

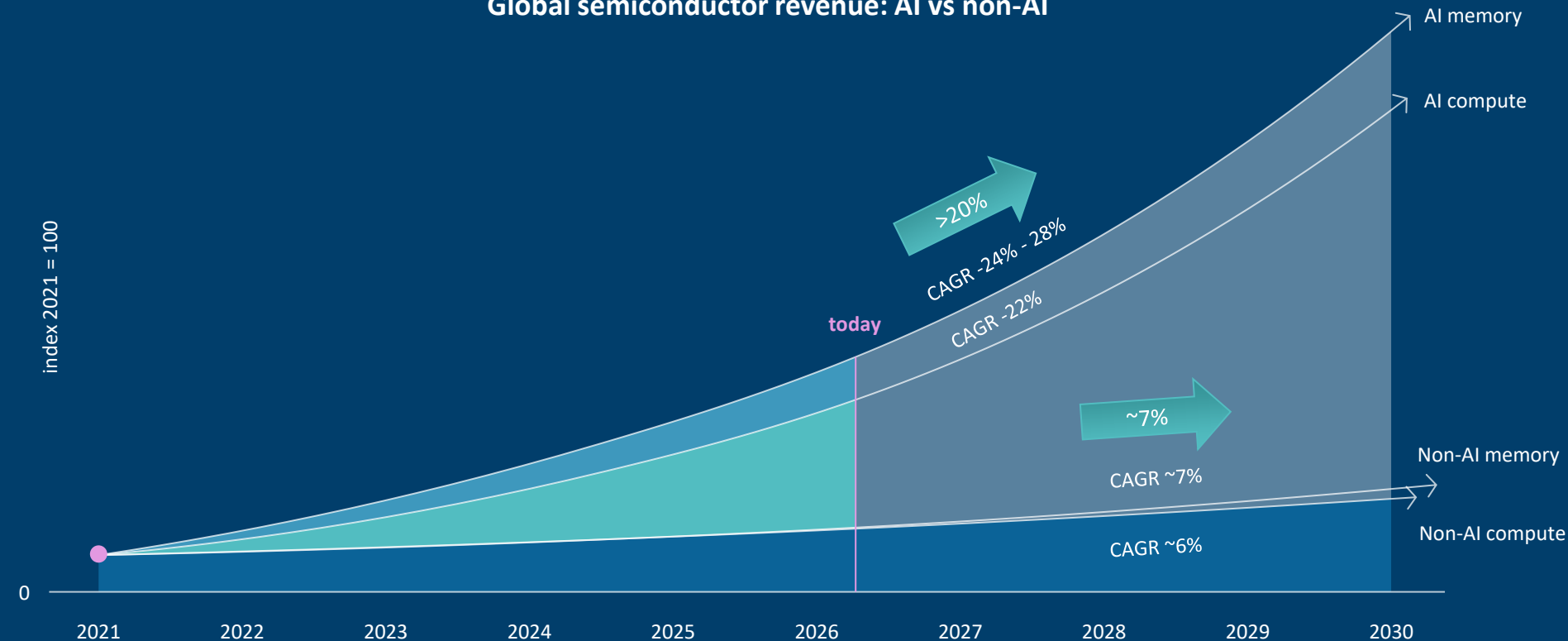
Closing Europe's innovation gap.
Seizing Europe's opportunity in the next wave of AI.

Patrick Vandenameele, CEO at imec

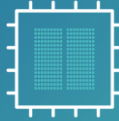


AI is expected to drive the semiconductor growth

Global semiconductor revenue: AI vs non-AI



The cost of not investing in AI today



Leading Fabless:
Margins of ~ 60-80%

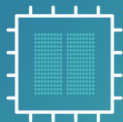


COGS



Leading fabless margin

The cost of not investing in AI today



Leading Fabless:
Margins of ~ 60-80%

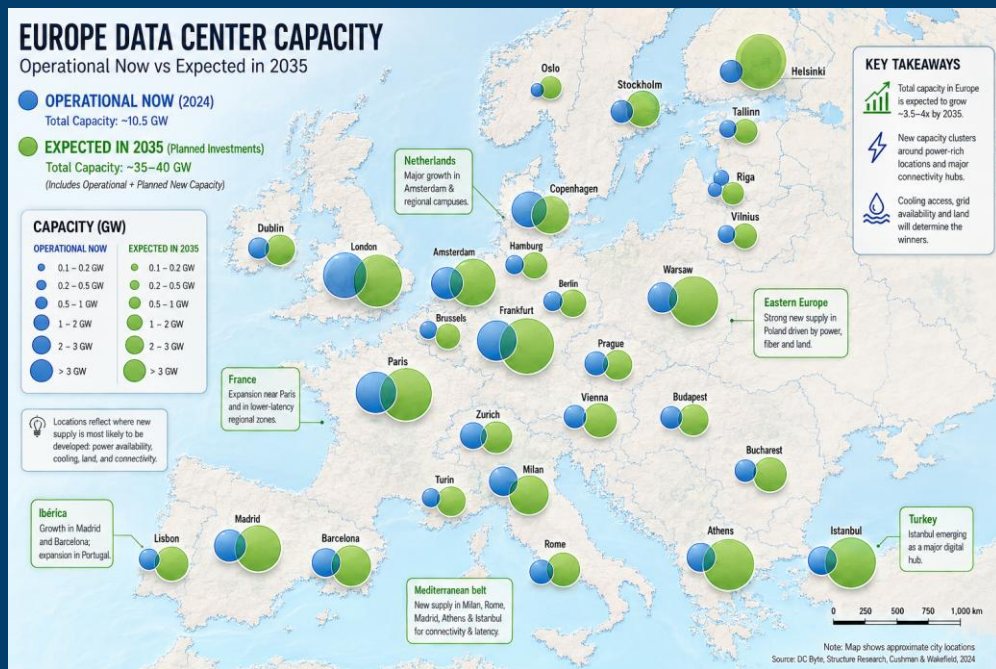


Foundries:
Margins of ~ 50-70%



For every 1000EUR EU spends on AI chips,
roughly **90% flows outside Europe.**

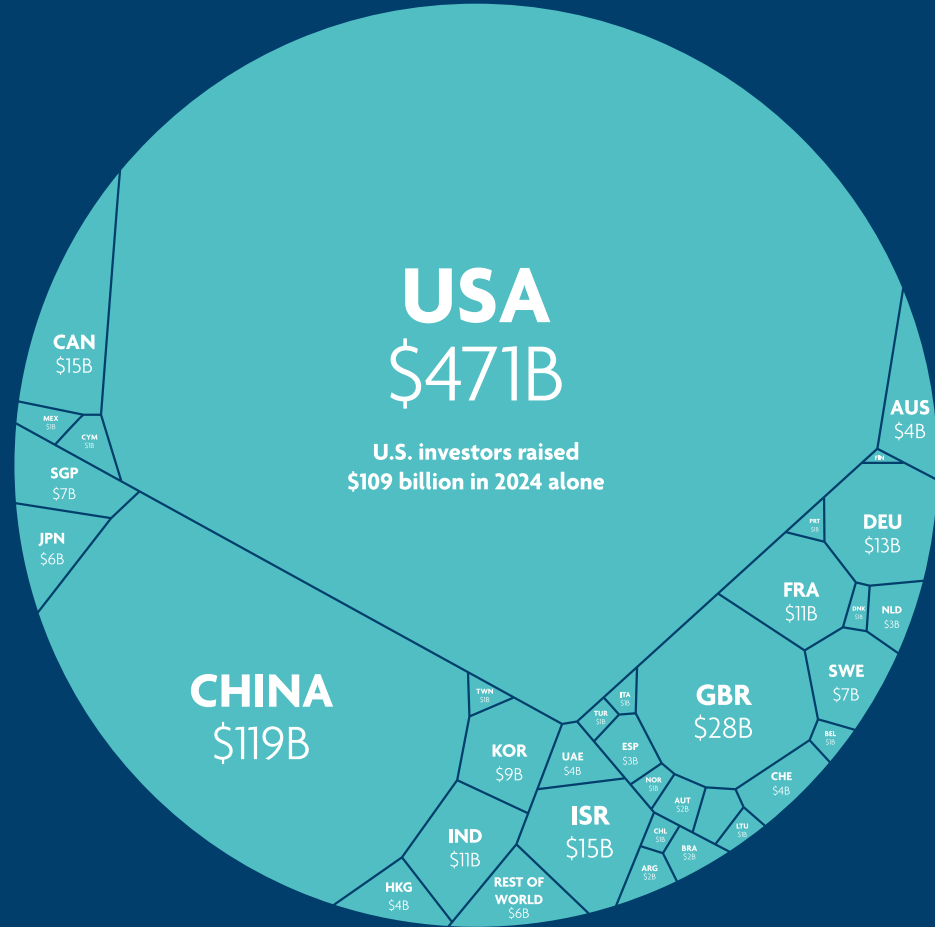
The cost of not investing in AI by 2035



~30-40 GW by 2035 could generate about €1.4T in margins, largely captured outside Europe.

Based on Cushman & Wakefield Data Center Reports; Structure Research; DC Byte; Synergy Research Group; CBRE; investor disclosures from Microsoft, Google Cloud, AWS, Equinix, and Digital Realty; and energy-system analyses from the IEA and European transmission system operators.

Who invested most in AI?



Europe retains powerful assets



RESEARCH



MARKET



INDUSTRY



TALENT



**Can Europe still
play a role?**

Europe needs to build compute demand & lead distributed AI



Distributed AI creates
additional opportunities

Compute demand builds
the foundation



Today's algorithms
are designed around
yesterday's systems

and

Tomorrow's chips
are optimized for
today's workloads.



We stretched
yesterday's
technology
to build
tomorrow's
intelligence



The perfect storm

Technology &
architecture

Energy

Applications

Sovereignty

Next-gen AI becomes much more heterogeneous

perception AI

speech recognition
image recognition
medical imaging

generative AI

digital marketing
content creation

agentic AI

coding assistant
customer service
patient care

physical AI

general robotics
autonomous vehicles

Physical AI is fundamentally different



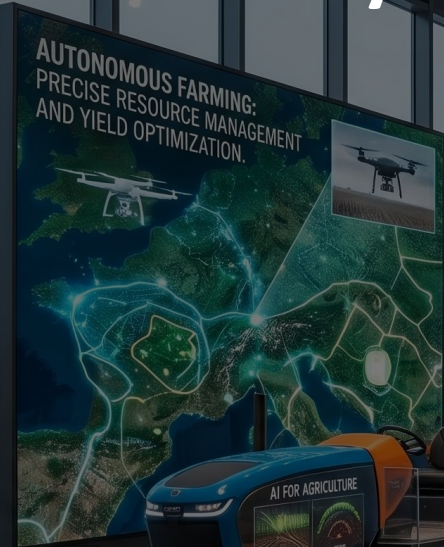
physical AI

Optimized for latency

Power constrained by physics

Safety in addition to security

Sense and actuate capabilities



AI FOR ELDER MOBILITY

AI FOR DISASTER RESPONSE

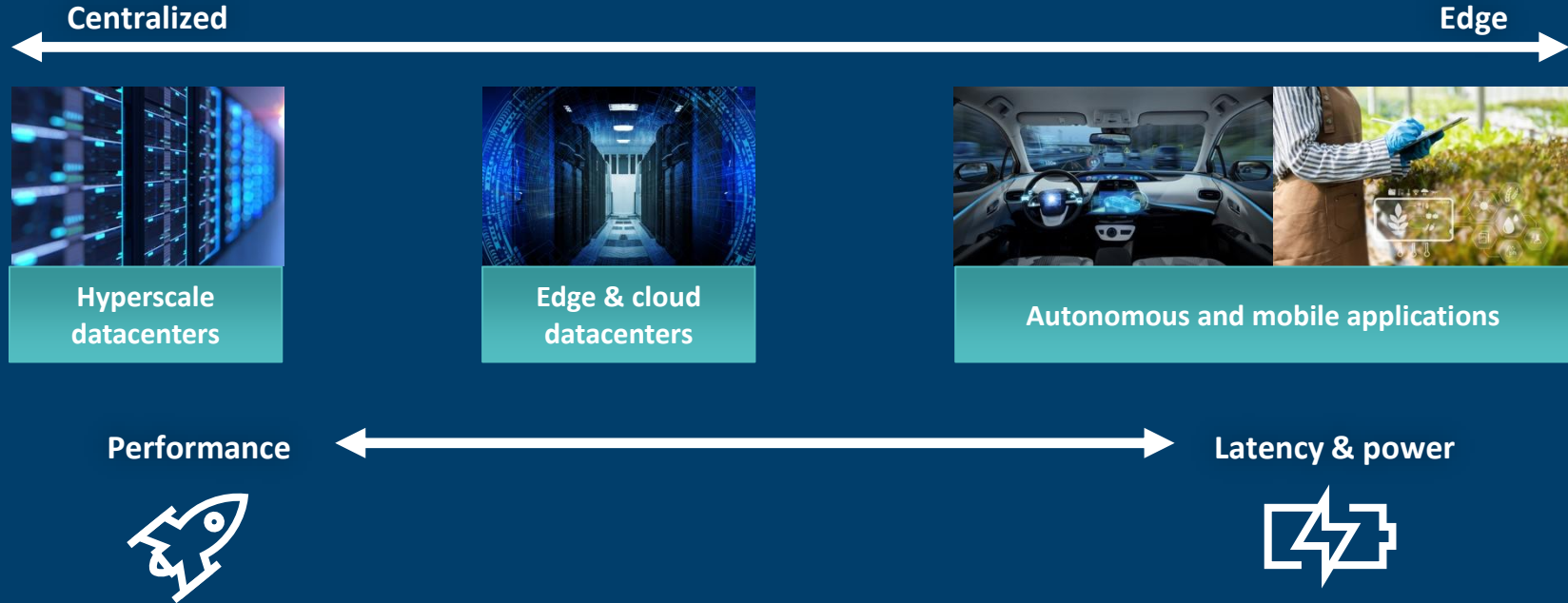
SEARCH & RESCUE ROBOTICS:
Navigating Hazards and Locating
Survivors with AI

AI FOR INTELLIGENT LOGISTICS

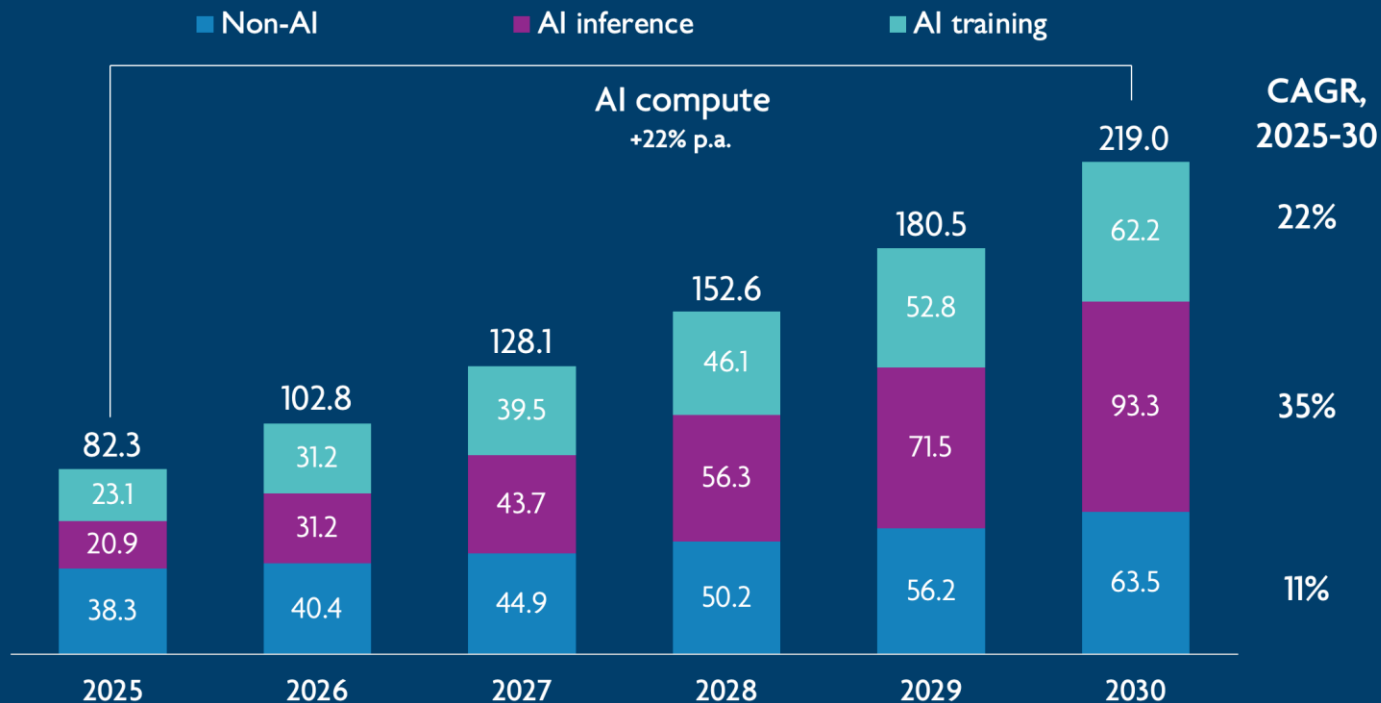
FULLY AUTOMATED WAREHOUSING:
OPTIMIZED INVENTORY AND SUPPLY CHAIN ROBOTICS



And pushing intelligence to the edge



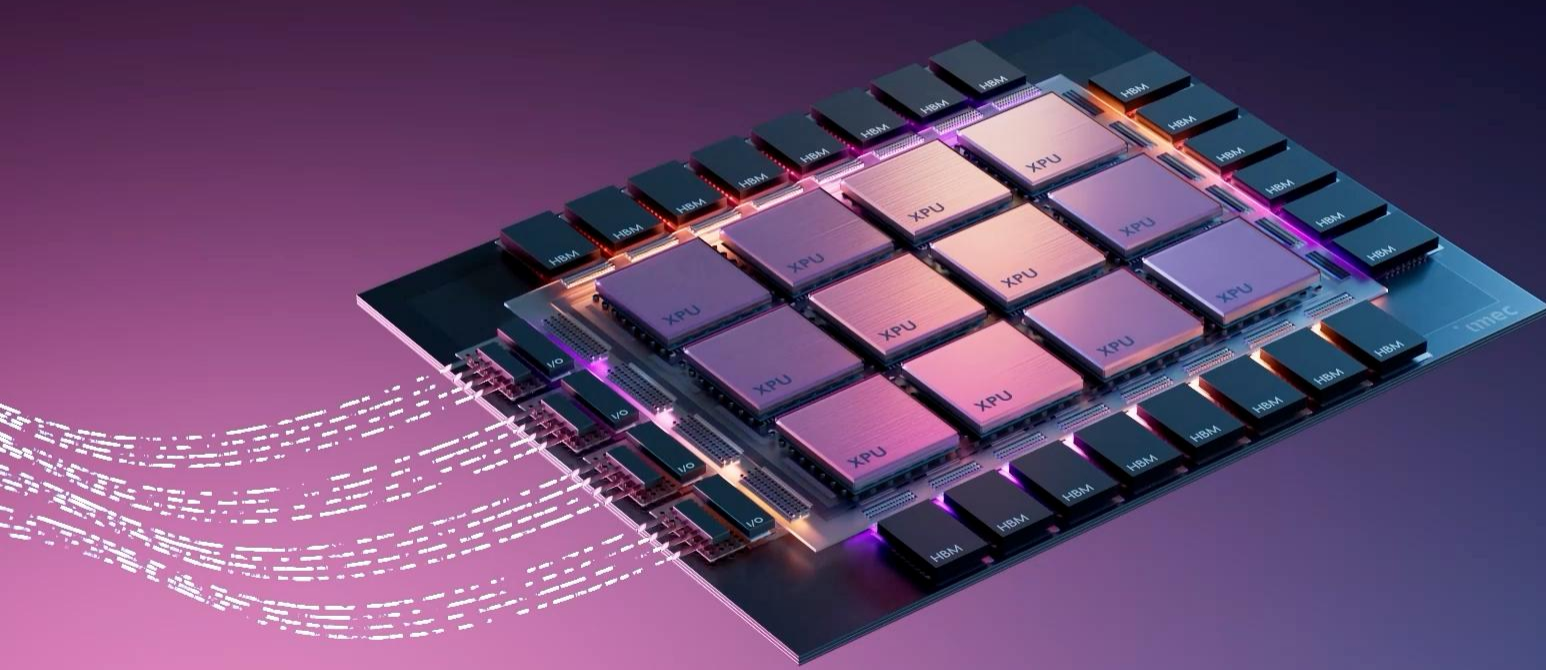
The raise of inference over training



Global datacenter demand by workload - 2025 – 2030 (in Gigawatts) - McKinsey

Europe's opportunity in AI

The rise of inference accelerators



Physical AI demands heterogeneous compute

No single compute architecture can handle the entire system

Perception & reasoning

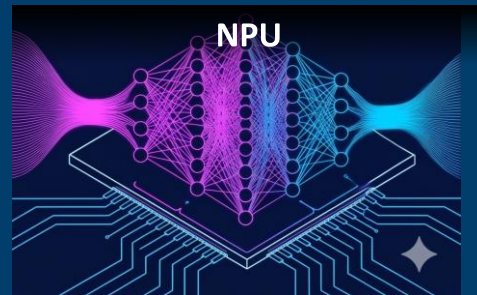
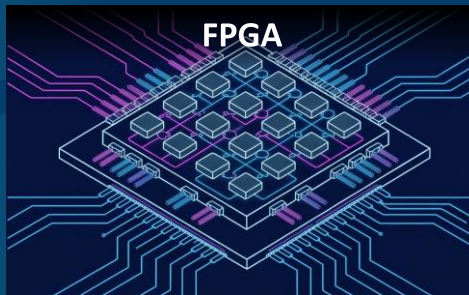
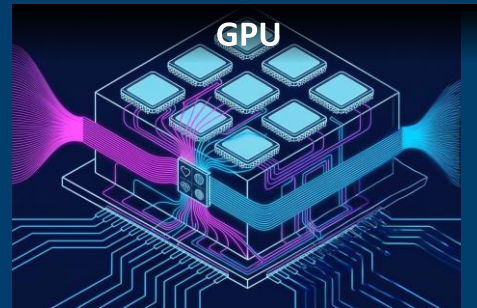
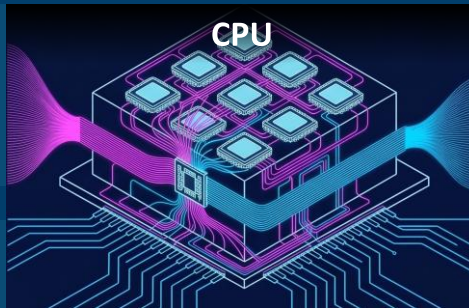
GPU / NPU / ASIC / CPU

Real-time control

FPGA / ASICs

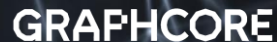
System coordination

CPU

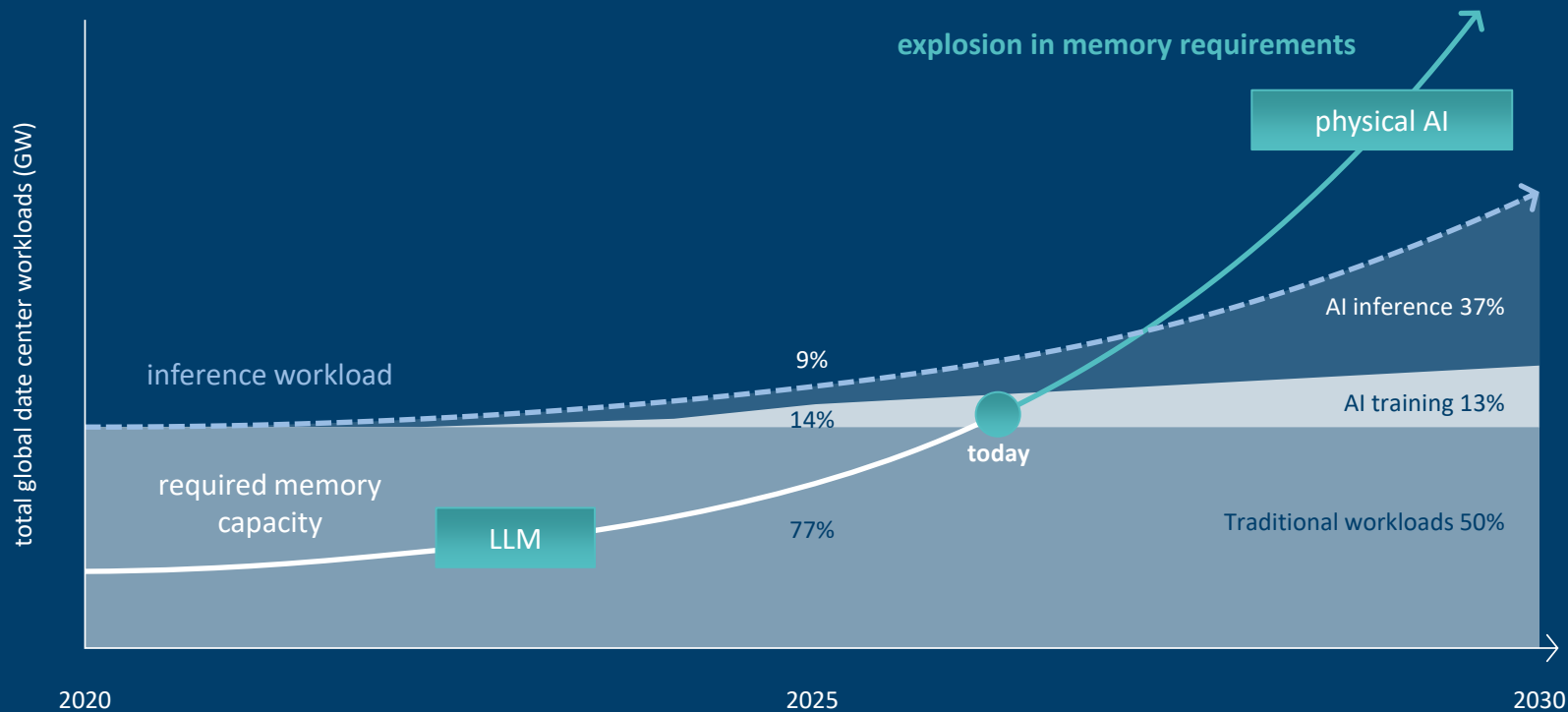


Europe's opportunity

An ecosystem of inference accelerators



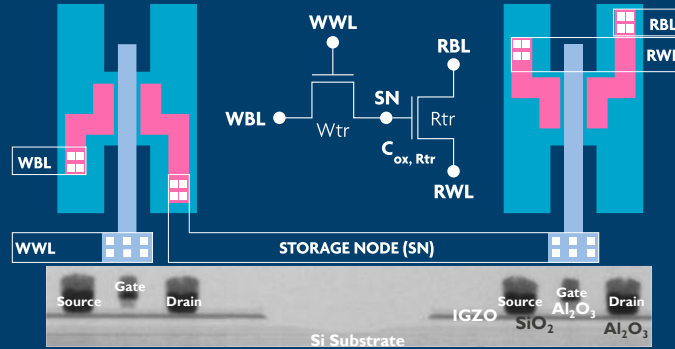
Agentic AI shifts the bottleneck to memory and data movement



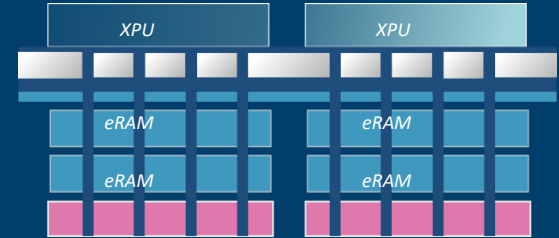
Novel memory types



3D DRAM



Capacitor-less embedded DRAM



Embedded memory Si interposer

Europe innovating at the memory technology and architecture level



reduces data movement via
memory technology

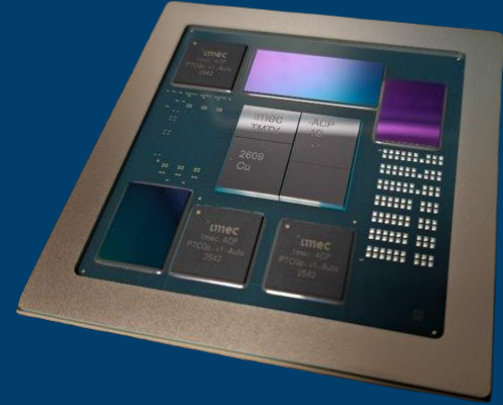


reduces data movement via
architecture

**How to manage this growing
complexity and heterogeneity?**

Chiplets: scaling performance, cost and resilience

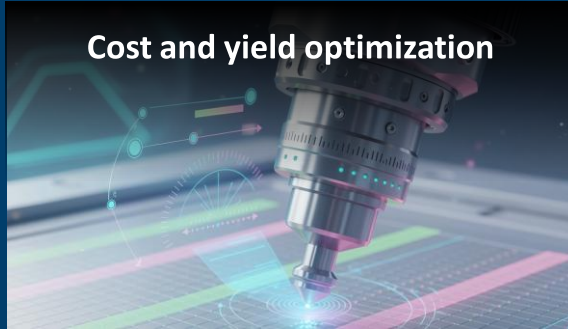
- ➞ Flexibility, keep pace with algorithmic evolution
- ➞ Modularity
- ➞ Technology node optimization



Supply-chain resilience



Cost and yield optimization



Re-use and scalability



**An orchestrated
European chiplet
ecosystem for HPC**

Chipelets as cross-industry collaboration fabric



Autonomous Edge Chipelet Program

Building the reference for autonomous edge platforms*



Advanced packaging



Under 9 months



Interoperable chiplets



Day 0 software integration



KnowGoodDie (KGD) flow



* Laying the groundwork towards a collaboration to build a reference for autonomous edge platforms.

Priorities for Europe to lead in AI's next phase

1

Maintain leadership on **R&D and innovation**

- Bridge R&D to manufacturing
- Driving full stack innovation

2

Build & scale the **European AI ecosystem**

- Boosting EU datacenter capacity
- Boost vibrant **design & fabless** start-up community
- Connect EU **system companies** to chip innovation
- Ensure access to **risk capital** for scale-up

3

Ensure secure access to critical **manufacturing**

- **Gradually step up manufacturing** on more advanced nodes
- On mature (essential) nodes

Thank you.

