

# Compound Semiconductor Applications (CSA) Catapult response to the UK's industrial strategy

## Executive summary

Semiconductors have a profound impact on society. They power our mobile phones, computers, cars, hospital scanners and satellites. The UK has a rich history in the design and manufacturing of semiconductors. However, as countries around the world introduce large subsidies to support their industries, the UK is at risk of being left behind.

The UK government's new industrial strategy is an opportunity to chart a new course for our semiconductor industry and establish ourselves as a world-leader once more.

**Compound Semiconductor Applications (CSA) Catapult has put forward eight recommendations to address industry challenges and support the government's growth mission:**

1. Elevate the importance of the semiconductor sector by recognising semiconductors as a subsector of the industrial strategy
2. Create a National Semiconductor Institute to strengthen, lead and co-ordinate targeted activity across the UK
3. Co-ordinate long-term skills plans for semiconductors across UK and devolved governments to maintain and grow talent pools
4. Position the UK as a 'semiconductor super cluster' to drive UK growth and exports for the long term by establishing a £305m Semiconductor Challenge Fund
5. Grow existing semiconductor clusters to develop regional capability and support regional growth
6. Invest in compound semiconductor manufacturing and infrastructure
7. Prioritise UK semiconductors in public contracts for digital infrastructure and defence
8. Increase access to funding, improve regulation and strengthen IP

## The UK landscape

Semiconductors are one of the UK government's five critical technologies and underpin industries including **automotive, defence, aerospace, health, telecoms** and **manufacturing**.

**In 2022, global semiconductor sales totalled \$574 billion.**

**In the same year, dedicated UK semiconductor companies generated approximately £9.6 billion in revenue.**

**These companies employed an estimated 15,000 people in the UK.**

The UK government's national semiconductor strategy puts forward a plan to grow the domestic sector, mitigate the risk of supply chain disruptions, and protect national security.

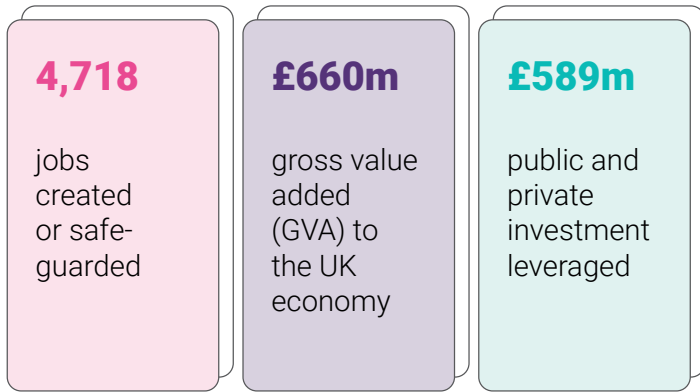
This is in response to rising geopolitical tensions and global semiconductor shortages caused by disruptive events such as the Covid-19 pandemic.

The strategy focusses on three areas in which the UK has world-leading strength: **research and development (R&D); design and IP**; and **compound semiconductors**.

## Compound semiconductors

CSA Catapult is the UK's authority on compound semiconductor applications and commercialisation.

We work with start-ups, SMEs, large organisations and academia to de-risk commercialisation, eliminate barriers to market and accelerate compound semiconductor technologies.

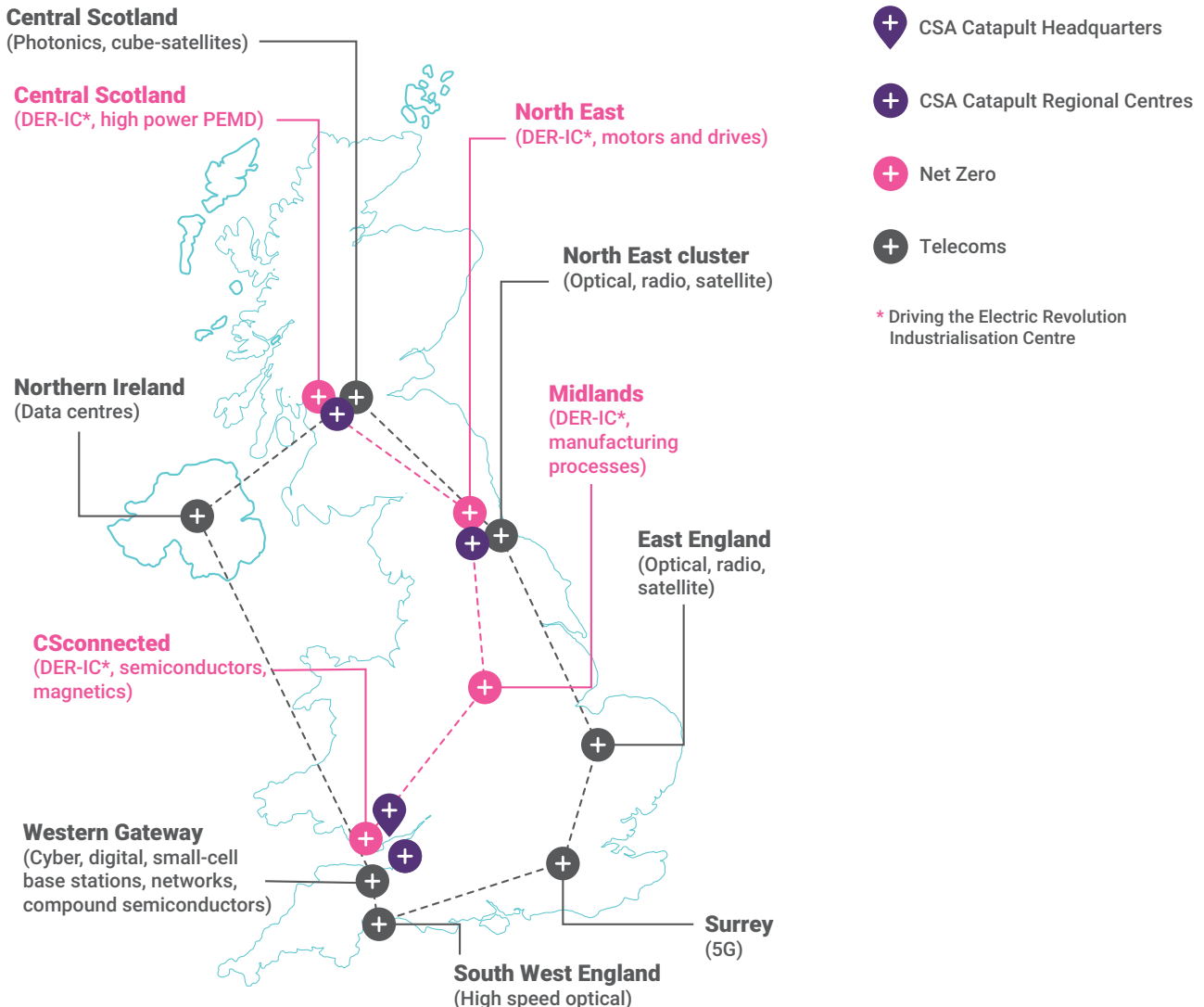


Since 2018, CSA Catapult's R&D projects have created or safeguarded 4,718 jobs and have contributed an estimated £600m of gross value added (GVA) to the UK economy. A total £589m of public and private investment has been leveraged by CSA Catapult customers in this time frame.

Compound semiconductors offer superior benefits to tradition silicon semiconductors, specifically when dealing with **power, speed** and **light**.

Compound semiconductors such as silicon carbide (SiC) and gallium nitride (GaN) are particularly useful in automotive and energy applications, future telecoms networks and next-generation quantum technologies.

The UK is a world leader in compound semiconductor research and technologies and has clusters of expertise in South Wales, the South West, Cambridge, the North East, Northern Ireland, and Scotland.



## CSA Catapult recommendations

**1. Elevate the importance of the semiconductor sector by recognising semiconductors as a subsector of the industrial strategy.**

**2. Create a National Semiconductor Institute to strengthen, lead and co-ordinate targeted activity across the UK.**

- Develop industry-led tech roadmaps to establish the UK as a leader in chip design, compound semiconductors and advanced packaging
- Co-ordinate policy development for skills across the UK
- Signpost inward and international investment pathways for the entire semiconductor ecosystem
- Engage with international partners through initiatives such as the EU Chips Act, EU Chips Joint Undertaking and US Chips Act

**3. Co-ordinate long-term skills plans for semiconductors across UK and devolved governments to maintain and grow talent pools.**

- Invest in skills development for commercialisation, such as design for manufacturing
- Grow skills base in key markets such as telecoms, AI, aerospace, automotive and space
- Maintain and grow skills at all levels from PhD to entry level roles
- Raise awareness of different pathways into industry to attract a greater and more diverse talent pool, and ensuring that the offer is attractive to both learners and employers
- Targeted visa programmes for high-tech skills and industry-academia partnerships, which will alleviate talent shortages in specialised areas like neuromorphic computing, quantum dots and electronic design automation (EDA)

**4. Position the UK as a 'semiconductor super cluster' to drive UK growth and exports for the long term. Establish a £305m Semiconductor Challenge Fund to support regional clusters with infrastructure projects, develop UK sovereign capability and supply chains, and develop export markets.**

- Key investments would be:
  - £125m for regional cluster development
  - £30m for a UK Semiconductor Centre, National Semiconductor Design Centre, and National Skills Centre
- Create a £150m cross-sector collaboration fund to develop UK resilient supply chains focussed on power electronics, advanced microelectronic packaging, photonics, quantum, future telecoms and neuromorphic computing
- Create a UK Centre of Excellence for quantum photonic integrated circuits (PICs)
- Create a state-of-the-art, world-first centre for AI-powered electronics, photonics, quantum and design automation (AI.EPQDA) in Cardiff
- Create a state-of-the-art power electronics centre for energy grids in Scotland
- Create a state-of-the-art centre for advanced electronic materials and satellites in the North East
- Provide targeted support programmes for existing compound semiconductor clusters in Northern Ireland, Torbay and Cambridge
- Establish a heterogeneous integration centre for advanced microelectronic packaging to speed up adoption of energy-efficient components and modules in AI-powered datacentres, high performance computing, future telecoms and space applications

## 5. Grow existing semiconductor clusters to develop regional capability and support regional growth.

- Continue to support clusters in the South West, South Wales, North East, Cambridge, Scotland and Northern Ireland through the industrial strategy
- Bring together national and devolved governments with local authorities to support semiconductor investment in regional clusters
- Develop capability in key technologies such as power electronics, advanced microelectronic packaging, photonic integrated circuits (PICs), and quantum photonics to support local economic growth and jobs

## 6. Invest in compound semiconductor manufacturing and infrastructure

- Invest in compound semiconductor manufacturing, 3D packaging and quantum photonics infrastructure to attract international partnerships and advance the UK's strategic positioning in high-value tech
- Prioritise long term infrastructure funding for semiconductor fabs, including those specialising in silicon carbide (SiC), gallium nitride (GaN) and gallium arsenide (GaAs)

## 7. Prioritise UK semiconductors in public contracts for digital infrastructure and defence.

- Consider long-term government contracts for UK-made PICs and wide bandgap semiconductor products

## 8. Increase access to funding, improve regulation and strengthen IP.

- Enable pension schemes to invest in high-risk, high-reward ventures, with risk-sharing models
- Establish government-backed funds or co-investment schemes to increase capital access for late-stage R&D projects
- Improve regulation of early-stage technology such as advanced packaging
- Strengthen IP laws to protect and encourage innovation, attracting both local and foreign firms
- Enhance IP protection, support patent acquisition, and enforce IP rights to build confidence in R&D investments

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