



Climate, environment and circular economy

Energy storage



ENERGY STORAGE

OVERVIEW AND CHALLENGES

The energy transition targets an increasingly low-carbon economy.

Observation	Problem
<ul style="list-style-type: none"> • 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 CO₂-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](#)

CONTACT



Yannick Peysson

Program manager

yannick.peysson@ifpen.fr

Energy storage

Link to the web page :