

Green energy electric vehicle storage basket picture

Why is energy storage management important for EVs?

We offer an overview of the technical challenges to solve and trends for better energy storage management of EVs. Energy storage management is essential for increasing the range and efficiency of electric vehicles (EVs), to increase their lifetime and to reduce their energy demands.

Is repurposing EV batteries a sustainable solution?

The concept of a circular economy -- in which materials are re-used, repurposed and recycled 188 -- is gaining traction as a solution to sustainability challenges associated with electric vehicle (EV) energy storage (see the figure, part a). Repurposing EV batteries is an important approach 189.

Can EV batteries be used as energy storage devices?

Batteries in EVs can serve as distributed energy storage devices via vehicle-to-grid (V2G) technology, which stores electricity and pushes it back to the power grid at peak times. Given the flexible charging and discharging profiles of EVs and the cost reduction, V2G has been considered for short-term power grid energy storage 193.

What is energy management in hybrid vehicles?

Energy management strategies control the power flow between the ICE and other energy storage systems in hybrid vehicles 136. Energy management in HEVs and PHEVs minimizes the energy consumption of the powertrain while fulfilling the power demands of driving.

What are battery management technologies & how do they help EVs?

Battery management technologies enable EVs to charge faster and more safely, and can also help with battery recycling at the end of an EV's life cycle. Embedded sensing and self-healing techniques of smart batteries enable more precise battery management.

What is energy management in HEVs & PHEVs?

Energy management in HEVs and PHEVs minimizes the energy consumption of the powertrain while fulfilling the power demands of driving. Additionally, energy management optimizes energy efficiency, reducing fuel emissions, extending battery lifetime and improving drivability (Fig. 3a).



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