THERMOS

Accelerating the development of low-carbon heating & cooling networks

Capacity Building and Train-the-trainer programme
Module 4: Optimising thermal planning, resources and technologies with THERMOS

Module 4 of the THERMOS Capacity and Training Programme

This module is divided into three parts as follows:

4.1 How to optimise energy resources and planning?
4.2 How to optimise thermal resources in urban areas? (*upcoming*)
4.3 Optimising technologies and systems (*upcoming*)

4.1 How to optimise energy resources and planning?

4.1.1 Pinpoint heat demand and cold demand densities (1/2)

The first step in optimizing energy resources and planning is the identification of heating and cooling demand densities.

This allows energy planners to determine the most feasible areas for the development of the potential district heating and cooling networks. For this purpose, it is key to gather information on:

- Building polygons and sectors
- Building efficiencies
- External and internal temperatures
- Digital surface models

4.1.1 Pinpoint heat demand and cold demand densities (2/2)

THERMOS has developed a state-of-the-art methodology for mapping heating and cooling demands and provides a free and open-source tool that can help local energy planners pinpoint the heating and cooling needs of the area to be assessed.

However, energy planners should note that the information available at the local level can help the tool refine the results and recommendations it provides. Therefore, the THERMOS team encourages users to override the default values used by the tool if more precise information is available.

4.1.2 Assess local renewable resources

After determining heating and cooling energy densities, energy planners should assess the local renewable energy sources and the local generation plants that could be included in the district heating and cooling networks.

The Heat Roadmap Europe (Peta4) project has already identified excess heat activities that energy planners should take into account when designing the district network for an optimal planning and use of the energy resources.

4.1.3 Measure infrastructure costs

Finally, energy planners should gather information on infrastructure costs to evaluate the economic feasibility of the district heating and cooling networks. Energy planners should identify potential routes for the network and should specifically collect information such as:

- Capital cost of pipes
- Capital cost of plant and other equipment
- Labour costs
- Road closure costs
- Design/ planning costs
- Operational costs
- Cost of digging
- Replacement costs during their life cycle

4.1.4 Shape your Heat Synergy Region (1/2)

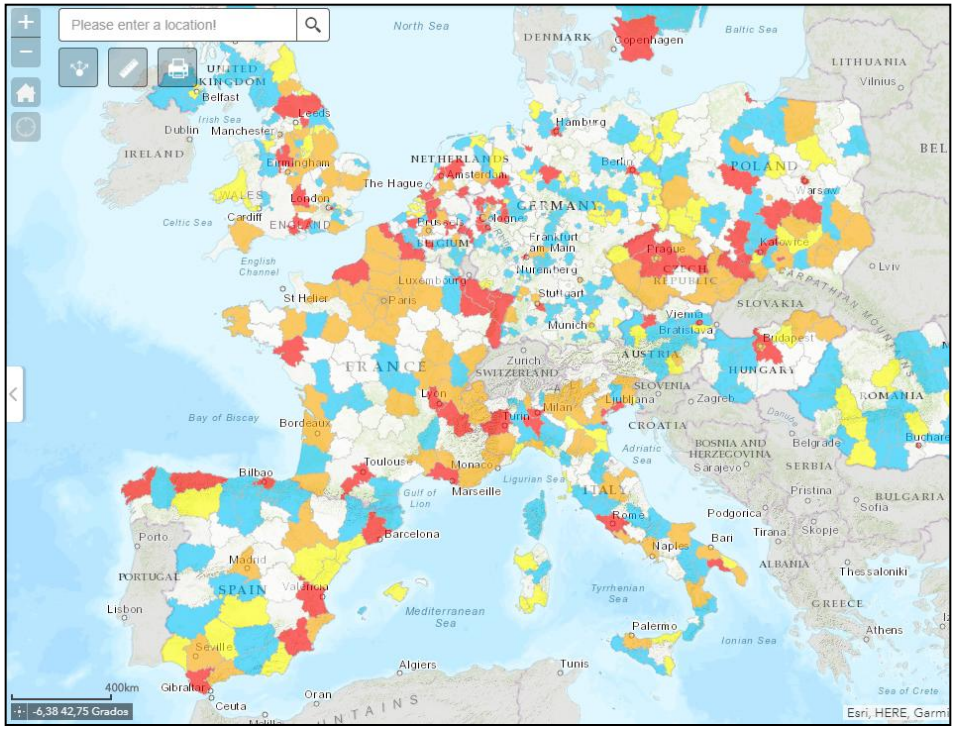
Once heating and cooling demands have been determined, the second step for an effective optimization of energy resources and planning is the identification of the areas that present the highest potential for the development of a district heating and cooling network.

In this respect, energy planners should specifically look at:

- Areas with the highest heating and cooling demand densities
- Levels of excess heat available
- Available electricity (power) infrastructure to support certain energy generating technologies (e.g. CHP or heat pump)

4.1.4 Shape your Heat Synergy Region (2/2)

By way of example, the Heat Roadmap Europe (Peta4.2) project has analysed the priority heat synergy regions looking at heating demand and excess heat levels:



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