



LIFE 4 HEAT RECOVERY



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

THE PROJECT

LIFE4HeatRecovery will demonstrate that a new generation of highly efficient district heating and cooling networks will be able to **recover a range of urban waste heat available at low temperature** within urban districts.

OBJECTIVES

- To demonstrate **opportunity and effectiveness** of waste heat recovery from multiple urban sources
- To verify **management strategies for district heating networks** exploiting such energy sources
- To prove **business models** allowing thermal energy purchase by several energy providers
- To develop **financial schemes** enabling the mobilization of large public and private investments

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.**



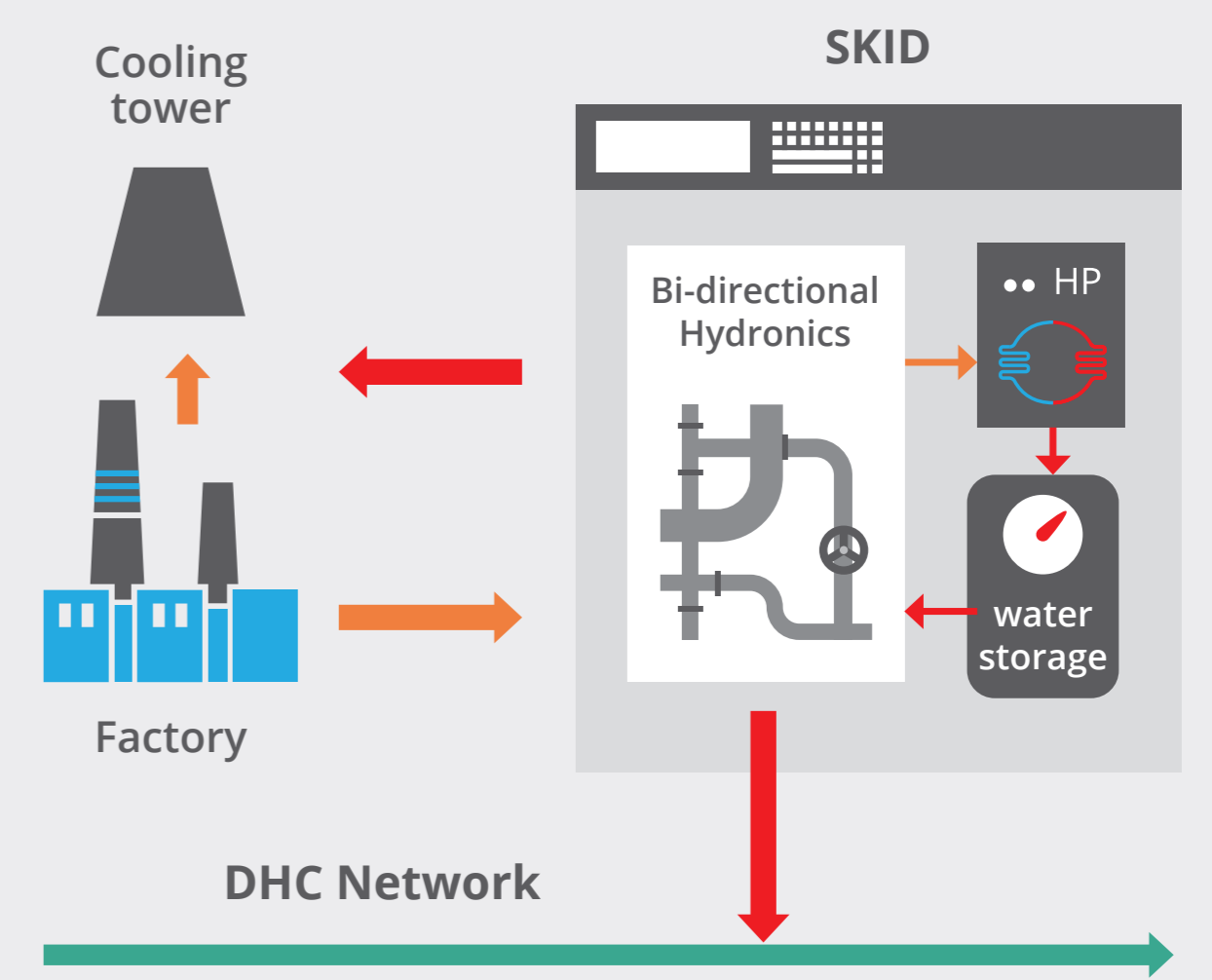
Prefabricated SKIDS

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.**



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 Mijwater 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)



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