Scenario analysis of the renewable district heating system in Ozalj, a small city in Croatia

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Introduction to CoolHeating project

Project name→*Market uptake of small modular renewable district heating and cooling grids for communities*

Start of the project→ *01.01.2016.*

Duration → *36 months*

Call → *H2020-LCE-2015-3*

Topic → *LCE-04-2015 Market uptake of existing and emerging renewable electricity, heating and cooling technologies*

Budget → 1 644 340 €

- The main aim of the project is giving support to implementation of small modular renewable district heating and cooling grids for communities in South-Eastern Europe

- Project partners from countries, which implemented a large number of innovative district heating systems will contribute with their knowledge and experience on implementation of these systems

- Further activities include measures for involving citizens of target communities into project activities, as well as capacity building for project development and further application for EU funds

- Overall, the project will result in policy recommendations; improved regulatory frameworks; and application of business models and innovative financing that way preparing the market for the uptake of such systems.

CooHeating.eu

GÜSSING ENERGY TECHNOLOGIES

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Most relevant outputs of the project so far

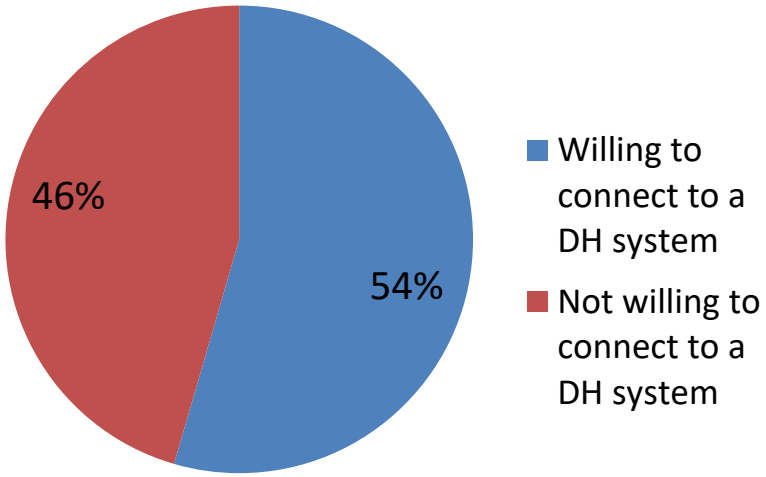
Reports:

- Best practice examples in Germany, Austria, Denmark and the target countries
- Analysis of legal framework for district heating systems in target countries
- Handbook on small modular renewable district heating and cooling systems
- Guideline for initiators of small renewable district heating systems
- Guidelines on improved business models and financing schemes

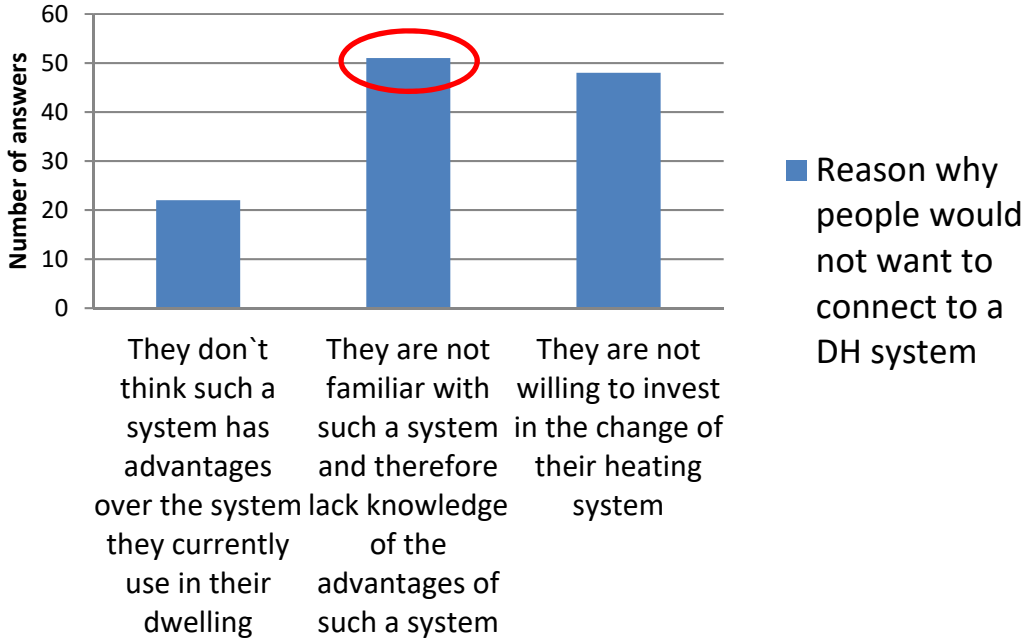
Survey:

- The main idea is to gather energy consumption data of the citizens, as well as their ideas, suggestions and doubts about district heating

Opinion towards connecting to a district heating system



Reason why people would not want to connect to a DH system



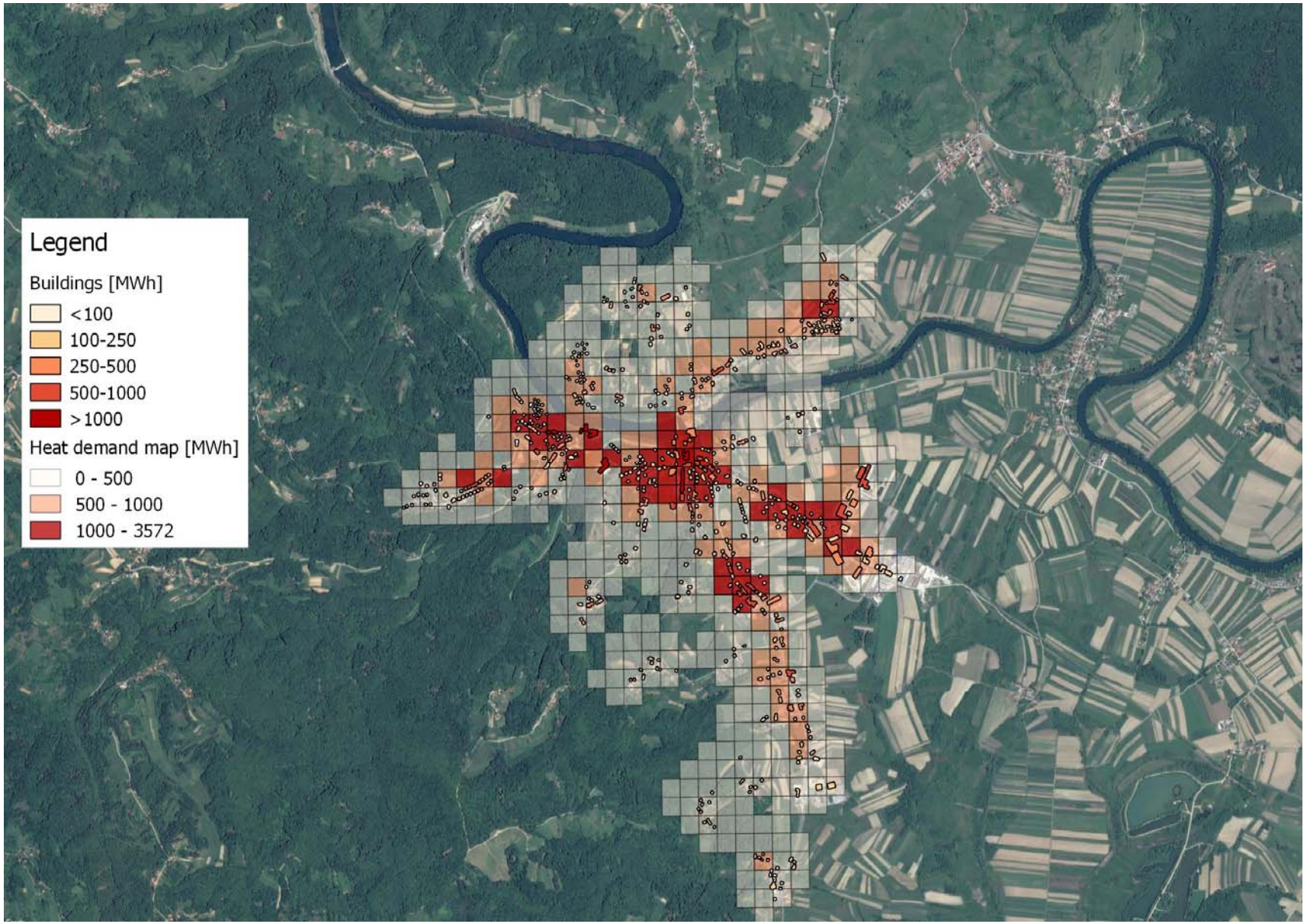
- Study tours to best practice examples in Denmark and Austria

Heat demand mapping for the city of Ozalj

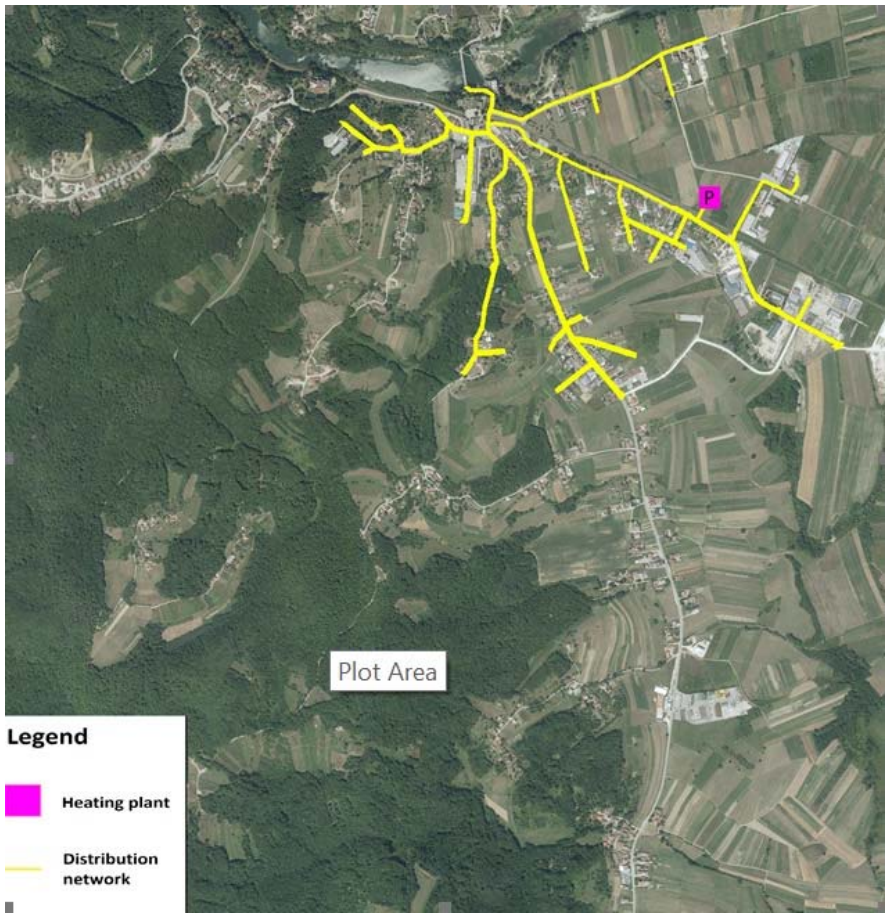
- Method is divided into four steps

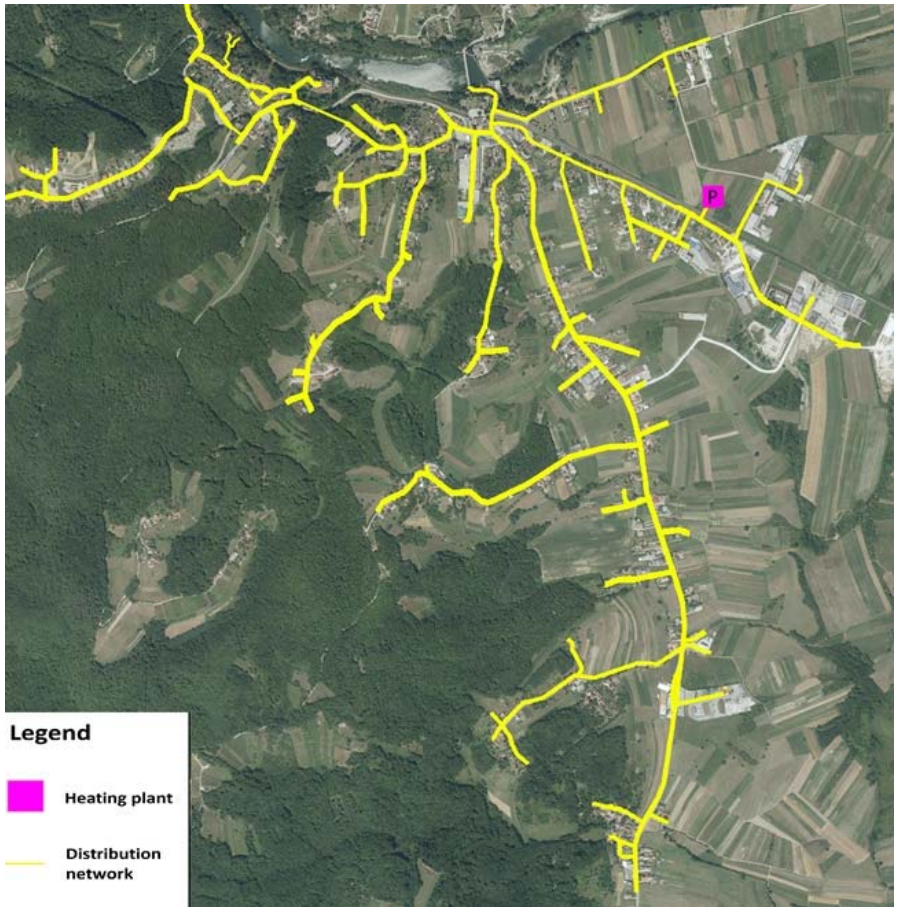
1. Creating a matrix that contains information on total gross area and locations of buildings from an online building census
2. Gathering data on the number of floors in every building
3. Classification of the buildings into 8 categories
4. Calculating total heat demand by multiplying total gross areas of buildings with specific heat demand of different types of buildings

Category	Specific heat demand (kWh/m^2)
Old house	177.75
New house	112.5
House without the facade	262.5
Apartment building	161.25
Office building	135
Public building	270
Historic building	78.75
Industry	110

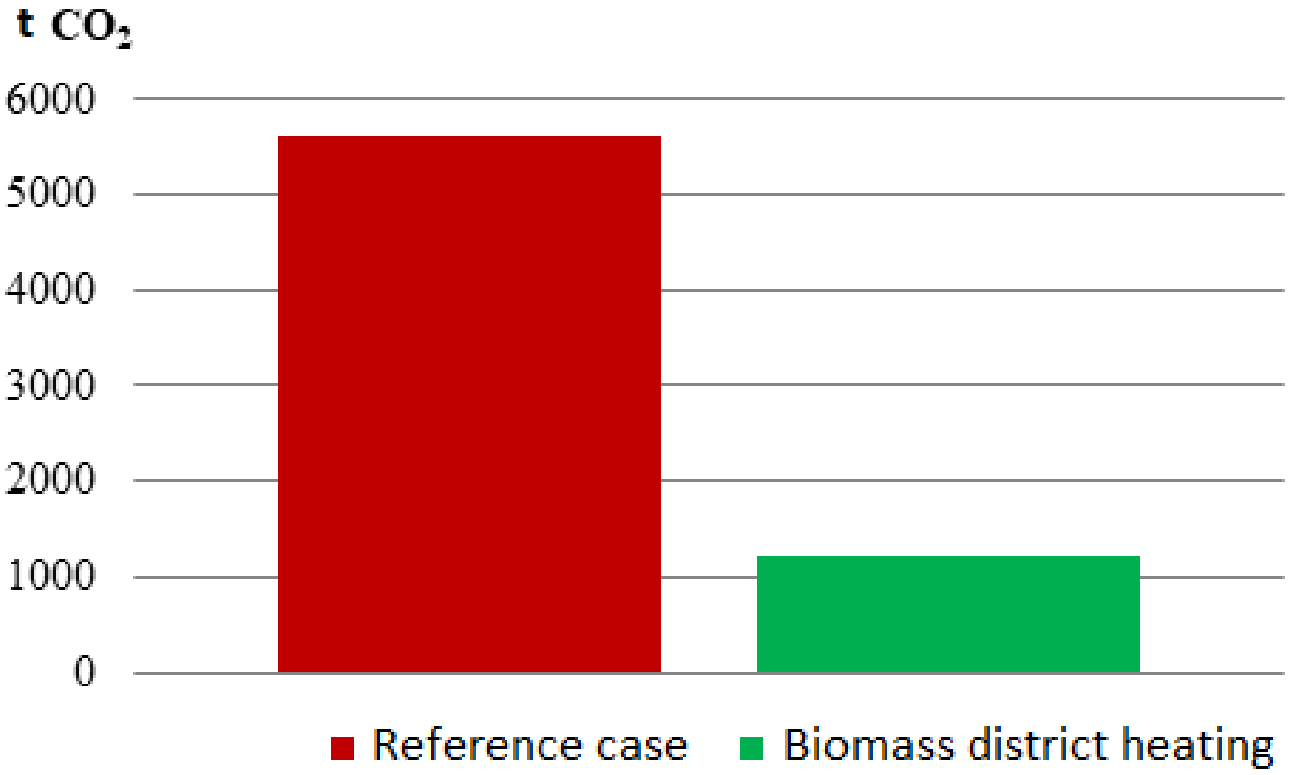

Legend
Buildings [MWh]
<100
100-250
250-500
500-1000
>1000
Heat demand map [MWh]
0 - 500
500 - 1000
1000 - 3572

Scenario analysis





	Version 1	Version 2
DH network length (m)	8,798.33	16,586.17
Household area connected to DH (m^2)	124,786.91	201,421.81
Heat demand of the connected households (MWh)	17,371.82	28,820.36
Needed capacity for the production facility (MW)	11.29	18.9
Internal rate of return (%)	9.51	9.93
Net present value (€)	2,013,852.24	3.354.797,71
Simple payback period (years)	7.75	7.58


t CO_2
6000
5000
4000
3000
2000
1000
0
Reference case
Biomass district heating

Conclusions

- High RES potential for district heating in south-east European countries
- Significant CO_2 reduction possibilities
- Economical feasibility in smaller rural areas

Thank you for your attention!

CoolHeating website: www.coolheating.eu

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