

# District Heating Pathways for a Climate-Neutral Padova

## Executive snapshot



Heating and cooling account for a significant share of urban emissions, yet they also offer one of the clearest opportunities for system-wide decarbonisation. In Padova, buildings and industry are central to the city's climate challenge, and district heating has been identified as a strategic solution within the Climate City Contract. The city aims to connect around 12.5% of residential buildings, 15% of tertiary buildings and 20% of industrial buildings to new low-carbon heat networks by 2030, helping to reduce emissions by more than 58,000 tonnes of CO<sub>2</sub> equivalent annually.

Through the City Expert Support Facility, a multidisciplinary team led by R2M Solution, together with EURAC Research and SEINGIM, delivered a comprehensive screening study to assess where and how efficient district heating and cooling could be developed across the city. The work combined geospatial analysis, digital twin modelling, technical and economic scenario assessment, and financing strategies to provide Padova with a practical roadmap for implementation.



# Knowledge Report

## THE IMPACT

The study equips Padova with the technical and financial evidence needed to turn district heating from a strategic ambition into an investable programme. By identifying viable locations, anchor customers and local heat sources, it reduces uncertainty and strengthens the city's ability to attract public and private investment.

District heating is expected to play a meaningful role in delivering Padova's climate-neutrality target by 2030. The city estimates that large-scale deployment could avoid more than 58,000 tonnes of CO<sub>2</sub> equivalent per year while improving air quality, reducing dependence on fossil fuels and creating local economic opportunities.

## THE APPROACH

The support was delivered between March and September 2025 under the City Expert Support Facility.

The study followed five integrated steps:

1. Heat mapping: GIS analysis of heating and cooling demand, urban form and potential renewable and waste heat sources.
2. Urban digital twin: Detailed modelling of selected districts and building stock to estimate present and future energy demand.
3. Scenario design: Technical and economic modelling of district heating and cooling systems.
4. Governance and finance: Assessment of ownership models, funding opportunities and delivery structures.
5. Implementation roadmap: A phased plan to guide project development and stakeholder engagement.

The analysis focused on Guizza, Arcella, Sant'Osvaldo, the historic centre and the Southern Industrial Zone .



## OUTCOMES AND LEARNING

The study confirmed that Padova has one of the strongest district heating opportunities in Italy, with an estimated technical potential of approximately **350,000 MWh of distributed heat per year**, placing the city sixth nationally.

Key findings include:

- Strong potential to use **geothermal energy**, particularly in low-temperature networks supported by large heat pumps.
- Significant opportunities to recover **waste heat** from industrial processes, data centres and wastewater treatment plants.
- Identification of the **Southern Industrial Zone** as the most economically attractive pilot area due to the availability of high-temperature waste heat from Acciaierie Venete, low-temperature heat from InfoCamere's data centre, and wastewater energy from the Cà Nordio treatment plant.
- Development of financing pathways, including a reference scenario based on approximately **€25 million CAPEX** using a Design-Build-Finance-Maintain (DBFM) concession model

### What worked:

Combining urban planning data, advanced simulation and stakeholder knowledge created a much stronger evidence base than relying on high-level screening alone. The integration of technical, governance and financing analysis ensured that the study moved beyond theoretical potential to identify realistic implementation pathways.

### Transferable insight:

Cities can accelerate district energy development by first identifying anchor loads - such as hospitals, universities and industrial facilities - and matching them with nearby renewable or waste heat sources. This approach improves commercial viability and creates a strong foundation for network expansion.

## NEXT STEPS FOR THE CITY

- Padova plans to use the study as the basis for advancing priority projects through detailed feasibility work, stakeholder engagement and financing discussions. Immediate follow-on actions include collaboration with investment support services and participation in local Living Lab events involving Climate City Contract signatories.
- The city is now well positioned to move from screening to implementation, beginning with pilot networks that can demonstrate technical performance, financial viability and replicability across other districts.

### WANT TO KNOW MORE?



Learn more about [Padua](#)

Read the report: [Studio sul teleriscaldamento a Padova: +DHC4Padova](#) (in Italian)

Still got questions? Ask us:  
[hello@netzerocities.eu](mailto:hello@netzerocities.eu)

