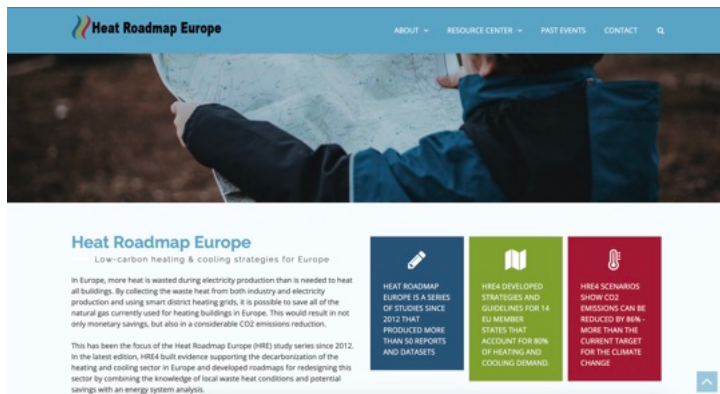


Heat Roadmap Europe: Low-Carbon Heating & Cooling Strategies for Europe



Good to Know

The project emphasizes that achieving the desired outcomes, such as a 30% reduction in space heating energy consumption by 2050, requires strong and effective policy frameworks. These frameworks need to focus on increasing refurbishment rates, expanding district heating and supporting the transition to renewable energy sources.

Toolbox Categories

Developing low-carbon heating and cooling strategies, called Heat Roadmaps, by quantifying and implementing changes at the national level for 14 EU Member States, which together account for approximately 85-90% of total heating and cooling in Europe.

- Country:** Europe
Category: Technical
Media: Guide and Application
Source: <https://heatroadmap.eu/>
Summary:

Heat Roadmap Europe (HRE) is an interactive application that offers low-carbon heating and cooling strategies for Europe, benefiting stakeholders such as government and the energy industry. Through built evidence and energy system analysis, HRE4 supports the decarbonization of the heating and cooling sector by integrating local waste heat conditions and potential savings. This tool provides valuable insights into redesigning the heating and cooling sector, offering users a roadmap for transitioning to more sustainable energy systems. By identifying opportunities for improving energy efficiency and utilizing waste heat, HRE facilitates informed decision-making at the local level, contributing to Europe's broader goals of reducing carbon emissions and transitioning to renewable energy sources. Its user-friendly interface and comprehensive data make it an attractive resource for policymakers, energy planners and other stakeholders involved in the heating transition across Europe.

PROJECT OVERVIEW

Title: Heat Roadmap Europe (HRE)

Objective: To provide scientific evidence and strategies to support the decarbonization of the heating and cooling sector across Europe, aligning with global climate goals.

Duration: 2012 - 2019 (HRE4: March 2016 - February 2019)

Partners:

- Aalborg University (Denmark)
- Joint Research Centre, Institute for Energy and Transport (Netherlands)
- Halmstad University (Sweden)
- PlanEnergi (Denmark)
- Europa-Universität Flensburg (Germany)
- Fraunhofer Institute for Systems and Innovation Research (Germany)
- Utrecht University (Netherlands)
- University of Zagreb (Croatia)
- ARMINES/MINES ParisTech (France)
- TEP Energy (Switzerland)
- ICLEI
- Euroheat & Power
- EHPA
- BPIE (European Think Tank)

Approach: Heat Roadmap Europe (HRE) integrates spatial planning with advanced energy systems analysis to explore decarbonization strategies in the heating and cooling sector across 14 European countries, covering 90% of the market. The project develops and utilizes four key models: Peta4 for geographic mapping of energy demands and resources, FORECAST for detailed sectoral demand profiles, JRC-EU-TIMES for evaluating energy technologies in line with EU policy objectives and EnergyPLAN for simulating energy systems on an hourly basis. This comprehensive approach identifies cost-effective strategies to reduce fossil fuel usage and enhance system resilience, aiming to achieve significant CO₂ reductions by 2050.

TOOL EVALUATION

How to Use

1. **Build a Starting Point**
Create a baseline using current data and develop a future Business as Usual (BAU) scenario.
2. **Integrate Heat Savings**
Apply heat savings via the FORECAST model until their cost matches that of renewable heat, incorporating into Peta for spatial analysis and planning.
3. **Compare Network Solutions**
Use Peta to assess feasibility of network solutions (e.g., gas, district heating) and identify areas for alternative technologies, integrating findings into energy planning.
4. **Compare Individual Heating Solutions**
Evaluate areas without network solutions using Peta and FORECAST and assess impacts of various heating technologies with energy planning tools.
5. **Integrate Excess and Renewable Heat**
Assess potential heat sources (e.g., industrial excess, solar, biomass) using Peta and integrate into the system with energy planning for cost evaluations.
6. **Integrate Renewable Electricity**
Optimize electricity use with CHP and heat pumps and model impacts of renewables on the heating and cooling sectors in EnergyPLAN.

7. Optimize and Develop Heat Roadmaps

Finalize and optimize scenarios for cost-effectiveness, analyze developments and create Heat Roadmaps for the 14MS.

Key Benefits

- Quantification and comparison of sustainable heat supply and technologies in Europe
- Hourly simulation of impact of district heating and cooling
- Heat Savings can cost-effectively reduce the total heat demand in Europe by approximately 30-50%

Cost Aspects

- Savings: Thermal storage is approximately 100 times cheaper than electricity storage, so introducing district heating and heat pumps will play a key role in accommodating larger penetrations of wind and solar electricity, in line with the Smart Energy System approach.
- Reduced reliance on imported natural gas.

Evaluation

- **Challenges:** Ensuring accurate and comprehensive data collection across all regions. Variability in regulations across Europe may affect implementation. Achieving consensus among diverse stakeholders on the proposed strategies.
- **Success Factors:** Strong alignment with the Paris Agreement targets. Use of existing, market-available technologies to ensure feasibility. Comprehensive, data-driven approach that supports both regional and European-level planning.

MORE INFORMATION FOR WORKSHOP PREPARATION

Contact: heatroadmapeurope@gmail.com, Prof. Brian Vad Mathiesen (Project coordinator)
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Willingness to engage in dialogue or workshop participation: no answer yet.

Possible support within REDI4heat: EHPA participated in the project.

Similar Approaches in the Toolbox: -

Further information on topic (with focus on target countries): -
