



BACKGROUND INFORMATION: WHAT IS HOTMAPS?

The Hotmaps project is a Horizon 2020 project which developed a database and toolbox for strategic heating and cooling planning. The Hotmaps toolbox allows quantitative scenario analysis. This toolbox was developed in cooperation with 7 local authorities which were pilot users (Kerry County, Milton Keynes, San Sebastian, Aalborg, Frankfurt-am-Main, Geneva, and Bistrita). They performed strategic heating & cooling planning using the developed toolbox to demonstrate its usability in the strategic planning process.

FRANKFURT & HEAT MAPPING: HOW IT STARTED...

Frankfurt's objectives

The City of Frankfurt has set targets for the years 2030 and 2050:

- » -50% CO2 emissions by 2030
- » Carbon-neutral by 2050.

To reach those goals, Energierferat, Frankfurt's energy agency, worked out a strategy process together with the municipality, architects, urban planners, and businesses. The initial plan towards decarbonisation relied mostly on reducing energy demand from heating through an increased refurbishment rate of buildings, the use of excess heat and the extension of the district heating network. Given the place of district heating in this plan, the municipal energy agency also included the local utility, Mainova, in the project, to further develop the district heating system.

Launching the analysis

When Energierferat joined the Hotmaps project, the heat demand for space heating and hot water generation in the buildings of the city was of around 6,850 GWh/year. Frankfurt's heating system was approximately fuelled at 70% by fossil gas. Through the strategy process and the Hotmaps toolbox, Frankfurt established a strategic planning, including the following steps:

- » An analysis of barriers and drivers,
- » A stakeholder analysis,
- » Mapping the existing heat demand and available resource potentials,
- » Development of scenarios for heating demand and supply in the city in the year 2050, and
- » Discussion of these steps and their results with relevant persons in the city.

The different scenario analyses underlined four main points of focus: the primary role of district heating, especially thanks to the large amount of available excess heat; the need for a building renovation strategy; a diversity of heat sources; limited peak load capacities.





... HOW IT IS GOING

First results

The quantitative scenario analysis showed that 60-80% of the buildings' heat demand in the city should be covered by district heating, especially to use the large amount of excess heat. The mapping showed that this system is the only one available to transport the excess heat which is available to the customers which maybe far away from the source. The calculations also helped underline the higher costs for decentralised supply, like heat pumps.

A broad variety of local energy sources are available for providing space heating and hot water. They include various heat pumps for excess heat in the different industrial parks, excess heat from data centres, excess heat in the wastewater treatment plants, the heat contained in the Main River and heat from near-surface geothermal sources, and solar thermal energy. Municipal waste incineration potentials would largely supply heat demand for industrial production, while only a small share will be used for buildings. Other heat sources, to be used with heat pumps and solar thermal will supply the rest of the buildings' heat demand by 2050.

In addition, it showed that the increasing the production of low-carbon heat is cheaper than a renovation strategy prioritising very-deep retrofitting. Still, 80% of the buildings in the city need to be renovated, to reduce the energy demand to 53%. However, covering the peak heat demand in winter without fossil fuels remains an issue (200MW gap). The city has just made this a priority and explores solutions such as thermal storage and low-carbon gases.

Taking the strategy further

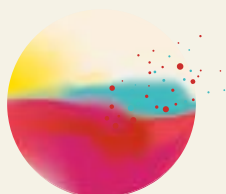
This started by using waste heat as an energy source whenever possible, with a development plan making sure the growing number of data centres provide waste heat to increase the energy systems efficiency.

Given the major role expected from district heating, the existing cooperation with the local utility Mainova will be increased. Even though district heating proved to be the system with the total lowest cost for providing 100% renewable heat (gap between 50-100 €/MWh compared to decentralised solution) – this will require a change of business model for the local utility, to integrate more and more heat from third-party producers.

Why does it matter?

With the upcoming revision of the Energy Efficiency Directive, the European Union foresees to make it mandatory for cities above 35,000 to map renewable heating and cooling potential in their areas.

So, get inspired by Frankfurt and start using [Hotmaps!](#)



ENERGYCITIES

www.energy-cities.eu

 [@energycities](https://twitter.com/energycities)

 [@energycities.eu](https://www.facebook.com/energycities.eu)

BESANÇON

2 chemin de Palente
25000 Besançon, France

BRUSSELS

Mundo Madou
Avenue des Arts 7-8
1210 Brussels, Belgium