Centre for Sustainable Energy

THERMOS Overview

G-Cloud Service definition document
January 2026

Who we are

Centre for Sustainable Energy

The Centre for Sustainable Energy

We're a charity supporting people and organisations across the UK to tackle the climate emergency and end the suffering caused by cold homes.

We do this by sharing our knowledge, practical experience and policy insights. For over 40 years, we've supported people to take effective action on energy in their homes.

We help communities and local councils to understand energy issues, set priorities, and put plans into action. Our research and analysis focuses on making the energy system greener, smarter and fairer.

Find out more at www.cse.org.uk or watch our impact highlights from 2024-2025.

Supporting local delivery for net zero

We support local authorities of all types and sizes, to lead and drive forward energy-related net zero goals in a timely, socially just and locally resonant way.

We provide access to the knowledge, data and expertise required to drive forward decarbonisation. We pioneer new approaches and analytical techniques for local energy decision-makers.

CSE has pioneered open access, net zero planning tools used extensively by local actors such as THERMOS Solar Wizard Future Energy Landscapes and Impact Tool - combining rigorous technical modelling with proven engagement processes, ensuring support is robust and socially grounded.

What is THERMOS

Centre for Sustainable Energy

THERMOS for fast, cost-effective heat network planning

THERMOS simplifies planning for a futureproof energy system; helping urban areas or building clusters reach net-zero emissions and tackle climate change through heat decarbonisation.

Using state-of-the-art modelling techniques, THERMOS will identify place-based, user-specific optimal heat network solutions for any given area within minutes.

THERMOS estimates the heat demands of every building in a city and deploys a set of purpose-built algorithms to optimise the design and layout of local heating and cooling networks.

THERMOS offers robust support to heat network pre-feasibility studies, producing optimised network scenarios enabling those with most potential to be prioritised for further investment and analysis.

THERMOS solving your heat network planning problems

THERMOS delivers planning analysis deciding which buildings to connect and how to connect them, from the thousands of possibilities.

It allows users to identify the optimal solution without the need for extensive training or experience of heat network planning.

Key benefits

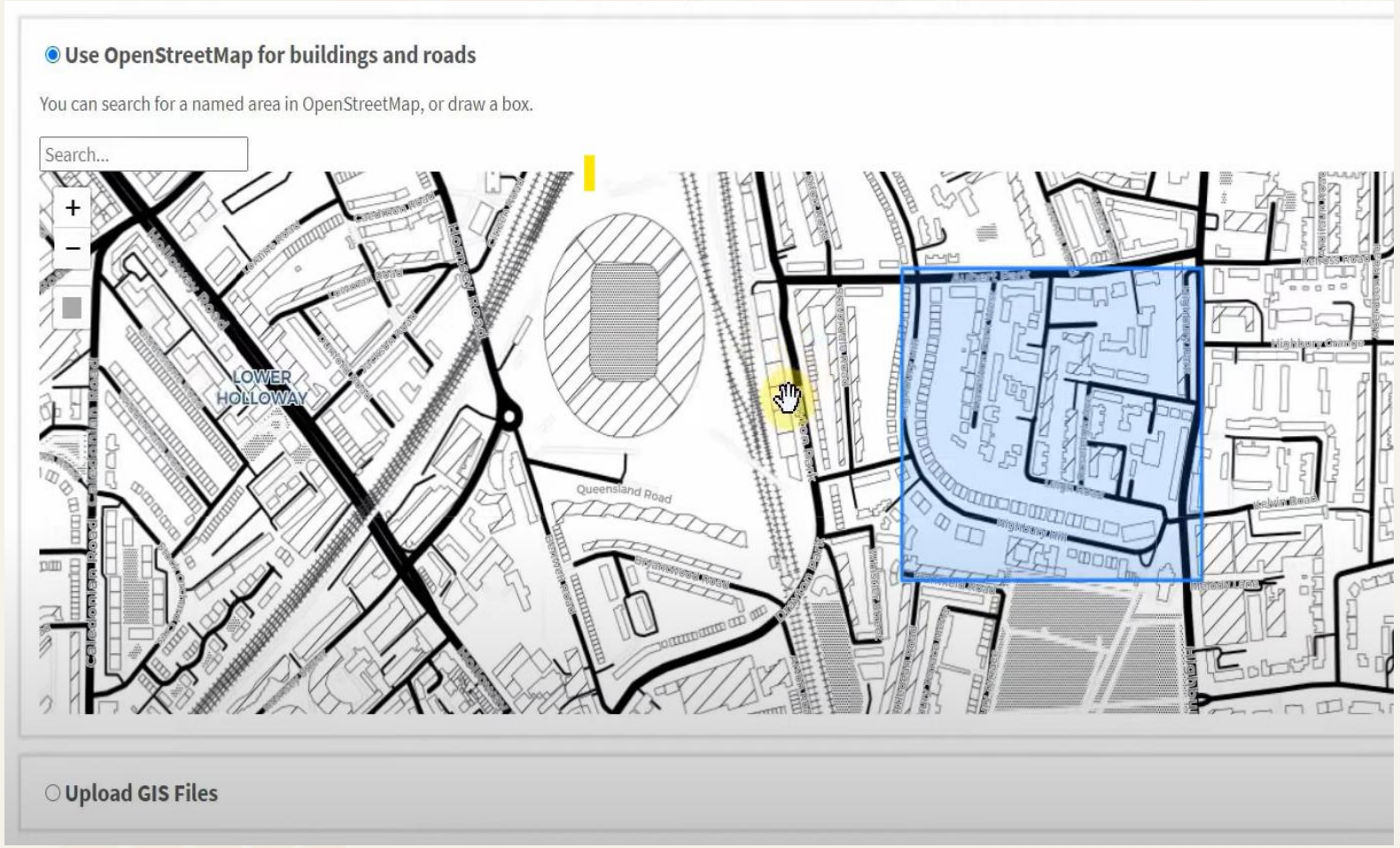
- Rapid results
- Rigorous and credible analysis
- Cost-effective solution
- Replicable and scalable
- Easy-to-use, accessible and shareable.

Preloaded with Open StreetMap

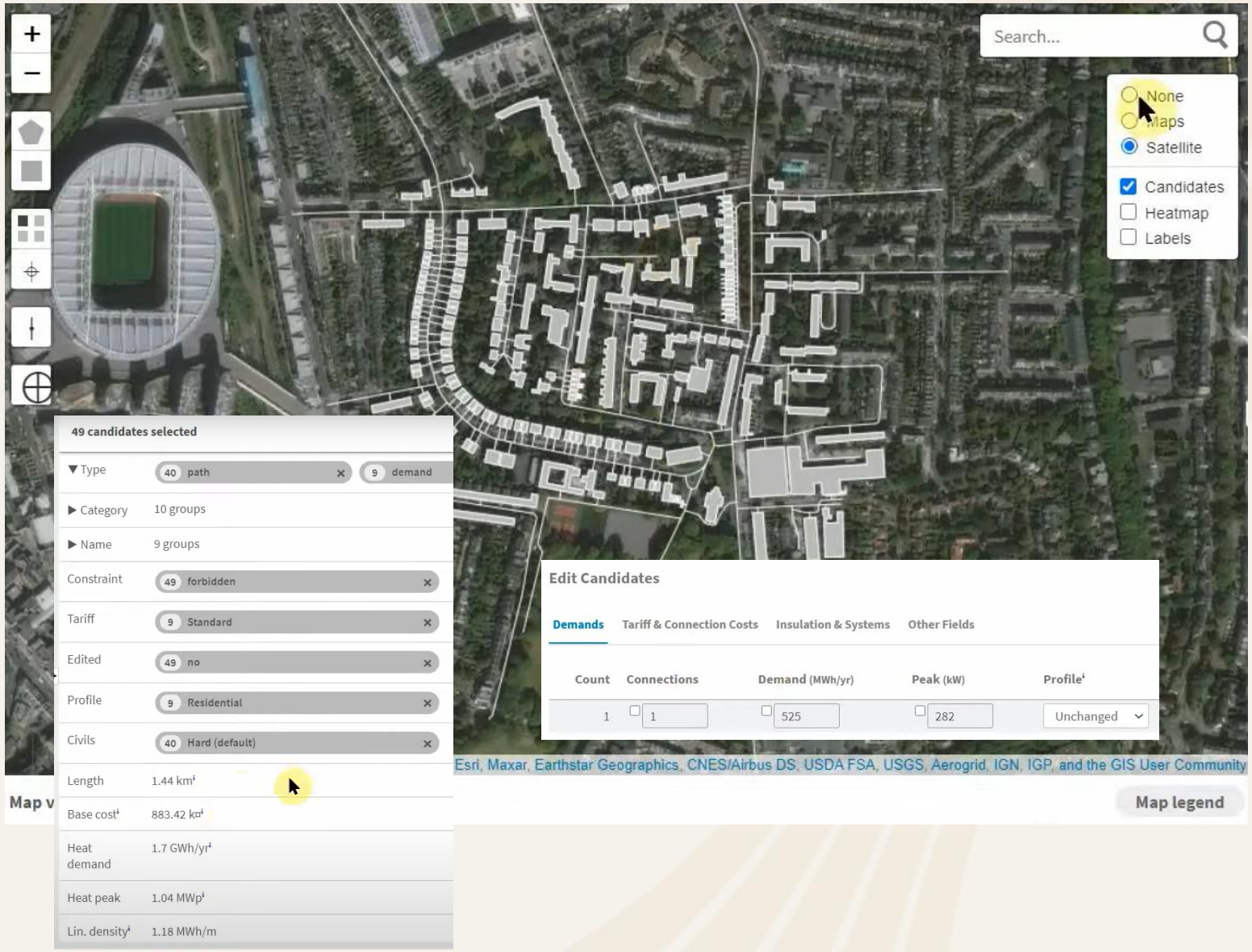
Heat demands and supplies are linked with buildings on a map, while potential heat pipe routes are associated with roads and paths in the map.

THERMOS is preloaded with OpenStreetMap data for basic analysis, removing the need for costly licensed data.

Accuracy can be further enhanced by uploading building height data or alternative geospatial datasets in a range of open GIS formats.



Automated energy demand estimation



THERMOS automatically analyses your chosen area, applying a sophisticated heat-demand model to deliver heat demand estimates.

Easily explore individual buildings or whole clusters to view clear summaries of peak and annual heat demand, helping you quickly understand energy needs.

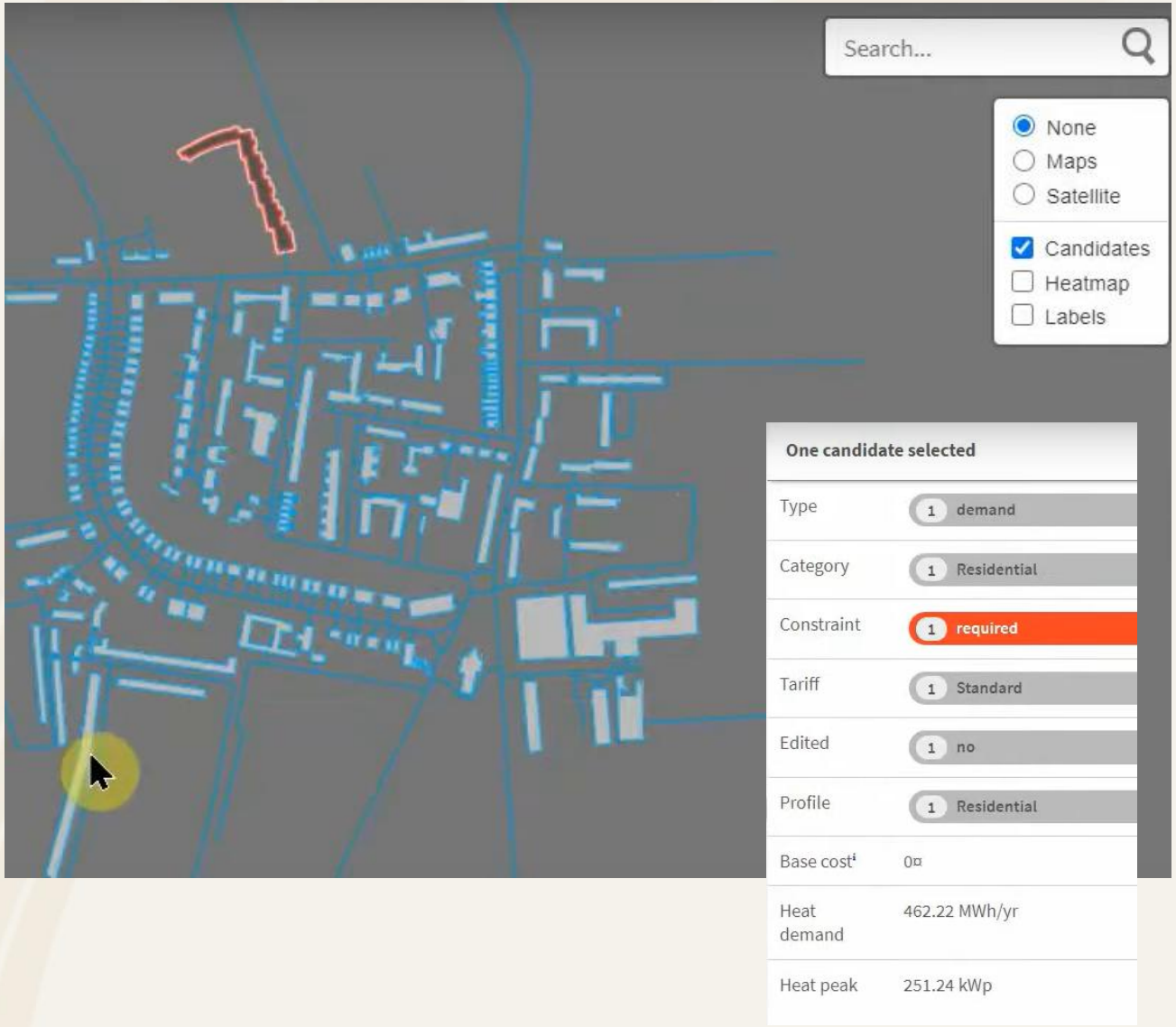
And when you have real-world figures, you can simply update the model with your own data, ensuring accuracy and confidence in every assessment.

User refinement of the scope of the heat network

Use simple tools to select the buildings and roads or paths to include in your heat network.

Refine your selection by marking buildings that are required to connect, are optional, or should be excluded.

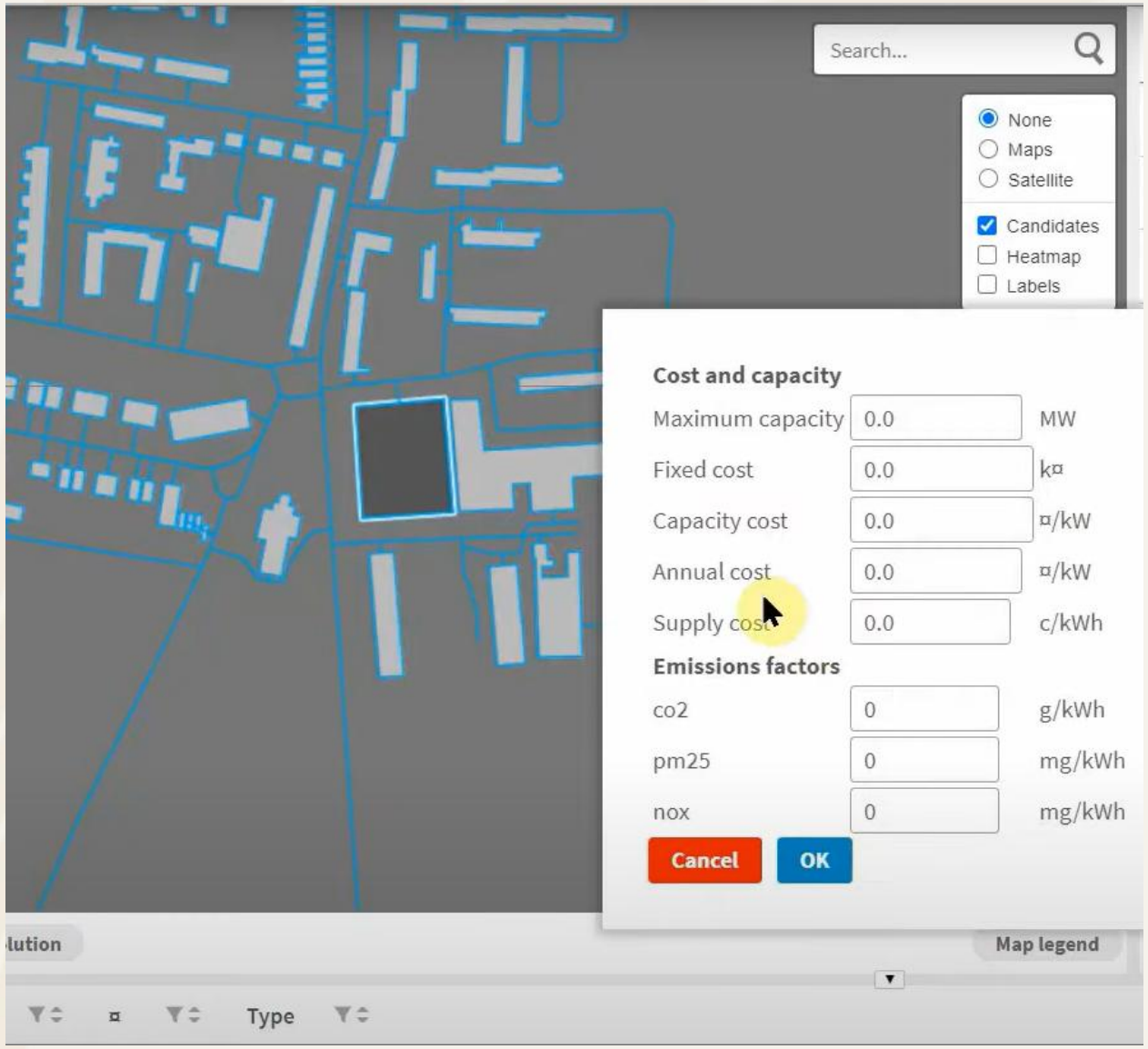
Constraints are displayed using distinct colours, providing quick and clear visual cues throughout the selection process.



Select a heat source

Choose the best location for your energy generation plant. Do this either by selecting an existing building or drawing your own custom point on the map.

Add key plant information such as maximum supply capacity and fixed and operational costs. This allows the model to generate accurate, robust cost benefit analysis tailored to your project.

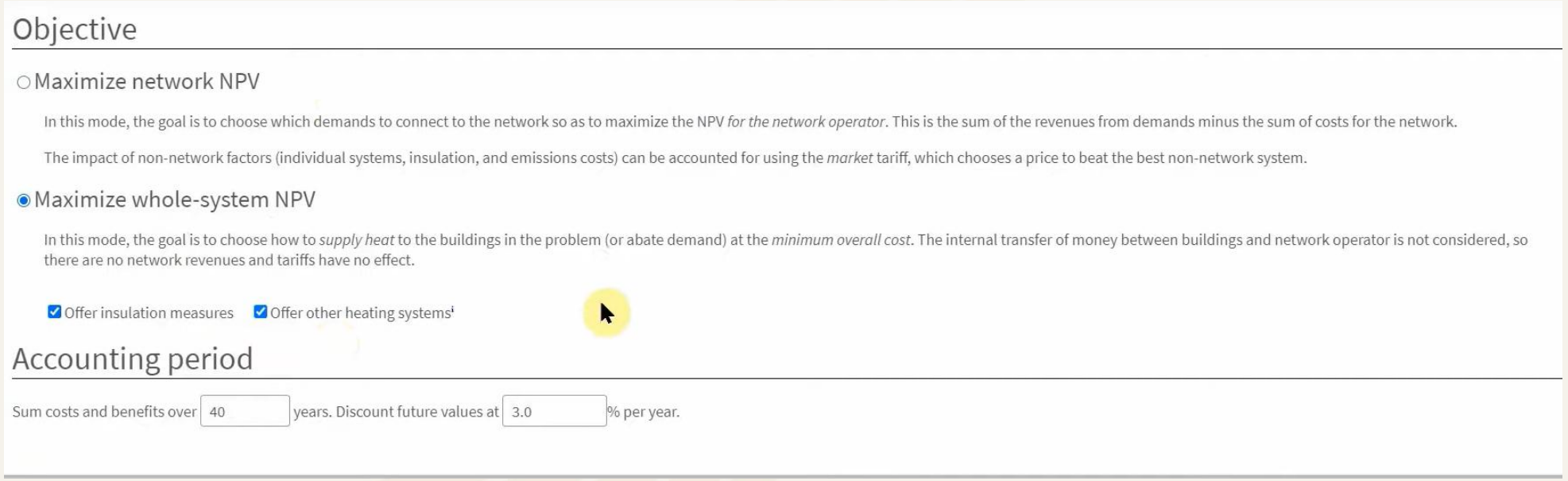


Uses clear, flexible financial inputs

THERMOS empowers you to assess heat networks using clear, flexible financial inputs that help you identify the most cost-effective and profitable network designs.

Users can fully customise tariffs, pipe costs, and other key financial parameters to match real-world conditions.

The model can run using two financial objectives: Maximise revenue by identifying the most commercially attractive network layout; or Minimise total heat-supply costs for an area by considering how measures such as insulation or individual heat pumps would reduce costs on or off a network.

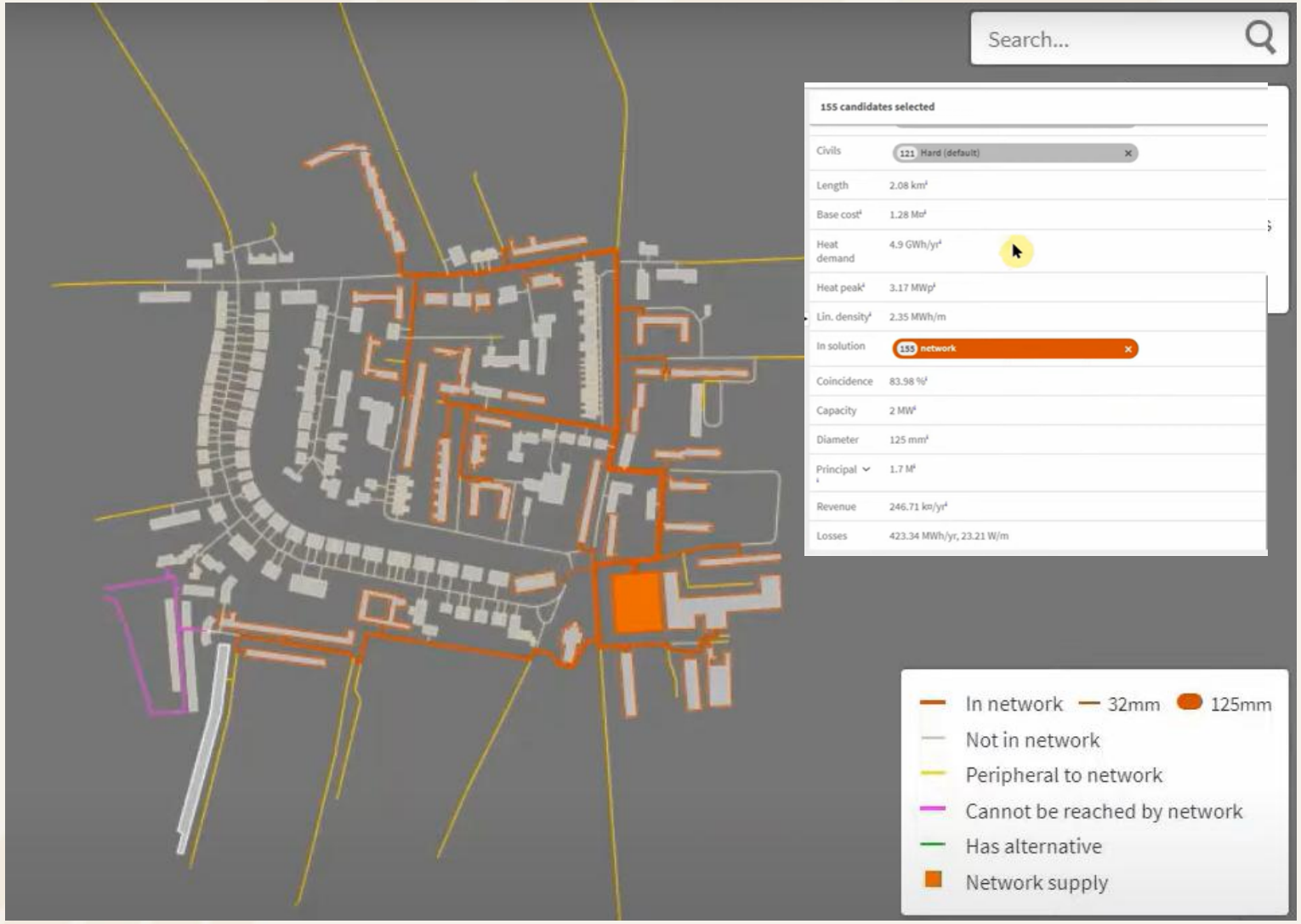


Rapid heat network generation and optimisation

In real time THERMOS creates the optimal heat network for your selected area based on your chosen financial model.

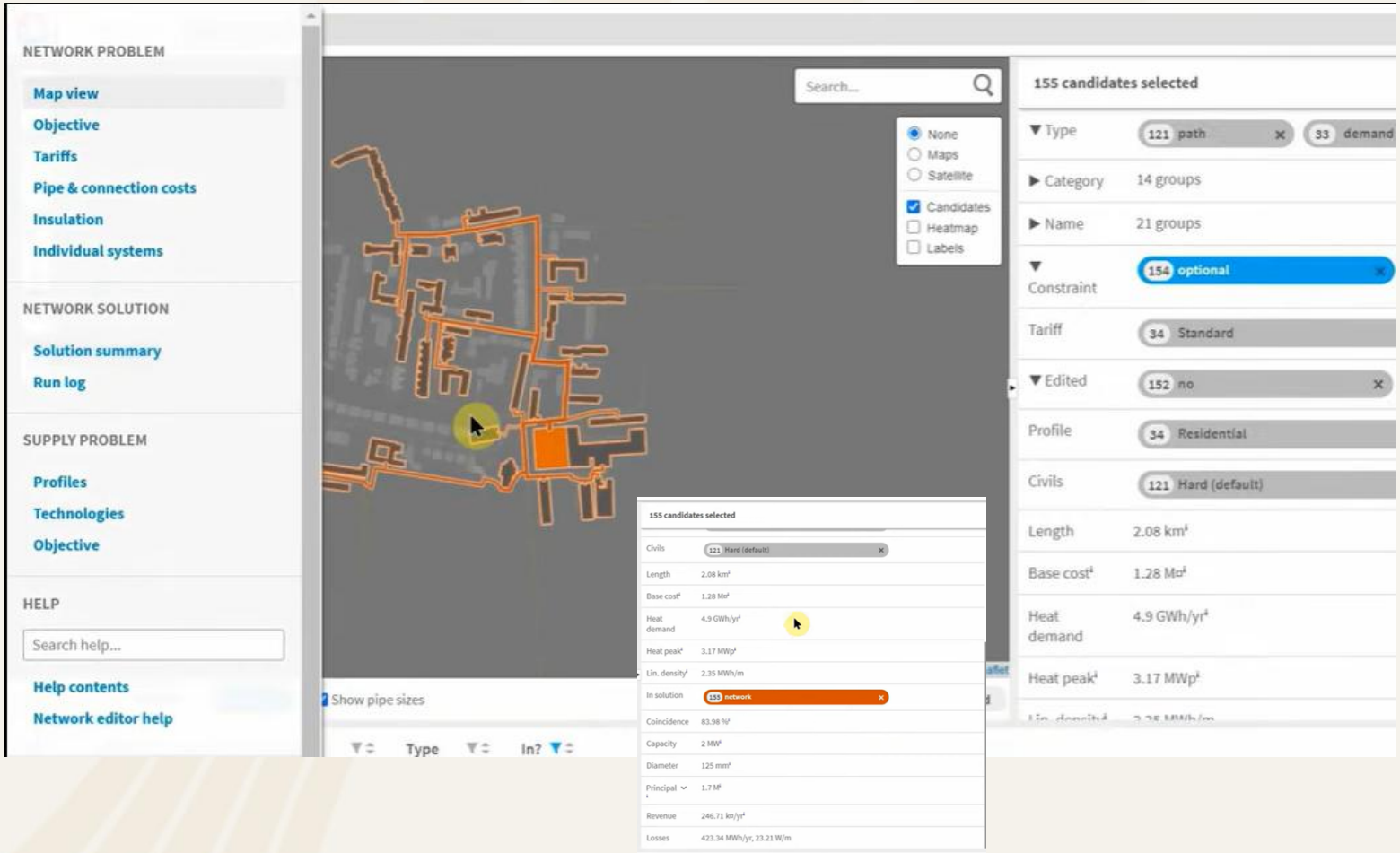
The resulting optimal network is clearly marked on the map, with a simple legend to help you quickly understand what has and has not been included.

To support deeper insight, THERMOS displays key project information alongside a detailed cost breakdown, helping you understand how the network is expected to perform based on net present value.



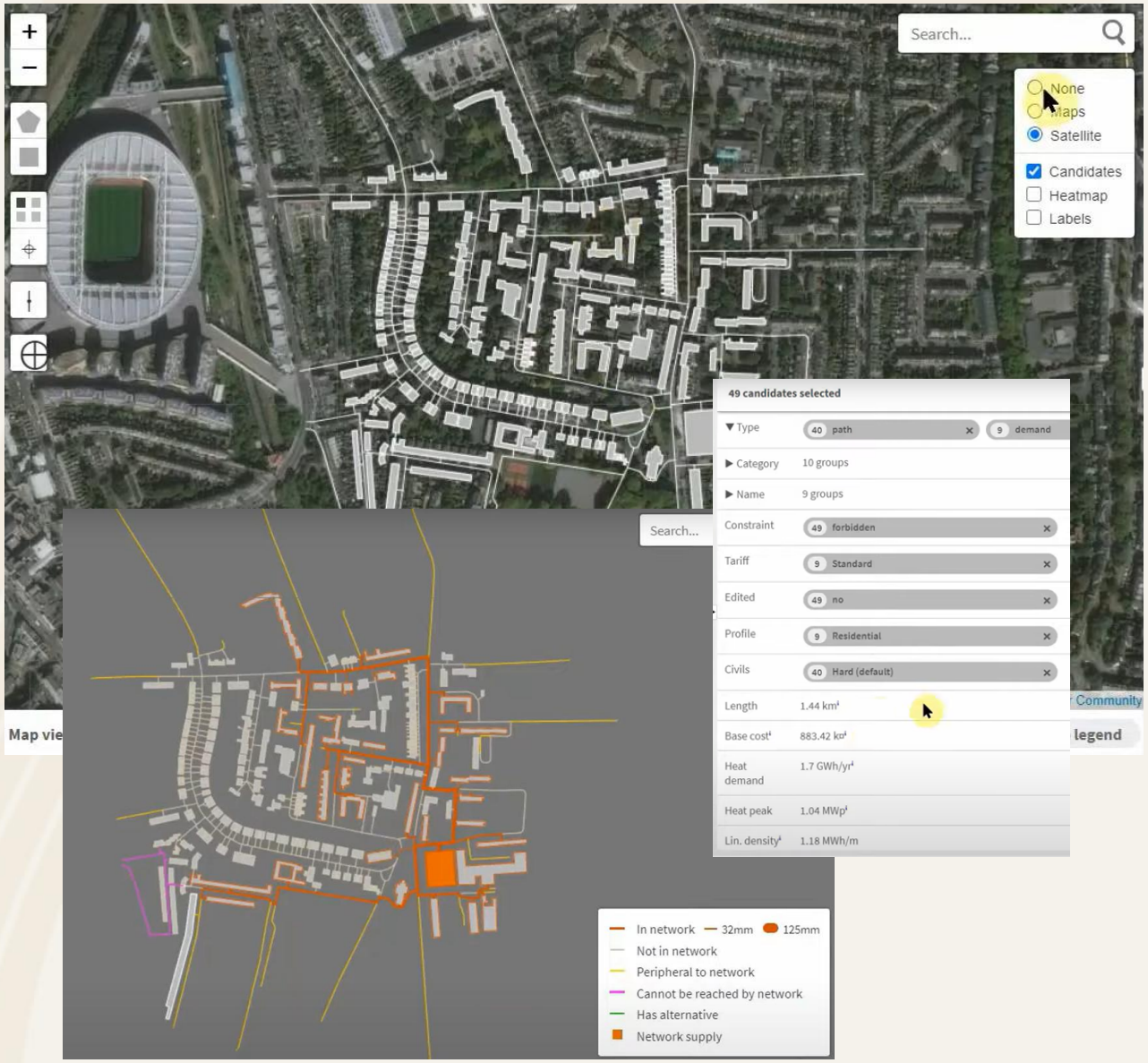
Quick and effortless to explore alternative scenarios

Easily adjust any aspect of your project, including adding more buildings or modifying the heat supply, before re-running the model to instantly see how each change impacts the network and its financial performance.



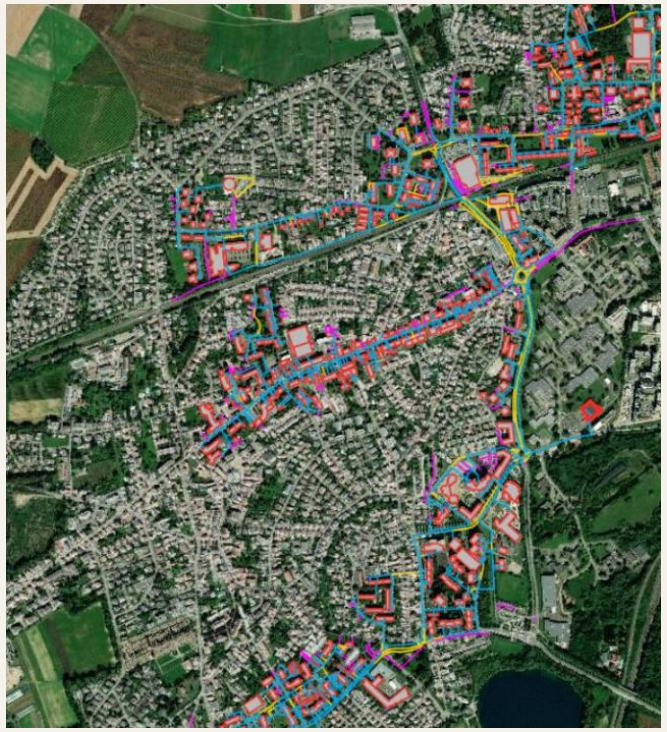
Easy to follow workflow methodology

1. Select your area from Open StreetMap
2. Automatically calculate energy demand.
3. Select your heat sources
4. Set financial objectives
5. Rapid generation of the optimal network
6. Change parameters and re-run the model

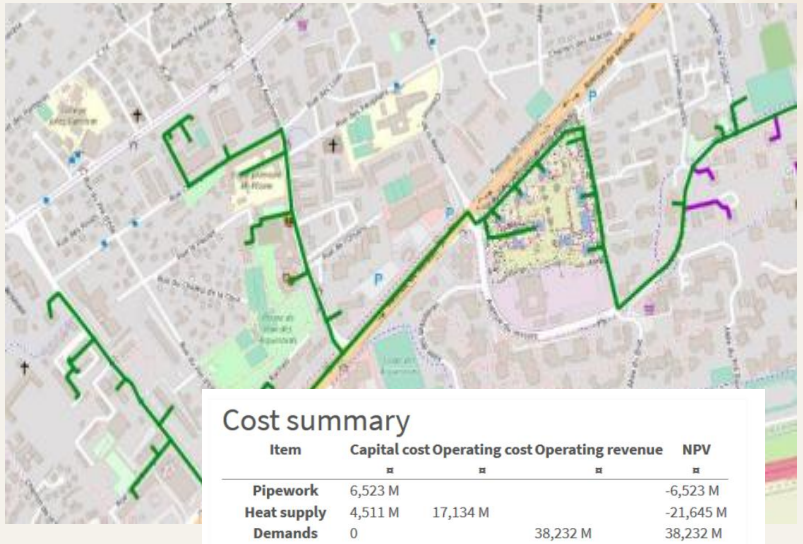


Use cases

Accelerate heat network planning on the path to net zero.



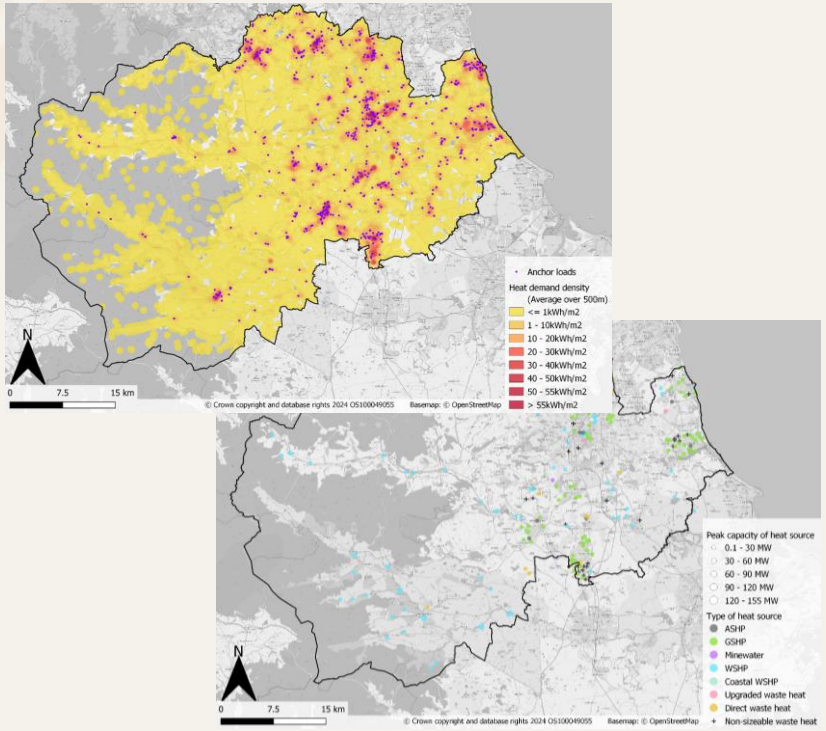
Accurate pre-feasibility study with detailed cost and benefit analysis



Cost summary

Item	Capital cost	Operating cost	Operating revenue	NPV
Pipework	6,523 M			-6,523 M
Heat supply	4,511 M	17,134 M		-21,645 M
Demands	0		38,232 M	38,232 M
Emissions		0		0
Network	*11,034 M*	*17,134 M*	*38,232 M*	*10,064 M*
Emissions		0		0
Individual systems		*0*		*0*
Insulation				

Heat source and heat demand mapping to quickly identify heat-network potential.



Keep in touch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Sign up for our monthly e-newsletter at cse.org.uk/newsletter.

Want to know more about THERMOS?

Visit the THERMOS website

Watch the videos

Start your free trial now

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