A Response to "Under the microscope" Parliamentary Inquiry,
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About CORNERSTONE Photonics Innovation Centre:

The CORNERSTONE Photonics Innovation Centre is the UK's leading technology hub for silicon photonics. We accelerate photonic innovation by bringing together tailored start-up support, engaging networking events, expert design consultancy, and flexible prototyping, backed by our open-source silicon photonics foundry.

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What do you want the committee to put under the microscope?

The committee should put **silicon photonics** under the microscope to investigate its competitive advantage and acceralte economic growth and innovation in this sector.

Photonics is the technology of light, and silicon photonics is the technology of light on tiny silicon chips, akin to electronics chips that power all electronics devices.

Silicon photonics has several compelling advantages compared to electronics:

- It enables energy efficient devices critical to future telecoms, data centres and AI.
- It supports very high bandwidth interconnects to satisfy our growing demand for data.
- It can be made at huge volumes and at extremely low cost.

The commercialisation aspect of silicon photonics has already proved successful in data centers. However, its potential extends far beyond, with promising applications emerging in domains like biological and environmental sensing for healthcare, defence; LiDAR for autonomous vehicles, quantum technologies and more.

Why does it matter to you?

Many near market applications of silicon photonics do not have dominant global players, presenting an opportunity for the UK to take a leadership position, particularly in innovation and prototyping. The UK is home to one of the pioneering research groups in silicon photonics having been active in the field since 1989, and with a plethora of high impact research groups active in the area spanning all 4 UK nations.

The economic impact of photonics in the UK is substantial, contributing £15.2 billion annually and supporting over 79,100 direct jobs [1]. This is a remarkably innovative sector, with two-thirds of businesses taking advantage of research and development (R&D) tax credits and more than half dedicating over 10% of their revenue to R&D activities [1].

What you think the government should do about it?

The UK has a great chance to strengthen its leadership in silicon photonics. However, to do this, the UK should invest in special facilities called **pilot lines**.

A pilot line is like a small factory designed to help new technology move from the research stage to actual products that companies can sell. Without such a facility, many promising ideas fail to reach the market, a problem often called the "valley of death." Supporting pilot lines and keeping them running long-term, the UK could attract more high-tech businesses, create a strong technology hub, and bring in investment from other countries.

The UK is well positioned to build a successful pilot line due to existing prototyping expertise at the Universities of Glasgow and Southampton (CORNERSTONE), a plethora of innovative start-ups in the technology (e.g. Finchetto, Optalysys, Salience Labs, Wave Photonics, Zero Point Motion), high impact research groups (e.g. Bristol, Cambridge, Glasgow, Manchester, Southampton, UCL, York), and larger companies seeking to innovate in the area. e.g. BT, Leonardo, Qinetiq, Renishaw, Toshiba).

[1] UK Photonics 2023, The Hidden Economic Engine (2023) Available from: https://photonicsuk.org/wpcontent/uploads/2023/06/UK_Photonics_2023_Hidden_Economic_Engine.pdf