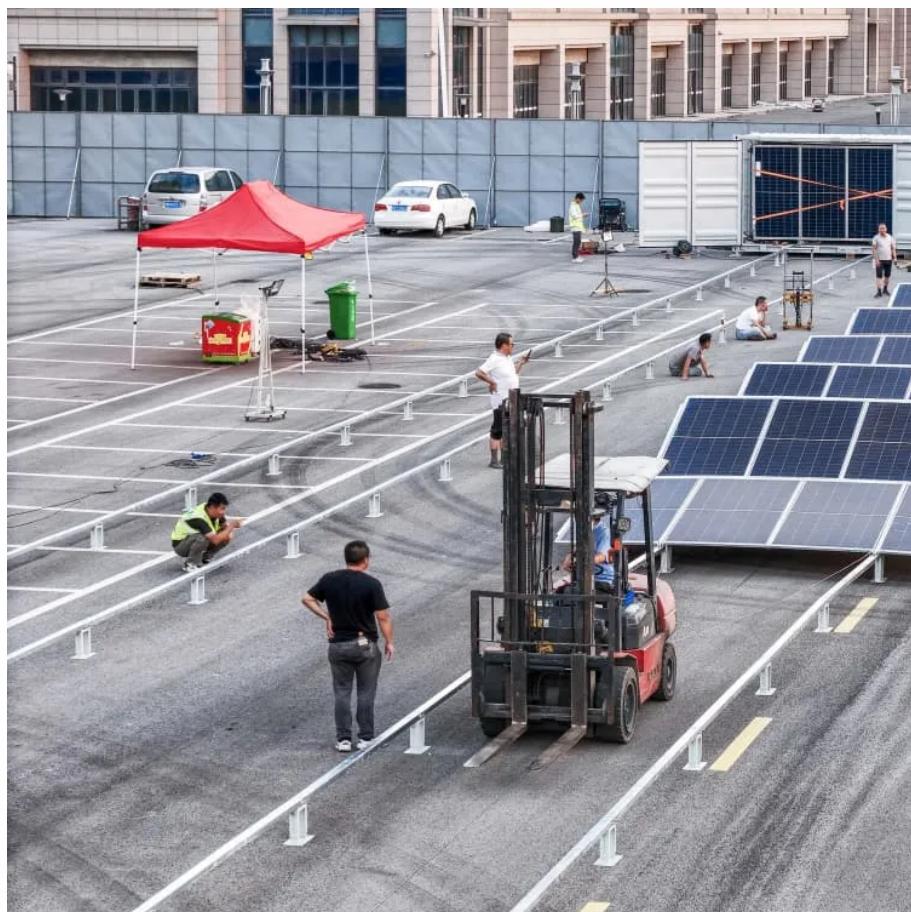


## A-Core Container

# Iron sulfate flow battery



## Overview

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To meet this need, PNNL scientists have developed iron-sulfide redox flow battery systems that demonstrate excellent energy conversion efficiency and stability and utilize low-cost materials. What is iron sulfate redox flow battery?

**Iron-sulfate redox flow battery** Iron-sulfate redox flow battery is a relatively new type of RFB consisting of iron sulfate and anthraquinone disulfonic acid (AQDC) that shows the outstanding electrical performance, chemical durability, and the capacity retention (209).

Are iron-based aqueous redox flow batteries the future of energy storage?

The rapid advancement of flow batteries offers a promising pathway to addressing global energy and environmental challenges. Among them, iron-based aqueous redox flow batteries (ARFBs) are a compelling choice for future energy storage systems due to their excellent safety, cost-effectiveness and scalability.

Are aqueous iron-based flow batteries suitable for large-scale energy storage applications?

Thus, the cost-effective aqueous iron-based flow batteries hold the greatest potential for large-scale energy storage application.

Why is electrolyte engineering important for all-iron flow batteries?

For all-iron flow batteries, electrolyte engineering is particularly important to mitigate HER, which competes with iron redox reactions. Additionally, optimizing carbon-based electrodes through surface modifications or catalyst coatings can enhance charge transfer efficiency.

How much does an iron-based flow battery cost?

Companies like ESS Tech, Inc. in the USA have made significant strides in developing and commercializing acidic all-iron ARFBs and the U.S. Advanced Research Projects Agency-Energy estimates that this iron-based flow battery

would achieve an energy storage cost as low as \$125 per kWh .

Which electrolytes are used in redox flow batteries?

A Novel Electrolytes for Redox Flow Batteries: Cerium and Chromium Couples in Aqueous System. Int. J. Energy Res. 2021, 45, 16176–16188.  
doi:10.1002/er.6850. Noack, J.; Berkers, M.; Ortner, J.; Pinkwart, K. The Influence of Some Electrolyte Additives on the Electrochemical Performance of Fe/Fe<sup>2+</sup> Redox Reactions for Iron/Iron Redox Flow Batteries.

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