



# Netherlands: State of Quantum – August 2025



# Executive Summary: Engineering Leadership at Ecosystem Scale

The Netherlands isn't chasing quantum headlines—it's executing a deeply coordinated, technically grounded national play.

Backed by its 2019 *National Agenda on Quantum Technologies* and anchored by the €615 million **Quantum Delta NL** initiative, the country continues to operate at an ecosystem scale. The 2024 launch of **Tuna-5**, a Dutch-built superconducting quantum processor now available via public cloud, marks a tangible milestone in hardware sovereignty—and in integrated national capability.

Now in mid-2025, the focus is shifting: from coordination to commercialization, from deep R&D to deployment, and from academic proof-of-concept to national and EU-level interoperability.





# National Strategy & Infrastructure: Coordinated, Funded, Focused

Quantum remains one of the Netherlands' 10 strategic technologies, supported by industrial policy and sovereignty frameworks.

## Quantum Delta NL

- €615 million from the National Growth Fund (2021–2027)
- Five regional hubs: Delft, Leiden, Twente, Amsterdam, Eindhoven
- Aiming for €5–7 billion GDP impact and 30,000 jobs by 2032







## Infrastructure Highlights

- **NanolabNL:** National cleanroom network for quantum and nano fabrication
- **House of Quantum (Delft):** A physical meeting ground for startups, researchers, and corporate pilots
- **SURF HPC Integration:** Quantum-classical workflows through national supercomputing resources

Together, these form a full-stack approach—from materials and qubits to software, cloud access, and applied user cases.



# Academic & Industry Collaboration: Deep Talent, Tight Integration

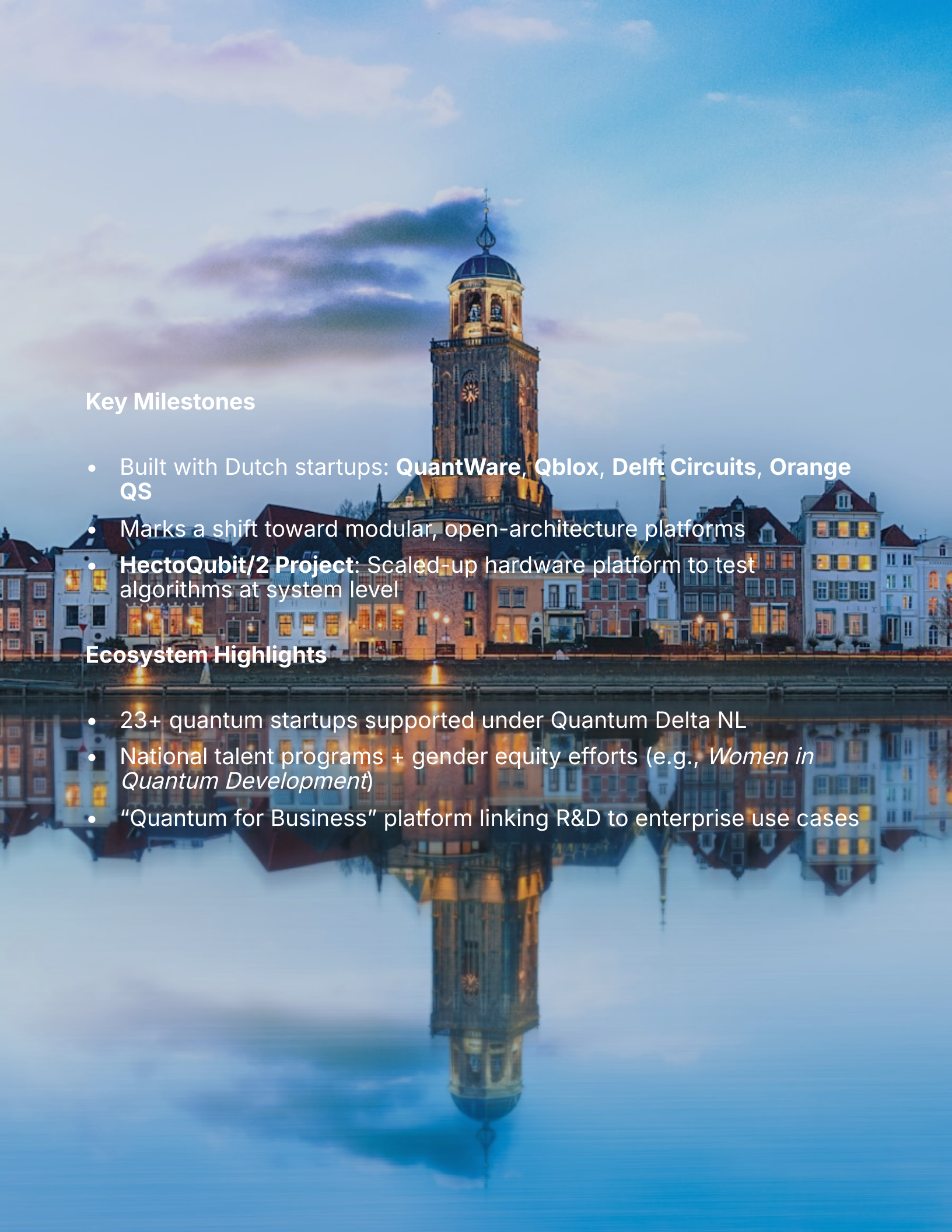
The Netherlands remains a heavyweight in academic quantum science, with strong institutional coherence.

## QuTech (TU Delft + TNO)

- Global reputation for quantum networking, error correction, and systems design
- Key voices: Ronald Hanson (quantum internet), Barbara Terhal (fault tolerance)







## Key Milestones

- Built with Dutch startups: **QuantWare, Qblox, Delft Circuits, Orange QS**
- Marks a shift toward modular, open-architecture platforms
- **HectoQubit/2 Project:** Scaled-up hardware platform to test algorithms at system level

## Ecosystem Highlights

- 23+ quantum startups supported under Quantum Delta NL
- National talent programs + gender equity efforts (e.g., *Women in Quantum Development*)
- “Quantum for Business” platform linking R&D to enterprise use cases



# International Engagement: Strategic Openness, Guardrails in Place

The Netherlands walks a careful line—welcoming collaboration, while enforcing protections.

## Key Engagements

- **EuroQCI & NordQuEst:** Quantum-secure comms + HPC integration
- **SURF HPC+QC:** Hybrid simulation + algorithm co-development
- **Wassenaar Arrangement:** Active strategic screening for sensitive quantum exports
- Bilateral work with **U.S., UK, Japan, Australia:** Shared testbeds, IP policy, and governance principles







Openness is strategic

This is soft power with sharp edges.

This is execution, Dutch-style—structured, intentional, and increasingly global in its reach.



# **Opportunities & Constraints**



# ***Strengths***

- **Quantum Delta NL:** Fully integrated ecosystem—research, talent, infrastructure, startups
- **Tuna-5 & Cloud Access:** Signpost for open-architecture scaling and commercialization
- **SURF Integration:** Quantum-classical workflows for real-world algorithms and testing
- **Photonic Leadership:** QuiX Quantum and others expanding optical frontier







# ***Constraints***

- **Global Funding Gap:** €615M is substantial—but still modest next to U.S. or China allocations
- **Strategic Screening:** Export controls may slow down international scaling
- **Translation Gaps:** Not all academic R&D is reaching commercial momentum yet

The potential is real. But friction still lives in the middle layers.



# Outlook for 2025 & Beyond: Scaling from Maturity to Market

| Focus Area                        | Near-Term Outlook                                                              |
|-----------------------------------|--------------------------------------------------------------------------------|
| <b>Startup Expansion</b>          | QuiX Quantum raised €15M (July 2025); targeting universal photonic QPU by 2026 |
| <b>Infrastructure Growth</b>      | Second House of Quantum under construction; nanofab upgrades underway          |
| <b>Cloud &amp; Software Layer</b> | Tuna-5 public integrations and SURF support for hybrid workflows               |

Execution is no longer theoretical—it's operational.





# Final Reflection: Precision Over Hype

As of August 2025, the Netherlands is more than a quantum research hub. It's a systems-level orchestrator—balancing regional infrastructure, global collaboration, and deliberate policy leadership.

With:

- Public cloud hardware (Tuna-5)
- An integrated innovation ecosystem (Quantum Delta NL)
- A growing startup base
- Hybrid computing infrastructure
- Policy maturity around export control and strategic openness





A photograph of a man and a woman riding bicycles down a cobblestone street in Amsterdam. The man is in the foreground, wearing a light blue shirt and khaki shorts, riding a black bicycle. The woman is behind him, wearing a white top and light-colored shorts. They are riding towards the right. In the background, there are historic Dutch buildings with many windows and a gabled roof. The sun is low in the sky, creating a warm, golden light. There are other people and bicycles in the background, and a street lamp is visible on the left.

... the country is positioned to help shape what “national quantum success” looks like.

But holding that position depends on one thing: **delivery**.

The research is excellent. The structures are in place. What’s next is scaling—commercial wins, workforce growth, and global integration that retains Dutch values and direction.

Quietly, precisely, the Netherlands is building the kind of quantum future others are still trying to define.