

THE PROJECT

Traditional 3rd generation District Heating networks distribute energy from a centralized generation plant to a number of remote customers.

Fourth generation networks advance on this basis by integrating a limited number of well predictable, high-temperature energy sources: recovering such energy is complicated and rarely realized.

The largest amount of waste heat available in the urban environment is rejected by low temperature sources and service facilities. The proposed solution is to **recover such low temperature energy into DH networks by means of heat pumps.**

LIFE4HeatRecovery steps further beyond by developing and demonstrating a new generation of smart district heating and cooling networks, where low-temperature waste heat sources can be as distributed as consumers are.

LIFE4HeatRecovery solutions will integrate effectively multiple waste heat sources from urban facilities and service buildings, where they are available along the DHC network, by managing energy at different temperature levels.

This will guarantee **flexibility and scalability** to the network design, and reliable, secure and clean thermal energy to the consumers.

Four real sites will be used to demonstrate the developed waste heat recovery solutions.

LIFE4HeatRecovery will also elaborate **innovative financing mechanisms** based for example on active participation models.

LIFE4HeatRecovery' **social dimension** will contribute to create new business opportunities and new participation, allowing energy users to become protagonists in the heating and cooling market.

OBJECTIVES

- Demonstrate opportunity and effectiveness of waste heat recovery from multiple urban sources
- Verify management strategies for district heating networks exploiting such energy sources
- Prove business models allowing thermal energy purchase by several energy providers
- Develop financial schemes enabling the mobilization of large public and private investments



LIFE 4 HEAT RECOVERY



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LEARN MORE ABOUT THE PROJECT

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Low Temperature, Urban Waste Heat into District Heating and Cooling Networks as a Clean Source of Thermal Energy

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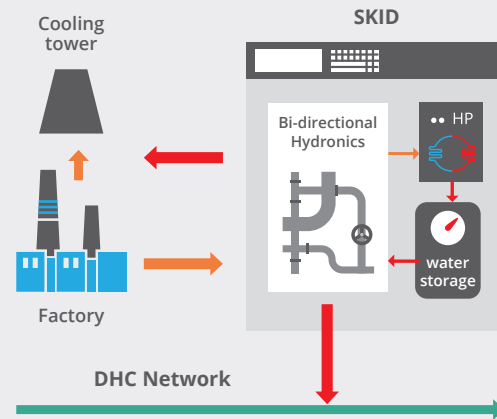
ACTIVITIES AND RESULTS

1.

Prefabrication, standardisation and modularity will be distinctive design drivers guiding the developments.

Prefabricated SKIDS will be designed and manufactured, including all necessary hydraulics, electric and electronic components.

Thanks to this strategy, **design and installation time and errors are minimised, while manufacturing cost reduction is pursued.**



Prefabricated SKIDS

Four prefabricated SKIDS will be devised:

- **2 solutions** including heat pumps **to recover heat in neutral-temperature networks**
- **2 installations** including heat pumps **to recover heat in 1 medium/high-temperature network**

The SKID hydraulics will enable bi-directional flow, so that both heat recovery and heat supply (i.e., heating and cooling) will be implemented at the connected site.

The SKIDS, designed to connect the waste heat source to the network, will be manufactured in selected factories before transportation on site and installation.



2.

Network management strategies will be studied, accounting for the full complexity of the built environment, and adjusting to thermal loads of old, refurbished and new buildings.

The management strategies will be **implemented at the demonstration networks** to infer effectiveness, viability and reliability.

A **database of energy environmental and economic performance** will be made available with respect to the assessed waste heat recovery solutions.



3.

Waste heat recovery brings multiple actors to play both the role of an energy producer and consumer, profiting from the waste heat provided to the network and moving forward from the actual "monopolistic" generation.

Business models will be studied allowing the district heating and cooling networks to exchange energy with multiple "prosumers".

The elaboration of business models will be **supported by geo-localised data of waste heat sources** available on the territory.



4.

Financing and risk management solutions will be assessed based on energy and environmental performance and on the elaborated business models.

This is believed to allow utility companies and investors to be better involved in the sector, consequently permitting to **mobilize large private-public investments.**



Recovering low temperature waste heat reduces primary energy use, local emissions and mitigates heat island effect in cities.



DEMONSTRATION SITES

Four real sites will be used to demonstrate the waste heat recovery solutions developed:

- **2 neutral-temperature network solutions** will be developed by the beneficiaries Cogeme **in Ospitaletto** (near Brescia, Italy) and Mijndijk **in Heerlen** (The Netherlands)
- **2 installations in a medium/high-temperature network** will be implemented by Aalborg Forsyning, Heatflow, Søren Jensen and Enisyst **in Aalborg** (Denmark)