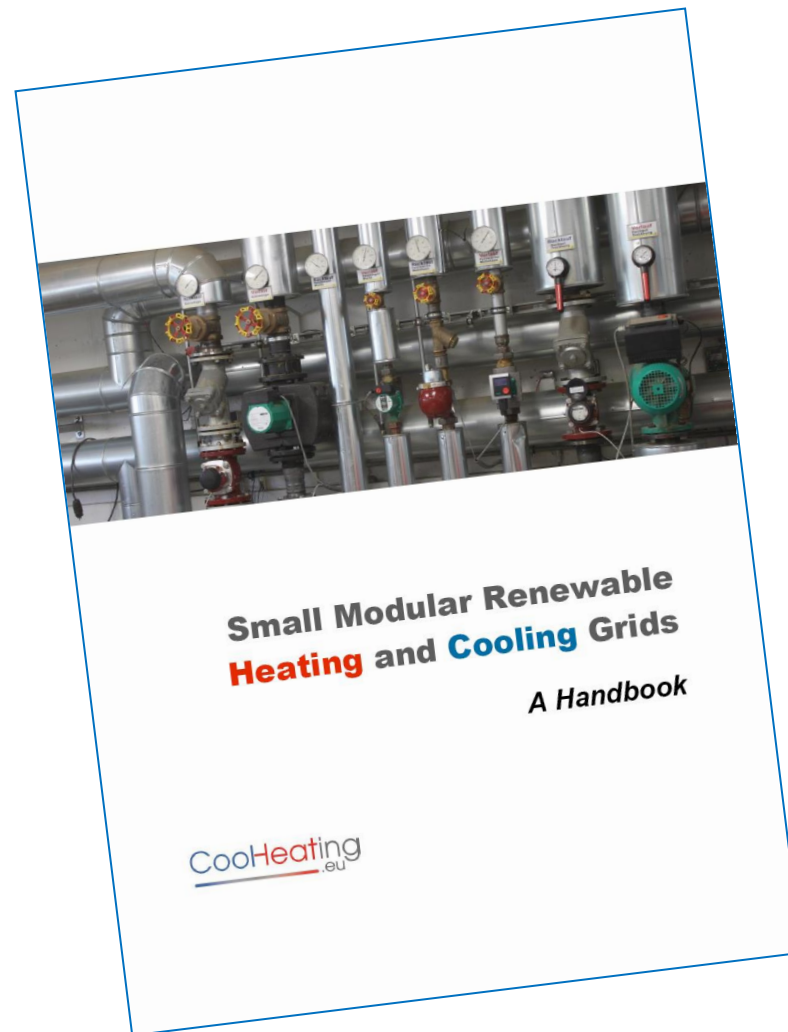
<http://www.coolheating.eu/en/publications.html>

Initiating new DHC grids

2018	Feasibility Check of a small modular renewable heating and cooling grid in Cven	EN	D6.1
2018	Feasibility Check of a small modular renewable heating and cooling grid in Zajcev Rid, Karposh	EN	D6.1
2018	Feasibility Check of a small modular renewable heating and cooling grid in Ozalj	EN	D6.1
2018	Feasibility Checks of small modular renewable heating and cooling grids: Letnjikovac & Nova Toplana	EN	D6.1
2018	Feasibility Check of a small modular renewable heating and cooling grid in Municipality of Visoko	EN	D6.1

EN: <http://www.coolheating.eu/images/downloads/CoolHeating-Handbook.pdf>

DE: http://www.coolheating.eu/images/downloads/Handbook-2016-12-12-translation-DE_2017-07-07.pdf





Christian Doczekal

Güssing Energy Technologies GmbH

c.doczekal@get.ac.at

www.get.ac.at

www.coolheating.eu

<https://at.linkedin.com/in/christian-doczekal-19768684>