Quantum Report (1)

Growing Global Interest in Quantum Technology:

Market Forecasts and Japan's Strategy

In recent years, efforts toward research and development and practical applications of quantum technologies have progressed at a pace exceeding expectations, with strategies aimed at advancing quantum technologies being formulated in countries around the world from the perspectives of both industrial competitiveness and national security. Furthermore, many companies and research institutes are competing fiercely, and as competition intensifies, international collaboration efforts are also becoming more active. Japan has been also keeping pace and, as one of the countries taking a leading role globally, is embarking not only on research and development but also on business applications and the creation of market opportunities. As a general overview of this series, this article focuses primarily on quantum computing (Note 1) among various quantum technologies and provides an overview of future growth potential as seen from market forecasts, as well as the strategies of other countries/regions and Japan.

■Tremendous Impact on a Wide Range of Industries

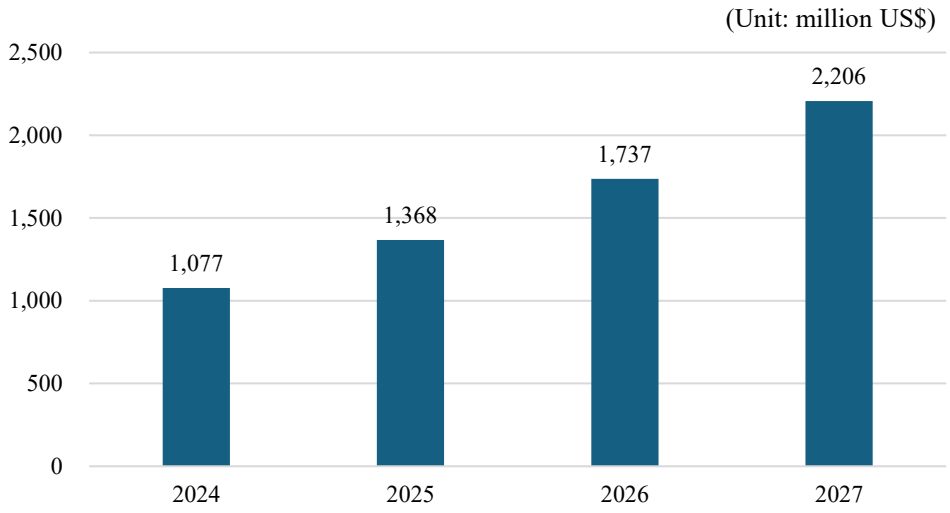
Quantum computers are next-generation computers that utilize quantum properties such as "superposition" (Note 2), "quantum entanglement" (Note 3) and excel at high-speed processing of calculations that would take an impractical amount of time on conventional computers (classical computers). For example, in "combinatorial optimization," factory layouts with numerous pieces of equipment can be arranged in the most efficient configuration. In quantum computational chemistry simulations, quantum computers can be used to predict the physical properties of chemical materials and analyze chemical reactions and are also suitable for applications such as advances in machine learning, cryptography and security. Therefore, it is expected to contribute to promoting innovation across a wide range of industries (drug discovery, materials chemistry, finance, logistics, etc.).

On the other hand, quantum computers are said to be unsuitable for speeding up the basic arithmetic operations that classical computers are based on. Additionally, controlling the state of "qubit," the basic unit of information in quantum computers, requires advanced technologies, and at present, there is a possibility of outputting incorrect answers due to errors. There are many challenges to practical applications, including the need to increase the number of qubits. Therefore, research and demonstration are also underway for hybrid utilization that leverages the characteristics of both quantum computers and classical computers to enhance synergistic effects.

■Market Projected to Expand Steadily

There are various forecasts regarding the market size and outlook for quantum computing, which is in its nascent stage. According to the U.S. Quantum Economic Development Consortium (QED-C) (Note 4), the global quantum computing market is estimated at approximately 1.077 billion dollars as of 2024. After that, the market is expected to grow at a compound annual growth rate of 27%, reaching approximately 2.206 billion dollars by 2027 (see Figure below).

Quantum Computing Market Size Forecast



Source: Created by JETRO based on QED-C research materials (commissioned to: Hyperion Research)

A survey by India's Fortune Business Insights, which conducts global market research, updated as of December 2025, also estimates the global quantum computing market size at approximately 1.16 billion dollars in 2024 and approximately 1.53 billion dollars in 2025, similar in scale to the aforementioned survey. The company predicts that the market will expand at a compound annual rate of 34.8% and reach approximately 12.62 billion dollars by 2032.

Regarding Japan's quantum computing market, a survey by Report Ocean, a market research company with bases in the United States, India, and Japan, updated as of November 2024, estimates the market size in 2023 at approximately 197 million dollars. It is expected to increase to approximately 2.877 billion dollars by 2032, with a compound annual growth rate of 34.7%, predicting growth at a pace comparable to the global market.

Regarding the economic value created by quantum computing, a survey by the U.S.-based Boston Consulting Group (July 2024) predicts it will reach 450 billion to 850 billion dollars by 2040. As

these multiple survey results indicate, the quantum computing market is expected to expand steadily over the next several years.

■Japan's Vision of a Quantum Future Society

Countries around the world are investing substantial funds toward practical applications, and from a national security perspective as well, emphasis is being placed on efforts to improve and commercialize quantum-related technologies domestically and through collaboration with comrade nations, including applications for cryptanalysis and more robust security communications. In this context, the Japanese government is formulating quantum-related strategies, led by the Cabinet Office. At the Integrated Innovation Strategy Promotion Council (Note 4) led by the Cabinet Office, three national strategies were formulated (Table), starting with the "Quantum Technology Innovation Strategy" in January 2020, followed by the "Vision of Quantum Future Society" (April 2022) and the "Strategy of Quantum Future Industry Development" (April 2023). In addition, to complement these initiatives, the Quantum Technology Innovation Council (Note 5) has issued the "Promotion Measures for the Development of Quantum Industries" (April 2024), which focuses primarily on international collaboration, and the "Promotion Measures for the Development of a Quantum Ecosystem" (May 2025), which outlines challenges and corresponding measures for building a quantum ecosystem.

Table: Japan's Quantum-Related Strategies and Promotion Measures (As of February 2026)

I : Strategies (Formulated at the Integrated Innovation Strategy Promotion Council)

Strategies	Date of Formulation	Overview
Quantum Technology Innovation Strategy	January 2020	Formulated as a national strategy to keep pace with international developments in quantum technologies, leverage Japan's strengths, and promote research and development as well as industrialization and commercialization. It positioned (1) identification of priority areas, (2) establishment of quantum hubs, and (3) promotion of international cooperation as key priority initiatives.
Vision of Quantum Future Society	April 2022	In response to the expansion of quantum technology applications and the growing importance of economic security following the "Quantum Technology Innovation Strategy," a future vision for society to be achieved through quantum technologies, as well as strategies to

		realize that vision, was formulated. Three goals have been set as the state to be achieved by 2030 (see main text).
Strategy of Quantum Future Industry Development	April 2023	A strategy that compiles priority and focused initiatives toward the practical application and industrialization of quantum technology to realize the vision and goals formulated in the "Vision of Quantum Future Society."

II: Promotion Measures (Formulated at the Quantum Technology Innovation Council)

Promotion Measures	Date of Formulation	Overview
Promotion Measures for the Development of Quantum Industries	April 2024	This document compiles specific initiatives that should be urgently strengthened or added, such as international collaboration, to respond quickly to advances in quantum technology, national strategies of various countries, and changes in the domestic and international situation regarding practical application and industrialization. (Positioning: "Measures to strengthen and complement the three strategies" toward the 2030 goals)
Promotion Measures for the Development of a Quantum Ecosystem	May 2025	In the context of rapidly evolving international landscape surrounding quantum technologies, this document compiles the initiatives required—particularly those aimed at building an ecosystem—in order to achieve the industrialization of quantum technology ahead of the rest of the world. (Positioning: "Measures to strengthen and complement the three strategies" toward the 2030 goals)

Source: Prepared by JETRO based on the Cabinet Office materials

Based on the "Quantum Technology Innovation Strategy," and from the perspective that it is essential to establish hubs that enable integrated collaboration among industry, academia and government—from basic research through technology demonstration, open innovation, and human resource development—in order to secure and strengthen international competitiveness with a focus on technology areas where Japan has strengths, the Quantum Innovation Hubs (QIH)

(headquartered at RIKEN) were established in February 2021. Multiple major research organizations, including universities, have been designated as QIHs, with the total number reaching 12 as of February 2026.

The "Vision of Quantum Future Society" envisions a "future society where economy, environment, and society are in harmony," where quantum technology permeates people's lives, driving a transformation of society as a whole. Under this strategy, the following were set as the key targets to be achieved by 2030: (1) increasing the number of domestic users of quantum technology to 10 million, (2) expanding the production value generated by quantum technology to a scale of 50 trillion yen, and (3) fostering the creation of quantum unicorn companies.

Based on the above strategies and the "Strategy of Quantum Future Industry Development," the Global Research and Development Center for Business by Quantum-AI Technology (G-QuAT) was established at the National Institute of Advanced Industrial Science and Technology (AIST) in July 2023, and as one of the QIHs, it is primarily engaged in creating new businesses and supporting industrialization by leveraging the breadth of Japan's industrial base. G-QuAT also has been playing a role in promoting domestic and international collaboration and has the advantage of being able to provide state-of-the-art facilities and environments to partner companies and others. The center also aims to become a world-leading global hub in the industrialization of quantum computers.

■Japanese Government Positions Quantum Technology as a Priority Field

Under the Takaichi administration, inaugurated in October 2025, quantum technology remains as a key priority. "Quantum" was included as one of the 17 strategic fields set forth by the newly established Japan Growth Strategy Headquarters in November of the same year, and the government aims to secure the necessary budget and promote investment through public-private partnerships. Additionally, in the explanatory materials for the outline draft of the 7th "Science, Technology and Innovation Basic Plan" (FY2026-2030), published in November 2025, quantum is positioned, under the category of "Strategic Prioritization of Technology Fields," as one of the 16 "Emerging and Foundational Technology Fields," and furthermore as one of the six "National Strategic Technology Fields" within that category. The plan is being discussed at the Expert Panel on Basic Plan established under the Cabinet Office's Council for Science, Technology and Innovation (CSTI) (Note 6). The Japanese government plans to prioritize the allocation of budgets from relevant ministries and agencies to this field, and to advance seamless, end-to-end support from research and development to industrialization, as well as to prioritize incentives for R&D investment. The outline draft states that across science, technology and innovation as a whole—including quantum technologies—the government will pursue organic coordination with national security policy, promotion of dual-use technologies, and social implementation of the outcomes achieved.

Each ministry and agency is pursuing initiatives toward the practical application of quantum computers by leveraging various frameworks. For example, one of the 10 Moonshot Goals determined by CSTI is the realization of a fault-tolerant universal quantum computer by 2050, which is being promoted primarily by the Japan Science and Technology Agency (JST) under the jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). In addition, there are quantum-related initiatives within the framework of the Strategic Innovation Promotion Program (SIP), a national project with CSTI serving as the central coordinating body. Furthermore, MEXT established the Photonics and Quantum Leap Flagship Program (Q-LEAP), and is promoting research and development toward the social implementation of quantum science and technology over a long-term span from FY2018 to FY2029.

In FY2025, under the jurisdiction of the Ministry of Economy, Trade and Industry (METI), more than 100.9 billion yen in total (including 51.8 billion yen from the FY2024 supplementary budget), was invested in the "Project to Accelerate Development and to Improve the Environment for the Industrialization of Quantum Computers" (Note 7), promoting technology development and environmental improvement to strengthen industrial competitiveness. In terms of technology development, approximately 49.5 billion yen has been allocated to the New Energy and Industrial Technology Development Organization (NEDO)'s "R&D Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems (Development toward Industrialization of Quantum Computers)," under which multiple projects have been publicly solicited and implemented. Meanwhile, in terms of environmental infrastructure development, approximately 51.5 billion yen has been allocated to expand G-QuAT's facilities and computing/evaluation equipment. For FY2026, a supplementary budget of 100.4 billion yen (Note 8), approximately double that of the previous fiscal year, has been secured, and strengthened measures toward industrialization will be continued based on three pillars: (1) acceleration of R&D for next-generation systems and human resource development, (2) large-scale demonstrations to create use cases, and (3) expansion of G-QuAT.

Like other major countries around the world, the Japanese government also places importance on quantum technology, which is expected to contribute to the development of critical technological infrastructure such as artificial intelligence (AI) and data linkage platforms, and which could also have a significant impact on national security. Looking beyond research and development in quantum technology, comprehensive initiatives are being promoted, including industry creation, human resource development, and ecosystem building. In the field of quantum computing, where the technology is not yet fully established and the market is still in its infancy, it is necessary for industry, government, and academia to work together to advance technological development and create market opportunities. In addition to maintaining Japan's existing strengths, global collaboration is indispensable. In the following sections, we will examine the current state of

quantum computing and quantum-related technologies surrounding Japan, with an emphasis on international initiatives.

Note 1: In this article, "Quantum computing" encompasses quantum computers and information processing methods and technologies.
Note 2: Quantum superposition refers to the property whereby a quantum system can simultaneously exist in multiple mutually opposing states, like the heads and tails of a coin.
Note 3: Quantum entanglement refers to the property whereby two quantum particles remain correlated and change in a linked manner, regardless of the distance between them.
Note 4: The Integrated Innovation Strategy Promotion Council was established in the Cabinet to conduct cross-cutting and substantive coordination of innovation-related command councils, including the Council for Science, Technology and Innovation (CSTI), and to promote the integrated innovation strategy.
Note 5: The Quantum Technology Innovation Council was established under the Integrated Innovation Strategy Promotion Council against the background of the need for relevant ministries and agencies to cooperate and collaborate in examining and implementing all possible measures. The Council is composed of experts from government, academia, and industry.
Note 6: CSTI, chaired by the Prime Minister, takes an overarching view of science and technology in Japan and, from a position above individual ministries, conducts comprehensive planning and coordination of science and technology policy. It was established in the Cabinet Office in January 2001 as one of the "Councils on Important Policies" (formerly known as the Council for Science and Technology Policy).
Note 7: The FY2024 supplementary budget amount (part of the Ministry of Economy, Trade and Industry) is 51.8 billion yen; 100.9 billion yen is the total amount including items such as national government debt burden commitments.
Note 8: Based on the FY2025 supplementary budget (part of the Ministry of Economy, Trade and Industry) enacted on December 16, 2025.

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