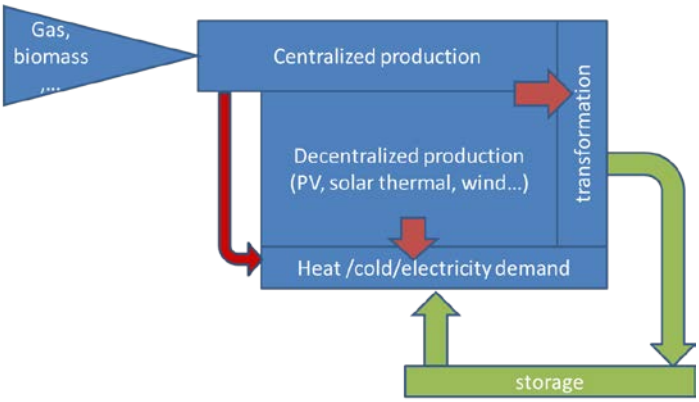
Evaluating the need for energy storage to enhance autonomy of neighbourhoods

Background

Energy requirements in urban areas are rising very fast and this trend is expected to continue with the increase in the urban population (70% by 2050). New buildings are built according to more and more stringent norms which can make them either net-zero or energy positive buildings. However the core of the existing buildings is still old and renovation strategies and scenarios will not be able to make neighbourhoods or buildings in urban areas fully autonomous. Decentralized urban energy systems are hence drawing a lot of attention from the research and industrial community as a possibility towards more sustainable urban areas. Thus the integration of renewable energy as well as the energy storage potential needs to be addressed and evaluated.



Objectives

- Review of the multiple energy storage capacities applicable in the Swiss and European Context
- Develop / extend existing model for the 3 most promising ones
- Application on two study cases one at the building scale (LESO building) and one at the neighbourhood scale (Quartier Nord)

Desired profile

We are looking for a motivated Master student having a strong interest in building physics, mathematics and sustainability. A good knowledge of energy flows at the urban scale is preferred. English is mandatory. The candidate should be willing to work with software such as EnergyPlus, CitySim and Matlab. Programming skills can be seen as an advantage.

The candidate will thrive in an exciting international research environment at the LESO-PB, where researchers work on various topics related to building physics and solar energy from the urban to the nano scale. This work will also be part of the SCCER FEEB&D (*www.**sccer**-feebd.ch/*)

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