SmILES Use Case by EDF

# Heat peak shaving

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**Keywords**: District Energy Management

## Objective

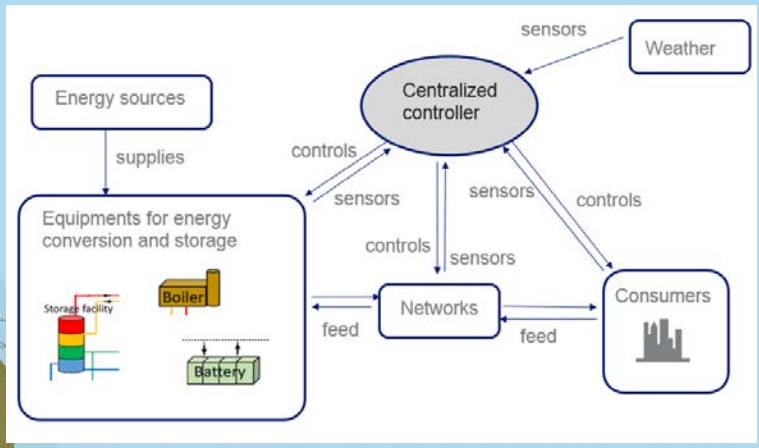
Reduce the maximum of the thermal losses

## Scope

District heating networks are dimensioned to cover the peak demand of the aggregated thermal load of all connected consumers. District heating networks with a large central feed-in (e.g. gas or biomass boilers) thus quite often operate at less efficient partial loads. This results in a lower production capacity utilization and increased losses due to oversizing the network components.
The deployment of distributed multi-energy infrastructures (power-to-heat technologies, thermal storage as well as decentralized local production) opens a smart solution to smooth the aggregated thermal load profile and spread the thermal production between the periods of high and low heat demand. Subsequently, a heating network can be better dimensioned, offering benefits for operational overall efficiency and lowering investment costs.

## Description

Distributed generation of heat can be produced directly from geothermal or solar sources as well as from combustion of biomass of natural gas, or indirectly via Power-to-Heat technology from PV or CHP electricity. The production patterns vary over a day or a year. Fluctuations can be balanced by thermal storage in aquifers, water tanks or phase change material. But, the interactions between the heat sources, storages and sinks have to be taken into account for an efficient utilization.
Therefore, a centralized energy management system is necessary to optimize the orchestration and the interactions between the energy carriers in place. In particular, it enables to balance the unequal spatial distribution of the distributed energy resource, power-to-heat technologies, thermal storage systems, and the end-users consumption.
This use case studies the optimal centralized energy management between local multi-energy infrastructures to perform heat-peak shaving.

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