Energy Systems and Storage Integration in the Urban Energy Transition

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Introduction

We present a deployment case for energy storage within local energy systems as part of the concept of a Positive Energy District (PED). A PED is a block or district within an urban area in a city that generates more local renewable energy that it uses itself. It includes demand reduction through building retrofits, neighborhood measures, citizen participation, deployment of renewable sources, integration of mobility systems, urban planning, strategy development, local trading, and integrated energy systems.

The PEDs in +CityxChange are developed through a co-creation process and are designed under the concept of Urban Living Labs, in the Lighthouse cities of Trondheim and Limerick. Here, we specifically share insights into the technical implementation in Trondheim on the integration of energy storage.



+CityxChange approach to PEB/PED development

Results and summary

- PEDs are a hyper-local implementation of the energy transition through integration of solutions from multiple domains and views,
- Local energy and flexibility trading has big technical and financial potential,
- Sector coupling allows (within limits) to balance and substitute thermal and electric energy consumption and storage,
- Within PEDs, (electric) storage is critical, its specific size depends also on integration in the wider grid.



Principles and boundaries of a Virtual PED [VAW2022]

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