Climate, environment and circular economy | Energy storage

ENERGY STORAGE

OVERVIEW AND CHALLENGES

The energy transition targets an increasingly low-carbon economy.

Observation	Problem
• electricity produced on a large scale from renewable sources, primarily wind and solar >> **variable production** • **decentralized** electricity production	• variable production and **difficulty balancing electricity supply and demand**; risk of disruption to electricity supplies in areas that are not interconnected

To guarantee the balance, several flexibility solutions exist:

- interconnections,
- consumption management as a function of production (Demand side management), with recourse to load management (whereby consumers are paid to reduce their demand),
- the provision of flexible, often CO_2-emitting production facilities, such as combustion turbines,

- **stationary electricity storage**. This solution is often the most expensive but it is also the one that delivers the most services, making it possible to:
    - manage surges,
    - and absorb production peaks.

Several challenges need to be overcome to enable the large-scale roll-out of energy storage:

- **life span** of the storage system: objective = around twenty years,
- **cost** of the electricity stored and fed back,
- **the environmental performance** of solutions: greenhouse gas balance, life cycle analysis, safety.

> *We are interested in storage technologies that can be used to supply grid services or services to areas that are either not or poorly interconnected. We are developing two technologies: a highly-efficient compressed air energy storage system; and a flow battery, which represents an alternative to Li-Ion batteries, the current market standard. We are also working on the management of electric systems and Energy Management Systems (EMS).*

Electrochemical storage via redox flow batteries meets the needs of both individual houses (a dozen kW) and eco-districts (several MW). It enables modular storage times ranging from 2 (self-consumption) to 10 hours (electricity distribution).

Developing technologies for the large-scale storage of electricity produced by renewable energies in order to ensure a balance between production and consumption.

Our solutions Our strengths

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