



2050

Heat Roadmap Europe

A low-carbon heating and cooling strategy

Heat Roadmap Europe 4 Brief Overview

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 695989.

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Heat Roadmap Europe 1, 2, 3, and 4

- Study 1 (2012): will **district heating** play a role in the decarbonisation of the European energy system?
- Study 2 (2013): what is the balance between **heat savings and heat supply** at an EU level?
- Study 3 (2015, STRATEGO WP2): low-carbon **heating and cooling strategies** for 5 member states
- Study 4 (2016-2019): low-carbon **heating and cooling strategies** for 14 member states



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General Information

- Heat Roadmap Europe (4)
 - Acronym: HRE(4)
 - Project Number: 695989
- Budget:
 - ~€2 Million
- 14 x Partners
- 6 x Board Members
- 7 x Work Packages
- 10 x Milestones
- 38 x Tasks
- 45 x Deliverables



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EU Map of HRE4 Partners & Advisory Board



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Heat Roadmap Europe 4

Overall Aim

To identify how 14 EU countries can cost-effectively decarbonise their heating and cooling sectors...

... by creating scientific evidence to support long-term decision making

...by quantifying the impact of various alternatives

...to empower the transition to a low-carbon energy system



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Heat Roadmap Europe 4

- Quantifies how to decarbonise the heating and cooling sector for 14 EU countries
- Countries are the **14 largest** in order of heat demand and therefore, account for 90% of the heat demand in Europe
- Quantification includes:
 - Energy consumption
 - Carbon emissions
 - Energy costs
- Key result will be a **low-carbon pathway for each country**, outlining how to decarbonise heating and cooling by 2050
- Heating and cooling strategy will be in line with a full decarbonisation of the other sectors in the energy system, which are electricity and transport



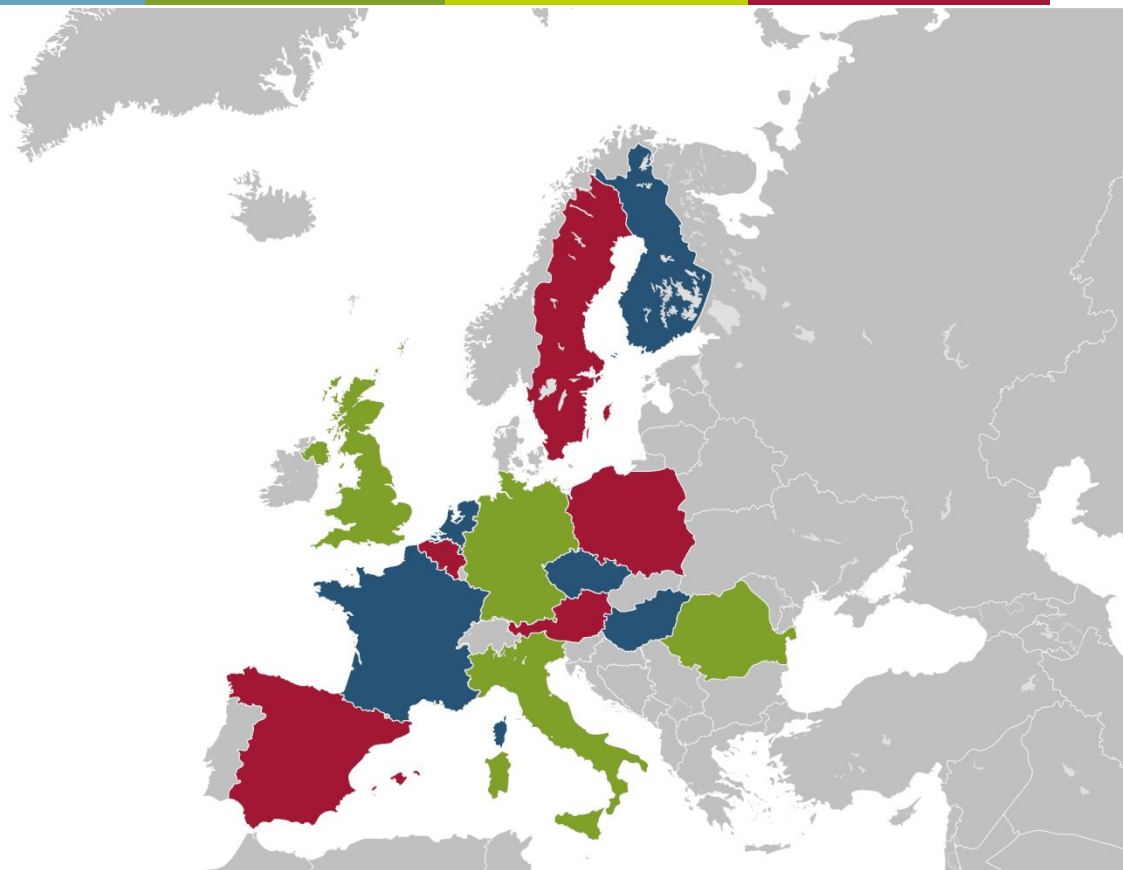
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HRE4 Countries: 14 Largest EU Countries by Heat Demand = 90% of EU Heat

1. Germany
2. France
3. United Kingdom
4. Italy
5. Poland
6. Spain
7. Netherlands
8. Sweden
9. Belgium
10. Czech Republic
11. Romania
12. Austria
13. Finland
14. Hungary



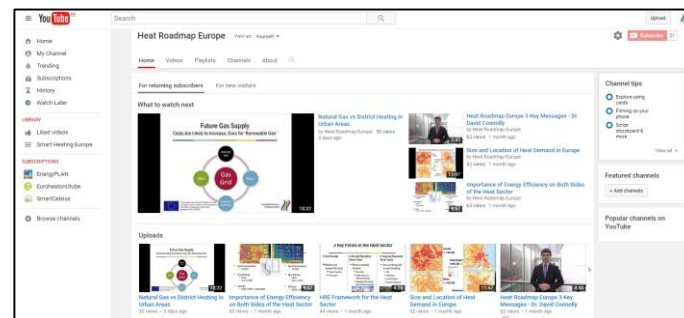
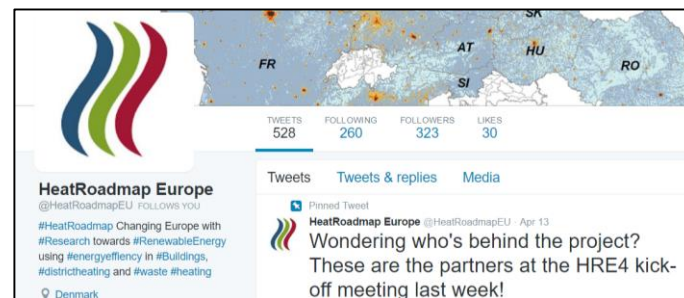
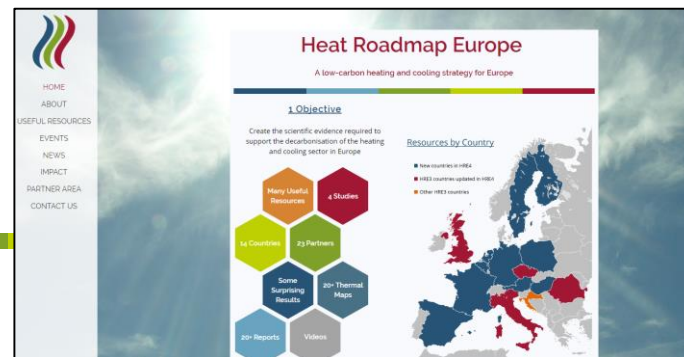
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Example of Results for Each Country: UK



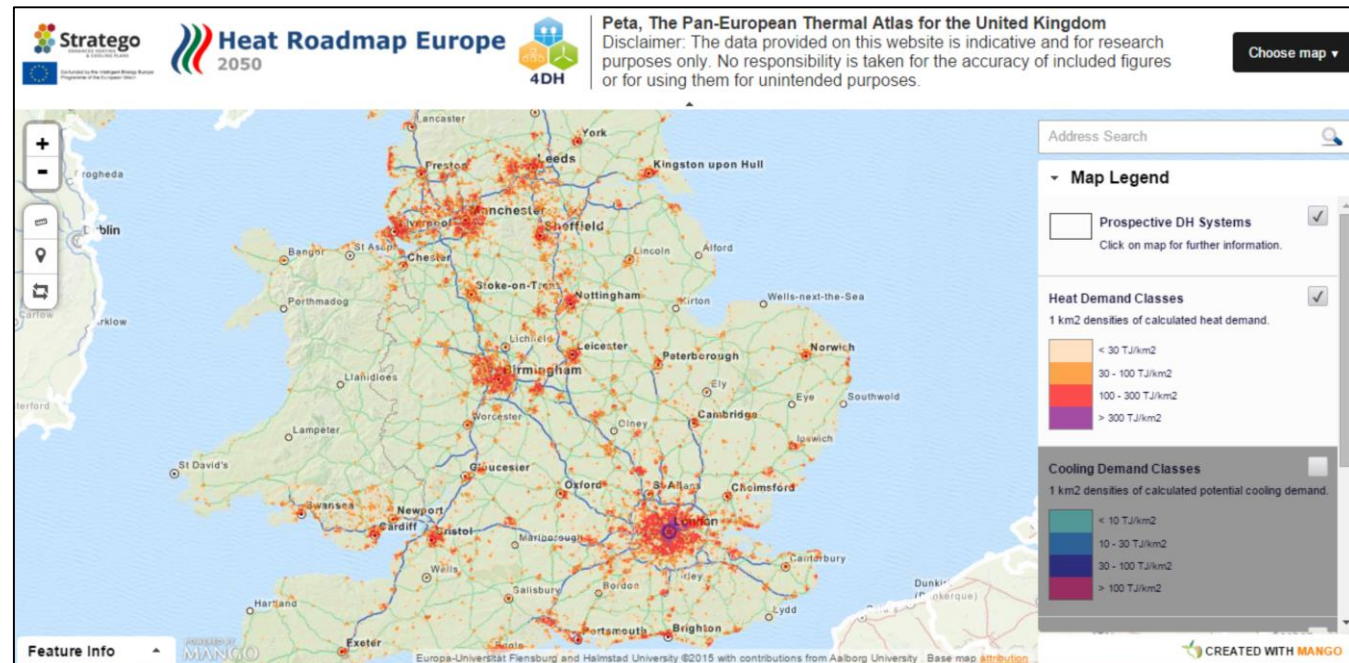
- 480 TWh: Total heat demand in buildings
- 410 TWh: Potential Excess Heat Available (excluding nuclear)
- 65 TWh: Renewable Heat Potential in DH areas (excluding biomass)
- Heat Savings can cost-effectively reduce the demand by 40% (estimate)
- District heating can provide 70% of the heat demand, due to high heat densities ($>100 \text{ TJ/km}^2$), compared to $<5\%$ today

Can reduce:

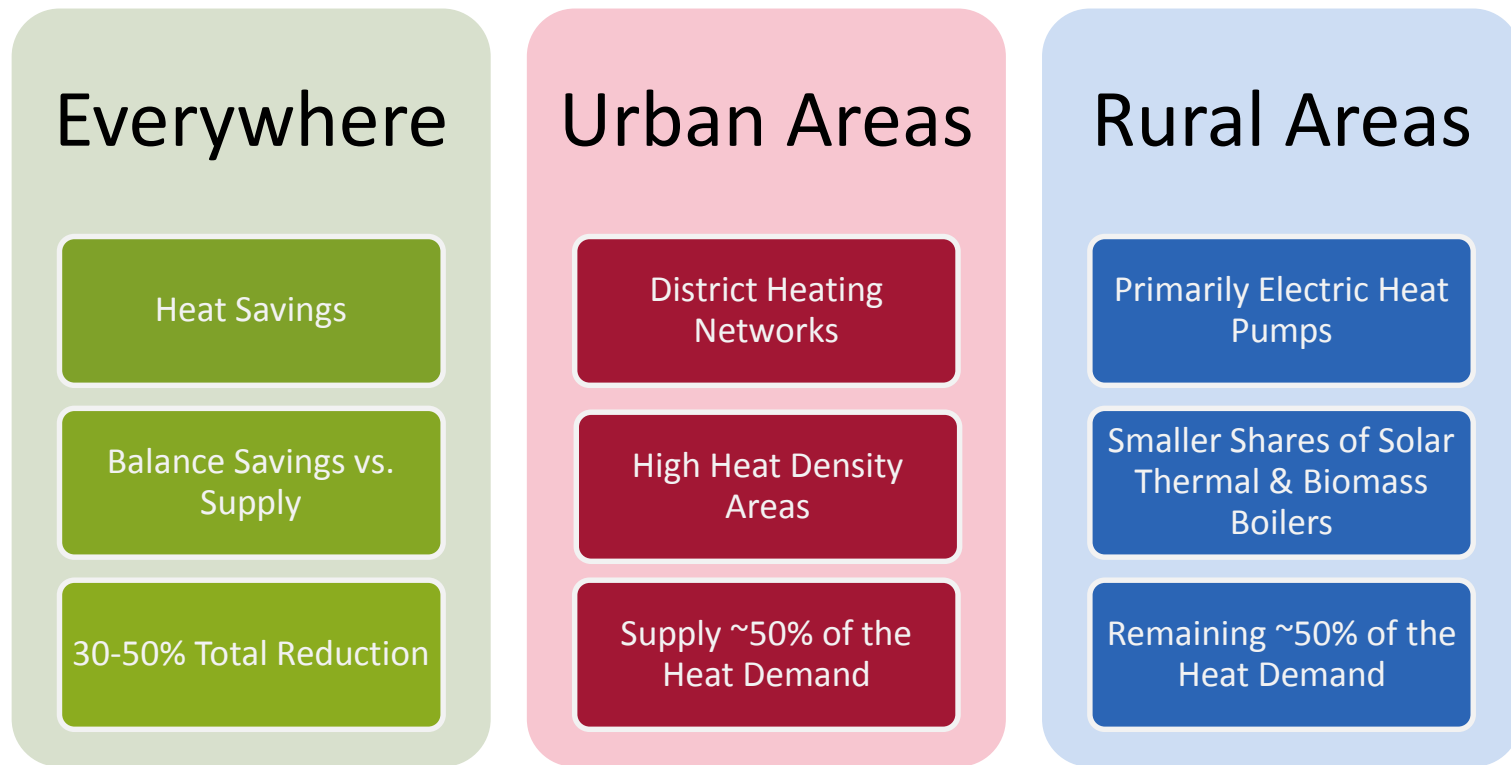
- Cost: -10%
- Demand: -20%
- CO₂: -25%

Can Increase:

- Renewables
- Jobs



Key Recommendations for the Heat Sector



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