

# **Finland's Quantum Technology Strategy – Aug 2025: A Precision Play**





# **Executive Summary**

**In April 2025, Finland laid out its national Quantum Technology Strategy for 2025–2035, positioning quantum tech not just as a scientific milestone, but as a cornerstone of sustainable growth and technological autonomy. This is more than a vision—it's an operational roadmap.**





**That strategy has already gained momentum. Since July, Finland's 50-qubit superconducting quantum computer—developed by VTT and IQM Quantum Computers—has been reliably operating in cloud-connected mode, allowing remote access for academic and enterprise R&D across Europe. The €20.7 million government-supported machine is now fully integrated with LUMI, Finland's flagship high-performance computing system, bringing hybrid quantum-classical workflows closer to reality. Finland's quiet confidence in research-driven innovation continues to speak volumes—especially now that the system is performing real work, not just lab demonstrations.**





# National Strategy & Infrastructure





The strategy, published by the Ministry of Economic Affairs, outlines eight priorities, ranging from establishing InstituteQ (a nationwide quantum competence network) to piloting quantum-safe encryption and securing a seat at the table when international standards are set.



A scenic landscape featuring a dense green forest in the background. In the middle ground, there is a small wooden cabin with a dark roof, situated on a grassy clearing. A body of water, likely a lake or river, occupies the foreground and right side of the image. A small wooden dock extends into the water, with a small boat moored next to it. The sky is blue with scattered white clouds. The overall scene is peaceful and natural.

**This holistic approach continues to target sustainable growth through innovations in energy optimization, healthcare analytics, and advanced materials, while promoting technological autonomy by enhancing domestic capabilities in quantum hardware and software.**



A photograph of the Aurora Borealis (Northern Lights) over a calm body of water. The sky is dark with numerous stars, and the aurora displays vibrant green and blue light patterns. The lights are reflected on the water's surface. A dark silhouette of a forested shoreline is visible in the background.

Since the strategy's publication, Finland has finalized new pilot programs in quantum-safe communications, with deployments already underway in select government and energy-sector networks.



An aerial photograph of a coastal landscape. In the foreground, there is a dense forest of trees with green and yellow foliage. A narrow path or stream winds through the forest. In the background, a body of water stretches to the horizon under a clear sky. The text is overlaid on the image, centered in the upper half.

From 2020–2024, roughly €274 million went into quantum R&D. Another €70 million is earmarked for 2024–2027, supporting Finland's roadmap toward 150 qubits in 2026 and 300 by 2028. IQM has confirmed chip fabrication for the 150-qubit prototype is now underway, with early thermal testing starting this autumn.







An aerial photograph of a vast, dense forest in Finland. The forest is composed of numerous tall, thin trees, likely spruce or fir, which are densely packed together. The ground in the foreground is a light-colored, sandy area, possibly a beach or a clearing. The sky is a pale, hazy blue, suggesting a clear day. The overall scene is one of a vast, untouched natural landscape.

Finland isn't going for sheer size;  
it's still playing the long game with  
surgical precision.

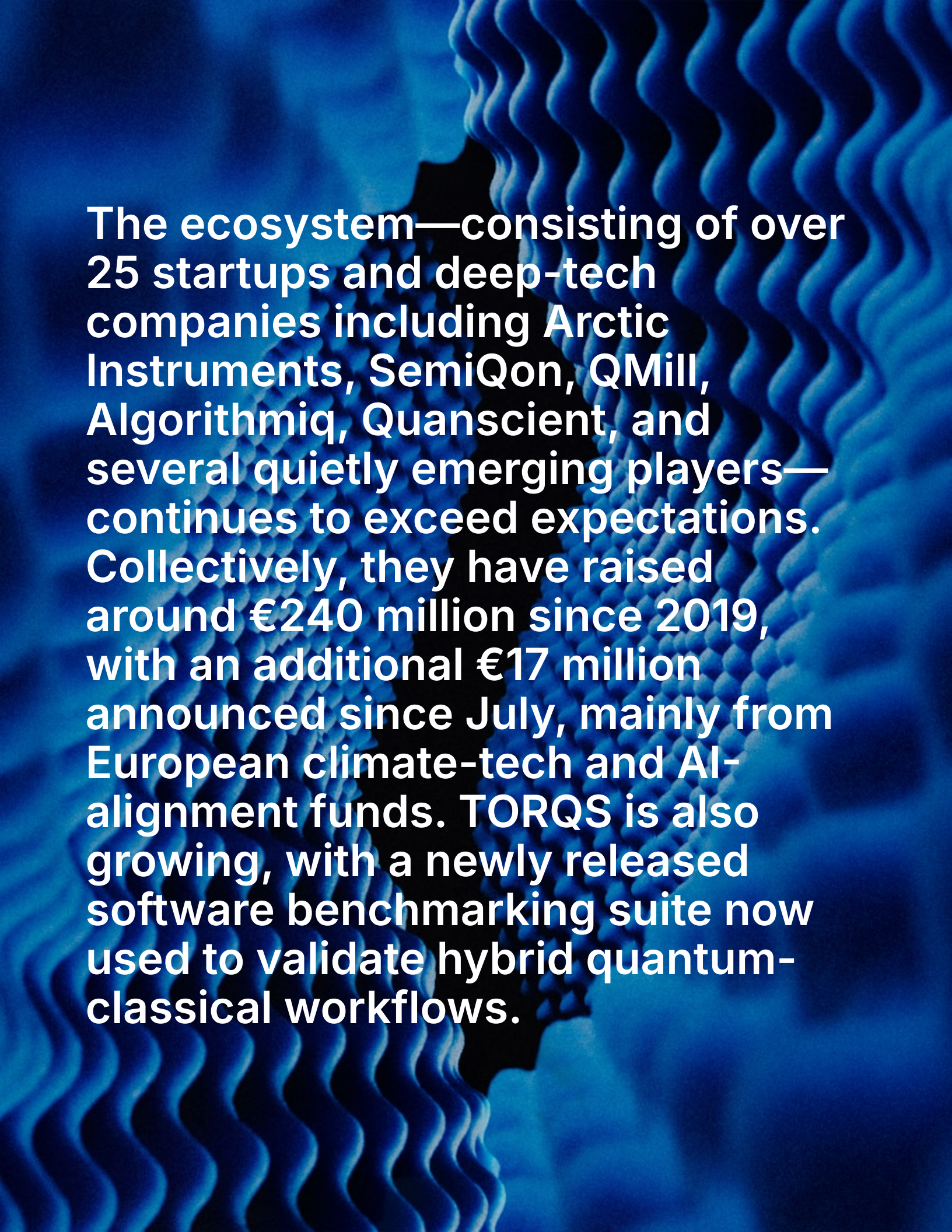


# Public / Private Collaboration & Academic Firepower

InstituteQ remains the central hub of Finland's quantum coordination. Under Prof. Jukka Pekola's leadership, the network has expanded its industry-facing programs and launched a microcredential curriculum this summer focused on quantum software engineering and secure systems.







The ecosystem—consisting of over 25 startups and deep-tech companies including Arctic Instruments, SemiQon, QMill, Algorithmiq, Quanscient, and several quietly emerging players—continues to exceed expectations. Collectively, they have raised around €240 million since 2019, with an additional €17 million announced since July, mainly from European climate-tech and AI-alignment funds. TORQS is also growing, with a newly released software benchmarking suite now used to validate hybrid quantum-classical workflows.

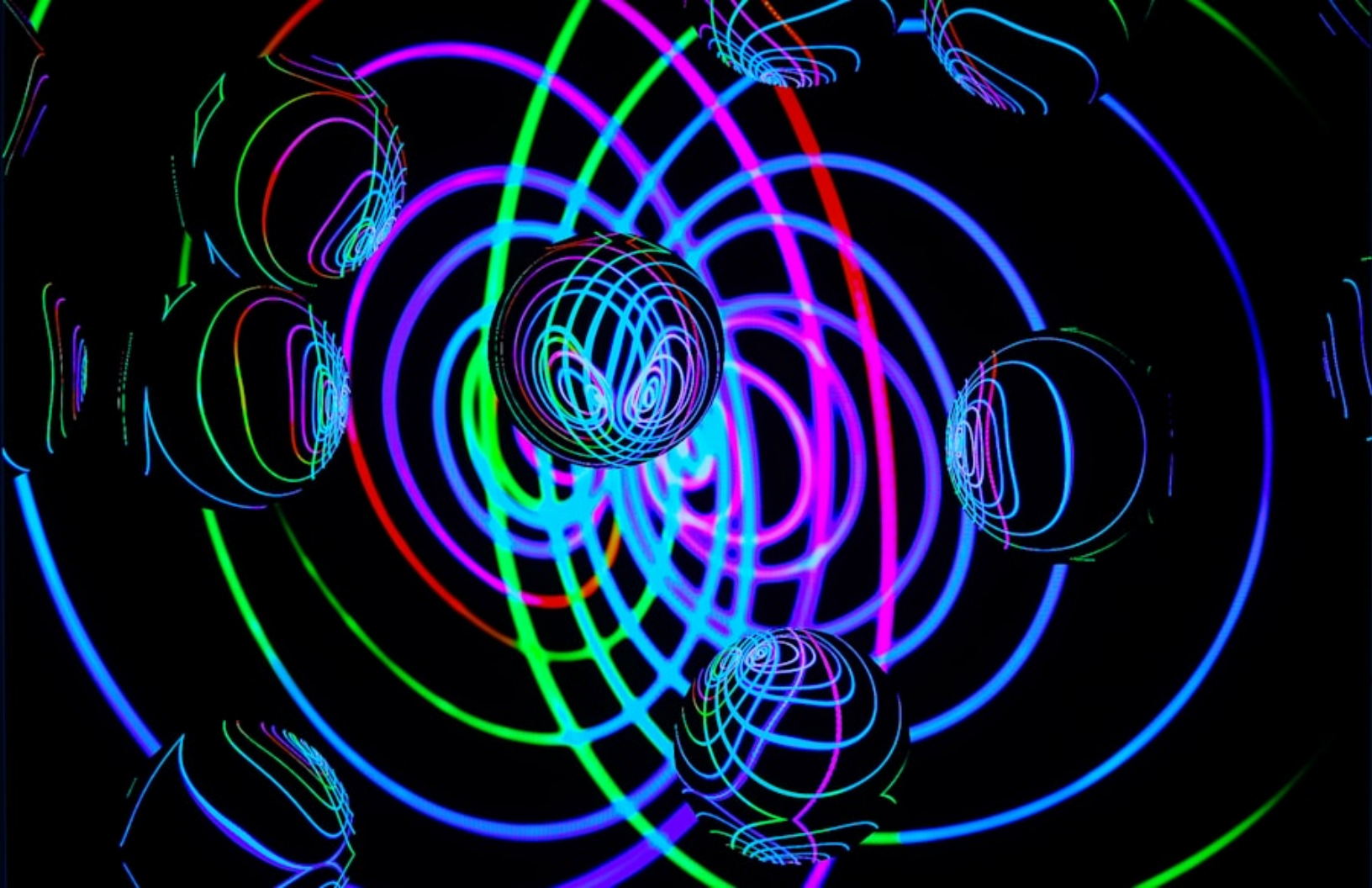


# International Relationships & Funding

Finland continues to actively participate in European quantum initiatives like EuroQCI and NordQuEst. In August, it also joined a new working group on post-quantum cryptography within ENISA, the EU's cybersecurity agency, reaffirming its commitment to securing communications in critical infrastructure.







The QUEST project under the EU defense umbrella is progressing, with a demo module of quantum-enhanced navigation systems expected this fall. Finland's participation in the EU's Quantum Europe R&I Initiative is now active, with initial funding already secured to expand educational programs and involve SMEs in quantum applications.

## **G7 Summit & Strategic Alignment**

While Finland isn't part of the G7, it's threading the same strategic needle. At the July summit, G7 leaders emphasized tech sovereignty, secure digital infrastructure, and resilient innovation ecosystems. You could lift whole paragraphs from Finland's strategy and drop them into the G7 declaration without missing a beat—especially around quantum-safe infrastructure and workforce reskilling.



# **Opportunities and Challenges**



## **Opportunities:**

**The 50-qubit system is now live and in use, putting Finland in an active leadership role in Europe.**

**The 150-qubit system is officially in development, and integration plans with LUMI2 are under discussion.**

**InstituteQ's talent pipeline is gaining traction with short-format, applied training programs now accepted by several Finnish employers as part of upskilling efforts.**





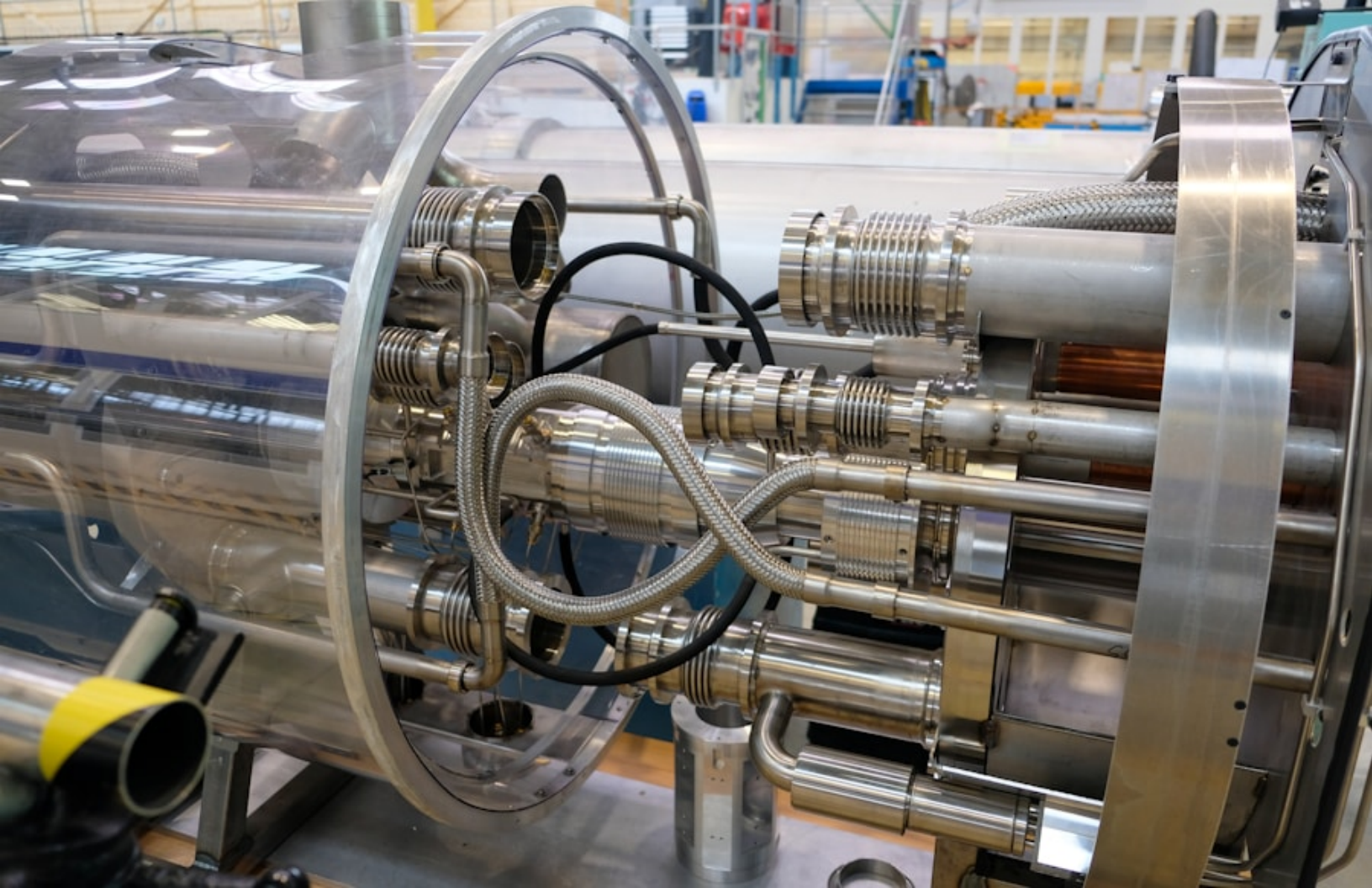
# Challenges:

Funding remains measured. Germany and France continue to dominate in terms of euros committed. Finland's strength is in ROI, but scaling will demand bigger financial plays soon.

Workforce depth, particularly in quantum-aware software engineering and systems integration, remains thin—although microcredential programs are a step in the right direction.

Standards work is accelerating globally. Finland must maintain presence and pace in technical working groups or risk falling behind in influence, even if it leads in capability.





# Outlook for 2025 & Beyond

## **Next on the runway:**

Fabrication milestones for the 150-qubit system are expected in Q4 2025. InstituteQ is expanding into quantum education at the secondary level through a new EU pilot involving six Finnish high schools. Progress continues on Open-SuperQPlus, with Finland contributing cryogenic infrastructure and middleware optimization. There is growing interest in quantum for climate modeling and power grid optimization, areas where Finland has both data and domain expertise.



# Final Reflection

As of August 2025, Finland has evolved from an R&D hub into a strategic operator. The 50-qubit machine is no longer a promise—it's a production resource. The 150-qubit system is officially under construction.

And more importantly, the pieces are in place to do something rare in tech: make quantum not just enjoyable, but valuable.

The next test isn't just technical. The question is whether Finland can turn deep national alignment—across policy, infrastructure, talent, and industry—into a long-term advantage.

Right now, it's not just in the game. It's setting the tempo.

