

## HEAT ROADMAP EUROPE 3 OUT NOW

**The Heat Roadmap Europe 3 (STRATEGO) study outlines how energy efficiency on the demand and supply side of the heat sector can simultaneously reduce energy demand, carbon dioxide emissions, and energy costs in five EU Member States:**



**Czech Republic, Croatia, Italy, Romania, and the United Kingdom. All three countries will require more heat savings in the buildings, an expansion of district heating in the cities, and more electric heat pumps in the rural areas. In total over €1 trillion of investment is required across all five countries, but these investments will result in a net reduction in energy costs. The final reports and maps are available here: [www.heatroadmap.eu](http://www.heatroadmap.eu).**



## AUTHORS



## SUMMARY

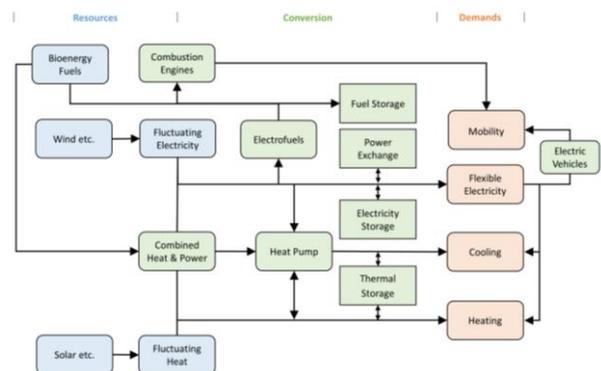
Heat Plan Denmark was the first ever study that combined local mapping of the heat demand with national energy planning to create a holistic heat strategy for an EU Member State. It outlined how various solutions could be combined in the heating sector of Denmark, to simultaneously reduce energy costs and decarbonise the Danish heating sector. It was first published in 2008, with a follow-up study in 2010, both of which were instrumental in defining Danish policies for the heating sector.



In 2012, the first Heat Roadmap Europe study was published (HRE1), where the Heat Plan Denmark methodology was applied to the EU energy system. In this study, Europe was modelled as one energy system, since the primary objective was to establish if the Heat Plan Denmark methodology was relevant in an EU context, rather than to define an 'optimum' heating solution. During HRE1 it became apparent that some crucial knowledge was missing to adequately design and analyse the heating sector in Europe, including suitable data, tools, methodologies, and results. To begin addressing this issue, HRE1 was the first study ever to:

- Model the electricity, heating, cooling, industry, and transport sectors of Europe on a one-hour time resolution, using the EnergyPLAN tool ([www.EnergyPLAN.eu](http://www.EnergyPLAN.eu)) based on the Smart Energy System concept ([www.SmartEnergySystem.eu](http://www.SmartEnergySystem.eu))
- Develop a 1 km<sup>2</sup> thermal atlas of the heat demand in Europe, currently known as the Pan-European Thermal Atlas (Peta)
- Quantify the amount of excess heat available from power plants, industry, and waste incineration in Europe

## Smart Energy System

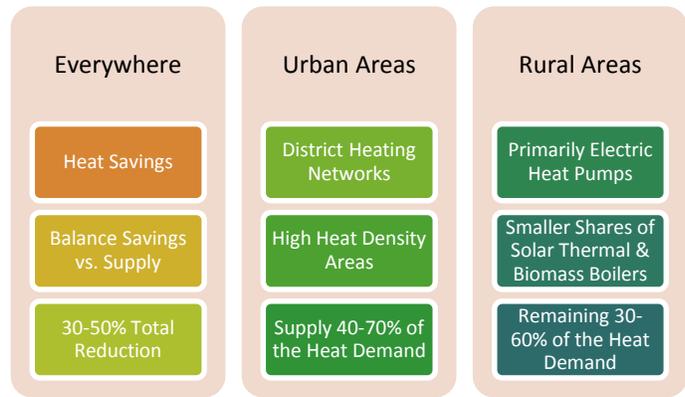


Using the new data, tools, and methodologies in HRE1, it was possible to demonstrate that district heating is extremely relevant for the decarbonisation of the EU heat sector. The heat demand is sufficiently high in cities across all of Europe to economically develop district heating and there is currently more excess heat in Europe than is required to heat all of the buildings in Europe.



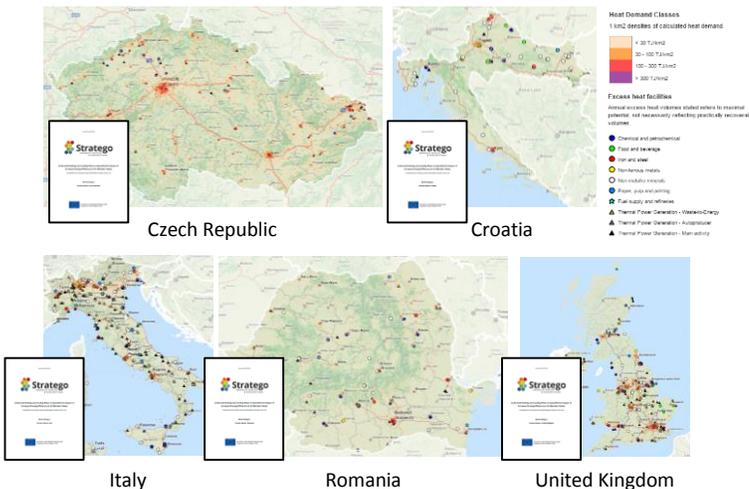
Heat Roadmap Europe 2 (HRE2) built on this work in 2013 by analysing the demand side of the heat sector as well as the supply side. HRE2 quantified the cost of implementing heat savings in the buildings in Europe, thus demonstrating how there is an economic balance between reducing the heat demand and supplying heat. In other words, it is essential to both reduce the heat demand and simultaneously improve the sustainability of the heat supply. In line with this, the key recommendations from HRE2 are:

- Implement heat savings in all buildings, but stop at the point where a sustainable heat supply is more cost-effective than additional heat savings
- Implement district heating in urban areas where the heat density is sufficiently high
- Implement electric heat pumps in rural areas, supplemented by small shares of biomass boilers and individual solar thermal



Heat Roadmap Europe 3 (HRE) was carried out as part of the STRATEGO project ([www.stratego-project.eu](http://www.stratego-project.eu)) and it was first published in June 2015. In HRE3, the Heat Roadmap Europe methodology was transferred from EU level to Member State level. Instead of modelling the EU energy system as one country, individual models and maps were developed for five EU Member States: Czech Republic, Croatia, Italy, Romania, and the United Kingdom. The results validated the same recommendations from the HRE2 study, demonstrating once again how a combination of heat savings, district heating, and heat pumps are the primary technologies required to cost-effectively decarbonise the heating sector. However, the HRE3 study provides individual recommendations for each of these five Member States.

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Furthermore, cooling is considered in detail for the first time in the HRE3. The current cooling demand is quantified for all 28 Member States in Europe and the maximum future cooling demand is estimated. The results indicated that the heat demand is much higher than the cooling demand almost all Member States, even those in the south of Europe. For example, the cooling demand in Italy is only ~15% of the heat demand today. There is a large potential for the cooling demand to grow in the future, even if all of the buildings in Europe use cooling, it is still unlikely to exceed the heat demand. Therefore, short-term efforts for cooling are more relevant at a local scale, but it could become a national challenge in the future if the demand grows.

Other parts of the STRATEGO project are still ongoing, which primarily involves informing and supporting different stakeholders about the solutions necessary in the heating sector. For example, the data, methodologies, tools, and results from Heat Roadmap Europe can be used by national authorities as part of the Article 14 in the Energy Efficiency Directive, which must be submitted to the European Commission by the end of 2015. Similarly, many of the actions required in the future will need to be driven by local stakeholders, so supporting them is a key focus in the remaining STRATEGO activities. In future studies, the Heat Roadmap Europe team will continue to expand the number of Member States included in the study and will improve the knowledge about the heating and cooling sectors.

#### LINKS

Heat Roadmap Europe Website: [www.HeatRoadmap.eu](http://www.HeatRoadmap.eu)  
 Pan-European Thermal Atlas: <http://maps.heatroadmap.eu>  
 STRATEGO Website: [www.stratego-project.eu](http://www.stratego-project.eu)

Heat Plan Denmark 1 and 2: <http://vbn.aau.dk/>  
 EnergyPLAN: [www.EnergyPLAN.eu](http://www.EnergyPLAN.eu)  
 Smart Energy System Concept: [www.SmartEnergySystem.eu](http://www.SmartEnergySystem.eu)

#### ACKNOWLEDGEMENT

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