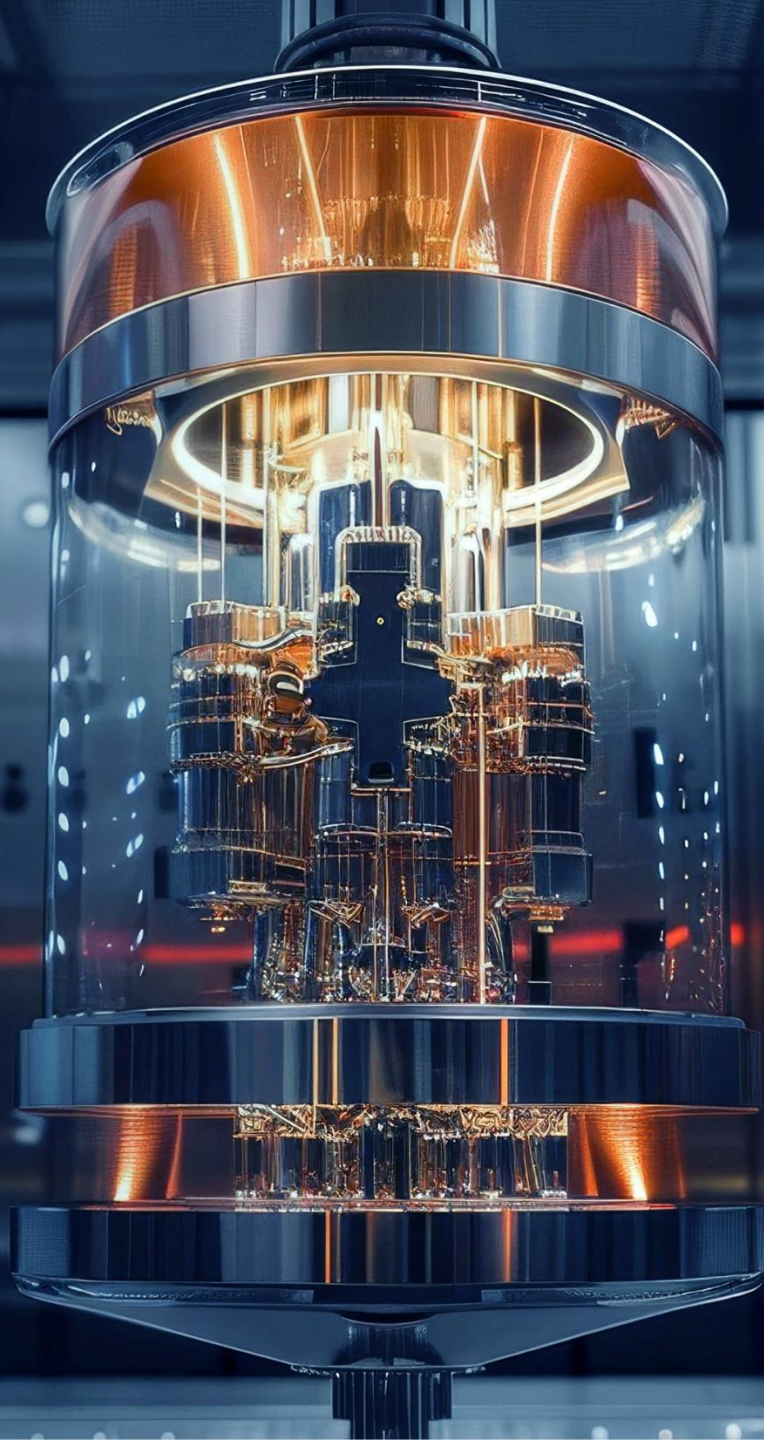


Quantum Computing

Market Research

October 2025



AdobeStock - AI generated

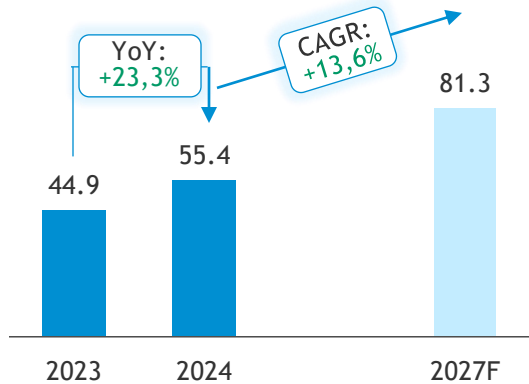
IBDO

Content

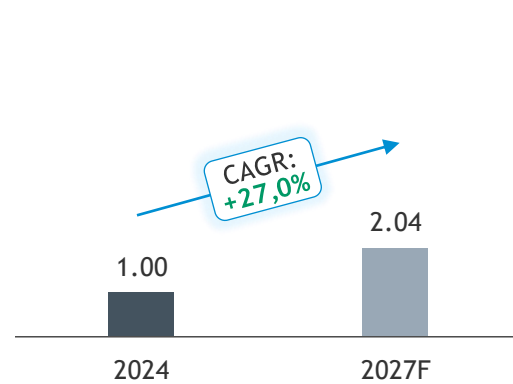
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Executive Summary

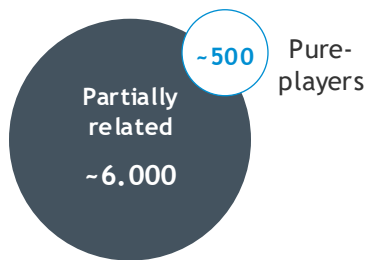
Global High-Performance Computing (HPC) / Technical Computing market size, Bn EUR



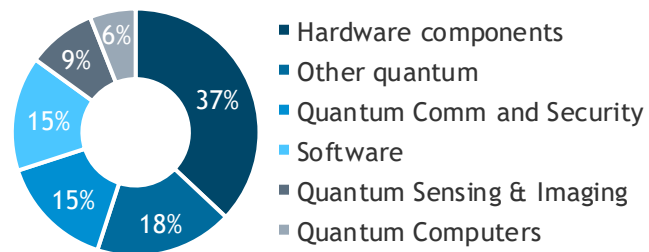
Global Quantum Computing market size, Bn EUR



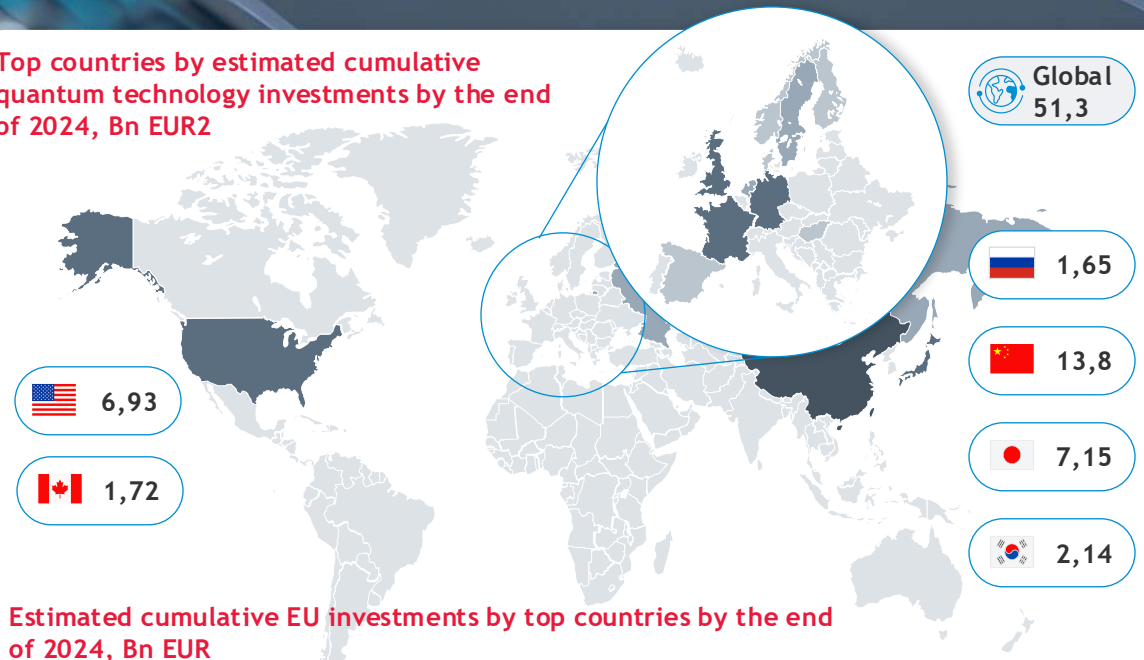
Total number of QT engaged organisations globally as of 2024



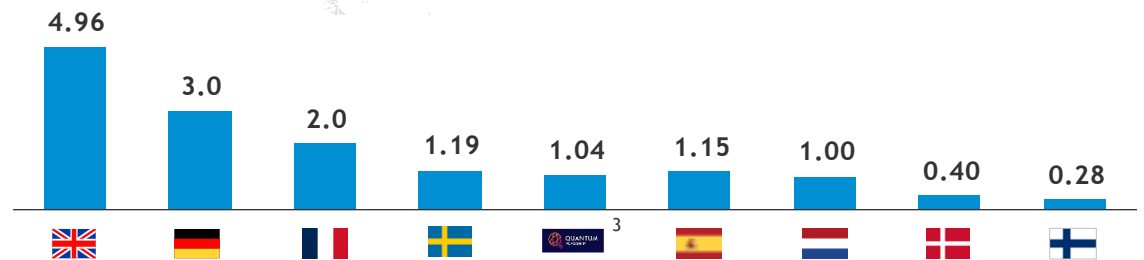
Classification of quantum stack companies, as of the end of 2024



Top countries by estimated cumulative quantum technology investments by the end of 2024, Bn EUR2



Estimated cumulative EU investments by top countries by the end of 2024, Bn EUR



Executive Summary

Key drivers



Convergence of technological breakthroughs



Record-breaking investment flows, both public & private



Enterprise demand for competitive advantage

Key trends



Marketplace concentration



Government urgency - increasing public funding globally



Innovation in clusters and the rise of Quantum Computing as a Service (QCaaS)



Rise of hybrid quantum-classical integration in HPC

Encryption and compliance exposure

Competitive disadvantage vs. early adopters

Key risks

Costly, complex migration to quantum-safe tech

Talent shortage and lack of quantum-related expertise

Top industries benefiting from Quantum Computing by 2035



Financial industry



Global energy and materials



Travel, transport and logistics



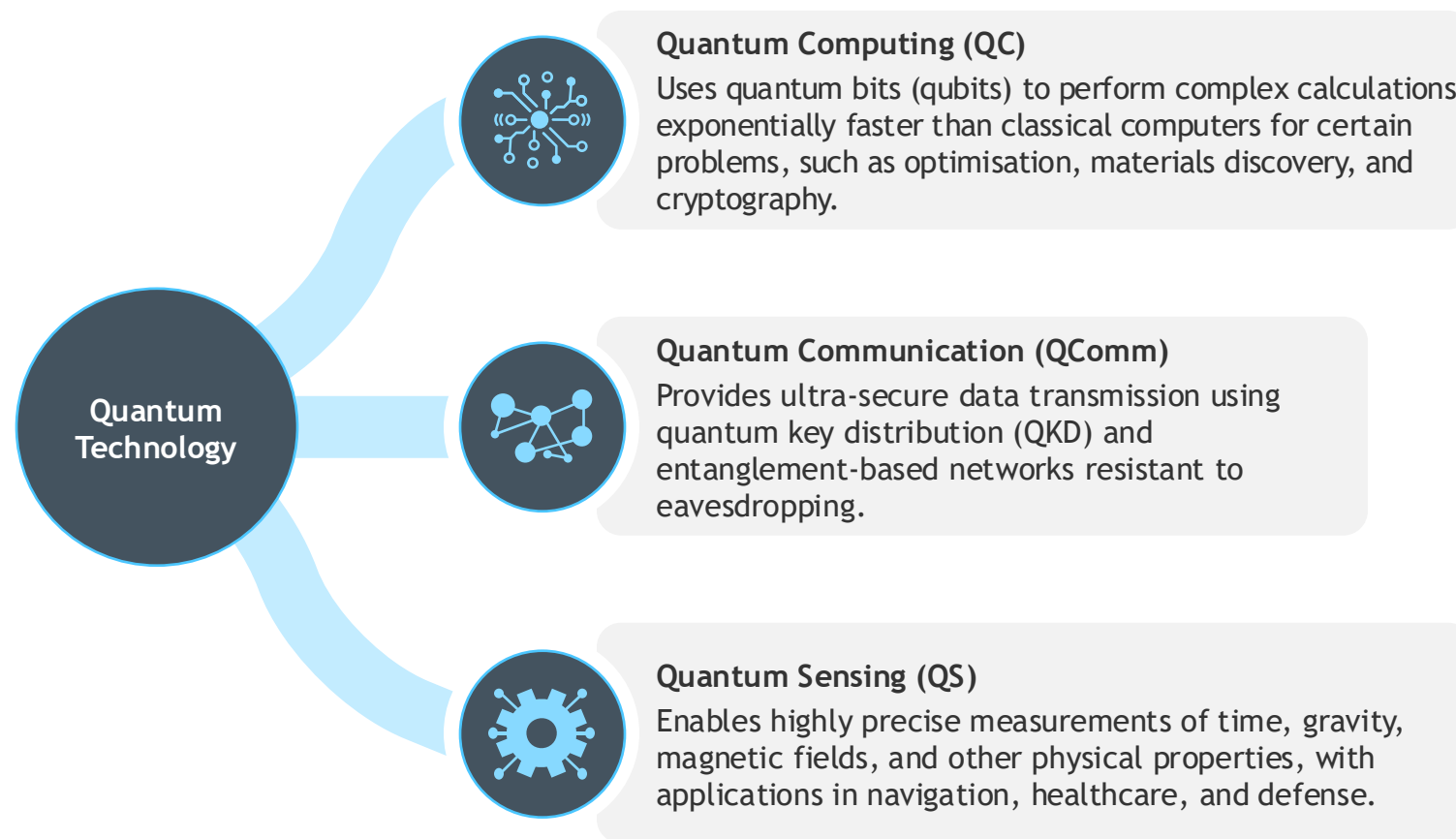
Potential economic value from QC in 2035:
~0,8 Tn EUR - 1,8 Tn EUR

QT Market Overview

Quantum Technology market segmentation

By 2035 QT market is estimated to generate up to 1,8 Tn EUR of economic value

Quantum Technology market components



Potential economic value¹ from QC in 2035:

~0,8 Tn EUR - 1,8 Tn EUR²

Potential value driven by four industries by 2035:

-  global energy and materials
-  pharmaceuticals and medical products
-  financial industry
-  travel, transport, and logistics

- ▶ Quantum technologies refer to a set of emerging technologies that exploit a **principle of quantum mechanics**, such as **superposition**, **entanglement**, and **quantum tunnelling**, to achieve capabilities far beyond classical systems
- ▶ These technologies aim to revolutionise computing, communication, sensing, and security by leveraging the unique behaviours of quantum particles

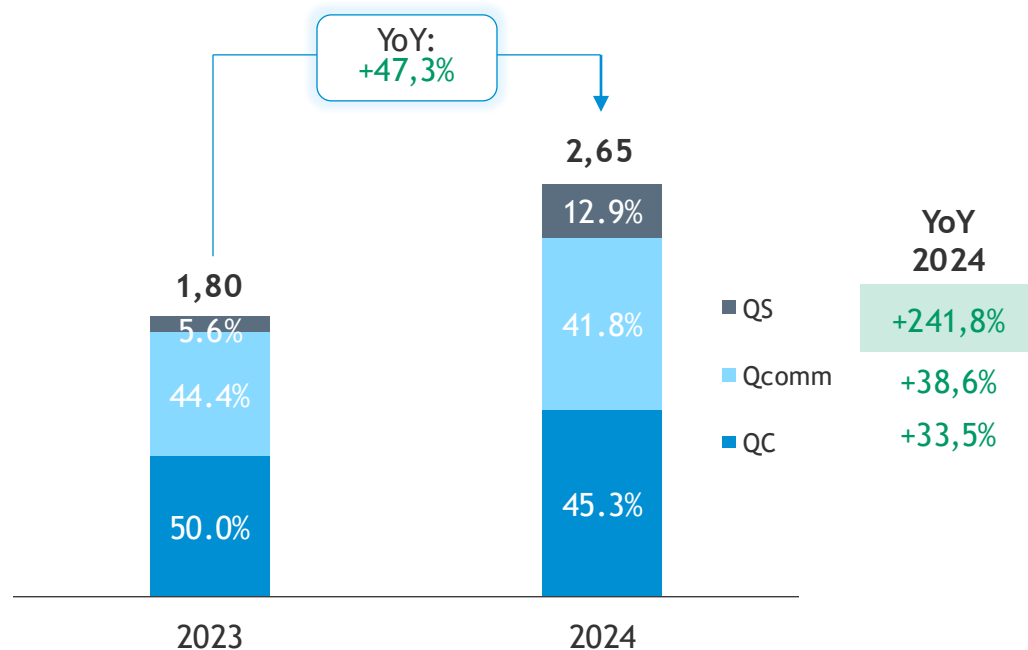
Sources: McKinsey Digital — Quantum Technology Monitor — [June 2025]

Notes: (1) Economic value is defined as the additional revenue and saved costs that the application of QC can unlock; (2) The numbers are converted from USD to EUR based on the average exchange rate for September by ECB

Quantum Technology market segmentation

In 2024, the QT market surged by 47,3% compared to the previous year, accounting for 2,65 Bn EUR

Global Quantum Technology (QT) market size by main quantum technologies¹, Bn EUR



Key insights for 2024

- ▶ In 2024, the **total Quantum Technologies market expanded sharply** from 1,8 to 2,65 Bn EUR, reflecting accelerating commercial adoption across quantum computing, communications, and sensing
- ▶ The **QC segment remained the largest** in 2024, expanding strongly YoY, primarily driven by enterprise QCaaS deployments and research partnerships
- ▶ Although still smaller, the QS segment demonstrated triple-digit growth and expansion of its market share in 2024. Such prominent growth was fueled by a **surge in defence and navigation demand, emerging commercial use cases, and maturing technology and integration**. Advances in miniaturisation and stability made quantum sensors more deployable and cost-efficient, attracting both public funding and private capital as part of broader quantum infrastructure programmes in Europe
- ▶ QComm growth in 2024 was supported by secure network pilots and **large-scale QKD² initiatives**, including the EU's EuroQCI and OpenQKD programmes, alongside similar efforts in the UK, China, and Japan to establish quantum-secure communication networks
- ▶ Overall, market growth in 2024 was **mainly fueled by the rapid scaling of sensing solutions** and continued institutional investment in quantum infrastructure and capabilities

Quantum Technology market forecast

The scenarios differ mainly in how quickly current challenges are solved and demand accelerates

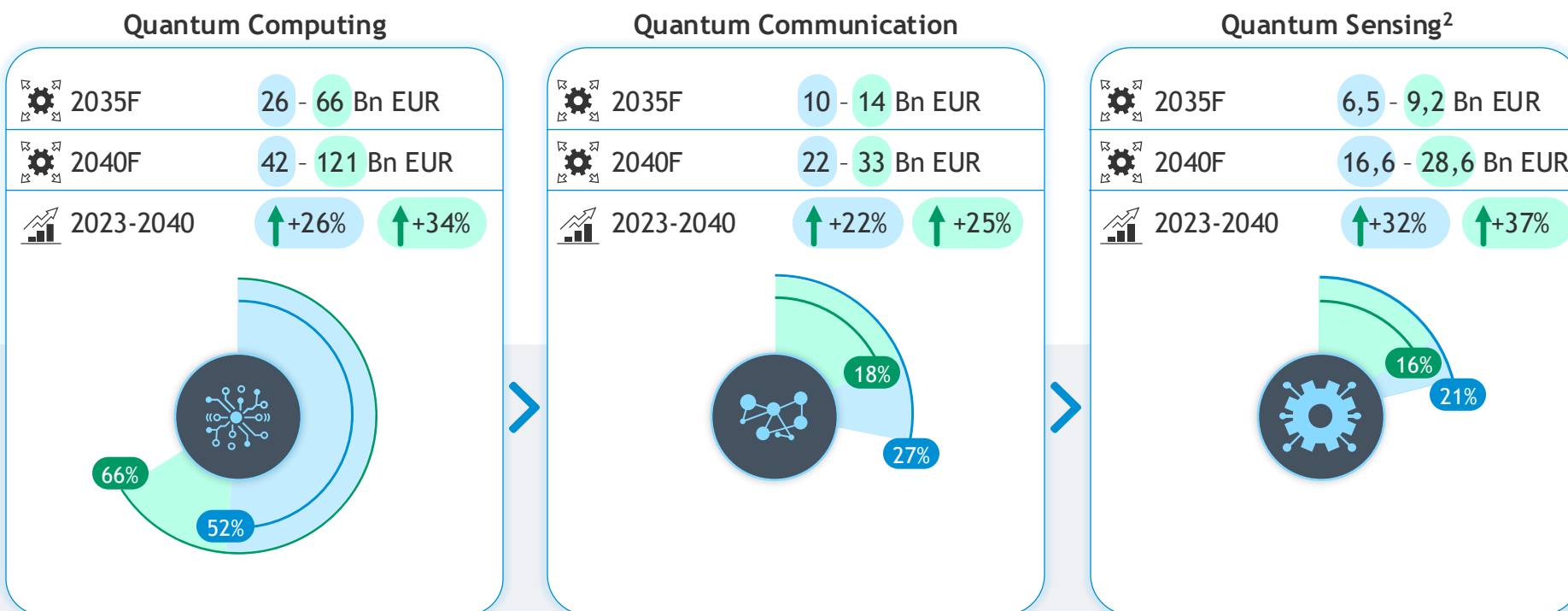
Total QT market size¹ by conservative / optimistic scenarios



QT market segments by conservative / optimistic scenarios

-  Market size
-  Annual growth rate (CAGR)
-  Conservative scenario
-  Optimistic scenario

Market share in 2040



Insights 2025:
The QS market forecast for 2035 was sharply revised upward, from 0,5-2,5 Bn EUR to 6,5-9,2 Bn EUR, with a similar revision for 2040. The 2025 update by McKinsey is based on an approach that uses recent use cases, developments, and breakthroughs.

Global government funding for Quantum Technology

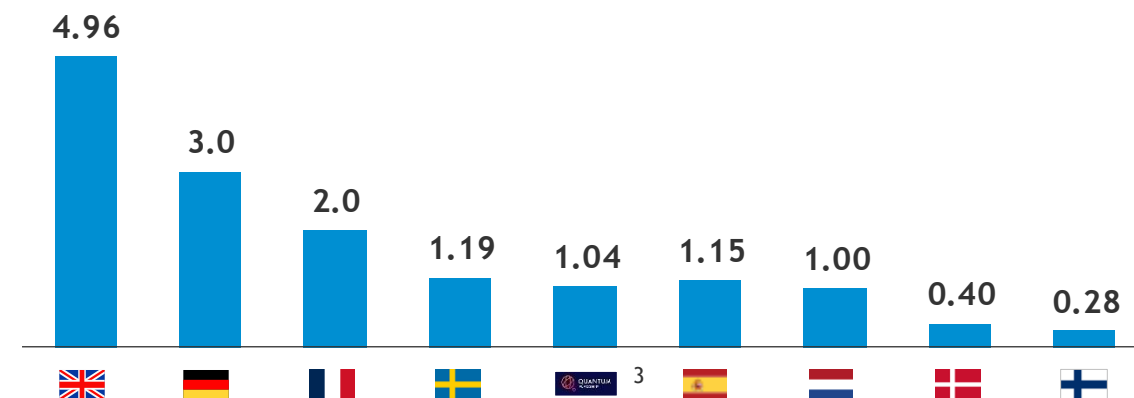
The QT market is set to grow rapidly, driven by global government initiatives and investments

Top countries by estimated cumulative quantum technology investments by the end of 2024¹, Bn EUR²



- ▶ **China**, an early investor in quantum since the 1990s, remains a global leader. In 2025, it launched a **124,7 Bn EUR** fund for advanced tech, including quantum, though exact allocations are undisclosed
- ▶ **The USA and Japan** are advancing rapidly behind China, with the USA expanding its **National Quantum Initiative** and Japan investing through its **Q-LEAP** and **Moonshot** programmes

Estimated cumulative EU investments by top countries by the end of 2024¹, Bn EUR



- ▶ Europe continues to lead globally in quantum research and innovation, building on a century of scientific excellence
- ▶ Nowadays, this development is supported by the 1 Bn EUR **Quantum Flagship** and complementary programmes such as **EuroHPC**, **EuroQCI**, and **DigiQ**, which aim to develop quantum infrastructure, establish standards, and train a skilled quantum workforce across the continent

Sources: Quereca website; Media overview

Notes: (1) Figures include total government funding through 2025 and future commitments (2-10 year programmes); private investments and revenues are excluded; countries with total investments exceeding 1,0 Bn EUR; (2) The numbers are converted from USD to EUR based on the average exchange rate for September by ECB; (3) The European Commission allocated 1,0 Bn EUR of funding over 10 years to launch the European Quantum Flagship in 2018

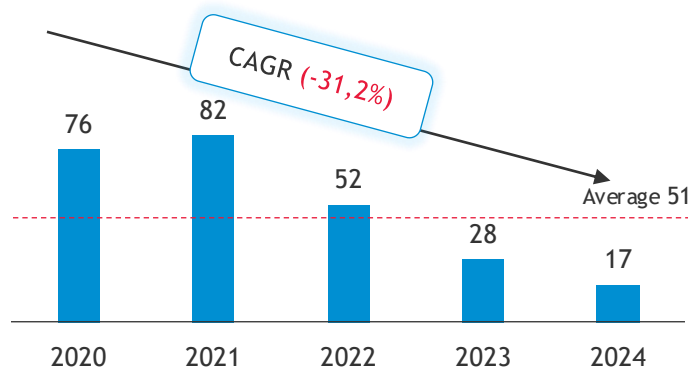
Major QT market trends (1/2)

The QT market tended to concentrate in 2020-2024, with start-ups consolidating into innovative clusters



Marketplace concentration

The number of pure-play quantum companies founded in 2021-2024

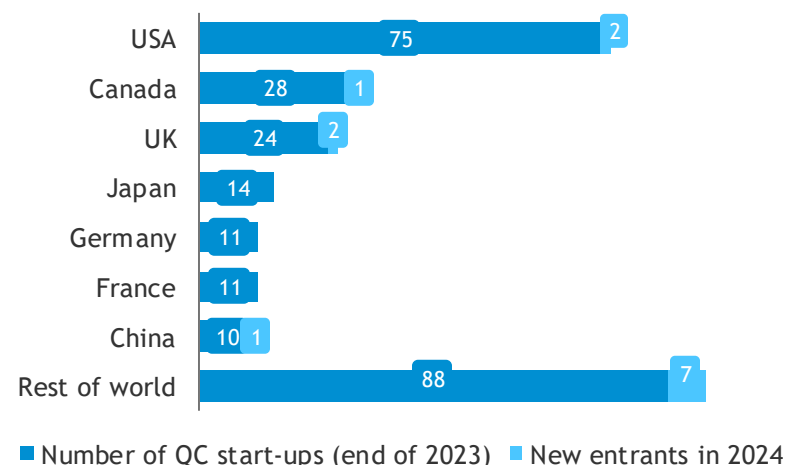


New pure-play formations have experienced a significant decline (approximately 80% decrease from the 2021 peak to 2024), reflecting a maturing marketplace, increasing mergers and acquisitions, and a concentration of venture funding on fewer, less risky firms and technologies.



Innovation in clusters

The number of QC start-ups



- In 2024, the USA maintained its position as the global leader in QC start-ups, followed by Canada and the UK. However, 13 new QC start-ups emerged in 2024, primarily outside the top seven countries, indicating a slower formation and growing market consolidation
- Moreover, as of 2025, new QC start-ups are being created in innovation clusters that group start-up accelerators, academic institutions, research centres, and investors. Quantum start-ups are actively partnering with regional and national authorities to create such clusters

Total: 274

261

13

Established QC clusters



Key US quantum clusters are expanding, with Illinois investing 461,9 Mn EUR¹ in 2024, and Maryland launching a 0,9 Bn EUR² public-private initiative in 2025.

Emerging QC clusters



Tel Aviv



Seoul



Abu Dhabi

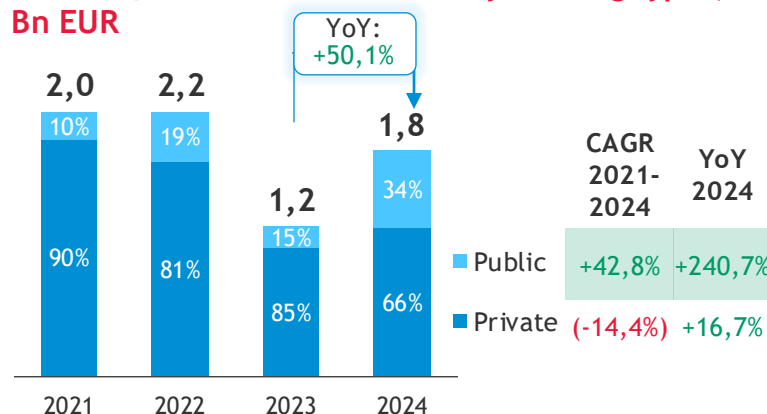
Major QT market trends (2/2)

In 2024, the QT market saw an uptick in public funding and a rise in hybrid computing models



Government urgency - increasing public funding globally

Global QT annual investments by funding type¹, Bn EUR

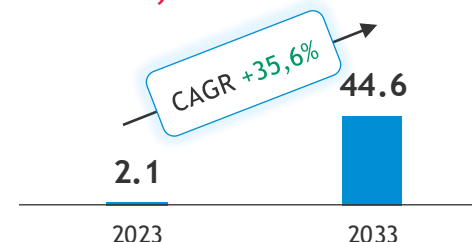


Global QT investment saw a **strong rebound in 2024**, marking a sharp rise from the previous year. **Public quantum funding grew at a CAGR of 42,8%** Public investments grew at an exceptional pace from 2021 to 2024, **peaking in 2024**. This shows increased urgency from governments to invest in QT's potential.



Surge in Quantum Computing as a Service (QCaaS)

QCaaS market size, Bn EUR



The QCaaS market is expected to grow at a CAGR of 35,6% annually from 2023 to 2033. The primary factors contributing to the surge in QCaaS:

- ▶ **VC funding concentration:** Venture capital is shifting toward fewer, mature players
- ▶ **High hardware costs:** Building and maintaining quantum computers requires extremely expensive, specialised infrastructure
- ▶ **Shortage of quantum talent:** Due to a global lack of quantum engineers and researchers, it is difficult for smaller firms to develop in-house expertise



Rise of hybrid quantum-classical integration in HPC

Another prominent trend in 2025 is the shift toward hybrid computing models, where **quantum processors act as specialised co-processors** alongside classical HPC systems. This approach reflects the reality that today's quantum devices remain too small and noisy to solve complex problems alone, but can already deliver advantages for targeted tasks such as **optimisation, simulation, and cryptography**.

Quantum-as-co-processor examples:

EuroHPC Joint Undertaking Initiative:

- ▶ Six hosting agreements signed in 2023 to integrate quantum systems with supercomputers in **Czechia, France, Germany, Italy, Poland, and Spain**
- ▶ Follow-on procurements in 2024-2025 (Germany, Finland, Netherlands, Italy, Spain)

Corporate partnerships:

- ▶ IBM Quantum System One linked to supercomputers in Germany, Japan and Canada

Key Quantum-related risks

The QT advancement offers opportunities but poses challenges in business, technology and talent domains

The primary QT risks identification through research and survey analyses (published in 2025)

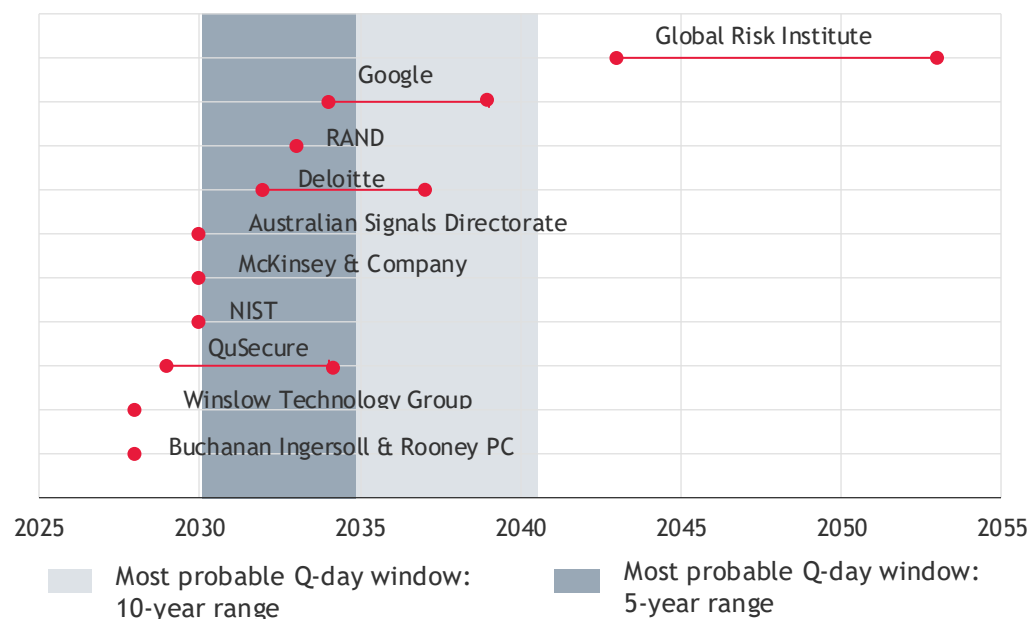
	Technology Leaders  	Strategic Consultancies  	Big 4 Advisors  
 Business-related	Compliance & regulatory pressure to adopt PQC ¹	Regulatory/compliance gaps around PQC	Cyber/digital trust risk if PQC is delayed
	Competitive disadvantage for late movers	Business trust & reputational risks if encryption is broken	Compliance & regulation uncertainty
	High cost & complexity of transitioning to quantum-safe systems	Priority misalignment: quantum seen as low priority	Vendor monopoly & lock-in risks
	Risk of broken trust & reputation if cryptography fails	Resource constraints (budget / personnel)	Competitive disadvantage vs. early adopters
	Risk of 'harvest now, decrypt later'	'Harvest now, decrypt later' risk	Risk of 'harvest now, decrypt later'
 Technology-related	Current encryption vulnerable	Urgency to adopt PQC & crypto agility	Integration difficulty with legacy IT
	Need crypto agility to swap PQC algorithms	Infrastructure readiness challenges	Timeline uncertainty (quantum winter risk)
	Risk of incompatibility with legacy systems	Timeline uncertainty	Vendor modality risk (lock-in)
	Discovering cryptographic assets is complex		Hardware fragility (noise, errors)
	Timeline uncertainty		Costly cryogenics/infrastructure
 Workforce-related	Shortage of skilled staff	Lack of technical knowledge / skills gap	Severe QIS ² talent shortage
	Need leadership engagement	Insufficient resources/personnel	Costly talent wars
	Risk of process errors during migration	Need for leadership & team awareness	Retraining classical staff is hard
	Lack of visibility of crypto assets		Leadership gaps in urgency & strategy
	Upskilling lag risk: delays in adopting PQC due to insufficient training, limited expertise, and the time required to build new technical capabilities		Risk of misdirected strategies; motivation risk if progress will be slow
	 Repeatable risks		

Q-day strategic security risk

Most experts predict Q-Day within the next decade, yet the majority of digital systems remain unprepared

Q-Day represents the inflexion point at which quantum computing capabilities will be sufficient to break existing public-key cryptography, such as RSA2048¹, which is fundamental to securing online transactions, emails, and other forms of digital communication. Its arrival would expose encrypted data to retrospective decryption, compromise authentication systems, and disrupt secure communications across governments, businesses and persons. Without timely migration to quantum-safe encryption, organisations face **systemic cybersecurity and operational risks** that could undermine confidence in digital services and regulatory compliance.

Estimates of Q-Day across research organisations



90% of websites are still exposed to quantum risk as of June 2025²

Quantum-safe encryption initiatives by major companies

- 
Testing hybrid quantum-resistant algorithms in Chrome and advancing post-quantum key exchange protocols. In 2025, Google introduced **quantum-safe digital signatures** in Cloud KMS in preview form.
- 
Integrating quantum-safe cryptography into IBM Cloud and offering migration tools for enterprises. This includes solutions like enhanced **Hyper Protect Crypto Services** and tools such as the **Quantum Safe Explorer** and migration services to help enterprises identify, prioritise, and migrate their existing cryptography to new, quantum-resistant algorithms.
- 
Embedding post-quantum cryptography in Azure and contributing to open standards development.
- 
Developing quantum-safe VPN and network security solutions.
- 
Providing quantum-resilient key management and secure (PQC) communication solutions for organisations.

Source: f5 Labs — The state of PQC on the Web — [June 2025]; SecureWorks website

Notes: (1) Cryptographic algorithm, named after its creators Rivest, Shamir, and Adleman and its 2048-bit key length; (2) According to F5 Labs treats research. A study was conducted on the websites of the following sectors: Oil & Gas, Utilities, Basic Materials, Telecommunications, Health Care, Financials, Government, Consumer Goods, Industrials, Technology, Consumer Services

Workforce-related risks for the QT market

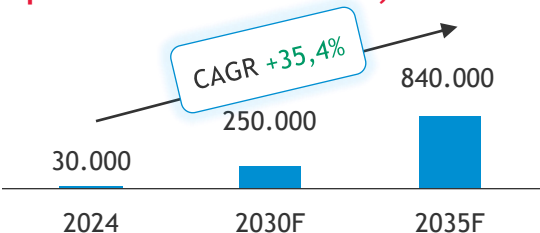
A lack of quantum-skilled workers is a key risk for scaling and adoption of quantum technologies

As of 2025, the Quantum Technology market faces significant **workforce challenges**, including a global talent shortage, a lack of technical knowledge / skills gap, costly talent wars, and low leadership awareness, which hinder readiness and delay commercialisation of QT.

Quantum talent gap

The number of workers in the quantum industry is expected to grow at a **CAGR of 35,4%**, reaching around 250.000 jobs by 2030 and 840.000 by 2035. This indicates that a **minimum of 10.620 quantum specialists will be required each year**. As of 2024, industry reports indicate that **demand for quantum professionals significantly exceeds the current supply**, resulting in a **3:1 gap** between job openings and qualified candidates. Furthermore, it is estimated that **fewer than 50% of quantum positions will be filled by 2025**.

Global quantum workforce size, number of jobs



Lack of technical knowledge / skills gap

Over 60% of professionals fear quantum risks, yet fewer than 10% understand mitigation standards, reflecting **widespread low awareness and lack of knowledge** across leadership and tech teams.



62% of surveyed global professionals¹ is worried that QC will break today's encryption

Only 7% of surveyed experts understand NIST's post-quantum standards



Leadership gaps in urgency & strategy

Multiple surveys show that **most executives** acknowledge quantum's importance but **underestimate its urgency**, with low levels of integration into corporate strategy, which confirms a **clear leadership awareness gap**.



Only 15% of surveyed executives report that their boards have discussed quantum strategy in 2024

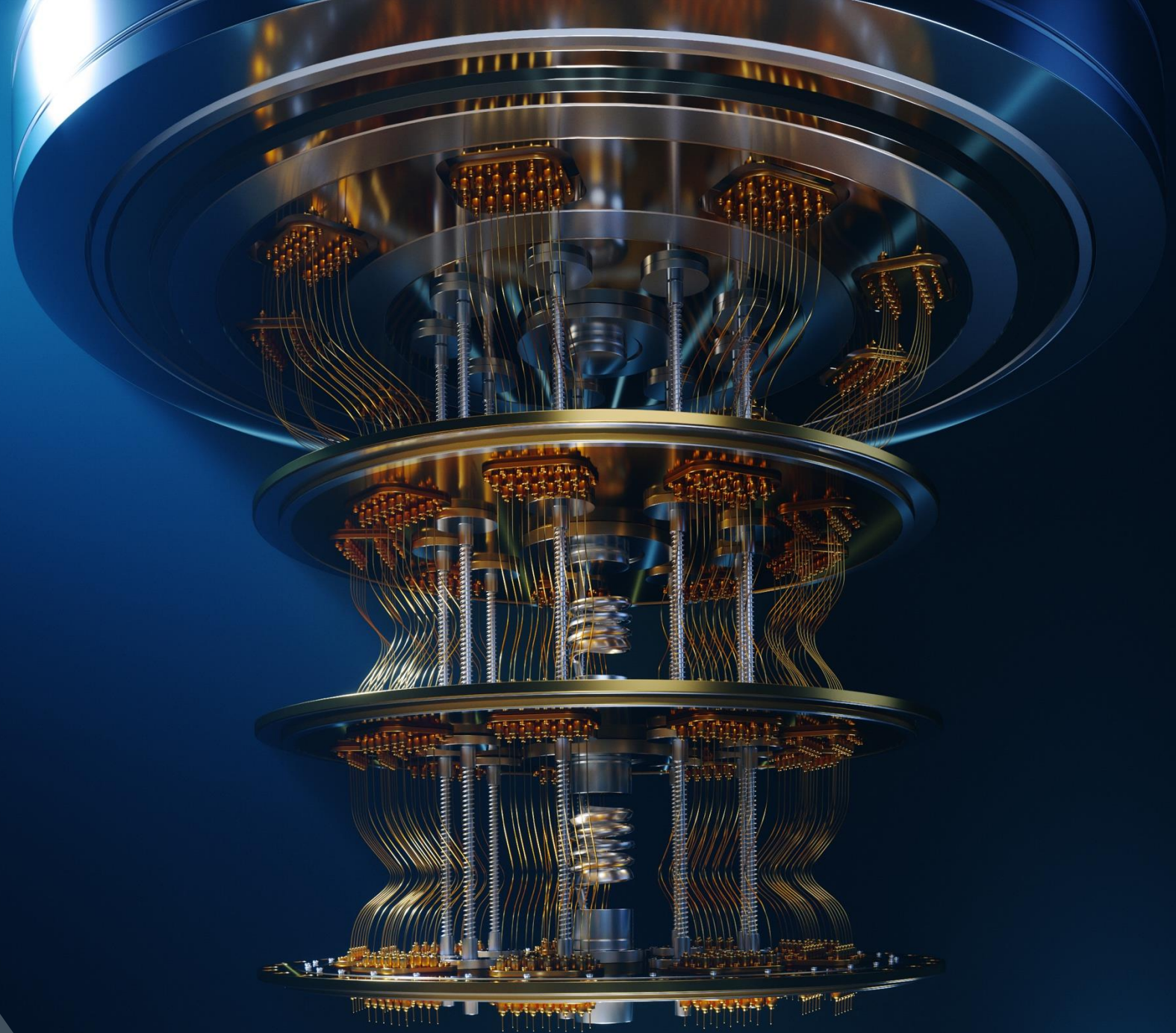
95% of organisations lack a Quantum Computing Roadmap



Source: Brian D.Colwell — 2025 Quantum Computing Industry Report and Market analysis: The race to 170 Bn USD by 2040 — [2025]; ASACA — Quantum computing pulls 2025 — [2025]; Deloitte — Quantum computing over the next five years: Scenario planning for strategic resilience — [2025]

Notes: (1) 2.685 global professionals who work in digital trust fields, including cybersecurity, audit, risk or data privacy

QC Market Overview

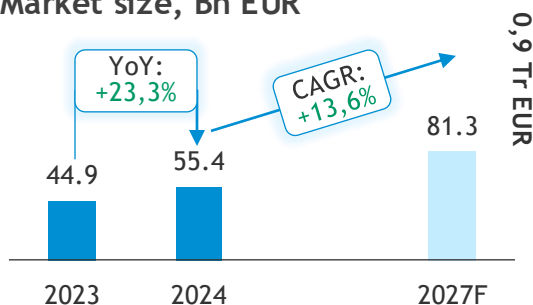


QC market size and place in the Global HPC / Technical Computing market

QC is set to unlock 0,9 Tr EUR in economic value through efficiency gains, new revenues, and job creation

Global High-Performance Computing (HPC) / Technical Computing market¹

Market size, Bn EUR



- ▶ HPC is dominated by classical computing, with the server's segment contributing 42% of revenue in 2024
- ▶ QC accounts for nearly 1,8% of the HPC market, concentrated in cloud and services, and provides specialised capabilities beyond classical HPC
- ▶ HPC centres and cloud providers are increasingly adopting hybrid HPC-quantum platforms

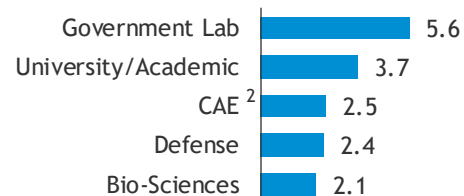
Market segments by revenue, in 2024

- ▶ On-premises servers: 42%
- ▶ Services: 21%
- ▶ Storage: 17%
- ▶ Cloud spending: 15%
- ▶ Software: 5%

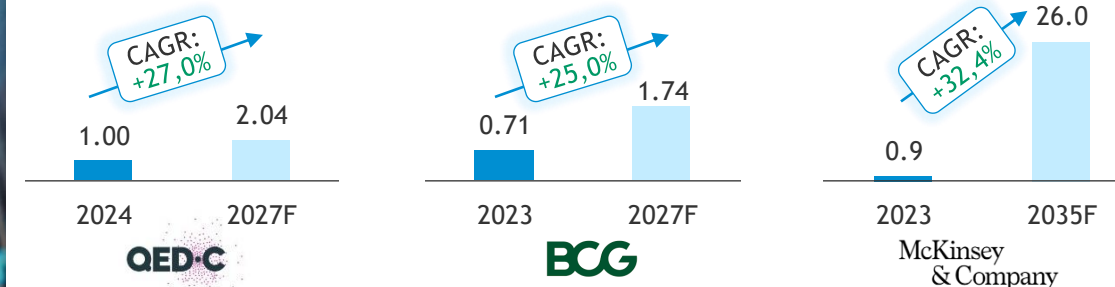
Top Revenue-generating Server Segments in 2024:

Large HPC (10 Mn - 150 Mn USD)	Supercomputers (1 Mn - 10 Mn USD)
27,9%	27,3%

Top 5 HPC applications in 2024 by revenue, Bn EUR:



Global Quantum Computing (QC) market size, current & forecast, Bn EUR



Global QC market forecast from Quantum Insider



Economic impact:

Quantum computing could unlock **approximately 0,9 Tr EUR** in cumulative economic value by 2035, driven by new revenue streams, cost optimisation, and operational efficiency gains across industries.



Vendors' revenue:

Vendors are expected to capture **nearly 46,2 Bn EUR** of this total through hardware sales, Quantum Computing-as-a-Service (QCaaS), and professional services.



Job creation:

The quantum sector is expected to generate **nearly 840.000 new jobs** globally by 2035, including **~250.000 by 2030**, underscoring its growing industrial footprint.

Current state of Quantum Computing Gate-Based technology

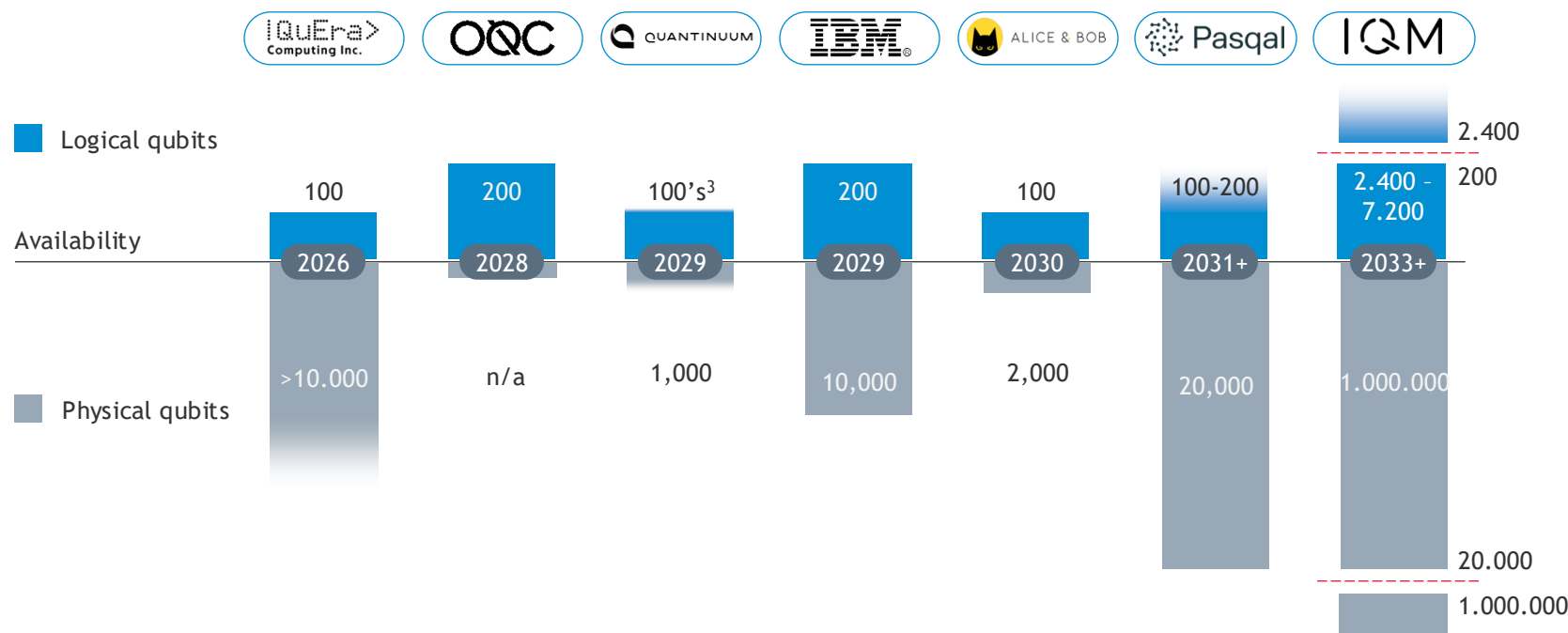
The Gate-Based systems remains noisy and pre-fault-tolerant, but hybrid algorithms already enable early practical use

QC Gate-based systems are in the NISQ era – a transitional stage where systems with 100+ qubits allow early pilots in optimisation, materials science, and cryptography, but remain noisy and small for full quantum advantage. The key milestone ahead is achieving 200-1.000 reliable logical qubits.

Hardware development

Gate-based quantum computers use qubits manipulated by quantum gates to perform universal computations. They aim for fault-tolerant systems capable of running any algorithm but are still in the noisy, pre-error-corrected stage.

Logical qubits targeting by selected companies



- ▶ In 2024, the focus shifted from increasing qubit counts to **stabilising qubits and reducing error rates**, a key step toward making quantum computers reliable for mission-critical use
- ▶ No platform has yet achieved a fully error-corrected, fault-tolerant quantum computer, but **hybrid algorithms** (VQE¹, QAOA²) and **error-mitigation techniques** (zero-noise extrapolation, probabilistic error cancellation, symmetry checks) **already allow useful results despite noise**
- ▶ As of 2025, over 20 manufacturers worldwide offer more than **40 quantum processing units (QPUs) commercially**, reflecting growing accessibility

Source: Companies' websites

Notes: (1) Variational Quantum Eigensolver; (2) Quantum Approximate Optimization Algorithm; (3) In Quantinuum's roadmap, '100's' denotes hundreds of logical qubits

The Quantum Computing Annealing-based technology

Quantum Annealing offers practical optimisation power - already commercially deployed

Quantum annealing minimizes cost functions by exploring energy landscapes via quantum tunnelling – ideal for optimization, logistics, finance, and scheduling. While gate-based quantum systems aim for long-term universal computing, annealing technologies already provide commercially useful quantum or quantum-inspired optimization capabilities.

“Quantum annealing” refers to hardware systems that use quantum tunnelling to find low-energy solutions (e.g., D-Wave). “Quantum-inspired” annealers (e.g., Fujitsu) emulate the same optimization principles using classical or hybrid architectures.

D:WAVE

- D-Wave Quantum Inc. – Advantage2 prototype (1,200 logical qubits planned, 5,000 physical); superconducting flux qubits; hybrid quantum-classical solvers via Leap cloud.

FUJITSU

- Fujitsu – Digital Annealer (quantum-inspired CMOS-based annealer); robust for finance, logistics, and manufacturing. Fujitsu’s Digital Annealer applies quantum annealing principles deterministically, usable in regulated environments (banks, automotive, etc.).

“Other active players include NEC Corporation (Japan), developing quantum annealers/annealing simulators, and Qilimanjaro Quantum Tech (Spain), developing next-gen analog/annealing systems.”

Technological Highlights:

- Near-term usefulness: quantum annealing is not universal but provides scalable, robust solutions for constrained optimization.
- Hybrid solvers combine QPU and CPU/GPU power, handling >1M variables efficiently.
- Continuous improvement in qubit connectivity (K-16) and reduced noise.

Characteristic	Quantum Annealing	Gate-based Quantum Computing
Maturity	Commercial since 2020	NISQ stage (pre-fault-tolerant)
Use cases	Optimization, routing, logistics, finance	Simulation, chemistry, cryptography, AI
Scalability	Thousands of qubits (dense coupling)	Hundreds of noisy physical qubits
Error correction	Intrinsic resilience, no logical qubits	Active research area
Access	Cloud-ready (D-Wave Leap, Fujitsu Digital Annealer)	Cloud pilot (IBM, Quantinuum, MS, AWS, etc.)

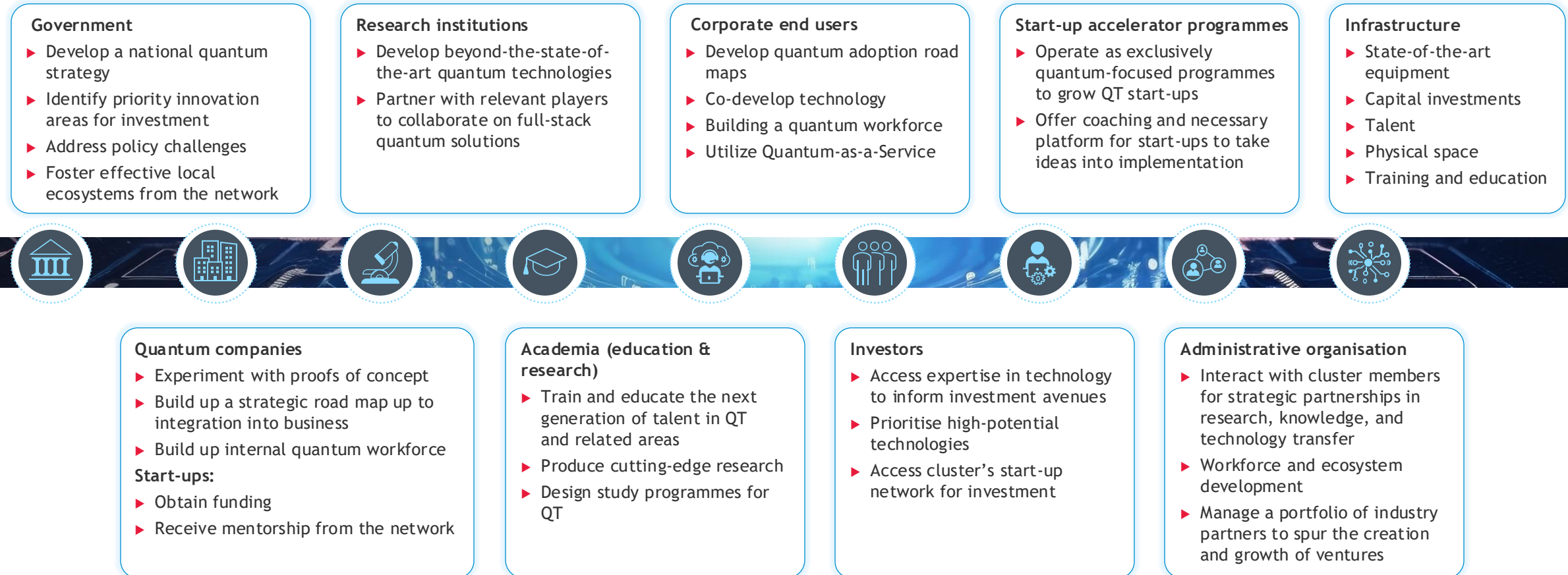
The background of the slide is a photograph of a quantum computing system. It features several vertical cryogenic modules, each with a complex network of gold-colored wiring and copper coils. The modules are housed in dark, industrial-looking enclosures. In the foreground, there are white, rectangular components, possibly part of the cooling or control infrastructure. The lighting is focused on the intricate wiring of the modules, creating a high-tech, futuristic atmosphere.

QT Ecosystem

QT ecosystem overview: stakeholders

Successful QT implementation requires broad support actions from all stakeholders

Support actions by QT ecosystem stakeholders

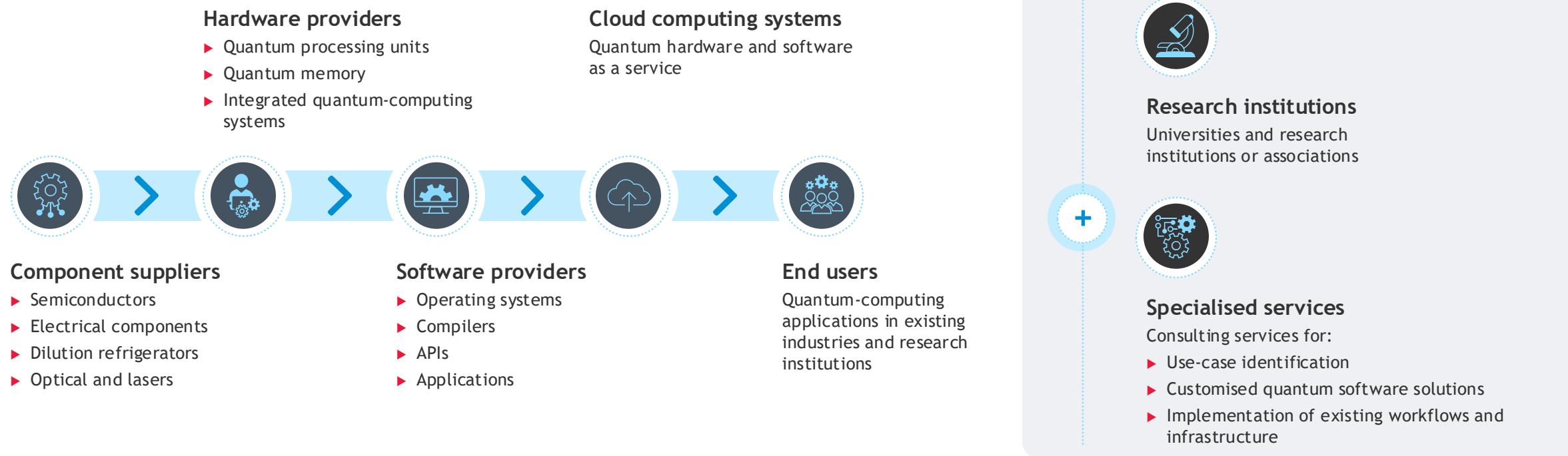


QT ecosystem overview: value chain

Software providers form the largest share of the value chain, while hardware attract the most investment

The quantum computing value chain involves the development of **hardware, software, and cloud infrastructure** to provide remote access to quantum resources. It also includes the creation of practical applications across various industries and service providers that offer integration and support for businesses adopting quantum technologies. End users, such as businesses and research institutions, utilise these solutions to address complex problems and drive innovation.

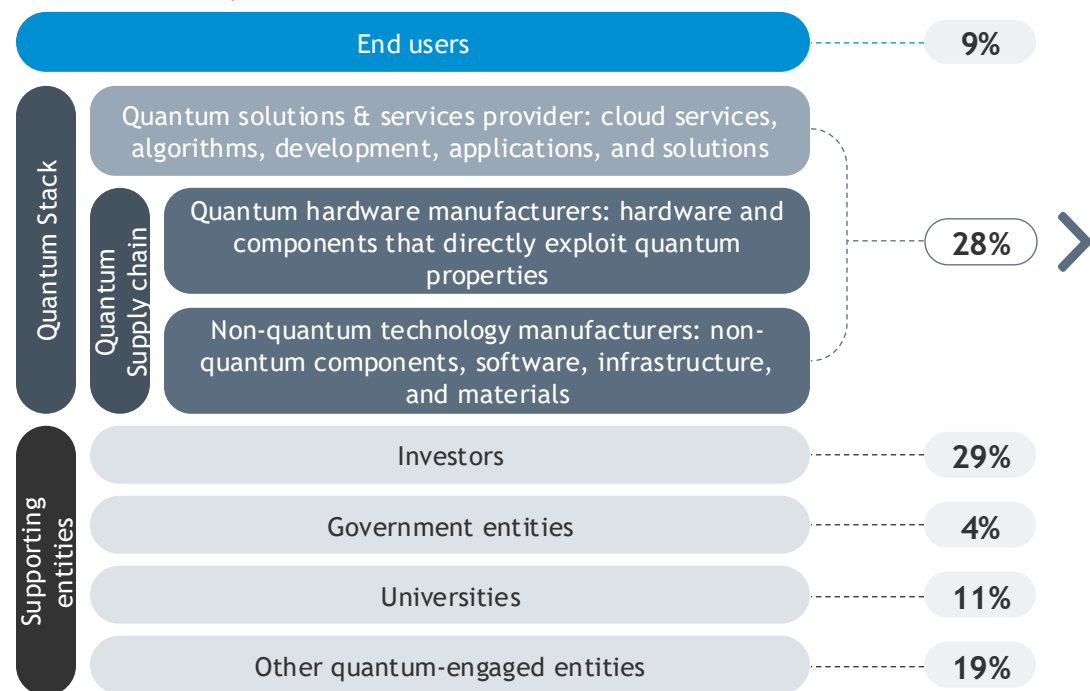
Quantum Computing value chain



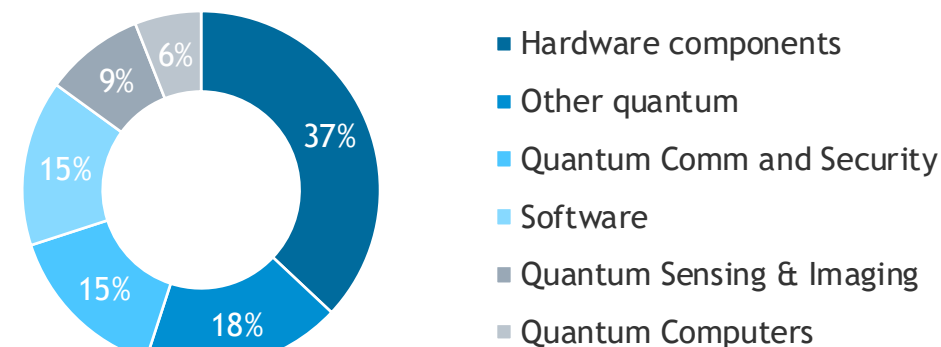
QT ecosystem overview: structure

Stack vendors and investors power the growing Quantum Technology ecosystem

Quantum Ecosystem Structure



Classification of quantum stack companies, as of the end of 2024



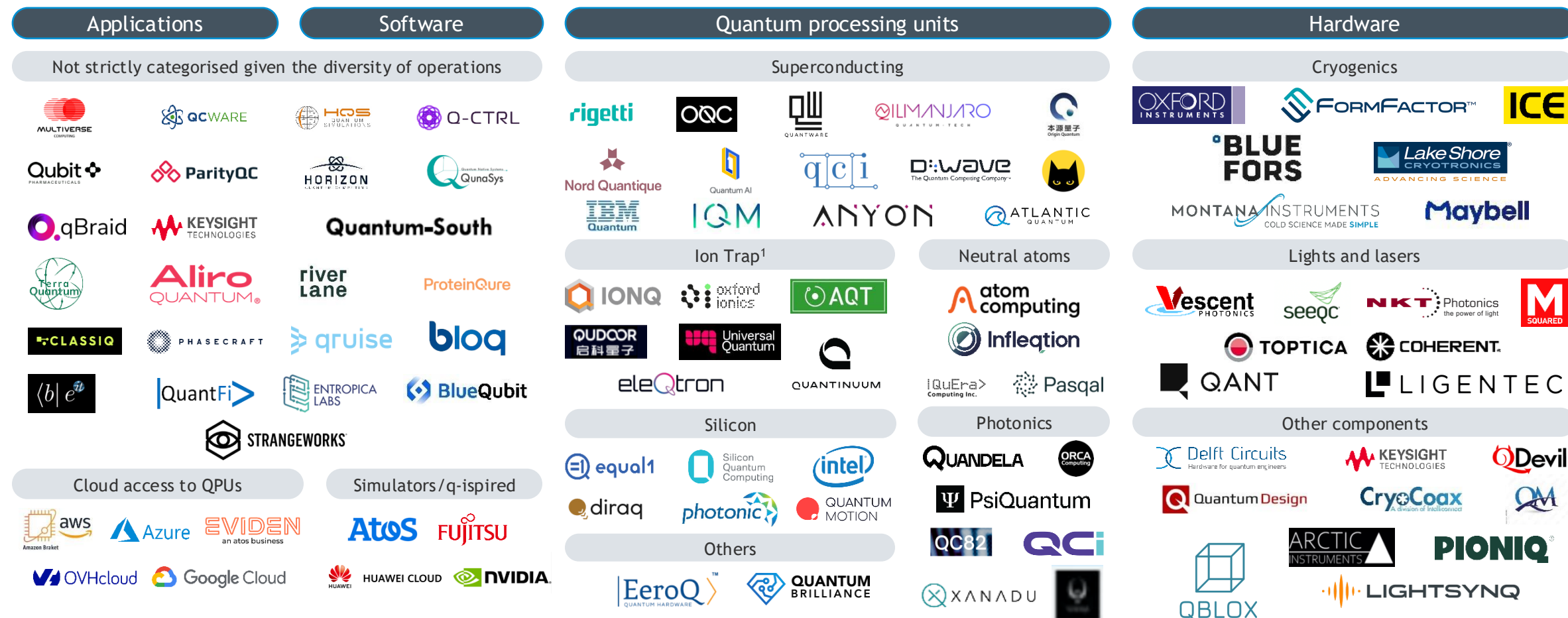
Pure play companies by region, as of the end of 2024



- ▶ As of 2025, the global QT ecosystem includes more than 500 pure-play quantum companies as well as almost 6.000 partial-play organisations involved in quantum-related activities. Within the ecosystem, quantum stack companies, those developing hardware, software, and enabling technologies, along with investors, show the strongest focus on commercialisation
- ▶ North America remains the biggest region, with the USA hosting the largest number of pure-play quantum companies (148), followed by the UK (64) and Canada (56)

Quantum Computing Market Map with selected participants by segments

Quantum market structure shows a balanced interplay between software and hardware pioneers



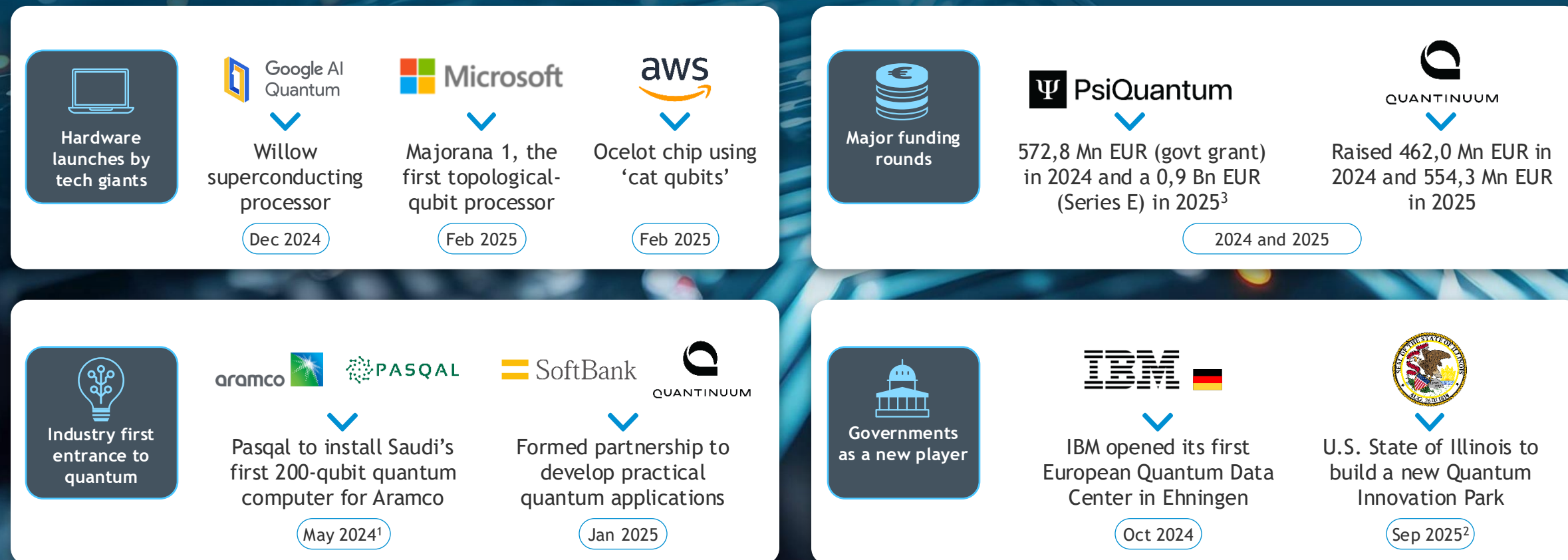
Sources: The Quantum Insider website

Notes: (1) A combination of electric and/or magnetic fields used to capture charged particles

New players in the quantum computing market

Quantum computing enters a new growth phase driven by diverse and strategic entrants

In 2024-2025, a diverse mix of new players emerged, with hyperscalers developing processors and industries such as energy and finance investing for the first time. Governments joined as co-innovators, and rising funding reflected growing confidence in scalable, revenue-generating quantum systems.



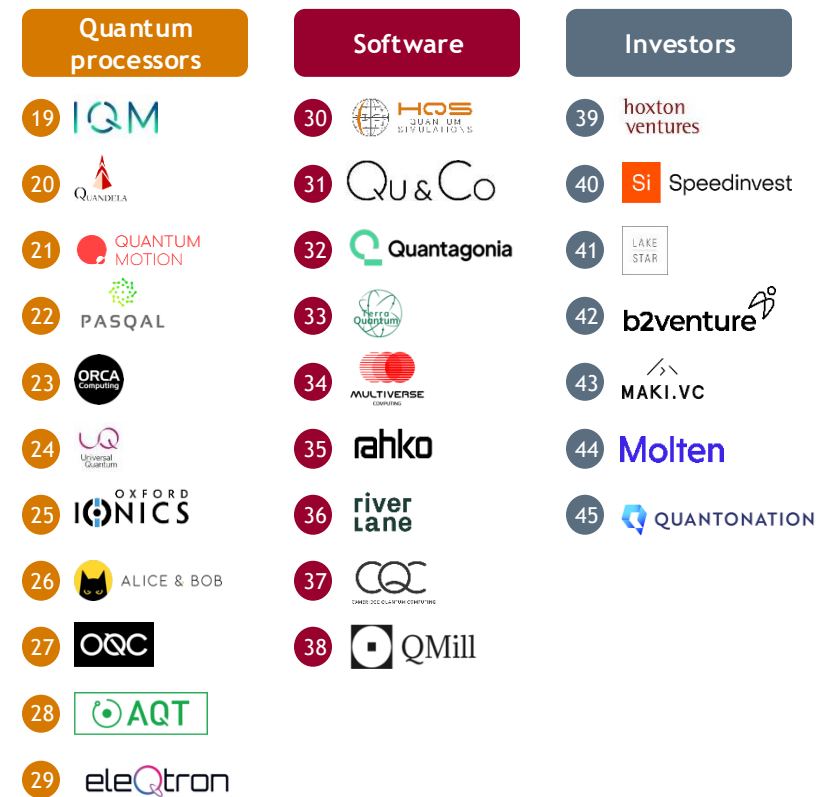
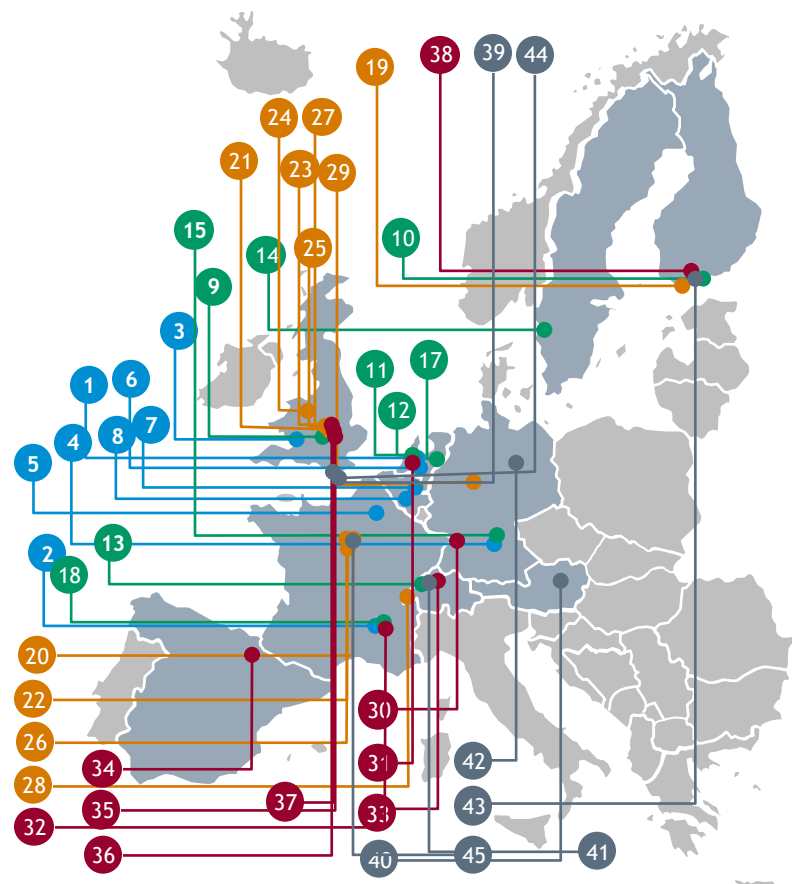
Source: Media overview

Notes: (1) The partnership was announced in May 2024, with deployment scheduled for the second half of 2025; (2) Construction began in September 2025 with a groundbreaking ceremony for the Illinois Quantum and Microelectronics Park (IQMP); (3) The numbers are converted from USD to Euro due to the average rate by the ECB

European quantum computing ecosystem

Europe's quantum leadership is concentrated in research-driven and hardware-focused clusters

Selected European QC companies



France, Germany, and the UK form the core European quantum cluster, driven by strong public research ecosystems and hardware-focused firms. Finland follows with commercialisation, while Austria and Belgium act as research and venture investment hubs.

Belgium's QT ecosystem

Belgium's QT ecosystem is mainly focused on developing QComm infrastructure and sensing technologies

Belgium Quantum Communication Infrastructure

The consortium (a part of the European EuroQCI) brings together theoretical, experimental and engineering expertise to introduce, evaluate and develop quantum communication infrastructure in Belgium.

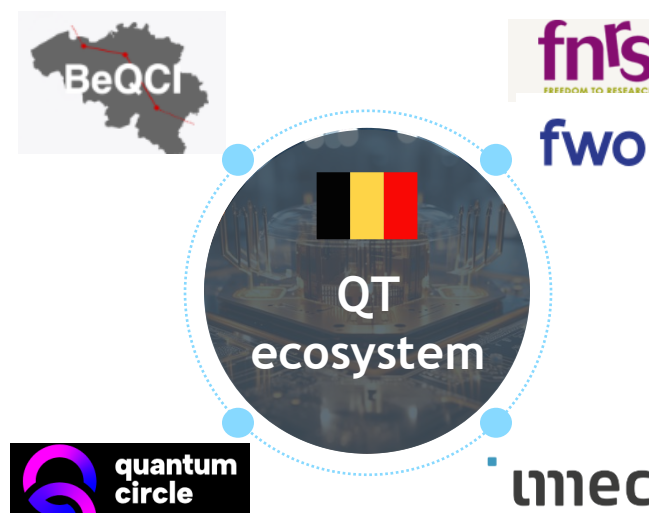
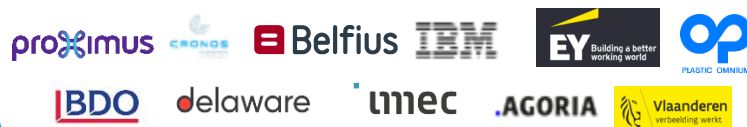
BeQCI participants



Quantum Circle community

The First Quantum Community for Belgium is a collaboration of stakeholders in quantum computing, communication and sensing. Its objective is to drive the development of quantum-driven applications.

Selected members



Funding volume in 2025

Key funds supporting QT

The Fund for Scientific Research (FNRS)

Research Foundation - Flanders (FWO)

90 Supported years research

Funded by Flemish Government

- ▶ In 2025, 27 QT projects were funded jointly by FWO and FNRS in Belgium
- ▶ Participates in the QuantERA¹ 2025 co-funded call for quantum and quantum technology research:

up to 300 K EUR² over 3 years from the FNRS side

700 K EUR (specifically for basic research)

The Interuniversity Microelectronics Centre

An international non-profit R&D organisation that has been operating in nanoelectronics and digital technologies, including 5G and sensing technologies, for nearly four decades.

6.000 scientists from over 100 countries

600 partners in the global network & 200 universities in the ecosystem

QT Industry application developments

Key industries and application enabled by Quantum Technologies

QS announcements focus on industry applications signaling a shift toward commercialisation

Top industries
benefiting from
QC by 2035



Financial
industry



Global energy
and materials



Travel, transport,
and logistics



Pharmaceuticals and
medical products

Selected Quantum Computing use cases

AI and ML

Grid optimisation

Cryptography and data security

Material science and design

Drug discovery and development

Protein folding

Disease risk predictions

Quantum chemistry

Financial modeling and portfolio
optimisation

Design optimisation

Traffic optimization and smart cities

Quantum in space

Weather forecasting and climate
modeling

Supply chain and inventory optimisation

Selected Quantum Sensing announcements

Innovation

Meaning



Demonstrated an ultracool quantum sensor in space, onboard the International Space Station, for the first time.

Enables space missions to use QT to track Earth's water, analyse moons and planets, and study cosmic phenomena.



Q-CTRL

Overcame GPS denial with quantum navigation, outperforming traditional systems without GPS.

Provides reliable navigation solutions in environments where GPS is unavailable.



SANDBOXAQ

Launched commercial real-time navigation system powered by AI and quantum sensing.

Provides unjammable, all-weather navigation when GPS is unavailable or denied.



QUANTUM DIAMONDS
SENSOR TECHNOLOGY

Developed a diamond-based quantum microscope for semiconductor chip failure analysis.

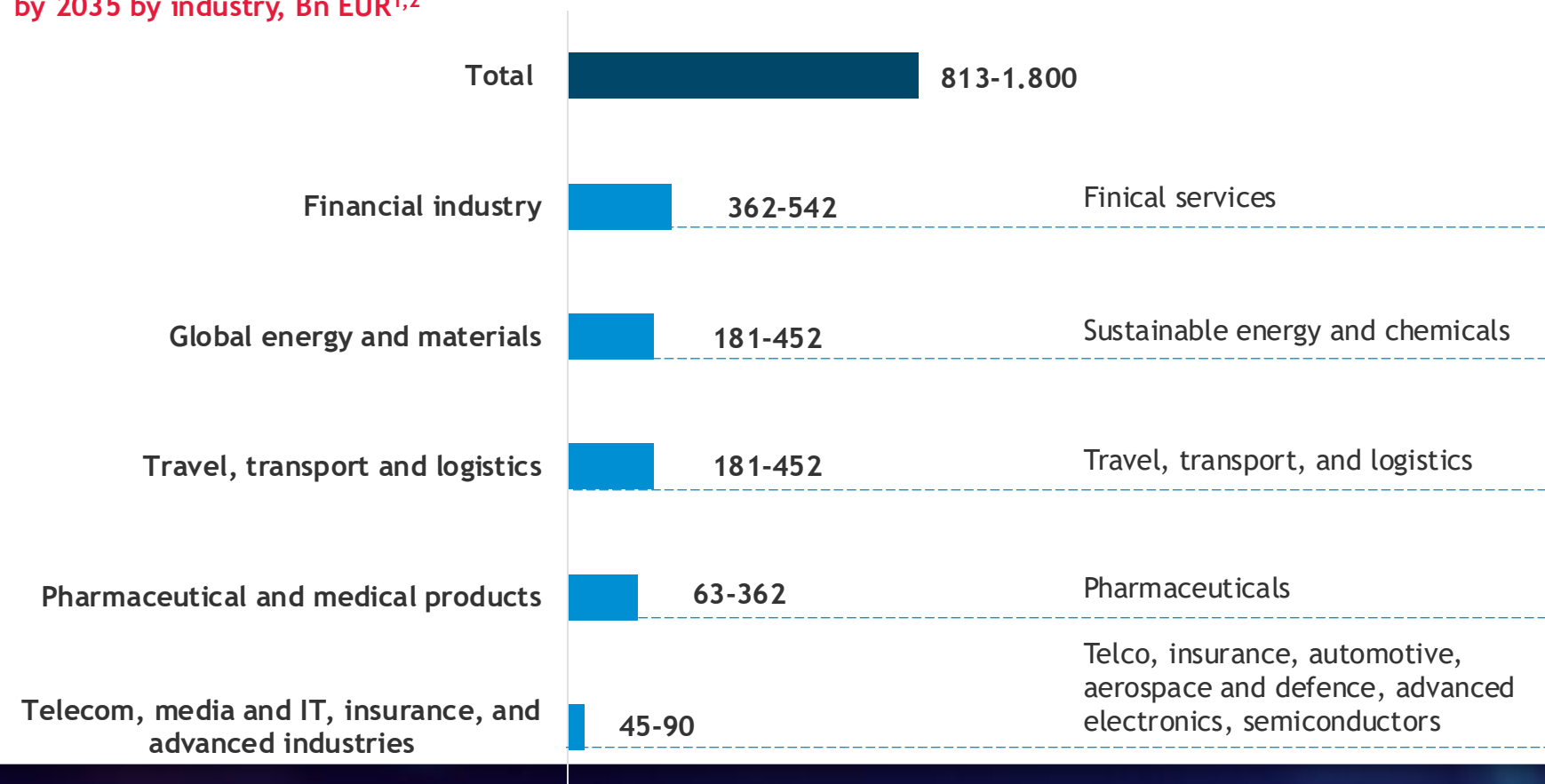
Addresses challenges in semiconductor fabrication, improving yields and accelerating production ramp-up.

QC use case opportunities

Quantum computing will create the greatest value in finance, energy, and logistics

Estimates the economic value of the incremental impact of QC by 2035 by industry, Bn EUR^{1,2}

Key segments for QC



- ▶ The **financial sector** is expected to be the leading early beneficiary of QT. By harnessing quantum capabilities, financial institutions will be able to perform **portfolio optimisation, risk modelling, option pricing, and fraud detection** with significantly higher speed and accuracy
- ▶ Across **Global energy**, QT can optimise energy storage, battery materials. For T&L Route and WH Logistics optimization, QT will accelerate innovation while reducing costs and environmental impact
- ▶ For **Pharmaceuticals and medical products**, QT offers speed up drug discovery and personalised medicine by predicting protein interactions and analysing large-scale genomic data

QC Adoption in the Transport and Logistics

QC delivers tangible progress in routing, scheduling, and load optimisation, with pilots already underway

QC readiness index¹ in transportation and logistics²



Quantum potential in transport and logistics:



QC tackles NP-hard logistics optimisation challenges.



Vehicle Routing Problems (VRPs) are considered a 'low-hanging fruit' for QC

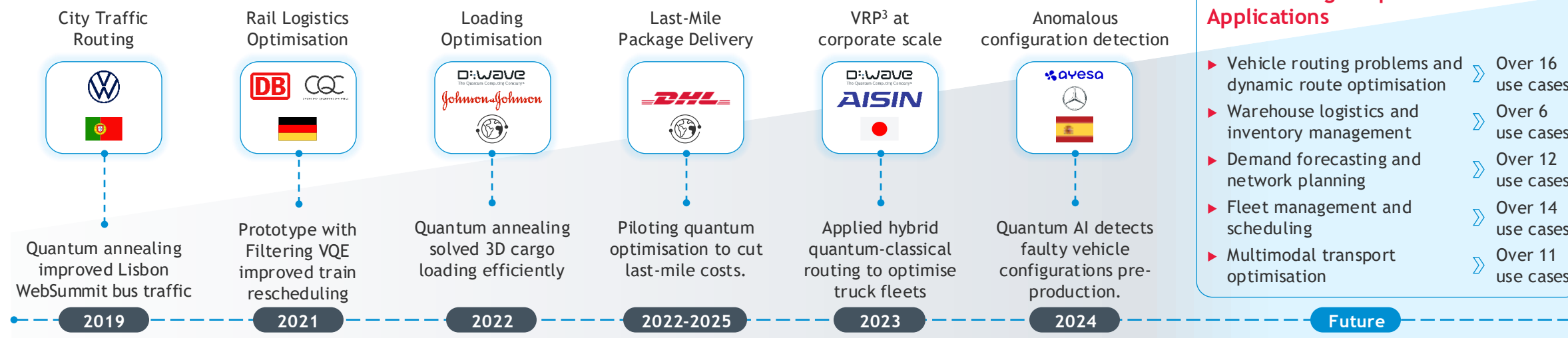


QC in routing offers 50-100 Bn USD in value potentially



QC pilots position logistics providers ahead competitively

Categories of impact applications supported with selected existing cases



Resource: Companies websites; BDO – Quantum Computing in Transport & Logistics – [2025]; Media overview

Notes: (1) When QC reached sufficient maturity to play a significant role within the industry; (2) According to the Quantum readiness survey conducted by EY and National Quantum Computing Centre within 1.516 UK-based executives across 11 industries in February - March 2022

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DISCLAIMER and TOOL USAGE

DISCLAIMER

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The purpose of this research is to identify trends and to make market information accessible in a concise and comprehensible format.

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TOOL USAGE

BDO Tooling:

BDO Alssist (Walled Garden Implementation with Azure Foundation), BDO research tooling using orchestration from UiPath and N8N.

Private Tooling:

OPENAI CHATGPT PLUS (All relevant models in every modus including private GPT's), CHATGPT ATLAS

PERPLEXITY PRO (all relevant models, search and research), COMET

MIDJOURNEY (Image Generation)



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