

What are energy storage systems?

Energy storage systems do not only allow to balance the energy at a given moment, but also allow to store and shift surplus energy or to supply a required energy demand, when it is needed. This time shifting potential for positive and negative control energy separates storage systems from all other flexibility options.

What are the requirements for the pilot project?

In addition to this, the pilot project also required that the active power of the resource was logged and saved locally with one second resolution, data which Svenska kraftnät could request for more careful follow-up, if necessary.

How many GW of energy storage capacity is needed?

In 2015 the IRENA (Int. Renew. Energy Agency) REmap 2030 project published a figure of approximately 425GW of energy storage capacity required worldwide to achieve the 2030 target of 45% renewable energy. Storage systems are characterized by their discharge time and their capacity.

How is recharging the energy storage system realised?

Recharging the energy storage system is realised by pumping the water out of the sphere against ambient pressure. The StEnSea system itself and the construction of the 1:10 scaled prototype is described in [1], where potential sites for full-scale systems are presented.

Will PHES become a dominant storage technology in 2050?

In 2030, IRENA expects a market share of 325 GW for PHES and 150 GW for battery technologies. Thus, PHES remain the dominant storage technology. For the year 2050 the International Energy Agency (IEA) expects the doubling of hydropower capacity worldwide and an increase of the PHES capacity by a factor of 3 to 5.

What is a pumped hydro energy storage system?

Well-established large-scale storage systems are pumped hydro energy storage systems (PHES) having rated powers ranging from several ten MW to several GW. At present, almost 99% of the global storage capacity is realised by PHES. In 2030, IRENA expects a market share of 325 GW for PHES and 150 GW for battery technologies.

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