Interreg

North-West Europe

Co-funded by the European Union

ResNRJwater

Energy transition

Emergency power and an energy management system for an urban wastewater treatment plant, DE

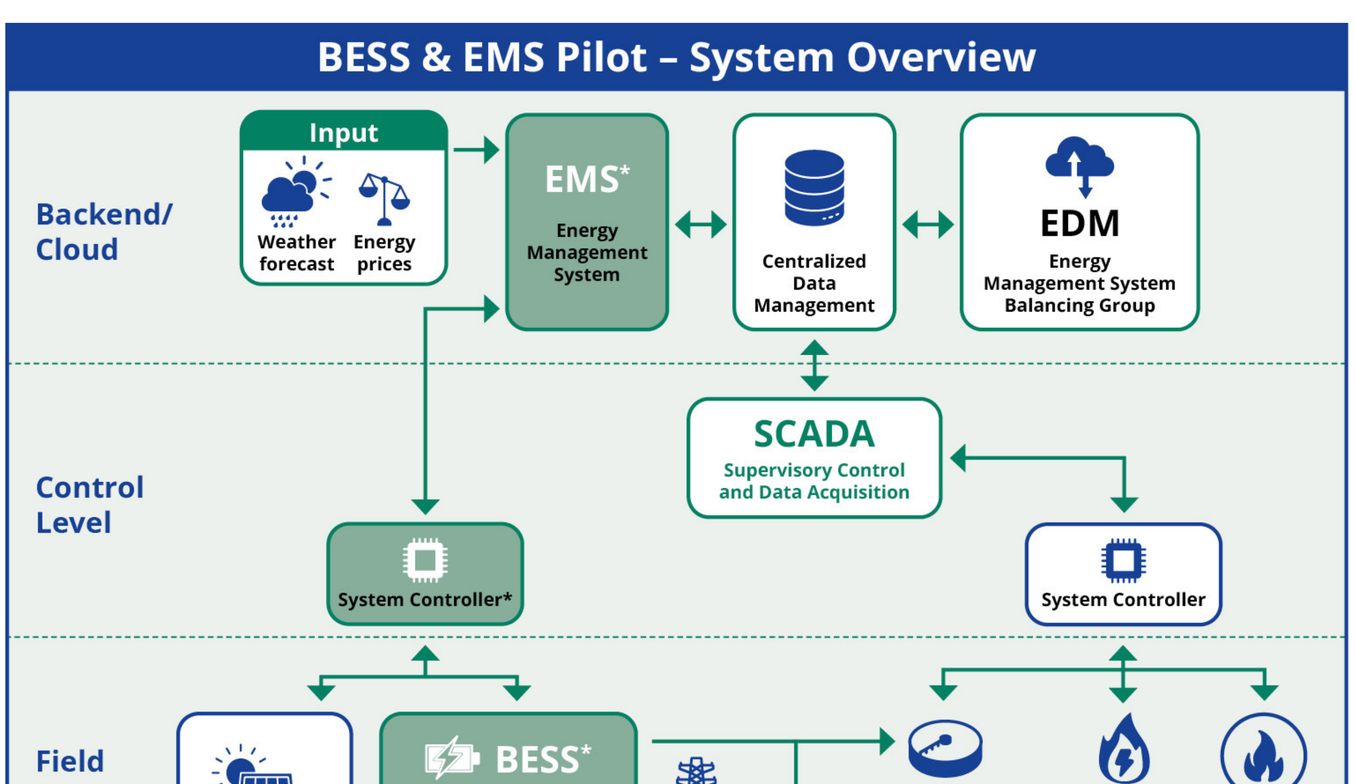
Dorsten-Holsterhausen wastewater treatment plant as an Energy Hub

Energy source:
Solar power & digester gas

Energy storage:
Lithium-ion battery storage system

Energy use:
- Power for the wastewater sector
- Peak shaving
- Load shifting for grid-neutral operation
- Emergency power supply





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Context

Wastewater treatment plants (WWTPs) are energy-intensive facilities facing pressure from rising energy costs and the ongoing energy crisis. At the same time, operators must prepare for possible power outages and make sure their on-site energy supply is reliable.

Specific problem

Electricity generation from Combined Heat and Power (CHP) and solar plants is partly mismatched with consumption profiles of WWTPs. Limited storage capacity results in inefficient use of self-generated power, continued grid dependency, and reduced resilience during public grid outages.

Idea

The project implements an integrated energy system combining CHP-based power generation, solar power, and battery storage with smart control. This system is designed to maximise self-consumption while enabling peak shaving and ensuring reliable plant operation during grid disruptions.

Lippeverband Investment

A battery system coordinated by an energy management system stores self-generated electricity not needed on-site. The electricity is produced from digester gas in a CHP unit and complemented by solar PV. This system optimises load profiles through peak shaving and self-consumption. Surplus electricity can be fed into the grid or allocated to a balancing group. During grid failures, the system provides backup power for wastewater treatment.

Benefit

Reduces energy costs and grid dependency while making the energy supply more secure. Enhances operational resilience through optimized self-consumption and reliable backup power.

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Contact person: Ina Schülling (schuelling.ina@eglv.de), Source: Lippeverband

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