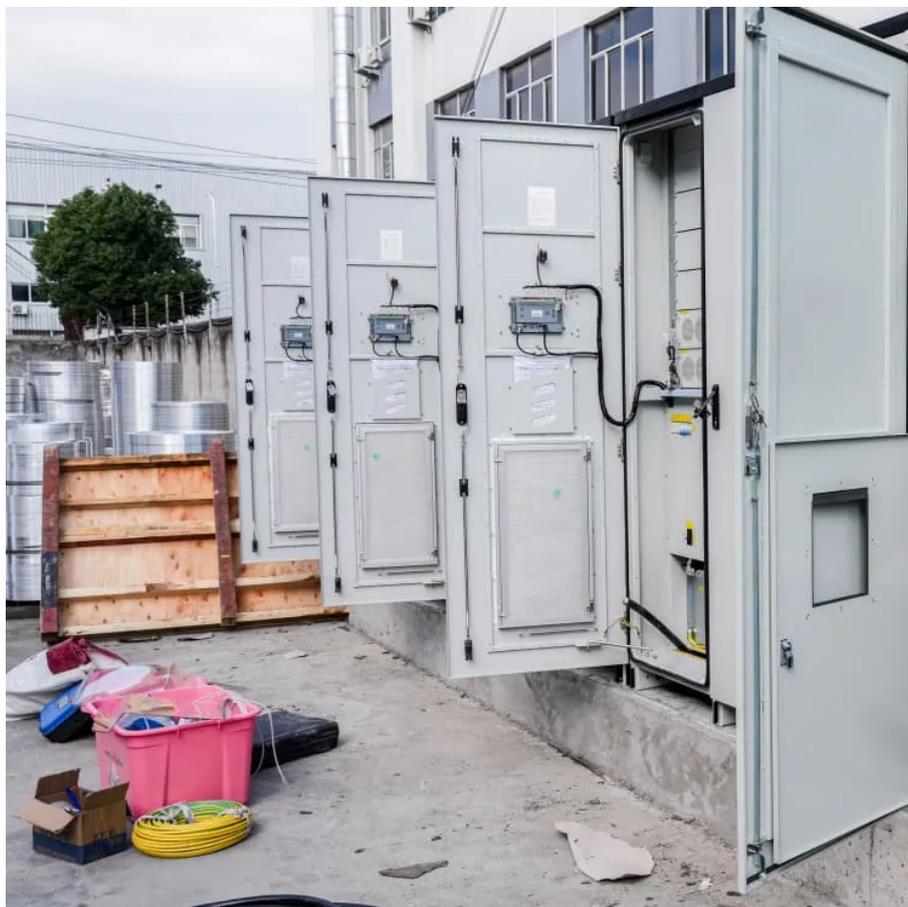




Iron flow battery life





Overview

The Iron Redox Flow Battery (IRFB), also known as Iron Salt Battery (ISB), stores and releases energy through the electrochemical reaction of iron salt. This type of battery belongs to the class of (RFB), which are alternative solutions to (LIB) for stationary applications. The IRFB can achieve up to 70% round trip . In comparison, other long duration storage technologies such as pumped hydro energy storage pr.

Our iron flow batteries work by circulating liquid electrolytes — made of iron, salt, and water — to charge and discharge electrons, providing up to 12 hours of storage capacity. ESS Tech, Inc. (ESS) has developed, tested, validated, and commercialized iron flow technology.

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The lifespan of iron flow batteries generally compares favorably to that of vanadium flow batteries, with iron flow batteries often offering longer design life and cycling durability. Iron flow batteries typically promise a lifetime exceeding 20 years and can achieve over 10,000 cycles without.

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. However, the advancement of various types of iron-based ARFBs is hindered by several critical challenges.

In June 2025, ESS Tech accelerated its iron flow long-duration energy storage roadmap by 18 months, achieving 12.2 hours at rated power with improved efficiency, durability and cost reductions under \$90 per kWh. In June 2025, ESS Tech, Inc., a manufacturer of iron flow long-duration energy storage.

The Iron Redox Flow Battery (IRFB), also known as Iron Salt Battery (ISB), stores

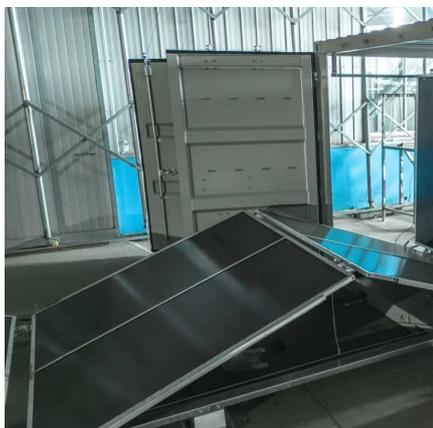


and releases energy through the electrochemical reaction of iron salt. This type of battery belongs to the class of redox-flow batteries (RFB), which are alternative solutions to Lithium-Ion Batteries (LIB) for.

An iron flow battery stores energy using liquid electrolytes made from iron salts. It circulates these electrolytes through electrochemical cells separated by an ion-exchange membrane. Oxidation and reduction reactions allow the battery to charge and discharge electrical energy, providing up to 12.



Iron flow battery life



[How does the lifespan of iron flow batteries ...](#)

Overall, iron flow batteries offer a lifespan that is at least comparable to vanadium flow batteries, with industry data supporting a ...

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How does the lifespan of iron flow batteries compare to that of

Overall, iron flow batteries offer a lifespan that is at least comparable to vanadium flow batteries, with industry data supporting a potential for longer operational life and cycling ...

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Unlike solid-state batteries, flow batteries separate energy storage from power delivery, allowing for independent scalability, longer lifetimes, and reduced environmental impact.

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Aqueous iron-based redox flow batteries for large-scale energy ...

Iron-based ARFBs rely on the redox chemistry of iron species to enable efficient and cost-effective energy storage. Understanding the fundamental electrochemical principles ...



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A high current density and long cycle life iron-chromium redox flow

Through the simulation and analysis of this complex system, researchers can better understand the performance of flow battery systems. It is important to consider various challenges and ...

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The iron flow battery can store energy up to 12 hours in existing technology with prospects of stretching it to 15 hours. Li-ion ...

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ESS Tech Exceeds Targets, Achieves 12.2-Hour Energy Duration

In June 2025, ESS Tech accelerated its iron flow long-duration energy storage roadmap by 18 months, achieving 12.2 hours at rated power with improved efficiency, durability and cost ...

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ESS Iron Flow Chemistry



Iron flow chemistry has a pH similar to soda or wine and contains iron, salt, and water. In addition, the battery system is substantially recyclable at end-of-life.

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Iron Flow Chemistry

Our iron flow batteries work by circulating liquid electrolytes -- made of iron, salt, and water -- to charge and discharge electrons, providing up to 12 hours of storage capacity.

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Iron redox flow battery

The IRFB can achieve up to 70% round trip energy efficiency. In comparison, other long duration storage technologies such as pumped hydro energy storage provide around 80% round trip ...

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Unlike solid-state batteries, flow batteries separate energy storage from power delivery, allowing for independent scalability, longer lifetimes, and ...

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[Iron Flow Battery technology and its role](#)



[in Energy Storage](#)

The iron flow battery can store energy up to 12 hours in existing technology with prospects of stretching it to 15 hours. Li-ion batteries are limited to a maximum of 4 hours.

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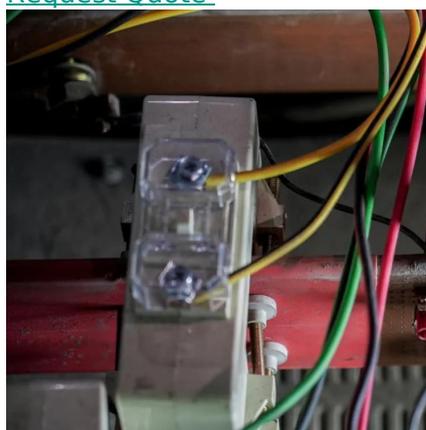


Iron redox flow battery

Overview Science Advantages and Disadvantages Application History

The Iron Redox Flow Battery (IRFB), also known as Iron Salt Battery (ISB), stores and releases energy through the electrochemical reaction of iron salt. This type of battery belongs to the class of redox-flow batteries (RFB), which are alternative solutions to Lithium-Ion Batteries (LIB) for stationary applications. The IRFB can achieve up to 70% round trip energy efficiency. In comparison, other long duration storage technologies such as pumped hydro energy storage pr...

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Iron Flow Battery: How It Works and Its Role in Revolutionizing ...

The longevity of iron flow batteries is another critical advantage. They typically have a longer cycle life, meaning they can undergo many charge and discharge cycles without ...

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A high current density and long cycle life iron-chromium redox ...

Through the simulation and analysis of this complex system, researchers can better understand the performance of flow battery



systems. It is important to consider various challenges and ...

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