

Japan Flow Battery Market Forecast 2025-2032

Market Report | 2025-11-17 | 125 pages | Inkwood Research

AVAILABLE LICENSES:

- Single User Price \$1100.00
- Global Site License \$1500.00

Report description:**KEY FINDINGS**

The Japan flow battery market size is valued at \$41.72 million as of 2025 and is expected to reach \$157.54 million by 2032, progressing with a CAGR of 20.90% during the forecast years, 2025-2032.

Japan's flow battery market continues advancing through strong government backing and deep technological expertise. According to our analysis, the country positions these systems as critical infrastructure for post-Fukushima energy resilience. Furthermore, local players like Sumitomo Electric Industries drive global commercialization with proven track records. Demonstration projects funded by the New Energy and Industrial Technology Development Organization (NEDO) and the Ministry of Economy, Trade and Industry (METI) validate long-duration storage capabilities.

Meanwhile, growing demand for microgrids and renewable storage in remote island regions boosts adoption. These factors create substantial opportunities for vendors seeking entry into this sophisticated market. Moreover, Japan's energy security concerns accelerate market growth significantly. The nation relies heavily on energy imports, creating urgency for domestic storage solutions.

MARKET INSIGHTS

Additionally, frequent natural disasters like earthquakes and typhoons underscore the need for resilient power systems. Consequently, municipalities and utilities invest in flow batteries for backup power and grid stabilization. Private-sector collaboration between utilities and technology companies further strengthens market momentum. However, high system costs and long payback periods present challenges that require strategic approaches from investors and developers.

Japan's regulatory framework increasingly favors flow battery deployment through targeted financial incentives and market access reforms. The Ministry of Economy, Trade and Industry (METI) allocated approximately 34.6 billion yen through its FY2024 renewable energy expansion program. This subsidy covers between one-third and two-thirds of equipment and construction costs for grid-scale storage projects. Moreover, recent legislative changes enable battery systems to participate in wholesale electricity markets and ancillary services. These market opportunities emerged following regulatory amendments in 2023 and expanded further in April 2024.

Consequently, developers can now stack multiple revenue streams, including energy arbitrage, capacity payments, and frequency regulation. However, policy adjustments occur roughly every six months, creating uncertainty for long-term project planning. Despite this volatility, the government's Green Transformation strategy commits substantial resources toward achieving carbon neutrality by 2050. This alignment between policy support and decarbonization goals creates a favorable environment for flow

battery investments throughout the Japanese archipelago.

SEGMENTATION ANALYSIS

The Japan flow battery market is segmented into offering, battery type, material, ownership, storage, and application. The material segment is further categorized into vanadium, zinc-bromine, iron, and other materials.

Vanadium-based systems dominate Japan's flow battery landscape due to proven performance and reliability. Based on our research, these batteries deliver exceptional longevity with minimal degradation over decades. Sumitomo Electric has deployed vanadium redox flow batteries exceeding 50 MW and 176 MWh across multiple regions.

The technology offers extremely low fire risk compared to lithium-ion alternatives. Consequently, municipalities prioritize vanadium systems for critical infrastructure projects. For instance, Kashiwazaki IR Energy ordered multiple 1 MW x 8-hour systems for renewable integration and energy trading. These installations support the city's transition toward becoming a decarbonized community by 2050.

Additionally, vanadium flow batteries enable long-duration energy storage essential for Japan's renewable energy goals. Our findings indicate that these systems can discharge continuously for 6 to 10 hours at rated capacity. This capability proves crucial for remote island regions with limited grid connectivity.

Moreover, the technology supports participation in Japan's wholesale electricity markets, which opened to energy storage in 2023.

Trading opportunities enhance project economics and accelerate investment decisions. However, vanadium supply chain considerations require careful evaluation from developers seeking to deploy large-scale projects across the archipelago.

COMPETITIVE INSIGHTS

Some of the top players operating in the Japan flow battery market include Sumitomo Electric Industries Ltd, NGK Insulators Ltd, GS Yuasa Corporation, and VRB Energy.

Sumitomo Electric Industries Ltd stands as a global leader in vanadium redox flow battery technology and commercialization. The company operates as a diversified engineering and materials conglomerate headquartered in Osaka, with over 290,000 employees worldwide. Sumitomo Electric's flow battery division delivers complete energy storage solutions for grid-scale and commercial applications. The company has accumulated over 30 years of experience developing vanadium redox flow battery systems. More than 180 MWh of capacity has been deployed or contracted across Japan, the United States, and Belgium.

In March 2025, Sumitomo launched a new generation battery with up to a 30-year operational lifespan. The system achieved 15% higher energy density and approximately 30% lower lifecycle costs through advanced materials. Modular configurations offer 6-hour, 8-hour, and 10-hour duration options for diverse customer requirements. These technical improvements enable projects with fewer containers and reduced maintenance demands.

Recent deployments demonstrate Sumitomo's expanding market presence throughout Japan's energy landscape. In December 2024, the company completed a 1 MW x 8-hour installation for KASHIWAZAKI IR Energy in Niigata Prefecture. This marked the first flow battery deployment for a municipal electric power company. Subsequently, Kashiwazaki IR Energy placed orders for two additional systems of equivalent scale. In March 2025, Sumitomo secured approval for its first government-subsidized flow battery project in Kyushu. The 2 MW/8 MWh facility for Shin-Idemitsu received backing through METI's FY2024 renewable energy expansion program.

COMPANY PROFILES

1. SUMITOMO ELECTRIC INDUSTRIES, LTD.

2. INVINITY ENERGY SYSTEMS

3. VRB ENERGY

4. NGK INSULATORS, LTD.

5. GS YUASA CORPORATION

Table of Contents:

1. RESEARCH SCOPE & METHODOLOGY

1.1. STUDY OBJECTIVES

1.2. METHODOLOGY

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 1.3. ASSUMPTIONS & LIMITATIONS
- 2. EXECUTIVE SUMMARY
- 2.1. MARKET SIZE & FORECAST
- 2.2. MARKET OVERVIEW
- 2.3. SCOPE OF STUDY
- 2.4. CRISIS SCENARIO ANALYSIS
- 2.5. MAJOR MARKET FINDINGS
 - 2.5.1. JAPAN POSITION FLOW BATTERIES AS PART OF ITS POST-FUKUSHIMA ENERGY RESILIENCE STRATEGY
 - 2.5.2. LOCAL PLAYERS SUCH AS SUMITOMO ELECTRIC INDUSTRIES LEAD GLOBAL COMMERCIALIZATION
 - 2.5.3. DEMONSTRATION PROJECTS ARE FUNDED BY NEDO AND METI TO VALIDATE LONG-DURATION STORAGE
 - 2.5.4. INCREASING DEMAND FOR MICROGRID AND RENEWABLE STORAGE IN REMOTE ISLAND REGIONS BOOSTS ADOPTION
- 3. MARKET DYNAMICS
 - 3.1. KEY DRIVERS
 - 3.1.1. GOVERNMENT SUPPORT THROUGH SUBSIDIES AND RESEARCH FUNDING PROGRAMS
 - 3.1.2. STRONG TECHNOLOGICAL EXPERTISE IN ADVANCED MATERIALS AND CHEMICAL ENGINEERING
 - 3.1.3. GROWING INTEREST IN ENERGY SECURITY AND DISASTER-RESILIENT POWER SYSTEMS
 - 3.1.4. PRIVATE-SECTOR COLLABORATION BETWEEN UTILITIES AND TECHNOLOGY COMPANIES
 - 3.2. KEY RESTRAINTS
 - 3.2.1. SLOW COMMERCIAL ADOPTION DUE TO HIGH SYSTEM COSTS AND LIMITED LOCAL DEMAND
 - 3.2.2. LACK OF LARGE GRID STORAGE PROJECTS COMPARED TO CHINA OR THE US
 - 3.2.3. LONG PAYBACK PERIODS HINDER INVESTMENT IN COMMERCIAL INSTALLATIONS
 - 3.2.4. COMPETITION FROM ESTABLISHED LITHIUM-ION AND HYDROGEN STORAGE TECHNOLOGIES
- 4. KEY ANALYTICS
 - 4.1. KEY MARKET TRENDS
 - 4.1.1. INCREASED DEPLOYMENT IN MUNICIPAL AND COMMUNITY ENERGY PROJECTS
 - 4.1.2. EXPANDING FOCUS ON INTEGRATING FLOW BATTERIES WITH SOLAR PV AND WIND TURBINES
 - 4.1.3. INTERNATIONAL COLLABORATIONS BETWEEN JAPANESE AND EUROPEAN BATTERY MANUFACTURERS
 - 4.1.4. GOVERNMENT-DRIVEN PUSH FOR HYBRID STORAGE SYSTEMS COMBINING MULTIPLE TECHNOLOGIES
 - 4.2. PORTER'S FIVE FORCES ANALYSIS
 - 4.2.1. BUYERS POWER
 - 4.2.2. SUPPLIERS POWER
 - 4.2.3. SUBSTITUTION
 - 4.2.4. NEW ENTRANTS
 - 4.2.5. INDUSTRY RIVALRY
 - 4.3. GROWTH PROSPECT MAPPING
 - 4.3.1. GROWTH PROSPECT MAPPING FOR JAPAN
 - 4.4. MARKET MATURITY ANALYSIS
 - 4.5. MARKET CONCENTRATION ANALYSIS
 - 4.6. VALUE CHAIN ANALYSIS
 - 4.6.1. RAW MATERIAL SUPPLIERS
 - 4.6.2. ELECTROLYTE MANUFACTURERS
 - 4.6.3. MEMBRANE AND STACK PRODUCERS
 - 4.6.4. SYSTEM INTEGRATORS
 - 4.6.5. PROJECT DEVELOPERS
 - 4.6.6. UTILITY AND COMMERCIAL END USERS
 - 4.7. KEY BUYING CRITERIA
 - 4.7.1. COST PER KWH

4.7.2. CYCLE LIFE
4.7.3. SCALABILITY
4.7.4. MAINTENANCE REQUIREMENTS
4.8. REGULATORY FRAMEWORK
5. FLOW BATTERY MARKET BY OFFERING
5.1. ENERGY STORAGE SYSTEM
5.1.1. MARKET FORECAST FIGURE
5.1.2. SEGMENT ANALYSIS
5.2. BATTERY
5.2.1. MARKET FORECAST FIGURE
5.2.2. SEGMENT ANALYSIS
5.3. SERVICE
5.3.1. MARKET FORECAST FIGURE
5.3.2. SEGMENT ANALYSIS
6. FLOW BATTERY MARKET BY BATTERY TYPE
6.1. REDOX
6.1.1. MARKET FORECAST FIGURE
6.1.2. SEGMENT ANALYSIS
6.2. HYBRID
6.2.1. MARKET FORECAST FIGURE
6.2.2. SEGMENT ANALYSIS
7. FLOW BATTERY MARKET BY MATERIAL
7.1. VANADIUM
7.1.1. MARKET FORECAST FIGURE
7.1.2. SEGMENT ANALYSIS
7.2. ZINC-BROMINE
7.2.1. MARKET FORECAST FIGURE
7.2.2. SEGMENT ANALYSIS
7.3. IRON
7.3.1. MARKET FORECAST FIGURE
7.3.2. SEGMENT ANALYSIS
7.4. OTHER MATERIALS
7.4.1. MARKET FORECAST FIGURE
7.4.2. SEGMENT ANALYSIS
8. FLOW BATTERY MARKET BY OWNERSHIP
8.1. CUSTOMER-OWNED
8.1.1. MARKET FORECAST FIGURE
8.1.2. SEGMENT ANALYSIS
8.2. THIRD-PARTY-OWNED
8.2.1. MARKET FORECAST FIGURE
8.2.2. SEGMENT ANALYSIS
8.3. GRID/UTILITY-OWNED
8.3.1. MARKET FORECAST FIGURE
8.3.2. SEGMENT ANALYSIS
9. FLOW BATTERY MARKET BY STORAGE
9.1. LARGE-SCALE
9.1.1. MARKET FORECAST FIGURE

9.1.2. SEGMENT ANALYSIS
9.2. SMALL-SCALE
9.2.1. MARKET FORECAST FIGURE
9.2.2. SEGMENT ANALYSIS
10. FLOW BATTERY MARKET BY APPLICATION
10.1. GRID/UTILITY
10.1.1. MARKET FORECAST FIGURE
10.1.2. SEGMENT ANALYSIS
10.2. COMMERCIAL AND INDUSTRIAL
10.2.1. MARKET FORECAST FIGURE
10.2.2. SEGMENT ANALYSIS
10.3. EV CHARGING STATION
10.3.1. MARKET FORECAST FIGURE
10.3.2. SEGMENT ANALYSIS
10.4. OTHER APPLICATIONS
10.4.1. MARKET FORECAST FIGURE
10.4.2. SEGMENT ANALYSIS
11. COMPETITIVE LANDSCAPE
11.1. KEY STRATEGIC DEVELOPMENTS
11.1.1. MERGERS & ACQUISITIONS
11.1.2. PRODUCT LAUNCHES & DEVELOPMENTS
11.1.3. PARTNERSHIPS & AGREEMENTS
11.1.4. BUSINESS EXPANSIONS & DIVESTITURES
11.2. COMPANY PROFILES
11.2.1. SUMITOMO ELECTRIC INDUSTRIES LTD
11.2.1.1. COMPANY OVERVIEW
11.2.1.2. PRODUCTS LIST
11.2.1.3. STRENGTHS & CHALLENGES
11.2.2. INVINITY ENERGY SYSTEMS
11.2.2.1. COMPANY OVERVIEW
11.2.2.2. PRODUCTS LIST
11.2.2.3. STRENGTHS & CHALLENGES
11.2.3. VRB ENERGY
11.2.3.1. COMPANY OVERVIEW
11.2.3.2. PRODUCTS LIST
11.2.3.3. STRENGTHS & CHALLENGES
11.2.4. NGK INSULATORS LTD
11.2.4.1. COMPANY OVERVIEW
11.2.4.2. PRODUCTS LIST
11.2.4.3. STRENGTHS & CHALLENGES
11.2.5. GS YUASA CORPORATION
11.2.5.1. COMPANY OVERVIEW
11.2.5.2. PRODUCTS LIST
11.2.5.3. STRENGTHS & CHALLENGES

LIST OF TABLES

TABLE 1: MARKET SNAPSHOT - FLOW BATTERY

TABLE 2: MARKET BY OFFERING, HISTORICAL YEARS, 2018-2023 (IN \$ MILLION)

TABLE 3: MARKET BY OFFERING, FORECAST YEARS, 2025-2032 (IN \$ MILLION)

TABLE 4: MARKET BY BATTERY TYPE, HISTORICAL YEARS, 2018-2023 (IN \$ MILLION)

TABLE 5: MARKET BY BATTERY TYPE, FORECAST YEARS, 2025-2032 (IN \$ MILLION)

TABLE 6: MARKET BY MATERIAL, HISTORICAL YEARS, 2018-2023 (IN \$ MILLION)

TABLE 7: MARKET BY MATERIAL, FORECAST YEARS, 2025-2032 (IN \$ MILLION)

TABLE 8: MARKET BY OWNERSHIP, HISTORICAL YEARS, 2018-2023 (IN \$ MILLION)

TABLE 9: MARKET BY OWNERSHIP, FORECAST YEARS, 2025-2032 (IN \$ MILLION)

TABLE 10: MARKET BY STORAGE, HISTORICAL YEARS, 2018-2023 (IN \$ MILLION)

TABLE 11: MARKET BY STORAGE, FORECAST YEARS, 2025-2032 (IN \$ MILLION)

TABLE 12: MARKET BY APPLICATION, HISTORICAL YEARS, 2018-2023 (IN \$ MILLION)

TABLE 13: MARKET BY APPLICATION, FORECAST YEARS, 2025-2032 (IN \$ MILLION)

TABLE 14: KEY PLAYERS OPERATING IN THE JAPAN MARKET

TABLE 15: LIST OF MERGERS & ACQUISITIONS

TABLE 16: LIST OF PRODUCT LAUNCHES & DEVELOPMENTS

TABLE 17: LIST OF PARTNERSHIPS & AGREEMENTS

TABLE 18: LIST OF BUSINESS EXPANSIONS & DIVESTITURES

LIST OF FIGURES

FIGURE 1: KEY MARKET TRENDS

FIGURE 2: PORTER'S FIVE FORCES ANALYSIS

FIGURE 3: GROWTH PROSPECT MAPPING FOR JAPAN

FIGURE 4: MARKET MATURITY ANALYSIS

FIGURE 5: MARKET CONCENTRATION ANALYSIS

FIGURE 6: VALUE CHAIN ANALYSIS

FIGURE 7: KEY BUYING CRITERIA

FIGURE 8: SEGMENT GROWTH POTENTIAL, BY OFFERING, IN 2024

FIGURE 9: ENERGY STORAGE SYSTEM MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 10: BATTERY MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 11: SERVICE MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 12: MARKET GROWTH POTENTIAL, BY BATTERY TYPE, IN 2024

FIGURE 13: REDOX MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 14: HYBRID MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 15: SEGMENT GROWTH POTENTIAL, BY MATERIAL, IN 2024

FIGURE 16: VANADIUM MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 17: ZINC-BROMINE MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 18: IRON MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 19: OTHER MATERIALS MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 20: SEGMENT GROWTH POTENTIAL, BY OWNERSHIP, IN 2024

FIGURE 21: CUSTOMER-OWNED MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 22: THIRD-PARTY-OWNED MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 23: GRID/UTILITY-OWNED MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 24: SEGMENT GROWTH POTENTIAL, BY STORAGE, IN 2024

FIGURE 25: LARGE-SCALE MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 26: SMALL-SCALE MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 27: SEGMENT GROWTH POTENTIAL, BY APPLICATION, IN 2024

FIGURE 28: GRID/UTILITY MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 29: COMMERCIAL AND INDUSTRIAL MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 30: EV CHARGING STATION MARKET SIZE, 2025-2032 (IN \$ MILLION)

FIGURE 31: OTHER APPLICATIONS MARKET SIZE, 2025-2032 (IN \$ MILLION)

Japan Flow Battery Market Forecast 2025-2032

Market Report | 2025-11-17 | 125 pages | Inkwood Research

To place an Order with Scotts International:

- Print this form
- Complete the relevant blank fields and sign
- Send as a scanned email to support@scotts-international.com

ORDER FORM:

Select license	License	Price
	Single User Price	\$1100.00
	Global Site License	\$1500.00
		VAT
		Total

*Please circle the relevant license option. For any questions please contact support@scotts-international.com or 0048 603 394 346.

** VAT will be added at 23% for Polish based companies, individuals and EU based companies who are unable to provide a valid EU Vat Numbers.

Email*	<input type="text"/>	Phone*	<input type="text"/>
First Name*	<input type="text"/>	Last Name*	<input type="text"/>
Job title*	<input type="text"/>		
Company Name*	<input type="text"/>	EU Vat / Tax ID / NIP number*	<input type="text"/>
Address*	<input type="text"/>	City*	<input type="text"/>
Zip Code*	<input type="text"/>	Country*	<input type="text"/>
		Date	<input type="text" value="2026-02-08"/>
		Signature	<input type="text"/>

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com