

Quantum Batteries Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented, By Technology Type (Quantum Dot Batteries, Quantum Polymer Batteries, and Others), By Raw Material (Quantum Dots, Nanomaterials, Superconducting Materials, Organic Polymers, and Others), By Application (Consumer Electronics, Electric Vehicles (EVs), Renewable Energy Storage, and Others), By Region & Competition, 2021-2031F

<https://marketpublishers.com/r/Q63AF9638340EN.html>

Date: May 2026

Pages: 185

Price: US\$ 4,500.00 (Single User License)

ID: Q63AF9638340EN

Abstracts

The Global Quantum Batteries Market is projected to expand significantly, rising from USD 15.35 Billion in 2025 to USD 49.85 Billion by 2031, demonstrating a robust CAGR of 21.69%. Quantum batteries are innovative energy storage devices that harness quantum mechanical phenomena, such as entanglement and superradiance, to offer the potential for near-instantaneous charging and superior energy density compared to traditional electrochemical cells. This sector's growth is primarily fueled by the worldwide shift towards renewable energy grids that demand efficient storage solutions and the urgent need within the automotive industry for ultra-fast charging capabilities to accelerate electric vehicle adoption. These specific drivers aim to overcome the inherent physical limitations of chemical ion transfer rates, setting them apart from broader technological trends. A key challenge to their commercialization, however, is mitigating decoherence, a process where environmental interference disrupts the delicate quantum states vital for energy retention. Consequently, the market is currently integrated into the wider quantum research ecosystem rather than functioning as an independent commercial revenue stream. The Quantum Economic Development Consortium reported that in 2025, the global quantum technology market was valued at

\$1.88 billion, providing crucial computational and sensing infrastructure necessary for advancing the material science required for these next-generation batteries.

Market Driver

Technological breakthroughs in superabsorption and quantum energy transfer protocols are fundamentally transforming the viability of quantum energy storage by directly addressing the critical issue of energy retention. Unlike classical batteries, whose charging speed is limited by ion diffusion, quantum batteries leverage collective quantum states to increase charging rates as their size expands. However, sustaining these quantum states against environmental decoherence has historically been a significant barrier to commercial application. A recent major advancement saw researchers dramatically improve energy retention times, bringing the technology closer to practical use. Specifically, Rinnovabili reported in July 2025 that researchers at RMIT University successfully extended the charge retention duration of a quantum battery prototype by over 1,000 times, from nanoseconds to microseconds. This progression is crucial for validating the theoretical advantages of quantum batteries in high-power applications, such as instant electric vehicle charging, by demonstrating that energy can be stored for a practically useful duration. A surge in global investments and funding for quantum technology research serves as the primary catalyst for translating these theoretical concepts into tangible prototypes. Developing materials and control systems resistant to decoherence requires substantial capital, prompting both public and private sectors to aggressively increase financial commitments to secure leadership in this strategic domain. According to Semiconductor Digest in March 2025, governments worldwide allocated an additional \$3.1 billion to quantum technology over the preceding year, bringing the total public funding to an estimated \$44.5 billion. This significant capital influx is directly expanding the specialized labor force essential for engineering these complex systems. Consequently, the Quantum Economic Development Consortium reported in March 2025 that the global workforce employed by pure-play quantum companies has grown to approximately 14,517 professionals, thereby establishing the intellectual infrastructure required to overcome the remaining thermodynamic hurdles impeding the commercialization of quantum batteries.

Market Challenge

The inability to effectively mitigate decoherence represents a critical technical barrier that prevents the Global Quantum Batteries Market from establishing a commercial foothold. Decoherence occurs when environmental interference disrupts the entangled

quantum states necessary for energy storage, leading to near-instantaneous discharge of potential devices. This inherent physical instability undermines the core function of a battery, thereby confining the technology primarily to laboratory experiments and preventing the development of reliable, consumer-ready energy storage products. As a direct consequence, the industry remains financially reliant on speculative investment rather than generating revenue from manufactured goods. The market is currently characterized by high cash burn rates as companies dedicate resources to engineer materials capable of sustaining quantum states for useful durations. According to the Quantum Economic Development Consortium, venture capital investment in quantum startups reached approximately \$2 billion in 2025. This substantial expenditure highlights that the market is still deeply entrenched in a resource-intensive research phase, focused on overcoming fundamental stability issues rather than scaling production for widespread applications in automotive or grid sectors.

Market Trends

An increasing emphasis on solid-state quantum battery designs is strategically reshaping the market's commercial trajectory as developers strive to overcome the volatility and decoherence issues inherent in liquid-electrolyte systems. This trend signifies a deliberate shift from purely theoretical quantum storage concepts toward hybrid architectures that integrate quantum mechanical tunneling effects into stable solid-state materials. This strategic pivot is attracting substantial capital into manufacturing infrastructure, validating the technology's potential for mass-market automotive applications. For example, QuantumScape Corporation announced in July 2025 an expanded collaboration with PowerCo to industrialize these next-generation designs, securing an additional \$131 million in payments to scale up production capabilities. Such significant investments indicate that the industry is prioritizing the engineering of robust physical formats capable of reliably housing quantum energy states within electric vehicle chassis. Simultaneously, the exploration of topological defects and 2D materials for energy storage has emerged as a crucial research direction, enabled by the growing availability of high-utility quantum processors for sophisticated material simulation. Researchers are increasingly leveraging advanced quantum hardware to model the complex topological phases essential for protecting stored energy from environmental dissipation, a process that is computationally intractable for classical systems. This data-driven approach to material discovery is accelerating the identification of substrates that can maintain quantum coherence for practical durations. As reported by the Investing News Network in November 2025, IBM released its Quantum Nighthawk processor, featuring 120 qubits—a hardware advancement explicitly designed to solve the fundamental chemistry challenges

required to engineer these sophisticated battery materials. This significant computational leap allows for the precise manipulation of 2D material properties, directly facilitating the transition of topological energy storage from mathematical abstraction to physical reality.

Key Market Players

Alphabet Inc.

QuantumScape Battery, Inc.

Quantum Instruments And Solutions

Volkswagen AG

Toyota Motor Corporation

SES AI Corporation

Murata Manufacturing Co., Ltd.

StoreDot Ltd.

Factorial Inc,

ProLogium Technology Co, Ltd

Report Scope

In this report, the Global Quantum Batteries Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Quantum Batteries Market, By Technology Type

Quantum Dot Batteries

Quantum Polymer Batteries

Others

Quantum Batteries Market, By Raw Material

Quantum Dots

Nanomaterials

Superconducting Materials

Organic Polymers

Others

Quantum Batteries Market, By Application

Consumer Electronics

Electric Vehicles (EVs)

Renewable Energy Storage

Others

Quantum Batteries Market, By Region

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Quantum Batteries Market.

Available Customizations:

Global Quantum Batteries Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

Contents

1. PRODUCT OVERVIEW

- 1.1. Market Definition
- 1.2. Scope of the Market
 - 1.2.1. Markets Covered
 - 1.2.2. Years Considered for Study
 - 1.2.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

- 2.1. Objective of the Study
- 2.2. Baseline Methodology
- 2.3. Key Industry Partners
- 2.4. Major Association and Secondary Sources
- 2.5. Forecasting Methodology
- 2.6. Data Triangulation & Validation
- 2.7. Assumptions and Limitations

3. EXECUTIVE SUMMARY

- 3.1. Overview of the Market
- 3.2. Overview of Key Market Segmentations
- 3.3. Overview of Key Market Players
- 3.4. Overview of Key Regions/Countries
- 3.5. Overview of Market Drivers, Challenges, Trends

4. VOICE OF CUSTOMER

5. GLOBAL QUANTUM BATTERIES MARKET OUTLOOK

- 5.1. Market Size & Forecast
 - 5.1.1. By Value
- 5.2. Market Share & Forecast
 - 5.2.1. By Technology Type (Quantum Dot Batteries, Quantum Polymer Batteries, Others)
 - 5.2.2. By Raw Material (Quantum Dots, Nanomaterials, Superconducting Materials, Organic Polymers, Others)

5.2.3. By Application (Consumer Electronics, Electric Vehicles (EVs), Renewable Energy Storage, Others)

5.2.4. By Region

5.2.5. By Company (2025)

5.3. Market Map

6. NORTH AMERICA QUANTUM BATTERIES MARKET OUTLOOK

6.1. Market Size & Forecast

6.1.1. By Value

6.2. Market Share & Forecast

6.2.1. By Technology Type

6.2.2. By Raw Material

6.2.3. By Application

6.2.4. By Country

6.3. North America: Country Analysis

6.3.1. United States Quantum Batteries Market Outlook

6.3.1.1. Market Size & Forecast

6.3.1.1.1. By Value

6.3.1.2. Market Share & Forecast

6.3.1.2.1. By Technology Type

6.3.1.2.2. By Raw Material

6.3.1.2.3. By Application

6.3.2. Canada Quantum Batteries Market Outlook

6.3.2.1. Market Size & Forecast

6.3.2.1.1. By Value

6.3.2.2. Market Share & Forecast

6.3.2.2.1. By Technology Type

6.3.2.2.2. By Raw Material

6.3.2.2.3. By Application

6.3.3. Mexico Quantum Batteries Market Outlook

6.3.3.1. Market Size & Forecast

6.3.3.1.1. By Value

6.3.3.2. Market Share & Forecast

6.3.3.2.1. By Technology Type

6.3.3.2.2. By Raw Material

6.3.3.2.3. By Application

7. EUROPE QUANTUM BATTERIES MARKET OUTLOOK

- 7.1. Market Size & Forecast
 - 7.1.1. By Value
- 7.2. Market Share & Forecast
 - 7.2.1. By Technology Type
 - 7.2.2. By Raw Material
 - 7.2.3. By Application
 - 7.2.4. By Country
- 7.3. Europe: Country Analysis
 - 7.3.1. Germany Quantum Batteries Market Outlook
 - 7.3.1.1. Market Size & Forecast
 - 7.3.1.1.1. By Value
 - 7.3.1.2. Market Share & Forecast
 - 7.3.1.2.1. By Technology Type
 - 7.3.1.2.2. By Raw Material
 - 7.3.1.2.3. By Application
 - 7.3.2. France Quantum Batteries Market Outlook
 - 7.3.2.1. Market Size & Forecast
 - 7.3.2.1.1. By Value
 - 7.3.2.2. Market Share & Forecast
 - 7.3.2.2.1. By Technology Type
 - 7.3.2.2.2. By Raw Material
 - 7.3.2.2.3. By Application
 - 7.3.3. United Kingdom Quantum Batteries Market Outlook
 - 7.3.3.1. Market Size & Forecast
 - 7.3.3.1.1. By Value
 - 7.3.3.2. Market Share & Forecast
 - 7.3.3.2.1. By Technology Type
 - 7.3.3.2.2. By Raw Material
 - 7.3.3.2.3. By Application
 - 7.3.4. Italy Quantum Batteries Market Outlook
 - 7.3.4.1. Market Size & Forecast
 - 7.3.4.1.1. By Value
 - 7.3.4.2. Market Share & Forecast
 - 7.3.4.2.1. By Technology Type
 - 7.3.4.2.2. By Raw Material
 - 7.3.4.2.3. By Application
 - 7.3.5. Spain Quantum Batteries Market Outlook
 - 7.3.5.1. Market Size & Forecast

- 7.3.5.1.1. By Value
- 7.3.5.2. Market Share & Forecast
 - 7.3.5.2.1. By Technology Type
 - 7.3.5.2.2. By Raw Material
 - 7.3.5.2.3. By Application

8. ASIA PACIFIC QUANTUM BATTERIES MARKET OUTLOOK

- 8.1. Market Size & Forecast
 - 8.1.1. By Value
- 8.2. Market Share & Forecast
 - 8.2.1. By Technology Type
 - 8.2.2. By Raw Material
 - 8.2.3. By Application
 - 8.2.4. By Country
- 8.3. Asia Pacific: Country Analysis
 - 8.3.1. China Quantum Batteries Market Outlook
 - 8.3.1.1. Market Size & Forecast
 - 8.3.1.1.1. By Value
 - 8.3.1.2. Market Share & Forecast
 - 8.3.1.2.1. By Technology Type
 - 8.3.1.2.2. By Raw Material
 - 8.3.1.2.3. By Application
 - 8.3.2. India Quantum Batteries Market Outlook
 - 8.3.2.1. Market Size & Forecast
 - 8.3.2.1.1. By Value
 - 8.3.2.2. Market Share & Forecast
 - 8.3.2.2.1. By Technology Type
 - 8.3.2.2.2. By Raw Material
 - 8.3.2.2.3. By Application
 - 8.3.3. Japan Quantum Batteries Market Outlook
 - 8.3.3.1. Market Size & Forecast
 - 8.3.3.1.1. By Value
 - 8.3.3.2. Market Share & Forecast
 - 8.3.3.2.1. By Technology Type
 - 8.3.3.2.2. By Raw Material
 - 8.3.3.2.3. By Application
 - 8.3.4. South Korea Quantum Batteries Market Outlook
 - 8.3.4.1. Market Size & Forecast

- 8.3.4.1.1. By Value
- 8.3.4.2. Market Share & Forecast
 - 8.3.4.2.1. By Technology Type
 - 8.3.4.2.2. By Raw Material
 - 8.3.4.2.3. By Application
- 8.3.5. Australia Quantum Batteries Market Outlook
 - 8.3.5.1. Market Size & Forecast
 - 8.3.5.1.1. By Value
 - 8.3.5.2. Market Share & Forecast
 - 8.3.5.2.1. By Technology Type
 - 8.3.5.2.2. By Raw Material
 - 8.3.5.2.3. By Application

9. MIDDLE EAST & AFRICA QUANTUM BATTERIES MARKET OUTLOOK

- 9.1. Market Size & Forecast
 - 9.1.1. By Value
- 9.2. Market Share & Forecast
 - 9.2.1. By Technology Type
 - 9.2.2. By Raw Material
 - 9.2.3. By Application
 - 9.2.4. By Country
- 9.3. Middle East & Africa: Country Analysis
 - 9.3.1. Saudi Arabia Quantum Batteries Market Outlook
 - 9.3.1.1. Market Size & Forecast
 - 9.3.1.1.1. By Value
 - 9.3.1.2. Market Share & Forecast
 - 9.3.1.2.1. By Technology Type
 - 9.3.1.2.2. By Raw Material
 - 9.3.1.2.3. By Application
 - 9.3.2. UAE Quantum Batteries Market Outlook
 - 9.3.2.1. Market Size & Forecast
 - 9.3.2.1.1. By Value
 - 9.3.2.2. Market Share & Forecast
 - 9.3.2.2.1. By Technology Type
 - 9.3.2.2.2. By Raw Material
 - 9.3.2.2.3. By Application
 - 9.3.3. South Africa Quantum Batteries Market Outlook
 - 9.3.3.1. Market Size & Forecast

9.3.3.1.1. By Value

9.3.3.2. Market Share & Forecast

9.3.3.2.1. By Technology Type

9.3.3.2.2. By Raw Material

9.3.3.2.3. By Application

10. SOUTH AMERICA QUANTUM BATTERIES MARKET OUTLOOK

10.1. Market Size & Forecast

10.1.1. By Value

10.2. Market Share & Forecast

10.2.1. By Technology Type

10.2.2. By Raw Material

10.2.3. By Application

10.2.4. By Country

10.3. South America: Country Analysis

10.3.1. Brazil Quantum Batteries Market Outlook

10.3.1.1. Market Size & Forecast

10.3.1.1.1. By Value

10.3.1.2. Market Share & Forecast

10.3.1.2.1. By Technology Type

10.3.1.2.2. By Raw Material

10.3.1.2.3. By Application

10.3.2. Colombia Quantum Batteries Market Outlook

10.3.2.1. Market Size & Forecast

10.3.2.1.1. By Value

10.3.2.2. Market Share & Forecast

10.3.2.2.1. By Technology Type

10.3.2.2.2. By Raw Material

10.3.2.2.3. By Application

10.3.3. Argentina Quantum Batteries Market Outlook

10.3.3.1. Market Size & Forecast

10.3.3.1.1. By Value

10.3.3.2. Market Share & Forecast

10.3.3.2.1. By Technology Type

10.3.3.2.2. By Raw Material

10.3.3.2.3. By Application

11. MARKET DYNAMICS

- 11.1. Drivers
- 11.2. Challenges

12. MARKET TRENDS & DEVELOPMENTS

- 12.1. Merger & Acquisition (If Any)
- 12.2. Product Launches (If Any)
- 12.3. Recent Developments

13. GLOBAL QUANTUM BATTERIES MARKET: SWOT ANALYSIS

14. PORTER'S FIVE FORCES ANALYSIS

- 14.1. Competition in the Industry
- 14.2. Potential of New Entrants
- 14.3. Power of Suppliers
- 14.4. Power of Customers
- 14.5. Threat of Substitute Products

15. COMPETITIVE LANDSCAPE

- 15.1. Alphabet Inc.
 - 15.1.1. Business Overview
 - 15.1.2. Products & Services
 - 15.1.3. Recent Developments
 - 15.1.4. Key Personnel
 - 15.1.5. SWOT Analysis
- 15.2. QuantumScape Battery, Inc.
- 15.3. Quantum Instruments And Solutions
- 15.4. Volkswagen AG
- 15.5. Toyota Motor Corporation
- 15.6. SES AI Corporation
- 15.7. Murata Manufacturing Co., Ltd.
- 15.8. StoreDot Ltd.
- 15.9. Factorial Inc,
- 15.10. ProLogium Technology Co, Ltd

16. STRATEGIC RECOMMENDATIONS

17. ABOUT US & DISCLAIMER

I would like to order

Product name: Quantum Batteries Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented, By Technology Type (Quantum Dot Batteries, Quantum Polymer Batteries, and Others), By Raw Material (Quantum Dots, Nanomaterials, Superconducting Materials, Organic Polymers, and Others), By Application (Consumer Electronics, Electric Vehicles (EVs), Renewable Energy Storage, and Others), By Region & Competition, 2021-2031F

Product link: <https://marketpublishers.com/r/Q63AF9638340EN.html>

Price: US\$ 4,500.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/Q63AF9638340EN.html>