Q-STAR's activities for the Quantum Ecosystem

Hiro Mori

Technology Evangelist
Corporate Technology Planning Div.
Toshiba Corporation

Chair, Global Consortium Alliance WG
Quantum STrategic industry Alliance for Revolution (Q-STAR)

November 3, 2026

Speaker Introduction



Hiro Mori

Chair, Global Consortium Alliances Working Group
Quantum STrategic industry Alliance for Revolution (Q-STAR)

Technology Evangelist
Corporate Technology Planning Div.
Toshiba Corporation

2011 Joined Toshiba
2011-2016 Toshiba America Information Systems
2019-2023 Toshiba Europe

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Quantum Technology Designated a Strategic Growth Priority

The Takaichi administration identified 17 priority investment areas to reinforce economic and industrial foundations and improve crisis resilience.

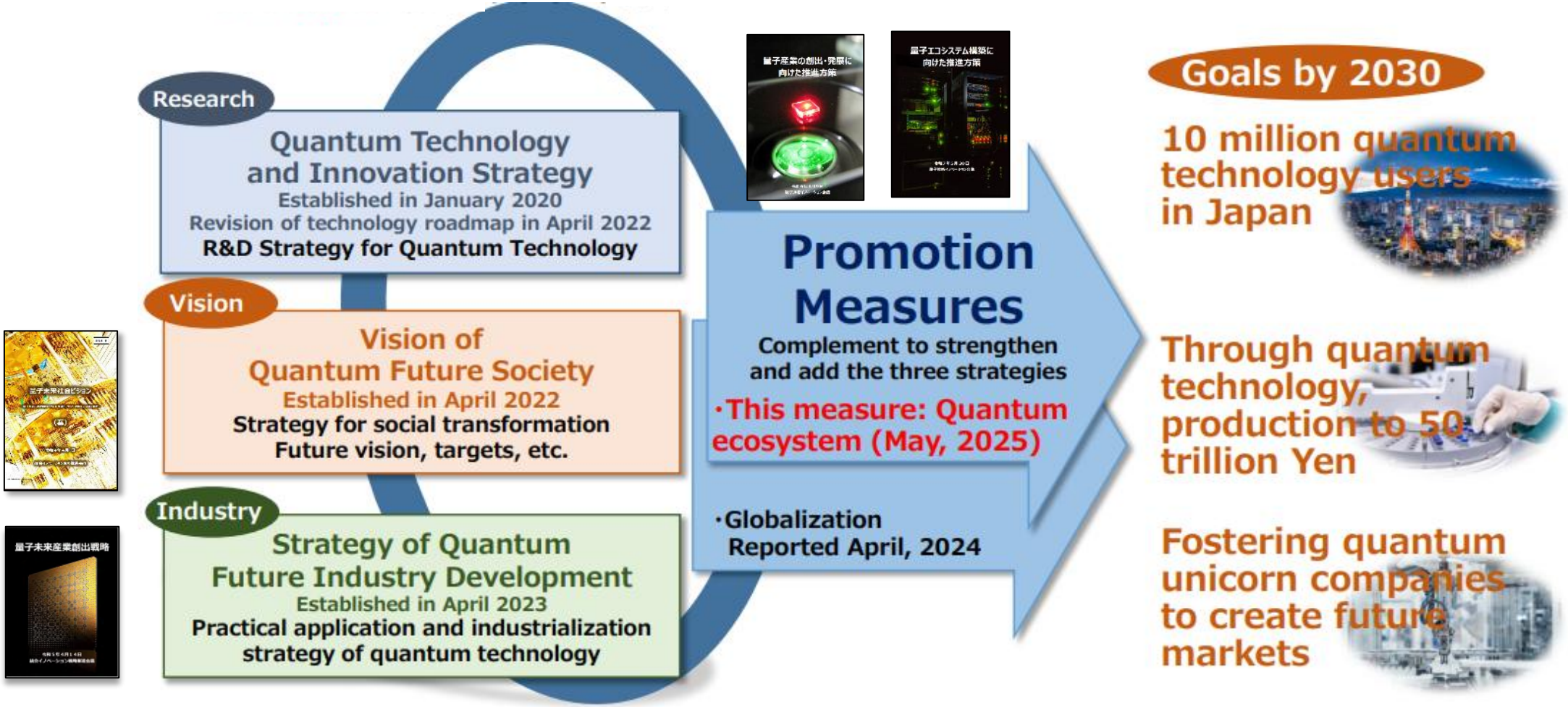


https://www.kantei.go.jp/jp/104/actions/202511/04kanbankake.html

- AI and Semiconductors
- Shipbuilding
- **Quantum Technology**
- Synthetic Biology & Biotech
- Aerospace
- Digital & Cybersecurity
- The content industry (e.g., games and anime)
- Food Tech (including food development)
- Resource and Energy Security/ Green Transformation
- Disaster Prevention and National Resilience
- Drug Discovery and Advanced Medical Care
- Fusion Energy (Nuclear Fusion)
- Materials (Critical Minerals & Components)
- Port Logistics (Logistics)
- Defense Industry
- Information and Communications
- Marine

Japan's Quantum Strategies

Japan is actively implementing a national strategy toward its 2030 goals, built on three pillars "Research, Vision, and Industry"



Source: Cabinet Office
https://www8.cao.go.jp/cstp/english/outline_promotionmeasures.pdf#2

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Q-STAR Overview

Quantum STrategic industry Alliance for Revolution

Purpose	**Create industries & businesses based on quantum technology**
Scope	**Quantum Computing** **Quantum Communication** **Quantum Sensing and Advanced Material** **Quantum Algorithm & Software**
Board Members	TOSHIBA, NEC \Orchestrating a brighter world, NTT, HITACHI Inspire the Next, FUJITSU, CHODAI, TOPPAN, なぜ、それトヨタ 未来創生センター TOYOTA, Speed up your AI FIXSTARS, JIJ, IBM, optQC, Yaqumo

Source: https://qstar.jp/en

Q-STAR Progress

2021
Establishment

May 2021
Formation of the Founding Committee

11 Members
6 Working Groups
4 Subcommittees

2022
Discussion and use case creation

May 2022
Became General Incorporated Association

65 Members
8 Working Groups
5 Subcommittees

2023
Demonstration Stage

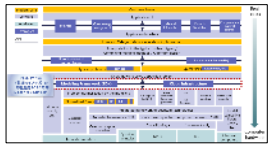
MOU signed to establish International Council of Quantum Industry Associations

ICQIA
INTERNATIONAL COUNCIL OF QUANTUM INDUSTRY ASSOCIATIONS

89 Members
8 Working Groups
6 Subcommittees

2024
Building Foundations for Real-World Adoption

Develop Software Infrastructure



Collaboration with G-QuAT



106 Members
8 Working Groups
6 Subcommittees

2025
Accelerating Initiatives Toward International Standardization

Promoting Initiatives as Japan's National Mirror Committee for IEC/ISO JTC 3 – Quantum Technologies



MoUs signed to strengthen collaboration with each organization

UKQuantum
NQCP
NIELS BOHR INSTITUTE

170 Members
(as of October 2026)
9 Working Groups
7 Subcommittees

Our Contributions to National Strategies



Vision of Quantum Future Society



Strategy of Quantum Future Industry Development



Promotion Measures for Development of Quantum Industries

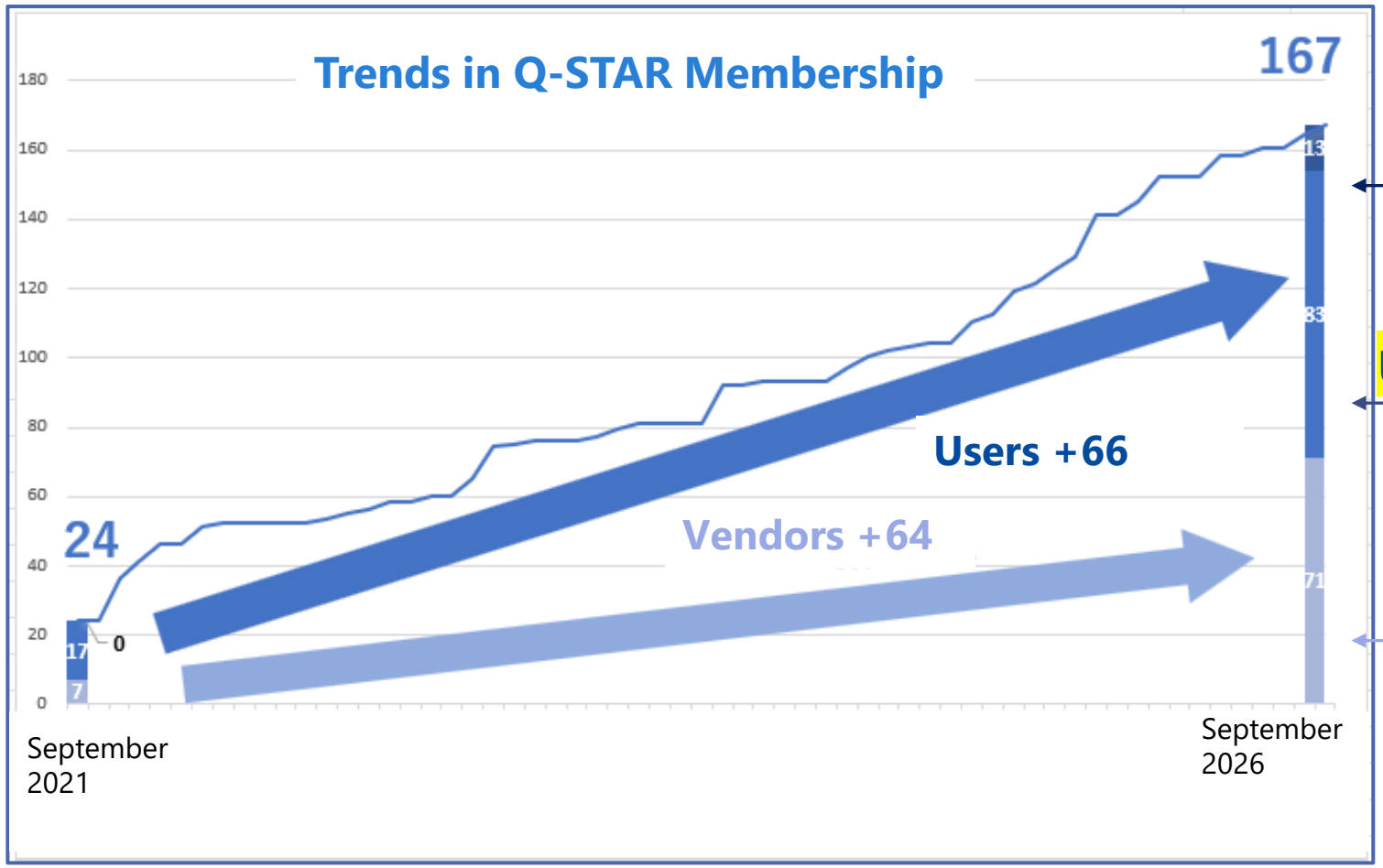


Promotion Measures for the Development of a Quantum Ecosystem

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Membership Growth and Trends at Q-STAR

The majority of our members are user companies, enabling collaboration from both the user and vendor perspectives.



Others 13

Users 83

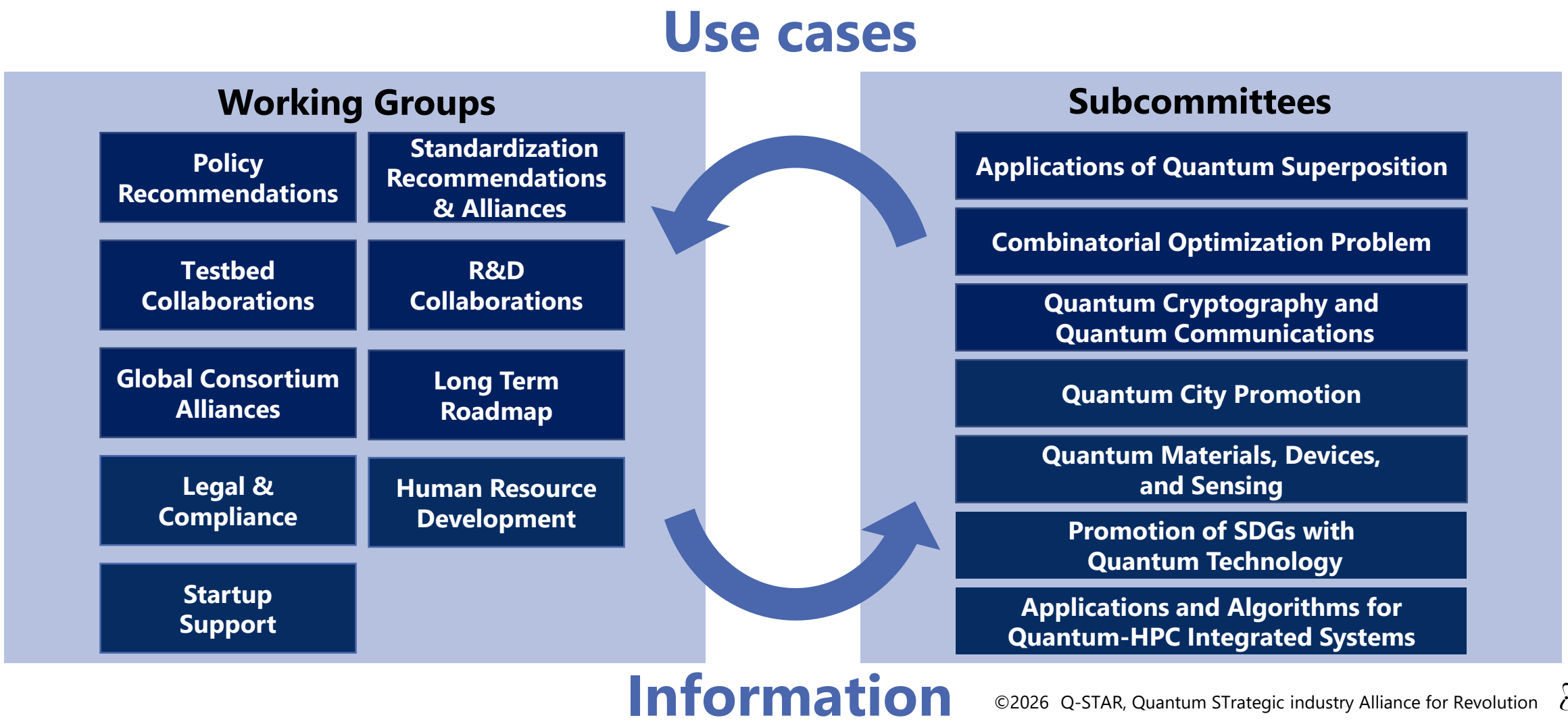
Vendors 71

Special Members	24
Corporate Members	52
Startup Members	42
Associate Members	36
Academic Members	13

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Creating Use Cases

Members from many fields participate in subcommittee activities and create use cases



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Toward Global Leadership in the Future Quantum Industry

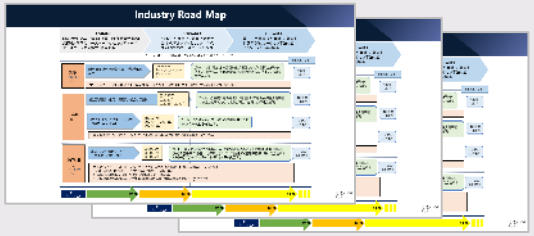
Q-STAR contributes to establishing Japan's leadership in global standards and the global supply chain by advancing three strategies.

Use Cases

Identify use cases



Roadmap to implement in society



Test Beds

Demonstrate use cases on a testbed

Q-STAR

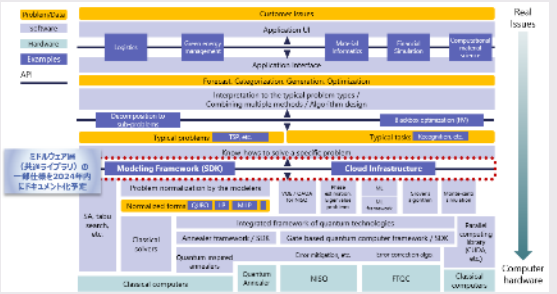
G-QuAT



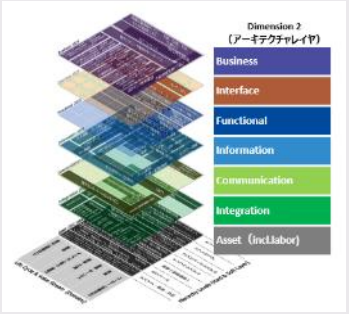
Source: https://unit.aist.go.jp/g-quat/index.html

Standardization

Software Stack Diagram



QRAMI



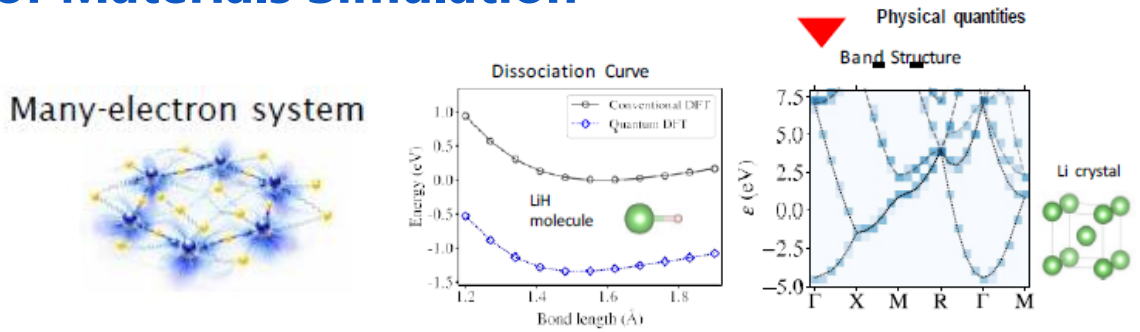
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Applications : Manufacturing x Quantum

Quemix Co-Create Quantum Simulation Solutions for the Automotive Industry

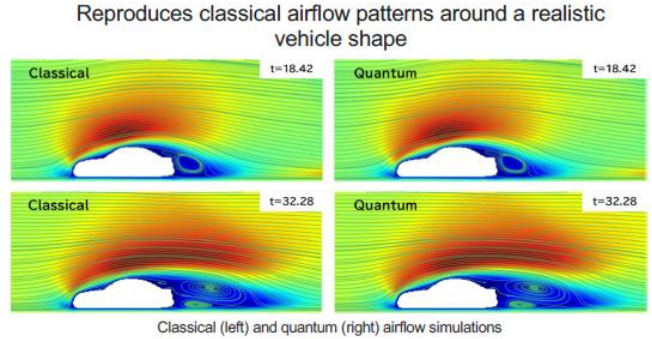
HONDA × Quemix

Quantum DFT : Exponential Acceleration of Materials Simulation



NISSAN MOTOR CORPORATION × Quemix

Quantum Fluid Simulation for Real-World Vehicle Aerodynamics



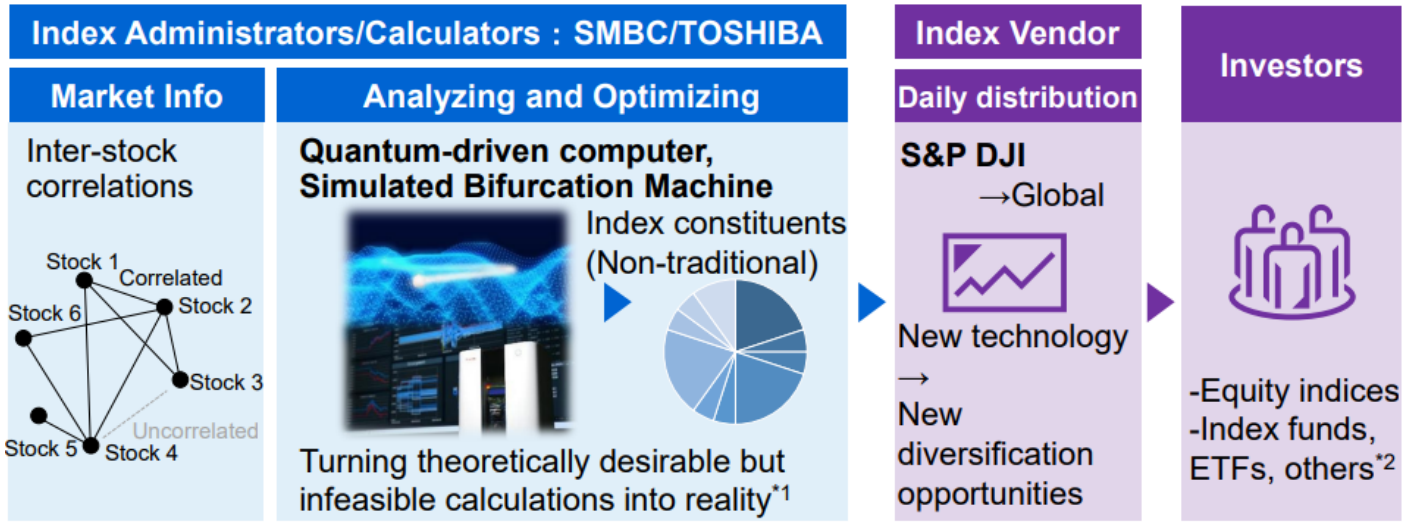
Classical (left) and quantum (right) airflow simulations

- **Quemix provides** advanced **quantum** algorithms and simulation **capabilities**
- **Honda and Nissan define** industry-specific **challenges** and engineering **requirements**.
- **Co-creation approach** ensures that **quantum technologies are designed** around meaningful, real-world **applications**

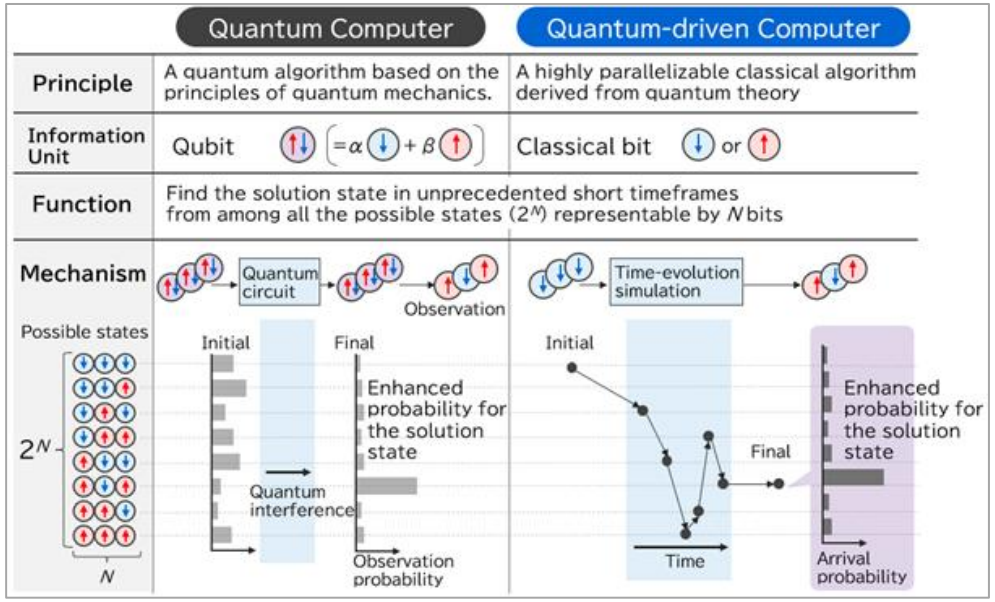
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Applications : Finance x Quantum

SMBC and Toshiba Jointly Develop New Equity Indices Using Advanced Quantum-Driven Technologies



*1 For details of the calculation methodology, see the S&P DJI website
*2 For details, see the news release by SMBC and TOSHIBA (May 20)



- **Combining** SMBC's **financial expertise** with Toshiba's **quantum technologies**
- **Quantum-driven optimization** for large-scale diversified equity portfolios
- **Engaging asset managers** on index funds, ETFs, and related investment products

https://www.global.toshiba/content/dam/toshiba/ww/products-solutions/ai-iot/sbm/pdf/smbctoshiba_quantum_diversified_supplementary_20260629.pdf

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G-QuAT

- Established in 2023 with the aim to socially implement a new computing technology that combines quantum technologies and AI by AIST initiative
- Strive to solve societal challenges, create new markets, and build a global business ecosystem for quantum technology



G-QuAT Building



Quantum computer



GPU Supercomputer(2020xNVIDIA H100)



Testbed quantum computing components



Facility superconducting quantum circuit

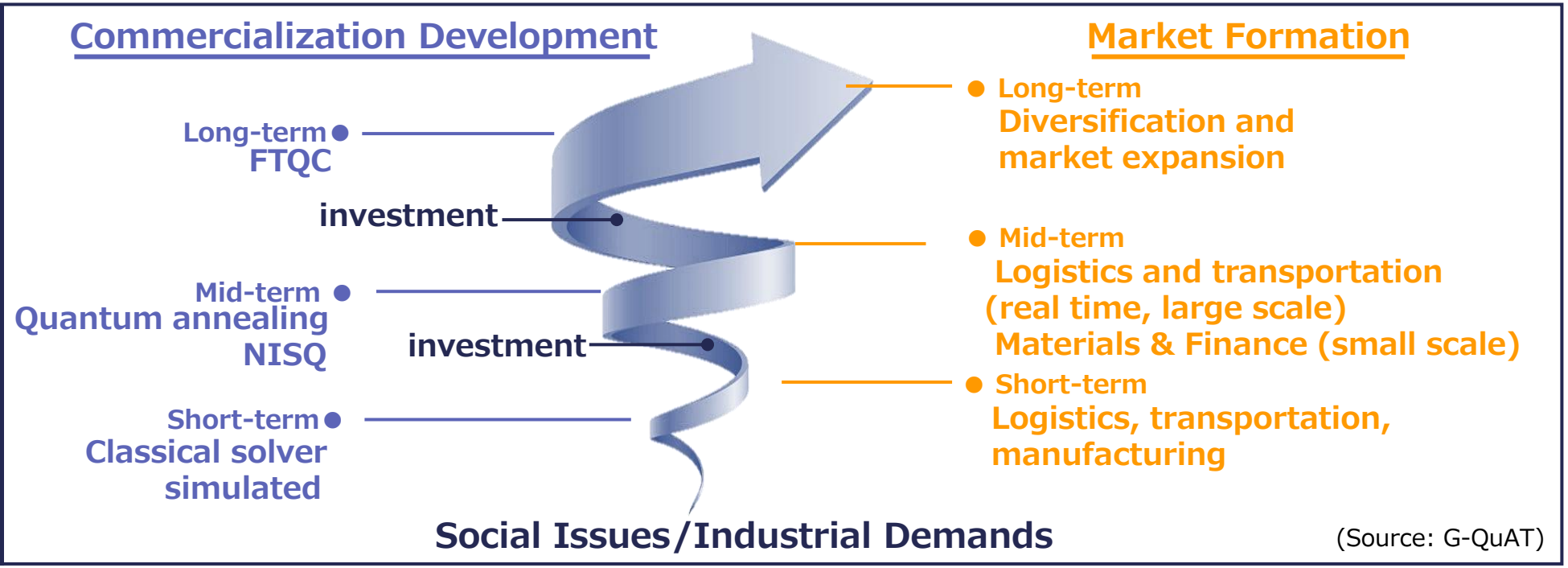
https://unit.aist.go.jp/g-quat/index_en.html

Pushing the Quantum Business Ecosystem Forward

Q-STAR and G-QuAT have signed a joint research agreement on a strategic effort to build a business ecosystem based on quantum computing solutions.

Q-STAR × G-QuAT

Ecosystem Construction Overview

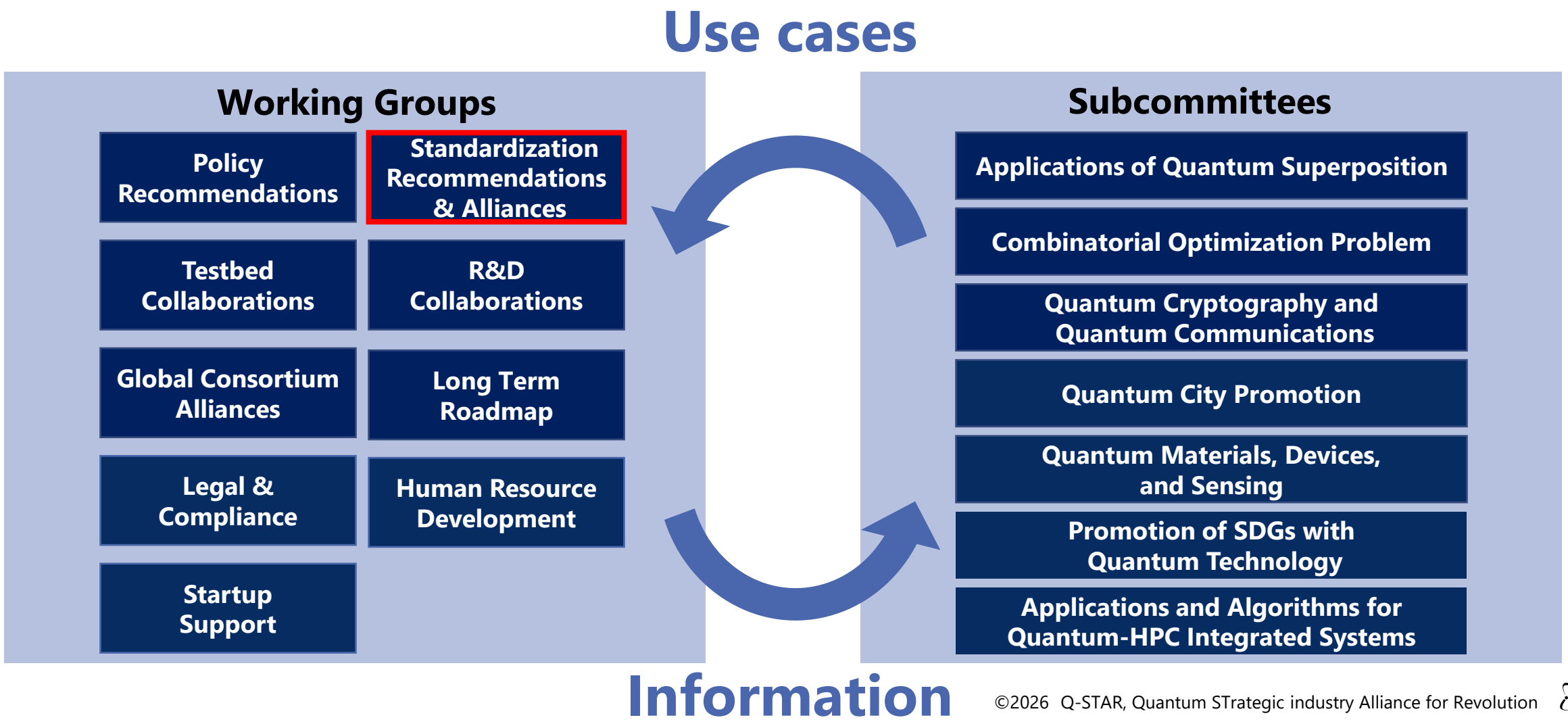


(Source: G-QuAT)

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Standardization in Q-STAR

Members from many fields participate in subcommittee activities and create use cases

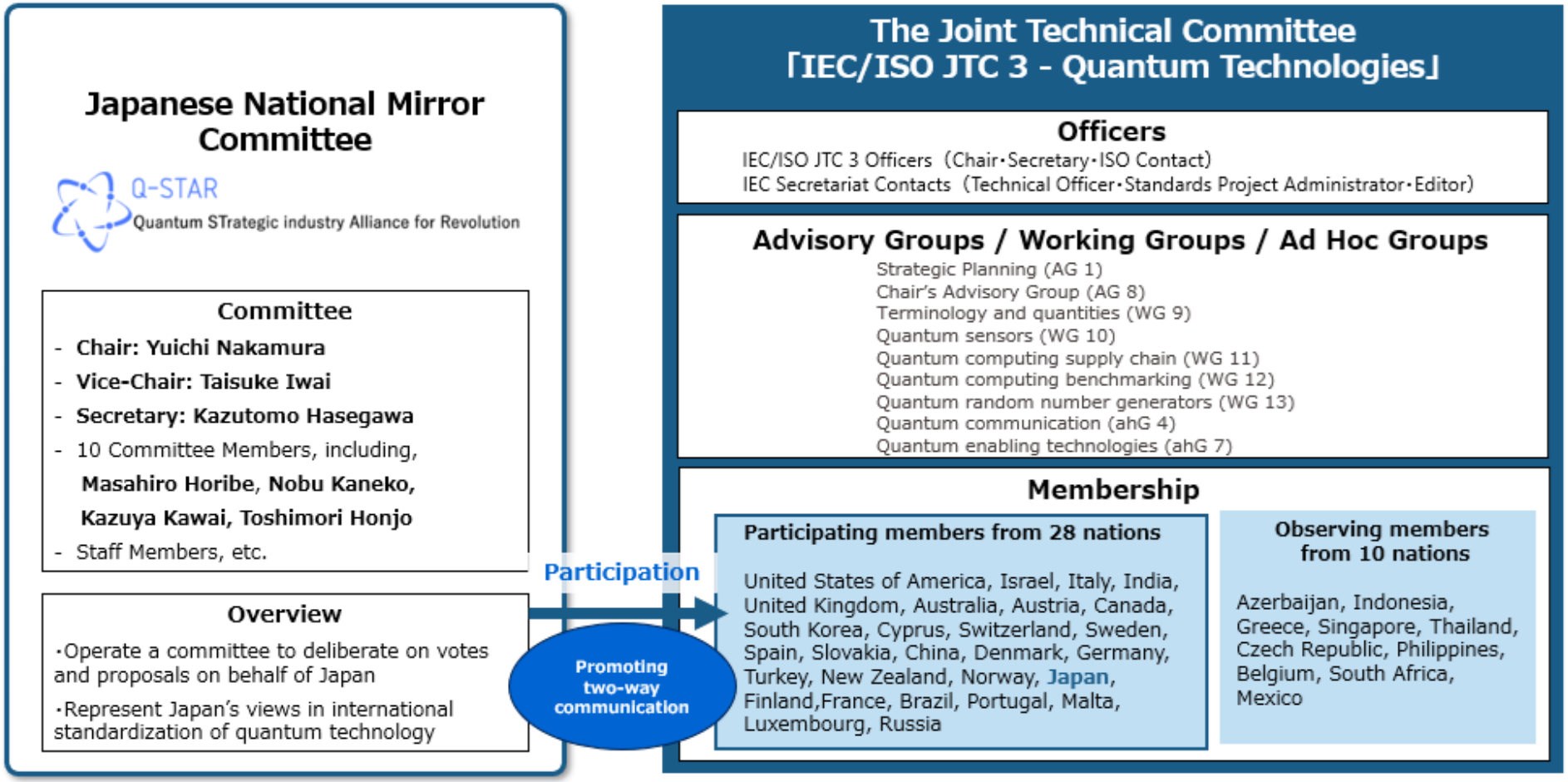


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Japanese National Mirror Committee for IEC/ISO JTC 3

Q-STAR was accredited as the Japanese National Mirror Committee for IEC/ISO JTC 3 – Quantum technologies

～Leads Japan's Contribution to the International Standardization of Quantum Technologies～



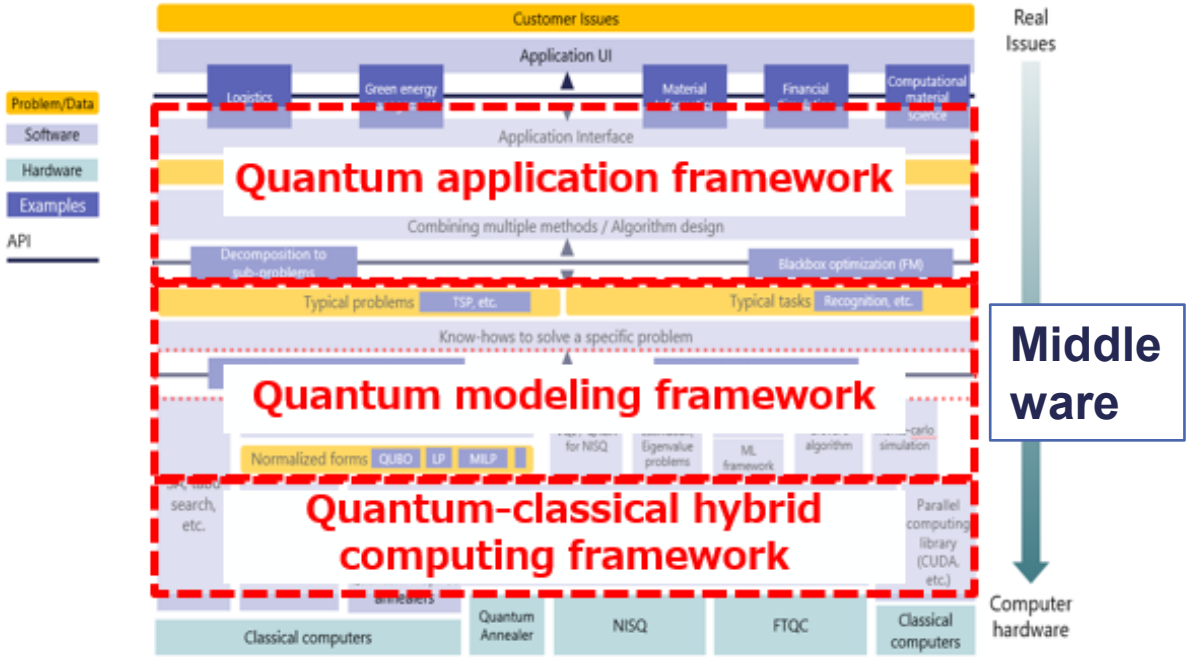
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Key Standardization Areas for Q-STAR

1. **Conducting benchmarking at the industrial use case level**
   - evaluation of the effectiveness for social implementation of the use cases
2. **Standardization of the middleware layer** (under consideration)
   - utilizing quantum-inspired machines and quantum simulators to promote the social implementation of the use cases ahead of the quantum computers era

Five maturity indicators for social implementation
TRL : Technology Readiness Level Indicator of the degree of technological development compared to the level of technological demand from society.
BRL : Business Readiness Level Indicator of the degree to which a technology-based business can create sustainable business value
GRL : Governance Readiness Level Indicator of the degree of institutional and regulatory development necessary for the diffusion of the technology
S(C)RL : Social (Communal) Readiness Level Indicator of the degree to which a technology can be demanded by society and business markets
HRL : Human Resources Readiness Level Indicator of the abundance of human resources needed for technology diffusion in society and business.

Ref: https://www8.cao.go.jp/cstp/gaiyo/sip/taskforce/smartbousai_3/siryo5.pdf



Software stack diagram developed by Q-STAR

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JTC 3/WG 12 | Quantum computing benchmarking

- **Dr. Masahiro Horibe has been appointed as the convenor for WG 12**
- **WG 12 has established Three Projects** * Project Leaders (PL) to be formally appointed

WG 12: Quantum computing benchmarking

- **Convenor: Masahiro Horibe (JP)**

- TR: Survey and classification of algorithmic and application benchmarking techniques (PL：Casey Myers (AU))
- IS: Algorithmic and application level benchmarks (PL： Harold Herbin (FR))
- IS: Hardware benchmarking (PL：Yuval Rishu Sanders (AU))

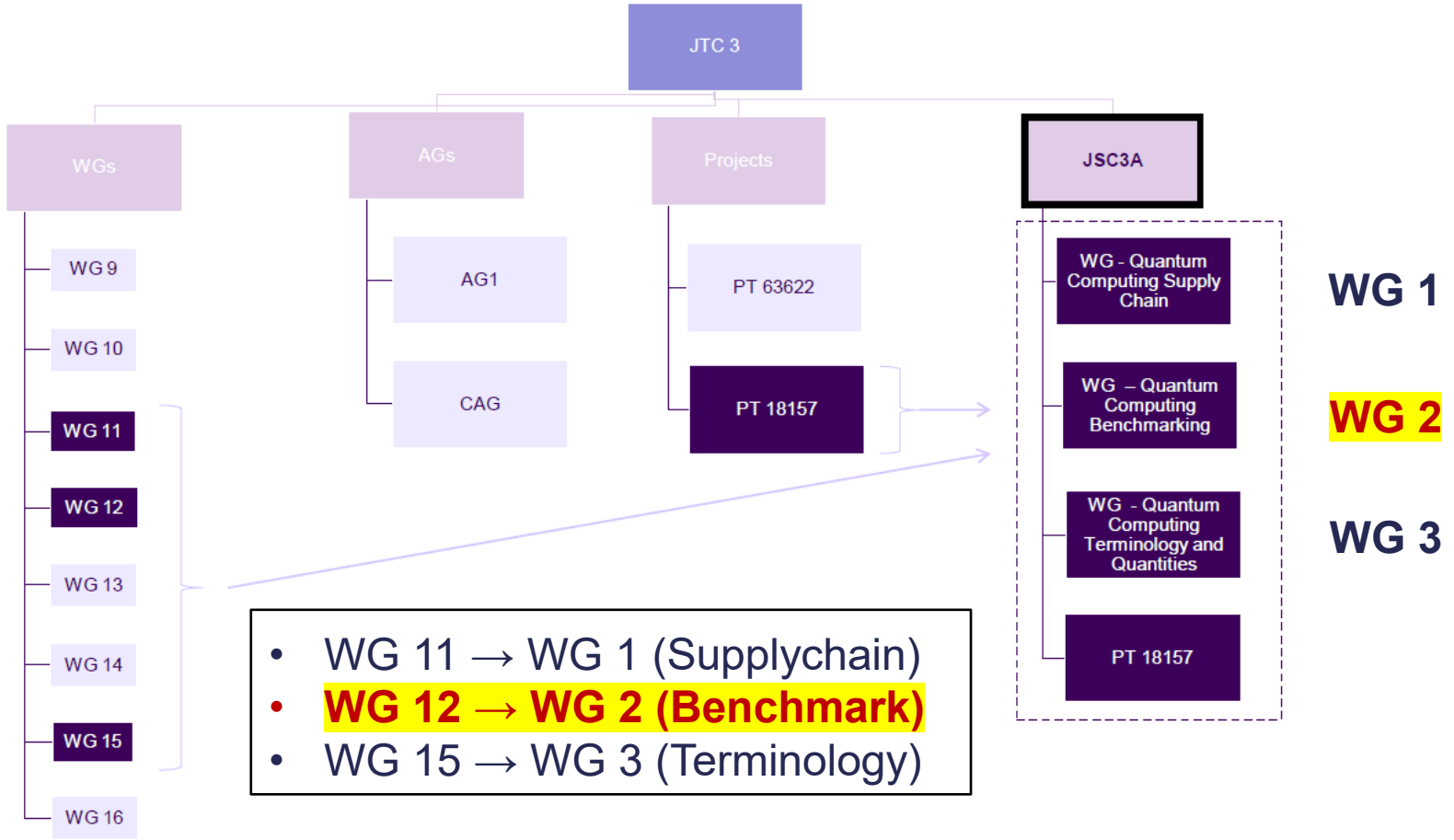
TR: Technical Report
IS: International Standard

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Subcommittee JSC3A

◆Establishment of Subcommittee (JSC 3A)

- Consolidate standardization activities in the field of quantum computing
- Promote standardization more efficiently and rapidly



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Quantum Secure Communication Testbed

- Build a globally competitive long-range testbed environment
- Demonstrate with confidential information (medical, finance etc.)

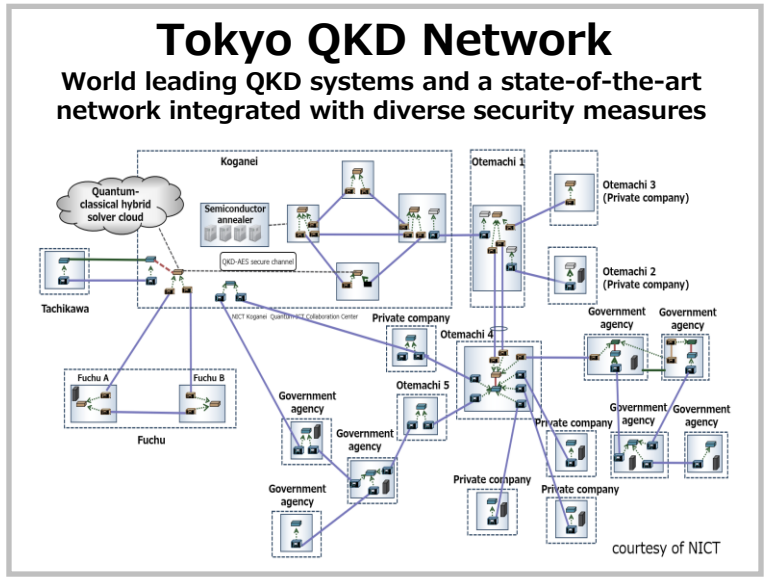
Quantum Secure Communication Testbed operating in Tokyo

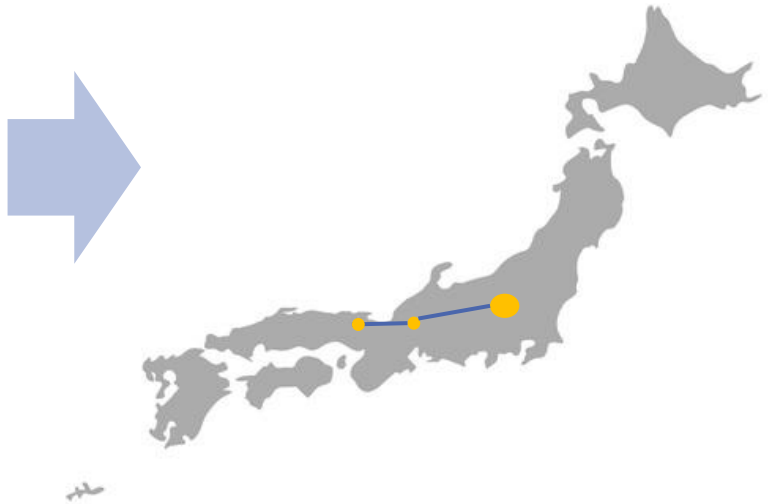
Extension to major cities

Tokyo QKD network to be expanded from Tokyo Osaka

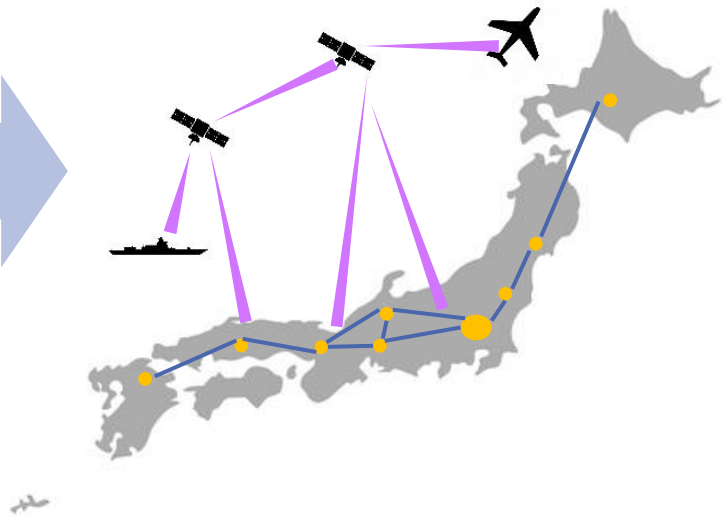
Nationwide network

Further expanding with Satellite QKD to cover all areas in Japan





https://www8.cao.go.jp/cstp/ryoshigijutsu/27kai/sanko3.pdf



https://www8.cao.go.jp/cstp/ryoshigijutsu/kento_wg/4kai/siryo2.pdf

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Talent Development

Building quantum talent across all career stages through programs developed in collaboration with leading universities

1. Quantum Literacy Program:
Build quantum-ready professionals across diverse industries
Target : Early talent

2. Research and Technology Program:
Six-month immersion in cutting-edge quantum research at OIST*
Target : Researchers & Specialists

スキルアップNeXt

OIST
Okinawa Institute of Science and Technology Graduate University

3. Global Leader Program:
Develop future leaders with international collaboration and ecosystem-building experience
Target : Future Industry Leaders

4. Hands-on & Outreach Program:
Learn through quantum demonstrations, events, and real-world engagement.
Target : Public & Community Engagement







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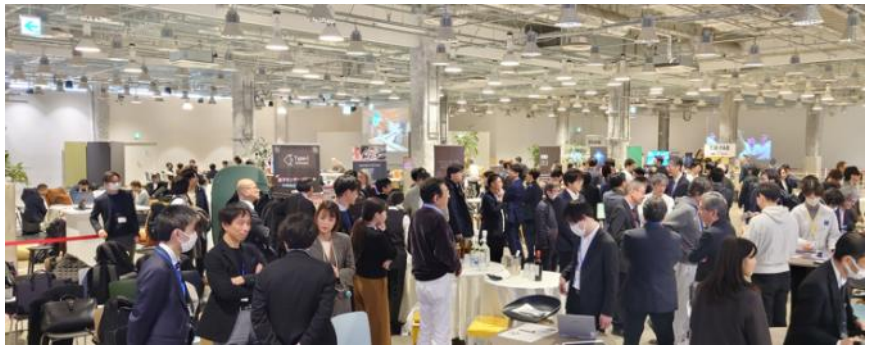
Q-STAR Member Engagement Programs

Offering dedicated programs tailored to the needs of startups and corporate leaders

Quantum Start-up Day

Connecting quantum startups
with investors to accelerate funding, partnerships, and growth





Executive Seminar

Helping corporate executives
understand the long-term business potential of quantum technologies and prepare for future market shifts





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ICQIA Expansion

ICQIA
INTERNATIONAL COUNCIL OF QUANTUM INDUSTRY ASSOCIATIONS





UKQuantum

KQIA
Korea Quantum Industry Association

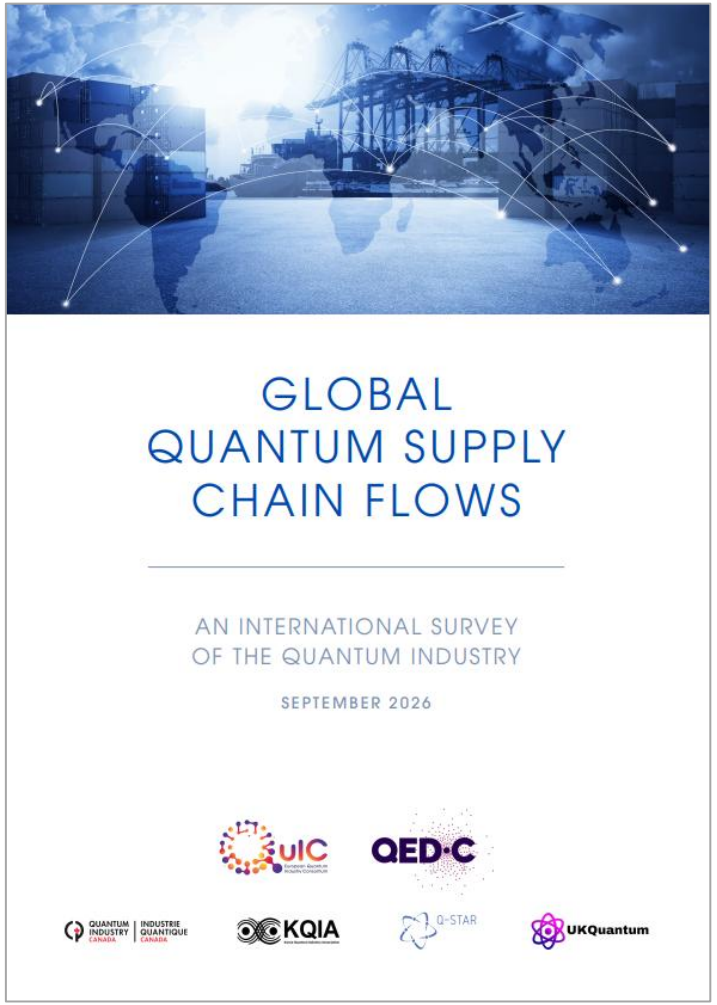
- **Founded in 2023 by four quantum associations from the U.S., Canada, Europe, and Japan.**
- **Pushing Forward a Global Quantum Industry Ecosystem**

The four founders welcomed UKQuantum (UK) and KQIA (South Korea) as new members at Q-Expo 2026

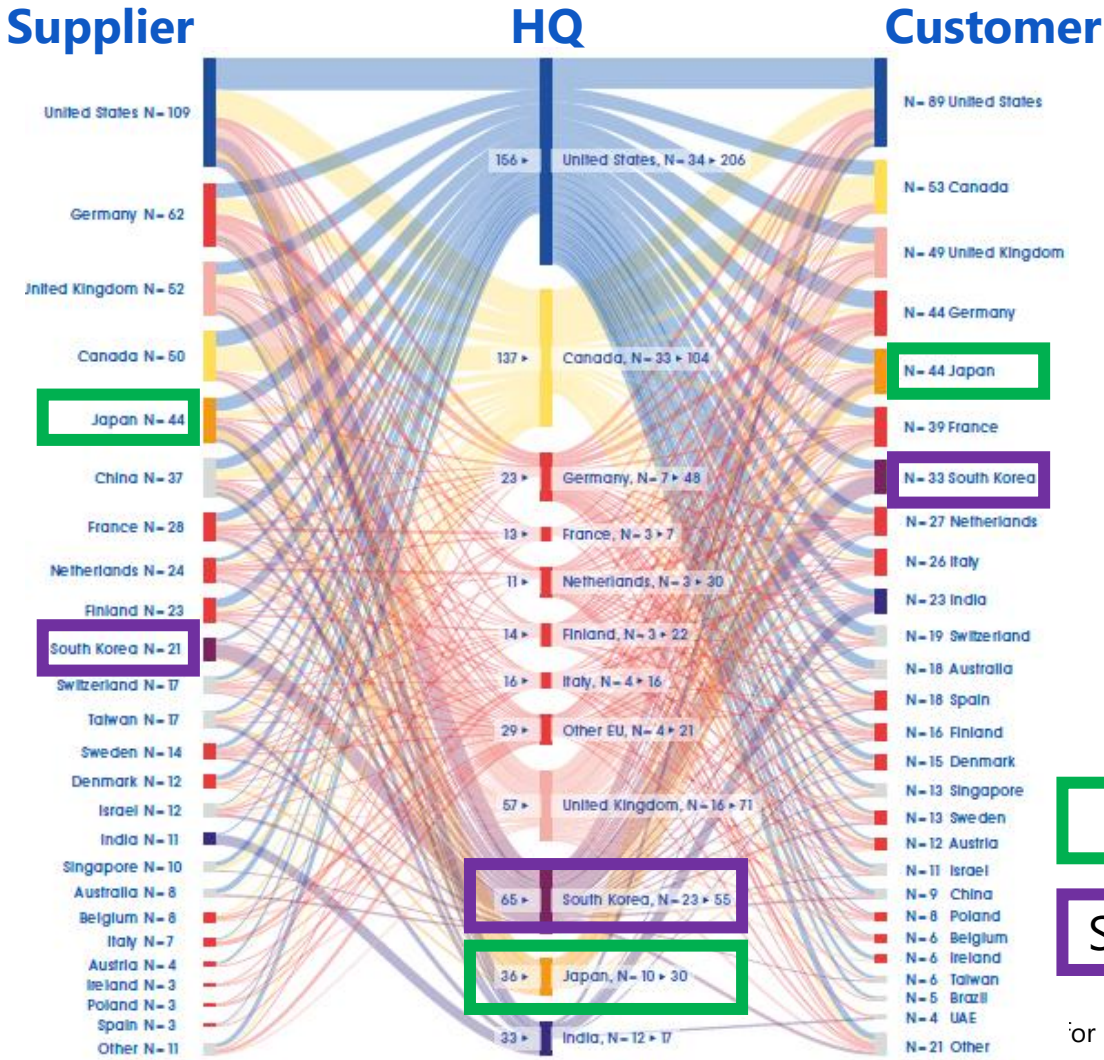
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Global Quantum Supply Chain Survey

Conduct a survey on the global supply chain and publish a report on the findings with visualization



https://8441224.hs-sites.com/hubfs/260921_SupplyChainFlow.pdf



Japan

South Korea

Q-STAR Initiatives for Global Quantum Ecosystem

Building Global Networks through International Events



Swiss Quantum Week



UK Quantum Showcase



European Quantum Technology Conf



Quantum Korea



Quantum World Congress

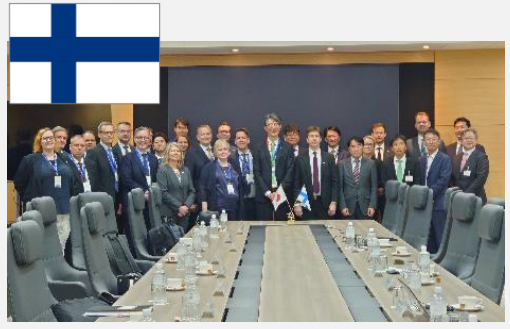
Hosting an International Delegation in Japan



Europa House



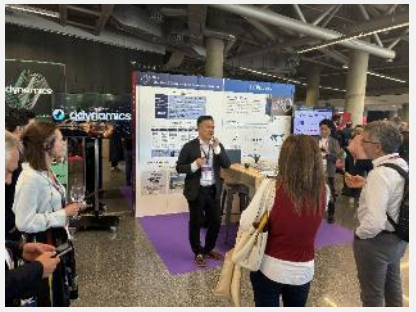
Quantum session with Norh American Visitor

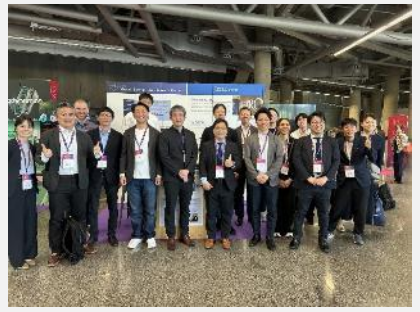


Roundtable with Finnish Delegation

Organizing Q-STAR International Delegations (2026)







Q-Expo Spain in May







France-Japan Quantum Workshop with Quantonation in June







Quantum Workshop with Quantum Australia in July

Vision for Advancing International Partnerships

Actively connect with global organizations on a variety of topics and together create quantum ecosystem



Japan Quantum Week in Dec 7-11th

- **7th Dec : Q-STAR/G-QuAT Joint Symposium, Tokyo**
- **8-11th Dec: Quantum Innovation 2026, Nagoya**





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Thank You

