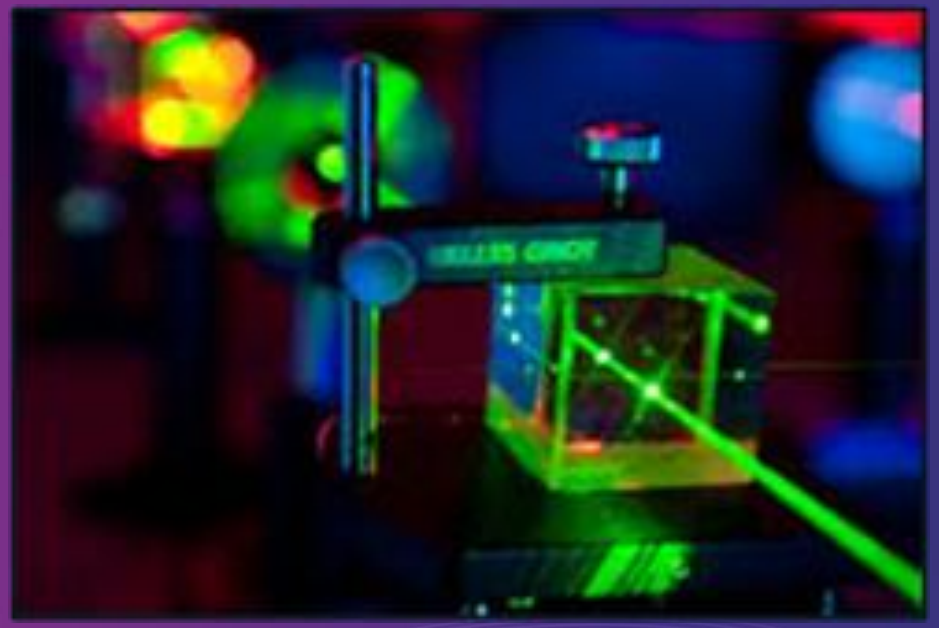

Photonics EU Perspective

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Relevant EU Strategies in 2025

Keeping the EU in the Global Race

1 New Strategic Signals from the EU in 2025

- **Competitiveness Compass:** innovation & growth
- **ProtectEU:** internal security & trust
- **Preparedness Union:** crisis anticipation & response
- **Savings & Investment Union:** mobilizing private capital
- **EU Defense Readiness 2030:** industrial base & sovereignty

A new mandate:
"**Photonics** is … a **strategic asset** for the European Union. Its applications permeate various sectors, contributing to our **resilience**, **competitiveness**, and **security**."

2 Common Threads and Key Messages

- Boost EU **competitiveness & resilience**
- Secure critical **technologies & infrastructure**
- Strengthen **public-private** cooperation
- Align funding with **strategic priorities**

No single Member State can face these problems alone, need for:

- **EU & international partnerships**
- **Public subsidies**

Why photonics matters

As key enabling and deep technology photonics is essential to reinforce EU competitiveness.

Photonic solutions contribute to megatrends such as AI, quantum, cloud computing and predictive medicine and supply key industries in IT, health, automotive, industrial automation etc.

Photonics is highly relevant for security and a key enabling technology in defence.

Photonics plays an essential role in reducing power consumption of IT.

A strong EU photonics industry reduces dependencies from other world regions.

Competitiveness & Security of the EU

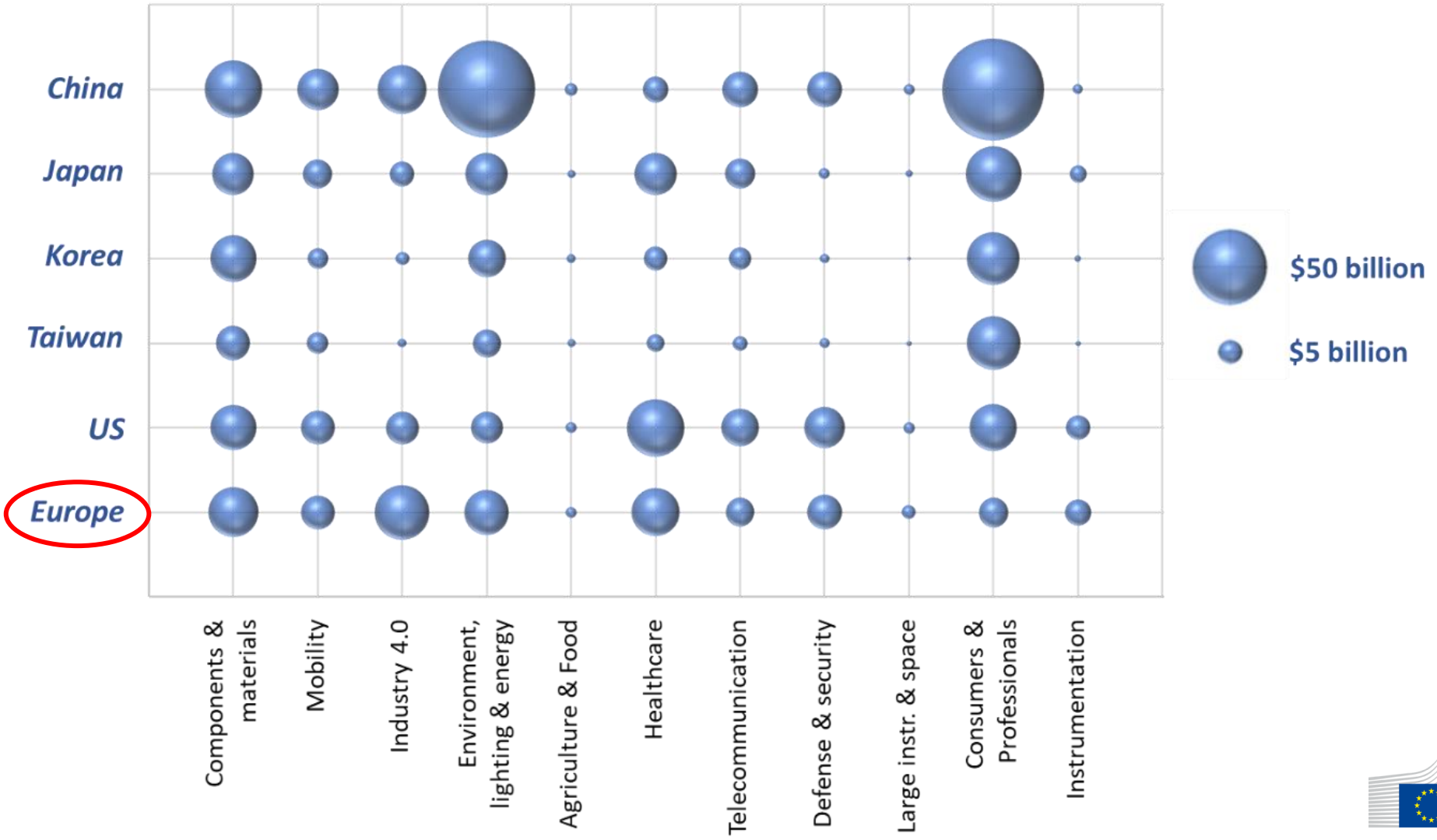
- Strengthen EU photonics supply chain to secure critical components and systems and reduce dependencies on non-EU suppliers, in particular for security and defense
- Build a strong & robust EU industry & maintain/expand market share
- Supply enabling technology for other critical sectors
- Push innovation in the EU to fully valorize the strong EU R&I capabilities
- Push research to *market readiness* targeting high TRL levels (7,8,9)

Photonics Market Situation

- Markets grow 7 % per annum
- Application areas are diverse
- EU is strong in industry automation, components/materials and healthcare
- R&D intensity of companies is often larger than 10%
- More than 90% of companies are SMEs with less than 250 employees

European Commission

Market shares of leading geographical areas



European Commission

Instruments

- **Partnerships with Innovators and Member States**
  - Drive core technologies (chips – PICs, system integration) in Chips **JU** successor
- **Application driven research and emerging technologies R&I - Horizon Europe**
  - Photonics benefitting application areas - manufacturing, energy, health ...
  - Emerging technologies and access to finance for start-ups (ERC, EIC)
- **Research Infrastructures and Skills - Digital Europe**
- **Deployment of industrial design and manufacturing**
  - **State Aid** facility to support photonic production (FOAK, IPCEI, GBER)
- **Partnering - International cooperation – Digital Partnerships and TTCs**

Photonics Partnership

Strengthen EU's R&I leadership

Instrument

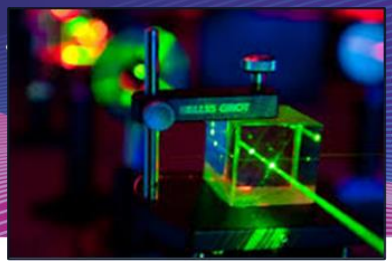
In **Horizon Europe (2021-2027)** the partnership focuses on supporting core technologies.

Outcome

- For the entire Horizon Europe cycle a budget of **€340 million** is foreseen.
- Alongside **€140 million** for joint call with other partnerships
- From 2021 to 2024 a total of **42 projects** have been funded with an EC contribution of **€206 million**.

European Commission

Future calls- HE WorkProgramme 2026-27
R&I elements



Preliminary ideas for discussion. The Partnership will further inform the concrete strands of R&I content.

Reinforce leadership of European research and industry in photonic technologies:

1. Explore new trends in **photonic integration** and **co-design with electronics** to bring down complexity and cost of production and add new functionalities
2. Push boundaries towards **ultra-low-power photonic** components and applications
3. Strengthen **sustainable, environmentally-friendly manufacturing** of photonic components and systems

Strengthen synergies with photonics-driven applications in the areas

- ***Industrial automation and advanced manufacturing (sensors and laser-based production)***
- ***Automotive***
- ***Data centers, communication and AI computing***
- ***Quantum***

And other relevant applications (Health, Farming and Food industry etc.)

European Commission

"*Chips for Europe*" Pilot Lines

IMEC €1,485 Bio

Leading-edge nodes below 2nm

Advanced nodes

CEA-Leti €831 Mio

FD-SOI scaling towards 7nm

Energy efficiency + robustness

Fraunhofer €746 Mio

Heterogeneous systems integration and assembly

Advanced packaging

CNR €362 Mio

Wide-bandgap semiconductors

Power electronics

ICFO €380 Mio

Photonic Integrated Circuits

On-chip photonics

- **Prototyping of validated designs**
- **Testing of equipment**
- **Validation of process flows up to TRL 6**

→ Future Industrialisation

Quantum Chips

European Commission

Security of Supply – Chips Act Pillar 2
Facilitate Investments in Manufacturing Facilities

__State aid__ distorts competition and is prohibited in the Union (TFEU) - unless justified by economic development needs

First-of-a-kind (FOAK) facility: introduce innovative products or processes that are currently unavailable within the Union, ensuring it does not distort competition.

Conditions: positive impact, security of supply, and commitment to next generation.

- 02/2025: ams OSRAM sensor fab in Austria approved for up to € 227M to boost EU chip sovereignty
- 2023 About ten projects with photonics activities approved in 2nd IPCEI on Microelectronics and Communication

Challenges

1. Photonics has increased **importance for semiconductor design and production** (Drivers: power efficiency, speed, integration of new functionalities)
2. Photonics **industry** in the EU is **fragmented** with many SME players and very few large players. -> SMEs prone to take-overs from international investors.
3. Companies have limited **access to finance** and are hindered to grow.
4. Innovation **platforms are diverse and scattered** over many competence centers.
5. Technology approaches are **not standardized**. Too many singular solutions are pursued.
6. EU photonics industry **risks to lose market share** and fall back in terms of strategic autonomy.

Focus Topics

1. **Communication and Computing**
   - Photons accelerate cloud and AI – high-bandwidth, low-power communication at all levels
   - Photons calculate – all-optical computing, neuronal networks etc.
2. **Sensing**
   - Photonic eyes for automotive, industry and health – sensing and imaging systems
3. **Lighting and Production**
   - Photons produce chips – next-gen. lithography and other equipment for chip fabrication
4. **Photons to protect – dual-use / defence**
5. **Lab-to-Fab**

What's next?

- **Develop a cohesive strategy** for the next Multiannual Financial Framework (MFF), focusing on both innovation and industrialization.
- **Strengthen** the industrialization of photonics
- **Leverage opportunities** from the **Chips Joint Undertaking**, coordinated through EPOSS, AENEAS, INSIDE and the Photonics21 partnership => focused inclusion of **photonics**
- **Collaborate with the electronics sector** on chiplets, co-packaging to drive advancements in key sectors such as communications, healthcare, automotive, security, and defence.
- Photonics21 partnership to update its Strategic Research and Innovation Agenda (SRIA), elaborate long term vision and roadmap, define **clear priorities**.

Thank you!