

BIOGAS IN DER DIREKTVERMARKTUNG UND FLEXIBILISIERUNG DER PRODUKTION

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District heating networks – challenges and opportunities

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Central Agricultural Raw materials Marketing and Energy Network,
registered *non profit* association

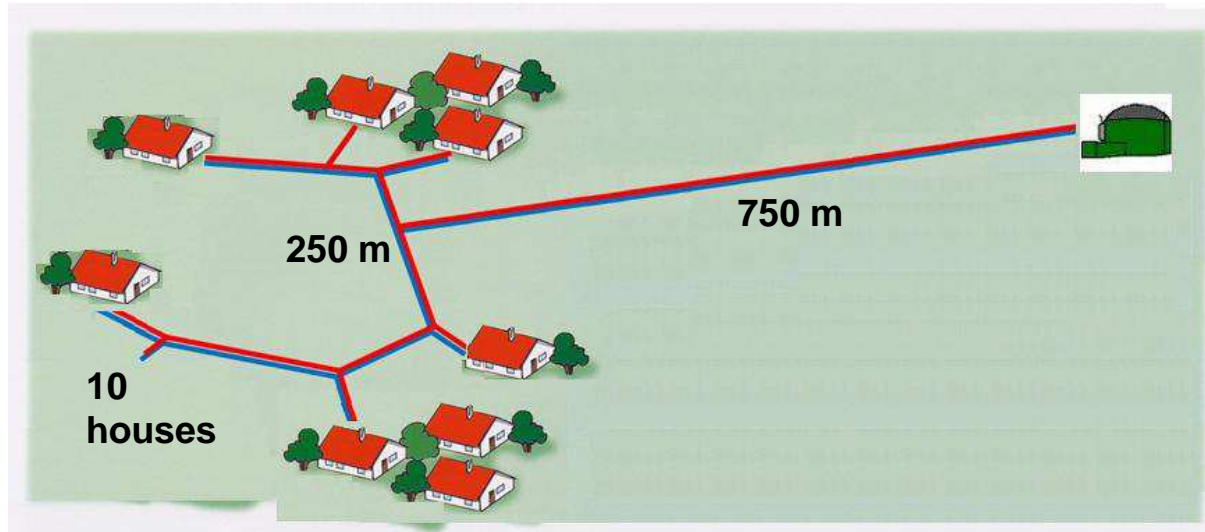
- Coordination office for renewable resources in Bavaria
- Founded in 1992, 75 members, 35 employees
- Consulting, public relations and project management with regard to energetical and industrial use of renewables
- Project assessment and project evaluation for the Bavarian Ministry Economy, Media, Energy and Technology and for the Bavarian Ministry of Food, Agriculture and Forestry



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DISTRICT HEATING NETWORKS

Challenge : Heat loss



Scenario: Biogas plant delivers heat via a 1.000 m long pipeline to 10 single family houses

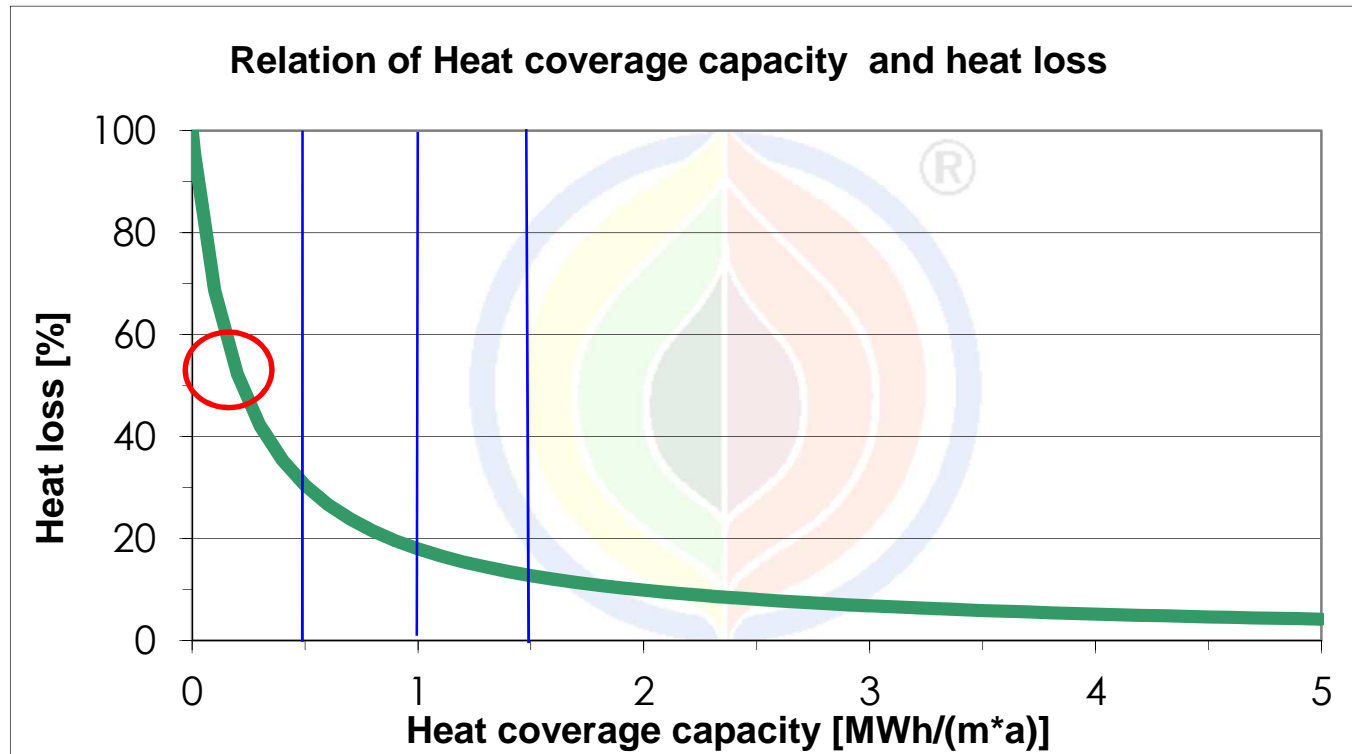
⇒ Heat coverage capacity

(Total annual heat demand of all connected parties / length of pipeline corridor)

~ 200 - 300 kWh/m/a



HEAT LOSS

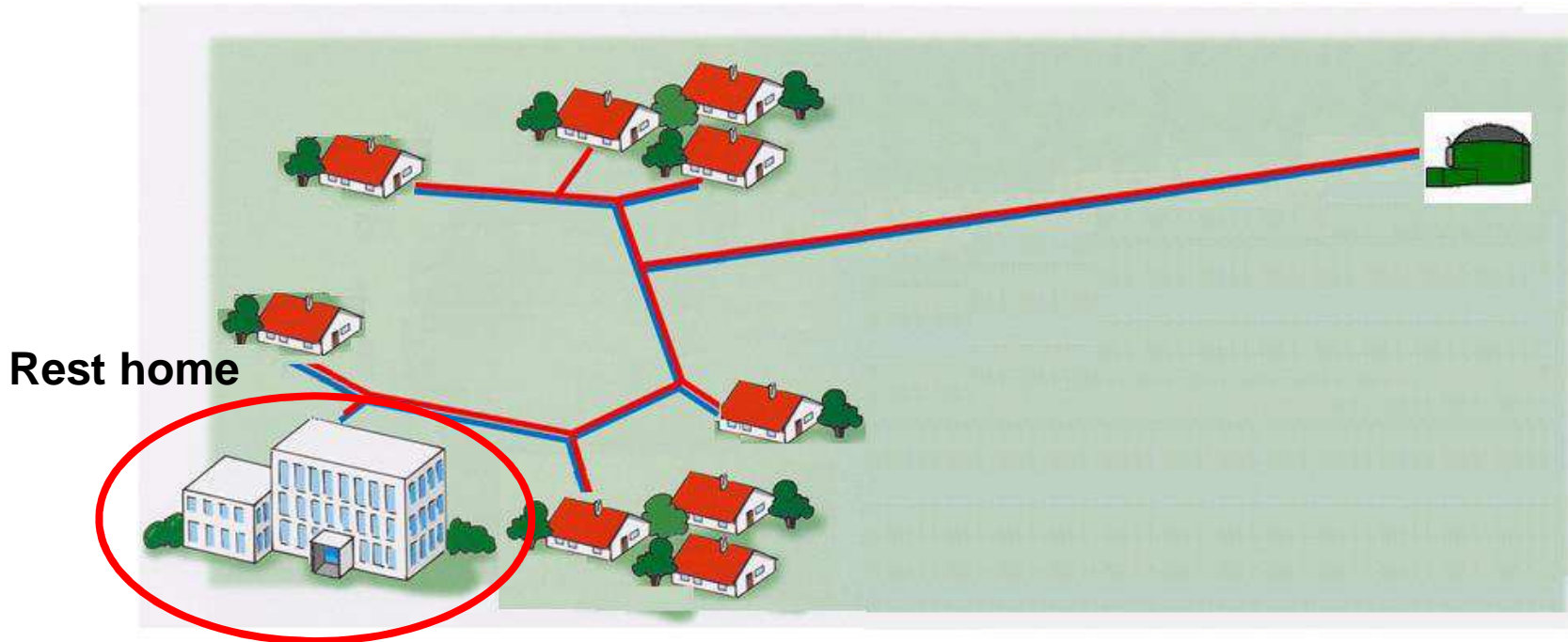


Heat coverage capacity of ~ 200 kWh/m/a correlates with heat losses of more than 50 %

⇒ The amount of heat loss is larger than the amount of heat that arrives at the customers

WHAT TO DO?

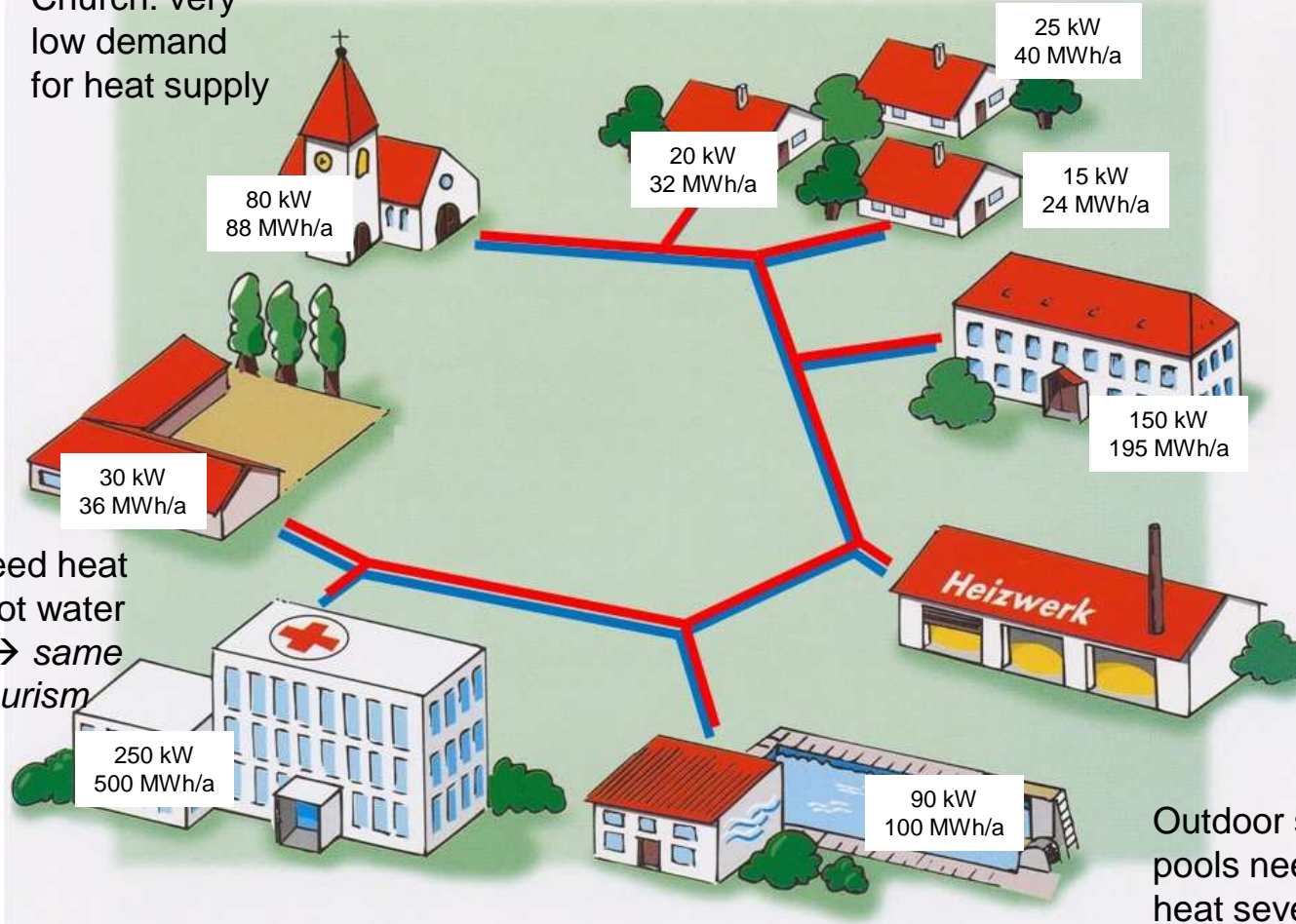
Acquire more consumers (industrial, commercial)



⇒ The addition of one typical rest home with otherwise unchanged parameters can boost the heat coverage capacity up to
~ 600 - 700 kWh/m/a

VARIETY OF CUSTOMERS

Church: very low demand for heat supply



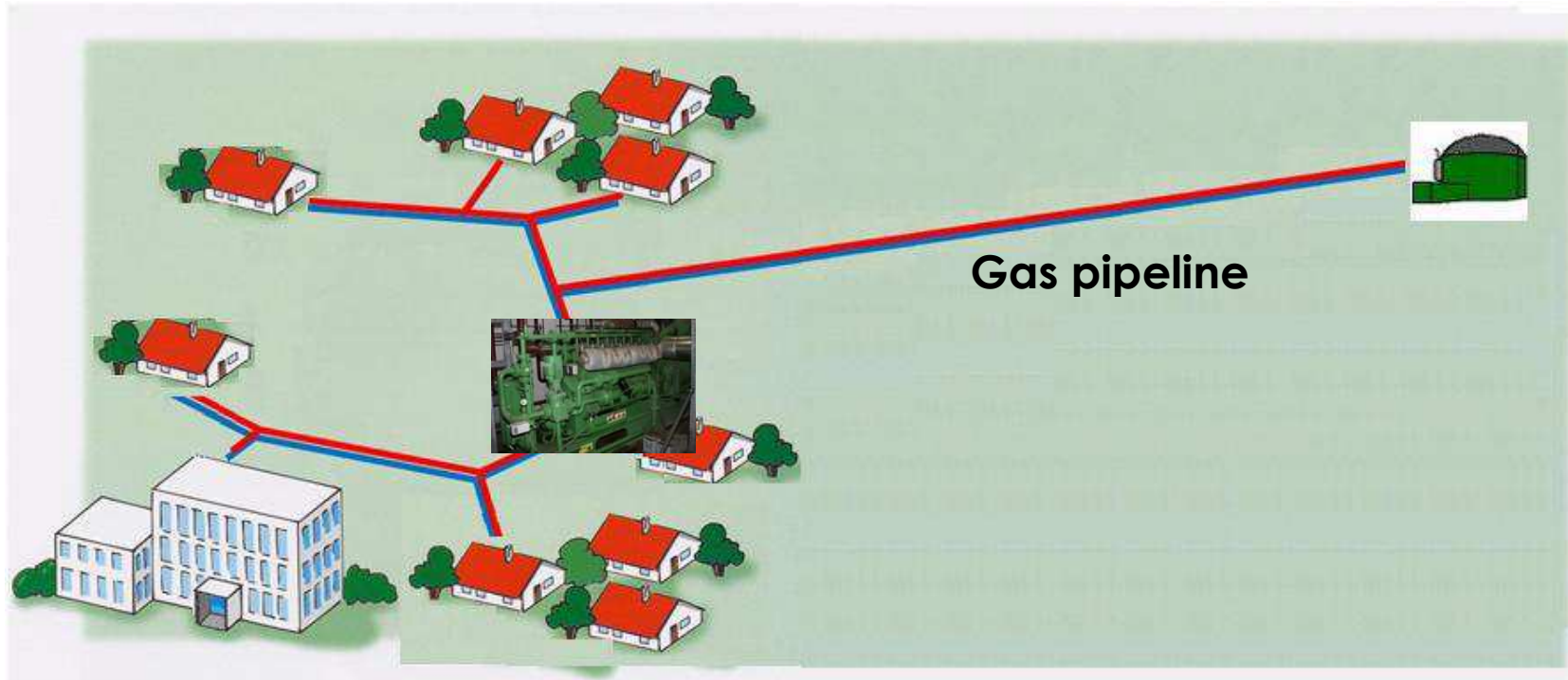
Schools need the heat up to nine months a year

Hospitals do need heat (cooling) and hot water all year round → *same conditions in tourism (hotels, spa...)*

Outdoor swimming pools need the heat seven months a year

Different customers
=> different annual curve and peak load

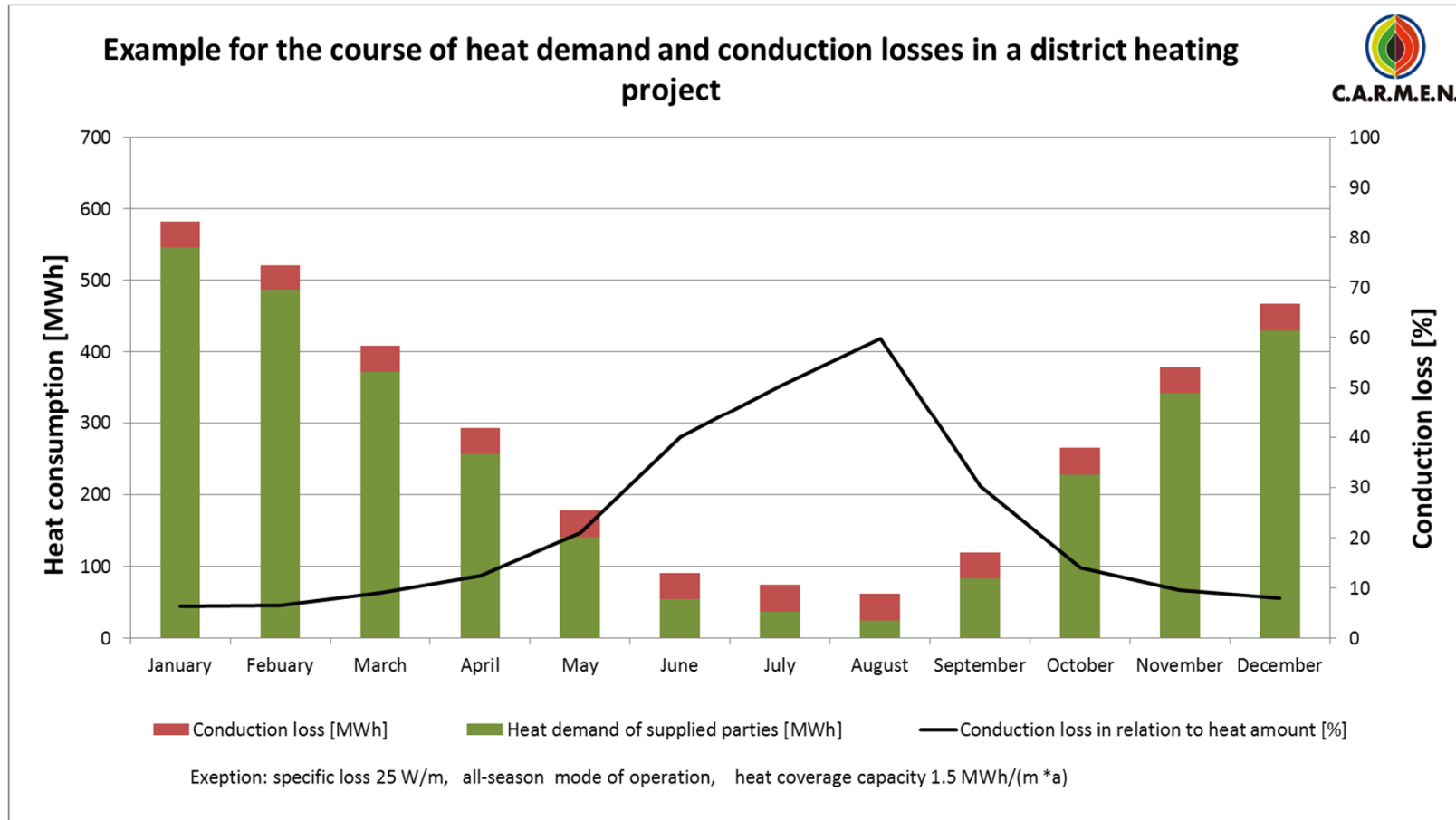
WHAT TO DO?



Another way to reduce heat losses is to span the main distance by a gas pipeline, install a satellite CHP close to the customers and distribute the heat from there

Attention: how to secure the heating of the digester?
installation of gas pipelines is more complicated

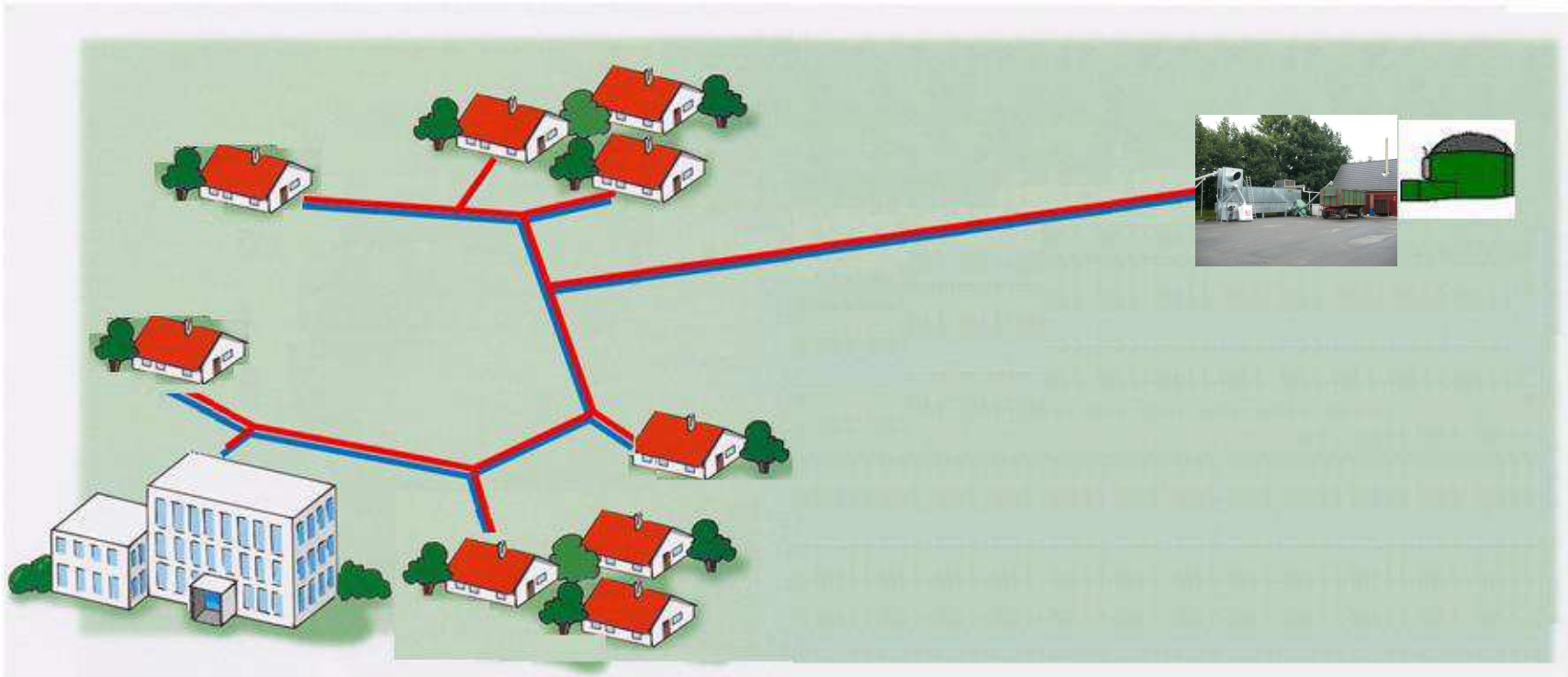
„SUMMER DILEMMA“



Even with „good“ networks that provide heating for buildings, there still remains the problem of low heat demand in summer which results in high relative heat losses

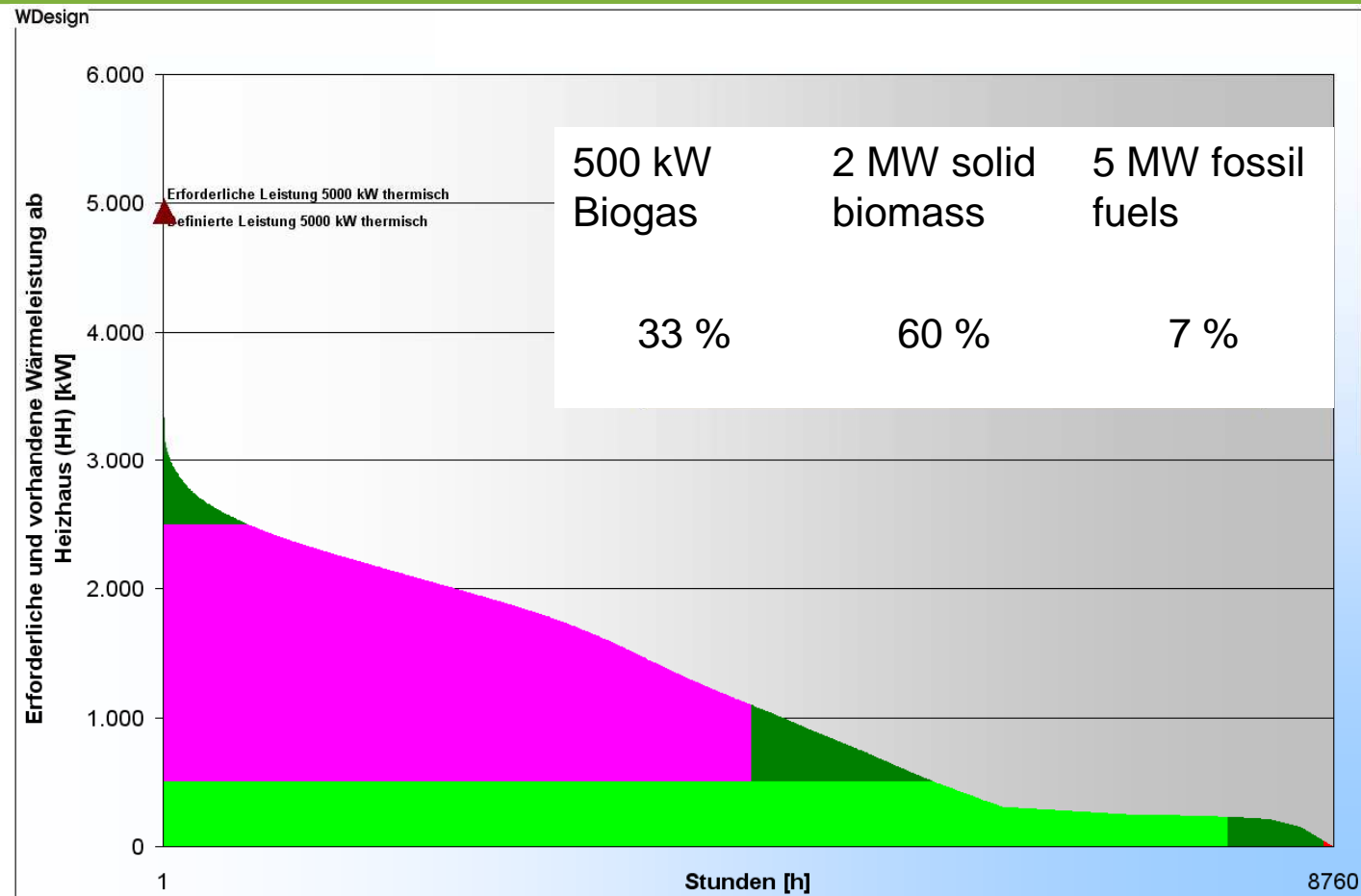
WHAT TO DO?

Install a drying facility



Possible drying goods	
corn, maize, hay	Wood / solid biomass
Digestate, Sewage sludge	herbs

COMBINATION WITH WOOD CHIP BOILER



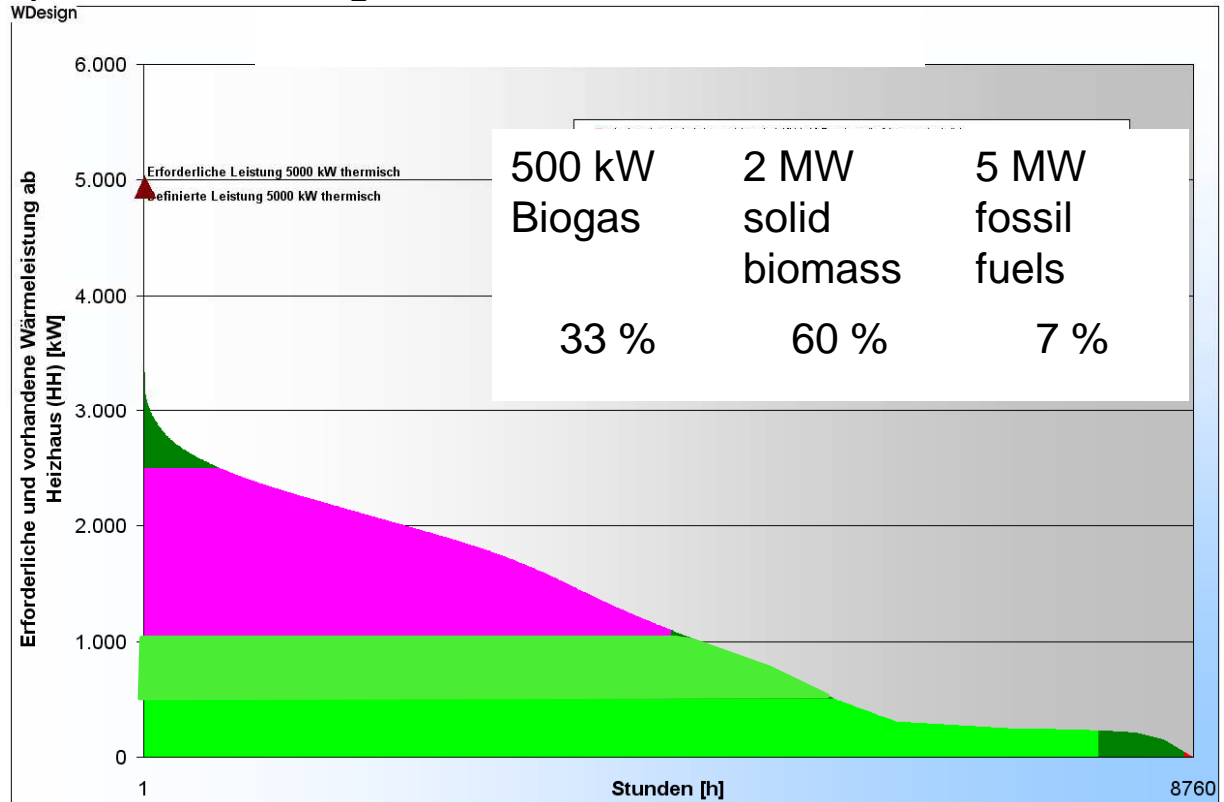
Biogas heat is the ideal heat source for base load in a bigger heating network, where the middle load is provided by solid biomass, f. e. wood chips

=> stable heat demand around the year

FLEXIBILITY

Increase of flexibility in biogas production brings about

challenges and opportunities



challenge: providing heat for customers during downtime of CHP-unit

opportunity: seasonal flexibilization (significantly more output in winter than in summer) can lead to larger heat sales volumes

ECONOMICAL ASPECTS

Opportunity:

With fixed feed-in-tariffs, heat distribution income can compensate for inflation



In Germany, the RESA legislation provides steady income over 20 years, but while the expenses rise continually, the revenues from the electricity sales remain fixed

=> it is possible to at least partially overcome this dilemma by including a price adjustment clause within the heat delivery contract

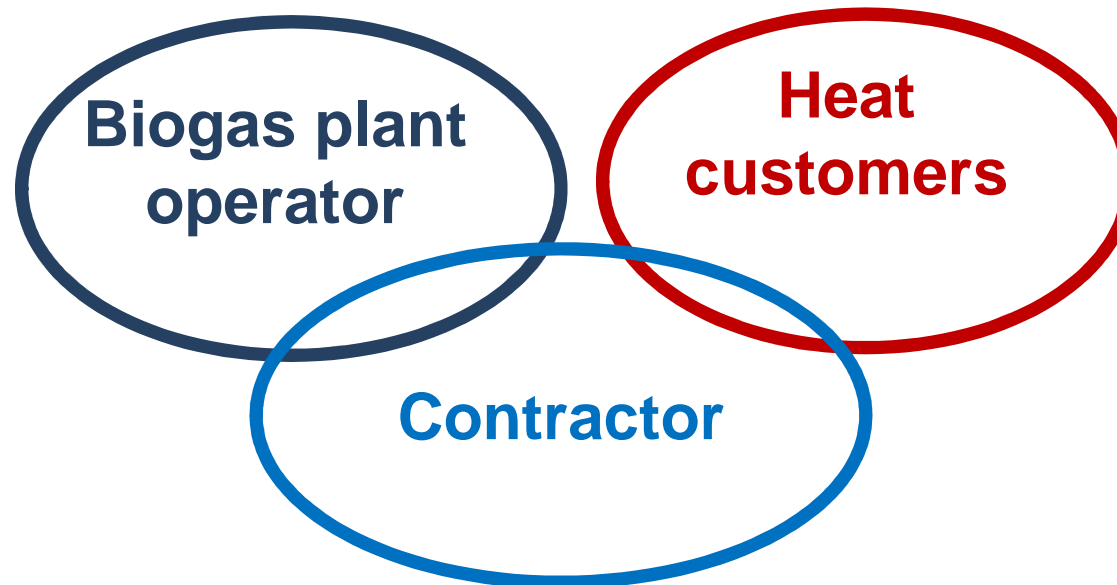


ECONOMICAL ASPECTS - PLAYERS

Challenge:

Who is responsible for planning, installing and operating of the district heating network?

Who is the caretaker?



Every one of the three alternatives has its pros and cons, but ultimately someone has to bear the responsibility



ECONOMICAL ASPECTS – HEAT PRICE

Challenge:

finding the ideal heat price

Aspects to be taken into consideration:

- Full supply or partial supply
- Level of market price
- Level of heat manufacturing costs



LEGAL ASPECTS

Challenge:

formulate a heat delivery contract that meets the regulatory requirements



Example: an irregular price adjustment clause can result in the nullification of prior price changes



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ACCEPTANCE

Opportunity: Acceptance



The production of biogas can come along with certain nuisances for the vicinity: odour, noise, traffic

This can result in damage to the acceptance of the biogas plant, but: convenient and reliable heat supply for the community definitely boosts acceptance of Biogas plant and biogas plant operator

ELECTRICITY HEATING

Challenge: electricity heating vs. heating based on warm water

In Germany, the vast majority of buildings have a water-based heating system

⇒ Connection with a water-based district heating network is simple

In France, many houses have electricity heating

⇒ To connect them with a district heating network requires extensive technical adjustments



CONCLUSION

- Biogas plants with local CHP produce huge amounts of heat
- The distribution of biogas heat with a district heating network is a way to make use of the heat
- a district heating network project requires intensive planning („the devil is in the details“), but:
- If the external preconditions are right and the planning is properly executed, both the biogas plant operator and the community gain benefits



CONTACT

Questions?



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