techUK
FOR WHAT COMES NEXT

Open and secure

Charting a path for UK tech in a world of resurgent strategic competition

May 2023

Contents

Overview

The world is becoming a more fractious and divided place. Recent years have seen the established norms of globalised trade eroded. From trade disputes between the world's two largest economies to actual wars of aggression being fought in Europe, the old certainties have disappeared.

This has profound implications for the United Kingdom as it continues to chart a path outside of the European Union. With the exports of goods and services totalling £813 billion and imports totalled £898 billion in 2022, the UK is highly exposed to changing international events.

The UK's tech sector is even more exposed. The supply chains for the physical technology products that the entire digital economy is built on are global in nature. As the recent techUK report *Risks in Tech Supply Chains* highlighted, across the huge number of complex supply chains that exist, some common features include: needing vast quantities of diverse raw materials and minerals that often come from unstable places; manufacturing that is heavily located in East Asia; and the reliance of sea routes to deliver these goods to markets across the globe.

In a world of heightened geopolitical tensions, all of these elements are more vulnerable to disruption. This is increasingly recognised across the West, with ever more measures being taken to boost each country's 'economic security'.[1] However, these policies, such as the United States of America's CHIPS Act and the Inflation Reduction Act, and the responses from the EU with the Net-Zero Industry Act, demonstrate a lack of coordination and result in potentially costly competition between allies.

The seeming abandonment of restraint when it comes to industrial policy and the subsidies they entail, leaves middle powers such as the UK particularly exposed. Unable to compete with the costs of industrial policies across the board, and lacking the protections of the international trading order as its previous defenders abandon its key tenants, prioritisation and clear strategy is needed.

At home, the past year has seen a great deal of change in UK politics and policies. Notably, substantial new policies have been introduced, including the Science & Technology Framework, the Pro-innovation Regulation of Technologies Review, the Integrated Review Refresh 2023, and the International Technology Strategy among others. The February 2023 reorganisation of government also changed the institutional structures that support the tech sector internationally with the creation of the new Department for Business and Trade and the Department for Science, Innovation and Technology.

As part of these strategies, the government has set out its ambition for the UK to be a Science and Technology Superpower. Unfortunately, the reality is the UK cannot be a leader in every area where it might aspire to lead. Lacking the economic heft of larger players, the UK must pick its battles, and pick its key sectors, to double down on. It must also ensure that it is using all of the tools and levers at its disposal, in a coherent and coordinated fashion to ensure the maximum impact. Doing these things successfully will lay the foundations for the UK's long term economic success.

1. Economic security is defined by Chatham House as encompassing "a broad set of interconnected issues and elements, such as investment screening, anti-coercion instruments, research integrity, and supply chain resilience".

This report will lay out how these changes internationally and at home are impacting the UK tech sector and set out some of the ways the UK can better support business in a changing world:

- The first section sets out in more detail the international state of play, detailing the shifting geopolitical tides globally and their impacts on the sector, before exploring the resurgence of industrial policy globally as a reaction to these challenges.
- The second section will then set out how the UK has been responding so far, including the challenges between a 'Global Britain' approach and the need to ensure the UK's 'economic security.'
- The final section will then set out how the UK can chart a 'middle path' going forward, pointing to the policy areas where the UK can be a leader in global tech policy, and some of the actions that it needs to take to ensure the security and success of the UK's tech companies before concluding with detailed recommendations.

The International State of Play

International Shocks and Vulnerable Supply Chains

The established shape of the international trading system has dramatically changed over recent years. The steady state picture that stood for more than two decades of a relatively open, peaceful, and global trading system has been subjected to multiple shocks. The decoupling of the UK from the EU and the erection of trade barriers, the ongoing trade war and geopolitical competition between the US and China, the COVID-19 pandemic, and the devastating and tragic war in the Ukraine that upended energy systems and shattered the peace of Europe, have all contributed in their diverse ways to a radically different geopolitical world.

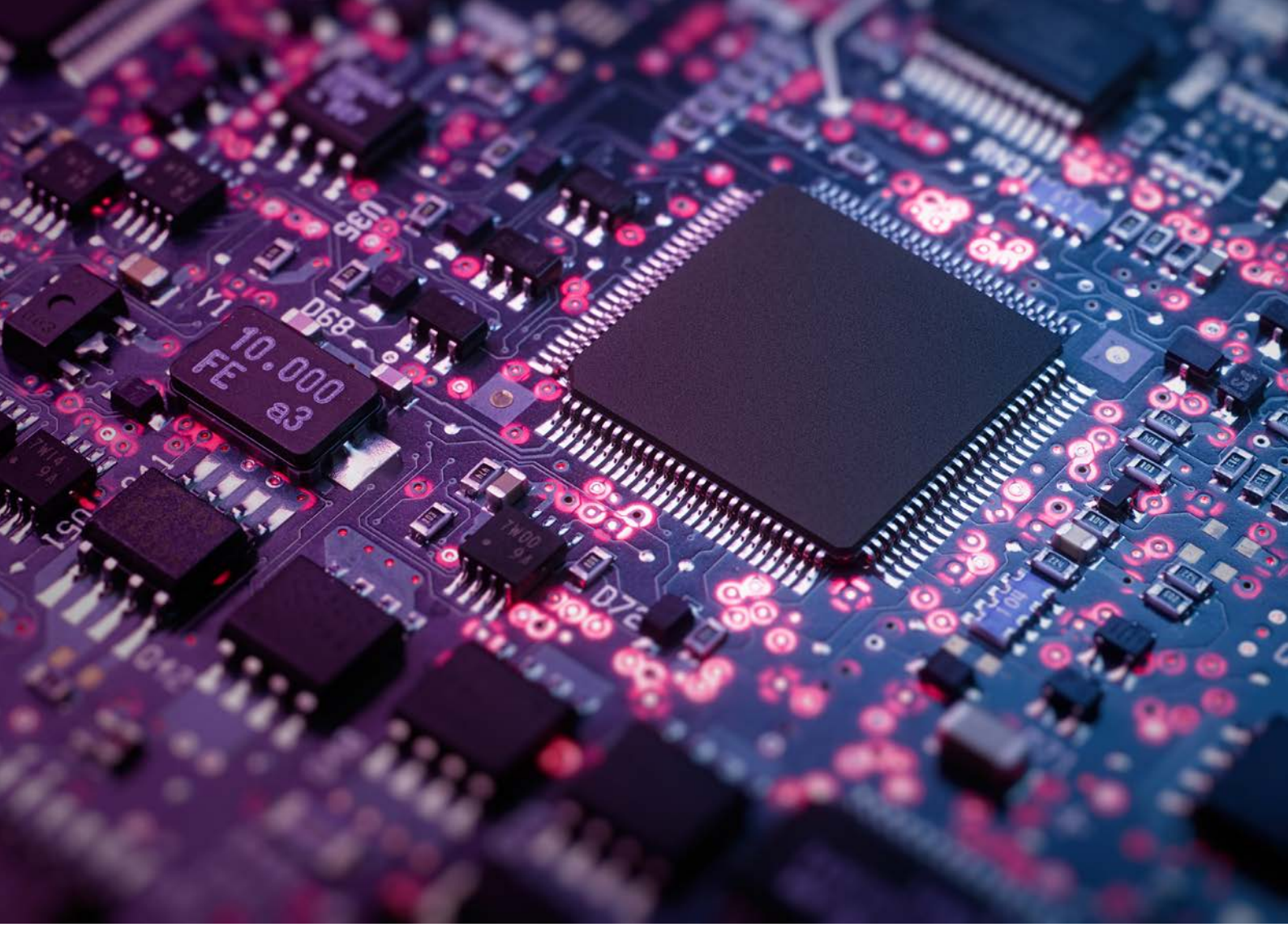
The technology sector is particularly exposed to these events. The digital world we take for granted is built on millions of devices whose value chains span the globe. Taking just Apple, their supply chain covers 52 countries, over 3 million people, and thousands of businesses and facilities covering: design and engineering, primary materials, smelters and refiners, component manufacturing, final assembly, logistics, retail stores, services, support, and recycling. As Apple demonstrates, the supply chains of technology products are not limited to just the physical goods and their production either. Immense value is embedded in them from their design and through the software that powers them. This can be seen with the UK headquartered semiconductor giant ARM, whose chip designs power the vast majority of high end smartphones across the world, as well as underpinning data centres, IoT devices and more.

Key Aspects of Technology Supply Chains:

- Tech products need a vast array of raw materials and minerals that come from unstable places;
- Manufacturing is primarily in Asia;
- Assembly often happens elsewhere;
- Most goods reach 'the West' via the sea;
- Firms make products for global markets;
- Support and after sales are regional;
- Tech is becoming more 'circular';
- Emissions hide in the supply chain, with supply chain emissions 11.4 times higher than operational emissions.

***Risks in Tech Supply Chains*, techUK, November 2022**

But despite the breadth of these supply chains, there are crucial bottlenecks. This includes, of course, the global dependence on semiconductors manufactured in Taiwan, which is increasingly viewed as a strategic vulnerability by policy makers. The House of Common's Business, Energy and Industrial Strategy Committee, recently highlighted that the territorial claims of China over Taiwan, 'coupled with the combined dominance of the Chinese and Taiwanese semiconductor markets, poses a material risk to the global economy and military and defence production capabilities'.



The Russian invasion of Ukraine further highlighted the risks down the supply chain, with the same BEIS Committee report stating how it has impacted the supply of raw materials — with Ukraine supplying around 70% of the world's neon gas, and Russia exporting around 40% of the world's palladium — both used in the manufacturing of semiconductors.

With tensions reaching new heights globally, these pinch points have taken on new importance. Greater fears of future disruptions, and a heightened awareness of the strategic importance of technologies such as semiconductors and AI, have meant that the divisions between trade and business on the one hand and geopolitics and security on the other have been eroded. As trade expert Dmitry Grozoubinski has noted for Time:

> *There was a sense that "you could let trade be trade and let people build their supply chains, make their investments, make money from wherever it makes sense to make money, manufacture things wherever it makes sense to manufacture things, and then let geopolitics be geopolitics and have the two be kind of separate […]" But within days of the Kremlin's invasion of Ukraine, scores of businesses around the world announced their intentions to suspend their operations in Russia. "The biggest change that's happened in people's minds after the invasion of Ukraine is watching just how quickly geopolitics can override economic considerations," says Grozoubinski. "You have regulators requiring that firms include in their risk analysis geopolitics, but increasingly boards [are] doing it as well," something that he says will prove just as relevant when it comes to U.S.-China relations.*

US-China Competition: Trade Wars and Competing Industrial Policies

It is the growing geopolitical competition and strategic rivalry between the US and China that is at the heart of worries globally. The war in Ukraine in many ways served as a wakeup call about the implications of a further deterioration in this crucial relationship between the US and China. Gavin Bade in Politico argues that "if Putin could hold Europe hostage with its gas supplies, what could China do with its even broader dominance of other critical sectors?" More than any other, it is the technology sector that is central to this competition and the push to reduce China's position of dominance.

Over recent decades, China established itself as the world's leading manufacturing hub. This rise was achieved not simply by cheap labour, but especially when it comes to high tech products, the intentional creation of a 'next-generation manufacturing ecosystem'. This ecosystem has meant that when companies want to prototype new products, all the component suppliers are co-located enabling manufacturers to quickly and rapidly turn around new ideas — something impossible anywhere else.

Recent years have seen a concerted effort to go beyond being just a manufacturing leader and instead move up the value chain. It was China's landmark 10-year industrial plan, "Made in China 2025", that clearly set out this ambition. It was characterised by the Center for Strategic & International Studies when it was released as "an initiative to comprehensively upgrade Chinese industry". As an analysis from the Council on Foreign Relations sets out, the plan set targets for China to "achieve 70 percent self-sufficiency in high-tech industries, and by 2049 — the hundredth anniversary of the People's Republic of China — it seeks a dominant position in global markets".

China's muscular industrial policy towards high-tech sectors has been interpreted to be aiming to achieve "civil-military integration" by establishing leadership in crucial dual-use technologies such as satellites, cyber, quantum, AI, automated systems and robotics.

The "Made in China 2025" agenda served as a watershed moment for the US response and fears. Brookings scholar Amy J. Nelson has argued that the US and China are competing, "not for access to new technology, but for primacy or the ability to 'get there first.' Achieving technological superiority enables the offsetting capabilities each side seeks in the military sphere." It is hard not to conclude that the US, and China are now competing in a new 'tech race', not dissimilar to the arms and space races of previous generations and that this has motivated the development of new far reaching industrial policies.

The Rise of Industrial Policy Globally

The increased worries of China's technological ambitions, combined with other economic grievances and trade tensions, prompted the Trump administration to launch a trade war. However, from the start, the use of section 301 tariffs as the US's main trade weapon — "a blunt instrument that have elevated uncertainty and raised costs for businesses" — suffered from "muddled strategic thinking" that cost the US economy and harmed efforts at reshoring manufacturing capacity.

Since coming to power, the Biden administration has instead used more targeted trade measures to limit China's technological developments, such as rules that seek to cut China's ability to

manufacture advanced semiconductors as well as plans to regulate US investments in China. These steps have then been accompanied with the largest expansion of US industrial policy in decades through huge new funding streams from the landmark CHIPS for America Act and the Inflation Reduction Act that together seek to boost the US's technological capacity and re-establish US leadership.

The industrial policies being deployed by the USA and China are part of a wider trend away from more laissez-faire policies and towards more robust state interventions. The global long-term strategy team at J.P. Morgan have concluded in a recent report that 'in an era of resurgent strategic competition, industrial policies are likely to be pursued competitively by countries' with the increased moves towards them likely to continue. While the heightened geopolitical competition that has marked recent years have been a significant driver of this trend, the reversal of hyper-globalisation under the weight of its own contradictions since the financial crisis, as described by economist Dani Rodrik, has accelerated this shift. The ways hyper-globalisation exacerbated distributional problems has further been a driver of the use of "place-based" strategies as part of the US's wider push towards industrial policy as a way to close deep regional divides and inequalities. It also figures heavily in the UK's Levelling Up agenda to extend opportunities across the country.

In addition, the pressing reality of climate change — "the mother of all market failures" — has been a major spur towards industrial policies. The IRA contains almost $400 billion in subsidies for solar, wind, electric vehicles and other green initiatives, making it "the most meaningful climate bill ever passed in the US". With an estimated $90 trillion needed to be spent on infrastructure to fight climate change by 2030, significant state action is needed.

The heavy use of industrial policies to bolster geopolitical positions and technology leadership, to address inequalities, and to tackle climate change, marks a significant shift from policies over recent years, and has served to highlight tensions, even between allies. The IRA was met with alarm by many European leaders, with fears that the scale of subsidies would undermine

European businesses, leading to French President Emmanuel Macron saying the act would "fragment the West", and European Commission President Ursula von der Leyen announcing an EU Net-Zero Industry act in response that will "focus investment on strategic projects along the entire supply chain".

The European response to the IRA has marked a shift from historical attitudes towards industrial subsidies and promoting European champions. While it has faced some pushback from countries who feel their industries are threatened, most notably Germany's automotive sector, it remains a notable development that the EU is shifting away from the hands off and free trade approach that has been its hallmark policy stance. This has been further reinforced by EU moves on semiconductors through the EU Chips Act, something that Dr. Paul Timmers for Brookings has described as " a trendsetter for how to advance the EU's strategic autonomy [and that] even if it's incomplete and weak in some regards, it paves the way for further comprehensive and realistic approaches to strategic autonomy in other areas."

The global move towards industrial policy has also extended to other countries as varied as India and the United Arab Emirates. With millions of people joining the workforce for the first time every year, India has been hyper-focused on growing its economy. Well situated geopolitically, and able to benefit "from global companies friend-shoring supply chains to diversity them away from China", India has announced incentive schemes to boost local production in key sectors, including green technologies, electronics, and telecoms equipment. In addition, in 2022 it launched a $10 billion mission to advance the production of semiconductors – further highlighting the scale of both investment and competition in high technology sectors.

Meanwhile, the UAE has been part of a push among countries across the Gulf region to move towards sovereign technology development through investment and talent attraction led by organisations such as the Technology Innovation Institute, part of the umbrella organisation the Advanced Technology Research Council.

These moves towards increased state intervention in the economy, as well as the heightened tensions globally, all coincide with the ongoing crisis in multilateralism. As the editorial board of the East Asia Forum have argued, "aggressive American action on semiconductor exports to China and Europe's collusion on electric car subsidies underscores a sobering truth: neither Washington nor Brussels is willing anymore to take on the mantle of global leadership in preserving the global trading system. China's attempts to use its trade to extract political concessions from countries like Australia and Lithuania suggest it is not fit or in no mood to do so, either." Such aggressive moves build on a global legacy of failed trade rounds as well as years of obstructionism by US administrations of both parties at the World Trade Organisation (WTO) that have left its Appellate Body paralysed.

They also are taking place at a time when the tech sector is facing increasing international regulatory complexity. Rapid developments, such as the ones we have recently seen in the field of generative AI, have sparked numerous efforts at vastly different regulatory responses. With the EU moving swiftly towards a complex and multi-layered approach to regulation, the US and China each actively considering new regulations, and Italy's privacy regulator outright banning ChatGPT, the regulatory landscape is ever more reflecting the splintering of the international trading system in other arenas, adding to the risk and complexity for innovative companies.

Competing Directions: The UK's Response

These changing tides internationally created a much more complex landscape for the UK. While the UK has been both a champion of multilateralism, supporting digital trade negotiations at the WTO, and a free trade leader since leaving the EU, negotiating notable new deals with Australia and New Zealand as well as a ground-breaking UK-Singapore Digital Economy Agreement, the scope of potentially impactful new trade agreements is narrow. Even the UK's welcome recent accession into the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP) will not fundamentally change the UK's trade and economic picture, with it expected to add only 0.08% to the UK's GDP. As trade expert David Henig has recently argued, "Focusing on FTAs as a success measure is understandable but limited as a long-term policy. The majority of UK trade is already covered by them and they arguably do little for a services superpower such as the UK. Their primary focus on tariff reduction is also outdated in an age when regulations are the main barriers to trade, and multiple factors considered in trade policy."

On its own, the UK now lacks the economic heft of the major powers in the US, China, or the EU, while still being subject to the pressures they are facing in rising geopolitical and technological competition, the return of war, a shift towards expensive industrial policies, and the impacts of climate change. In addition, the UK has been facing its own economic challenges. The Resolution Foundation's Economy 2030 Inquiry's interim report has identified the scale of the UK's problems:

- On the eve of the financial crisis, GDP per capita in the UK was just 6 per cent lower than in Germany, but this gap had risen to 11 per cent by 2019
- Labour productivity grew by just 0.4 per cent a year in the UK in the 12 years following the financial crisis, half the rate of the 25 richest OECD countries (0.9 per cent)
- Real wages grew by an average of 33 per cent a decade from 1970 to 2007, but this fell to below zero in the 2010s
- Between 2019 and 2021, UK trade openness fell by 8 percentage points
- There are 430,000 fewer people in work now than pre-pandemic and investment remains more than 9 per cent below its pre-pandemic level

While the UK tech sector has been a bright point in this gloomy picture, it faces headwinds from the rising global geopolitical competition. With 3 million people working in UK tech and the total value of the sector reaching $1 trillion last year, more than double Germany's and triple France's sectors, tech is essential to the UK's prosperity. Technology has long been 'global by default' and the sector has come to maturity over the long period of open global trade that is now under threat. With technology central to the US-China rivalry that is pulling in countries globally to take sides, the UK cannot be complacent about relying on the sector as an engine of growth without ensuring that its policies domestically and internationally are geared towards its continuing success.

Global Britain vs Economic Security

The intertwined challenges economically and internationally are captured by the competing narratives of Global Britain and protecting Britain's economic security. While the picture of a free-trading, dynamic, and multilateral Global Britain has been one commonly painted by the government in the years following the 2016 vote to leave the EU, the need to protect the UK's economic security has been a more recent story. Defined by Chatham House as encompassing "a broad set of interconnected issues and elements, such as investment screening, anti-coercion instruments, research integrity, and supply chain resilience", economic security has taken on a more prominent role in government policy and rhetoric in the wake of the Covid-19 pandemic and the war in Ukraine.

This shift has been most pronounced when it comes to China. After a long period of seeking to boost UK-China relations and trade, the UK has begun to shift towards a more cautious stance, on the one hand highlighting China as an essential partner on major issues like climate change, and on the other, seeking to put more distance between the two countries driven by fundamental disagreements in approach. The Prime Minister's speech to the Lord Mayor's Banquet in November 2022 was one of the clearest articulations yet of this change. Sunak forcefully set out that "the so-called 'golden era' is over, along with the naïve idea that trade would automatically lead to social reform." Going further, the Prime Minister argued that "We recognise China poses a systemic challenge to our values and interests, a challenge that grows more acute as it moves towards even greater authoritarianism". The UK's response will be to partner with like-minded powers such as the US, Canada, Australia and Japan and work on "dramatically improving our resilience, particularly our economic security". Steps in this direction placed the UK tech sector firmly at the epicentre, with Sunak citing the action the government took

to ban Huawei from UK 5G networks and, more recently, the creation of new powers under the National Security and Investment Act leading to the blocking of the sale of Newport Wafer Fab.

The centrality of technology to the government's economic security agenda has been further emphasised by other recent actions. The vulnerability of critical mineral supply chains and their importance to UK security is central to the Government's Critical Mineral Strategy and the recent agreement with Australia to work together to "increase and diversify critical mineral supply chains". The agenda also features strongly in the Government's Integrated Review Refresh 2023, which promises to:

> develop more robust measures to bolster the UK's economic security. We will step up work to protect the capabilities, supply chains and technologies of strategic importance to the UK and our allies and partners, with the new National Protective Security Authority providing a source of expertise and interface between government and UK businesses. We will publish a new strategy on supply chains and imports and refresh our approach to delivering the Critical Minerals Strategy. A new Semiconductor Strategy will set out plans to grow the UK semiconductors sector and improve resilience of semiconductor supply chains at home and overseas.

While "economic security" as a phrase does not feature as prominently in the newly released International Technology Strategy, the ideas underlying it remain core, including in the four guiding principles of the Strategy: Open, Responsible, Secure and Resilient as well as in its strategic priorities (see box). As the Strategy sets out: "In a geopolitical climate that is increasingly adversarial, technology can be used for both benefit and harm. Autocratic regimes use technology to gain advantage in the world, suppress freedoms domestically and export authoritarian precepts. They do not subscribe to our ethical or social norms and seek to influence the development of technologies. This strategic competition between authoritarian and liberal values will define how technologies shape our future." Its response is to seek to reinforce the UK's "capacity to shape how technologies will develop for national and global good. Central to this is ensuring that technology promotes our shared values of freedom and democracy."

International Technology Strategy Strategic Priorities:

1. **Priority technologies and data: building strategic advantage in these areas to ensure the UK is world-leading and that they develop in line with our values.**
2. **International partnerships for global leadership: supporting our shared growth and addressing global challenges.**
3. **Values-based governance and regulation: promoting our principles and vision for a future technology order that benefits all by working with partners and through international fora to shape governance.**
4. **Technology investment and expertise for the developing world: building capacity to bridge the technology divide and support partners to make informed choices.**
5. **Technology to drive the UK economy: continuing to drive UK technology exports, and promote the UK as the best place for technology companies to raise capital and attract foreign direct investment.**
6. **Protecting our security interests: ensuring sensitive technology does not fall into hostile hands and that we retain critical technology capabilities in the UK.**

The strategy is a welcome step to bring greater clarity to UK policy and sets out a positive vision for how the UK can cement its role as a science and technology leader globally. However, much like other statements and strategies, it does not fully reckon with the risks, the head-winds, and the trade-offs that the UK tech sector is facing. Placing greater emphasis on security and resilience may well be logically looked at through the lens of national decision-making, but it can run counter to the decision making of companies who are grappling with the on the ground realities of revenue generation, complex supply chains, global battles for talent and IP, and who lack the knowledge and expertise to place their experiences into the context of geopolitical trends.

This can be illustrated with the challenges facing the UK semiconductor sector — a technology crucial to US-China competition as discussed above and one that features as one of the priority technologies in the International Technology Strategy. As the recent enquiry into the semiconductor industry in the UK by the Business, Energy and Industrial Strategy Committee of the House of Commons says, "the UK has world-leading capabilities in certain fields, notably in core intellectual property, research and development, fabrication of compound and advanced material semiconductors, and packaging design and development" with one witness summing up the UK's position on the global stage as "very high in terms of our capability. In terms of our footprint, it is very low at the moment." The result is that the UK lacks an end-to-end supply chain, resulting in important sectors such as auto manufacturing suffering from pandemic-era shortages, and sees the "forced outsourcing of our most sensitive defence-related chip designs to overseas manufacturers, posing a real and present threat to the UK's national security." However, as the report concludes "it would not be realistic for the UK to attempt to onshore the entire semiconductor supply chain in all its forms."

It instead recommends building on the UK's "tradeable strengths" by working "more closely with allies in the EU and US, and elsewhere, to safeguard security of supply, both of finished products and of the materials needed for production in the UK. The Government should at the same time be working to represent the UK's expertise and to entrench and expand the UK's role in global semiconductor supply chains".

There are clear tensions between the need to promote the UK's tradable strengths and taking a more forceful approach to economic security and protecting supply chains. This is exacerbated when there are inconsistent policies across government as can be clearly seen in the case of the UK's export regime (see box). It is important that the UK is working in step with other like-minded countries to avoid conceding ground to them. Since leaving the EU, the UK has established a leadership role in key multi- and plurilateral fora such as at the WTO and in the G7, and it now needs to use those positions and leadership to actively get countries on the same page with policies. Where this is not possible, the government needs to be keenly aware of the impacts on UK business and quicker to amend its own policies or otherwise support its innovative companies.

Ceding Ground to Likeminded Competitors — Failing to balance trade and security:

The UK's export regime is currently failing to keep up both with the policies of close allies as well as the realities of technological change. A good example of this is the UK's Open General Export Licences that enable the export of dual-use technologies to the EU as well as Norway, Switzerland, Liechtenstein, the US, Australia, New Zealand, Canada, and Japan. As techUK members have said in response to the International Trade Committee's call for evidence into export opportunities, these licenses are "very helpful in enabling them to fulfil contracts with customers in these markets with a very light touch outside of normal commercial and due diligence activities." However, other key exports markets that the UK has signed Free Trade Agreements with, such as South Korea, are not included within these OGELs. This omission makes it harder for UK companies to export to these markets and take full advantage of the improved trade conditions agreed within the FTA. The same is the case for other notable trade partners, putting UK companies at a disadvantage compared to international competitors. For example, India is included on the US's Strategic Trade Authorisation Tier 1 list, but does not have a UK OGEL, meaning that US exporters have a competitive advantage.

Similar issues face UK companies when dealing with cryptography export controls, with identical software meeting both "mass market" criteria for decontrol when in a consumer product and not subject for controls, such as an Apple iPhone using AES 256-bit encryption technology, but the exact same chip in a PC or wireless access point would be subject to controls. This is again in contrast to the policies US exporters are subject to, leaving UK exporters on an uneven footing.

Charting a New Path: Recommendations

One thing is clear — the UK cannot be a superpower across the board. While the UK has many strengths, including, of course, Europe's largest tech sector, the size of the UK's economy and population mean that it is unrealistic to think that it can be a leader in every emerging technology. It is also impossible for the UK to ensure that it has end-to-end supply chains in priority technologies, especially given the UK lacks many of the critical minerals essential for modern tech. Internationally, while the UK is keen to be an early mover when it comes to emerging regulatory issues, it still lacks the heft of the major powers in the US, EU, and China to set the agenda globally.

However, all of that does not mean that the UK cannot be a superpower in key areas. Doing so relies on it taking the steps needed to recognise the new and challenging environment that UK businesses are operating in. The UK needs to be crystal clear in where it is seeking lead, ensuring that the UK's strength is being used where it can best be leveraged to advance key interests and sectors. It also requires the UK being strategic in how it builds and deploys its international capital. Outside of the formal structures of the EU, and without automatic invites to forums such as the US-EU Trade and Technology Council, the UK must build the capital and leverage to ensure it is an essential partner to different international allies. The UK also needs to build its capacity in the how – by providing a coherent and coordinated policy and providing businesses with the supports they need to navigate a challenging environment. To fail to take these steps will dilute the UK's impact and undermine the advantages of the UK's tech sector — a sector that is essential to ensuring the long-term growth and prosperity of the UK economy.

1. Where the UK can Lead

Continue to support multilateralism
Despite the numerous and well documented problems afflicting the WTO, it remains the only global forum for setting the rules of trade. While the Appellate Body is no longer functioning, the organisation itself still is and it remains an important forum especially for advancing regulatory cooperation given trade frictions are increasingly about non-tariff barriers. As a middle-sized power, the UK would be especially vulnerable to a complete breakdown of the multilateral trading system, and its replacement by a world where the largest powers truly do have free reign to set global trade rules.

While the WTO is central, the UK must also ensure it takes a strategic approach to influence the development of international standards and accredited conformity assessments. As other international powers take coordinated approaches to ensure that the technology of national champions are embedded in common standards, and that their national interests are reflected in global rules, the UK cannot be complacent and should work closely with industry in these forums.

Crucially, the UK should not lose sight of some of the global challenges that are going to

rely on true multilateral cooperation to solve. Most importantly, this includes averting a climate catastrophe, which is going to require cooperation and coordination with China even if it takes place during otherwise heightened competition. Other areas such as AI-powered weapons systems and cybersecurity are also going to require true multilateral cooperation. The UK should be a convenor and a leader on these issues.

Promote the UK's Regulatory Strengths and pro-innovation agenda internationally

It is essential that the government identifies the issues where the UK can be a difference-maker internationally. There is limited bandwidth both for the government to meaningfully focus on issues and for other countries to pay attention and act on the basis of what the UK is saying. The UK must make the most use of its international reputation and influence to advance high priority and high impact issues with key partners. The UK's strengths as a regulatory leader can be built on here provided that the UK maintains its pro-innovation stance. Potential areas include:

Data Flows

The UK has an opportunity to act as a broker on the contentious topic of international data flows to help establish a common international approach. As last year's techUK report Crafting a Strategy: UK International Digital Policy Cooperation argued, promoting data flows and preventing countries moving towards protectionist data localisation regimes are key defensive interests and that remains true today. The UK has already been a leader on this topic, building off the EU's existing framework and data protection legislation to implement new language and approaches to data flows in the UK-EU Trade and Cooperation Agreement. While opposed by the US who instead advocates for the voluntary Cross-Border Privacy Rules (CBPR) system, including at a recent data summit held in the UK, the UK's approach nevertheless has wide support from industry and other countries internationally,

and as a result has greater potential to develop into a common international standard for cross-border data flows. With data already identified as a priority in the International Technology Strategy, this is an area ripe for focused attention. In particular, the UK should prioritise leading the conversation on cross-border data flows at the G7 and as part of the WTO's ongoing Joint Statement Initiative on e-commerce to help build a critical mass of countries' will to adopt common language. It should further use its leverage with allied countries such as Japan and Australia to play the broker and support efforts from the EU to get the same common language included in their own bilateral trade agreements.

Digital Ethics

The UK has a long and impressive track record as a leader in digital ethics. As the UK sets out a strategy that places great emphasis on promoting "the design, development and use of technologies which support personal freedom and democratic values", it is vital that ethical approaches to technology occupy a central place in that push. It is welcome that the government's new white paper A pro-innovation approach to AI regulation sets out the need to "act quickly to continue to lead the international conversation on AI governance and demonstrate the value of our pragmatic, proportionate regulatory approach". This is exactly what the government must do. The UK has already broken new ground in this area, for example through the inclusion of clauses on it in the UK-Singapore Digital Economy Agreement. It is essential that the UK continues to build on its digital economy agreements and FTAs and seeks to operationalise them. The UK must also be active in all relevant international forums, including standards bodies and global accreditation forums, to advance digital ethics as an issue, and should work with partners, such as Singapore, to ensure that allies are lined up to support. Finally, it is crucial that the UK moves at speed when it comes to its own regulations. At a time when other countries are moving swiftly, if the UK aims to set the regulatory direction internationally is must make sure it is the first mover.

Double Down on UK Strengths

With countries across the globe investing heavily in industrial policies to carve out leadership positions for key sectors, the UK must ensure that it is not left behind. As we have seen, we are now in a more assertive and competitive international environment. Even as the concept of 'friendshoring' rises in prominence, allies are nevertheless jostling for position and for the advantage of their main domestic players. If the UK is to realise its ambition to be a Science and Technology Superpower, it needs to also be laser focused on propelling its strongest sectors forward and ensure that it is supporting crucial strategic sectors.

As techUK has set out in its Tech Superpower campaign, "success must be measured against the ability to mitigate the challenges facing the UK's society and economy, while concurrently supporting areas where UK technology and innovation can flourish". As part of this there are three key pillars that the government must advance if it is to achieve its aims.

The first is Enabling Innovation — providing the support to the emerging technologies that the UK needs to drive forward change. These have been set out clearly in the government's International Technology Strategy: Artificial intelligence, Quantum technologies, Engineering biology, Semiconductors, Telecoms, and Data. However, there are several technology areas where the

UK displays natural strengths outside of these categories, such as immersive technologies within the creative industries, and geospatial technologies, and the UK should seek to develop the environment where technology ecosystems can flourish. Finally, it is critical that the UK does not view these technologies in isolation, but as part of an interconnected technology chain that when applied together will boost productivity and achieve its science and tech superpower ambitions.

The second pillar is Accelerating Innovation — ensuring the right foundations are in place for innovation to flourish and for these emerging technologies to grow and stay in the UK. These priority sectors need to be supported across the continuum of innovation, from providing substantial investments in early stage R&D, participating in Horizon Europe, providing the facilities and infrastructure to ensure that innovative technologies can be developed and tested, such as through the Catapult network, and ensuring that the talent and skills are available for universities and companies to lead. Accelerating innovation also depends on some crucial horizontal levels that apply across all technologies including: data access, public infrastructure investment, and regional investment.

The final pillar is Applying Innovation. Ultimately, if the UK is growing technologies and generating ideas that are then commercialised and deployed elsewhere, then the UK will have missed out on many opportunities to boost our stagnant productivity growth. Business adoption of priority technologies should be encouraged, including through the UK's pro-innovation regulatory environment. In addition, the UK should use the procurement power of the state to support and grow the UK's industrial, particularly in deep tech areas where market financing is not available to the same degree and where there is a higher bar to commercialise.

2. How the UK can lead

Ensure there is policy coherence, domestically and internationally

Having the best policies in place to support the UK's tech sector is worth very little if there are also policies in place that cancel them out. This is currently the case with outdated export controls on cryptographic products as has been highlighted above. Similarly, not granting Open General Export Licenses to countries the UK has signed a bilateral FTA with undermines the tech sector's ability to take advantage of that trade deal with a country that the UK government presumably deems a close trading partner. The UK also needs to ensure that its ethical and pro-innovation regulation at home is backed up by robust action to bring along other countries to adopt the UK approach lest other digital sectors with lax ethical standards achieve market dominance elsewhere. As the Pro-innovation Regulation of Technologies Review sets out, it is important that the UK is active in "seeking international regulatory harmonisation once technologies are becoming established, ensuring market access for our most innovative companies".

It is important too that the UK government works to ensure alignment between UK policies and those of allies. As a recent report from Flint Global has noted, while "unilateral interventions benefit from being quick to implement [they] are often less effective or more readily bypassed", and in addition "also increase the risk of unintended consequences". This can be seen when it comes to export controls. With a greater

use of these tools along with sanctions in a less friendly world, it both harms UK businesses and fails to achieve the wider diplomatic goal if UK policies are out of sync with those of allies. The misguided initial attempt at the Foreign Influence Registration Scheme, which aimed to "crack down on malign covert foreign influence in the UK's political processes", but was "indiscriminate" in its reach, potentially criminalising ordinary day-to-day activities of businesses, NGOs and charities even from allied countries, is a case study of the type policy that was not coherent or in sync with those of allies and should be avoided. Instead, where possible, multilateral and plurilateral solutions should be found with high levels of alignment.

Provide greater support for businesses navigating an uncertain world

Businesses are not well equipped to understand and react to the full complexities and geopolitical competition of a more fractious and divided world. It is important the UK government provides guidance and direction for businesses to help them navigate this new situation. The greater priority that is being placed on the resilience of supply chains is a marked shift from the systems and incentives that were in place pre-Covid and pre-Brexit.

With a need to move away from just in time production and diversify sourcing regions that comes with this kind of shift, the UK government should seek to make sure that policies are aligned accordingly, and are informed by engagement with the tech sector to understand their needs, concerns, and opportunities. This includes providing incentives and clear guidance for businesses to consider onshoring and friend-shoring and increasing the resiliency of their supply chains as well as support in other areas such as enabling the construction of the storage and warehousing needed to move away from just in time. Examples such as Canada's business-led Supply Chain Task Force that is informing the development of National Supply Chain Strategy, Singapore's connected supply chain

strategy that covers everything from trade deals to stockpiling, and the Australian government's Supply Chain Resilience Initiative, that provides businesses with between $50,000 and $2 million " to establish or scale a manufacturing capability or a related activity to address supply chain vulnerabilities" are example of the kind of initiatives and tangible support that businesses need to see from government to help them respond to emerging international risks and provide a clear direction. The world-leading National Cyber Security Centre is also a domestic example of an organization providing highly valuable support and guidance to industry that should be replicated in other areas of economic security. Where possible, the UK should look to coordinate with like-minded international partners in providing this kind of support to avoid unnecessary duplication and competition.

In this more uncertain environment, it is important that government support includes specific cybersecurity support for individual companies and entire industries and is informed by collaboration between industry, academia and government. It is crucial that the UK continues to support and drive initiatives such as Digital Security by Design to transform technology and improve our resilience.

The creation of the Department of Science, Innovation and Technology and Department of Business and Trade are welcome developments. It is important, however, that DBT ensures that both imports and exports are considered equally in the design of UK trade policy, taking into account the complex supply chains and inputs that remain needed to ensure the success of the UK's tech sector.

Detailed Recommendations

1. The UK should must maintain a vigorous support for multilateralism and the WTO as a cornerstone of its international policy.
2. The UK should be work closely with industry to be proactive in its engagement with international standards bodies and accreditation forums to make sure UK interests are reflected.
3. The UK should be a convenor and leader on existential issues that require true multilateral cooperation to address, such as climate change and AI weapon systems.
4. The UK must make the most use of its international reputation and influence to advance high priority and high impact issues with key partners.
5. The UK should prioritise the fight against data protectionism by leading the conversation on cross-border data flows at the G7 and as part of the World Trade Organization's ongoing Joint Statement Initiative on e-commerce to help build a critical mass of countries willing to adopt common language.
6. The UK should seek to advance efforts from the EU to get the same common languages included in EU bilateral trade deals.
7. It is essential that the UK continues to build on its digital economy agreements and FTAs and seeks to operationalise them.
8. The UK must be active in all relevant international forums, including standards bodies and global accreditation forums, to advance digital ethics as an issue.
9. The UK should work with partners to develop and lead allied blocs to support the UK's approach to digital ethics.
10. The UK must ensure it is the regulatory 'first-mover' if it is to ensure that it is setting the international direction.
11. The UK should be laser focused on supporting and growing its strongest sectors and sectors of strategic value: Artificial Intelligence, Quantum technologies, Engineering biology, Semiconductors, Telecoms, and Data.

12. The UK should be ambitious in meeting and then exceeding its target of spending 2.4% of GDP on R&D – this should involve participation in Horizon Europe.
13. The UK should develop a skills strategy that maps the skill needs for all priority sectors and sets out a roadmap to meet them.
14. The immigration system should be better utilized to enable companies to attract the best and brightest international talent.
15. The Catapult Network should receive higher levels of support to advance collaborations and SME growth.
16. The government should pass planning reforms to enable development and investment in the UK's most productive regions.
17. The government should use its procurement powers to be an early customer for high-risk deep tech companies.
18. The UK should update its export controls on cryptographic products.
19. The UK should grant Open General Export Licenses to countries the UK has signed a bilateral FTA with.
20. The UK should pursue pro-innovation regulatory harmonization to ensure market access for UK companies.
21. The UK should ensure either multilateral or plurilateral alignment on policies with international implications.
22. The government should take a proactive role in communicating the strategic direction of policy for businesses (i.e. the prioritisation of resilience over efficiency), should engage with the tech sector to understand their needs, concerns, and opportunities, and provide them with tangible support and clear guidance to assist them.
23. The UK should aim to coordinate business support and investments with like-minded international partners to avoid unnecessary duplication and competition and seek guarantees of reciprocal behaviour.
24. It is crucial that the UK continues to support and drive initiatives such as Digital Security by Design to transform technology and improve our resilience.
25. The new Department for Business and Trade should ensure it takes a holistic view of the needs of the UK tech sector, including the role of imports and international inputs as well as promoting exports.

techUK
FOR WHAT COMES NEXT

About techUK

techUK is a membership organisation that brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. We collaborate across business, Government and stakeholders to fulfil the potential of technology to deliver a stronger society and more sustainable future. By providing expertise and insight, we support our members, partners and stakeholders as they prepare the UK for what comes next in a constantly changing world.

linkedin.com/company/techuk

@techUK

youtube.com/user/techUKViews

info@techuk.org

Author, Dr Thomas Goldsmith, B.A., M.A., Ph.D.