In hybrid systems, the solar fraction reduces with decreasing battery capacity. However, as ageing proceeds, the danger of the so-called "fatal defect" increases. This results in a more or less sudden breakdown of the battery, and can create considerable problems for the user. They are usually due to short circuits, caused by erosion sludge, corrosion flakes from the poles or dendrite growth between the electrodes. This risk should be considered when the decision is made about replacing a battery with clearly reduced capacity.

The operation strategy has a significant effect on the battery lifetime. It is necessary to take this into consideration when planning and designing an autonomous power supply system. Some additional investments in the battery peripherals will result in significant savings within the system lifetime. Frequent additional full charging and deep-discharge protection on the basis of a state-of-charge determination are highly recommended.

Hydrogen storage systems and redox batteries are options for the future, but the hydrogen storage systems have a fundamental drawback concerning the efficiency and the complexity of the system. Nevertheless, important impulses for their development will come from load-levelling applications in grids with a high penetration of renewable energy sources.

Further development on the conventional battery systems is necessary and will happen within the coming years. After almost one century (1880–1980) with no sustainable market entry of different fundamental battery technologies, we have seen within the last decade great achievements with nickel-metal hydride and lithium batteries, which were not expected. Further, improved battery technologies and a more integral system design and operation resulting in longer lifetimes will allow a decrease in the specific costs for electrical energy storage within the next decade by approximately a factor of two. Further cost reduction can hardly be seen from today's point of view.

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