Flow Battery Market worth $2,260.34 million by 2030, growing at a CAGR of 12.36% - Exclusive Report by 360iResearch

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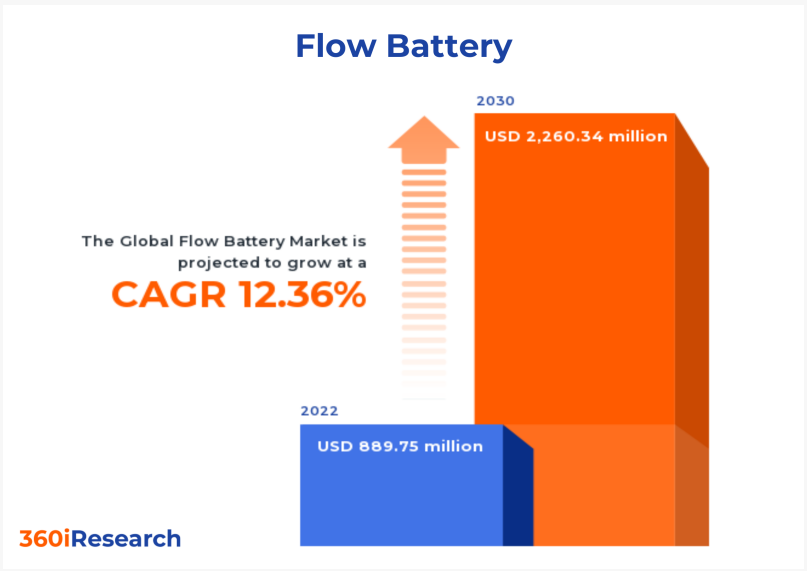

Flow Battery Market - Exclusive Report by 360iResearch

PUNE, MAHARASHTRA, INDIA, November 16, 2023 / EINPresswire.com/ -- The "Flow Battery Market by Type (Hybrid Flow Battery, Membrane-less Flow Battery, Redox Flow Battery), Material (Iron, Vanadium, Zinc–Bromine), Ownership, Storage, Application - Global Forecast 2023-2030" report has been added to 360iResearch.com's offering.

The Global Flow Battery Market to grow from USD 889.75 million in 2022 to USD 2,260.34 million by 2030, at a CAGR of 12.36%.

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The flow battery refers to a rechargeable battery that employs liquid electrolyte solutions to store and release electrical energy. Flow batteries have applications in a wide range of industries, such as utility-scale power grids, microgrids, renewable energy integrations, electric vehicles (EV) charging infrastructure, and industrial backup power supply. The global growth factors influencing the adoption for flow batteries include increasing demand for renewable energy sources and the rising advancements in energy grid infrastructure. Furthermore, supportive government policies and incentives promote clean energy usage and increase demand for flow batteries. However, high upfront costs associated with flow battery installations, when compared to other conventional storage technologies, hinder the adoption of flow batteries. Furthermore, competition from alternative energy storage technologies can reduce the scope and application of flow battery products. However, efforts by major manufacturers to accelerate the

development of battery technologies and upgrade existing flow batteries can help compete with traditional battery alternatives. Other key areas of innovation include developing cost-effective materials or exploring alternatives to expensive metals.

Type: Preference for hybrid flow batteries in situations where high energy density and long durations of power is required
A hybrid flow battery combines the features of a conventional flow battery with those of a non-aqueous system, offering advantages in terms of energy density and efficiency. These batteries often employ various materials, such as metal ions and organic molecules, to store energy chemically. Hybrid flow batteries are preferred in situations where high energy density and long durations are required, such as grid-scale storage or remote microgrids. The improved efficiency minimizes energy losses during charge-discharge cycles, making them suitable for applications demanding frequent cycling. Membrane-less flow batteries eliminate the need for a costly ion exchange membrane found in traditional redox flow batteries. By leveraging laminar flow principles to keep electrolytes separated within the cell stack, these systems can reduce costs while maintaining power output and energy capacity. These batteries can prove viable for various energy storage applications, such as renewables integration and load leveling. Redox flow batteries use reduction-oxidation reactions to store and release energy through two liquid electrolytes separated by an ion exchange membrane. They offer several advantages, including high scalability, flexible power-to-energy ratios, and long cycle life. They are also suitable for applications where frequent cycling or deep discharges are expected without significant degradation in performance.

Material: High adoption of iron flow batteries owing to its safety and sustainability factors
Iron-based flow batteries utilize the redox reactions of iron ions as their energy storage mechanism. They are often preferred for their low cost, abundance, and eco-friendly properties. A key advantage of iron flow batteries is their non-toxic nature and low risk of thermal runaway, making them a safer choice compared to other chemistries. Vanadium-based flow batteries are widely recognized for their high energy efficiency, long cycle life, and ability to operate at wide temperature ranges without degradation. These attributes make vanadium batteries an ideal choice for applications requiring robust performance and long-term usage, such as grid-scale storage or commercial/industrial installations. Zinc-bromine flow batteries showcase a unique combination of high energy density and lower environmental impact compared to traditional lithium-ion technologies. They exhibit superior performance characteristics, such as higher tolerance to deep discharge cycles without significant capacity loss over time. This makes zinc-bromine batteries suitable for remote area power supply systems and as backup energy storage in critical applications.

Application: Rising adoption of electric vehicles necessitating deployment of flow batteries in EV charging stations
Commercial and industrial sectors require reliable energy storage systems to ensure continuous operation during peak demand times and to manage intermittent renewable energy generation. Mission-critical commercial facilities such as data centers rely on uninterrupted power supply

(UPS) systems to protect sensitive equipment from power disruptions. The rapid penetration of electric vehicles (EVs) has led to a demand for efficient charging infrastructure that can accommodate increasing power demands without straining the grid. Flow batteries can facilitate fast-charging capabilities while ensuring grid stability due to their high power density. The modular nature of flow batteries allows them to be easily scaled according to the site-specific requirements of the EV charging station. For utility companies, flow batteries present several benefits that enhance grid stability, resiliency, and overall performance. These advanced energy storage systems can help utilities optimize power generation, smoothen voltage fluctuations, and prevent blackouts during peak demand periods.

Storage: Growing adoption of flow batteries for large scale storage to accommodate renewable energy integration
Compact flow batteries are designed for small-scale applications where space constraints and ease of installation are the primary considerations. These batteries are ideal for residential, commercial, or remote power systems such as microgrids and off-grid energy storage solutions. Large-scale flow batteries cater to grid-scale energy storage requirements where high power output, capacity, and long cycle life are essential factors. They provide utility companies with load leveling, frequency regulation, renewable integration support, and backup power supplies during peak demand or emergencies.

Regional Insights:
In the Americas, particularly in North America, flow batteries are being increasingly deployed for grid-scale energy storage. The push for renewables integration with a focus on solar power generation projects has facilitated research funding and commercialization efforts for advanced flow battery technologies in the region. The region has seen significant investments from both private companies and venture capitalists in the flow battery sector. Regional players are involved in developing innovative flow battery solutions for utility-scale applications such as microgrids or backup power systems. Asia observes significant production capacity and demand for flow batteries, with established manufacturers across China and Japan setting up plants to produce vanadium redox flow batteries (VRFBs). The region's rapid urbanization, coupled with increasing electricity demand and renewables adoption, has driven governments to invest heavily in energy storage research and development, necessitating advancements in flow batteries that match the products. European countries are leveraging their strong research institutes to advance flow battery technology. Key players in Europe's flow battery landscape are focusing on innovative R&D efforts supported by government funding.

FPNV Positioning Matrix:

The FPNV Positioning Matrix is essential for assessing the Flow Battery Market. It provides a comprehensive evaluation of vendors by examining key metrics within Business Strategy and Product Satisfaction, allowing users to make informed decisions based on their specific needs. This advanced analysis then organizes these vendors into four distinct quadrants, which represent varying levels of success: Forefront (F), Pathfinder (P), Niche (N), or Vital(V).

Market Share Analysis:

The Market Share Analysis offers an insightful look at the current state of vendors in the Flow Battery Market. By comparing vendor contributions to overall revenue, customer base, and other key metrics, we can give companies a greater understanding of their performance and what they are up against when competing for market share. The analysis also sheds light on just how competitive any given sector is about accumulation, fragmentation dominance, and amalgamation traits over the base year period studied.

Key Company Profiles:

The report delves into recent significant developments in the Flow Battery Market, highlighting leading vendors and their innovative profiles. These include C-Tech Innovation, CellCube Energy Storage Systems Inc., Cellfion, Elestor, ESS, Inc., H2 Energy Solutions Inc., Invinity Energy Systems, Jenabatteries GmbH, Kemiwatt, Largo Clean Energy, Lockheed Martin Corporation, Primus Power Corporation, RedFlow Ltd., RFC Power, Schmid Group, StorEn Technologies, Sumitomo Electric Industries Ltd., UniEnergy Technologies, LLC, Vanadis Power GmbH, ViZn Energy Systems, and VRB Energy.

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Market Segmentation & Coverage:

This research report categorizes the Flow Battery Market in order to forecast the revenues and analyze trends in each of following sub-markets:

Based on Type, market is studied across Hybrid Flow Battery, Membrane-less Flow Battery, and Redox Flow Battery. The Membrane-less Flow Battery is projected to witness significant market share during forecast period.

Based on Material, market is studied across Iron, Vanadium, and Zinc–Bromine. The Iron is projected to witness significant market share during forecast period.

Based on Ownership, market is studied across Customer-Owned, Third-party Owned, and Utility Owned. The Third-party Owned is projected to witness significant market share during forecast period.

Based on Storage, market is studied across Compact and Large Scale. The Large Scale is projected to witness significant market share during forecast period.

Based on Application, market is studied across Commercial & Industrial, EV Charging Station, and

Utilities. The EV Charging Station is projected to witness significant market share during forecast period.

Based on Region, market is studied across Americas, Asia-Pacific, and Europe, Middle East & Africa. The Americas is further studied across Argentina, Brazil, Canada, Mexico, and United States. The United States is further studied across California, Florida, Illinois, New York, Ohio, Pennsylvania, and Texas. The Asia-Pacific is further studied across Australia, China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam. The Europe, Middle East & Africa is further studied across Denmark, Egypt, Finland, France, Germany, Israel, Italy, Netherlands, Nigeria, Norway, Poland, Qatar, Russia, Saudi Arabia, South Africa, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, and United Kingdom. The Asia-Pacific commanded largest market share of 38.13% in 2022, followed by Europe, Middle East & Africa.

Key Topics Covered:

1. Preface
2. Research Methodology
3. Executive Summary
4. Market Overview
5. Market Insights
6. Flow Battery Market, by Type
7. Flow Battery Market, by Material
8. Flow Battery Market, by Ownership
9. Flow Battery Market, by Storage
10. Flow Battery Market, by Application
11. Americas Flow Battery Market
12. Asia-Pacific Flow Battery Market
13. Europe, Middle East & Africa Flow Battery Market
14. Competitive Landscape
15. Competitive Portfolio
16. Appendix

The report provides insights on the following pointers:
1. Market Penetration: Provides comprehensive information on the market offered by the key players
2. Market Development: Provides in-depth information about lucrative emerging markets and analyzes penetration across mature segments of the markets
3. Market Diversification: Provides detailed information about new product launches, untapped geographies, recent developments, and investments
4. Competitive Assessment & Intelligence: Provides an exhaustive assessment of market shares, strategies, products, certification, regulatory approvals, patent landscape, and manufacturing capabilities of the leading players

5. Product Development & Innovation: Provides intelligent insights on future technologies, R&D activities, and breakthrough product developments

The report answers questions such as:
1. What is the market size and forecast of the Flow Battery Market?
2. Which are the products/segments/applications/areas to invest in over the forecast period in the Flow Battery Market?
3. What is the competitive strategic window for opportunities in the Flow Battery Market?
4. What are the technology trends and regulatory frameworks in the Flow Battery Market?
5. What is the market share of the leading vendors in the Flow Battery Market?
6. What modes and strategic moves are considered suitable for entering the Flow Battery Market?

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