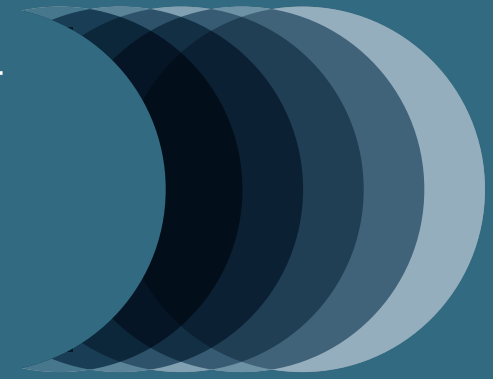


FUTURE GOVERNMENT POLICY ACTIONS FOR PHOTONICS



PHOTONICS
LEADERSHIP GROUP 

Light is critical to a resilient 21st century UK economy.

Underpinning defence, communications, health and manufacturing; the deep technologies of Photonics, applying light, lasers and optics, are critical to a resilient 21st century economy.

\$2.4 trillion worth of goods and >\$10 trillion of services across the world depend on photonics, yet we are only at the start of the light age.

Photonics is enabling progress in new and old industries alike; vital to the realisation of AI, quantum, autonomous transport, 3d printing, virtual reality, the energy transition, healthcare diagnosis/treatment and future agriculture. Modern defence heavily leverages photonics; from situational awareness and unmanned systems, to precision munitions and directed energy. Securing and enhancing UK photonics capability is essential to securing and protecting our future.

Without decisive policy actions to accelerate domestic commercialisation of photonics and strengthen manufacturing infrastructure, the UK will be dependent on imported photonics hardware. This will weaken the UK's ability to solve the societal challenges of Net-Zero, productivity and health. Lack of action further risks eroding the UK's economic and technological trade balance, jeopardising our economic and security independence.

The UK has been an international power house of photonics innovation for over 200 years. With £15.2 billion of annual photonics output, the UK has the second largest photonics industry in Europe. Policy actions that anchor this industry in the UK will protect over 80,000 jobs. By increasing domestic adoption we will enhance the UK's economic and technology resilience and boost sustainability, with the potential to generate another 80,000 direct jobs and far more in the AI and quantum industries of the future.

Policy Action:

To build on the UK's photonics strengths embedded in over 1,200 firms and 50 global renowned research institutes, the **Photonics Leadership Group** has identified five key policy areas where action is essential to enable the industry to prosper and support all areas of the economy.

There is a committed and passionate native photonics industry, experienced in engaging and winning on the global stage, willing to engage with Government to create lasting impact in society.

Risks:

- The photonics industry is heavily globalised. UK photonics firms typically export over 80% of their output. This supports the trade balance, yet makes business vulnerable to relocation overseas to be nearer customers.
- Photonics is being integrated into the heart of ever more products and processes across the economy. Action is vital to ensure all industry sectors have access to state-of-the-art photonics without which many sectors will not be globally competitive.
- Policy action is essential to expand the customer base in the UK, enhancing economic resilience and prosperity through faster deployment of next generation photonic solutions into end industries.
- Without action established end industries from agriculture to health, and next generation industries in AI and quantum, will depend on buying in photonics components from overseas. Those solutions will not be UK optimised and vulnerable to unpredictable trade frictions.

As representatives of UK industry the Photonics Leadership Group recommend urgent policy actions to:

1. Increase Confidence in Investment:

Accelerate the next Spending Review to provide certainty to departmental budgets. Protect innovation support alongside support for fundamental science to enable the UK to make more of its global science leadership.

2. Tax Credits:

Enhance tax credit delivery. Removing incentives for HMRC to negotiate down tax credits companies are due and targeting a 30 day period to pay tax credits in line with the government's own targets for paying invoices from SMEs.

Protect and expand capital equipment tax reliefs to support manufacturing scale-up in the UK, including 100% full expensing of capital.

3. Skills:

Photonics creates high gross value added (GVA) jobs, at over 200% of the UK average GVA per employee. To continue to expand production and applications, the industry requires a growing skilled workforce, which needs a pipeline of incoming talent, requiring:

- a review of careers education for 16-18 years olds to ensure that career advisory professionals are aware and communicating the opportunities, impact and prospects for career options in modern manufacturing design and innovation in the UK;
- support the development of a skills training matrix between educators and industry to highlight required and missing skills now and anticipated in the future;
- streamline and accelerate the visa sponsoring process for STEM skills at all levels reducing the time SMEs take to fill positions where UK candidates cannot be found.

4. Future Proof Resilience:

Support photonics companies to develop solutions for quantum and AI technologies, reducing the risks and providing incentives to invest in markets of vital importance to the UK but where scale and timing remain highly uncertain.

- Proceed at pace with the recommendations of the UK semiconductor infrastructure feasibility review. Providing support at scale for compound semiconductors and integrated silicon photonics where the UK has a leading innovation lead and globally competitive position on which to build.

5. Balance Innovation Support:

Instruct government agencies to balance support between challenge focused initiatives and maturing underpinning technologies in photonics, acoustics, fluids and electronics that are vital to supporting progress in all society challenges and enable solutions to be realised with maximum UK supply chain content.

- Dedicated support for innovation projects derisking advances in photonics that will have impact across multiple end applications e.g. integrated photonics.
- Enhance capex support in grant funding from UKRI agencies to support development of advanced automation by reimbursing 100% of hardware equipment costs used within projects to demonstrate new/updated manufacturing processes.
- Prioritise incentives to accelerate deployment of the latest production equipment across whole of UK manufacturing. Inherently digital and clean, wider adoption of photonics production techniques is essential to the deployment of AI, digital manufacturing and emission reduction. The UK is currently falling behind its competitors in adoption, jeopardising our future manufacturing competitiveness.
- Update the UK's Advanced Manufacturing Plan and scope of Made Smarter to explicitly include machine vision; 3d printing; laser machining, joining and cleaning.
- Develop a National Strategy for future modern manufacturing facilities and investment in the UK. Covering the planning, incentivisation and derisking the hi-tech manufacturing infrastructure required by UK businesses of tomorrow.

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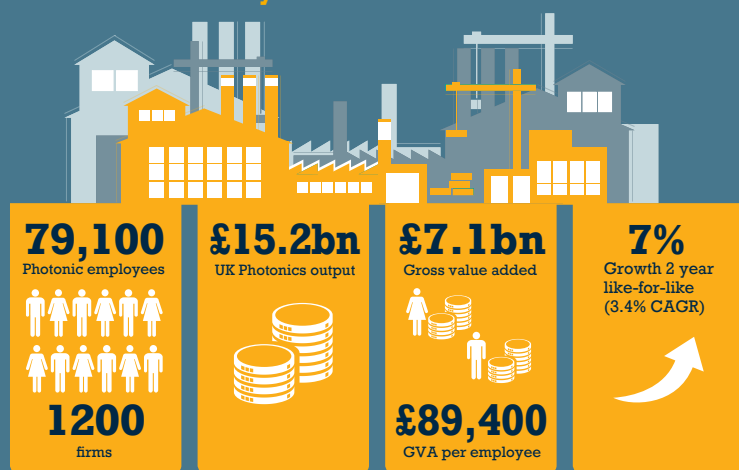


Photonics defined

All science and technology related to the generation, transmission, detection and manipulation of light is known as 'photonics'. Photonics technologies range from lenses and optical fibre, to lasers, semiconductors and LEDs, displays and cameras of all types, incorporated in products and high productivity manufacturing processes worldwide.

The global photonics component market exceeds \$368 billion annually (SPIE). The global photonics components and systems market exceeds \$865 billion (Tematys). The value of photonics enabled products sold annually exceeds \$2.4 trillion annually and photonics enabled services worldwide are worth >\$10 trillion every year (SPIE).

UK Photonics key statistics



Also available from the Photonics Leadership Group at www.photonicsuk.org

