

No digital sovereignty without semiconductor sovereignty – Why Europe must build on its strengths

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Public

What is sovereignty?

- DIGITAL SOVEREIGNTY
  - The ability of a state to **develop and maintain digital spaces according to its objectives and values**, and to **protect those against unwanted or adverse influences**.

- TECHNOLOGICAL SOVEREIGNTY
  - The ability of a state to **protect, access and develop key technologies and vital functions** of technical systems against adverse influences **by actively managing and leveraging interdependencies.**



- SEMICONDUCTOR SOVEREIGNTY
  - The ability to **maintain reliable access to critical semiconductor technologies, manufacturing capacity and knowledge**, while **managing global interdependencies** and **retaining the freedom to act**.

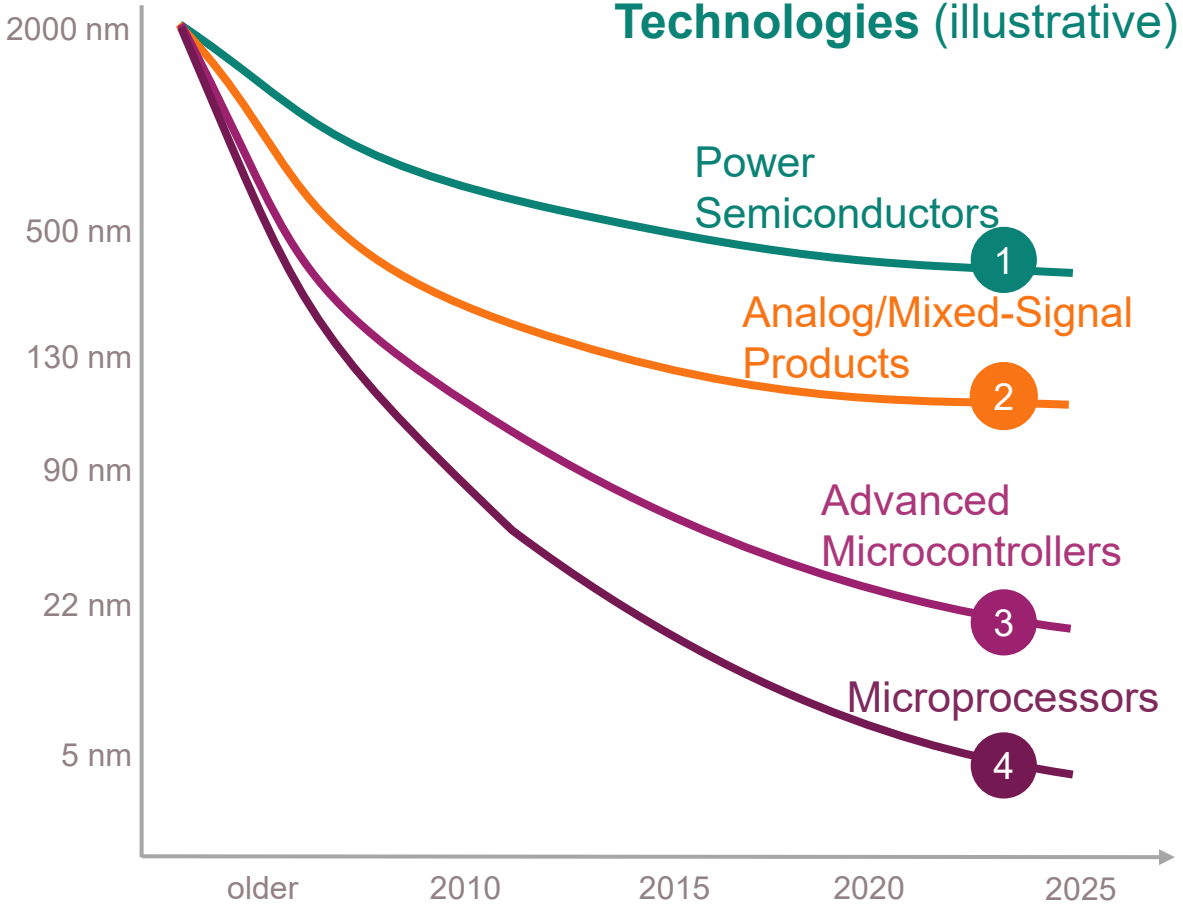
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Not every strategic semiconductor is an advanced-node processor

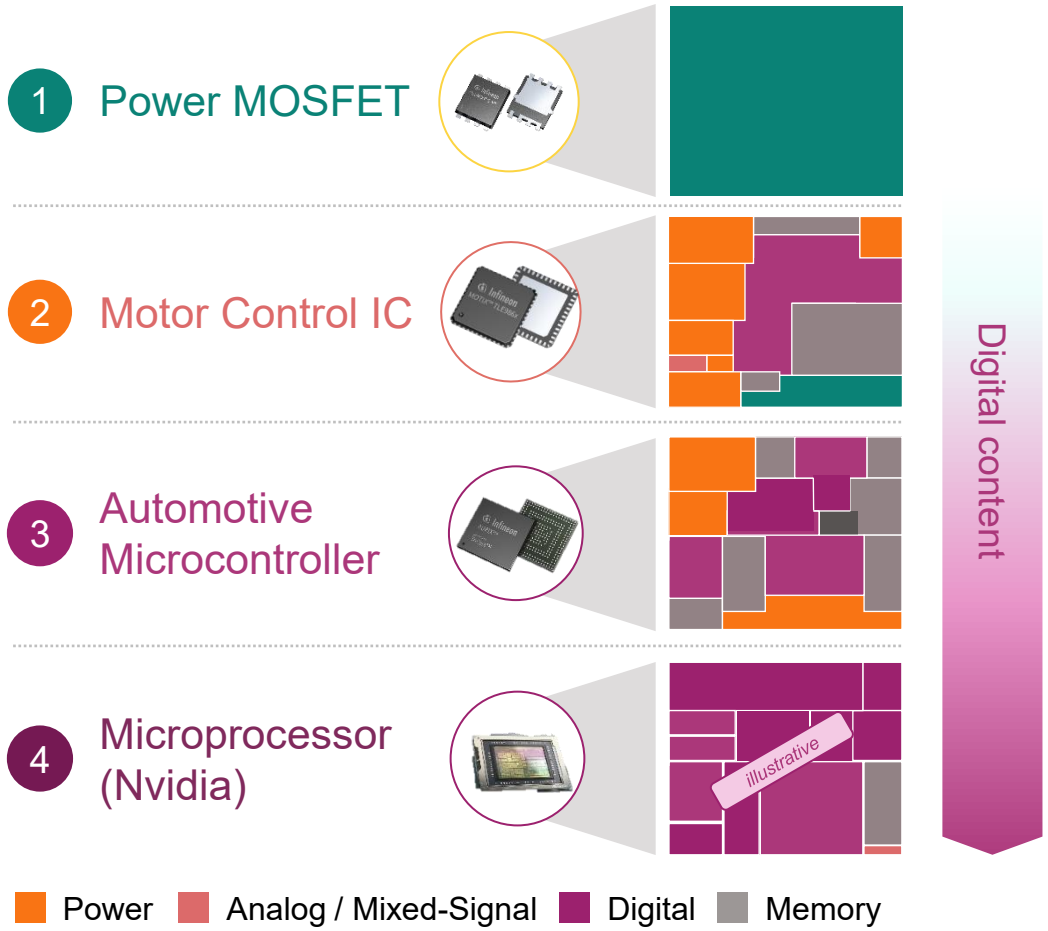
The semiconductor industry diversified into various specialized chip technologies

Feature Size (“Node”)

Development of Semi Technologies (illustrative)



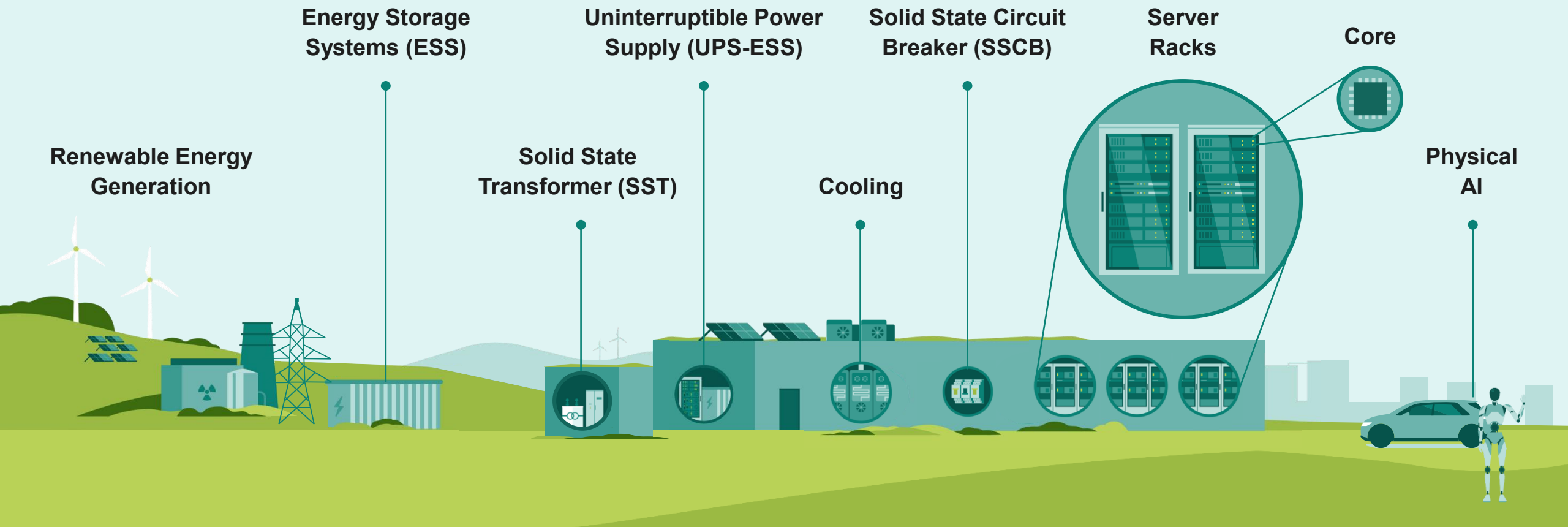
Functional Blocks (illustrative)



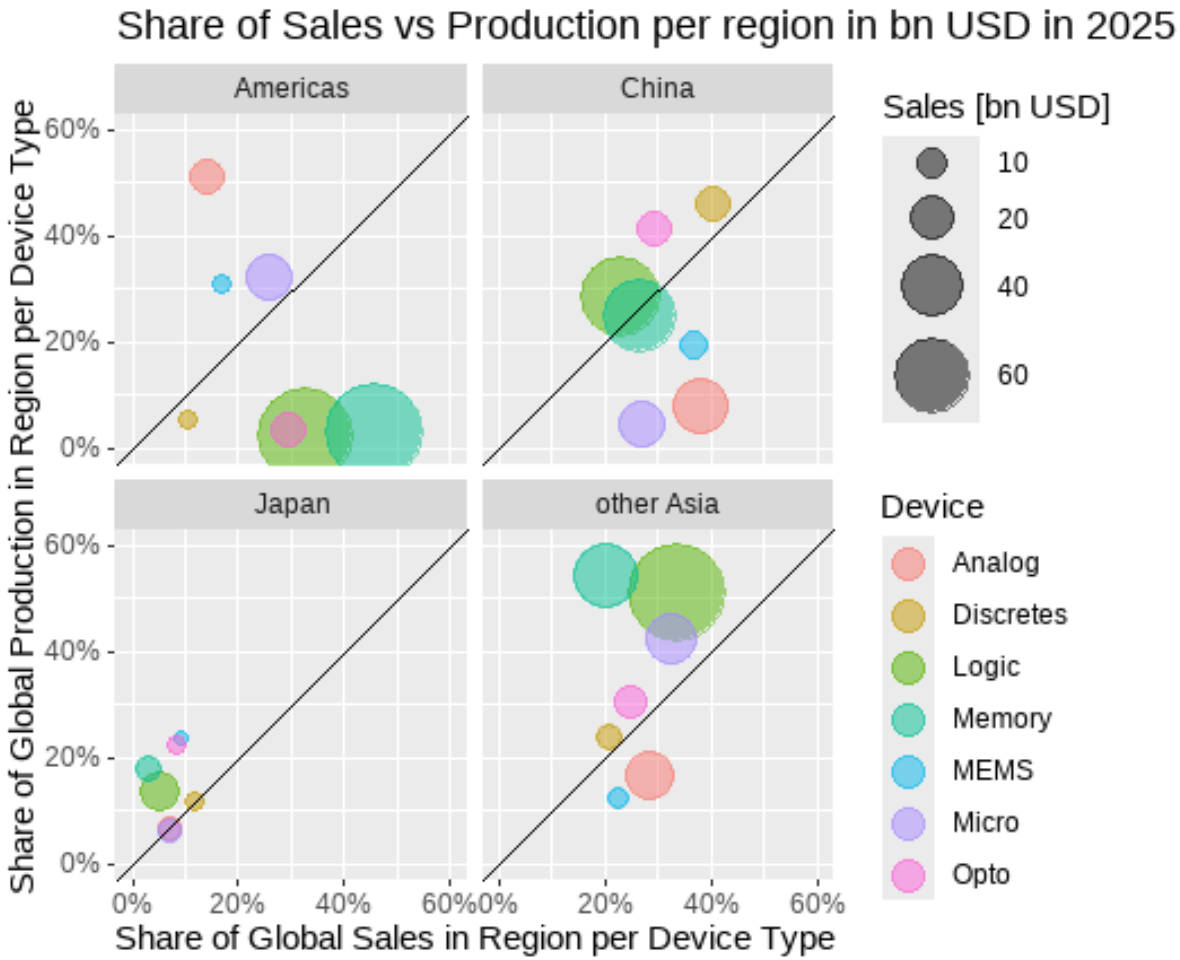
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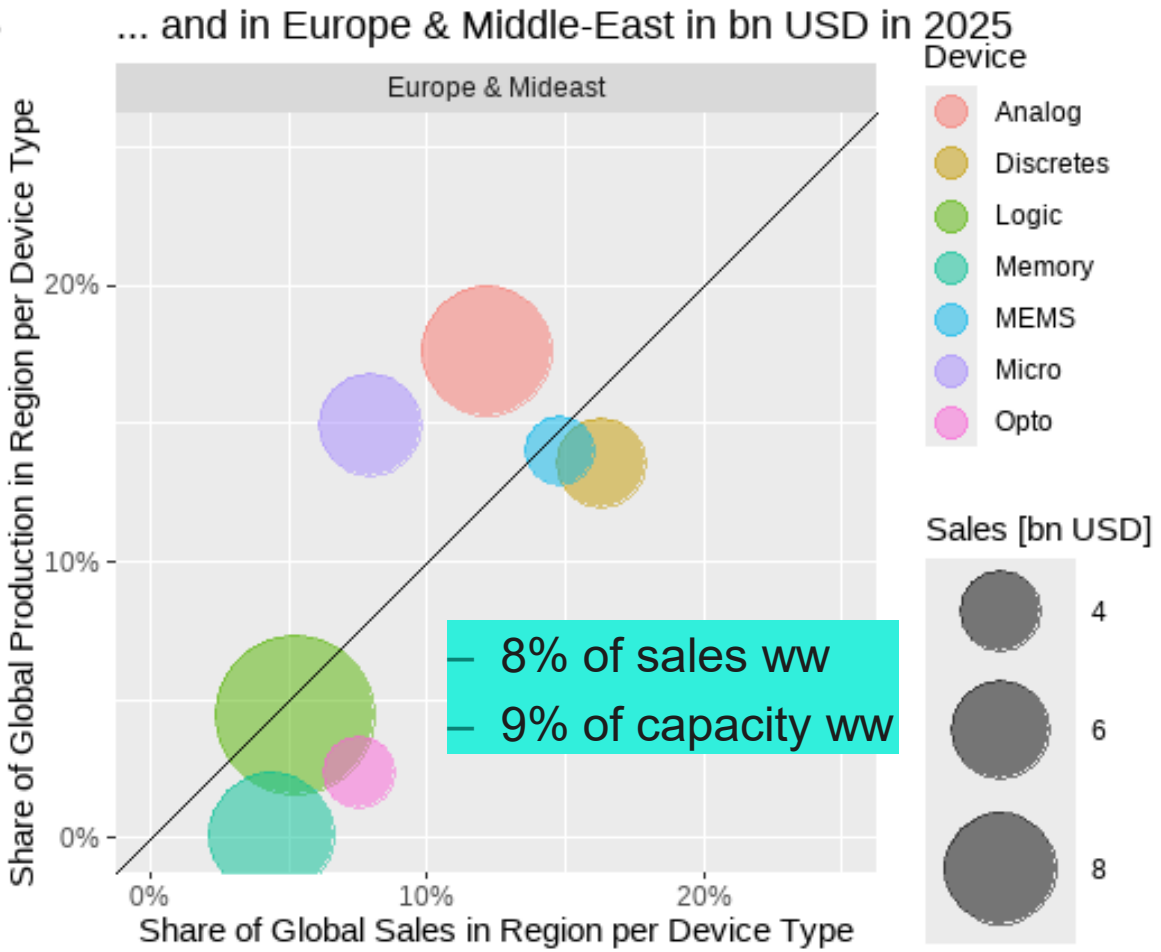
Even AI depends on power, sensing and control, from grid to core and beyond

Grid | Rack | Core | Physical AI



Semiconductor sovereignty cannot mean autarky





– **Europe to strengthen its strengths & improve on weaknesses**

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Europe has industrial strengths, but sovereignty requires effort

Demand

– Growth extends **beyond leading-edge compute**:

Edge AI, robotics, electrification, and automation **increase demand in the automotive and industrial sectors**.

Supply

– Capacity is shifting toward Asia and China:

The non-European **capacity base is growing, particularly below the leading edge.**

Competitiveness

– Europe's fab landscape must **scale and modernize:**

Larger wafer diameters, automation, and **smart manufacturing at scale** will be crucial.

Geopolitics

– No region will have every component:

Cooperation remains indispensable, critical dependencies need to be controlled

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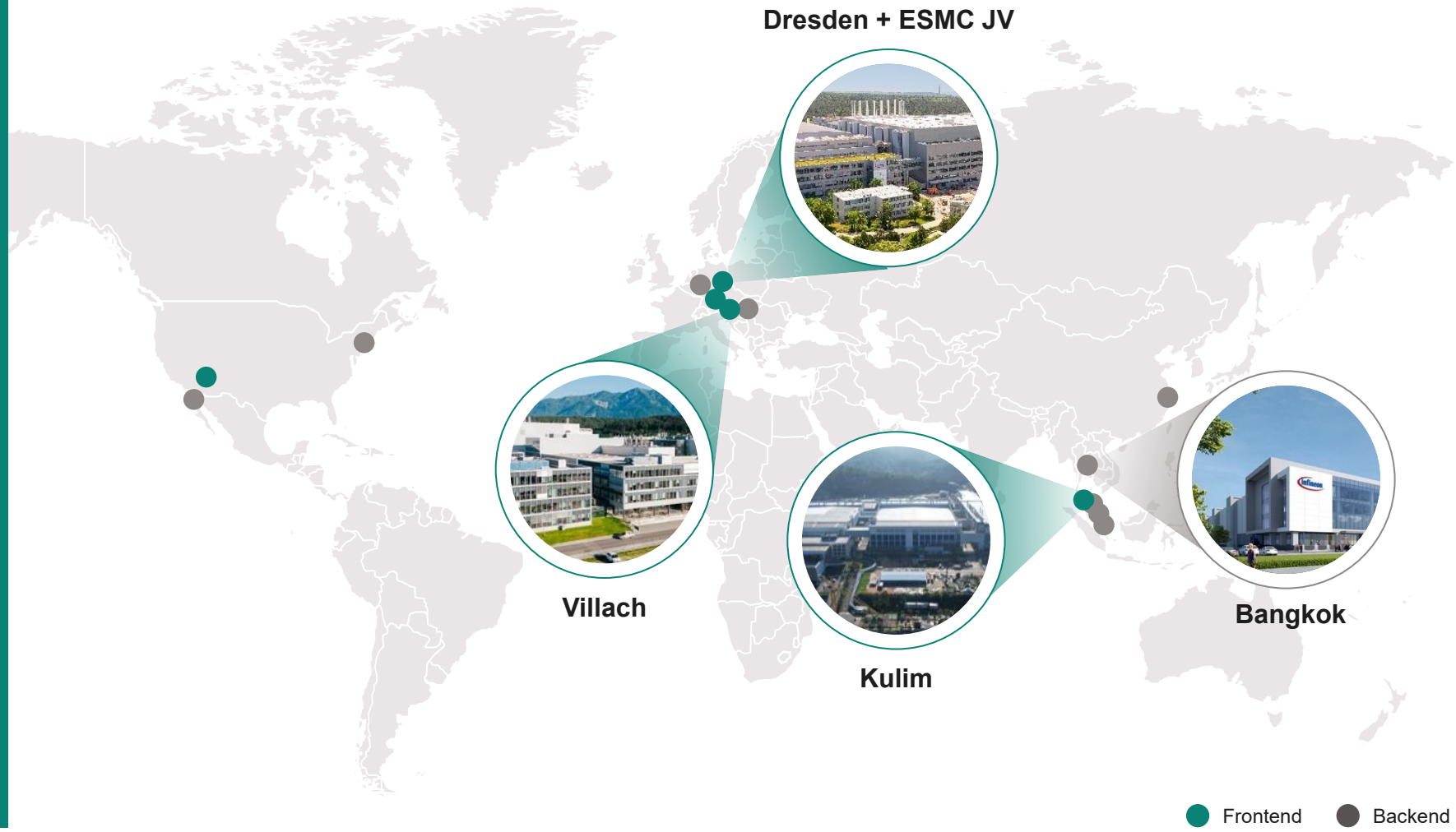
In-house manufacturing creates capacity, knowledge and resilience

14 manufacturing sites
In Americas, Europe, Greater China and Asia

Majority in 300 mm wafer diameter
Further growing

Highly efficient Wide-Bandgap capacity
In best cost location (Kulim)
+ accelerated 200 mm conversion

Enabling growth in FE & BE, driving economy of scale

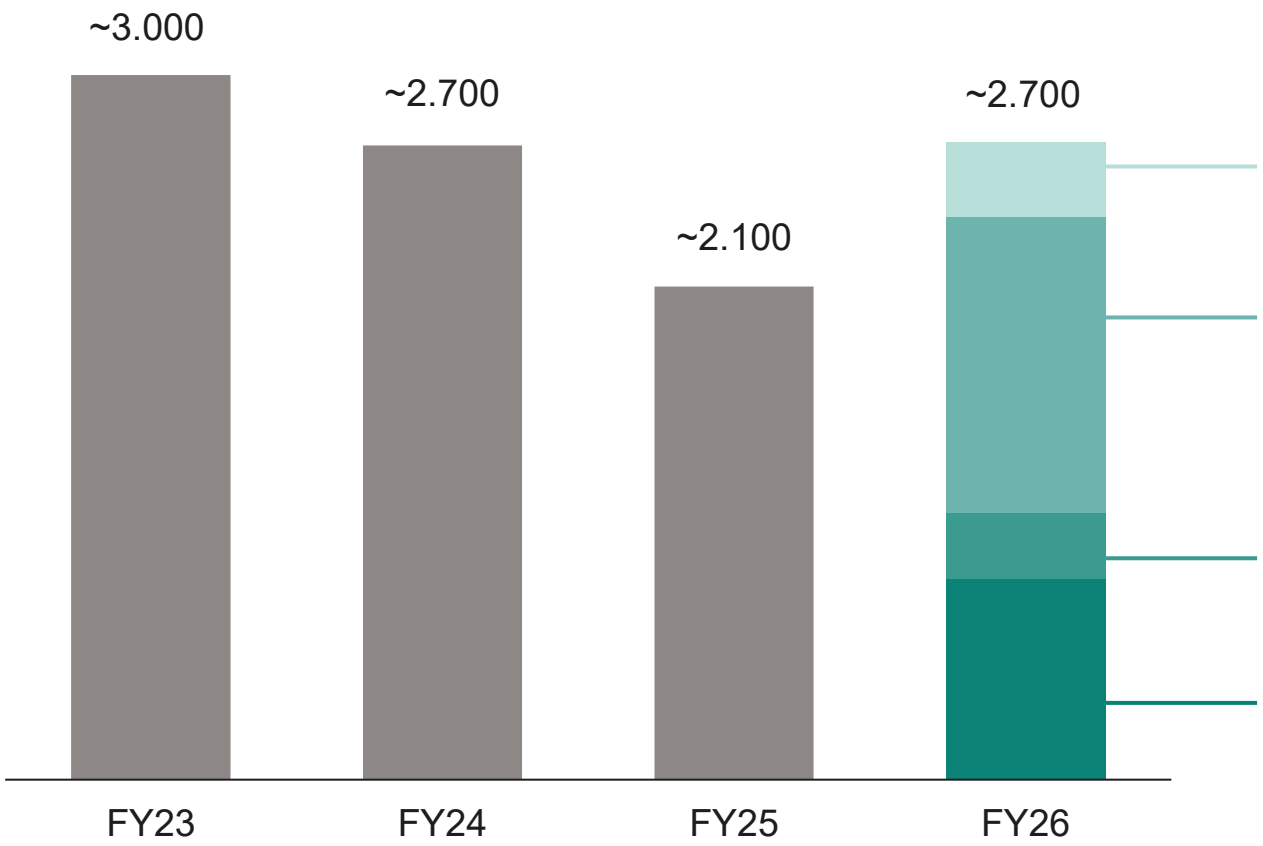


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Sovereign capacity must also be economically sustainable

Infineon investments[1] FY23-26

[EUR m]



Infineon has consistently invested in highly differentiating capacity, enabling further growth and scalability to its customers

Strategic investments
- Dresden module 4

Capacity investments
- Smart power and logic: enabling further growth for ”powering AI” and analog/mixed-signal products
- Strong focus on capital efficiency, incl. re-use

Research and development
- IFRS capitalization of development cost

Basic investments
- Maintenance, process optimization, quality, IT

[1] Investments are defined as the total amount invested in property, plant and equipment and in other intangible assets, including capitalized development costs

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Strategic partnerships can create sovereign options

ESMC brings advanced foundry capacity and global technology partnerships to Europe

tsmc + Infineon BOSCH NXP

– First establishment of a FinFET capable foundry in the EU, 10 B€ capital expenditure (50% funding)



Advanced semiconductor technology to support industrial and automotive customers

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Open ecosystems strengthen technology sovereignty

RISC-V enables shared standards, alternative implementations and lower lock-in

The mission to make RISC-V available for Automotive

QUINTAURIS

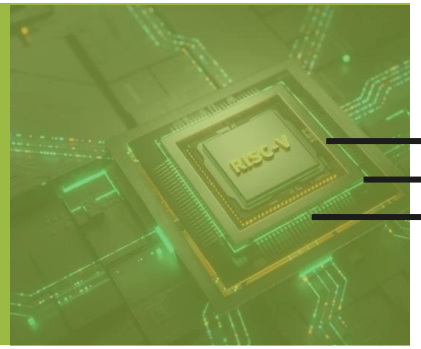
a joint platform to foster standardization in the ecosystem

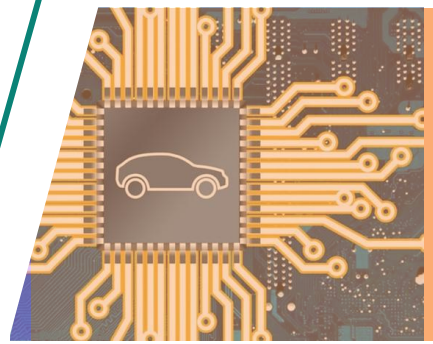
Aligned with the RISC-V community and government bodies



Accelerating the **commercialization of RISC-V** based products, **addressing certification and maintenance** challenges

Leveraging RISC-V benefits of flexibility, control and visibility, providing a blueprint for **reliable implementations**





Quintauris as trusted bridge between **RISC-V innovation & commercial** solutions – **defragmenting** the ecosystem **without lock-in**

Five leading industry players as shareholders:

BOSCH, infineon, NORDIC SEMICONDUCTOR, NXP, QUALCOMM

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Future sovereignty starts before technologies reach scale

Quantum computing requires early competence, manufacturing capabilities and strong partnerships

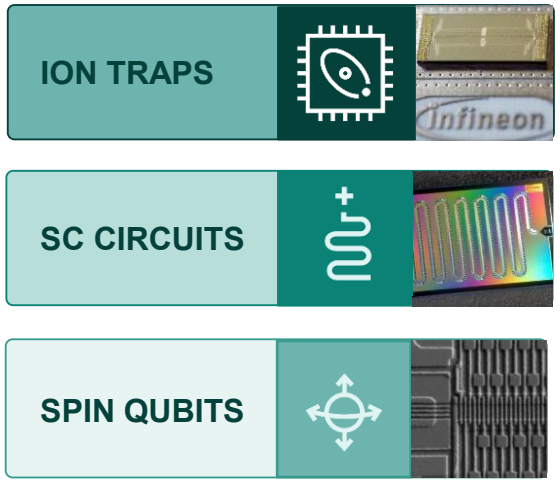
Quantum Processing Units



Global Leader
in automotive, power management, energy efficient technologies and IoT
Working on Quantum Computing since 2017

Our Team
64+ elite researchers and engineers in Villach, Dresden and Munich

Qubit-Modalities



Key Capabilities

- Low RRR Metal
- TCO Integration
- Integrated Photonics
- In-house Testing with Ions
- TSVs, Cryo Electronics
- Interposer with Capacitors
- Surface Potential Characterization
- Traps with >5 Routing Layer

- Superconducting 200mm wafer technology
- Based on Nb/Al/AlOx/Nb trilayer Josephson junctions
- Successful demonstration of travelling-wave parametric amplifier (TWPA) prototypes

- Implementation of Si/SiGe platform in a high-volume CMOS production line
- Ultra-fast single-electron shuttling (> 100 m/s with F > 99%), extremely low charge noise

Partners

(only publicized partnerships shown)

QUANTINUUM · IONQ · eleQtron · ZuriQ

Partner Universities

ETH · TUM · JOANNEUM RESEARCH · TU WIEN Technische Universität Wien Vienna University of Technology · JÜLICH Forschungszentrum · Universität Siegen · Leibniz Universität Hannover · Technische Universität Braunschweig · universität innsbruck · PTB · Universität Tübingen · WMI · Stockholm University · UNI GRAZ · Johannes Gutenberg Universität Mainz · Montan Universität Leoben

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Europe should not try to make everything.
Europe must retain the ability to act.

- **Build resilient capacity and close critical gaps**
  - Strengthen European capabilities in Power, Analog, Sensors and Embedded Control, while using trustworthy partnerships to cover strategic gaps.

- **Sustain globally competitive manufacturing**
  - Combine scale, investment, advanced automation and manufacturing excellence.

- **Preserve knowledge and strategic optionality**
  - Retain process understanding, data access and the ability to shape open technologies and ecosystems.

➔ Semiconductor sovereignty means the capacity to act, the capability to compete and the knowledge to remain in control.

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