

Toward district heating of the future: efficiency and sustainability in focus in USES4HEAT project

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At the General Assembly at FBK, 27 European partners discuss innovations in geothermal district heating for a sustainable energy transition with focus on demonstrators in Riva del Garda and Oslo

How to build the **district heating** of the future with **efficiency, sustainability and flexibility** in mind? This was the question posed by the 27 partners attending the General Assembly of the USES4HEAT European project, organized at FBK on Wednesday, October 30.

The General Assembly, which saw **50 representatives at the European level gathered at FBK in Povo**, discussed the progress of the USES4HEAT European project, which started in December 2023 for a duration of 4 years. USES4HEAT has received funding for 9.7 million euros from the European research program Horizon Europe out of a total budget of 12.4 million and is coordinated by the KTH Royal Institute of Technology, Sweden's leading technical university.

USES4HEAT will specifically develop at two demonstration sites – **Oslo in Norway and Riva del Garda in Italy** – two units for seasonal **thermal energy storage in an underground environment** (Borehole Thermal Energy Storage – BTES and Aquifer Thermal Energy Storage – ATES). The two units will be connected to large-scale district heating networks capable of storing and using various **sustainable heat** sources. The Riva del Garda district heating system, built since 2007 and operated by **Alto Garda Servizi**, currently supplies more than **300 customers in a 27-km grid**. Heat is generated by **Alto Garda Power's cogeneration plant**, which also supplies Cartiere del Garda paper mills. The primary power source is methane gas.

Eight partners will be engaged in **the Riva del Garda project**, which can count on a budget of **4.1 million euros**, 3 of which will come from Europe: Fondazione Bruno Kessler, through the Sustainable Energy Center, Cartiere del Garda, Alto Garda Power, Alto Garda Servizi, Hydra, Hiref, Endef, and Energenius.

The goal is to integrate **four different innovative technologies**:

1. new seasonal, large-scale ATES through advanced drilling technologies – provided by Hydra;
2. new groundwater high-temperature, low Global Warming Potential (GWP) heat pump connected to both ATES and district heating – provided by Hiref;
3. hybrid solar panels (PVT) – provided by Endef;
4. intelligent energy management through artificial intelligence, big-data and cloud-based computing tools – provided by Energenius.

FBK has been engaged in research projects on **geothermal energy for more than 10 years**, mainly on the province of Trento territory, characterizing its potential through special mapping and monitoring the operation of various plants in different locations across Trentino, also supporting the PAT Geological Service.

FBK's Center for [Sustainable Energy](#) is involved in several activities for the USES4HEAT project, including baseline monitoring and planning of demonstration activities, modeling of district heating decarbonization through geospatial mapping and multi-objective dynamic optimization, transient modeling of the plant system, support for plant layout design, supervision of the experimental campaign and critical assessment.

The European project aligns well with the results of the scenarios developed by FBK for the new [2023-2030 PEAP Provincial Environmental Energy Plan](#), according to which **methane gas usage will have to decrease by at least 22 percent over the 2016-2030 period**, in a trajectory consistent with the full decarbonization (and fossil sources, including methane gas, phase-out) planned for 2050.



Also worth mentioning is that, following the European Union's [RED III directives](#) on **decarbonization and energy system security**, the **district heating and cooling sector will have to incorporate incremental shares of renewable energy, from 1 percent in 2024 to 34 percent in 2030.**

In the first 11 months of the project, preliminary geological and engineering design was initiated and completed, and the first exploratory survey will be conducted in early 2025.

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