



# Overcoming barriers to electrical energy storage: Comparing California and Europe

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The pursuit of a low carbon energy mix is leading to a rise in variable renewable energy sources, most notably wind and solar. The unpredictability of these sources will cause energy flow fluctuations in the network inducing a greater stress for the grid and, therefore, increasing the need for flexibility. Electrical energy storage (EES) is a technically feasible technology as proved in multiple grid applications. EES can increase the reliability and resilience of the network and deliver energy more efficiently. However, its high capital costs and various market and regulatory barriers are hindering the required deployment of the technology.

Whereas the EES sector is progressing quickly in California, in Europe it is stuck at this moment. This paper aims to clarify why the prospects for energy storage in Europe are not as good as they are in California. The UK, Germany and Spain are the countries chosen as

generally representative of the European situation. The market and regulatory framework in California and Europe are analysed critically, and changes to overcome the main barriers are recommended.

From our analysis we draw a number of conclusions on what needs to be done to improve the prospects for EES in Europe:

**Definition and classification of EES:** EES definition and the services that the systems can provide must be clarified by legislation.

**Further study of the need for EES and the benefits from its deployment:** The US and, particularly, California began to study EES early, and this has allowed them to make more progress with deployment of EES.

**Creation of new markets for ancillary services:** One of the main reasons why it is not possible to monetize all the potential value of EES is because there are no markets for some of the specific services that they can provide.

**Technology-neutral market design:** Both existing and new markets should be adapted to the new technologies that can access them. They must be technology-neutral.

Currently, EES systems that do not meet the minimum requirements for market participation have to be aggregated with other assets, which reduces the monetizable value of the installation. This implies that the minimum requirements to participate in the market should be reviewed to open the market to other potential providers such as EES.