TECHNOLOGIES

RELaTED will integrate present technologies into a new ULT DH concept, at distribution temperatures below commercially operative DH networks today.

DISTRICT HEATING SUBSTATION TECHNOLOGY

3FSs allow buildings to operate without local storage and to integrate buildings as distributed heat sources in the DH network.

HEAT PUMP TECHNOLOGY

District heating integrated renewable heat pump system will be integrated with the DH networks as its primary heat source, at sensibly constant temperatures at 30-45°C, depending on connection pipe of the primary loop.

BUILDING INTEGRATED SOLAR THERMAL SYSTEMS TECHNOLOGY

RELaTED will integrate two ST collector as components of the Building Integrated Solar Thermal (BILTST) solar loop. These are differentiated by their aesthetics and their geographic suitability:

Glazed ST collector system

All-polymeric solar collectors demonstrate aesthetic integration into the building envelope, overcoming existing installation barriers and reducing overall costs at the building site.

Unglazed ST collector system

The unglazed ST collector is integrated into a highly customizable architectural envelope in terms of aesthetics and integration into architectural projects.

RELaTED, Renewable Low Temperature District

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RELaTED

Low Temperature DISTRICT HEATING SOLUTIONS

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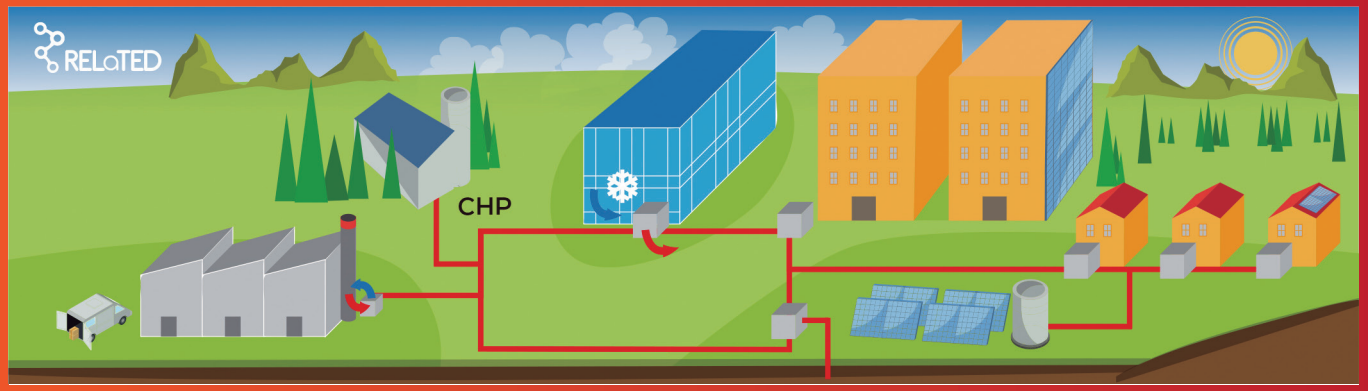

About
RELATED PROJECT

District heating is one of the most energy efficient systems to deliver heat in urban environments. DH is also identified as key system to aim the de-carbonization of heating energy in European Cities. Renewable and waste heat sources are foreseen at the same time as de-carbonized heat sources and the way to guarantee competitive energy costs with limited influence of fossil fuel supply price volatility.

Despite this fact, district heating is serving to a market share of only 12% of the European citizens today, when studies have shown that these systems can be expanded to a market share of 50% in 2050.

Such ambitious scenario requires a conversion of the actual DH concept. In the forthcoming energy market, DHs need to evolve regarding:

- The reduction of their operation temperature to integrate low-grade industrial heat sources.
- The introduction of larger shares of renewable energy sources.
- The introduction of distributed heat sources
- To guarantee economic viability of DH heat load reduction due to the evolution of Near Zero Energy Buildings.

Concept
ULTRA-LOW TEMPERATURE

RELaTED will provide an innovative concept of decentralized Ultra-Low Temperature (ULT) network solution that can pave the way for expanding and modernizing existing district heating networks as well as introducing and establishing district heating in emerging EU markets.

This project, funded under the European Union's Horizon 2020 research and innovation programme, aims to develop a robust ultra-low temperature concept, which allows for the incorporation of low-grade heat sources with minimal constraints.

Also, ULT DH reduces operational costs due to fewer heat losses, better energy performance of heat generation plants and extensive use of de-carbonized energy sources at low marginal costs.

EXPECTED RESULTS

- Increase the operational efficiency of heat production.
- Incorporate renewable energy sources; reject heat, industrial waste heat, combined heat and power production.
- Reduction in the final cost of heat due to lower distribution heat losses.
- Reduction of Greenhouse Gas Emissions and air pollution.
- Develop a heat price system, which allows integrating variable energy price schemes.

DEMONSTRATIONS

Considering the complexities and particularities of each district heating (DH), RELaTED concept is being implemented in four different DH networks covering extremely different climatic conditions, construction traditions, urban density, pre-existing district scheme, ownership and energy services contract schemes:

BELGRADE (SERBIA), LARGE DH NETWORK
The district heating network of Belgrade delivers 3500GWh to approximately 50% of the city. RELaTED will deploy the low temperature conversion of one subnetwork comprising several households and apartment build-ings with modern insulation levels. Tentative network temperature levels of ~50-55°C are expected in this conversion.

VINGE (DENMARK), NEW URBAN DEVELOPMENT
RELaTED will demonstrate its ULT DH system for new low-energy developments with large shares of renewable energy with the best possible fiscal solution for homeowners and district heating companies and minimal environmental impact.

TARTU (ESTONIA), BIOMASS BASED DH
94% of the energy delivered to Tartu consumers is obtained from biomass and peat. RELaTED will develop a heat purchase strategy from one or several industrial waste heat producers with an estimated power of 0.5 to 1 MW.

IURRETA (SPAIN), CORPORATE DH NETWORK
Within RELaTED will be performed ULT conversion of the DH network, with LT conversion of heat delivery systems within buildings. Operation temperatures in the main distribution network will be adapted for at ~40-45°C.