

SmILES Use Case by EDF

Optimal design of local energy infrastructure

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Keywords: Planning of District Energy System

Objectives

1. Selection of energy carriers
2. Sizing of the elements of a local energy infrastructure

Scope

Urban transformation and development enable to built up energy infrastructures more respectful to the environment, within socially and economically accepted boundaries.

A Local multi energy infrastructure can consist of many different energy production technologies - gas-driven boilers and CHPs, HPs, PV panels - DHN, electricity and heat storage facilities as well as imports and exports of electricity from the grid. The electricity and heat demands have to be provided at all times, either by local production or by imports from the superior grid.

Description

The design of the local multi-energy infrastructure (selection of the energy carriers and energy conversion technologies, sizing of the production and storage capacities) and its operation (arbitrage of imports, local generation, exports and storage etc.) has a crucial impact on the final economical, environmental and social performances. Therefore, an optimized infrastructure of all technologies leads to a better management of the overall energy flows: lower installed capacities, higher energy efficiencies, recovery of waste heat, better integration of local resources and more flexibility.

This use case optimizes the design of local energy system infrastructure, considering legislative, economic and environmental boundary conditions.

