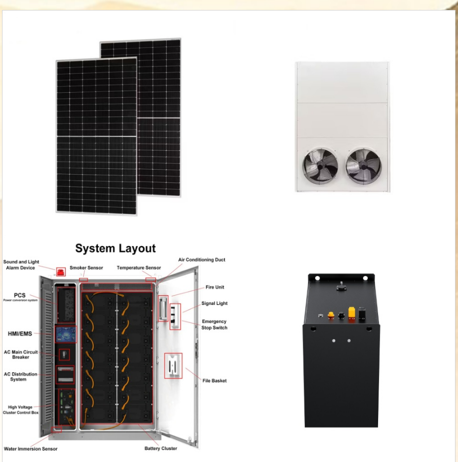
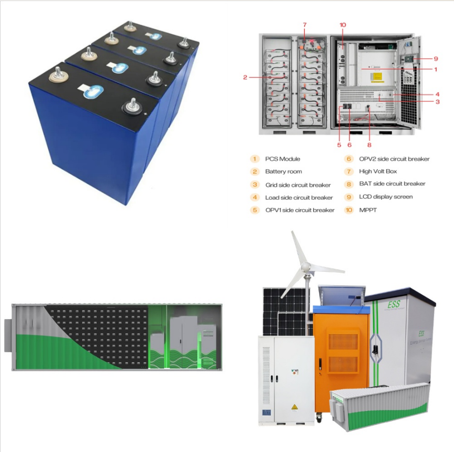
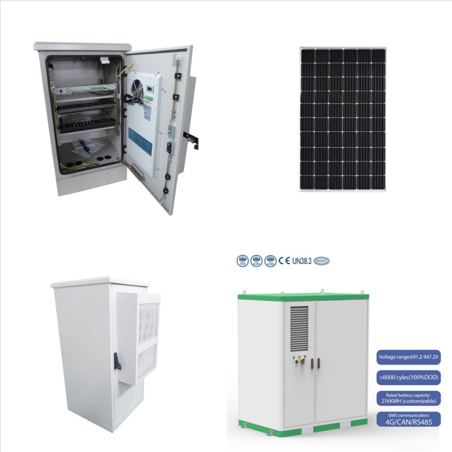


Redox flow battery (RFB) is reviving due to its ability to store large amounts of electrical energy in a relatively efficient and inexpensive manner. RFBs also have unique characteristics, which make them more attractive than conventional batteries.

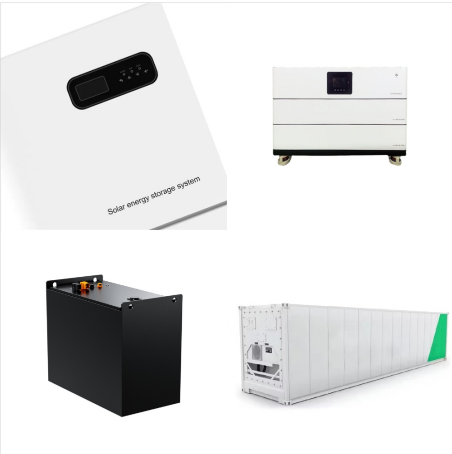


The flow battery is mainly composed of two parts: an energy system and a power system. In a flow battery, the energy is provided by the electrolyte in external vessels and is decoupled from the power.

To address these challenges, we demonstrate a neutral aqueous organic redox flow battery (AORFB) technology utilizing a newly designed cathode electrolyte containing a highly water-soluble ferrocene molecule.



The flow battery systems incorporate redox mediators as charge carriers between the electrochemical reactor and external reservoirs. With the addition of solid active materials in the external tanks, SMFBs have been successfully shown to be compatible with a traditional RFB.



In this way, a redox flow battery interconverts between chemical and electrical energy. Considerable research has been undertaken in the field of RFBs since their inception in the 1970s. One of the early demonstrations of RFBs was based on an Fe/Cr redox system.

In this Focus Review, structure???property relationships that have led to advances in membranes for various RFB types (vanadium, zinc, iron, etc.) are analyzed. First, two strategies to increase conductivity are highlighted: tuning membrane microstructure and controlling electrolyte uptake.

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The Pacific Northwest National Laboratory proposed a possible alternative to solve this problem by adding hydrochloric acid (HCl) to the electrolyte solution, resulting in the mixed-acid vanadium redox flow battery (G3 RFB).