



DeepTech NL

Dutch Future of Compute companies breaking barriers of innovation

Helen Kardan | Director of Science & Technology, TNO

This Presentations shows the result of collaboration with Techleap on Future of Compute

Digital Economy moving faster than ever

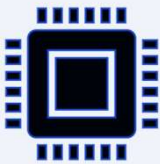
From IoT to AI-enhanced-IoT



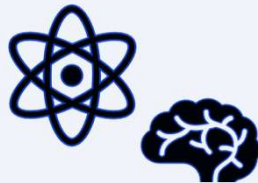
Digital Economy incl. AI



Increasing demand, going beyond AI chips



Semiconductor
Chips and Memory



Upcoming Compute
Paradigms



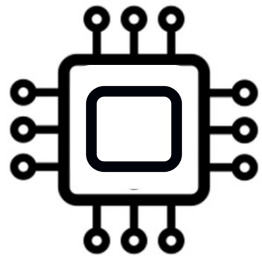
Energy



New Materials

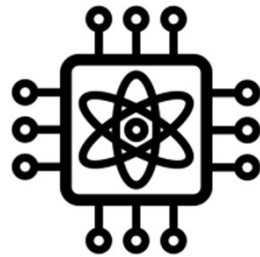
Future of Compute beyond AI chips

Orchestrating different compute paradigms to tackle real-world problems at exceptional scale



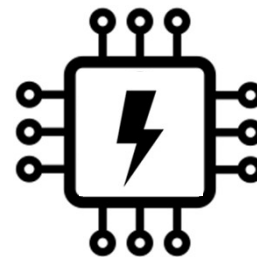
Advanced Semiconductors

Using nano-scale microchips and advanced packaging to execute highly complex information processing tasks.



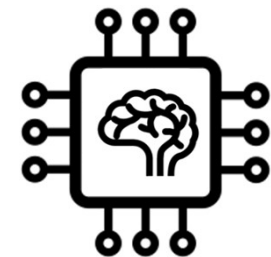
Quantum Computing

Leveraging superposition and entanglement via qubits to tackle exponential complexity in chemistry and crypto.



Photonic Computing

Using light for ultra-fast, low-latency processing and interconnects with near-zero energy dissipation.



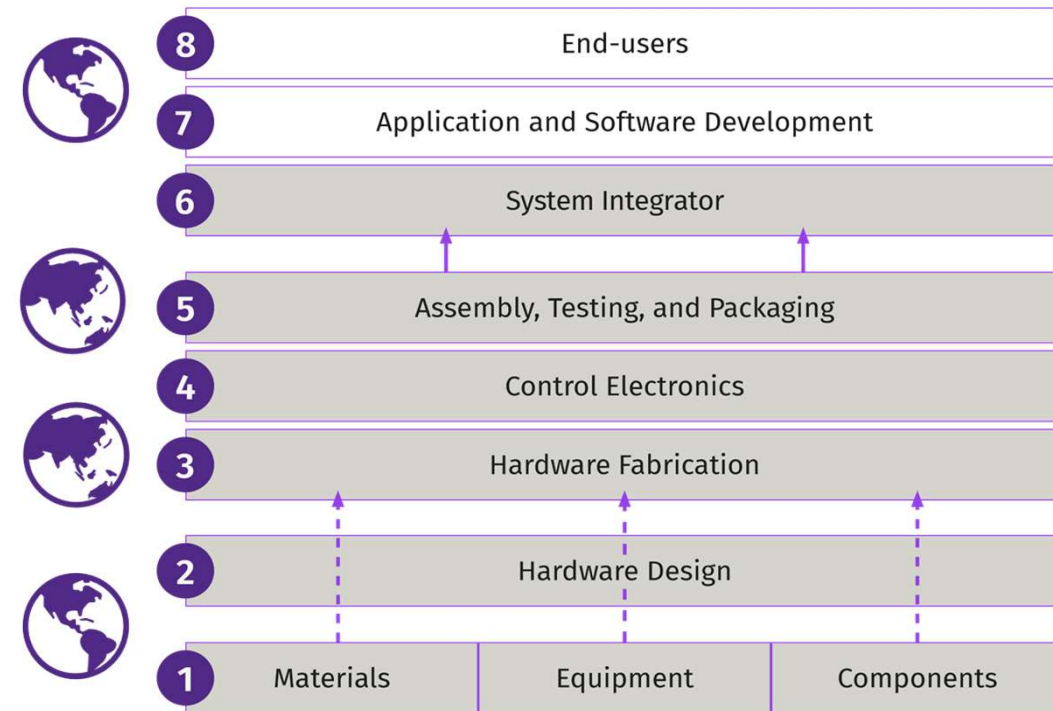
Neuromorphic computing

Mimicking biological synapses for event-driven, low-power pattern recognition at the edge.

Segment	2024-2025	2030 Forecast	2035+ Potential
Semiconductors (AI)	715 BEUR (110 BEUR)	1.47 TEUR (420 BEUR)	2.1-2.5 TEUR (+850 BEUR)
Quantum Computing	1.1 BEUR	9-15 BEUR	65-90 BEUR
Photonic ICs (PICs)	15 BEUR	35 BEUR	60+ BEUR
Neuromorphic Computing	0.8 BEUR	12 BEUR	70 BEUR (High CAGR)

Innovating in the Hardware Value Chain

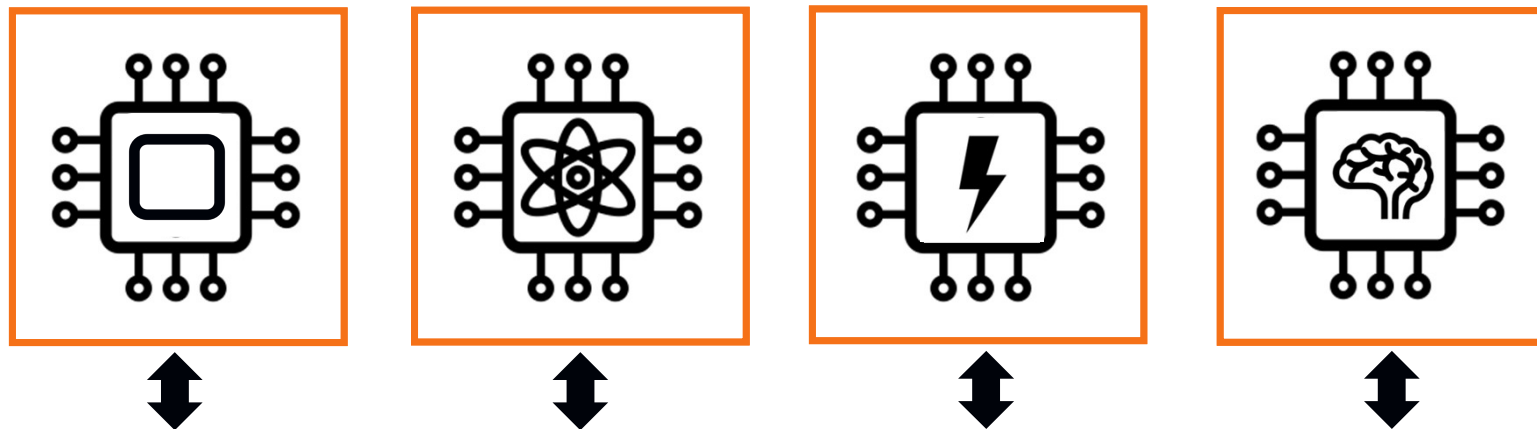
FoC companies, a subset of DeepTech, as the hardware layers of the stack (1-6)



- 1** The first layer of the value chain consists of **raw materials, specialized components, and fabrication equipment**. These technologies enable the assembly of a novel computing system.
- 2** **Hardware design** teams and **fabrication** facilities turn these
- 3** inputs into advanced computing hardware.
- 4** **Control electronics** are used to control the hardware fabricated in the previous layer.
- 5** Then, **assembly, testing, and packaging** ensure reliable operation and seamless integration.
- 6** Finally, **system integrators** work closely with **application-, and software-developers** to deliver solutions to **end-users**, who benefit from services enabled by advanced compute technologies.

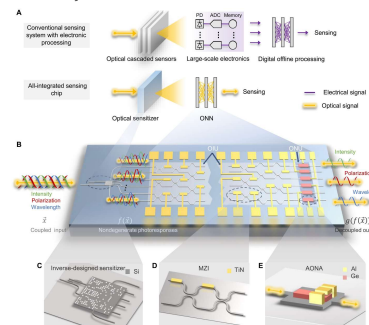
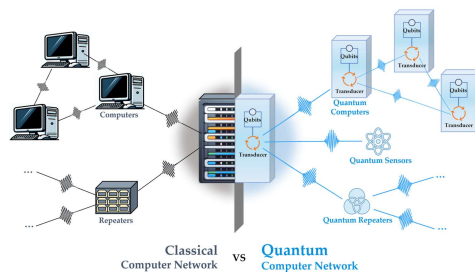
Transducers: The Hybrid Connecting Glue

Hardware + Software interfaces that translate signals across quantum, photonic, neuromorphic and classical compute domains



TRANSDUCER LAYER — Hardware Interface + Software Middleware

Microwave $\leftrightarrow$ photonic | Electro $\leftrightarrow$ optic | Acousto $\leftrightarrow$ optic | Classical orchestration | Hybrid scheduling middleware



The Netherlands has a great right to play in FoC

Five key strengths that put Us in pole position for future value chains



Global industry leaders

ASML, NXP Semiconductors, ASM and Besi. Measured in number of employees, NL has the largest semicon sector in Europe.



Strong R&D foundation

with TU Delft, Eindhoven University of Technology, University of Twente and TNO.



Fast growing cohort of Dutch companies

65 FoC companies raise 28% of Dutch deeptech investments, capturing 30% of capital invested in FoC in Europe in 2024.



Strategic government funding

via Beethoven, IPCEI (€230M), Quantum Delta NL (€615M), PhotonDelta (€1.1B).



World-class international collaboration

with leading global tech players (e.g. NVIDIA, Intel, Microsoft) and proximity to IMEC.

Netherlands is home to a rich landscape of +65 Dutch Future of Compute companies

This cohort has a balanced positioning across the hardware value chain and paradigms.



Photonics and Semiconductor companies in the lead by 70%

Photonics and advanced semiconductors are dominant paradigms in the cohort of +65 FoC companies, with resp. 21 and 24 companies, followed by quantum computing with 19. There is only 1 company in neuromorphic computing¹. 47 out of 65 are startups. Featured here are the 18 companies that raised more than €10M, ordered per paradigm.

Advanced Semiconductor



Quantum Computing



Photonic Computing

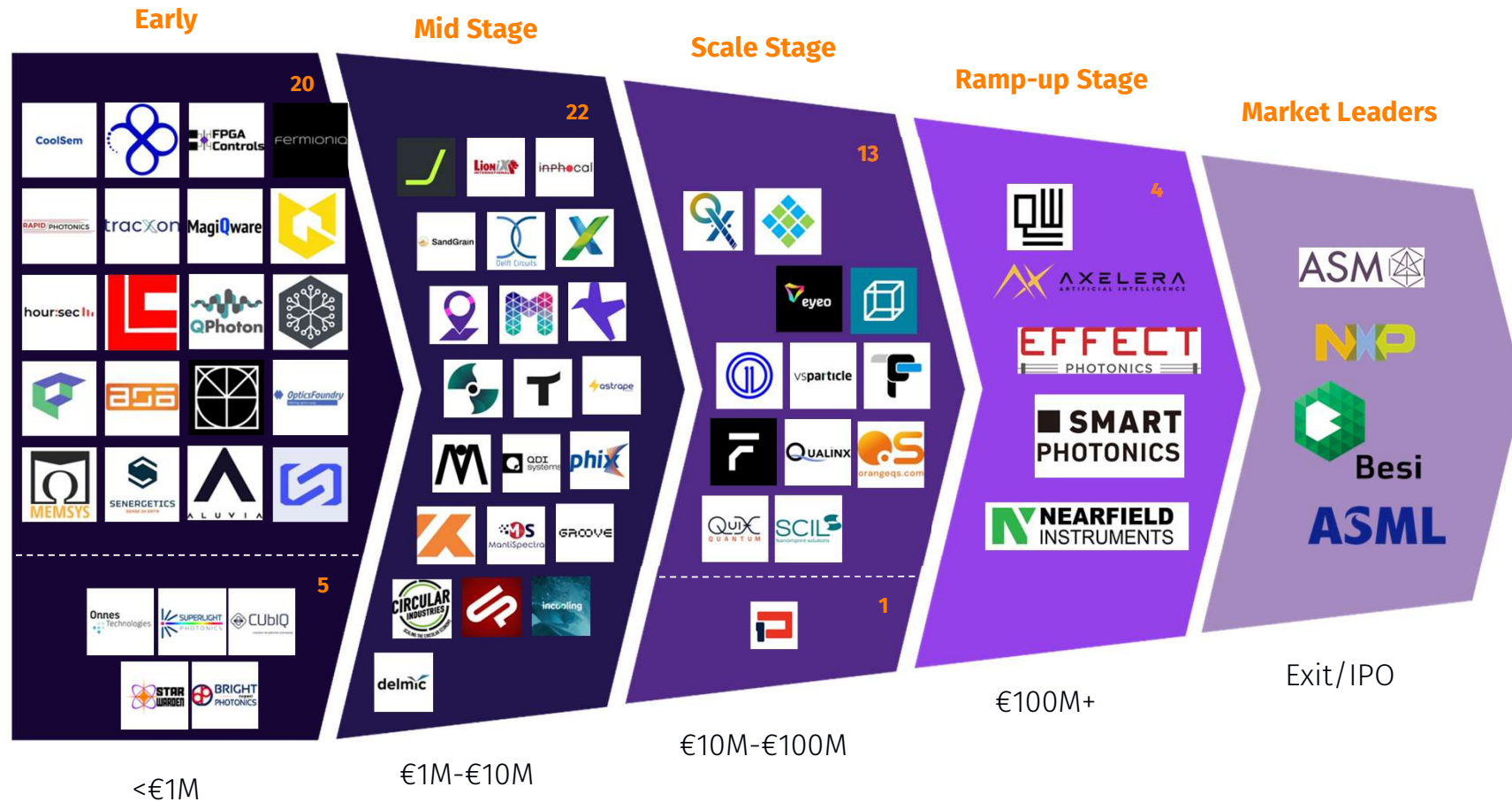


Neuromorphic Computing



¹Note that companies such as Axelera AI and Hoursec may be classified under both the Neuromorphic and Advanced Semiconductor paradigms. When Dealroom labels a company as 'Neuromorphic,' this classification takes precedence over Advanced Semiconductor.

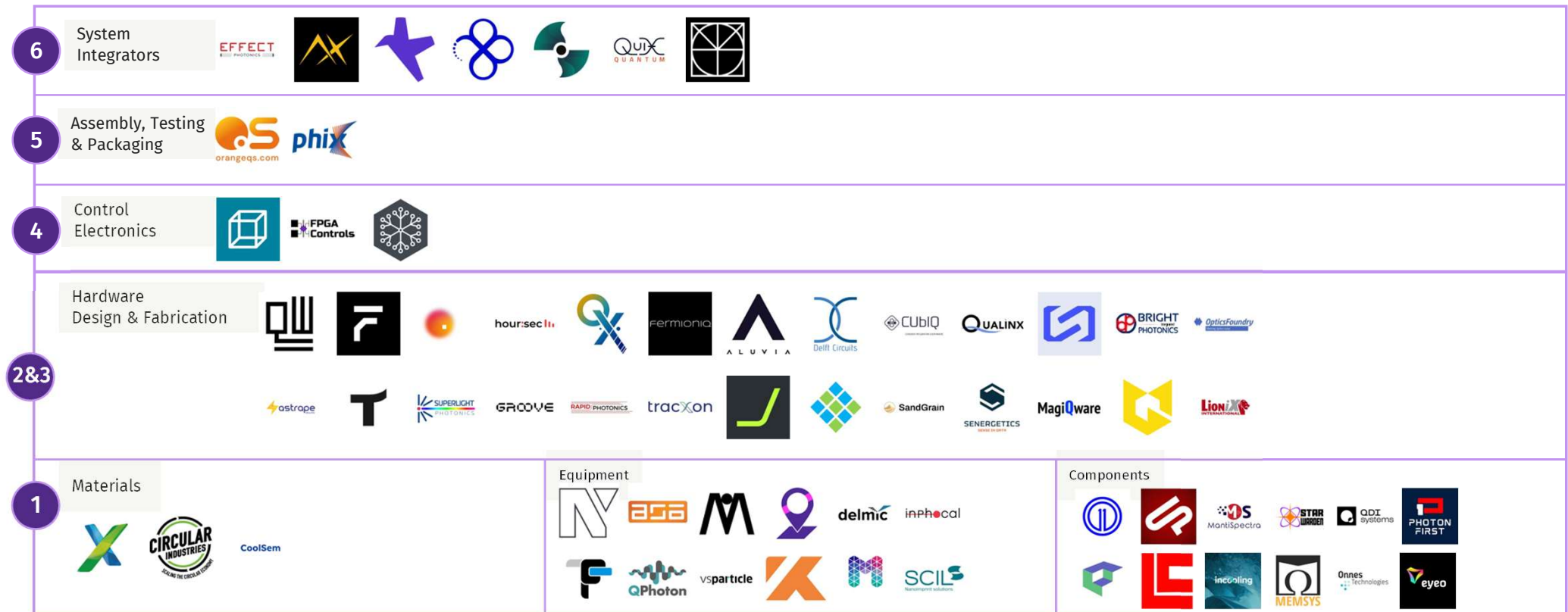
Future of Compute: current momentum in the start- and scale-up funnel



Source: Dealroom; transactions up to August 2025
Companies that have not raised funding or received grants since January 2023 are considered to be stabilized in their growth, visualised at the bottom.

Dutch FoC portfolio: balanced positioning across the value chain

+65 companies - diversified across multiple layers of the hardware value chain.



Companies may operate across multiple layers of the value chain. In such cases, a company is represented at the highest layer in which it operates.

Call for Action: **NL–Japan Deep Tech Collaboration**

► **Materials & Process Co-development**

Joint R&D on advanced semiconductors, quantum materials and photonic substrates. NL materials expertise + Japan precision manufacturing = global competitiveness.

► **Software & Application Co-innovation**

Co-develop hybrid compute middleware, quantum algorithms and AI-accelerated applications for manufacturing, healthcare and logistics at scale.

► **Transducer & Equipment Supply Chains**

Integrate Dutch quantum transduction & photonic integration with Japanese chip fabrication and precision equipment makers. Reduce single-nation dependency.

► **Ecosystem & Investment Bridges**

Leverage Brainport–Eindhoven, PhotonDelta and Quantum Delta NL as entry points. Match Dutch FoC scaleups with Japanese corporate venture & government partners.

Let's build the future of compute — together.

Thank you!