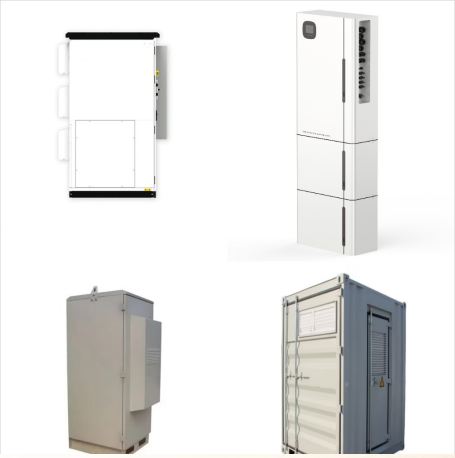
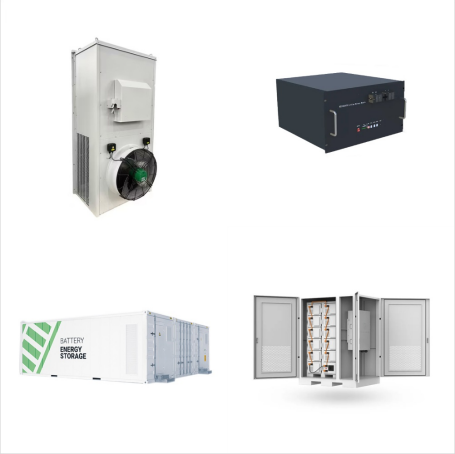
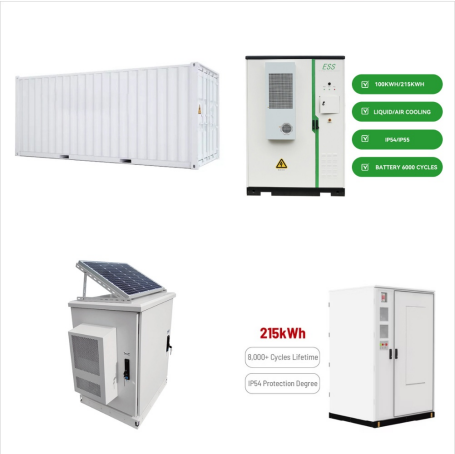


Developing large-scale energy storage systems (e.g., battery-based energy storage power stations) to solve the intermittency issue of renewable energy sources is essential to achieving a reliable and efficient energy supply chain.

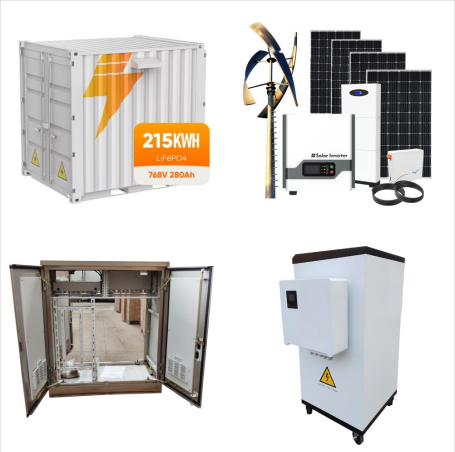


Long-distance transport and long-term storage of hydrogen can be realized with Liq. Org. Hydrogen Carriers (LOHC) based on a two-step cycle: (1) loading of hydrogen (hydrogenation) into the LOHC mol. (i.e., hydrogen is covalently bound to the LOHC) and (2

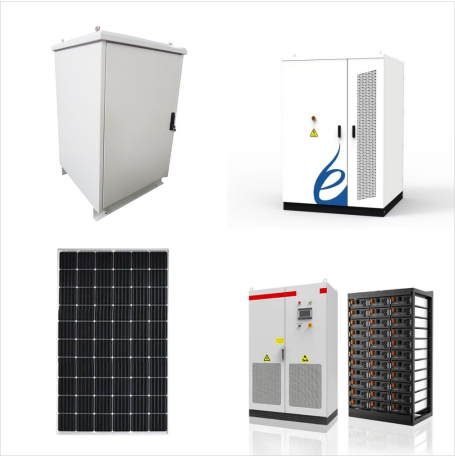


The molecule must remain in this high-energy isomerized state long enough to enable long-term stor-age, which is controlled by the barrier of thermal back-conversion (DHz). Addition-ally, the energy difference (DH storage) between the photoisomer and the parent

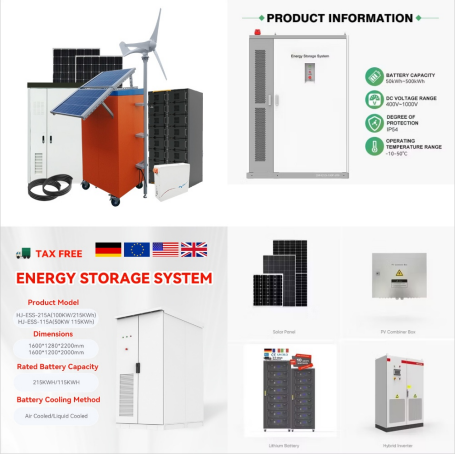
LONG TERM ENERGY STORAGE MOLECULE



To enhance the long-term stability, also polymers containing NDI redox-active moieties were thoroughly investigated. Dominko and co-workers tested a simple polymer of nitrogen-linked NDI units in a hybrid magnesium-ion cell.

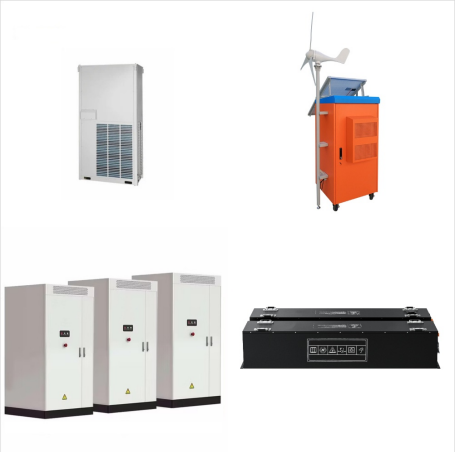


Energy storage performance: better characterization of energy storage performance (e.g. operation-dependent efficiencies, degradation) in long-term system models is an important research need, especially as increasing installations and operational experience

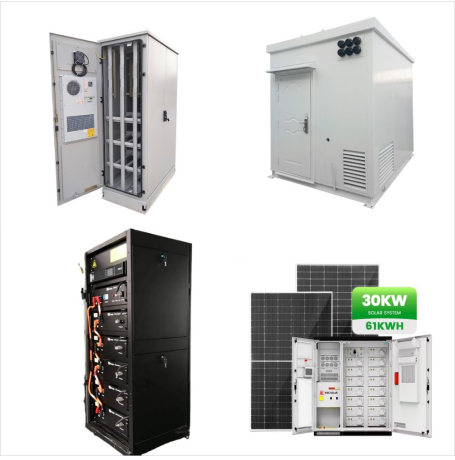


The molecule must remain in this high-energy isomerized state long enough to enable long-term storage, which is controlled by the barrier of thermal back-conversion (??H ???). Additionally, the energy difference (?? H storage) between the photoisomer and the parent molecule, representing the energy that can be stored by the system, should be

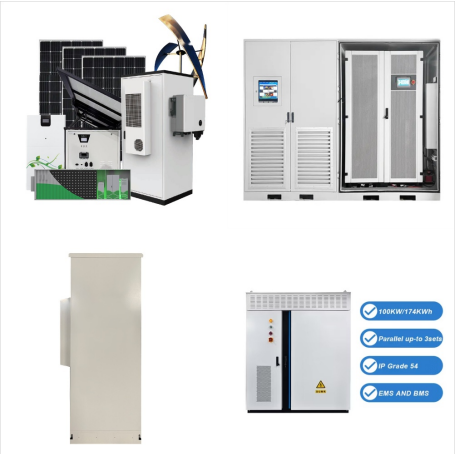
LONG TERM ENERGY STORAGE MOLECULE



These dopants, possessing activation energy barriers for switching between photoisomers, provide stability to the phase storing thermal energy and triggerabilty for energy release, thus



Liquid organic hydrogen carriers (LOHC) can be used as a lossless form of hydrogen storage at ambient conditions. The storage cycle consists of the exothermic hydrogenation of a hydrogen-lean molecule at the start of the transport, usually the hydrogen production site, becoming a hydrogen-rich molecule.



A high energy density enables the storage of larger amounts of energy in a limited space, making it essential for long-term energy storage applications (Zhao et al. 2021a). On the other hand, high power density is crucial for applications requiring rapid energy delivery, such as in electric vehicles or portable electronic devices (Xu et al