Welcome & Strategy Towards FP10

15 May 2025, Lutz Aschke, Photonics21 President
& CEO Photonics Systems Group

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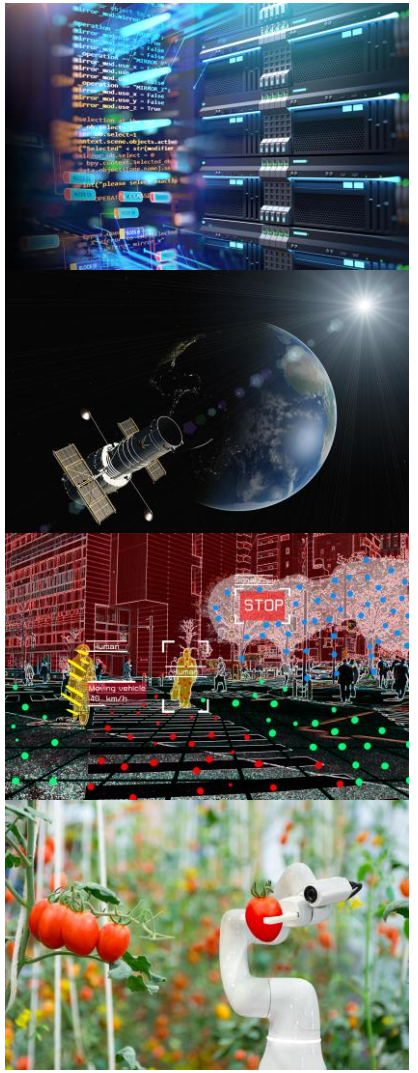
Draghi Report – Call for a more competitive and sovereign Europe

- **Boost Investment in R&I**
  Increase public and private investment in Research and Innovation.
- **Autonomy in Critical Technologies**
  Reduce dependence on non-EU suppliers; secure raw materials & manufacturing capacity.
- **Stronger Public–Private Ecosystems**
  Larger-scale public-private funding & commercialization initiatives.
- **World-Class Infrastructure**
  Invest in EU-wide labs, pilot lines, testing hubs; create a single innovation market.
- **Talent & Skills Development**
  Train a future-ready workforce through expanded STEM, vocational & mobility programs.

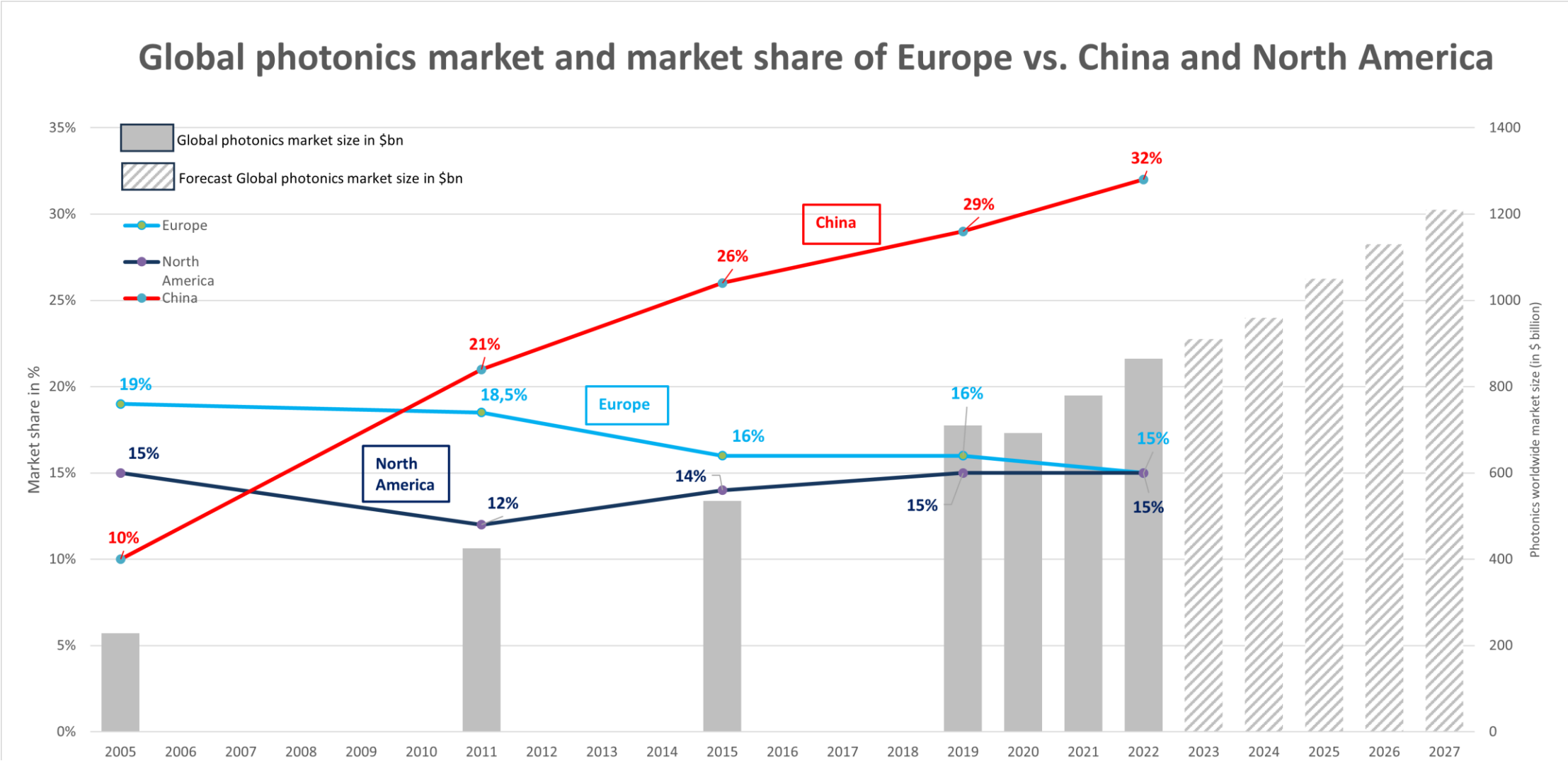
Photonics – Critical for Europe's future technology sovereignty and competitiveness

- **Secure Communications & Quantum Networks**
  Photonics powers ultra-fast, tamper-proof communications – essential for EU digital sovereignty & encrypted data infrastructure.
- **Artificial Intelligence & High-Performance Computing**
  Optical interconnects & photonic chips reduce latency & energy in AI/data centers – enabling scalable, green compute infrastructure.
- **Automotive & Mobility**
  Key to LiDAR, optical sensors & ADAS systems – photonics ensures safe, autonomous, and connected vehicles.
- **Defence & Space**
  Core to next-gen surveillance, imaging, and sensing – enabling resilient systems with strategic autonomy in EU security.
- **Medical technologies, Biotech and Smart Farming**
  Enabling precise imaging, real-time biosensing, and optical monitoring for early diagnostics, targeted therapies, and sustainable food production



EU – Leading in innovation, lagging in scale?

Europe must step up investments in photonics



Photonics – Increasingly recognized by EU Member States as a critical technology

Photonics

A large number of challenges need to be addressed in the field of photonics. To this end, the existing industrial structures of the photonics partnership should be utilised. Given the importance of photonics as a key technology for numerous strategic EU initiatives/ partnerships such as Made in Europe, Smart Networks and Systems, Virtual Worlds, Quantum Flagship, EuroHPC JU, Chips JU, Innovative Health Initiative, the introduction of a new cooperation mechanism is advisable.

The area of **co-packaged optics** with high-speed digital silicon and **photonic integration**, including design tools or photonic integrated circuits, **Very-large-scale integrated (VLSI)-photonics and photonic neural** networks/neuromorphic adaptive programmable photonics, will contribute significantly to the further development of strategically important fields such as high-performance computing, AI and quantum computing, among others.

In the field of sensor technology and imaging, the focus is on **hardware miniaturisation** and the **combination of different technologies and frequency bands** (UV-VIS-IR-THz). One specific technology to be promoted is spectrally resolved **X-ray photon counting**. In addition, **new types of image sensors** are required **for accurate real-time assessment of biological processes.**

The development of **new materials such as new glass fibres** with high stability in signal transmission combined with very low losses and an operating range over a broad wavelength band also holds great potential for communication technologies, for example.

In the further development of **laser light sources**, the efficiency and flexibility of beam and pulse parameters should take centre stage. However, **ultra-high intensity lasers for use with secondary radiation sources** such as extreme ultraviolet, X-ray or particle radiation are also of great importance. Laser- and photonics-based applications should be increasingly investigated in the areas of production (e.g. sustainable additive manufacturing), medicine, biology and extended reality.

EU photonics end-user industries speak:
Make Photonics a Strategic Investment Priority in FP10

- Backed by **Leading Industries** Powering: **AI & Communication Infrastructure, Quantum Tech, Industry 5.0, Semiconductors Manufacturing, Automotive & Mobility, IoT, Defence, and Consumer.**

- **Momentum Builds… Help Us Engage Even More European End-User Industry Champions!**

- Work in progress -

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Photonics21 position towards FP10

Investing in Light: Secure Europe's Competitiveness in the Global Tech Race

The Photonics21 Board of Stakeholders is currently preparing its strategic position.

Calls for …

- Strong investment initiative for Photonics R&I in Europe in FP10 needed
- Accelerate Photonics Manufacturing Scale-Up in Europe to secure supply chains for critical industries.
- Create high-TRL Photonics Application Hubs to accelerate technology transfer in key European sectors like AI, manufacturing, quantum, and defence.
- Raise investment readiness of photonics firms to turn startups into global industry leaders.
- Secure a strategic role for Integrated Photonics in the Chips Act 2.0.
- Photonics Moonshots with Game-Changing Potential

- Work in progress –


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Position Paper

Investing in Light: The Vision to Secure Europe's Competitiveness in the Global Tech Race

European Photonics industry calls for a bold public-private investment initiative in Photonics to empower Europe's Critical Strategic and Defence Industries.

European industry pledges over €200 billion for Photonics R&I in Europe and calls for a Public-Private Partnership in the upcoming 2028-34 Multiannual Financial Framework.

Executive Summary

This position paper urges the European Commission to launch a Photonics Public-Private Partnership (PPP) in the 2028–2034 Multiannual Financial Framework (MFF), with €2 billion in public funding to leverage €6–8 billion gearing industry's €200 billion pledge. Photonics, vital to 20% of the EU economy, drives innovation in manufacturing, defence, healthcare, and energy, yet Europe risks losing its edge to China and the United States. Where billions are invested annually. With over 50% of EU photonics firms reliant on Chinese components, this PPP is critical to secure supply chains, scale manufacturing, and ensure technological sovereignty. Swift action is needed to reinforce Europe's global leadership in this fast-growing sector.

Calls to Action:

- Establish a €2 billion Photonics PPP in the 2028–2034 MFF to drive €6–8 billion in industrial co-investment in Photonics R&I in Europe.
- Accelerate Photonics manufacturing scale-up in Europe to secure supply chains for critical industries.
- Create high-TRL photonics application hubs to accelerate technology transfer in key European sectors like AI, manufacturing, quantum, and defence.
- Raise investment readiness of photonics firms to turn start-ups into global industry leaders.
- Secure a strategic role for Integrated Photonics in the Chips Act 2.0.

This initiative is a clarion call for the European Commission to act decisively. By investing in photonics, Europe can safeguard its industrial base, strengthen its defence capabilities, and lead the world in a technology shaping the future. The time to secure Europe's photonics advantage is now.

1. Europe's opportunity to lead the world in photonics: the most essential technology of the 21st century

Harnessing the power of light is vital to innovation and growth across the entire economy, from energy to agriculture. Industry across the world is now accelerating its use of photonics in all markets to deliver competitiveness, driving the photonics industry to continue to grow at 6.8% annually, five times the rate of the rest of the European economy[1]. Photonics was described by

[1] Photonics Market Study 2024 – Highlights & Trends, TematysPhotonics21, 2024

Thank you!

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