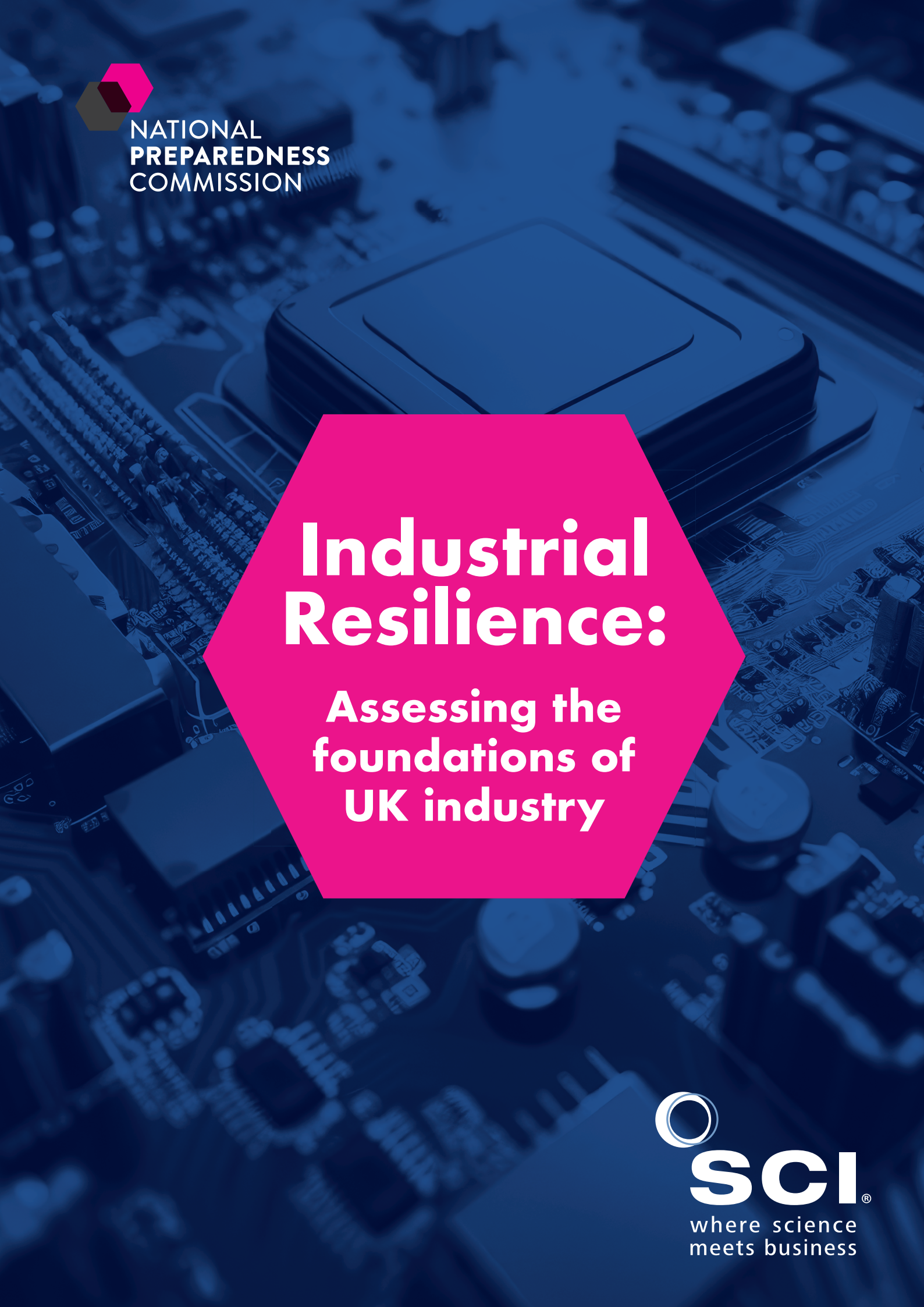

NATIONAL PREPAREDNESS COMMISSION

Industrial Resilience:

Assessing the foundations of UK industry

SCI®
where science meets business

About National Preparedness Commission:

The National Preparedness Commission was established in late 2020 to bring together senior figures from public life, business, academia and civil society with the mission of promoting better preparedness in the UK for a major crisis or incident.

The Commission has been set up to make a difference. The quality of the work produced, combined with the status and experience of its Commissioners, ensures that its recommendations will have an audience of policy-makers and decision-takers, both at national and local level as well as in the business and community sectors.

The Commission's programme of work is intended to be both strategic (recognising that what is needed to be better prepared for many disruptions is the same whatever the initiating cause), and practical (to encourage comprehensive actions so as to get away from merely 'admiring the problem').

The Commission recognises that the increasing complexity of society and its systems brings many benefits, but potentially creates its own fragilities. Above all, the Commission looks systemically at what needs to be done to improve societal preparedness and national resilience.

About SCI:

SCI, formerly The Society of Chemical Industry, operates at the interface of academia and business. It was established as a learned society by Royal Charter in 1881 to support the commercialisation of the UK's strengths in scientific innovation and invention. That is still its mission today.

SCI's expertise and focus have expanded far beyond its roots in the UK's chemical sector, and SCI is now a global network of innovators using science to tackle some of the big societal challenges of the day, across climate & planet and health & wellness. It brings together companies with over $500bn in sales and with over $30bn invested globally in scientific R&D and publishes 9 peer reviewed journals, including the recently launched 'Sustainability' journal.

SCI convenes its community across industry and academia, with a particular focus on training and mentoring the next generation of innovators and science entrepreneurs though its College of Scholars, which includes participants in the Bright SCIdea Challenge, and the Industry Awards programme.

SCI provides thought leadership in the area of industrial policy providing proprietary independent research to inform evidence-based policy making.

Acknowledgements:

Thank you to the NPC Commissioners and SCI members who contributed to this report.

November 2025

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Executive Summary

Supply chain shocks, driven over recent years by geopolitical events and the COVID-19 pandemic, have revealed the vulnerability of the UK to disruptions of trade. An increasingly volatile international environment, overlaid by growing climatic and cyber threats, points to an ever more fragile situation.

This report considers a scenario involving multiple hybrid shocks resulting in a severe impact on the UK's import/export flows.

This is an area of key vulnerability as the UK has a heavy reliance on imported materials to make most of its critical items – such as defence equipment, electronics, pharmaceuticals, energy and even food.

Once the bastion of world manufacturing, the UK is now heavily dependent on imported goods to supply almost every part of the economy. The erosion of manufacturing in the UK has been driven largely by a lack of competitiveness and this has accelerated over the last two decades, with most supply chains being significantly hollowed out, leaving very little industrial capability. Key materials required to support the manufacture of electronics, batteries and energy are neither mined nor manufactured in the UK and, under current circumstances, it is not conceivable that they could be on-shored in a commercially competitive way without a clear strategy and significant intervention.

Quite apart from the contribution to rising energy prices, the pathway to Net Zero – and specifically the growing reliance on intermittent renewables – is intensifying this vulnerability both because the technologies rely on imports of raw materials and components, and because uncompetitive energy costs are leading to the rapid contraction of the UK's remaining production of fossil fuels, which are still, and will remain, critical for energy, transportation and as a feedstock for the majority of industrial materials into the foreseeable future.

Policymakers must not equate a transition to a low carbon economy with an end to hydrocarbon production. As well as being essential to energy security hydrocarbons remain the building blocks for most everyday products from soaps to medicines to electronics and clothes. The loss of manufacturing capability to meet basic consumer essentials as well as more complex products such as batteries and electronics, only results in increased imports to meet demand.

The examples below illustrate the extent of the issues:

- Electronics production is limited to small-scale advanced sectors, while bulk electronics are all imported
- The UK has no end-to-end manufacturing capability for key products, such as batteries at scale
- In pharmaceuticals, the UK is heavily reliant on imports, with only 25% of generic drugs produced domestically
- Over 40% of food consumed in the UK is imported with the sector replying on just-in-time supply chains
- Some critical basic materials are no longer manufactured in the UK. An example is ammonia – little appreciated, but a key ingredient for a wide range of products including fertilisers, explosives, solvents and pharmaceuticals. The last manufacturing site in the UK closed in 2023. A further example of reduced capability is ethylene – the key building block to most materials today. SABIC closed one of the last ethylene manufacturing plants in 2024
- The UK is very exposed on energy, being reliant on intermittent renewables, which are not best suited to sustain shortage or crisis situations.

This report analyses the resilience of key industrial sub-sectors to a scenario combining a series of crises which significantly disrupts imports into the UK, requiring a high level of national self-sufficiency. It finds that the country's heavy reliance on imports of materials, with complex supply chains and just-in-time deliveries, coupled with the lack of significant industrial capability to respond in such a crisis, poses significant threat to the UK's national resilience.

A summary of the impact across key supply chains is shown in the table below, using a RAG (Red, Amber, Green) system to denote severity of the impact.

Figure 1: Summary of Resilience of Critical Supply Chains

Sector	Domestic Raw Materials	Critical Minerals Dependency	Industrial Capability to Flex
Energy and material feedstocks – fossil fuel	Red - Amber	Green	Amber - Red
Energy – solar/wind	Red	Amber	Red
Electronics	Red	Red	Red
Batteries	Amber - Red	Red	Amber - Red
Pharmaceuticals	Green - Amber	Green	Amber

RAG Key

- Green indicates low dependency, moderate capabilities, able to be self-sufficient in the worst-case scenario
- Amber indicates moderate dependency, some capabilities but there would be major disruption in the supply chains
- Red indicates high dependency, low capabilities and that the supply chain would not function

Recommendations

1. Government should create a Critical Materials Manufacturing Strategy (CMMS), rooted in a detailed review of current materials manufacturing capabilities, companies and supply chains to ensure the UK has the necessary industrial capacity to function in a time of national crisis. This would include a list of critical companies
2. Government should consider measures to improve national self-sufficiency including maintaining sufficient fossil fuel production for energy and material feedstocks; building more manufacturing capability in critical minerals and materials; supporting research into alternative technologies not reliant on scarce rare earth elements and supporting the recycling of critical minerals
3. Government should take urgent action to lower industrial energy prices to reverse their extremely damaging impacts on industry
4. Government should ensure that a resilience assessment is mandated to be carried out on all technologies proposed to form part of the future energy mix
5. Government should determine how the distribution of limited resources of energy, raw material and components would be prioritised should the UK face an interruption to imports
6. Government should mandate that resilience assessments and plans are built into the Industrial Strategy.

Introduction

Geopolitical tensions, economic shocks and the accelerating impacts of climate change are converging to test the robustness of our systems. Add to this the threat of future crises, whether another pandemic or a debilitating cyberattack, and it is increasingly clear that the UK needs to be prepared to sustain itself - if necessary alone - through a period of isolation.

In recent years, the COVID-19 pandemic and the knock-on impacts of the invasion of Ukraine have underscored how vulnerable the UK is to unpredictable shocks due to its high dependence on imports of critical raw materials, critical minerals, components and products.

The Government's Modern Industrial Strategy (published in June 2025)[1] focused on 8 sectors identified to support economic growth. The Strategy recognised the growing threats that geopolitical volatility poses to the UK, explicitly included resilience as a core goal for securing sustainable economic growth and included a number of welcome interventions to support supply chain resilience in priority sectors.

But the potential impact of the global volatility would not be limited to the Government's ambitious targets for economic growth. Whilst they may not be considered high growth sectors, the more traditional industries underpin these sectors, as well as providing other materials that support everyday life for the UK population. Failure to have strong foundational industries or loss of them would undermine the country's ability to function.

The publication of the UK Resilience Action Plan[2] in July 2025 marked a significant milestone — a whole-of-society strategy that sees Government, industry, communities, and individuals sharing responsibility for ensuring the country withstands and recovers from disruption.

However, this report identifies a critical gap in the planning: the absence of a strategic vision for Critical Materials Manufacturing Strategy (one which identifies key capabilities and the companies that provide them, to complement the existing framework for Critical National Infrastructure (CNI).[3]

While CNI focuses on infrastructure (transport, energy, water, communications, chemicals) whose failure would severely impact essential services, this report notes that the erosion of the UK's foundational industrial capabilities—which underpin the very infrastructure we seek to protect - would be equally catastrophic. They, too should be considered to be part of the critical national infrastructure.

2.1 Defining Resilience

The UK government defines 'resilience' as the "ability to withstand or quickly recover from a difficult situation, but also to get ahead of those risks and tackle challenges before they manifest"[4]. By focusing on UK industry through the lens of a crisis that significantly cuts off the country from physical imports, this report seeks to identify those functions which present the greatest risks, and those sub-sectors which are most at danger of being unable to respond to such a difficult situation.

1. The UK's Modern Industrial Strategy 2025 - GOV.UK
2. CCS0525299414-001_PN9801267_Cabinet_Office_-_HMG_Resilience_Strategy__3_.pdf
3. UK Defence and Security Exports - Securing Critical National Infrastructure - an introduction to UK capability
4. The UK Government Resilience Framework - GOV.UK

This report used the National Risk Register[5] (NRR) to create a hypothetical scenario: a convergence of geopolitical, cyber, infrastructural and heath crises, resulting in cascading failures across critical systems which necessitates a period of national self-reliance.

Figure 2 identifies a series of individual risks from the NRR and assesses the impact each one could have bearing in mind the state of the industrial capability assessed in this report. Certain risks pose disproportionately greater threats to specific industries and it should be noted that the most severe scenario would be a combination of seemingly small scale risks occurring at the same time, that combine to severely disrupt materials accessibility affecting multiple sectors and activities.

Figure 2: Risk Scenarios

Risk #	Risk	Score	Science-based industries impacted
#26a	**Failure of the National Electricity Transmission System (NETS)**		Impact on energy security and knock on impact on domestic and industrial users. Backup sources and storage capability limited.
#11	**Cyber attack on infrastructure (healthcare, transport, communications)**		Risks of multiple small scale attacks happening sequentially or in parallel severely disrupting communications, transport, manufacturing and trade.
#7	**Larger scale Chemical, Biological, Radiological or Nuclear (CBRN) attacks**		Major incident response required from multiple sectors including medical, healthcare, materials and food.
#12	**Disruption of global oil trade routes**		UK highly exposed on energy and feedstocks. Most activities would grind to a halt quickly.
#54	**Pandemic**		A possible scenario but the UK has already stress tested a response. Industrial R&D and manufacturing capability in the UK critical to effective response.
#19	**Grounding incident(s) (grounding /sinking) of a vessel blocking a major port for several months.**		Likely and could disrupt trade flows. Impact small on an individual basis but this amplifies if combined with multiple incidents or other risks.

In the hypothetical crisis scenario envisaged by this report, a coordinated hostile action causes the interuption of physical import routes into the UK and energy imports via interconnectors from continental Europe. In the worst case, at the same time, a cyber-attack disrupts communications, utility infrastructure or targets selected companies.

A combination of any two of these potential risks would pose great challenges to the ability of the UK's industry to function. This worst-case scenario would lead to significant - and potentially catastrophic - economic, social and infrastructure impacts across the UK.

The UK would have to survive without imported oil, gas, raw materials, food, components, and finished products. The industrial activities and resources most critical to the country's security, economy, health and communications would need to be rapidly prioritised and reallocated. The corollary of this would be the need to deprioritise some functions, and shift resources away from them.

For this to happen as smoothly as possible requires a high level of national preparedness.

5. National Risk Register - 2025 edition

The Government has committed, in the Modern Industrial Strategy, to enhancing central understanding of the complex supply chains on which the UK depends and is due to update the Critical Mineral Strategy this year. These are essential foundational tools for ensuring preparedness. But there also needs to be a precise, up-to-date understanding of which industrial capabilities the UK has (including which companies or entities control them), and which it does not, and which are the most vital for the country to secure if it is to withstand a period of effective blockade. And it needs a clear process – communicated in advance – for switching industry to crisis mode when the need arises.

2.2 Purpose and Objectives of this Report

This report offers a high-level assessment of the state of UK's industrial resilience—specifically, its ability to withstand and adapt to major mid- to long-term disruptions in international trade and operations.

The analysis has involved assessing the stages in the supply chain, the key materials and the companies operating in the UK in these chains. Over 200 companies have been assessed.

The analysis uses the following RAG (Red-Amber-Green) assessment of the strength of critical industrial sub-sectors, evaluating their capacity to continue functioning under stress.

RAG Key		Green indicates low dependency, moderate capabilities, able to be self-sufficient in the worst-case scenario Amber indicates moderate dependency, some capabilities but there would be major disruption in the supply chains Red indicates high dependency, low capabilities and that the supply chain would not function

The analysis rates the strength of industrial sub-sectors in terms of:

1. The availability of input materials –raw materials, components or ingredients, the reliability and readiness of their supply and the criticality of them on the downstream supply chain stages.
2. Critical minerals dependency – the reliance on critical minerals to deliver important functionality and key products in the supply chain.
3. Industrial capability – the presence and capacity to develop, produce and pivot to manufacture components and end-use products.

Key sub-sectors included in the assessment are:

- Fossil fuels and renewable energy
- Materials and Minerals
- Electronics
- Batteries
- Defence
- Pharmaceuticals
- Food production

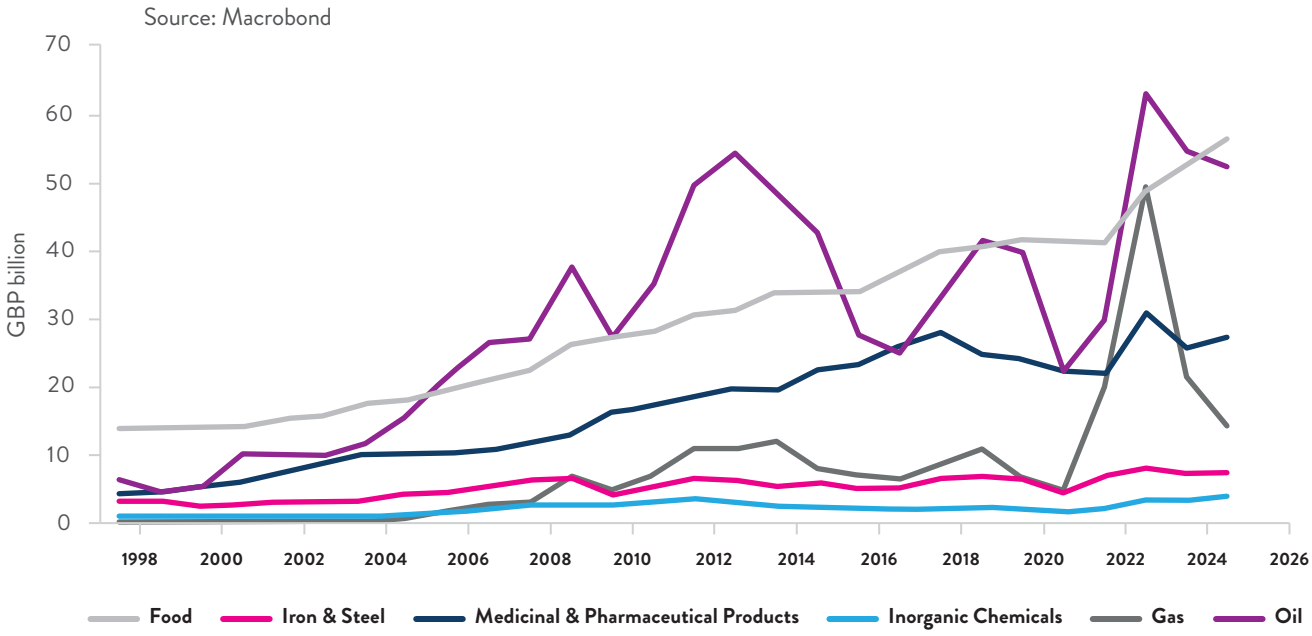
This analysis of the weaknesses and strengths of the UK's industrial infrastructure is intended to support policymakers in deciding whether the current state of play is acceptable from a resilience perspective, and in developing mitigation plans including how to allocate resources in time of crisis. It will also inform decision makers as to where intervention is necessary ahead of a crisis to assure the UK's ability to thrive in a volatile world (either by devising new policies or by accelerating or reversing current trends). Detailed proposals for improving preparedness of individual sub-sectors are included in the body of the report. The Conclusion includes over-arching recommendations to shape policymakers' approach to the issue of industrial resilience.

The Decline of UK Industrial Capacity

3.1 Trends

Despite its history as one of the great manufacturing economies, the erosion of manufacturing capability over more than two decades, leaves the UK with very little end-to-end manufacturing capability and heavy dependence on imported materials to supply every part of the economy. This strategy is the opposite to that adopted in many other countries, which have sought to bolster and build manufacturing – some countries building from commodities up the value chains (e.g. China) and others targeting selected areas to specialise in (e.g. Ireland, Singapore). Today over £200bn pa of materials are being imported into the UK across the 6 key supply chains as shown in Figure 3 below.

Figure 3: Growth in UK imports of key goods



One sector where capability has been severely eroded has been the chemicals industry. This key sector supplies most of the raw materials for many other sectors – transport, defence, pharmaceuticals, electronics, batteries, food and consumer products.

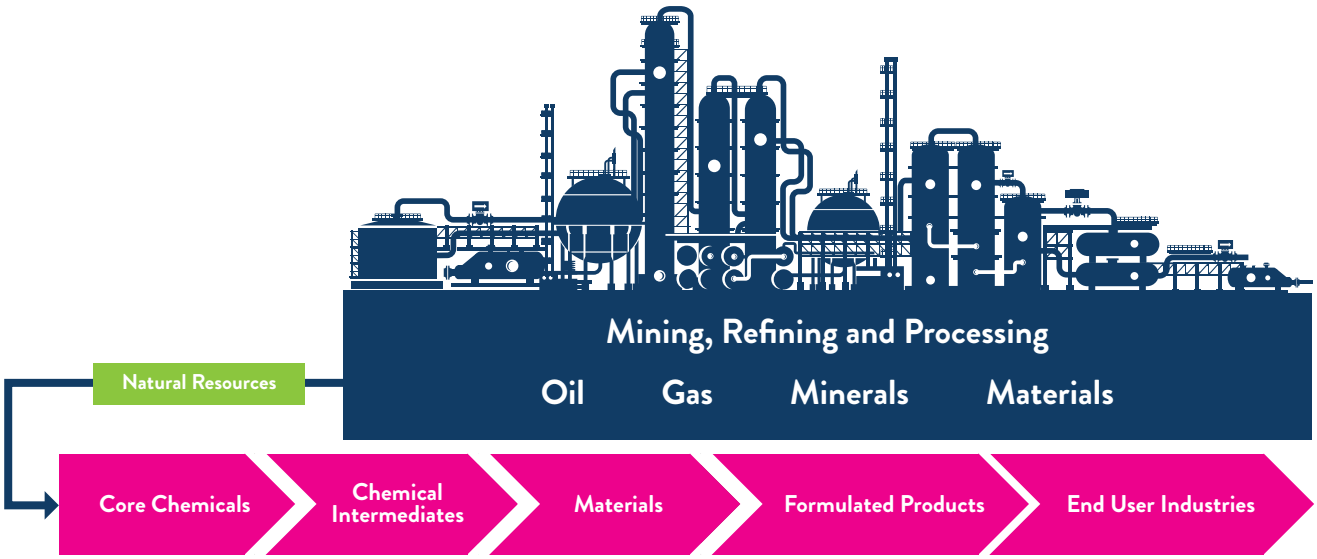
The structure of the industry is highly integrated, with fossil fuel raw materials being used to manufacture basic chemicals – about 8 core building block materials – which are then processed into an estimated 350,000 materials that are further processed into millions of finished products.

The sector originally developed around large players who were integrated into the downstream products, with ICI being the UK example of such a company. These complex and highly integrated supply chains have been optimised over decades, as shown in Figure 4.

The main hydrocarbon source for this materials supply chain is oil, with around 5% of annual fossil fuel production feeding this material supply chain. Whilst other sources of carbon are already being used and developed, none will be available in sufficient quantities or cheaply enough to replace the fossil fuel source required today or into the medium-term future.

Figure 4: Structure of the Chemicals, Materials and Downstream Industries

The chemical industry provides the building blocks that enable all aspects of daily life. Basic chemicals are converted through multi-step processes into more specialised materials that are then formulated into products by the downstream sectors.



- **Olefins**
  - ethylene, propylene, butylene
- **Aromatics**
  - benzene, toluene, xylenes
- **Chlor-Alkali**
  - chlorine, caustic soda
- **Others**
  - e.g. ammonia, phosphorous

- **Commodities**
- **Differentiated commodities**
- **Technical specialities**

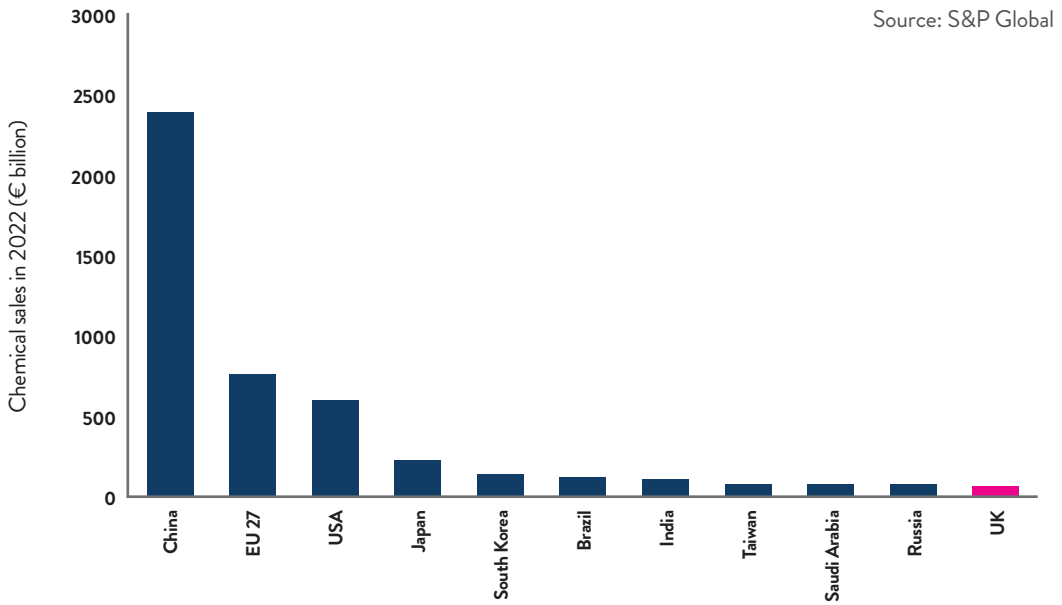
- **Battery materials**
- **Electronic materials**
- **Medicinal materials**
- **Composites**
- **Fine Chemicals**
- **Plastics**
- **Fibres**
- **Surfactants**
- **Flame retardants**

- **Paints & Coatings**
- **Adhesives & Sealants**
- **Lubricants**
- **Water treatment products**
- **Cleaning products**
- **Textiles**
- **Packaging**

- **Agriculture**
- **Consumer Products**
- **Consumer Healthcare**
- **Construction**
- **Communications**
- **Defence**
- **Energy**
- **Food**
- **Pharmaceutical**
- **Transportation**
- **Water**

Despite the global oil market being sizeable ($5.7 trillion) and growing (2-3% pa) the UK's share has been in constant decline with the UK currently producing around 5% of the global market. China is now, by a large margin, the main producer as shown in Figure 5 below.

Figure 5: World sales of chemicals by country, 2022



Chemicals underpin most of the UK's critical national infrastructure and supply raw materials for every sector on which our modern society depends, including transport, defence, pharmaceuticals, electronics, batteries, food and consumer products (Figure 6).

Figure 6: UK Chemical imports and exports

Chemicals account for 15% of UK exports and 12% of imports, the second largest UK export sector

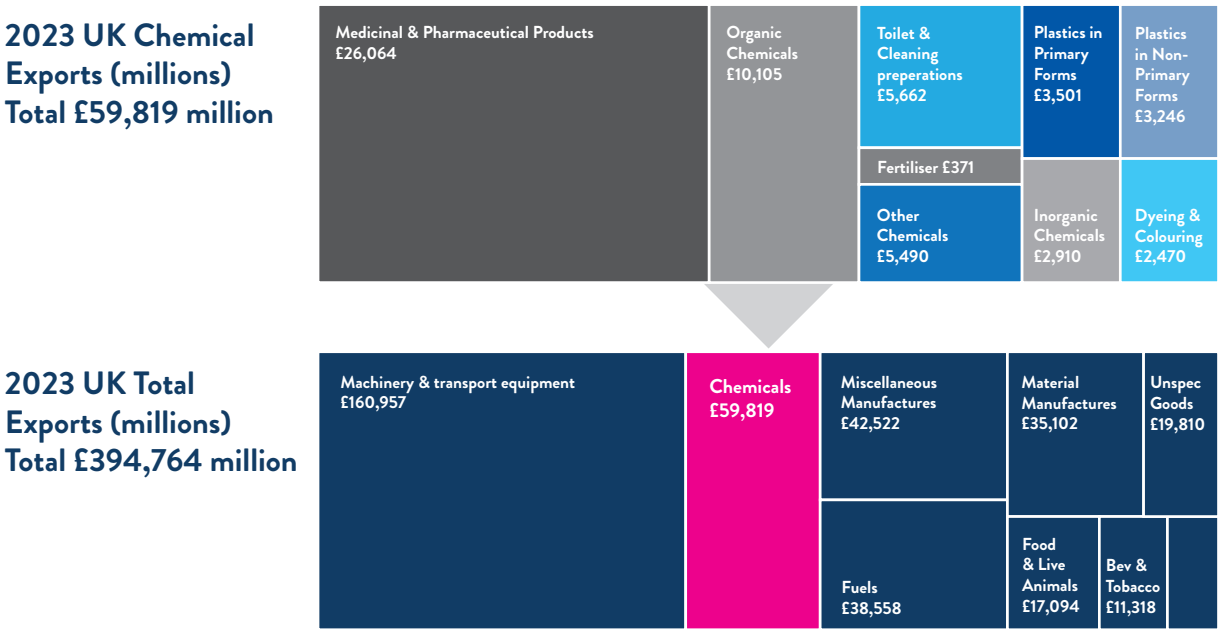
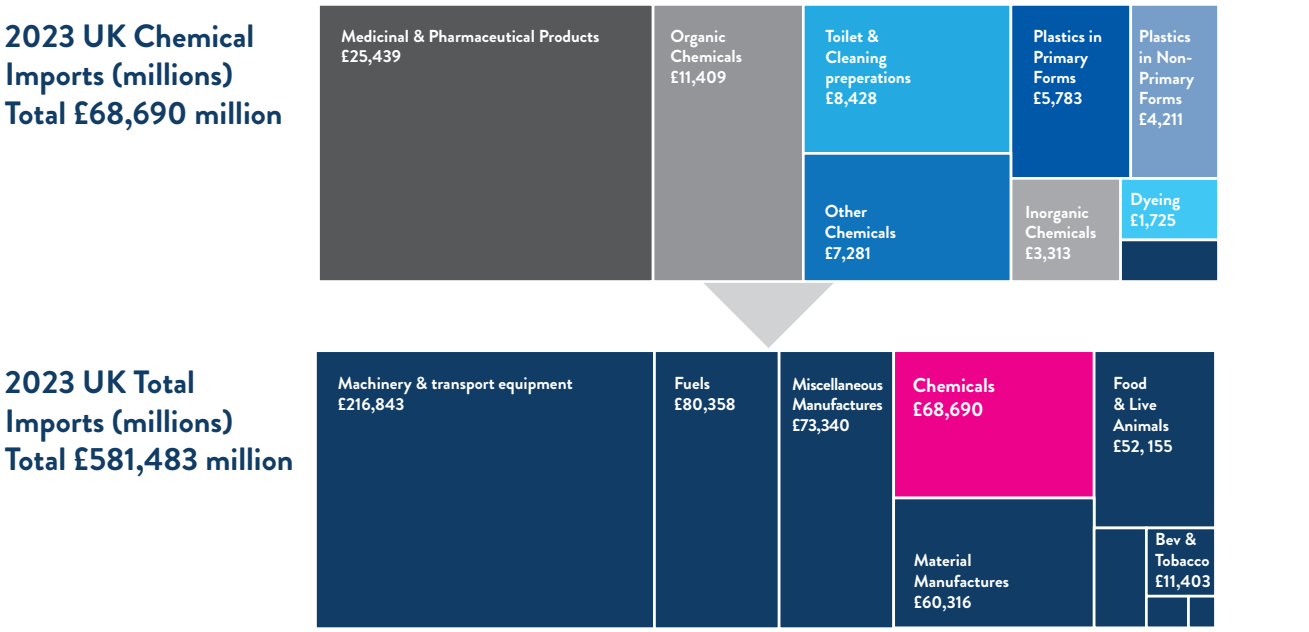


Figure 6: UK Chemical imports and exports (continued)



Source: S&P Global

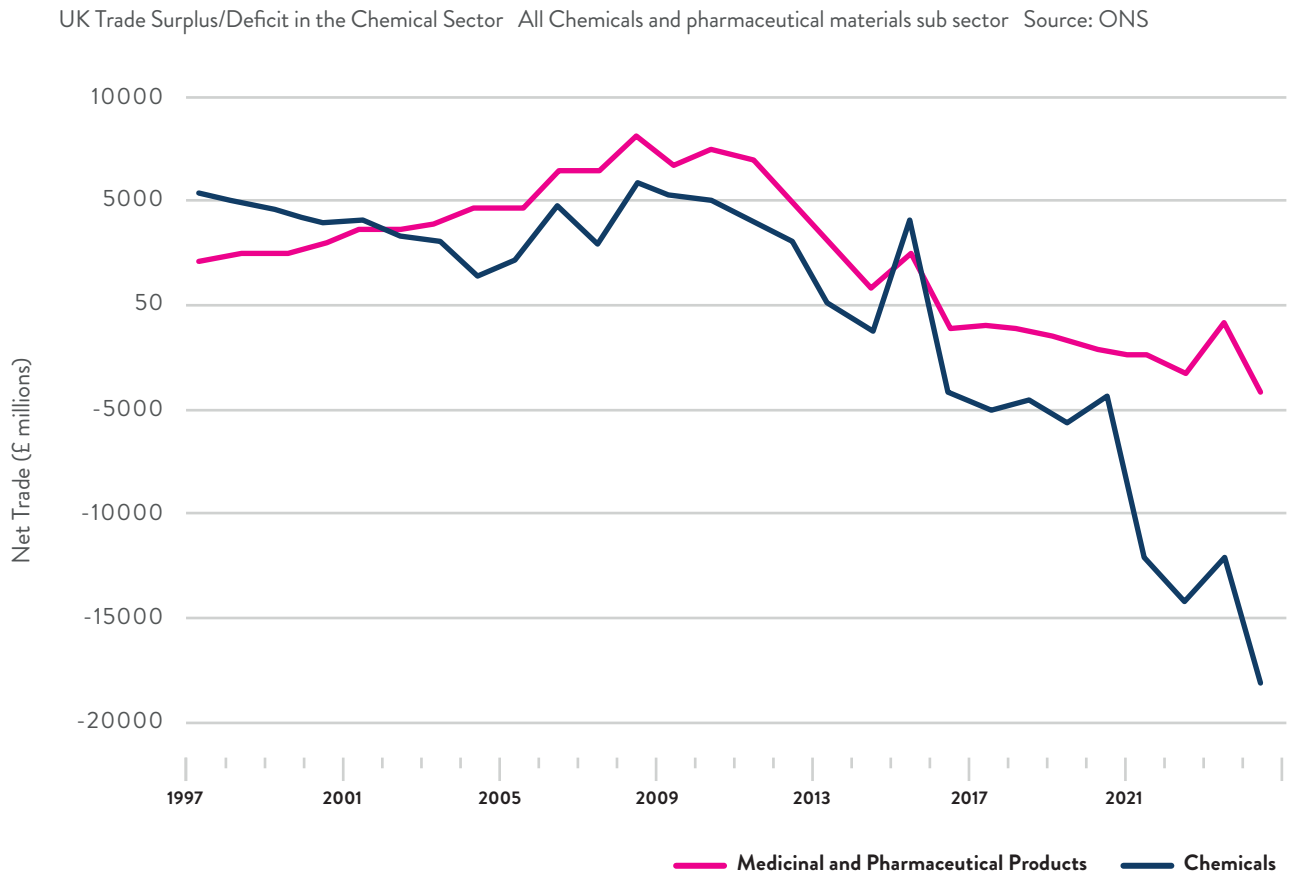
In the UK, the chemicals sector is the second largest industrial sector, representing 1.2% of UK GDP, with a turnover in 2022 of £70bn and accounting for 15% of UK exports, falling to £60bn in 2023.[6]

The decline in UK production has accelerated in recent years with the chemicals sector experiencing a 40% fall in output since January 2021. The UK trade balance for chemicals moved from a strong surplus of over £5bn in 2008 to a deficit low of £16.6bn in 2022, before 'improving' to a deficit of £11.1bn in 2023. Chemicals now represent 12% of total UK imports. This low point reflects the impact of high energy and raw material costs and geo-political shocks which make production more expensive. This situation is intensifying as demand increases for a new generation of materials and components to support the transition to Net Zero and for use in advanced technologies.

The trend in loss of UK manufacturing has translated into other connected sectors as increasing reliance on imported materials has weakened supply chains. The net trade in chemicals and the pharmaceutical materials is shown in Figure 7.

6. https://www.cia.org.uk/download?ac=2192

Figure 7: Net trade in chemicals and pharmaceuticals



3.2 Current State and Threats

Supply chains have become international and highly fragmented and so complex that policy makers, and even companies themselves, have difficult tracking their dependencies beyond their Tier 1 suppliers and their vulnerability to the disruption of upstream supplies.

The rapidly changing political landscape is accelerating the move to deglobalise, with countries increasingly localising their manufacturing strategies and core capabilities.

For the UK to meet its economic growth targets, resilience needs and its modern industrial ambitions requires it to identify its place in this new world and develop a manufacturing strategy that ensures resilience in critical materials and minerals. Rebuilding fragmented global supply chains entirely onshore is neither feasible nor desirable. But understanding the vulnerabilities they represent, of the key gaps that exist, and of the measures necessary to prepare the country for an unpredictable future are essential. Policy makers must identify where strategic intervention is needed—whether through crisis adaptation planning or pre-emptive support for at-risk enterprises. This report provides a foundation for further assessment of the UK's industrial strengths and vulnerabilities, and the interventions necessary to ensure industrial continuity in times of crisis.

Energy: The Challenges of Transition

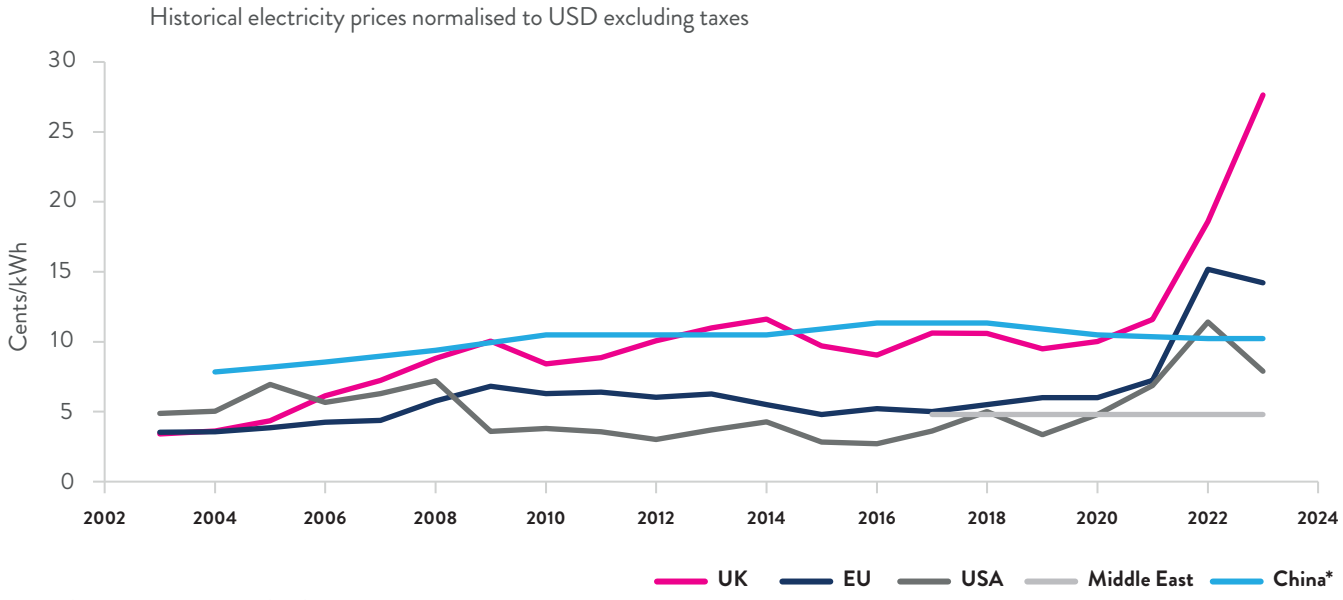
In its June 2025 report on the UK's Energy System Resilience for the National Preparedness Commission, Baringa outlined the scale of the challenge to the UK in maintaining a resilient energy supply during the transition to Net Zero.[7] In addition to the range of issues highlighted on energy strategy in that report there are additional issues to be cognisant of that relate to the materials chains, driven by the UK's high prices and the technology choices being made.

4.1 Energy Prices

If the UK is to compete in a global market it is critical that there are abundant sources of energy at competitive prices. The fact that the UK has some of the most (by some measures the most) expensive non-domestic energy amongst its competitors has big – negative – implications for the resilience of the UK's industrial sector, and the country's ability to function in the case of an extended interruption to trade as envisaged hypothetically by this report.

UK energy costs are now significantly higher than most other countries as shown in Figure 8 below. Forecasts based on current government policies show that this price differential will continue. This is likely to result in further closures amongst remaining industries in the UK.

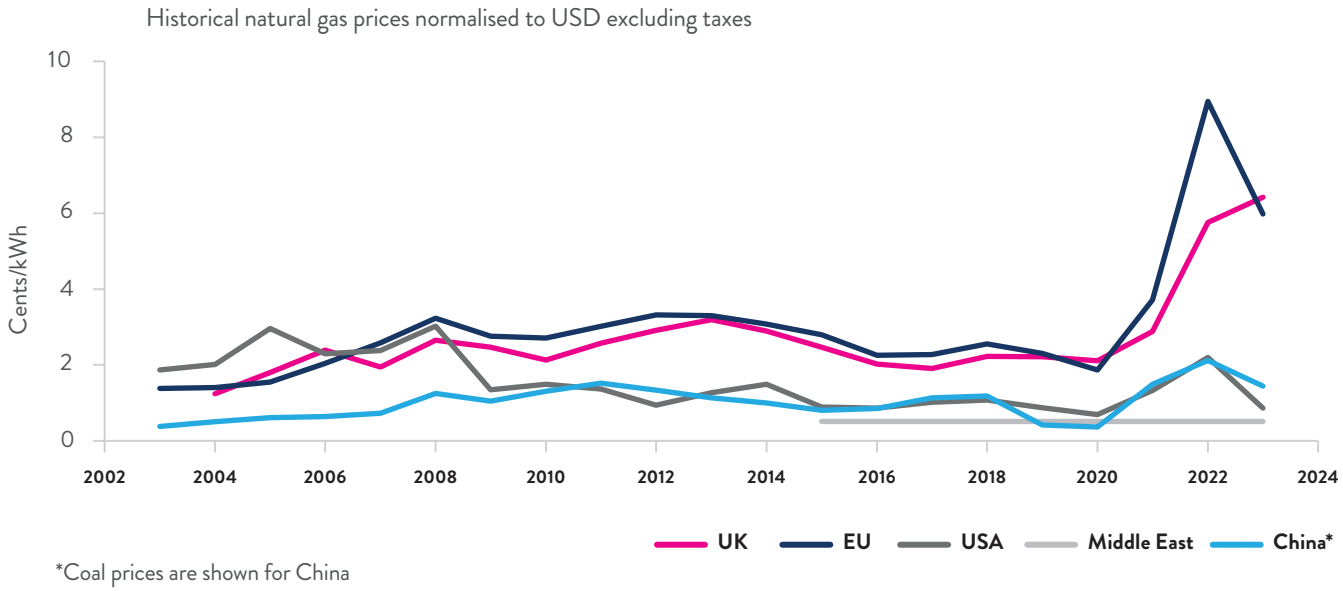
Figure 8: Evolution of UK energy prices versus other countries over time



*Coal prices are shown for China

7. NPC & Baringa - UK Energy System Resilience

Figure 8: Evolution of UK energy prices versus other countries over time (continued)



*Coal prices are shown for China

These sharply rising energy costs in the UK have already had significant impacts on a wide range of the country's industries - from traditional heavy industry to pottery manufacturers.

According to reports from the Office for National Statistics (ONS), several sub-sectors with high energy dependency have experienced a decline in output. Many business leaders report that energy prices represent a real pressure for their operations, and a number of critical industries have reduced or ceased production, with energy prices cited as a key contributing factor. The long terms trends in GVA across energy intensive sectors are shown in Figures 9 and 10.

Figure 9 : Energy Intensive Sector GVA

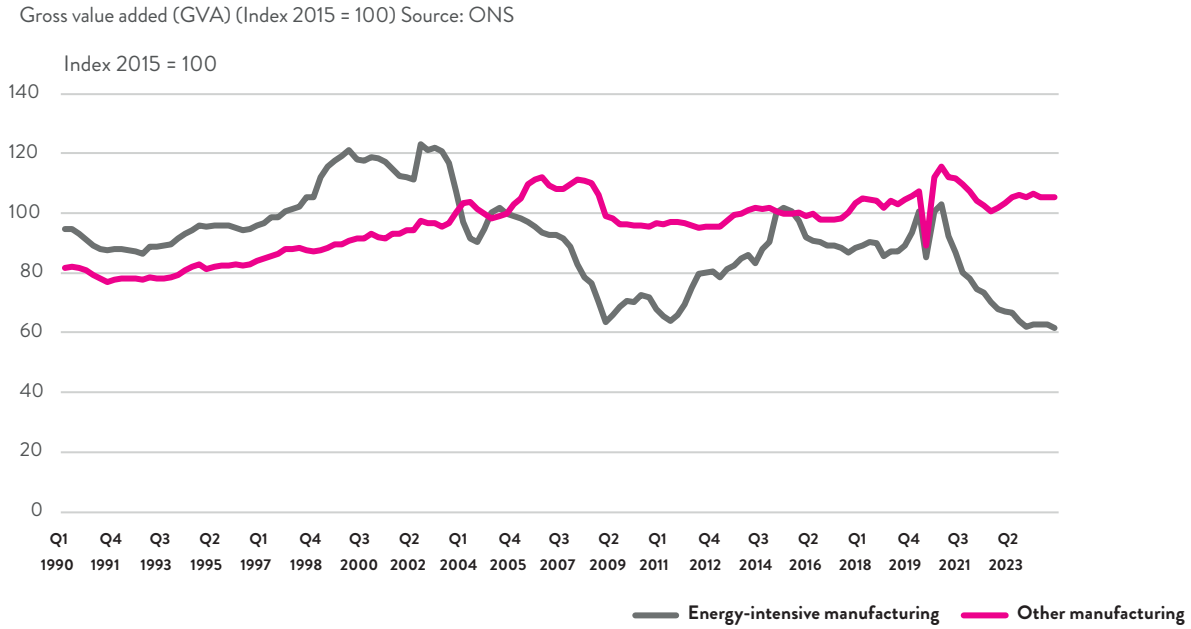
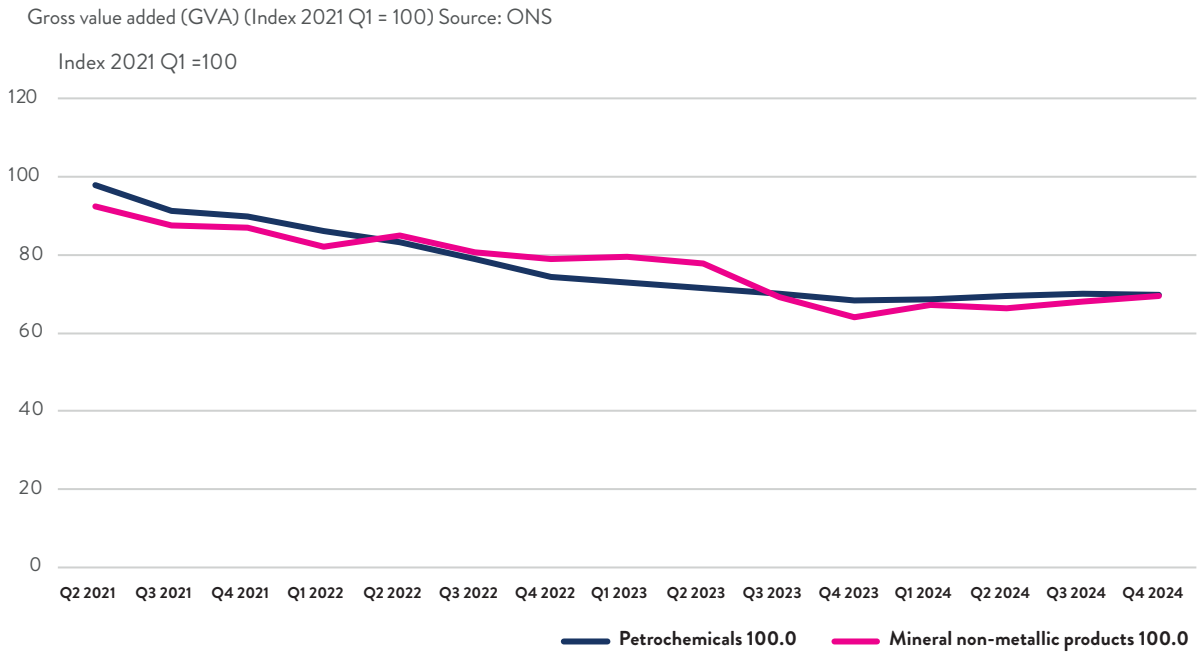


Figure 10: GVA of key sectors



This has serious implications for the UK's industrial resilience in the form of systemic weakening of the remaining energy-intensive sub-sectors still in operation in the UK (which will be explored in Sections 5 and 6) and increasing reliance on imports.

Dealing with the structural issues behind these high energy costs is essential if the UK is to rebuild - or even save - its industrial base.

Extreme energy prices in the UK in relation to competitors is not inevitable. It has been driven in large measure by policy decisions taken by successive governments. Government policies can – and must – provide solutions. Whilst some government schemes (the British Industry Supercharger[8], introduced in 2024 and extending in 2026; the British Industrial Competitiveness Scheme[9], due to start in 2027) try to mitigate the impact of high energy prices for the most exposed industrial firms, for many companies this is too little and too late. The businesses being lost are often highly skilled and capital intensive and once lost from the UK are unlikely to be replaced with businesses with similar capabilities. This attrition of capabilities is reaching a critical state in the materials sector with the closure of the SABIC ethylene facility in Teesside 2025, and the decision by CF Fertilisers to permanently close its ammonia plant at its Billingham Complex[10] - both key building block materials.

As well as considering reforms to the policy structures for energy, Government needs to calculate, the impact of the Net Zero pathway on national industrial resilience, and assess how it should be modified to ensure that the current pathway does not lead to further deindustrialisation.

4.2 Technology Choices

The technology choices made to assist in the move to Net Zero can have a significant affect on the resilience profile of the energy mix. As well as impacting on energy costs, other issues affecting resilience relate to adopting increasingly complex technologies with a knock-on impact of increasing dependency on overseas manufacturing and increasing reliance on critical minerals that may be in short supply globally.

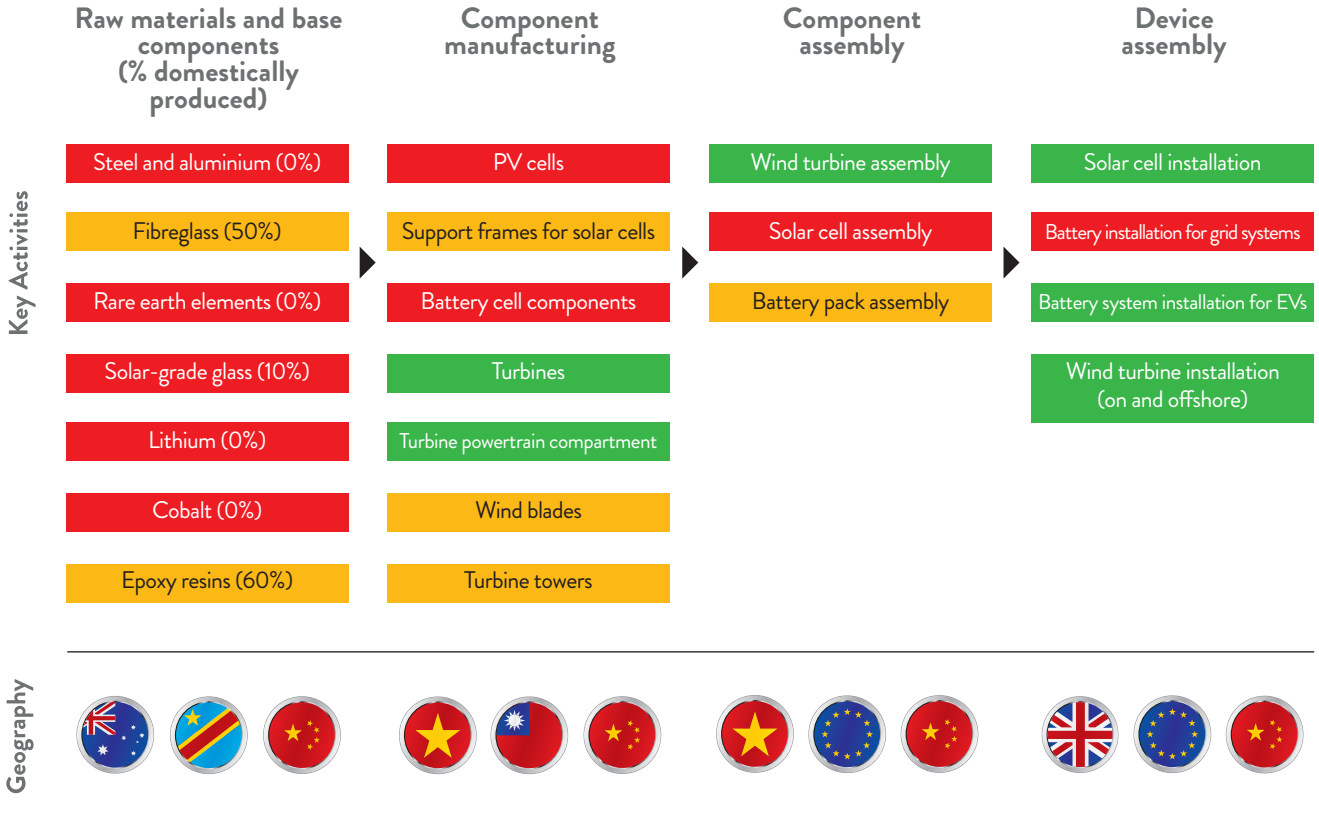
8. British Industry Supercharger gives huge boost to UK businesses - GOV.UK
9. Powering Britain's future: Electricity bills to be slashed for over 7,000 businesses in major industry shake-up - GOV.UK
10. CF Fertilisers UK Announces Proposal to Permanently Close Ammonia Plant at Billingham Complex | CF Industries

4.2.1 Technological complexity

Most of the technologies that are currently being prioritised in the transition to Net Zero involve moving from a fuel made from a single chemical process step (e.g. refined oil, diesel etc.) to much more complex systems relying on the production of a significantly higher number of materials. There is also a degree of assembly required, creating complexity, not only in the materials supply profile, but also in the manufacturing and assembly processes. Batteries, turbines and solar panels all require multiple materials to be made and then assembled. In addition, for intermittent renewables the complexity and cost increases as they require storage capabilities to be built in.

The following table shows the vulnerability of the UK's renewable energy sector to a trade crisis which interrupts the import of raw materials and components to support it. (Figure 11)

Figure 11: Outline supply chain for wind and solar



Based on analysis developed by ERM for SCI

4.2.2 Reliance on critical minerals

As the previous table shows, the UK is highly dependent on the import of raw materials and components for both solar and wind generation and for the batteries necessary to make the system function. Its ability to maintain and develop its renewable energy capacity independently in the crisis scenario envisaged by this report would be particularly seriously restricted by dependence on imported raw materials and limited domestic refining and processing capacity.

As noted in the NPC/Baringa report, access to the critical minerals necessary for the transition to Net Zero is already significantly circumscribed by the scale of international demand and the fact that much of the extraction and processing of them has either already been secured by individual countries or is subject to a global race to secure long-term access. A particular focus of global competition are the key energy transition minerals such as copper, lithium, nickel, cobalt, graphite and rare earth elements (REE), as well as other metals like aluminium and steel which are essential for the green technologies needed to achieve Net Zero.

This weakening of the UK's agency over its own renewable energy sector has intensified with the tightening of export controls announced by China in October 2025.[11] The additional uncertainties this causes to the supply of energy in the UK reduces the strength of UK industry.

The impact of restrictions in REEs - also key in industrial sub-sectors like batteries, aerospace, automotive, defence and cyber security - will be explored further in Section 5.

With an increasing number of renewable technologies becoming commercially available the UK needs to assess its energy choices with energy security and national resilience in mind.

4.3 Securing hydrocarbons for fuel and feedstocks

Section 3 outlined the fundamental importance of fossil fuel as the key feedstock for the majority of materials used today. Section 5 gives greater detail.

A strategy to eradicate all fossil fuel capability from the UK would eliminate any ability to make materials and rebuild key materials supply chains in the country. Although there are possible routes to some materials from other processes such as bio-based processes (a capacity which the UK does not have to any scale) these are not appropriate or competitive for the vast majority of materials.

For the foreseeable future, therefore, the UK - and the world at large - will need to continue using fossil fuels not only to provide competitive fuel and energy but strategically to secure materials production capabilities. Therefore a strategy that focuses on securing cost effective low carbon capability is a critical part of the national need.

The UK has seen a dramatic decline in the domestic production of primary oils since 2010, with a fall of 8.9% to 31m tonnes in 2024, the lowest level since North Sea production was established in the 1970s, and is, as a consequence, becoming more dependent on the import of hydrocarbons and processed oil, with net imports of primary oils increasing by 12% to 20m tonnes in 2024.[11]

Alongside this fall in extraction capacity, the UK has been losing its capability to refine the oil it extracts from its own deposits in the North Sea, a result of the closure of refineries and of growing incompatibility of North Sea crude with the UK's remaining refining infrastructure. Over time, up to half of North Sea oil may be incompatible with UK refining infrastructure unless upgrades are made. As a result, the UK now exports the majority of the crude it extracts – 87% in 2024 - and relies on imported crude and refined oil. Refinery production sits at around 60% of the 2000 figure, whilst in 2024, 13m tonnes of oil products were imported, the second highest figure since the UK became a net importer in 2013.

With regard to gas, the story is similar: the UK has one of the largest natural gas processing capacities in Europe. However, in the context of the UK's Net Zero goals, there is little incentive to maintain or develop infrastructure and storage, and imports – often with lower extraction costs - are rising. To maintain production during off-peak periods, the UK exports much of the gas it produces as a seasonal buffer.

11. China expands rare earths restrictions, targets defense and chips users | Reuters

In 2023, 55% of natural gas supply was domestic - a reduction of 11% since 2010.[12] In this report's hypothetical crisis scenario, given UK's low storage capacity, natural gas would potentially be exhausted after a fortnight of interrupted imports, with dramatic impacts on the ability of industry to continue production. Figure 12 illustrates the reliance on the UK of imported oil and gas.

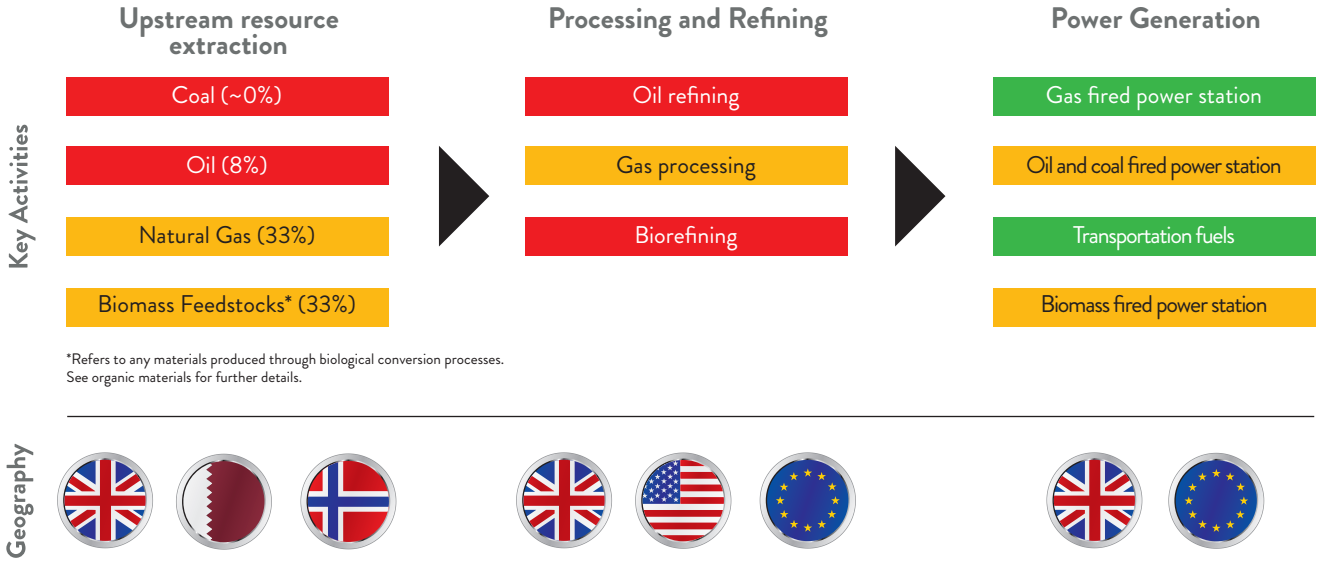
Figure 12: Outline supply chain for oil and gas [13, 14, 15]

Key 2024 statistics*

*The UK does not disclose the volume of oil it stores

**Time taken to consume all natural gas reserves in an off-peak scenario

Natural Storage capacity	3.2bn m^3
Estimated storage consumption time**	13 days
Natural gas domestic production rate	90m m^3/day
Domestic oil production rate	0.6m bpd
Domestic oil consumption rate	1.2m bpd



Based on analysis developed by ERM for SCI

The technology choices on energy are significantly reducing national resilience across a number of fronts, and consideration must be given to addressing this immediately.

Recommendations

The energy system underpins all industrial sectors, and a consistent, competitively priced supply is vital for resilience. It is recommended that Government should:

- Urgently address the impact of high energy prices on critical industries (refineries, foundational industries and chemicals) to avoid further attrition of critical capability, considering the expansion of schemes to reduce the cost of industrial energy such as the British Supercharger scheme and the exemption from costs associated with renewable energy obligations to protect them.
- Build a new energy strategy to secure affordable cost effective and low carbon fossil fuel as both energy and critical feedstocks for materials manufacture.
- Reassess the transition pathway to Net Zero to ensure critical industry is able to survive in a global market and to reduce competition for scarce or insecure power in the case of an import crisis.
- Reassess the current storage strategy to ensure energy security during the intense build-out/installation phase of the renewables infrastructure (explored in greater detail in the Materials section of this report).

12. Energy Trends December 2024
13. UK Gas Storage: Capacity, Sites and Security
14. DUKES_2025_Chapter_3.pdf
15. Pensana PLC | Magnet Metal | Rare Earths | NdPr

Materials

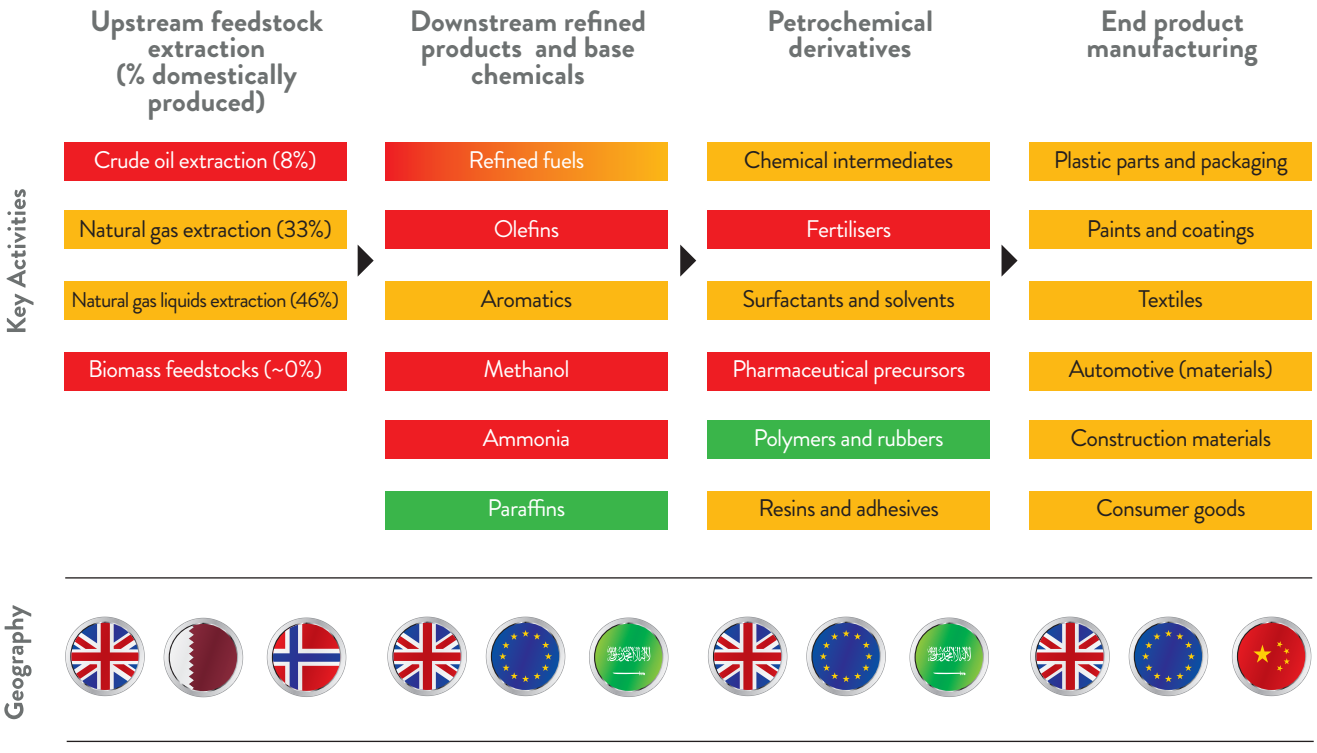
Along with the rapid decline of key production capabilities described in the previous sections, the lack of availability of feedstocks and basic materials is the greatest threat to resilience across all industrial sectors in the UK.

The UK relies heavily on imported raw materials, intermediate and end products within each industrial sub-sector. It has limited – and declining - capacity to produce base chemicals and components. A crisis which interrupts imports to the UK would impede the functioning of all supply chains on which the country depends, including pharmaceuticals, explosives, electronics, batteries, fertilisers and food. It is impossible to envisage any storage strategy that would provide the necessary resilience. Capability in manufacturing is the only basis for ensuring critical capability and capacity to adapt to a national crisis if required.

5.1 Materials: Organics

As outlined in Section 4, as well as their role as an energy source, fossil fuels are the major feedstock for the hydrocarbon ('organic') materials which form the basis of most products. The UK has had historical strengths in organics manufacturing, but over time most of this has been shut down, although the UK is still strong in the research and manufacture of some speciality materials. The manufacture of organics has been in decline primarily because of increasing issues with the lack of competitiveness of the UK for manufacture, including a Net Zero strategy that has penalised fossil fuel manufacture, and this decline is now accelerating at an alarming rate due to high energy prices. In a scenario in which trade flows into the UK are severely disrupted, gaps in the materials supply chain would rapidly emerge. Figure 13 illustrates the extent of UK dependence on imports of organic materials for feedstocks, refined products and base chemicals and petrochemical derivatives. Note that the UK no longer has methanol manufacture or any olefins capability as the last ethylene plant, the main feedstock, stopped production in 2020.

Figure 13 : High level materials supply chain [16, 17]



Based on analysis developed by ERM for SCI

16. Digest of UK Energy Statistics (DUKES): petroleum - GOV.UK
17. Digest of UK Energy Statistics (DUKES): natural gas - GOV.UK

There are no viable alternatives to using fossil fuels to create most materials, as none of the alternative technologies can be relied on to provide replacement raw material carbon sources at scale and for a competitive cost. Bio processes, for example, may be used in specific applications but suffer from competition for raw material sources and energy-intensive processing. Enzymatic processes are most suited for specialised applications as they suffer from low selectivity and again are often energy intensive. In most cases hydrocarbons will remain the only viable option for organic materials manufacture for the foreseeable future but the UK is being left with no manufacturing and increasingly no capability to address that manufacturing gap as companies with that capability exit the UK.

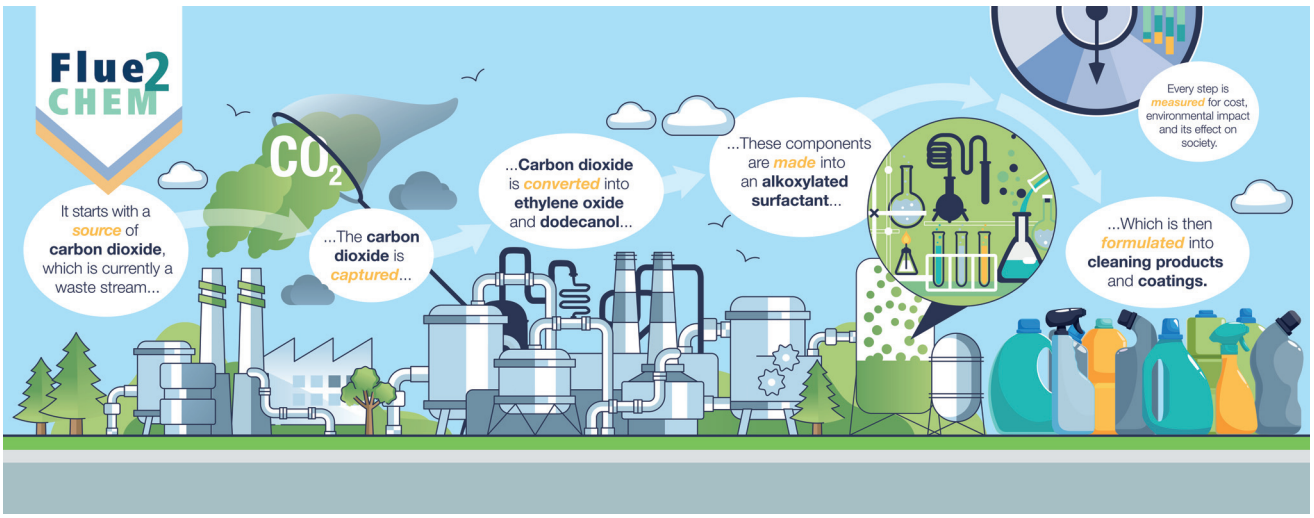
To build resilience the UK needs to urgently develop a strategy to enable a viable integrated feedstock-to-materials chain to be secured in the UK.

The core objectives would be to ensure key feedstocks are secured and that the manufacturing is sustainable from both a low carbon footprint as well as a cost competitive aspect. To that end new technologies such as hydrogen and CO_2 utilisation would need to be taken from lab scale and deployed on commercial scale, alongside the feedstock manufacture, and policy frameworks adjusted where required.

Developing CO_2 technologies is the 'holy grail' as there is limited demand for CO_2 globally as a product in its own right. Many Carbon Capture and Storage / Utilisation technologies are addressing CO_2 storage only and these are only a cost to the manufacturer. However new technologies that convert CO_2 to be a viable alternative feedstock to fossil fuel provide the potential for captured CO_2 to be used as a co product, replacing fossil fuel carbon from some applications.

The UK has acknowledged strengths in research and innovation, and UK scientists are helping drive forward research into using recycled carbon dioxide from flue gases as a new pathway to materials. The recently concluded Flue2Chem project[18] brought together 17 partners in industry, with academia and some SMEs to develop new technology to recycle industrial CO_2 into consumer cleaning products in place of virgin fossil fuels. This consortium consisted of major players in the UK - Unilever, Johnson Matthey, BASF and Reckitts, along with SCI and others, and new technologies were developed and patented. However, despite the success of the 2 year project the technology is being developed further overseas, as there is no mechanism for scale up support in the UK.

Figure 14 : Flue2Chem - Courtesy of SCI



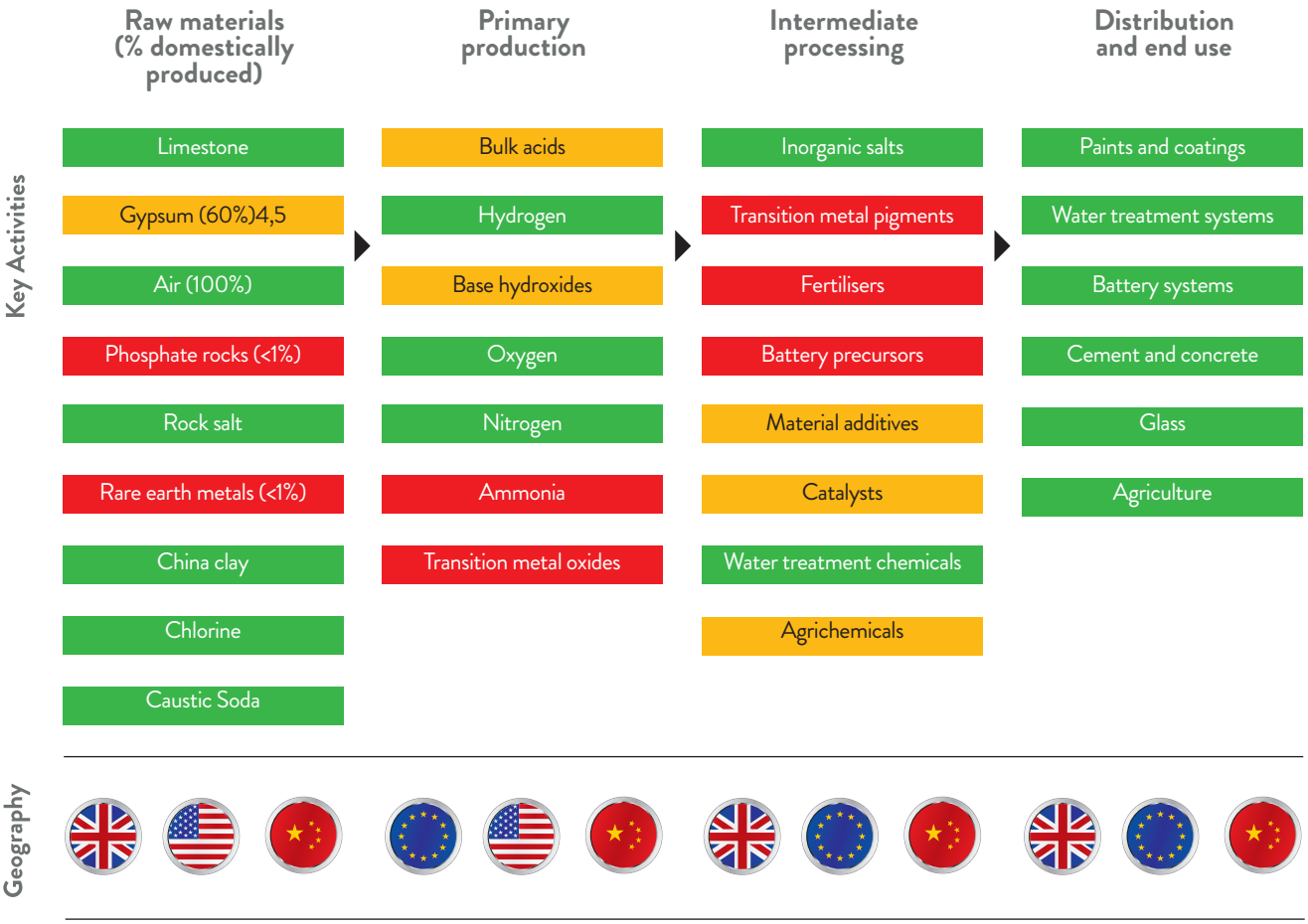
More research is necessary across the whole supply chain before the full potential advantages of domestic renewable carbon as a new feedstock running in parallel with fossil fuel feedstocks can be assessed. However a national programme that supports applied research, technology optimisation and scale-up in the UK could build on this foundation to rebuild a sustainable chemical industry and help underpin our national industrial resilience. Without such an intervention the last remaining remnants of the chemical industry will disappear from the UK placing the UK in a more perilous situation.

18. SCI - Flue2Chem

5.2 Minerals: Inorganic

The UK has substantial domestic sources of some important inorganic materials (i.e. non-hydrocarbon minerals and metals) which are widely used in construction, manufacturing, and other industrial applications. For example, limestone, clay and salts are distributed in abundance across the country, and the UK has a well-established mining and quarrying infrastructure.

Figure 15 : Inorganic Supply Chain [19, 20, 21, 22]



Based on analysis developed by ERM for SCI

However, there are some specific gaps in the UK's self-sufficiency which give serious cause for concern. A notable example is ammonia - a material derived from fossil carbon and critical for the production of fertilisers, pharmaceutical precursors, solvents and explosives. Green ammonia, a low-carbon alternative to conventional ammonia, produced using renewable energy and a precursor to green hydrogen, also has the potential to support the decarbonisation of UK industry, power generation and transportation. The 2023 closure of the CF Fertilisers ammonia production facility at the Billingham Complex in Teesside (citing high natural gas prices in the UK, the impact of carbon costs and declining domestic demand due to shutdowns of industrial customers)[23] means that, whilst the UK retains extensive capacity to process ammonia, the UK now relies almost entirely on imported ammonia as a raw material.

A strategy to stockpile is not credible for these materials and manufacturing capability is the only route to building national resilience. There is significant mothballed storage capacity in the UK following the closure of multiple production facilities which could be utilised. Options to increasing domestic production by reopening closed plants and integrating them into the developing CO_2 (CCU) infrastructure to produce blue ammonia (ammonia produced using natural gas with CCS – a lower-carbon alternative to conventional ammonia) could be assessed[24].

19. Resilience for the Future: The UK's Critical Minerals Strategy - GOV.UK
20. United Kingdom - cefic
21. UK mineral statistics - MineralsUK
22. Gypsum in Construction | Types, advantages, disadvantages, harm
23. CF Fertilisers UK Announces Proposal to Permanently Close Ammonia Plant at Billingham Complex | CF Industries
24. Hydrogen production business model - GOV.UK

Like other energy-intensive areas of industry, manufacture of inorganic materials has faced serious challenges from declining UK competitiveness – specifically high energy costs and regulatory pressures.

An example is the cement sector, a low margin product which, for many years, has been facing strong global competition. Data published by the Mineral Products Association (MPA) in September 2025 revealed that, despite high demand and abundant limestone reserves, UK cement production in 2024 fell to the lowest level since 1950 - just half the volume produced in 1990[25] whilst cement imports tripled over the past two decades, from 12% of UK sales in 2008 to 32% in 2024. The MPA attributed this trend to cheaper foreign cement, especially from countries with lower energy costs and less stringent carbon taxes and pointed to the implications for national resilience should the sector decline further.

Measures were included in the Modern Industrial Strategy specifically to "provide continued relief on electricity prices for materials sectors like cement", and Government must continue to monitor – and where possible, mitigate - the impact of high energy prices on UK resilience in materials that form the basis of its industry. It needs to consider whether there are some materials which are so fundamental that, *in extremis,* it would be desirable for Government to intervene to retain them.

5.3 Advanced Materials: Electronics

The loss of basic material manufacture and capability creates significant challenges for key products which inevitably have to rely on imported feedstocks and materials. These are particularly consequential for critical advanced manufacturing sectors, such as electronics and batteries, which underpin so much of the technology on which the UK economy and society depend.

The UK has a world-class science and engineering base and contributes to R&D, design and innovation in the electronics sector. It also hosts a number of semiconductor fabrication facilities, mostly producing legacy or low-volume chips, with strengths in compound semiconductors and wafer epitaxy for optical and power applications, rather than large scale silicon digital chip production.[26] The current state of having mostly small, specialised manufacturing alongside limited to no capability to turn on manufacture of more basic components in a crisis for electronics needs urgent review.

Alongside the challenges posed by the decline of hydrocarbons, metals and minerals, the lack of access to critical minerals such as rare earths present an additional threat to resilience.

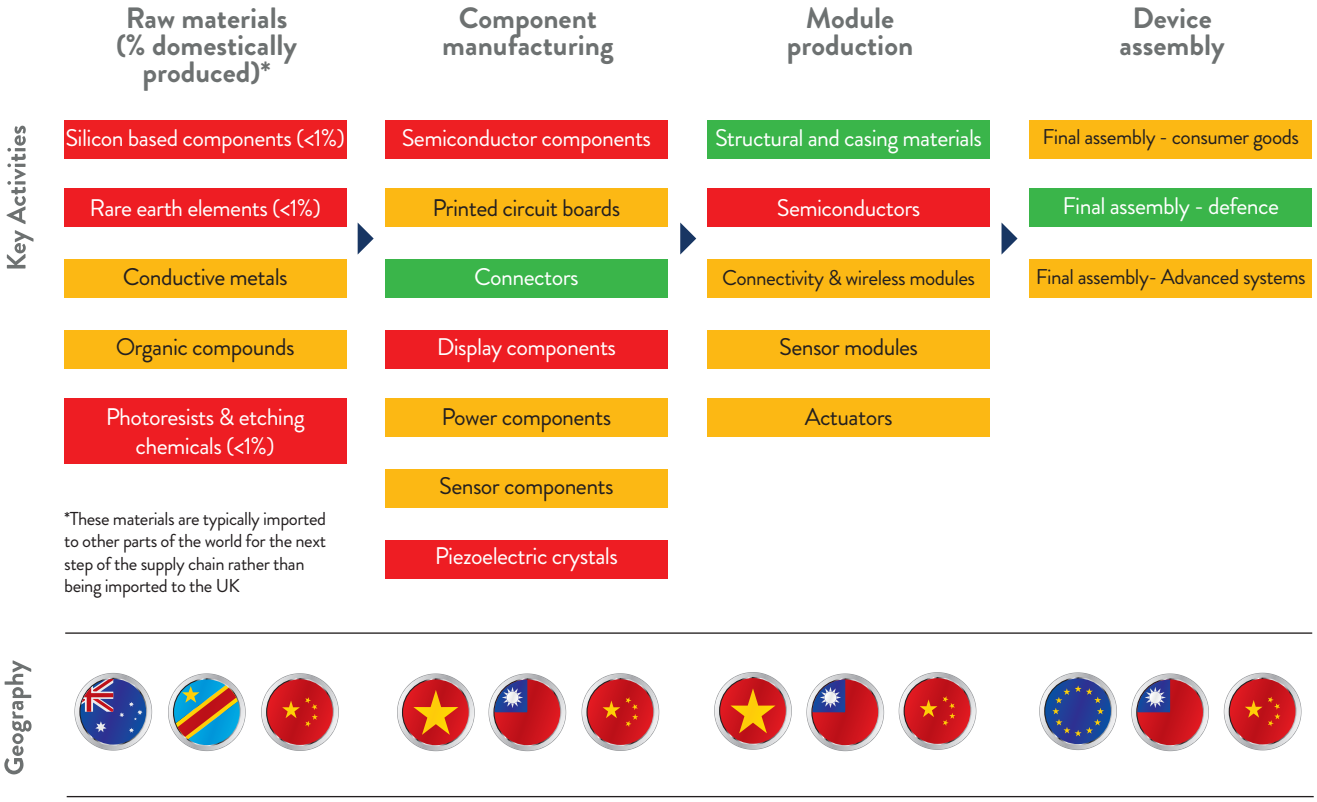
Whilst deposits of some are distributed widely around the world, many are concentrated in – or controlled by – a very limited number of countries. For example, according to EU calculations[27], 63% of the world's cobalt is extracted in the Democratic Republic of Congo; 97% of the EU's magnesium supply is sourced from China; 100% of the rare earths used for permanent magnets are refined in China. The recent announcement by China to apply restrictions of the export of rare earth elements highlights the significant challenges in accessing critical products.

A strategy to focus on recycling is undermined by the decision by Pensana in October 2025[28], to scrap plans for a refinery in the UK to process rare earths for magnets for electric cars and wind turbines. Pensana confirmed that the decision to move operations to the USA was driven by more favourable financial conditions and stronger government support there points to the essential role of government action in securing important capabilities in the UK.

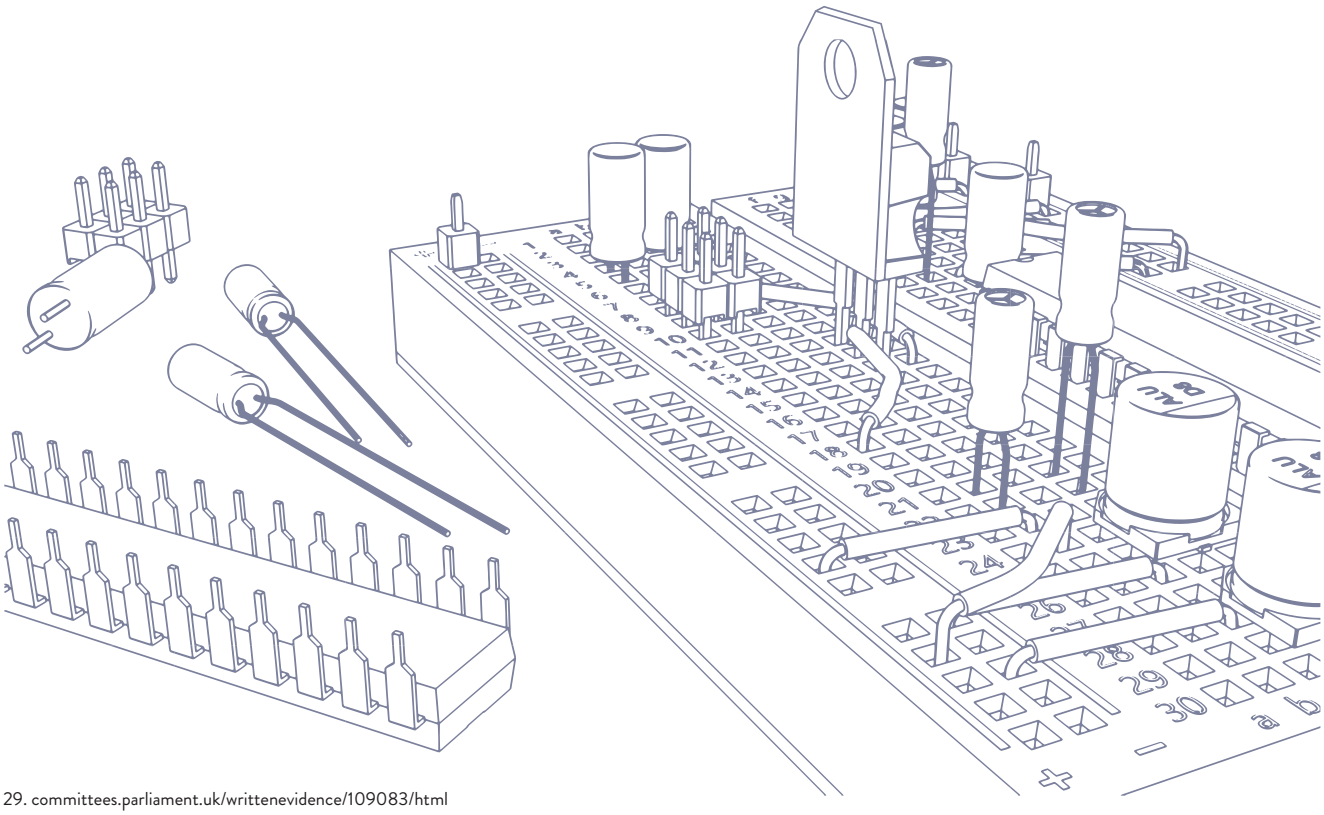
There is a deep systemic risk to the UK's industrial resilience in its reliance on long, complex, international supply chains for critical capacity – nowhere more so than in advanced electronics, as illustrated by the supply chains shown in Figures 16 and 17.

25. UK cement production falls to 75-year low
26. National semiconductor strategy - GOV.UK
27. European Critical Raw Materials Act - European Commission
28. UK suffers blow in bid to become minerals superpower - as it's snubbed by its own leading firm | Money News | Sky News

Resilience Figure 16: Electronics Supply Chain [29]

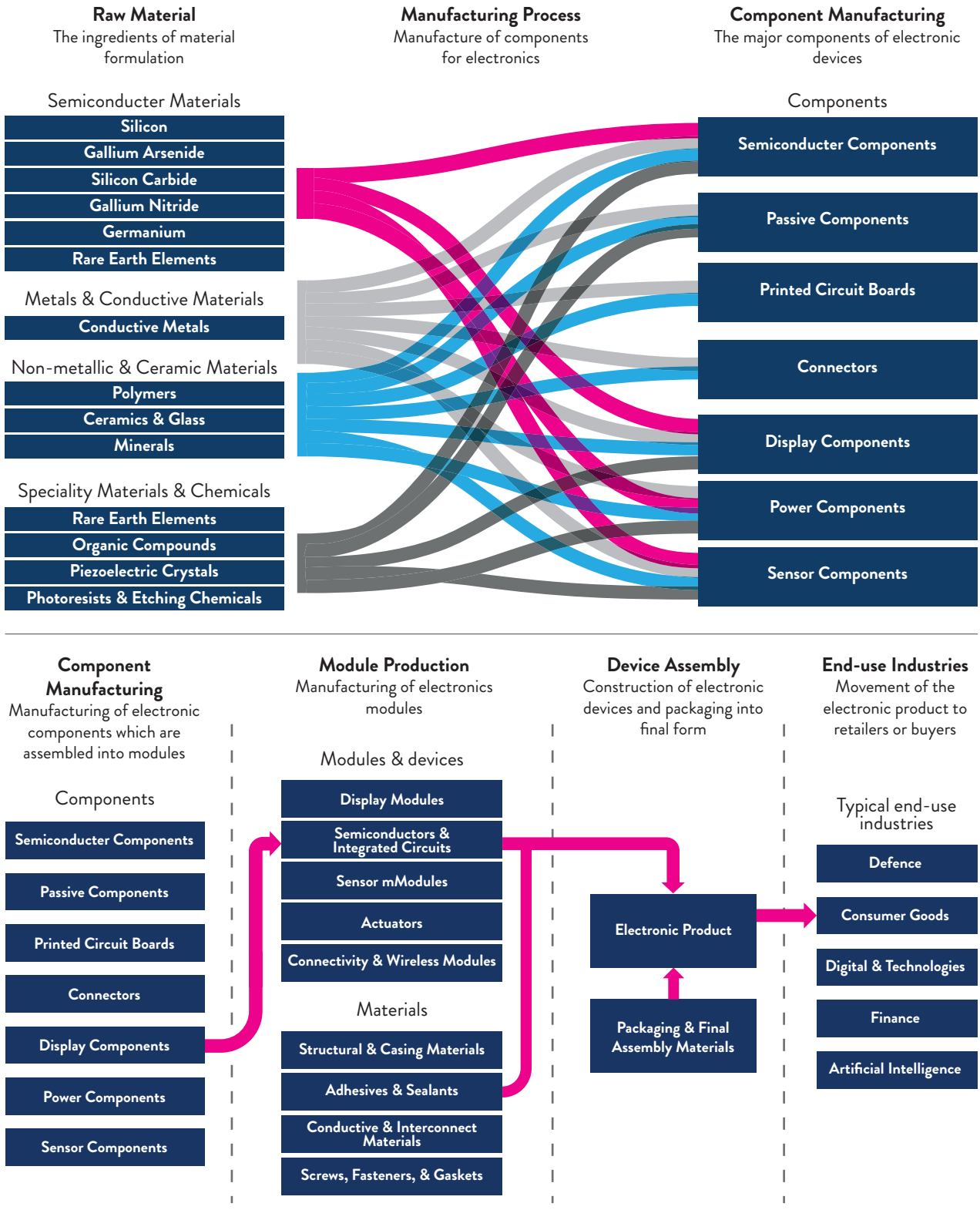


Based on analysis developed by ERM for SCI



29. committees.parliament.uk/writtenevidence/109083/html

Figure 17: Electronics Supply Chain [30, 31, 32]



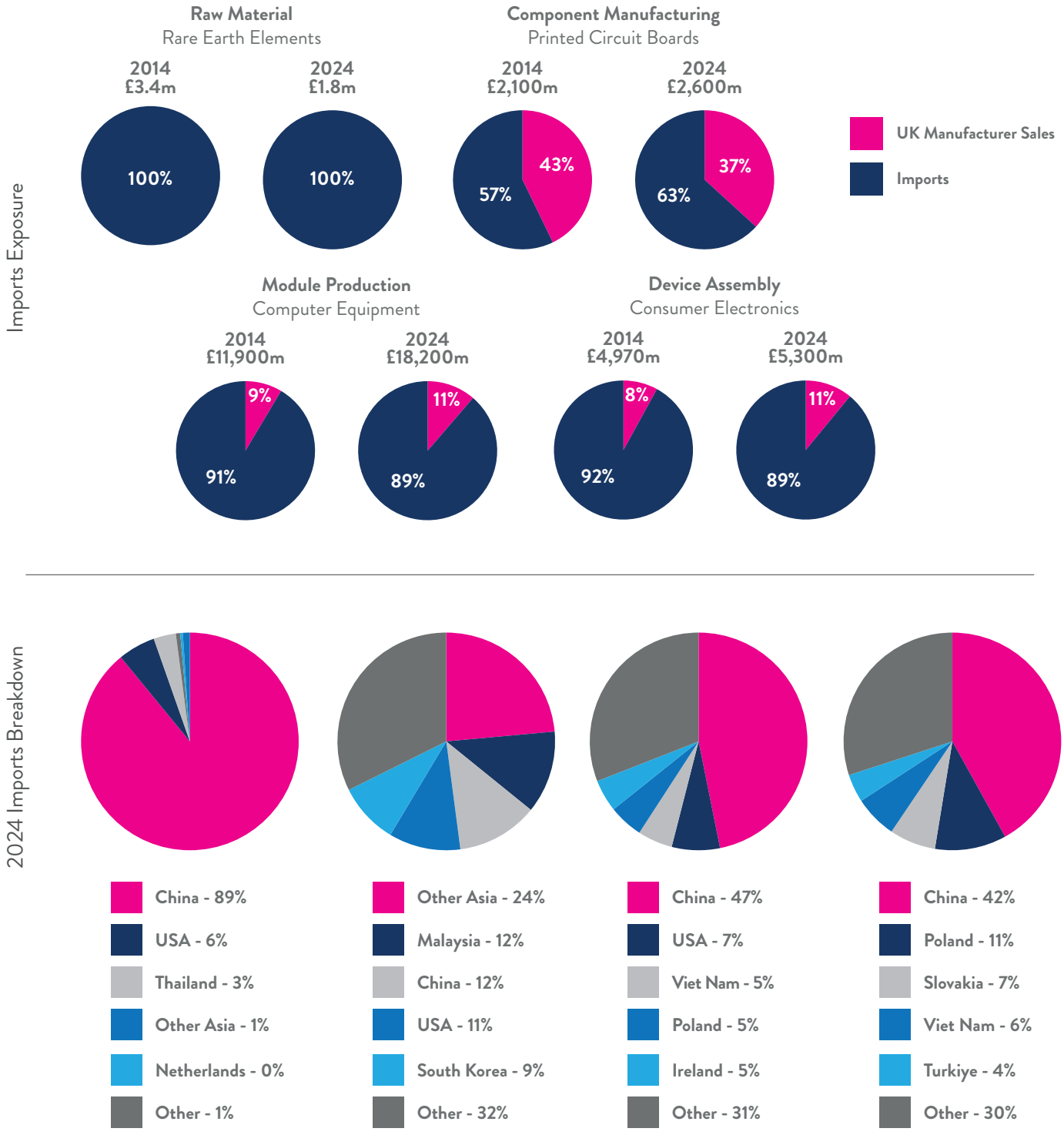
Sources: ONS UK Manufacturers Sales by Product; ONS UK Trade In Goods

Based on analysis developed by ERM for SCI

30. UK manufacturers' sales by product - Office for National Statistics
31. UK trade in goods by industry, country and commodity, imports - Office for National Statistics
32. UN Comtrade

The almost complete dependency on imports from distant countries makes the UK – and its closest allies – very vulnerable to trade disruptions at a time when the electronics industry is increasingly hardwired into all major UK systems including utilities, communications, banking, manufacturing. Figure 18 shows the scale of this dependency.

Figure 18: Value of UK electronics import dependency

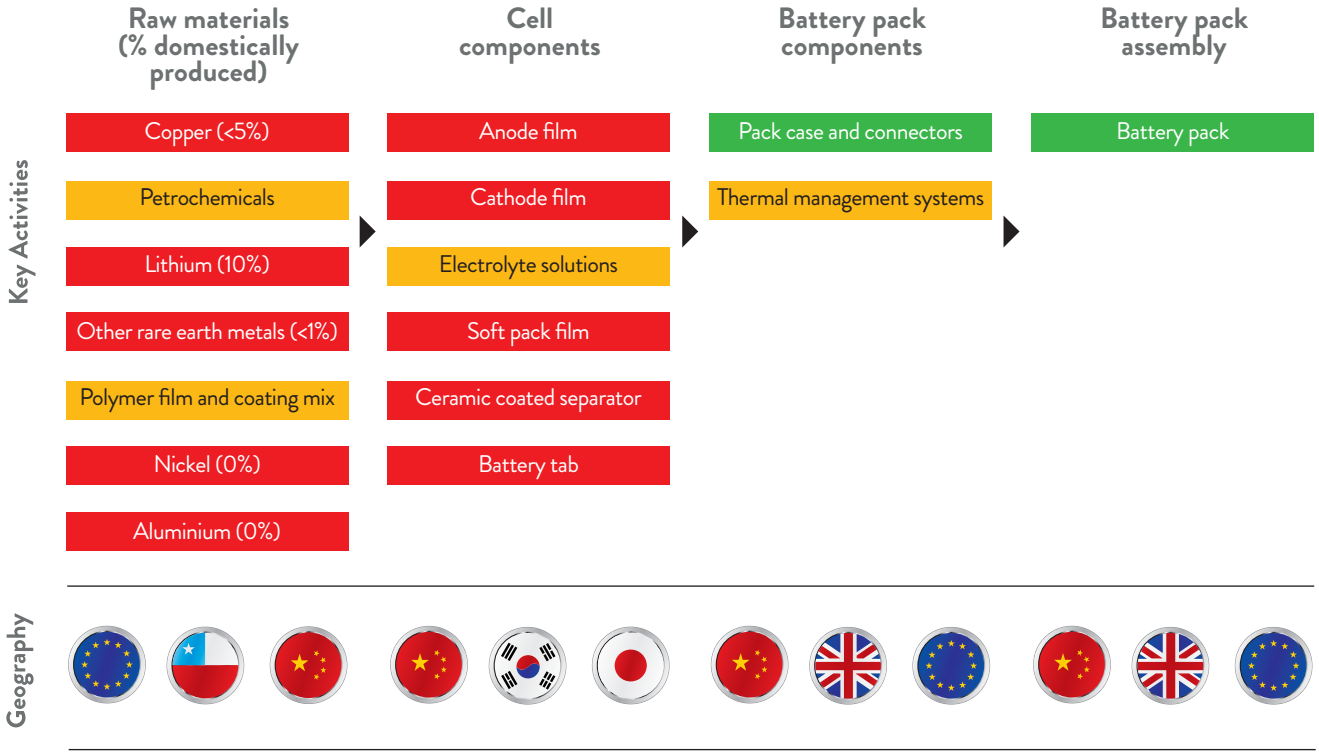


Based on analysis developed by ERM for SCI

5.4 Advanced Materials: Batteries

The UK is similarly vulnerable because of its dependence on imports to support its demand for batteries, a key sector which is experiencing rapid growth because of the drive to Net Zero. Again the UK is strong in battery R&D, driving innovation and scaling battery technology, and it has some capability in system assembly but it is almost entirely reliant on imports for cell components and critical materials and minerals, as illustrated in Figure 19.

Figure 19: Outline supply chain for batteries [33, 34, 35]



Based on analysis developed by ERM for SCI

The UK has potential to produce lithium in significant quantities but has limited capabilities to produce others such as copper. Many of the raw materials necessary for battery manufacturing are controlled by China, with components supply also centred on the Far East. The UK's capabilities in battery manufacturing are based in the automotive sector where imported components are assembled into battery packs for electric vehicles. Notably, the P66 facility[36] is a major global producer of feedstocks for anode production, but in the absence of further capability in the UK, it exports its production to China for processing.

Attempts to build battery manufacture and cathode manufacture in the UK have seen limited success exposing the importance of building strong and sustainable supply chains to deliver downstream products.

5.5 Defence

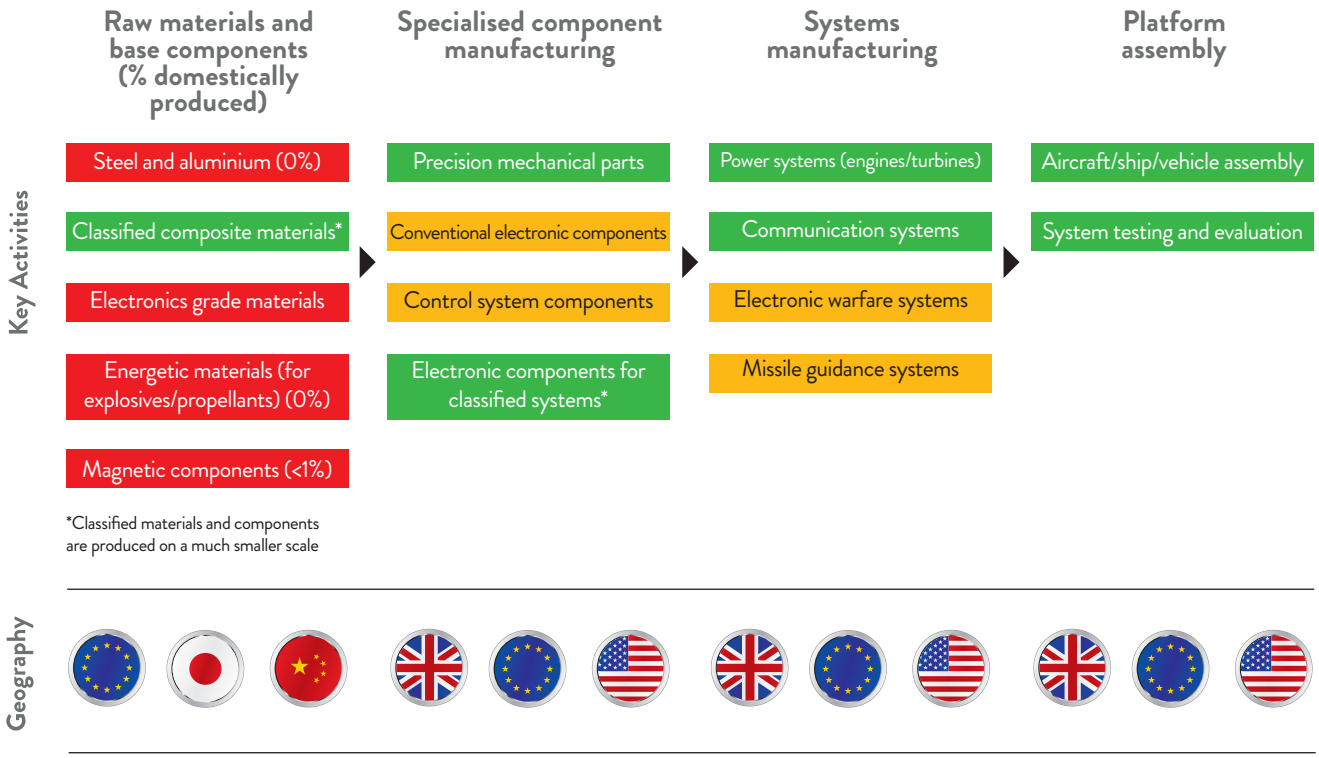
In light of the volatile geopolitical situation and the growing threat to UK security, the Government noted the urgent need for the UK to grow the country's defence resilience in its Modern Industrial Strategy and the Strategic Defence Review Strategy[37] published this year. However, the Defence Industrial Strategy[38] (published alongside the Industrial Strategy) emphasised that it is not practical to think in terms of self-sufficiency in security, and that the UK will continue to rely on traditional military alliances and partnerships for equipment, integration of forces and security frameworks. Much of the UK's defence manufacturing comes from deep partnerships with allies, with different countries producing specific components for a given system.

33. UK Battery Strategy
34. United Kingdom Imports of Copper - 2025 Data 2026 Forecast 1993-2024 Historical
35. 2021 Preliminary Economic Assessment - Anglesey Mining
36. Humber Refinery: Leading in Specialty Fuels | Phillips 66
37. The Strategic Defence Review - GOV.UK
38. Defence Industrial Strategy 2025: Making Defence an Engine for Growth - GOV.UK

The UK manufactures and assembles components for the domestic defence industry and has some self-sufficiency in systems integration and in cyber. For example, it is growing its capabilities in advanced manufacturing and precision engineering in composites and materials, such as Rolls Royce's additive manufacturing (3D printing) for jet engine parts[39].

However, as Figure 18 illustrates, should the UK be forced to increase its self-sufficiency in armaments (as assumed by this report's hypothetical scenario) the same shortage of raw materials that affects so much of the industrial base of the country will also represent a problem for UK defence industrial resilience. The UK has seen a significant decline in metals manufacturing in recent decades, particularly steel and aluminium, and global electronic and magnetic material production is concentrated in SE Asia. The absence in the UK of a production capability for sulphuric acid and ammonia leaves it with limited resilience in explosive materials and the vagaries of the materials supply chain has already been discussed.

Figure 20: Outline supply chain for defence [40, 41, 42]



Based on analysis developed by ERM for SCI

A powerful lesson in the importance of industrial resilience for national defence comes from Ukraine, which has seen a rapid pivot to self-sufficiency in drone manufacturing following the 2022 invasion. The country has become, according to the Ukrainian Government, the world's largest producer of tactical and long-range uncrewed vehicles and aims to produce up to 4 million drones each year.[43] Whilst it has been dependent on China for raw materials and components,[44] as part of its strategy of drone self-reliance, Ukraine is developing the capacity to produce not only the drones but also the components on which they rely.

That capacity has been built by focusing on decentralised innovation, supporting hundreds of domestic manufacturers, and integrating start-ups, civilian engineers and hobbyists into military supply chains.

39. AMS Collaborates with Ministry Of Defence and Rolls-Royce on the 'Tornado 2 Tempest' Project - Additive Manufacturing Solutions
40. Defence sector contributes record value to UK economy - Army Technology
41. UK's defence sector and STEM skills shortages | Guidant
42. Strategic defence review to spark UK manufacturing drive
43. Drones and defence innovation in Ukraine: consolidating wartime ingenuity | Feature from King's College London
44. China is a Key Factor in Ukraine's Surging Drone Industry — Beijing's New Export Controls May Ground It

As noted by Dr Julia Muravska, Visiting Senior Research Fellow at the Freeman Air and Space Institute at Kings College, London[45] "Ukrainian ingenuity is rooted in pre-war research and development (R&D) activities, as well as societal, political, and demographic trends and factors. At a basic level, these include a historic preponderance of STEM disciplines in the labour force, an active and diverse civil society, an embrace of digitalisation by both the government and the public, and a growing sense of national identity, bolstered by Russia's annexation of Crimea in 2014."

Whilst some of these conditions exist in the UK context, in the face of a systemic shock the UK cannot merely assume it could pivot to similar levels of capability and capacity across its industrial base, particularly given the dependence on imports of components and raw materials for their manufacture. It is also worth noting that, whilst developing its drone capabilities, Ukraine has been able to rely on more conventional defence systems, firepower and payloads provided by third countries (including the UK) - a condition that would not pertain in the hypothetical crisis scenario underpinning this report.

Recommendations

Raw materials and feedstocks: There are serious systemic issues with the UK's materials supply chains. Government should:

- Urgently develop a strategy to rebuild some materials manufacture using new technologies to develop low carbon, low cost feedstocks.
- Bring forward a detailed Critical Minerals Strategy that addresses security of access to critical minerals.
- Review the cases to rebuild selected key building block material manufacturing capability in the UK, including ammonia and ethylene.
- Prioritise and support investments into critical minerals recycling capacity in the UK.
- Ensure resilience assessments are conducted into technologies considered to be strategic to the UK's future.

Electronics: Whilst the electronics supply chain is dependent on import of critical rare earth elements and silicone components, significant gaps also exist further downstream. Government should:

- Carry out a detailed review of the electronics supply chain and develop strategies to address critical gaps.
- Fully explore opportunities to build stable, strategic supply agreements with strategic states.

Batteries: To develop a self-sustaining battery sector, the UK should focus on building a competitive supply chain with critical supplies in the UK. Government should:

- Look to develop a self-sustaining battery sector in the UK, including extracting and processing key raw materials and improving recycling capabilities for battery grade materials.
- Assess new technologies that build less reliance on difficult to source materials.

Defence: Gaps in resilience for defence-related supply chains are most severe in raw materials and base components like steel, aluminium and magnetic components. In response, Government should:

- Consider the case for stockpiling reserves of materials – e.g. metals, ammonia and ammonium nitrate.
- Promote the development and production of non-ammonia-based energetic materials and explore integration with the organic materials sector (e.g. fertilisers) by leveraging overlaps in feedstocks and processing infrastructure.
- Promote investment in electric arc furnaces to increase domestic capacity for recycling scrap steel and facilities for industrial magnet recycling.
- Diversify magnetic supply chains to reduce dependency on politically sensitive countries.

45. Drones and defence innovation in Ukraine: consolidating wartime ingenuity | Feature from King's College London

Life Sciences - Pharmaceuticals and Agriscience

6.1 Pharmaceuticals

The COVID-19 pandemic showcased the UK's ability to respond agilely to a health crisis which, as well as requiring the rapid development of new diagnostics and vaccines, brought together the research, academic, regulatory, manufacturing and distribution components of the life sciences sector. However, the pandemic also highlighted the interdependence of the UK sector on global supply chains and multinational collaboration and a limited capacity to quickly manufacture new medicines and products domestically. In terms of resilience and self-sufficiency, the UK like many other countries lacked the full capabilities to manage the pandemic. The pandemic represents a clear warning that the UK lacks self-sufficiency and resilience to cope with this kind of systemic crisis in isolation.[46]

The UK's shift towards imports – even in areas where it was once considered robust, such as medicines manufacture - was compounded during the pandemic by moves from other countries to restrict exports until their own needs had been met. The European Commission's threat to block exports to the UK of the AstraZeneca vaccine from manufacturing facilities in the EU further illustrated the risk to the UK of fragility of trade relations, even from near neighbours, in times of crisis.

The UK pharmaceutical sector benefits from a powerful innovation ecosystem founded on the presence of the global powerhouses of AstraZeneca and GSK. There is strong R&D across the supply chain from academia, through SMEs to the international giants. The sector contributes a total of c£34bn in GVA to the UK economy and supports more than 300,000 jobs across the UK. It was this science ecosystem that underpinned the development of the Oxford-AstraZeneca COVID-19 vaccine - an undisputable triumph for the UK's life sciences sector.

But this sector – generally considered to be a jewel in the crown of the UK industrial realm - has been in decline for almost a decade. Previous SCI reports have shown that relative to other countries, the UK's share of foreign direct investment in life sciences has fallen (from 2nd place in global rankings in 2017 to 8th place in 2023). Industry interventional clinical trials initiated in the UK have decreased by 8% since 2017/18, largely attributed to slow regulatory timelines, poor recruitment and high costs. The UK has dropped from 5.4% of global pharmaceutical exports (2018) to 3.8% (2023), and over the last decade employment in life sciences in Europe has grown by 20%, whilst remaining flat in the UK.[47]

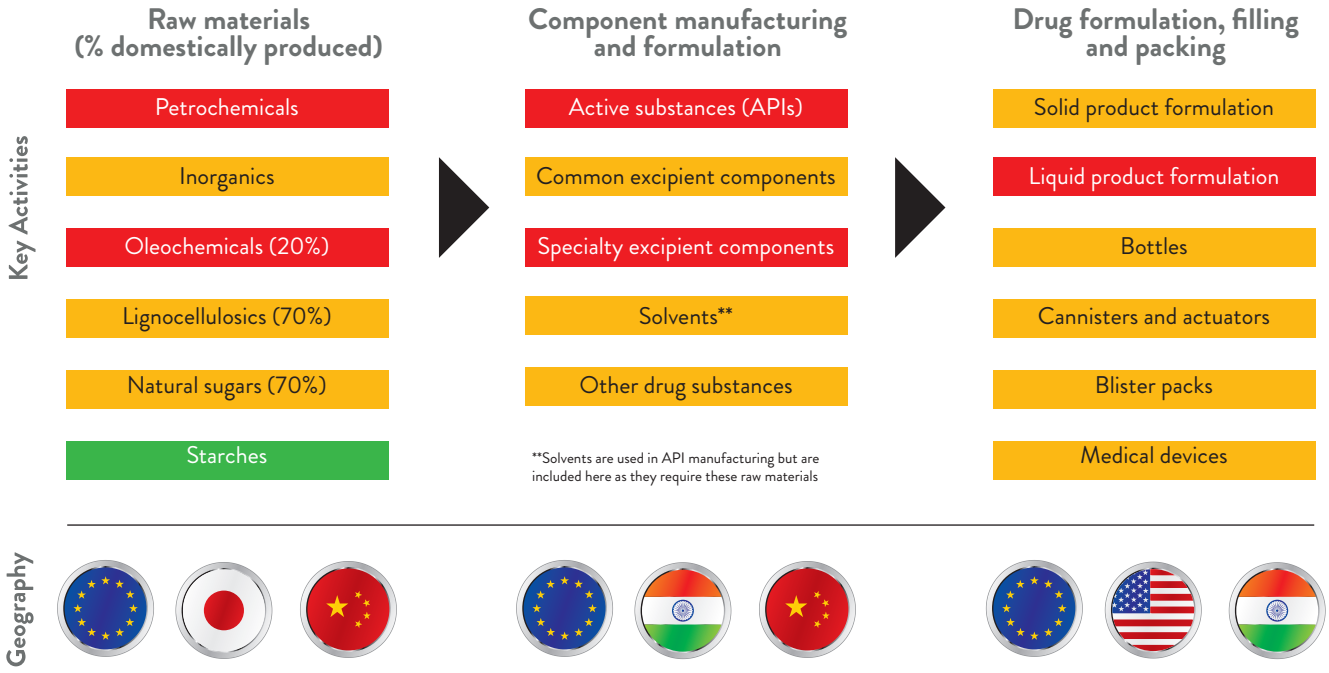
The pharmaceutical supply chain is now heavily dependent on imports due to limited raw materials and a decline in manufacturing capabilities (Figure 21). The loss of manufacturing capacity is not only a cause of job and export decline, but it also leaves the UK more vulnerable in any future global health threat, and more reliant than ever on imports.

46. Resilience and preparedness (Module 1) - UK Covid-19 Inquiry
47. UK economy losing out on £15 billion a year as life sciences investments shift overseas

Figure 21: Outline supply chain for pharmaceuticals

Key 2024 statistics

Total prescriptions	1.26 bn
Prescriptions increases on 2023	4%
Most dispensed medicines by volume	1.Atorvastatin (65.5m) 2.Amlodipine (37.4 m) 3.Omeprazole (35.7 m)
Shortage warnings	1,938



Based on analysis developed by ERM for SCI

The reality is that the UK has limited capacity to produce pharmaceutical grade raw materials following the closure of critical manufacturing sites over the last five years, including the INEOS ethanol plant in Grangemouth, which closed citing high energy prices and carbon taxes[48]. Pharmaceutical manufacturing is increasingly focused on global hubs in China and the USA as both countries seek to build integrated domestic supply chains.

The UK also lacks the medicinal plants and minerals used as raw materials in pharmaceutical products, and while many domestic and international contract development and manufacturing organisations still operate in the UK, large scale manufacturing often takes place overseas. There have been few recent investments in new large-scale facilities whilst, by contrast, several companies have announced major investments in the USA, China, the EU and elsewhere.[49] Ireland, in particular, has been benefitting from new investment – for example, AstraZeneca's new API (Active Pharmaceutical Ingredients) plant is being built in Dublin rather than Macclesfield.[50]

48. Confirmed: Grangemouth, the UK's oldest refinery, is to close in 2025 | Fuel Oil News
49. Merck scraps £1bn expansion in the UK over lack of state investment - BBC News
50. 5 reasons AZ may be siting its new plant in Ireland, not UK | pharmaphorum

More tellingly and worryingly from a UK resilience perspective is the recent collapse of the AstraZeneca's plans for a new vaccine manufacturing facility in Speke. The new facility would have provided a major boost to UK manufacturing capacity with flexibility to make, fill and finish different vaccines that may be required in any future health threat. The plan reportedly collapsed as the grant offered by Government was considered by AstraZeneca to be both too little and too late.[51] This must serve as a key wake-up call for the Government and the sector as a whole - the UK simply cannot afford to lose such opportunities in the future.

As a result, the UK produces just one quarter of the generic drugs it consumes, and the NHS, which relies heavily on cheaper generic drugs, already experiences regular shortages of key medicines.[52]

Successive Governments have recognised the need to attract more investment into UK medicines and life sciences manufacturing. Grants for medicines manufacturing have been available for a decade, but these are relatively small and have had limited impact as other factors such as energy costs and taxation have worked against new large-scale investments. The 2024 government announcement of £520m to improve supply chain security in pharmaceutical manufacturing was welcome, as was the inclusion of energy price relief measures in the 2025 Industrial Strategy – but they have not done enough to offset the impact of high energy costs which are presenting such a challenge to UK manufacturers.

Announcements in 2025 from GSK and AstraZeneca, the leading UK based global pharmaceutical companies, that they are to invest in new manufacturing capacity in the USA are a sign that the UK is not providing the right environment for this essential part of the life sciences ecosystem – the part that generates substantial export revenues for the UK. Other companies are cancelling major planned R&D and smaller investments in the UK citing the NHS medicine pricing regime as a major factor in their decision-making, but research commissioned by SCI suggests that the broader investment environment and governmental attitude to business are also playing a role. A further announcement by AstraZeneca that it is to dual list in the US highlights the frustration of companies to gain traction to invest in the UK as the UK has so far failed to address its poor competitiveness. The poor competitiveness and lack of attention to these critical companies must be urgently addressed before more of the sector is lost to global competitors and the UK's resilience is further weakened.

6.2 Agriscience and food production

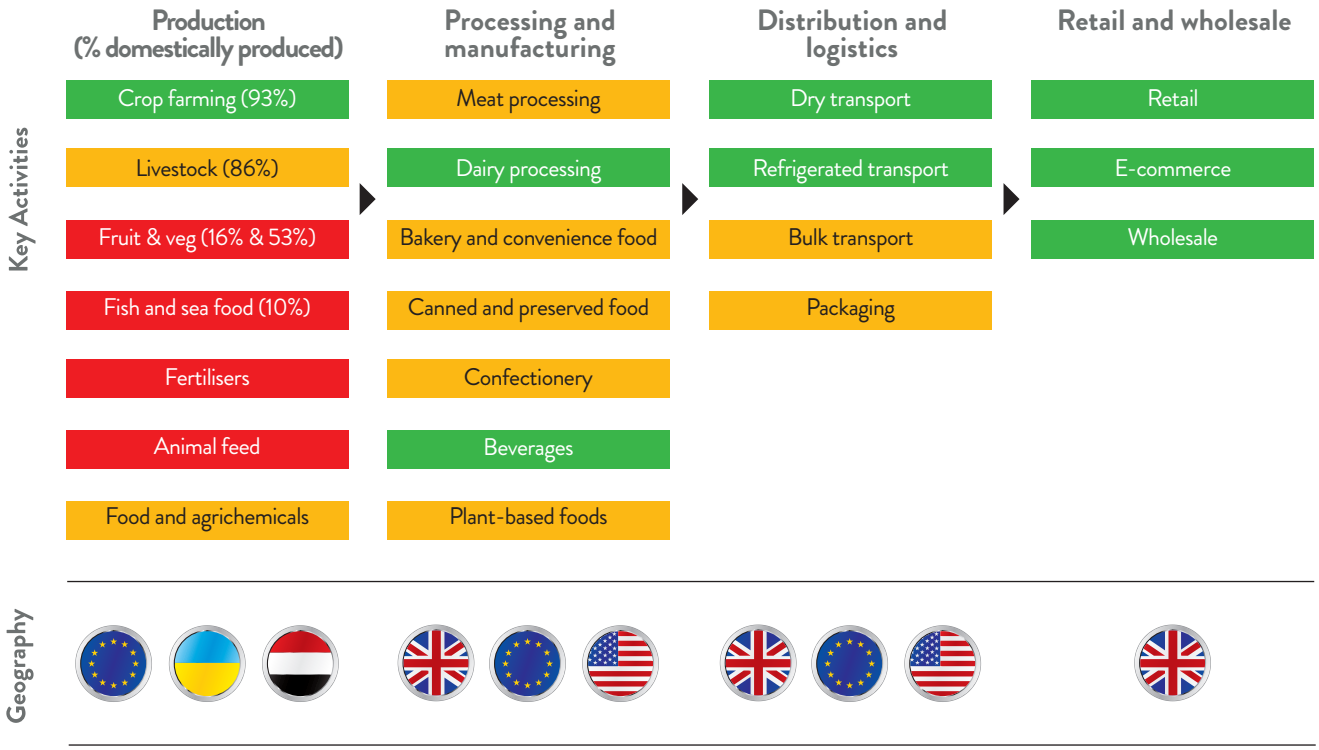
The National Preparedness Commission's 2025 report, *Just in Case: 7 steps to narrow the UK's civil food resilience gap*,[53] authored by Professor Tim Lang, described in detail the vulnerability of the country's food security to external shocks and climatic shifts, and the extent to which those challenges have been compounded by successive government policies.

Whilst the UK is almost self-sufficient in cereals and livestock, the UK imports around 40% of its foodstuffs, including 90% of fish and seafood, and 50-85% of fruit and vegetables depending on the season. The just-in-time food transport system on which the UK has come to depend may be efficient, but it is highly vulnerable to disruption, relying on a small number of bulk wholesalers and retailers as well as frictionless trade and minimal stockholding. The system demonstrated some resilience during the pandemic, but there are inherent vulnerabilities in its dependence on speed, coordination and key transport links, and an urgent need for a contingency system.

In a sudden interruption of trade, there would be immediate, severe shortages. There would be little possibility of rapid domestic substitution as the UK holds no strategic grain reserves and cannot grow some foods due to its climate. (Figure 22).

51. AstraZeneca ditches £450m investment in UK plant - BBC News
52. Medicines shortages - House of Commons Library
53. NPC-Just-in-Case-Main-Report_PDF-Download.pdf

Figure 22: Outline supply chain for food production



Based on analysis developed by ERM for SCI

This report does not seek to rehearse these issues of food supply and delivery systems. However, it does briefly consider the opportunities for innovative industry to help address the issues of food insecurity by using science and technology to increase UK crop efficiency and yields.

The UK's agritech and agrichem sectors are notably strong, again being derived from the industrial base of ICI (Syngenta is a spin out of ICI). The UK boasts world-class science R&D, with high levels of investment in food innovation and automation, including robotics and drone technology. But again – a familiar theme - the sector is highly dependent on imports not only for foodstuffs, but also for vital raw materials such as fertilisers (including ammonia), animal feed and oils.

Although natural fertilisers such as manure and seaweed could be scaled up, this reliance on imports for agrichemicals would make it difficult to intensify production by greater use of fertilisers. Shortages of domestic capacity in pesticides would undermine yields and limited supplies of energy in a time of crisis would lead to competition for the power which could otherwise help increase production of fruits and vegetables (grown in heated glasshouses).

Recommendations

The UK must focus on restoring domestic capacity of essential pharmaceutical precursors, and ensure the business environment incentivises drug producers to manufacture medicines in the UK. Government should:

- Assess opportunities to establishing pharmaceutical manufacturing hubs focussed on producing essential drugs currently sourced from Asia, in particular high-value and complex active pharmaceutical ingredients (APIs) and excipients, while intensifying nearshoring relationships.
- Address the lack of competitiveness to facilitate more inward investment.
- Consider the case for stockpiling critical medicines.
- Leverage the UK's strong agritech capabilities to expand domestic fresh food production and improve productivity, and promote emerging sustainable manufacturing such as green/blue ammonia to improve domestic fertiliser supply.

Conclusion

The combination of elevated geopolitical tensions, threats from national and non-state actors through terrorism, cyberattack and disinformation, and natural hazards like climate change and pandemic present serious challenges to the UK's national resilience.

The UK's once integrated materials manufacturing capability has been decimated over recent decades following the decline of ICI, and the remaining capability is small and being pushed to near extinction. Critical industrial capability is being lost as companies are leaving the UK.

The shortage of domestic critical raw materials, decline of domestic industrial capability and growing reliance on complex and fragmented international supply chains leaves serious gaps in the UK's ability to withstand a significant interruption to imports of supplies and energy lasting any more than a fortnight. This analysis suggests the lights would – quite literally - start going out after a fortnight of blockade or effective isolation.

It will take concerted focus, from policymakers and business working together, to start to close this industrial resilience gap. Without significant intervention the problem will continue to grow. Work must start now.

Urgent action is required:

We need a clear understanding on the part of government, the private sector, civil society and citizens of the significance of industrial resilience - and an open, nuanced, public conversation about what it will take to achieve it. The kinds of intervention recommended in this report could be both politically and economically contentious. They pose potential challenges to the UK's economic model which in recent decades has valued minimal government intervention and free trade response.

Policy recommendation: The UK urgently needs to create a Critical Materials Manufacturing Strategy (CMMS) to sit alongside the Critical National Infrastructure framework and mandate a national body to monitor and recommend actions to improve industrial resilience. The role of a Critical Materials Manufacturing Strategy would be to:

- Identify the specific industrial functions which are essential for national resilience, and design a plan to optimise their ability to continue to operate in a crisis
- Identify which companies or organisations the UK depends upon to maintain those key capabilities and heighten policymakers' readiness to take action to support them if necessary. It should consider whether HM Treasury needs to reassess its value-for-money calculations in the case of critical sub-sectors deemed at risk of failure
- Determine whether any of the country's 'lost industries' should be rebuilt or built from scratch and develop a plan of action to achieve that
- Assess the case for strategic stockpiling of critical materials, determine what infrastructure would be required and decide who would be responsible for developing and maintaining it
- Recommend how industry should be incentivised to substitute domestically-produced materials for imported ones
- Increase research into recycling of valuable waste materials, including captured carbon, and incentivise industry to make use of it
- Assess where market distortions (eg tariff regimes) endanger critical domestic industries and fully consider the implications in any trade negotiations.

A recurring feature of this report is the challenge posed to the UK's industrial resilience by the current transition pathway towards Net Zero.

The reduction in the UK's carbon footprint over the last decades has been achieved in part through the decline in domestic carbon-intensive industry and its substitution with cheaper products and materials produced (often with greater carbon intensity) overseas. Whilst, in time, R&D (much of it carried out in the innovation hubs of the UK) will enable renewable energy to replace virgin fossil fuels, for now they remain fundamental for energy, fuel and industrial feedstocks

However, as long as the UK remains dependent on them, the decline of our fossil fuel sector has significant implications for national resilience.

Policy recommendation: In that context, the Government must:

- Acknowledge the UK's continued dependence on fossil fuel and feedstocks if it is to support a genuinely sustainable roadmap to decarbonisation
- Recognise the complexity of the science and technological advances that will be needed to underpin this transition, and be realistic about the speed with which innovators can develop solutions and build new, secure, competitive supply chains
- Promote initiatives to improve the circular economy for critical minerals (e.g. promoting efficiency in manufacturing techniques, investing in greater domestic capacity for recycling rare earth metals (like the first rare earth magnet recycling facility being developed in Birmingham), and developing domestic capacity where possible and supporting research into rare earth metal beneficiation (i.e. upgrading mined material into purer concentrate).

This analysis makes it clear that the UK's industrial base would struggle to 'go it alone' in the event of the hypothetical scenario that interrupts imports for any length of time. In common with so many countries, it has become too intensely dependent on long, complex, international supply chains. The better case scenario is that at least some imports from geographically neighbouring countries are possible. In that case, the UK must develop an understanding of the opportunities for increasing friendshoring and reducing dependence on imports from distant, more politically sensitive countries.

Workforce development and skills retention are critical across all sectors and Government should:

- Prioritise targeted upskilling initiatives to improve the pipeline of skilled workers in electronics, defence and pharmaceutical industries. This should include protecting university science provision, expanding technical education, vocational training and strengthening industry-academic partnerships
- Promote reskilling programmes to retain valuable labour while accelerating the UK's shift to a low-carbon, self-resilient energy system.

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