

2025 Global Quantum-Safe Industry Development Outlook

Quantum Technologies Annual Report Series

February, 2025

Definition of Quantum-Safe

The research subject of this report is the Quantum-Safe Industry. The Quantum-Safe Industry is a technology - intensive sector. It has been formed to counter the threats that quantum computers pose to traditional cryptographic systems. It centers on the research, development, application, and commercialization of two key areas: quantum communication technologies, with Quantum Key Distribution (QKD) being a prime example, and Post-Quantum Cryptography (PQC).

► Quantum-Safe Secure Communication

Quantum-Safe Secure Communication utilizes the fundamental principles of quantum mechanics. These include the no-cloning theorem, quantum entanglement, and the uncertainty principle. It achieves secure information transmission through secure communication protocols and engineering technologies. Examples of such technologies are Quantum Key Distribution , Quantum Random Number Generators, and Quantum Teleportation.

► Post-Quantum Cryptography

Post-Quantum Cryptography refers to cryptographic algorithms designed to resist attacks from quantum computers. These algorithms are developed with the aim of ensuring that their computational complexity remains exponential, even when quantum computers become a practical reality, thus safeguarding information security. Any new algorithm capable of resisting quantum computing attacks can be considered part of Post-Quantum Cryptography.

Policies Guide the Direction of the Industry, Financing Sparks Innovation Vitality.

Global Quantum-Safe Enterprise Financing Status and Number of National-Level Policies Issued in 2024

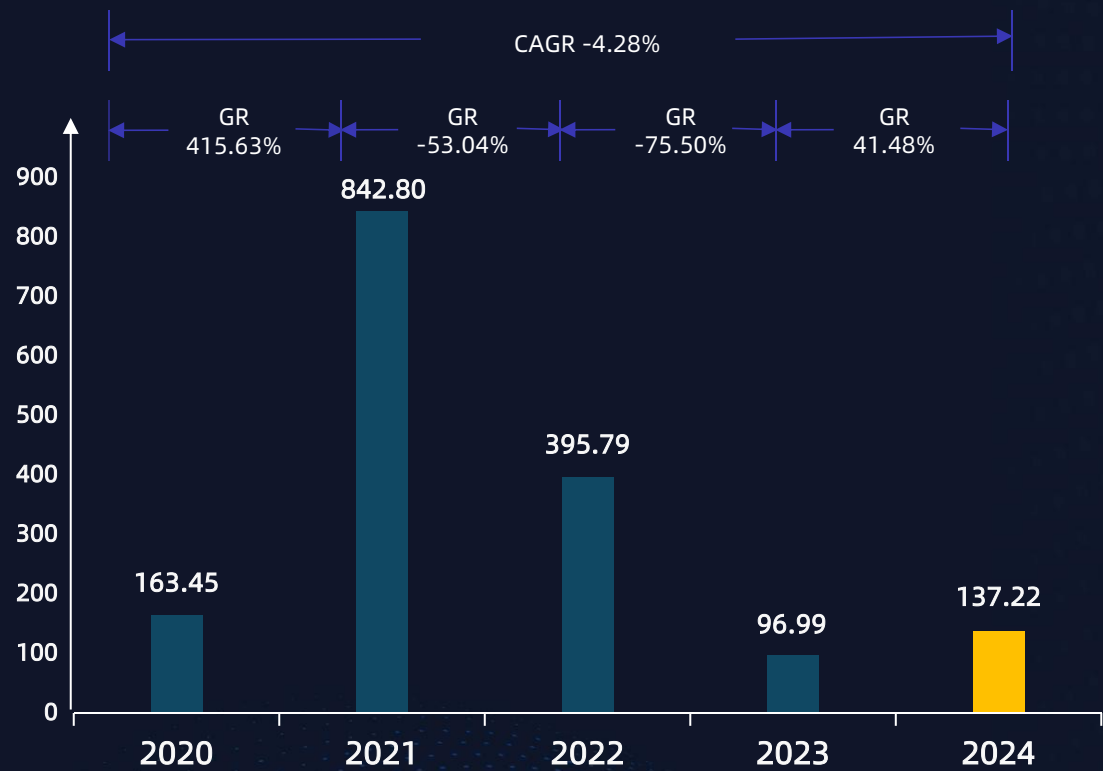


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- The dual drivers of policy and capital are accelerating the maturation and implementation of the global Quantum-Safe industry.
- Policies formulate strategies, set standards, and guide funding toward critical areas.
- Financing powers research projects and enterprise development, ensuring the execution of policies.
- Together, they enhance international cooperation and competitive advantages, promoting industrial growth.

Total Funding Has Risen Compared to 2023, though the Growth Is Gradual.

Global Quantum-Safe Sector Funding, 2020-2024 (in Million USD)



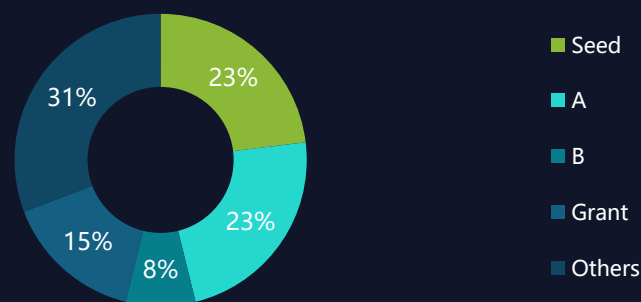
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In 2024, a total of 11 companies in the Quantum-Safe sector secured \$137 million in financing. Compared to 2023, the amount of financing has increased, but the upward trend remains slow.

Although the global Quantum-Safe industry has made progress in attracting capital, it still faces numerous challenges, such as the small scale of the industry and the high uncertainty of investment returns. These factors have prevented a significant surge in the inflow of social capital.










Financing Rounds Relatively Dispersed, Still in the Early Stages of Funding.

Distribution of Companies and Financing Rounds in the Global Quantum-Safe Sector in 2024



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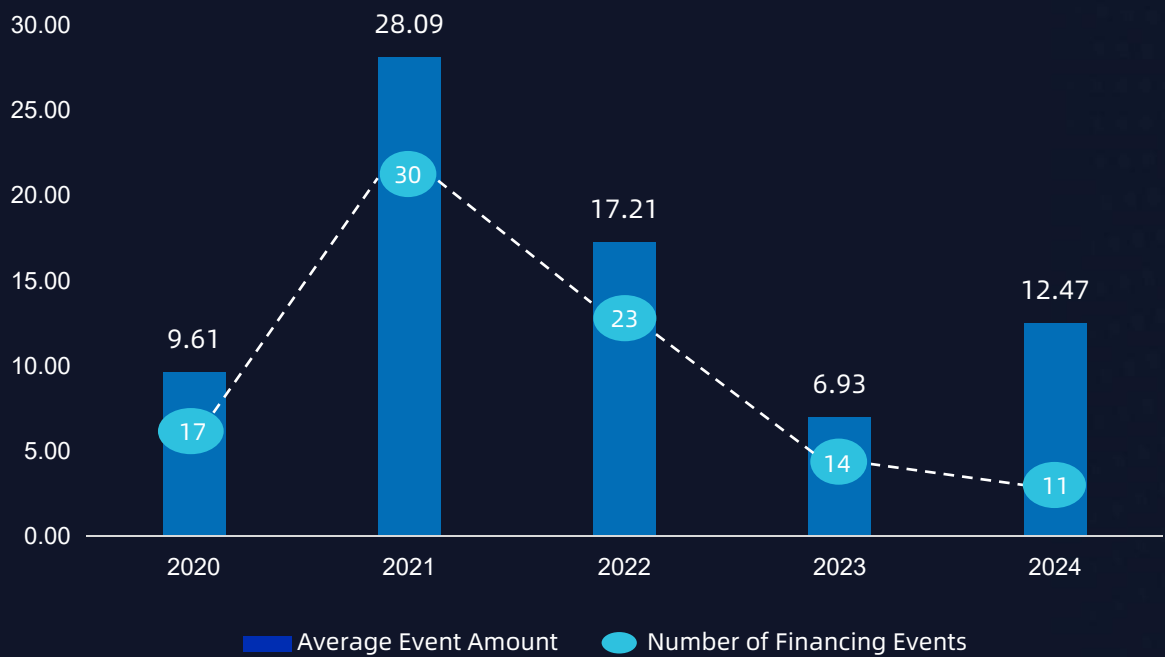
In 2024, financing rounds were dispersed without a concentrated trend, covering seed rounds, Series A, Series B, as well as government grants/subsidies. This indicates that quantum enterprises have made varying degrees of progress at different stages.

Financing Rounds of Global Quantum-Safe Companies in 2024				
Financing Rounds	QKD	QRNG	PQC	Quantum Network
Seed				
A	 QUANTUM CORRIDOR® QUANTUM OPTICS JENA		 沐创集成电路 MICRO INNOVATION INTEGRATED CIRCUIT	
B				
Grant	 LUXQUANTA		 Q-bird quantum connectivity	
Others	 sener		 AMERICAN BINARY  SEAL SQ semiconductors + quantum	

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Number of Financing Rounds Declining for Four Consecutive Years.

Global Quantum-Safe Financing Events and Average Amounts from 2020 to 2024 (in Million USD)



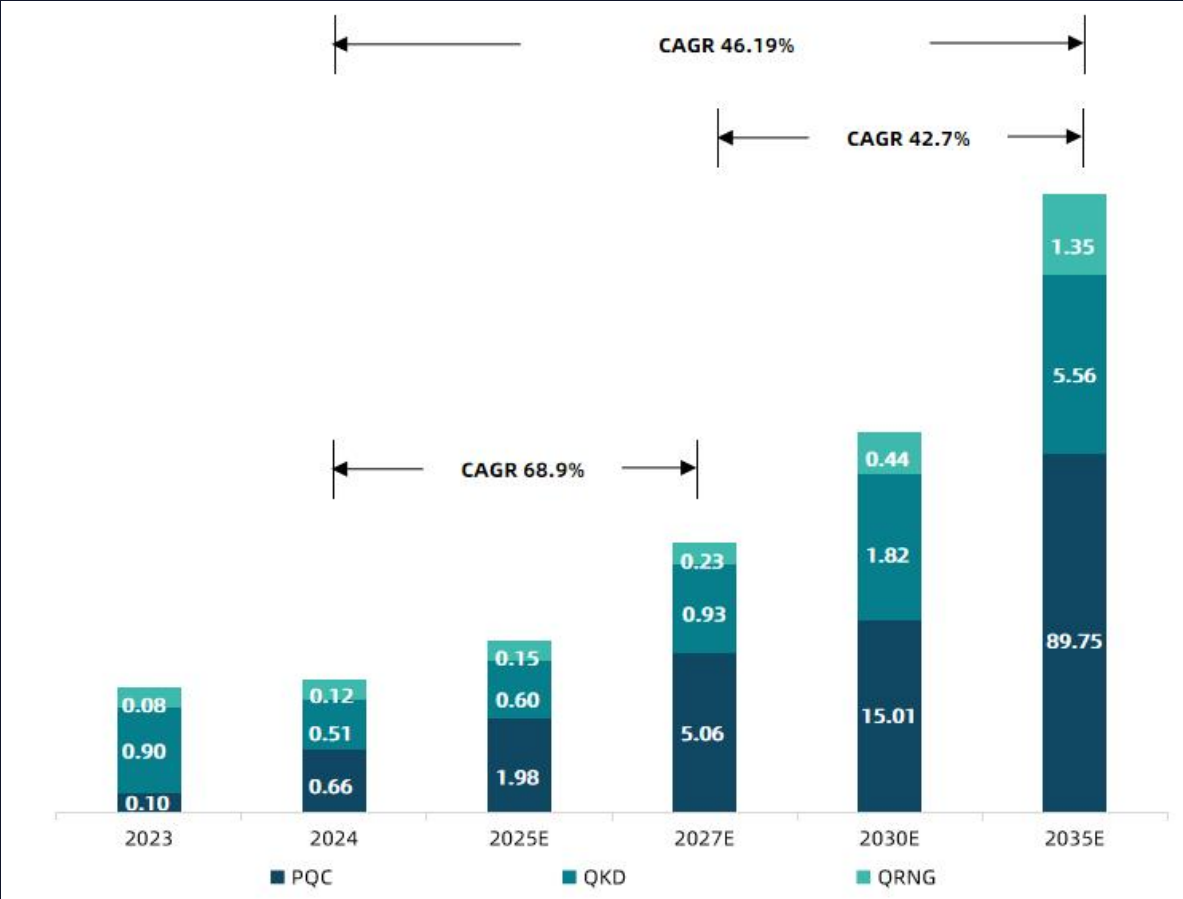
In 2024, a total of 11 financing events occurred, representing a decrease compared to 2023. However, the average financing amount in 2024 was \$12.47 million, which represented an increase of \$5.55 million compared to 2023.

This indicates that while the number of financing events decreased, the total financing amount and the average funding per financing event both increased.

This implies that the attractiveness of individual projects likely increased, as investors reallocated resources towards high-quality projects, demonstrating a more discerning investment approach in the quantum-related financing landscape.

Global Quantum-Safe Industry Size Forecast

Global Quantum-Safe Industry Size Forecast (2023-2035E, in Billion USD)



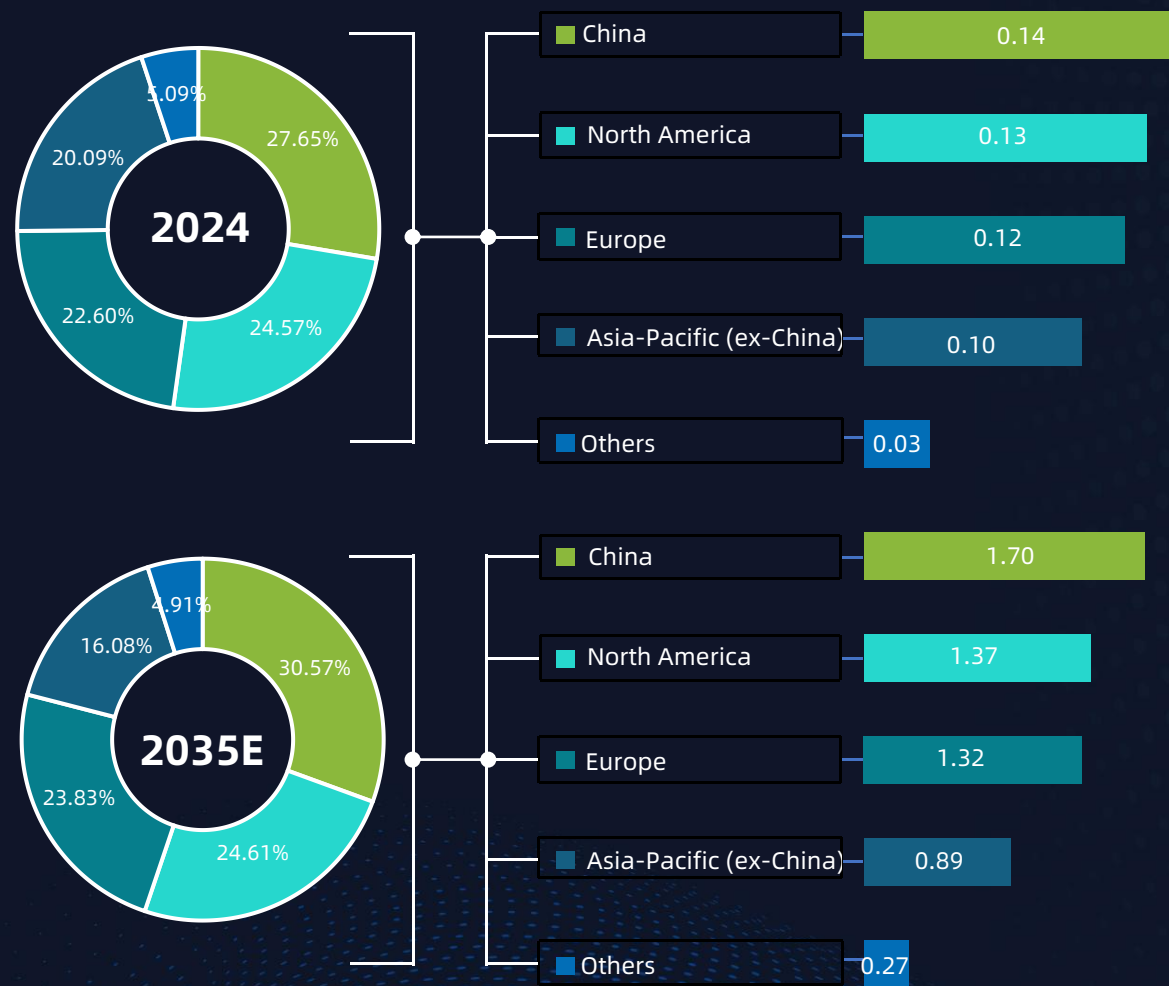
In 2024, the global Quantum-Safe industry size expanded further, reaching approximately \$1.29 billion, an increase of \$210 million compared to 2023, representing a growth rate of 19.4%. This indicates that the Quantum-Safe sector continues to attract more investment resources, and market attention and recognition are rising steadily.

From a long-term perspective, the industry is projected to reach \$96.66 billion by 2035, with a compound annual growth rate (CAGR) of about 68.7% during 2024-2027 and around 42.5% during 2027-2035.

The overall trend indicates sustained high-growth levels, reflecting the industry's vast development potential.

Quantum Key Distribution Expected to Double within Five Years.

2024 & 2035E Global QKD Sector Size by Region (in %, Billion USD)

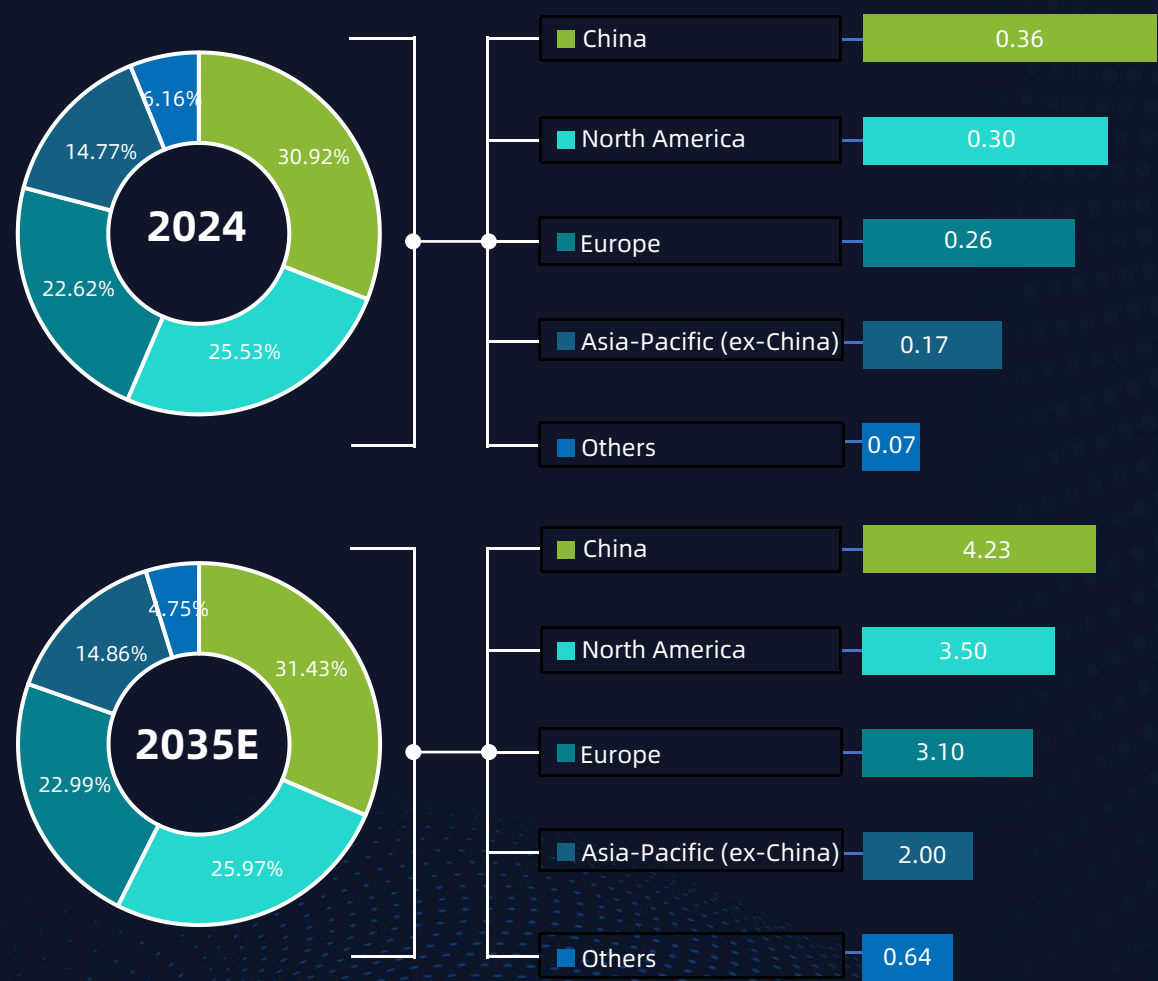


The Quantum Key Distribution (QKD) market size in 2024 was \$509 million. It is projected to grow to \$1.821 billion by 2030, with a compound annual growth rate (CAGR) of approximately 24.22 % during 2024-2030. By 2035, the market, maintaining steady growth, is expected to reach \$5.558 billion, with a CAGR of around 25.01 % during 2030-2035.

In 2024, China led the global QKD industry in terms of market share, with North America, Europe, and the Asia-Pacific region (excluding China) also holding significant portions. By 2035, China is expected to continue leading, with its share further increasing. The industry size in all regions is projected to grow, with China showing particularly strong growth momentum and immense potential.

Expanding Multi-Scenario Applications, Quantum Random Number Generator Show Steady Growth.

2024 & 2035E Global QRNG Sector Size by Region (in %, Billion USD)

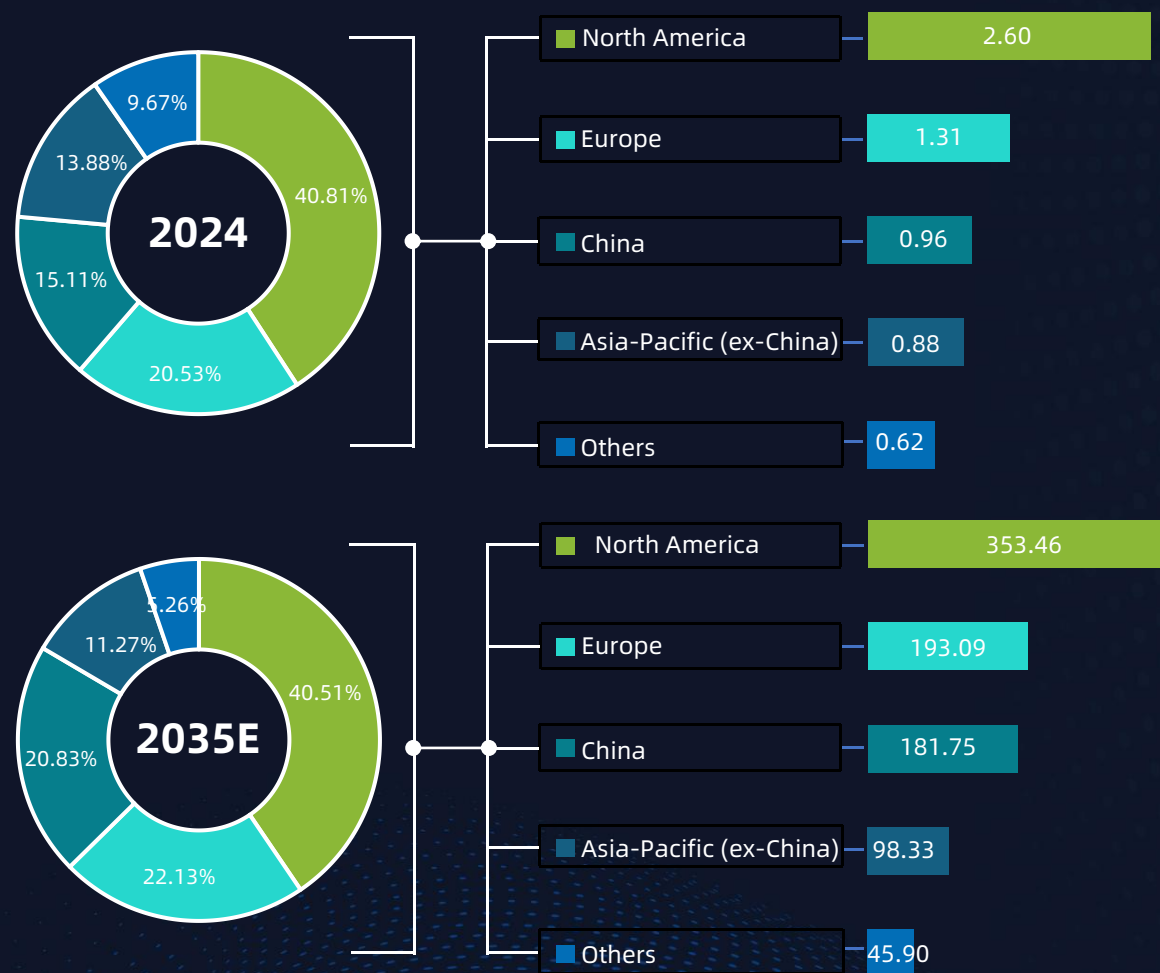


The scale of the quantum random number generator market was \$116 million in 2024. Although its proportion in the overall industry is relatively small, it is still developing steadily. It is expected to grow to \$442 million by 2030, with a compound annual growth rate of approximately 25.23 % from 2024 to 2030.

By 2035, it is expected to reach \$1.347 billion, with a compound annual growth rate of approximately 24.49 % from 2024 to 2035. As the applications of quantum random numbers in more emerging fields such as cryptography and simulation are explored, its market scale is expected to gradually increase.

Standards Drive Technology, Post-Quantum Cryptography Set to Surge Over Tenfold by 2030.

2024 & 2035E Global PQC Sector Size by Region (in %, Billion USD)



In 2024, the industrial scale of PQC grew rapidly, reaching \$656 million. With the release of the first official post-quantum cryptography standards by the US National Institute of Standards and Technology (NIST) in 2024, 2024 became a crucial turning point for the development of the entire PQC industry.

With the development of quantum computing technology, traditional cryptography faces the risk of being cracked. Therefore, PQC technology has become the key to addressing this challenge and has received high attention from the market. By 2035, the industrial scale of PQC will reach an astonishing \$89.746 billion, with a compound annual growth rate of approximately 51.97 % from 2024 to 2035.

Contact Us

iCV TA&K

Technology Advisory
& Knowledgebase



5250 Fairwind Dr
Mississauga, Ontario
Canada, L5R 3H4



101 Upper Cross Street, #04-17
People's Park Centre
Singapore, 058357

