



BAE SYSTEMS' CONTRIBUTION TO THE UK ECONOMY

AN INDEPENDENT REPORT
BY OXFORD ECONOMICS

JUNE 2023

BAE SYSTEMS



The Global Combat Air Programme (GCAP) is a truly international endeavour that will see the United Kingdom (UK), Italy, and Japan work together with a shared ambition to develop a next generation fighter aircraft. Announced in December 2022, the GCAP builds on the substantial progress already made in the UK by BAE Systems, Leonardo UK, MBDA UK, Rolls-Royce, and the UK Ministry of Defence through the Team Tempest partnership. Read more about the GCAP programme in the case study on page 72.

TABLE OF CONTENTS

Foreword	2
Executive summary	4
1. Introduction	7
2. GDP contributions	17
2.1 Direct GDP	17
2.2 Indirect GDP	17
2.3 Induced GDP	19
2.4 Total GDP	20
3. Socio-economic and sustainability impact	27
3.1 Employment and skills	27
3.2 Tackling economic inequality	38
3.3 Environmental sustainability: Towards net zero	40
3.4 Diversity, equity, and inclusion	44
3.5 Supporting communities and protecting heritage	49
3.6 Supply chain management	52
4. Wider and long-term economic impacts	57
4.1 Technology and R&D	57
4.2 Capital investment	62
4.3 Exports	65
5. Tax contributions	69
5.1 Direct Tax	69
5.2 Total Tax	70
6. Regional impacts	75
6.1 North West of England	80
6.2 North East of England and Yorkshire and the Humber	82
6.3 London and South East of England	84
6.4 South West of England	88
6.5 Scotland	92
6.6 Wales	94
Appendix A: Detailed local findings	98
Appendix B: Economic impact methodology	102
About Oxford Economics	104

FOREWORD



I'm extremely proud to lead an organisation that helps protect and defend nations and keep citizens safe. The ongoing conflict in Ukraine and threats to our world order have brought the importance of defence, and the work we do at BAE Systems, into even sharper focus. In short, the engineering, design and manufacturing skills of our 39,600 UK-based employees deliver some of the world's most technologically advanced defence, security, and aerospace equipment and services for the United Kingdom and our allies. Our commitment to this national endeavour supports the UK's sovereignty, our freedom of action, and our place in the world.

This new independent report by Oxford Economics articulates the economic, employment, social, and technological contributions of the work we do across our 50 UK sites at both a national and regional level. The size and scale of our UK-based business is illustrated by the £11.1 billion contribution we made to the UK's GDP in 2022 including £3.7 billion of goods and services exported. In its analysis, Oxford Economics also found that in total, last year our operations supported the equivalent of 132,000 full time UK jobs. This includes direct employees, jobs supported indirectly through a supply chain of approximately 6,000 businesses, with whom we spent £4.1 billion, and through the induced effect of workers spending their earnings.

Our geographical footprint and the acceleration of our workload, in particular for the Dreadnought submarines, the Global Combat Air Programme, and the Type 26 frigates, mean that we have a unique role in the economic and social development of regions and towns where we operate and in sustaining the UK's engineering and manufacturing sectors. As we expand to deliver new defence and security projects, we're also making substantial capital investments, developing new engineering, manufacturing and training facilities at a cost of £250 million across our sites last year.

As we recruit thousands more employees at all career stages to support the growth in our business, we continue to invest in education, skills, and life-long learning, spending some £180 million last year. And to ensure our people have the skills they need to deliver the next generation of integrated defence and security technologies, this year we will launch a new physical and virtual Global Digital Skills Academy. The early career programmes we run provide significant opportunities for social mobility and in 2022 we trained 3,400 apprentices and nearly 1,000 graduates and interns. In a noteworthy milestone, we also engaged the one millionth pupil in a STEM roadshow for schools. This education outreach programme is the longest running of its type in the UK and is a highly successful partnership with the Royal Navy and Royal Air Force, visiting 400 schools every year. Our education outreach

programme is also helping to challenge outdated perceptions of engineering, resulting in an increase in the numbers of young women and those from ethnically diverse backgrounds joining our business as apprentices.

BAE Systems' social impact extends to creating opportunities in disadvantaged communities, where some 14,900 of our employees resided in 2022 and in which we spent £730 million with supplier companies. We never take the support of the localities where we are based for granted, and contributed £4.4 million to national and local charities last year, focusing on armed forces charities, education programmes, volunteering, and preserving our shared military and aerospace heritage with the UK's armed forces. Our work in supporting the Armed Forces Covenant too was recognised last year through the revalidation of our Gold Employer status.

The investments we make in research and development ourselves, and are trusted to make on behalf of the UK Ministry of Defence, stood at £1.45 billion in 2022. This expenditure supports important research partnerships with universities and highly innovative companies, empowering the UK to exploit its existing capabilities in artificial intelligence, cyber security and advanced manufacturing. With a focus on integrating defence capabilities across air, land, sea, and space, new technology partnerships will enable the UK and allied nations to achieve a battlefield

advantage and stay ahead of their adversaries.

We're also focused on reducing our carbon footprint and that of our armed forces customers. We have set ourselves a 2030 Net Zero ambition for our own operations in the UK, well ahead of many of our peers, and an ambition to achieve Net Zero across our entire supply chain by 2050. Importantly, our sustainability activities are now subject to the same auditing scrutiny as our financial performance.

With the welcome announcements that BAE Systems will play a key role in helping Australia to acquire its first nuclear powered submarines, and a key role in the UK's Global Air Combat Programme (GCAP) collaboration with Italy and Japan, the social and economic contributions we can make, particularly in the North West of England, will increase substantially.

In the uncertain world we live in, I strongly believe that defence capabilities and the defence industry are a force for good. Having led BAE Systems for six years, the pride of our employees in their work, and our mission, is a source of continued inspiration for me. I hope this report goes some way towards describing the significant role we play in assuring the nation's security and prosperity.

Charles Woodburn
Chief Executive Officer
BAE Systems PLC

EXECUTIVE SUMMARY

132,000

The number of UK full-time equivalent jobs supported by BAE Systems in 2022.

BAE Systems is the largest defence, aerospace, and security company in the UK and is the largest supplier to the UK's Ministry of Defence in terms of annual spend. The Company

has business operations across the defence "domains" of air, land, sea, space, and cyber, designing and manufacturing equipment and technologies and providing services for the UK and other allied nations. In doing so, the Company has a significant impact on the national economy.

£11.1 bn

Total gross value added contribution to UK GDP in 2022 by BAE Systems.

This report focuses on the impact that BAE Systems had on the UK economy in 2022. We assess this through the

Company's contributions to UK gross domestic product (GDP), employment, and tax revenues. We also analyse BAE Systems' contributions to the longer-term prosperity of the UK through research and development activity, capital investment, and exports, as well as its contribution to social value and sustainability in the form of engagement with communities and schools and programmes to reduce carbon dioxide emissions. We assess the impact of BAE Systems at the national level, and then look in closer detail at areas where the Company has a particularly significant footprint.

For every £100 contributed directly by the Company, a total economic contribution of £360 was supported.

72%

BAE Systems staff in engineering or engineering-related roles.

We estimate that in 2022 BAE Systems supported 132,000 full-time equivalent (FTE) jobs in the UK. This employment

is supported through three channels: those working directly for the Company; the indirect impact within the Company's supply chains; and the induced effect when workers at the Company and in its supply chains spend their wages. In 2022, BAE Systems employed 39,600 UK workers directly, and supported indirect employment of 49,000 jobs at the Company's approximately 6,000 suppliers and their onward supply chains, and an induced impact of 43,000 jobs. For every 100 FTE jobs at BAE Systems, the Company supported a total of 330 jobs in the UK economy as a whole.

£250 m

Capital investment by BAE Systems in the UK in 2022.

The Company's GDP contribution in 2022 is estimated to have been a total of £11.1 billion, equivalent to 0.4% of the UK economy. Of this, £3.1 billion was contributed directly by BAE Systems' own operations. A further £3.9 billion of GDP was supported by the Company's procurement spending, and £4.1 billion by workers spending their wages. For every £100 contributed to GDP directly by the Company, a total of £360 was supported across the economy.

BAE Systems makes significant investments in its workforce to enable this economic activity. **The Company spent a total of £180 million in 2022 on skills and education.** As well as investing in STEM (science, technology, engineering and mathematics) outreach with schools and universities, BAE Systems spent £140 million recruiting and training its 3,400 apprentices and nearly 1,000 graduates and university placement students, as well as a further £26 million on ongoing professional development or 'lifelong learning'. The workforce is highly skilled, with 72% in engineering and engineering-related roles. BAE Systems staff each contributes an average of £78,570 to UK GDP, which is 4% higher than across the UK economy as a whole on an FTE basis.

The Company's impact extends beyond these core contributions.

BAE Systems delivered more than £1.45 billion of R&D activity in the UK in 2022, including £140 million of self-funded research and development and £1.3 billion carried out on behalf of customers, and made £250 million in capital investments. R&D and capital spending can both help to boost the long-term growth potential of the UK by raising worker productivity. BAE Systems also contributes to UK growth through its exports, selling a total of £3.7 billion worth of products and services abroad in 2022. After subtracting imports of £1.3 billion, this means that it contributed a total of £2.4 billion to the UK's trade balance in net exports.

The Company's employment and procurement spending also helps to support economic activity in some of the most deprived areas of the country:

BAE Systems directly employed 14,900 workers who live in the most deprived fifth of parliamentary constituencies, and also spent £730 million in these areas.

BAE Systems supported a total tax contribution to the UK Exchequer of £2.7 billion in 2022 through all channels of impact. For context, this is more than the combined departmental budgets of the Cabinet Office, the Treasury, and the Department for International Trade in 2021-22.¹ Of this total, £770 million was contributed directly by the Company, largely through corporation tax and labour-related taxes such as National Insurance contributions and income tax.

£180 m

Spending on education and skills in 2022.

£1.45 bn

R&D work carried out in 2022.

£3.7 bn

Exports from the UK in 2022.

£78,570

Average contribution to UK GDP by each BAE Systems employee.

£4.1 bn

Domestic procurement spending with 6,000 suppliers in 2022 including £730 m spent in the UK's most deprived areas.



Radio frequency susceptibility tests are conducted on critical aircraft components at BAE Systems' specialist facility in Rochester, Kent.

1. INTRODUCTION

BAE Systems is one of the largest defence, aerospace, and security companies in the world. Headquartered in the UK, it was estimated to be the seventh-largest company globally in 2021 by defence revenues,² as well as the biggest in Europe.³ Globally, BAE Systems employs over 93,000 people in around 40 countries, including the US, Sweden, Australia, and countries in the Middle East. In the UK, it is the largest supplier to the Ministry of Defence (MOD) in terms of annual spend.⁴

BAE Systems designs, manufactures, and provides ongoing support and upgrade services for major defence and security programmes, such as the Typhoon combat aircraft, the Type 26 frigate programme, and the Queen Elizabeth Class aircraft carriers. The Company engineers and manufactures all of the Royal Navy's submarine fleet and 80% of the UK's general munitions requirements. It delivers torpedoes, radar, warship support, and battlefield communication systems, as well as defence and security-related services such as cyber security and data analytics across the defence "domains" of air, land, sea, and space.⁵ The Company also develops technologies for commercial markets, in areas such as avionics and electric propulsion.

To deliver these products and services, the Company directly employs almost 40,000 people distributed widely across the UK, which represents 43% of the Company's global workforce.⁶ Major sites include:

- Submarine-building facilities in Barrow-in-Furness, in Cumbria, managed by BAE Systems Submarines;
- Two combat air engineering facilities in Warton and Samlesbury, in Lancashire, and a digital engineering and structural testing site in Brough, Yorkshire managed by BAE Systems Air;
- Two shipyards in Govan and Scotstoun, both in Glasgow managed by BAE Systems Naval Ships;
- His Majesty's Naval Base, Portsmouth, where the Maritime Services business provides support to half of the Royal Navy's surface fleet and also delivers waterfront services and infrastructure projects for the Naval Base through a joint venture with engineering and technical consulting firm KBR;
- Sites operated by the Company's new Digital Intelligence business, which was created by combining cyber security, space and other operations, around the UK, including in London, Guildford, Gloucester, and Leeds.

² Defence News, Top 100 for 2022.

³ Stockholm International Peace Research Institute, The SIPRI Top 100 Arms-producing and Military Services Companies, 2021, 2022.

⁴ Ministry of Defence, MOD trade, industry and contracts 2022, 2023.

⁵ BAE Systems, What We Do.

⁶ All employment figures noted in this report refer to full-time equivalents (FTEs) rather than headcounts.

1.2 HOW BAE SYSTEMS SUPPORTS THE UK ECONOMY

To support operations at these sites and many other locations, every year BAE Systems purchases billions of pounds of goods and services from thousands of UK suppliers. These suppliers in turn procure their own inputs from other UK businesses. In this way, on top of its direct economic contribution, BAE Systems indirectly supports further economic activity in the UK through its supply chain. Still more economic activity is supported when employees of BAE Systems and of its suppliers spend their wages in consumer-facing sectors.

The sum of these three impact channels—the direct channel, the supply chain or “indirect” channel, and the wage-spending “induced” channel—makes up BAE Systems’ total economic impact, quantifiable in terms of jobs, GDP, and tax receipts.⁷ This report quantifies each of these impacts.

We also describe further ways in which BAE Systems contributes to the UK’s wider prosperity. By employing hundreds of new graduates and apprentices every year, it helps develop the skills required for the next generation of engineers, scientists, and manufacturers. The Company supports regional development and equality by sustaining jobs and economic activity in some of the most deprived locations in the country. It is making strides in developing technologies that reduces its own (see page 41) and the MOD’s carbon footprint to support the UK’s net zero ambitions. The MOD’s carbon footprint to support the UK’s net zero ambitions. The Company’s R&D activities require partnerships with universities and regional organisations and have the potential to generate innovations applicable to civil purposes, while its capital investments add to the economy’s future productive capacity and help develop regional infrastructures. Finally, its exports are beneficial to the UK’s trade balance and support relations with trade partners.

1.3 STRUCTURE OF THIS REPORT


This report is structured as follows:

- **Chapter 2** provides national-level estimates of GDP supported by BAE Systems in the UK.
- **Chapter 3** presents national estimates of employment, and explores how the Company supports social value, for example through its operations in deprived areas of the country; efforts to reduce its environmental footprint; initiatives to support diversity, equity, and inclusion in its workforce; and by supporting local communities and its supply chain.
- **Chapter 4** discusses how BAE Systems contributes to the longer-term economic prosperity of the UK, through investments in R&D and capital equipment, as well as through exports.
- **Chapter 5** estimates the Company’s tax contributions to the UK Treasury.
- **Chapter 6** presents employment estimates for six parts of the UK: the North West, the North East and Yorkshire and the Humber, London and the South East, the South West, Scotland, and Wales.⁸

Project OdySSEy brings together experts in simulation, supercomputing, data analytics and augmented and virtual reality to create a single synthetic environment, enabling air, land, sea, space and cyber forces to plug in and train together.

8 ⁷ See pages 12 and 13 and Appendix B for more details on Oxford Economics’ economic impact modelling.

⁸ The regions of England used here are defined by Office for National Statistics definitions.



DREADNOUGHT SUBMARINES TO CARRY UK'S NUCLEAR DETERRENT THROUGH TO 2060s

Since 1969, the UK's nuclear deterrent has been carried by Royal Navy submarines.⁹ The Vanguard class that currently fulfils this role is due to be retired in the 2030s¹⁰ and as such, the MOD is investing in Vanguard's successor—Dreadnought—to maintain this strategic capability. BAE Systems began building the first of four Dreadnought submarines in 2016 in Barrow, Cumbria, and work on the second and third boats began in 2019 and 2023 respectively. The new submarines will enter service in the early 2030s and serve until the 2060s.

The Dreadnought programme is a significant source of economic activity. The Company estimates that about £7.5 billion will be spent with approximately 1,500 UK suppliers over the life of the programme.¹¹ Previous

Oxford Economics analysis for BAE Systems estimated that the programme would support a peak of 30,000 jobs across the UK. With over £1 billion in facility and infrastructure investment at the shipyard and a peak of 8,000 workers employed directly, the Dreadnought Programme is an important source of local employment in Barrow, one of the most deprived areas in England.¹²

The new class of submarines features several important technical improvements on its predecessor. The boats will be powered by a new generation of nuclear propulsion system with reduced maintenance costs and a longer service life,¹³ and will be equipped with the latest sonar systems, providing crews with greater situational awareness.

⁹ Gov.uk, UK nuclear deterrence policy, 2021.

¹⁰ Gov.uk, Dreadnought submarine programme: factsheet, 2021.

¹¹ BAE Systems, UK Dreadnought Submarine Programme supports tens of thousands of jobs, 2021.

¹² ONS, Exploring local income deprivation, 2021.

¹³ Naval Technology, Dreadnought-Class Nuclear-Powered Ballistic Missile Submarines, 2023

AN INTRODUCTION TO OUR ECONOMIC IMPACT ANALYSIS

The full impact of BAE Systems on the UK economy is assessed using a standard means of analysis called an economic impact assessment. This involves quantifying the Company's total impact on the UK across three "core" channels:

- **Direct impact**—relating to BAE Systems' own UK activities. This encompasses the economic activity, taxes, and employment directly supported by the Company.
- **Indirect impact**—the economic activity, taxes, and employment supported in the UK supply chains of BAE Systems' UK sites, as a result of their procurement of goods and services from other firms. Note: this channel includes the impact of the Company's capital investments, such as new facilities and IT equipment, as well as that of its day-to-day purchases;
- **Induced impact**—the wider economic benefits that arise when BAE Systems' employees in the UK, and those in the Company's UK supply chains, spend their earnings—for example in local retail and leisure establishments.

This approach enables us to build a picture of BAE Systems' overall contribution to the UK economy across three key metrics:

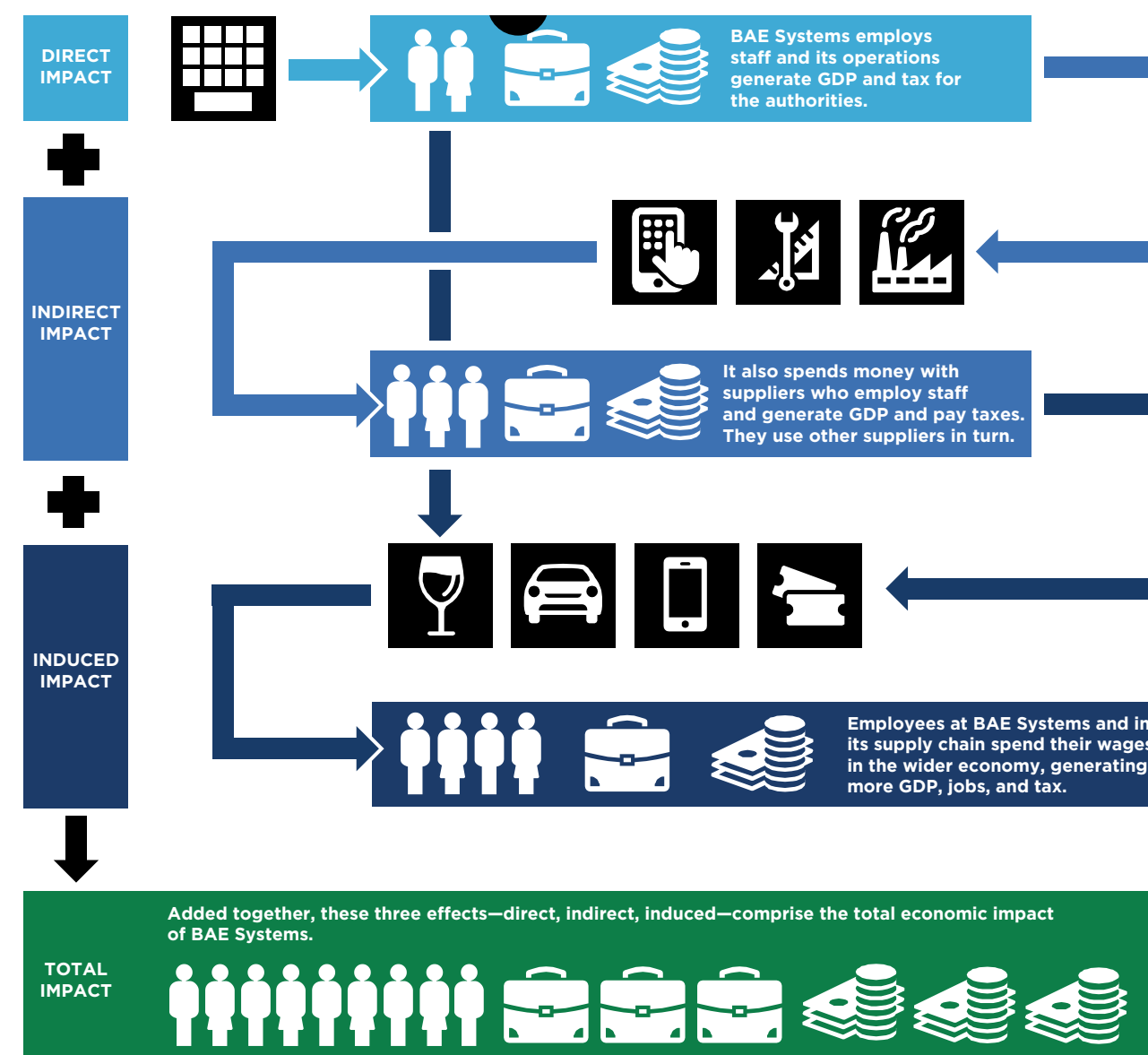
- **Economic contribution**—or more specifically, BAE Systems' gross value added (GVA) contribution to GDP. In simple terms, we estimated the GVA of BAE Systems as the Company's revenue minus its procurement spending. For brevity, we refer to this as the "economic contribution" throughout the report;
- **Employment**—measured on a full-time equivalent basis;
- **Government revenues**—including income tax, corporation tax, business rates, and National Insurance contributions.

Alongside these core economic impacts, we also consider the wider economic impacts through which BAE Systems contributes to the UK's long-term prosperity. These effects correspond to a number of the themes identified in recent Government strategies, such as export growth, skills development, and building future capabilities through R&D.

The modelling upon which this report is based computes the economic footprint of BAE Systems in the UK for 2022. Our approach uses financial data for that year from BAE Systems' own accounts, plus the latest economic data available at the time of writing.

Fig. 1 (right) presents a schematic diagram of our Economic Impact Analysis model. Additional information on our modelling approach is provided in this report's appendix.

Fig. 1: The five channels of economic impact in our model



PROVIDING SECURE DEFENCE COMMUNICATION NETWORKS

The threats faced by governments have become more complex, in part due to increasingly sophisticated technologies employed by unfriendly nations. Part of the UK's strategy to tackle this is to fully integrate different "domains" of defence, such as land, air, sea, and space forces with government intelligence departments, enabling diverse battlefield technologies to work together effectively.¹⁴

A key requirement of this "multi-domain integration" approach is to enable secure communications between friendly forces. R&D by BAE Systems is helping develop the UK's capabilities in this area.

The Company recently announced a system called NetVIPR™, designed to establish secure networks across all types of battlefield units and military commands. The system is software-based, can be maintained remotely, and is designed to work with hardware commonly used across military systems from a variety of suppliers. This removes the need for vulnerable, fixed infrastructure and makes installation, maintenance, and upgrades more cost-effective than traditional hardware.

Another significant development area is the Company's suite of Software Defined Radios (SDRs), in which a lightweight computer running specialist software replaces heavier, more power-hungry communications units. As an SDR's operation is defined and controlled by software instead of being "hard-wired", it is possible to dynamically re-programme that software to undertake different roles and tasks. This ability to perform different roles enables switching from communications to electronic surveillance and electronic warfare tasks in one device, rather than requiring multiple traditional radios. By ensuring the software is based on open system architectures, the SDR suite will be able to communicate with units provided by different manufacturers in the future, elongating their useful lifetime and providing cost efficiencies for users.

Aside from increasing the resilience of military information exchanges, advances in multi-domain integration also have further technology benefits to wider society, for instance making it possible to connect Government databases to help police identify vulnerable children and criminal activity.



¹⁴ Paraphrased from Gov.UK



BAE Systems' munitions manufacturing site in Washington, near Sunderland, employs 260 people and focuses on developing heavy ammunition for artillery and tanks.

2. GDP CONTRIBUTIONS

This chapter presents estimates of BAE Systems' contributions to GDP in 2022. The Company's total contribution is the direct impact of its operations plus the GDP supported by procurement spending and supported as a result of spending by workers at the Company and in its supply chain.

2.1 DIRECT GDP

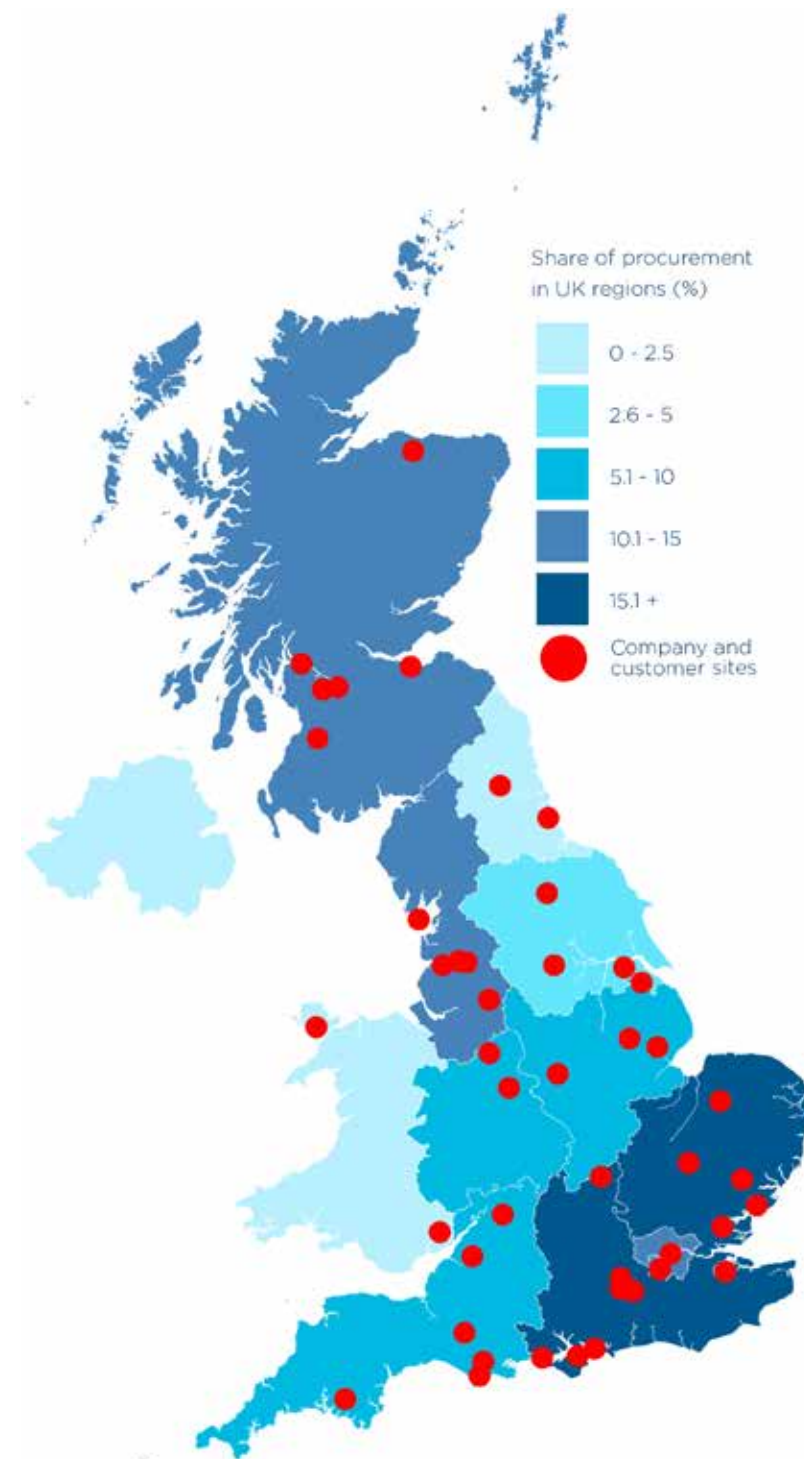
BAE Systems generated turnover of £8.9 billion in 2022 through its UK operations. Subtracting total procurement spending from this revenue provides an estimate of the Company's GDP contribution—this is known as the “production approach” to estimating GDP. BAE Systems' UK operations are estimated to have supported a £3.1 billion GDP contribution in 2022, representing 0.1% of the UK's national economy in 2022.

2.2 INDIRECT GDP

In 2022, BAE Systems' supply chain spending with UK companies totalled £4.1 billion. The largest spending type was aircraft systems and equipment, with other large spending categories including consultancy, construction, IT services, and the procurement of sensors, radars, and engines.

The majority of this spending occurred in the South East, East and North West of England, as well as in Scotland, as illustrated in the map on the next page. However, the effects are far-reaching, with more than £1 million spent in over 300 of the UK's 650 parliamentary constituencies. In Chapter 3, we explore the prevalence of this spending within the UK's most deprived areas.

Fig. 2: BAE Systems procurement spending by UK nation and region, and top 50 Company and customer worksites in 2022



Source: Oxford Economics

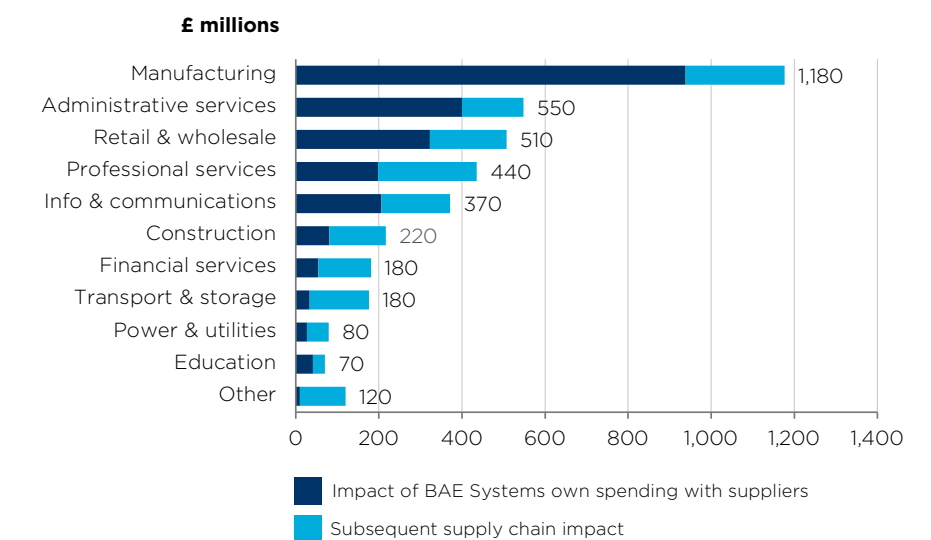
We estimate that the Company's procurement spending stimulated a total of £3.9 billion in GDP throughout the economy. Approximately 60% of this was through BAE Systems' own spending with its suppliers, with the remaining 40% coming from subsequent supply chain effects, as those immediate suppliers made their own purchases. Reflecting the Company's spending on manufactured inputs, the sector with the largest indirect GDP impact was manufacturing, with significant activity also supported in the administrative, retail and wholesale, professional services, and information and communication sectors.

2.3 INDUCED GDP

Wages paid to BAE Systems employees, its contracted workers, and employees supported by its supply chain spending stimulated further economic activity as workers spent their wages in the wider economy. We estimate that this wage-induced expenditure stimulated a £4.1 billion contribution to UK GDP in 2022.

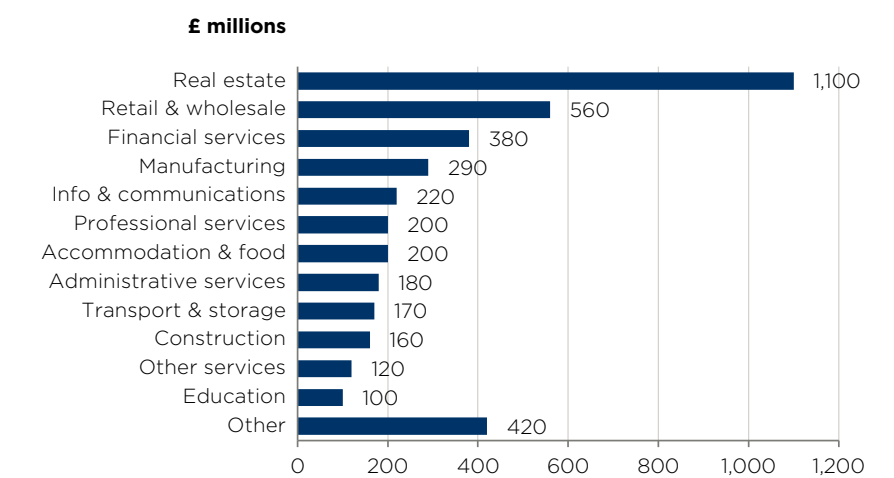
The sectors supported by this consumer spending are notably more consumer-facing with real estate and retail & wholesale benefiting from induced GDP impacts of £1.1 billion and £560 million respectively.

Fig. 3: Sectoral breakdown of indirect contributions to GDP supported by BAE Systems, 2022



Source: Oxford Economics

Fig. 4: Sectoral breakdown of induced contributions to GDP supported by BAE Systems, 2022

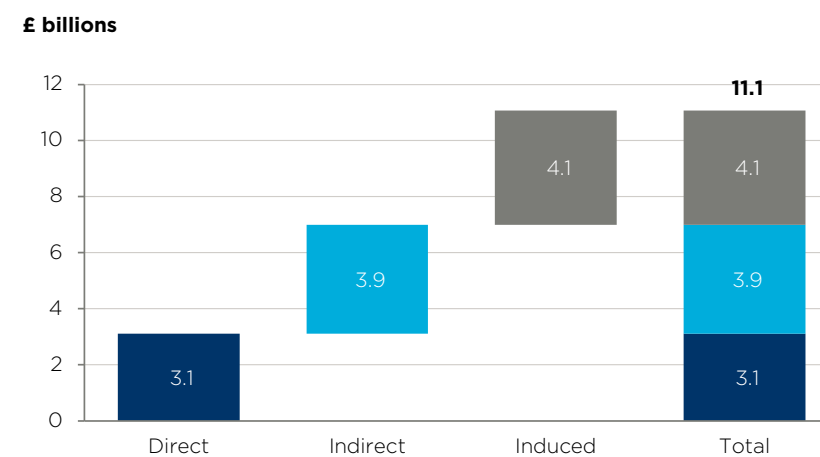


Source: Oxford Economics

2.4 TOTAL GDP

Considering the GDP supported by its own domestic activities, the indirect impacts stimulated by BAE Systems' supply-chain spending and the induced impacts arising from wage payments to its staff and workers in the supply chain, the Company contributed a total of £11.1 billion to GDP in 2022. This implies that BAE Systems' activities in the UK have a GDP multiplier of 3.6; for each £100 in GDP supported by the Company itself, a total of £360 is supported around the UK economy.

Fig. 5: Total contributions to GDP supported by BAE Systems, 2022



Source: Oxford Economics

BAE Systems and Pipistrel, the company behind the Velis Electro, are collaborating on the development of the application of electric aircraft in a series of trials to develop understanding of electric aircraft and battery technology. Electric-powered aircraft are one way that international air forces are looking to reduce carbon emissions and deliver significantly reduced running costs.





HMS Anson, the fifth Astute class submarine, was commissioned into the Royal Navy in August 2022 at Barrow-in-Furness.

COMMITTED TO THE ARMED FORCES COVENANT

BAE Systems supports veterans and their families through participation in the UK Armed Forces Covenant. This is an agreement by the UK government and participating organisations that recognises the significant contribution made by active and former UK armed forces personnel and their families. It aims to ensure veterans are continually supported by society and face no disadvantages in accessing public and commercial services. BAE Systems was a founding member of the Covenant and was re-confirmed for the scheme's Gold Award in late 2022.

Supporting employment opportunities for service leavers is an important commitment for Covenant members. BAE Systems works with the MOD's Career Transition Programme to promote job vacancies and training to those leaving the armed forces, helping them transition to civilian life.

Fifty employees at the Company have also volunteered hundreds of hours through the Recruit for Spouses programme, which supports the partners of serving personnel by providing career advice and coaching.¹⁶

As well as helping veterans and their families access the job market and find employment, BAE Systems provides support for those actively serving. Employees that are spouses of armed forces personnel are given a flexible approach to requests for leave around their partner's deployments.¹⁷ In addition, employees that are members of the armed forces reserves are offered 15 paid leave days a year for training duties, allowing them to fulfil their commitments while working.

The Company also delivers on its commitments under the Covenant in promoting Armed Forces Day events

across the UK and working with local and national armed forces charities including the Royal British Legion, SSAFA Forces Help and the Cadet Associations.

These activities are supported by members of the VetNet employee network—an employee-run group for veteran and reservist employees. With its 700 members, VetNet focuses on reinforcing personal and career development following the transition to the private sector as well as raising funds for military charities.¹⁸

Overall, the Company contributed £1.4 million to Armed Forces charities around the UK in 2022. This included donations and charitable sponsorships, as well as 364 hours of employees volunteering time.



¹⁶ Recruit for Spouses, "Recruit for Spouses career academy recognised with BAE Systems award"

¹⁷ BAE Systems, "Committed to the Armed Forces Covenant"

¹⁸ BAE Systems, "Employee Resource Groups"



In 2022, BAE Systems hired 1,070 new apprentices - its highest number to date.

3. SOCIO-ECONOMIC AND SUSTAINABILITY IMPACT

This chapter presents examples of the ways in which BAE Systems makes socio-economic contributions to the UK and to the areas in which it operates, including through the employment its activities support. The chapter also describes the Company's sustainability programmes including investments in reducing the environmental impact of its operations.

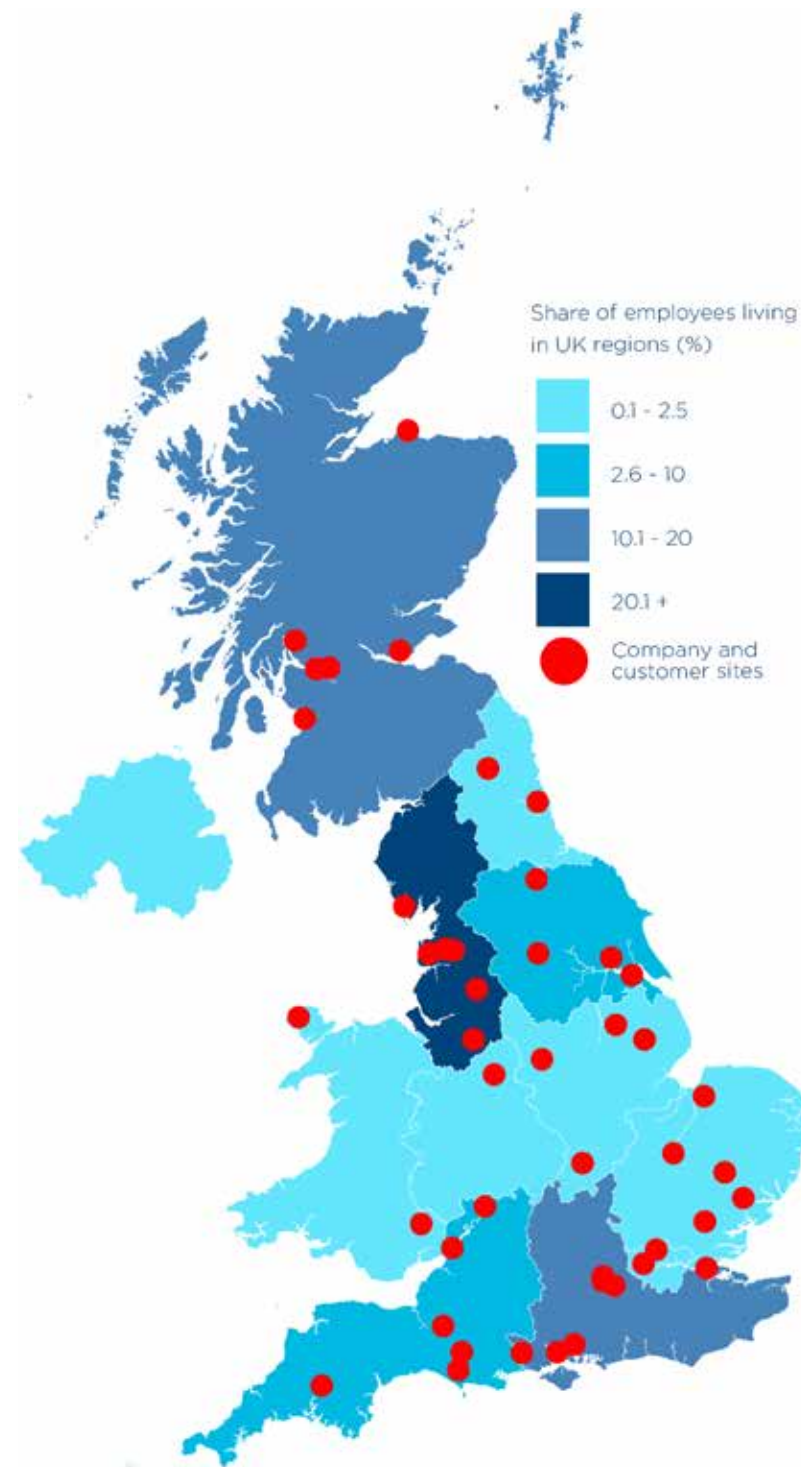
3.1 EMPLOYMENT AND SKILLS 3.1.1 DIRECT EMPLOYMENT

BAE Systems supports employment across the UK economy directly through its own operations as well as through its supply chain purchases and by workers' spending. Employment figures presented in this chapter are given on a full time equivalent (FTE) basis.

In 2022, BAE Systems employed 39,600 FTE workers around the UK, representing 43% of its global workforce and 1.6% of employment in the UK's manufacturing sector. The Company's largest site by employment is at Barrow-in-Furness, in the North West of England, which employed approximately 9,500 workers in 2022. This region is also the location of two other major sites, in Warton and Samlesbury (over 10,000 employees across both sites), both located near Preston in Lancashire. In total, the Company's sites in the North West represent more than half (57%) of BAE Systems' UK employment.

A further 18% of BAE Systems employees work in the South East, with the highest concentration of workers at sites in or around Portsmouth in Hampshire, which is the base for 3,500 workers. Scotland is the third largest location, with 10% of workers, including 3,200 employees based in the Glasgow shipyards at Scotstoun and Govan.

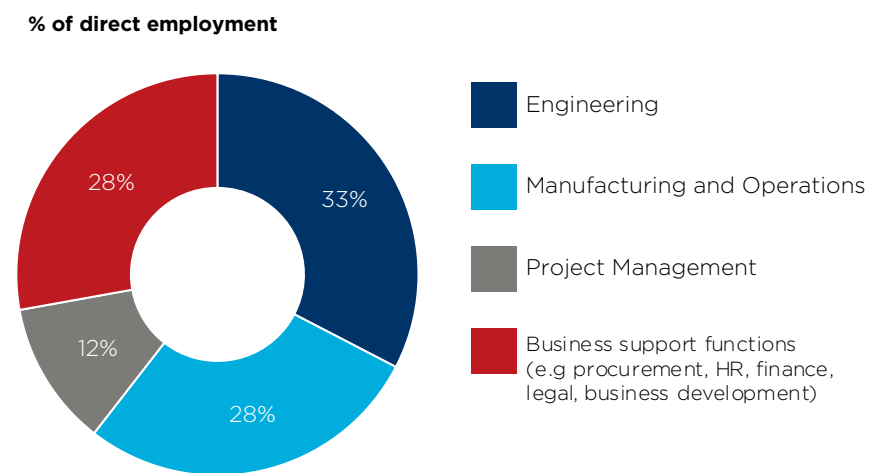
Fig. 6: BAE Systems' employees by region of residence, and major Company worksites in 2022.¹⁹



Source: Oxford Economics

Reflecting the technical skills required by BAE Systems' operations, 33% of workers were employed in engineering roles such as electrical, software, and mechanical engineers. When combined with a further 28% of employees in manufacturing roles and operations roles (such as supporting activity at customer sites) and 11% in project management, 72% of the Company's staff are employed in engineering or engineering-related roles. The Company's remaining employees work in business support roles such as procurement, IT, human resources, and finance.

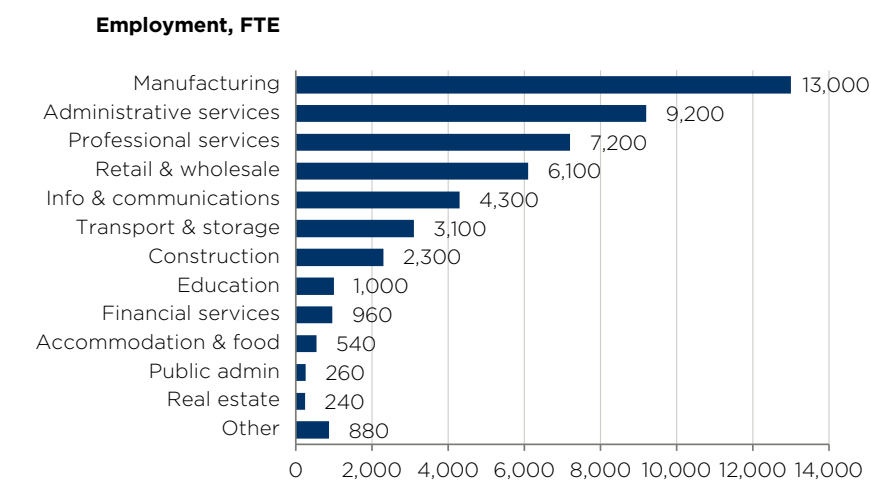
Fig. 7: Share of UK employment by job function at BAE Systems, 2022



Source: Oxford Economics
Total does not sum due to rounding

As highlighted in the previous chapter, BAE Systems contributed an estimated £3.1 billion to GDP in 2022. Combining this figure with the total number of direct employees means that average productivity at the Company in terms of GDP contributions was £78,570 in 2022, 4% higher than the average worker across the UK economy in FTE terms.

Fig. 8: Sectoral breakdown of indirect employment supported by BAE Systems, 2022



Source: Oxford Economics

3.1.2 Indirect employment

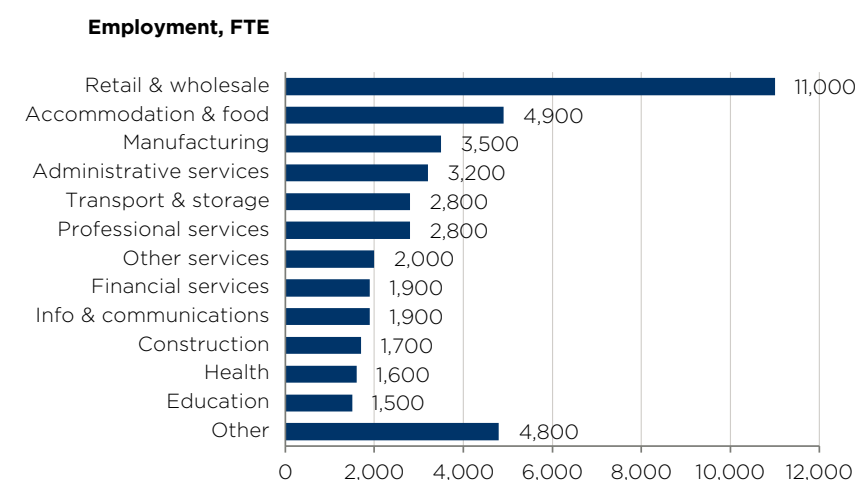
Through the economic activity stimulated by its supply chain spending, BAE Systems supported a further 49,000 people in employment in FTE terms in 2022. The sectors that benefit most from the Company's supply chain spending were manufacturing, administrative services, and professional services. This reflects BAE Systems' supply chain spending on products and services within the manufacturing sector and its employment of contractors that work within the administrative and professional service sectors, such as engineering professionals.

3.1.3 Induced employment

We estimate that the wage expenditure of BAE Systems employees and workers in its supply chain supported the employment of 43,000 FTE workers in 2022.

As with the Company's induced GDP impacts, sectors with the most employment supported are consumer-facing; induced employment impacts are greatest in the retail and wholesale services sector and the accommodation and food sector.

Fig. 9: Sectoral breakdown of induced employment supported by BAE Systems, 2022

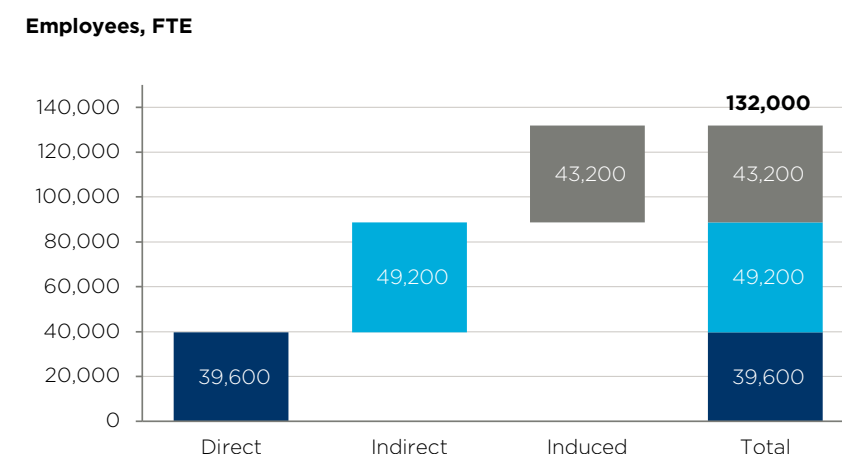


Source: Oxford Economics

3.1.4 Total employment

Through its own operations and the employment sustained by the Company's indirect and induced impacts, BAE Systems supported the employment of more than 130,000 workers in 2022. This means that for every 100 jobs at BAE Systems, the Company supported a total of 333 jobs around the UK economy.

Fig. 10: Total employment supported by BAE Systems, 2022



Source: Oxford Economics

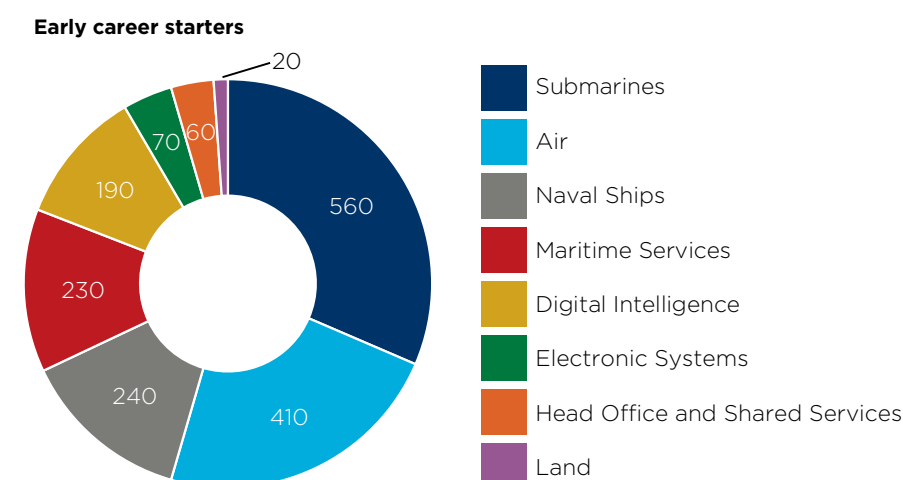
3.1.5 Skills

In 2022, BAE Systems spent a total of £180 million on training across all employee grades and in education outreach and the promotion of STEM (science, technology, engineering, and maths). This includes a strong focus on hiring and training a large number of workers each year to maintain the skills base needed to deliver technologically-advanced MOD projects.

The Company's main programmes for recruiting entry-level staff are its apprenticeships, graduate programmes, and industrial placements and internships for undergraduates. In 2022, BAE Systems hired 1,070 new apprentices and 710 graduates and undergraduates—its highest number to date. The majority of the Company's training spend is with these groups, with £105 million spent on apprenticeship employment and training costs in 2022, as well as £34 million in graduate recruitment and development in 2022 and £2.6 million on industrial placement students.

Over half (55%) of the new early careers staff in 2022 were placed in the Submarines and Air businesses in the North West of England, with placements in Naval Ships, Maritime Services, and the Digital Intelligence business making up most of the remainder.

Fig. 11: Total early careers entries by business area, 2022



Source: BAE Systems

Two thirds of apprentices at the company are working towards an intermediate or advanced qualification, equivalent to higher GCSE grades and A levels respectively, with the remainder on apprenticeships equivalent to foundation degrees and higher. Apprenticeship completion rates at the Company stand at 95%, and the Department for Education ranked BAE Systems ninth in the 2022 Top 100 Apprenticeship Employers list.²⁰

As well as its own new-starter training programmes, BAE Systems participates in other skills-boosting initiatives for the UK workforce. Almost 80 disadvantaged young people completed placements at BAE Systems in 2022 as part of the Movement to Work initiative (see case study on page 36) and another 14 completed placements through the UK Government's Kickstart Scheme, a programme that aimed to create job placements for 18-24 year olds on Universal Credit.^{21,22} In support of employing experienced workers, the Company partners with external organisation STEM Returners to offer a 12-week programme that provides candidates with career coaching and mentoring following a career break. To date, BAE Systems in the UK has employed 100 STEM professionals after their completion of the programme.²³

The Company has also launched a new Sustainability

Apprenticeship programme with Cranfield University. The first cohort of nine students began their apprenticeship in March 2022 and a second cohort of eight followed in March 2023. The aim of the new Masters-level qualification is to train a group of "sustainability champions," with students undertaking a range of sustainability-related training modules over two years, and completing a series of work placements across the organisation.²⁴

As part of its programme of life-long learning for employees, and to prepare for the requirements of new defence programmes and technologies, BAE Systems will also begin training its UK staff through a new Digital Skills Academy being set up in 2023. The Academy will run physical and virtual training in focus areas such as cyber security, data, engineering, and project management. The new Academy follows the establishment of multi-million pound Academies for Skills and Knowledge at both Samlesbury in Lancashire and in Barrow-in-Furness, in Cumbria. BAE Systems is also investing a further £15 million in an Applied Shipbuilding Academy in Glasgow to support the development of skills across the entire shipbuilding business—from apprentices to senior leaders.

Aside from training programmes for professionals and early careers workers,

the Company participates in a range of outreach schemes with schools, as detailed in the box (right). Supporting this wide range of initiatives across all age groups has several socio-economic benefits. For the Company, some of the schemes help to ensure a continuous pipeline of the skills fundamental to delivering complex defence programmes. The graduates, apprentices, and pupils themselves gain new skills that will benefit their future careers. Finally, the UK gains from having a new cohort of thousands of young people every year trained in engineering, technology, and advanced manufacturing, supporting the country's long-term competitiveness in these areas.

SCHOOLS ROADSHOW REACHES ONE MILLION PUPILS

BAE Systems supports a variety of programmes to engage school children with STEM careers. This includes the Schools STEM Roadshow, an interactive experience for 10- to 13-year-olds delivered jointly by the Royal Air Force, the Royal Navy, and BAE Systems. The Roadshow began in 2005, and now visits around 400 schools a year. In October 2022 the one millionth student took part in the show that focused on the role of magnets across healthcare, transport, and power generation.²⁵

Other examples of engagement with schools include the Bright Stars programme, which allows primary school pupils to experience running their own mini social enterprise. BAE Systems helps sponsor the programme, in which 60 Cumbria schools in 2022 were paired with volunteer advisors from the Company and other local businesses. The volunteers provide guidance and advice to the pupils to develop a business idea, with the ultimate aim of inspiring them to become young entrepreneurs.²⁶



The Company's employees also volunteer thousands of hours in support of the STEM Ambassadors programme, where volunteer employees in STEM careers spend time in schools and the community

with the goal of inspiring the next generation to pursue STEM subjects and careers.

²⁰ Department for Education, Top apprenticeship employers for 2022 announced, 2022.

²¹ BAE Systems, First intake of Kickstart recruits welcomed into the business, 2021

²² Gov.uk, Kickstart Scheme

²³ Sarah Morgan and Alex Brinded, Returning to the STEM of the issue

²⁴ BAE Systems, First of its kind sustainability apprenticeship launches, 2021

²⁵ BAE Systems, Engineering roadshow engages its one millionth pupil, October 2022

²⁶ Centre for Leadership Performance, BAE Systems Bright Stars Awards



Ensuring employees are safe at work is a priority for BAE Systems. The Company runs awareness campaigns and delivers safety training on an ongoing basis.

3.1.6 Safety, Health and Wellbeing

As well as focusing on the skills development of employees, BAE Systems invests in the safety, health, and wellbeing of its staff across its UK business. Manufacturing activities on Company sites present risks such as work in confined spaces and at height, and operating machinery. BAE Systems has several programmes focusing on the physical safety of employees, including extensive training, with the aim to eliminate, mitigate, and manage workplace safety risks. For instance, in 2022, the Company undertook a pilot of a new safety, health, and environment data platform designed to improve safety analytics capabilities. With the pilot phase complete, the platform is now being rolled out across the business.

As well as physical safety, BAE Systems provides resources to support mental health for employees and family members, promoting discussion and awareness on topics such as family loss, menopause, stress, and depression. Support is offered through the MindSet employee resource group, via access to a digital platform provided by wellbeing company Unmind, and via trained Mental Health First Aiders throughout the UK business. The Company also partners with Cancer Research UK to deliver a range of information and live webinars on cancer, focusing on risk factors such as smoking, obesity, and alcohol.



PROMOTING OPPORTUNITIES FOR SOCIAL MOBILITY

BAE Systems is involved with several schemes aimed at supporting social mobility for people. This includes the Company's large apprenticeship programme, which employed over 3,400 trainees in 2022, including over 1,000 new starters that year alone. These training schemes offer routes to career progression for young people in a workplace setting, with more than a quarter (27%) of the apprentice intake in England coming from disadvantaged communities in 2022.²⁷ Providing these entryways to employment is important for social mobility as existing research suggests that young people from disadvantaged backgrounds benefit most from apprenticeships.²⁸

BAE Systems also works to support social mobility by participating in the Movement to Work (M2W) initiative,²⁹ a collaboration of UK employers that provides work experience and training to unemployed young people. BAE Systems was a founding member in

the scheme and continues to participate, with the Prince's Trust providing employability skills training alongside work experience at the Company. Of the 700 people that have participated in the scheme through BAE Systems since its start in 2014, 420 went into employment or education, with 210 taken on directly by the Company.

One participant in M2W was Josh, who took a week's IT-oriented placement in May 2022 at BAE Systems, experiencing various departments and projects. He was offered an initial six month contract, which was quickly extended by a year, and now has a permanent role as an IT Operations Service Analyst at the Company. Josh said "within one year I have gone from being out of work to securing a full-time, permanent role. The experience has been really invaluable".

Josh, who took part in a two-week Movement to Work placement with BAE Systems in 2022, now has a permanent role with the Company.

²⁷ BAE Systems, Look at the person, not the CV

²⁸ Social Mobility Commission, Apprenticeships and social mobility, 2020. Women from disadvantaged backgrounds achieved an earnings boost of 16% from an intermediate apprenticeship compared to 10% for those from non-disadvantaged backgrounds.

²⁹ Movement to Work, BAE Systems

3.2 TACKLING ECONOMIC INEQUALITY

BAE Systems supports communities through activities such as charitable donations and volunteering, which will be discussed in greater depth in section 3.5. However, the Company also works directly with local authorities and community groups to regenerate and boost regional economies and livelihoods through investment in new and regenerated infrastructure and social wellbeing projects.

For instance, in 2022 BAE Systems purchased a number of empty former retail outlets in the town centre. It will regenerate these into working spaces to be used by employees from the Submarines business. The Company is also working with the University of Cumbria and the local council on a new university campus that will be built on the Barrow site, next to the existing Submarine Academy of Skills and Knowledge.

In January 2023, BAE Systems announced a £200,000 contribution towards the #BrilliantBarrow programme, which is a local initiative comprising seven projects designed to support the development and attractiveness of the area. For instance, one of these projects will see the creation and launch of a network of Community Wellbeing Hubs across Barrow, providing

a facility for activities and services for people of all ages.

In Portsmouth, BAE Systems is funding two local projects. A £500,000 grant to Portsmouth City Council will bolster the provision of youth services in the Stamshaw area with the creation of a new educational facility. A £250,000 grant to HIVE Portsmouth, which is a collaboration between local not-for-profit organisations and local government, will fund two new hubs, spurring the recovery of the voluntary sector post-pandemic. The two hubs, the first of which opened in June 2023, will enable voluntary organisations to share facilities, reduce costs and to collaborate on projects providing a wide range of services.

Aside from these investments and donations, the economic footprint of BAE Systems is distributed broadly across the UK in terms of employment and supply chain spending, as detailed earlier in this report. As such, the Company's impact extends into some of the more deprived areas of the nation, helping to support economic activity, wellbeing and jobs.

By using data on deprivation in local areas from the governments of each country in the UK we found that in 2022, BAE Systems directly employed 14,900 workers who live in the most deprived fifth of parliamentary constituencies.³⁰ This is equivalent to 38% of BAE Systems' total UK workforce, meaning its employment disproportionately benefits some of the UK's most deprived communities. As well as acting as a direct employer for staff, BAE Systems also supported further economic activity in these communities by spending £730 million with businesses based in these areas. Notable examples include spending £31 million in Ladywood, Birmingham, which is one of England's 10 most deprived constituencies, and £79 million in six areas in Glasgow, all of which are in the 10 most deprived constituencies in Scotland.



BAE Systems has been supporting Inspiring Barrow's Kickstart mentoring programme for a number of years. In 2023 five STEM Ambassadors mentored 10 Year Six pupils through the programme to help them with their transition into secondary school.

3.3 ENVIRONMENTAL SUSTAINABILITY: TOWARDS NET ZERO

BAE Systems' approach to environmental sustainability consists of reducing the carbon dioxide (CO₂) emissions of its operations and from its supply chain, and developing lower-carbon products that will help customers reduce their emissions.

The Company's target is to achieve net zero greenhouse gas (GHG) emissions across its own operations by 2030, with interim targets along the way meaning GHG emissions are reduced every year by at least 4.2%. More efficient management of worksites and manufacturing operations is a key factor in meeting these targets, which has started to have an effect: despite growth in employment and revenue, in 2022 emissions from equipment that BAE Systems owns or controls in the UK—also known as “Scope 1” emissions—were down by 27% compared to 2021 levels. Emissions from energy purchased for the Company's use in the UK (“Scope 2” emissions) decreased by 16%. Combined, emissions for every full-time equivalent employee fell from four tonnes of CO₂-equivalent to three.

One early example of a successful implementation of this strategy is the Company's supply chain team identifying re-use opportunities for components within the

manufacturing of the F-35 combat aircraft. As a result, CO₂ emissions associated with the production and transport of temporary fasteners, which secure components of the aircraft during the build process, were reduced by 50% between 2021 and 2022.

The Company also focuses on the protection of wildlife and natural habitats. One example is an Ecological Design and Management Plan at BAE Systems' development of Dargavel Village, a new community of 4,000 homes and facilities being built on the 2,400 acre former Royal Ordnance Factory site at Bishopton, outside Glasgow. Within the boundaries of the site, the remediation teams have worked closely with Scottish Natural Heritage to preserve the habitat of 24 species of mammal, four species of amphibian, and over 100 species of birds, as well as rare fungi. Other examples include the Company's munitions site in Glascoed, Wales, which hosts a population of orchids, meaning the land is regarded as a Site of Importance for Nature Conservation for grassland, and is also the home of at least 12 species of bat. At RAF Coningsby, BAE Systems and RAF employees maintain beehives as part of a conservation programme.

BAE Systems is also aiming for emissions through its supply chain purchases, also known as “Scope 3” emissions, to reach net zero by 2050. The Company has worked to estimate the greenhouse gas emissions associated with its spending with its UK suppliers over the past few years, which has highlighted hotspots and areas of focus for BAE Systems to engage with individual suppliers on decarbonising their operations.

NEW TECHNOLOGIES DELIVER ENERGY EFFICIENCIES



BAE Systems has developed new products that operate with a lower CO₂ footprint than existing technologies. The Company's electric drive and propulsion systems already power more than 15,000 hybrid and fully electric commercial land vehicles around the world.

In the maritime sector, the Company has fitted catalytic converter systems to the Royal Navy's two newest 90-metre Offshore Patrol Vessels, which reduce emissions of nitrogen oxide gases (Nox) by up to 90%.^{31,32} The Maritime Services team is working with ARCO, its PPE supplier, to establish a best in class recycling and reporting scheme for all types

of PPE. It will be trialled on His Majesty's Naval Base, Portsmouth in the near future.

In the air sector, BAE Systems is working with Malloy Aeronautics, a UK-based SME specialising in electric uncrewed air vehicles, to create an uncrewed, electric delivery vehicle capable of carrying loads of up to 300kg to a distance of up to 30km.³³ This “quadcopter” has the potential to deliver rapid response capability for military and civilian purposes, while reducing human risk and saving on CO₂ emissions by providing an alternative to higher-carbon transport means such as helicopters. The Company is also developing

prototypes of aircraft electrification systems for urban air mobility and regional transport jets.^{34,35} BAE Systems is working with two aircraft manufacturers, Embraer and Heart Aerospace, on other electric aviation technologies (discussed in more detail in section 4.1).

Aside from emissions, BAE Systems has identified new opportunities to cut the amount of waste going to landfill from its UK operations. From its Samlesbury site in Lancashire, carbon fibre waste is now incinerated at a waste-to-energy plant, generating electricity for the national grid and hot water for the local community.³⁶

³¹ Naval Technology, UK Royal Navy's Type 26 fleet to feature Selective Catalytic Reactors, 2022.

³² NOx emissions can be harmful to health and biodiversity, as well as mixing with other gases to form the greenhouse gas ozone—the UK's NOx target for 2030 is a decrease of 73% compared to 2005 levels: Defra, Emissions of air pollutants in the UK – Nitrogen oxides (NOx).

³³ BAE Systems, T-650 Heavy Lift Electric UAS Concept Vehicle.

³⁴ BAE Systems, Clearing the path to electric flight.

³⁵ BAE Systems, Aircraft electrification.

³⁶ BAE Systems, Reducing carbon emissions from our carbon fibre waste.



HELPING REDUCE DEFENCE EMISSIONS

Defence activities account for half of the UK central government's carbon dioxide (CO₂) emissions, and the MOD's ambition is to help the nation reach targets of net zero emissions by 2050.³⁷

One way BAE Systems is helping to support these objectives is through virtual or "synthetic"

training. In 2022, the Company worked with the UK's Typhoon jet fighter crews to fly more than 6,300 virtual training missions, saving over 100,000 tonnes of CO₂ compared to using physical aircraft. Development is now underway to reduce the size of the simulator hardware needed for this training—from a large room with digital projectors

to one the size of a physical cockpit used with virtual reality goggles. This will allow training to be run in more locations, and the technology has already been trialled with the Company's customers.

The synthetic training approach is now being extended to cover larger scale military exercises

incorporating a wider variety of defence forces across land, sea and air. This greater use of virtual resources is expected to help further reduce the financial and environmental cost of defence training.

New equipment at Typhoon aircraft bases is also reducing emissions. More than 40% of

the CO₂ emitted by the fleet's ground operations is estimated to come from the diesel-fuelled power units. These supply electricity to jets on the ground at the RAF bases at Lossiemouth and Coningsby to run onboard computers and other functions while the engines are powered down. The BAE Systems-led consortium that holds the

support contract for the Typhoon programme has recently tested new electric ground power units. Forty power units have been purchased for £4 million,³⁸ and are expected to save the MOD £13 million in running costs over the next decade as well as cutting carbon emissions by 90%.

³⁷ Ministry of Defence, Climate Change and Sustainability Strategic Approach, 2021.

³⁸ MOD DE&S, Greener Power for our Air Power, 2022

3.4 DIVERSITY, EQUITY, AND INCLUSION

BAE Systems takes steps to support diversity, equity, inclusion, and socio-economic mobility. This includes participation in programmes to boost the employability of young unemployed people, such as Movement to Work and the Kickstart Scheme, as well as the Company's own apprenticeship programme. More information on these is included in a case study on page 36.

Other ways in which inclusivity is supported in the Company include employee resource groups (ERGs) related to disability, mental health and wellbeing, military veterans, cultural and ethnic diversity, LGBTQ+, and gender themes. Some 8,000 employees are now involved in one or more of the ERGs.

The Gender Equity Network (GEN) is a group for all BAE Systems employees in the UK who believe everyone should be given the opportunity and support to succeed in their career, regardless of gender. At the moment, the group is focused on growing opportunities for women to develop their careers and arranges coaching and mentoring support for employees. The group works across the UK business to raise awareness of gender issues and also organises best practice sharing at events to mark International Women's

Day and International Women in Engineering Day. Read more about further initiatives underway in BAE Systems to increase gender balance in the case study on page 46.

Another employee-led group is VetNet, a network for ex-service personnel and employees who are also reservists. VetNet focuses on different ways to support the Armed Forces Covenant – read more in the case study on page 24. Furthermore, Embrace, a group for BAE Systems supporting cultural and ethnic diversity helps raise awareness throughout the year, challenging perceptions and organising activities to mark events, including Black History Month.

ENabled advises senior leaders on strategies to support employees with seen and unseen disabilities, helps raise awareness of the impact of different disabilities, and runs awareness campaigns across BAE Systems. The group organises events and conferences examining different aspects of disability such as promoting disability confidence and recognising hidden disabilities. ENabled also works closely with BAE Systems' facilities management teams to improve physical accessibility in the Company's workplaces.³⁹

To further support inclusion, in 2022 the Company became one of the founding members of Neurodiversity in Business, a business forum that aims to share industry good practice on neurodiversity recruitment, retention, and empowerment.^{40 41}

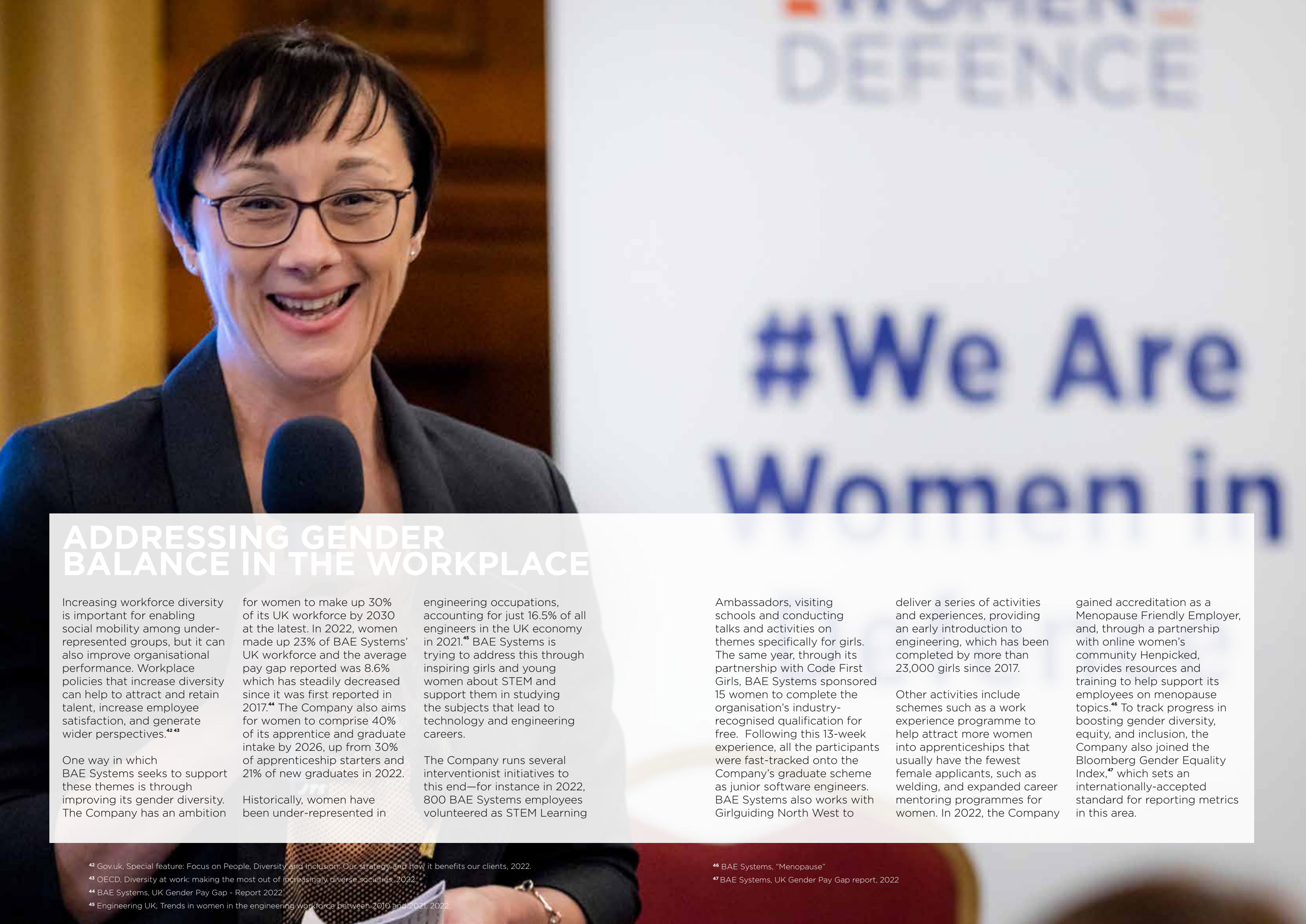
The Company's OutLink employee group for LGBTQ+ communities has 2,700 members and allies. In 2022, BAE Systems' employees took part in nine PRIDE events across the UK.



³⁹ BAE Systems, ENabled.

44 ⁴⁰ Neurodiversity in Business, About Us.

⁴¹ "Neurodiversity describes the idea that people experience and interact with the world around them in many different ways; there is no one 'right' way of thinking, learning, and behaving, and differences are not viewed as deficits." (Harvard Health Publishing, What is neurodiversity?, 2021)



ADDRESSING GENDER BALANCE IN THE WORKPLACE

Increasing workforce diversity is important for enabling social mobility among under-represented groups, but it can also improve organisational performance. Workplace policies that increase diversity can help to attract and retain talent, increase employee satisfaction, and generate wider perspectives.^{42,43}

One way in which BAE Systems seeks to support these themes is through improving its gender diversity. The Company has an ambition

for women to make up 30% of its UK workforce by 2030 at the latest. In 2022, women made up 23% of BAE Systems' UK workforce and the average pay gap reported was 8.6% which has steadily decreased since it was first reported in 2017.⁴⁴ The Company also aims for women to comprise 40% of its apprentice and graduate intake by 2026, up from 30% of apprenticeship starters and 21% of new graduates in 2022.

Historically, women have been under-represented in

engineering occupations, accounting for just 16.5% of all engineers in the UK economy in 2021.⁴⁵ BAE Systems is trying to address this through inspiring girls and young women about STEM and support them in studying the subjects that lead to technology and engineering careers.

The Company runs several interventionist initiatives to this end—for instance in 2022, 800 BAE Systems employees volunteered as STEM Learning

Ambassadors, visiting schools and conducting talks and activities on themes specifically for girls. The same year, through its partnership with Code First Girls, BAE Systems sponsored 15 women to complete the organisation's industry-recognised qualification for free. Following this 13-week experience, all the participants were fast-tracked onto the Company's graduate scheme as junior software engineers. BAE Systems also works with Girlguiding North West to

deliver a series of activities and experiences, providing an early introduction to engineering, which has been completed by more than 23,000 girls since 2017.

Other activities include schemes such as a work experience programme to help attract more women into apprenticeships that usually have the fewest female applicants, such as welding, and expanded career mentoring programmes for women. In 2022, the Company

gained accreditation as a Menopause Friendly Employer, and, through a partnership with online women's community Henpicked, provides resources and training to help support its employees on menopause topics.⁴⁶ To track progress in boosting gender diversity, equity, and inclusion, the Company also joined the Bloomberg Gender Equality Index,⁴⁷ which sets an internationally-accepted standard for reporting metrics in this area.

⁴² Gov.uk, Special feature: Focus on People, Diversity and Inclusion: Our strategy and how it benefits our clients, 2022.

⁴³ OECD, Diversity at work: making the most out of increasingly diverse societies, 2022.

⁴⁴ BAE Systems, UK Gender Pay Gap - Report 2022.

⁴⁵ Engineering UK, Trends in women in the engineering workforce between 2010 and 2021, 2022.

⁴⁶ BAE Systems, "Menopause"

⁴⁷ BAE Systems, UK Gender Pay Gap report, 2022



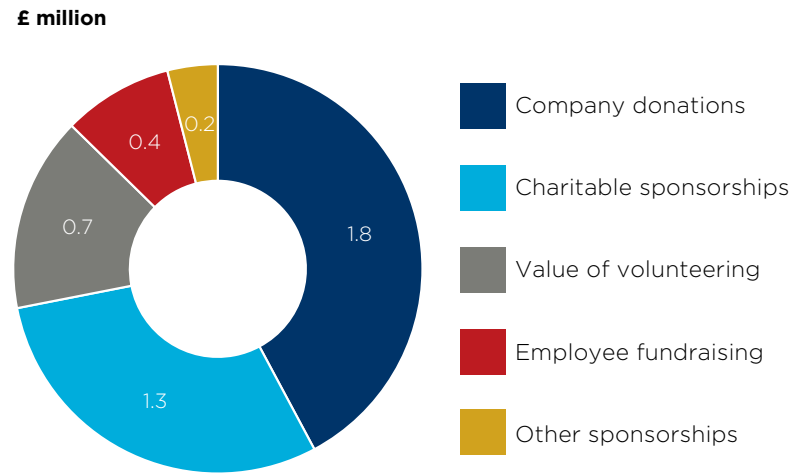
As part of its community investment programme, BAE Systems donated £100,000 to the Magic Breakfast charity to provide healthy breakfasts to schoolchildren.

3.5 SUPPORTING COMMUNITIES AND PROTECTING HERITAGE

BAE Systems supports charities and not-for-profit organisations through its community investment programmes. In 2022, it contributed a total of £4.4 million, including £3.3 million in Company donations and sponsorships, £670,000 in the value of 14,500 hours of volunteer time, and £380,000 through employee fundraising. The main areas of focus for this community investment are:

- Supporting armed forces personnel, including a commitment to the UK government's Armed Forces Covenant and £1.4 million of the total above used to support armed forces charities (more information on this area is given in a case study on page 24);
- Educational outreach, supporting various initiatives aimed at encouraging schoolchildren to study STEM subjects and pursue related careers (see case study on page 33)
- Protecting UK heritage, through activities such as partnerships with museums and the running of dedicated visitor centres or archive research centres at several of the Company's UK sites.

Fig. 12: BAE Systems' UK community investment by type, 2022



Source: BAE Systems

BAE Systems supported more than 40 foodbanks in 2022, with donations of £160,000, mainly through the Trussell Trust, funding hundreds of thousands of meals.⁴⁸ The Company also donated £100,000 to the Magic Breakfast charity, through which it is estimated that 1,800 children will be provided with a total of 350,000 breakfasts to support their nutritional needs across the 2022/23 academic year.⁴⁹ This support is particularly timely in the current cost of living crisis, when most food banks have seen a rise in demand while receiving fewer donations.⁵⁰

To help meet a growing need to support schools in delivering digital and STEM skills, around 18,000 young people across Lancashire are benefitting from a £500,000 investment from BAE Systems over the next three years. Working with Chorley-based CREATE Education, BAE Systems is helping to expand the charity's digital skills education programme in the region. Each school taking part in the programme gets access to the very latest industry-standard equipment and expertise. They are provided with their own 3D printer and interactive training workshops for staff and students by CREATE Education. Since the programme started, more than 100 teachers from 52 Lancashire secondary schools have received training in the use of the printers and

associated technology and more than 2,500 Year 8 students have so far been given the opportunity to take part in interactive, hands-on workshops.

In assisting armed forces charities, and as part of BAE Systems' commitment to the Armed Forces Covenant, (see case study on page 24) the Company donated £100,000 in 2022 to help expand the Royal British Legion Industries' Centenary Village at Aylesford in Kent. The Village is the largest development project of its type in the UK and once complete, will provide homes, support and special physical, mental and educational care to 12,000 veterans of all ages and their families.⁵¹ BAE Systems has also worked with ABF, The Soldiers' Charity for more than 20 years. In the past decade the Company's donations have supported hundreds of soldiers find employment through the charity's Tools for Transition programme. Donations have covered education and training fees for those transitioning to gain qualifications for their chosen career—from private security licenses to teacher training courses; training materials and laptops; and recovery and rehabilitation tools for soldiers suffering health problems. Further donations to Combat Stress and the Royal Navy and Royal Marines Charity have supported veterans in recovering and managing mental health issues.

Much of BAE Systems' community support comes through employee volunteering. The Company's Digital Intelligence business has provided pro bono support to the government's Child Exploitation and Online Protection Command, passing on knowledge and expertise in online protection. BAE Systems also ran environmental regeneration projects involving planting 1,400 trees in the UK in 2022, employees in Scotland spent time cleaning up the Clyde, and workers in the North West of England worked with Ribble Rivers Trust to help regenerate the environment. Furthermore, business leaders at BAE Systems spent almost 1,000 hours coaching and supporting small and medium enterprises through the Be the Business initiative and a further 1,000 hours was contributed to the Movement to Work programme to support young people into employment.

Preserving the Company's unique heritage from its predecessor companies is also a key part of BAE Systems' community programme. BAE Systems' heritage across air, land, and sea defence dates back to at least the 1800s and incorporates organisations including Vickers, English Electric, A.V Roe, Royal Ordnance, Hawker Siddeley, and BAC. The Company invests nearly £500,000 each year in protecting key artefacts and



In 2022 employees raised £380,000 for charities and community causes. Tim from the Company's Digital Intelligence business ran the London Marathon in support of Combat Stress.

⁴⁸ BAE Systems, Supporting foodbanks this winter, 2022.

⁴⁹ BAE Systems, Fuelling learning with Magic Breakfast, 2023.

⁵⁰ UK Parliament, Food bank demand and the rising cost of living, 2022.

⁵¹ BAE Systems, Supporting the UK's veterans.

models as well as managing collections of millions of original designs, drawings, film, and photographs, and has recently begun a large-scale digitisation project to scan thousands of its historic negatives to better aid in their preservation and access. The main archive is located in Farnborough in Hampshire with additional archives located at BAE Systems' sites at Warton in Lancashire, Glascoed in Wales, Brough in Yorkshire, and in Rochester, Kent. The Company works closely with several museums and Trusts, including the Imperial War Museum at Duxford, the Dock Museum in Barrow, and The Shuttleworth Collection in Bedfordshire, often loaning out parts of its collections for public display.

Additionally, donations and sponsorship activities undertaken by the Company help preserve a shared British military history at associated organisations. This includes at Bletchley Park, a World War II intelligence heritage site, where BAE Systems took a leading sponsorship role in supporting the development of The Intelligence Factory. This new permanent exhibition showcases the scale and complexity of the Bletchley Park operation—from tracking positions of Allied and enemy vessels, to handling millions of items of data and the facilities necessary to accommodate thousands of staff.

3.6 SUPPLY CHAIN MANAGEMENT

As well as supporting its staff through training and investing in the development of local communities, BAE Systems aims to support the approximately 6,000 UK organisations in its supply chain. The Company is a signatory to the UK's Prompt Payment Code and aims to remove barriers to trade, especially for small- and medium- sized enterprises. It provides suppliers with opportunities to access new business, share best practice, and develop skills. Businesses in the Company's supply chain are invited to join the Chartered Institute of Procurement and Supply Aerospace & Defence Academy training programme.

BAE Systems is committed to supporting its suppliers in making a positive and sustainable social impact. It encourages suppliers to offer apprenticeship programmes, develop education outreach, and support the Armed Forces Covenant and the Movement to Work project for disadvantaged young people (see respective case studies on pages 24 and 36).

BAE Systems has implemented a robust framework to mitigate any risks in its supply chain and safeguard the continued delivery of critical defence and security equipment and services. The Company has established a set of Supplier Principles giving guidance in working responsibly. At the contracting stage, BAE Systems stipulates its expectation that suppliers embrace standards on ethical behaviour. A global Supply Chain Central Risk Intelligence hub has been established to collect and share new risk intelligence associated with suppliers, as well as cyber security, political and ethical information that may affect their business. Particular attention is paid to suppliers who deliver critical goods and services procured through BAE Systems' supply chain, with mitigation plans in place to limit disruption to business operations.

The Herne Extra Large Autonomous Underwater Vehicle concept will enable navies to monitor the underwater battlespace and protect critical industries.

NEW SATELLITE CLUSTER TO BRING FASTER ACCESS TO INTELLIGENCE

Satellites perform an important role in gathering data and observations for governments, military, and civilian organisations. However, accessing data from existing satellites can typically involve a data-transfer process that can take many hours and potentially be interrupted by loss of signal.

A new cluster of four low earth orbiting BAE Systems satellites, being prepared over the next few years for launch, and collectively known as Azalea, aims to make this process more efficient. The satellites will not only collect visual, radar, and radio frequency information, but will also combine and analyse this data in-orbit. This means the satellite can flag suspicious activity immediately, rather than waiting for data to be transmitted to the ground for processing.

The advanced radar imaging technology used in the cluster, developed by Finnish space firm ICEYE, can collect images day and night and is not

affected by cloud cover. The ability that this technology provides to frequently monitor locations no matter the conditions, combined with its ability to directly analyse and flag important data, is important for decision makers in rapidly-changing situations, such as military operations or those responding to natural disasters.

The satellites are also designed to be reconfigurable while in orbit, in anticipation of changing requirements in the future and reducing the need to launch new satellites.

The Azalea programme supports the UK government's 2022 Defence Space Strategy,⁵² which identified Earth observation as a priority, by providing a sovereign capability in this area.



⁵² Gov.UK, Defence Space Strategy, 2022.

4. WIDER AND LONG-TERM ECONOMIC IMPACTS

Employees at Samlesbury in Lancashire manufacture the rear fuselage for the F-35 combat aircraft. Since 2005, BAE Systems has delivered over 1,000 rear fuselages to the prime contractor, Lockheed Martin.

BAE Systems' ongoing business operations help to sustain UK GDP and employment each year. However, the Company also has a wider impact on the UK economy through R&D, capital investment, and exports, all of which help to support the UK's engineering and manufacturing sectors and the longer-term growth potential of the economy.

4.1 TECHNOLOGY AND R&D

Research and development spending drives innovation, which is an important contributor to long-term economic prosperity and competitiveness. Innovative new processes can improve BAE Systems' own production efficiency and reduce costs to the taxpayer. New technologies can offer the armed forces enhanced operational capabilities and/or reduced costs; and certain innovations can bring wider benefits to society, for example by improving public services or quality of life.

In March 2023 the UK government announced an ambition to become a "science and technology superpower" by 2030.⁵³ BAE Systems helps to contribute to this goal through the R&D it carries out—in 2022, the Company funded £142 million of research work, an increase of 15% from 2021. On top of self-funded research, BAE Systems carries out significant amounts of R&D work on behalf of customers such as the MOD. In total, the Company performed more than £1.45 billion of R&D work in the UK in 2022 alone, up from £1.2 billion in 2021.

To put this R&D activity in context, the latest official data show that £47 billion of R&D work was carried out by all UK businesses in 2021, meaning BAE Systems performed 2.6% of all UK business R&D that

year. This figure rises to 4% when only considering R&D carried out in fields closely related to the Company's operations.⁵⁴

BAE Systems partners with other organisations to provide new technologies used by customers. For instance, in April 2023, the Company announced a partnership with Microsoft, the software and cloud services provider. Since beginning this collaboration, the two companies have implemented three work programmes that boost delivery and efficiency of defence programmes, including software that creates a "digital thread", which can support the effective maintenance of maritime equipment from initial concept to ultimate disposal. The partnership has also developed secure software that provides real-time data updates to aircraft.

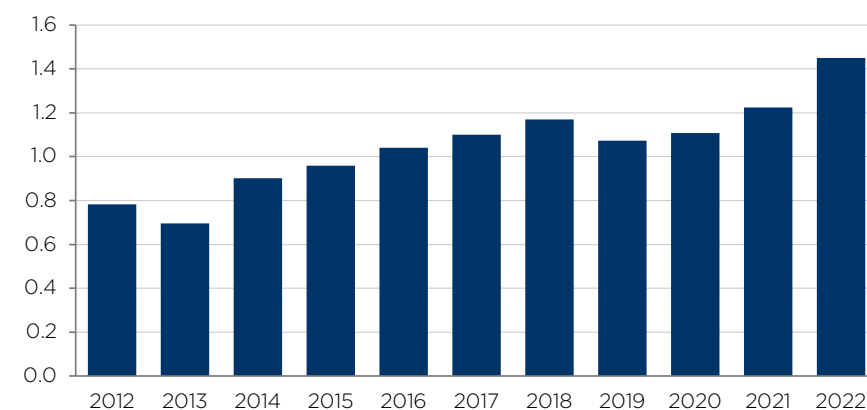
Other collaboration includes the Company's strategic partnerships with the universities of Birmingham, Manchester, Nottingham, Southampton, Strathclyde and Cranfield. Research projects with these institutions focuses on areas such as sensors, autonomy, robotics and machine learning, power systems, and advanced materials science. Each university also puts forward a doctoral student for BAE Systems' PhD of the Year award, won most recently in

⁵³ Department for Science, Innovation and Technology, Science & Technology Framework, 2023

⁵⁴ ONS, Business Enterprise R&D 2021 data, published November 2022. The sectors defined as closely related to BAE Systems' operations are: mechanical engineering, electrical machinery, transport and aerospace manufacturing, telecommunications, technical testing and analysis, information services and research and development services. Sectors excluded as unrelated are chemicals and pharmaceuticals, wholesale & retail trade, public administration, agriculture, construction, energy, mining and "other manufacturing", which comprises fields such as food, textiles, plastics and basic metals.

Fig. 13: Total annual value of R&D work carried out by BAE Systems' UK operations

£ billions, nominal



Source: BAE Systems

2022 by Callum Stark at the University of Strathclyde. His research into quieter marine propellers drew inspiration from whale fins and has the potential to reduce noise pollution for marine life.

Important areas of technology focus for BAE Systems include “multi-domain integration”,⁵⁵ artificial intelligence (AI) and autonomy, the space sector, and environmental sustainability-driven technologies.

⁵⁵ This refers to technologies that allow the different “domains” of defence to work together more effectively. Domains include land, sea, air, space, and the “cyber” realm.

One recent example of such work is the Herne autonomous underwater vehicle announced by the Company in 2022 as a new option for militaries to perform anti-submarine and surveillance roles without risking military personnel and larger vessels.⁵⁶

Another example is work in the area of electric aviation, with several collaborations recently announced. In 2022, BAE Systems unveiled plans to work with Pipistrel Aircraft, a Slovenian manufacturer of light electric planes, to develop new products for the defence market.⁵⁷ The Company also announced an intent to work with Embraer, a Brazilian aerospace manufacturer, on a defence variant of Embraer’s EVE electric vertical take-off and landing vehicle that was originally designed for the urban air mobility market.⁵⁸ And in early 2023, BAE Systems and Heart Aerospace, a Swedish aircraft manufacturer, announced a collaboration on a battery system for regional electric aeroplanes.⁵⁹

The Company has also worked on technologies that help to lower CO₂ emissions. For instance, in 2022 BAE Systems acquired computer simulation business Bohemia Interactive Simulations (BISim), whose products are used by more than 60 countries, and help to reduce customer CO₂ footprints by using simulated military training techniques instead of real-world training exercises. For instance, the “single synthetic environment” (SSE) for training, known as OdySSEy, was announced in 2023. It will allow defence forces from across the air, land, sea, space, and cyber domains to train together in an immersive virtual environment, and will capture data from each trainee to tailor their future sessions. Additional examples of emissions-saving products are given in the case study on page 41.

Further examples of the Company’s technological research and developments can be found in case studies throughout this report, such as the acquisition of satellite business In-Space Missions that has helped lead to the planned launch of a cluster of satellites in 2024 (see case study on page 54); unmanned vehicles (see case study on page 60) and next-generation combat aircraft (page 72).

The impact of the Company’s R&D work is also demonstrated by the number of patents produced. According to the World Intellectual Property Organization, BAE Systems was eighth highest in the UK in terms of the number of international patent applications filed in 2022.⁶⁰

⁵⁶ BAE Systems, Herne information sheet

⁵⁷ BAE Systems, BAE Systems and Pipistrel set to combine aerospace expertise

⁵⁸ BAE Systems, Embraer and BAE Systems announce collaboration

⁵⁹ BAE Systems, BAE Systems and Heart Aerospace to collaborate, March 2023

⁶⁰ World Intellectual Property Organization, United Kingdom Country Profile, latest available data.

CREWLESS BOATS DELIVER ENHANCED AI PERFORMANCE

BAE Systems is focusing on developing and integrating autonomous and AI systems. The deployment of AI in autonomous operations enables data to be collected and processed, supporting decision-making by armed forces and security services. Autonomous systems can help keep human operators out of harm's way, as well as perform repetitive roles in some defence operations. The fact that these technologies allow vehicles to be operated and data to be collated remotely without a crew onboard also reduces personnel requirements.⁶¹ Together, these benefits will help governments establish combat assets quickly and efficiently, while enhancing their ability to protect people.

A recent example of the Company's work in this area is the Autonomous Pacific 24 (AP24) rigid inflatable boat, which in early 2023 was awarded an Unmanned Marine Systems Certification by Lloyds Register, a maritime

classification society. This is the first time the certification has been awarded to a militarised autonomous vessel, following an assessment against a set of safety and operational requirements to certify its safe design, build, and maintenance. The AP24 has the capability to undertake maritime security, anti-piracy, and intelligence gathering missions, and is designed to share its sensor data easily with other units.

Systems like the AP24 that use AI also bring benefits of enhanced operational performance. For instance, a fleet of such vessels could be deployed over a wide area of operations, increasing visibility of the surrounding environment beyond what can be achieved by ship-mounted sensors. This increases the inflow of data which, when combined with the application of AI to automatically assess the landscape for threats, means decision-makers can be alerted more quickly to the highest priorities.

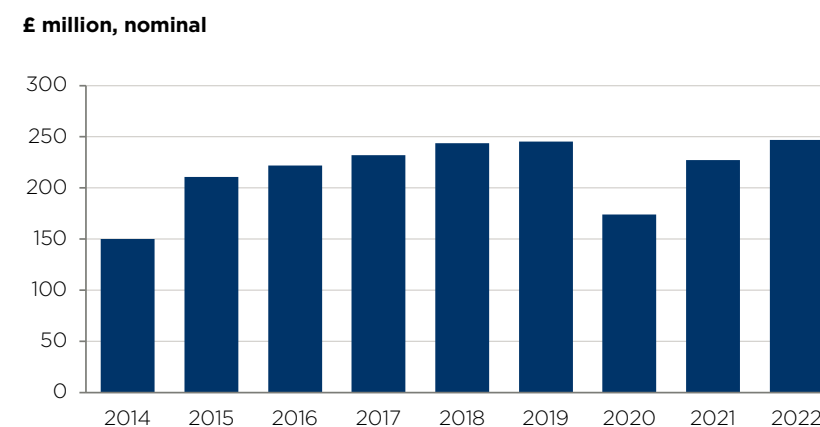


⁶¹ BAE Systems, Autonomous Systems

4.2 CAPITAL INVESTMENT

Capital investment boosts the total capital stock of the economy, providing extra or improved equipment for workers to use, and raising worker productivity. In the UK, BAE Systems contributed to this source of long-term growth potential with capital investments of £250 million in 2022, and a total of £1.1 billion in nominal terms over the past five years. Examples are given in the box on the opposite page.

Fig. 14: Capital investment by BAE Systems' UK operations



Source: BAE Systems

INVESTMENTS IN ENGINEERING, MANUFACTURING AND CYBER FACILITIES



Recent examples of capital investment include an agreement to spend £90 million on the Company's munitions business as part of a long-term contract with the MOD, which includes the upgrade and expansion of manufacturing equipment and infrastructure. The Company is also investing £15 million in a new Applied Shipbuilding Academy in Glasgow to support the delivery of new frigates (more information in case study on page 66).

Further facilities investment was made at the Maritime Integration and Support Centre (MISC) outside Portsmouth. A £4.9 million extension to the naval technology development and testing facility was completed in 2022,⁶² as part of a wider multi-year £13 million upgrade programme. Early in 2023, the MISC supported a training exercise between the UK and nine other NATO nations, testing missile systems off the coast of Scotland. Engineers from the MISC team joined the

exercises, while a live feed of the operations was streamed back to a visualisation suite at the centre.

On 1 January 2022, BAE Systems launched a new business called Digital Intelligence, which is home to 4,500 digital, data, cyber, and intelligence experts. To grow this business the Company is investing £18 million over five years in a new Manchester facility, as well as delivering an upgrade worth £1.5 million to facilities in Yeovil, Somerset.

⁶² VolkerFitzpatrick, Awarded contract to upgrade MISC, 2021

During the military exercise known as "Formidable Shield 2023", BAE Systems' Type 45 Sampson and Type 23 Artisan radars demonstrated their anti-ship ballistic missile defence capability. The Sampson radar tracked a ballistic missile throughout its flight and the Artisan provided early detection and tracking through its experimental tracking software.

4.3 EXPORTS

The final channel through which BAE Systems contributes to the UK's longer-term economic potential is through exports, which can boost growth by providing new avenues for UK producers to sell their products and services.

Overseas sales of UK products are particularly important for the defence, aerospace, and security sectors as they provide an extra return for the UK economy on the initial development costs of large maritime, air, and other projects—much of which is funded by the government. Defence exports can also foster international cooperation between countries, helping strengthen strategic alliances. More broadly, exports can expose UK companies to

international competition and create potential for knowledge sharing from cross-border collaborations.

In 2022, BAE Systems exported a total of £3.7 billion worth of products and services from the UK. Nearly half of this (48%) was to the Middle East, including support to Hawk and Typhoon jets for the Kingdom of Saudi Arabia and Oman, and supply and support of Hawk and Typhoon jets to Qatar.

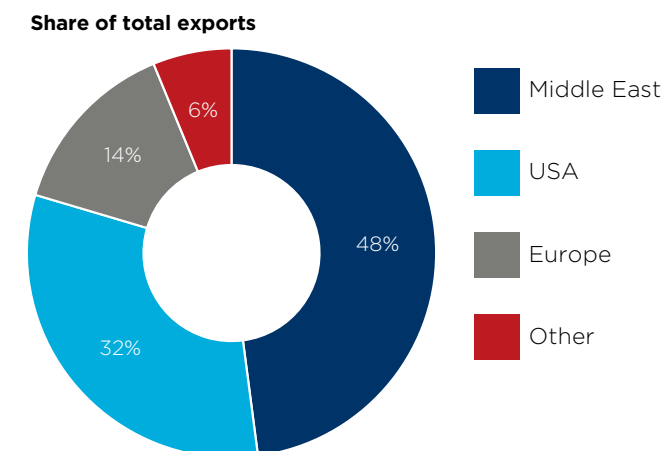
A further third of exports were to the US, including F-35 combat aircraft rear fuselages, as well as electronic systems for aircraft such as "head-up displays" for pilots.

The remainder is largely split between Australia and other European countries, such as a £500 million order, placed

in 2022, for the Company's contribution to building 20 new Typhoon aircraft for Spain. Recent developments that are expected to boost BAE Systems exports over the coming years are the "AUKUS" trilateral agreement between the governments of the UK, the US, and Australia, where the Company will play a role in helping Australia to acquire its first nuclear-powered submarines, and the recently announced Global Combat Air Programme (GCAP) (see case study on page 72) which will lead to increased trade with Italy and Japan.

As the Company imported £1.3 billion of inputs in its procurement spending, this means that a total of £2.4 billion was contributed to the UK's trade balance in net exports.

Fig. 15: BAE Systems UK exports by destination, 2022



Source: BAE Systems



TYPE 26 FRIGATES UNDERPIN FUTURE OF GLASGOW SHIPYARD

BAE Systems is building a new class of anti-submarine and air defence warship for the Royal Navy at the Company's shipyards in Glasgow. The UK government placed a £3.7 billion order for the first three Type 26 frigates in 2017,⁶³ with a further £4.2 billion contract agreed in late 2022 for another five vessels. The steel was cut on the first of this second batch, HMS Birmingham, in April 2023.

The shipbuilding work will sustain employment at the Glasgow sites into the 2030s. BAE Systems estimates that up to 4,000 jobs will be supported directly and across the supply chain,⁶⁴ with £1.2

billion associated with the new order being spent with companies around the UK.

The Company has applied for planning consent to construct a new shipbuilding hall at a cost of more than £100 million, to provide additional capacity to build the eight frigates already ordered, as well as any future orders.

To support the delivery of these ships, BAE Systems is also investing £15 million in a new Applied Shipbuilding Academy in Glasgow. This will provide training across the entire workforce from senior leaders to apprentices. In fact, 180 new apprentices started

in 2022, joining the 400 already working on the Type 26 programme.

The Type 26 has also been chosen by the Royal Canadian Navy and the Royal Australian Navy to expand and update their fleets, and the use of the Type 26 design is worth a reported £6 billion to the UK economy in export orders.⁶⁵ Significant infrastructure and skills development programmes are under development by BAE Systems Australia to deliver the Hunter Class programme, as the Type 26 programme will be known in Australia.

⁶³ BAE Systems, Manufacturing contract for Type 26 Global Combat Ship awarded to BAE Systems

⁶⁴ BAE Systems, BAE Systems awarded £4.2bn contract to build five more Type 26 frigates in Glasgow

⁶⁵ UK National Shipbuilding Office, National Shipbuilding Strategy, 2022



In March 2022 BAE Systems was awarded a £590 million contract to continue to deliver support and servicing for the UK's Royal Air Force Hawk fleet. The contract secured hundreds of engineering jobs at RAF Valley in Anglesey, North Wales, the home of No. 4 Flying Training School, which trains the UK's next generation of fighter pilots.

5. TAX CONTRIBUTIONS

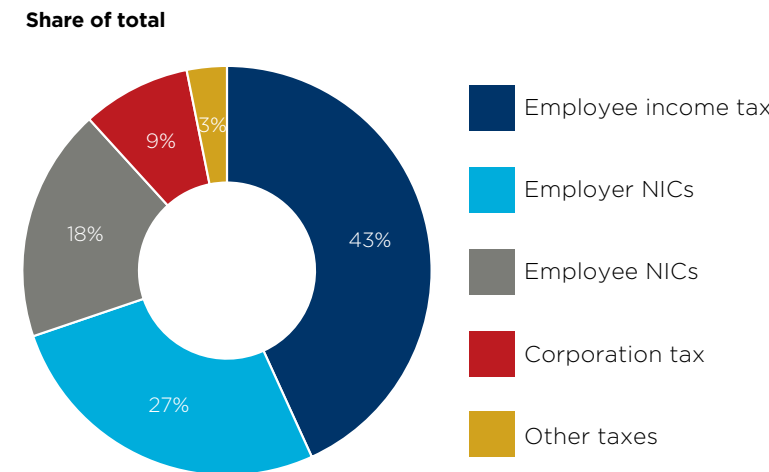
The economic activity supported by BAE Systems described in the previous chapters helps to generate tax revenue for the UK government. In this chapter, we set out these tax contributions using the same framework as the economic impact: direct tax contributions are paid by the Company itself; indirect tax contributions are paid by the supply chain; and induced contributions are taxes paid as a result of the induced output supported by the Company.

5.1 DIRECT TAX

BAE Systems' UK operations directly paid nearly £770 million in taxes in 2022. Nearly £680 million (88%) of these taxes were related to labour in the form of income tax paid on wages, and employee and employer National Insurance contributions (NICs).

The Company paid a further £66 million in corporation tax, with the remainder coming from other smaller taxes including the Climate Change Levy and Insurance Premium tax.

Fig. 16: BAE Systems' direct tax contribution by type, 2022



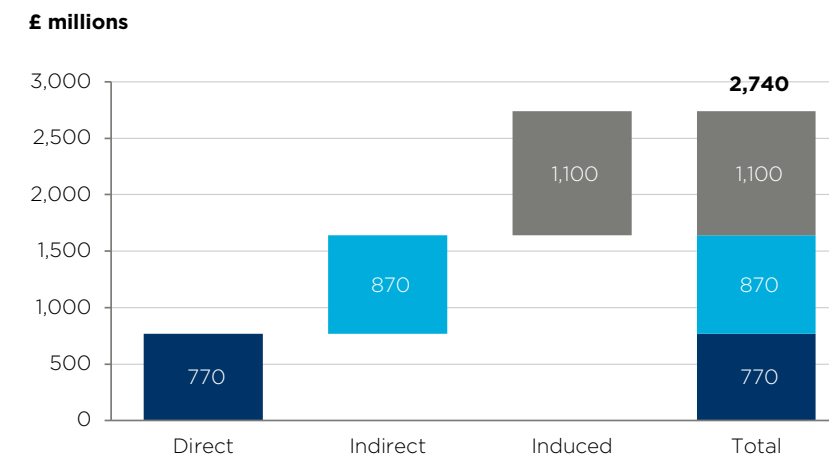
Source: BAE Systems

5.2 TOTAL TAX

In addition to the £770 million in taxes paid directly by the Company, £2 billion worth of tax contributions were supported by BAE Systems' indirect and induced impacts, generating a total tax contribution of £2.7 billion.

£870 million in tax contributions were supported through the output stimulated by the Company's supply chain purchases. These taxes included income tax and National Insurance contributions paid on employee wages and corporation taxes paid by businesses in BAE Systems' supply chains. Induced tax contributions are comprised of these taxes but are also boosted by the inclusion of VAT paid on the consumer spending. In 2022, taxes paid as a result of the induced output stimulated by BAE Systems were estimated to be £1.1 billion.

Fig. 17: BAE Systems' total tax contribution, 2022



Source: Oxford Economics

BAE Systems' Digital Intelligence business employs 4,500 people and was created in January 2022 to help armed forces and security services achieve an information advantage on the physical and virtual battlefield.





DELIVERING THE UK'S NEXT GENERATION FUTURE COMBAT AIR SYSTEMS

In 2018 the UK Government launched the Future Combat Air System (FCAS) programme, bringing together the expertise of the MOD, BAE Systems and major companies in the Combat Air sector under the name of Team Tempest, to identify and co-develop technologies that could replace current combat air capability and deliver next-generation technologies.

The FCAS programme is set to deliver significant economic benefit to the UK, helping to sustain and develop critical skills in the Combat Air industry and wider industrial base. There are already more than 2,800 people working directly as part of Team Tempest across the UK industry partners and MOD, with more than 1,000 apprentices and graduates recruited across the partners

since 2018. There are also more than 580 UK organisations already on contract across the UK, including 91 SMEs and 26 academic institutions.

In 2022, the governments of UK, Japan and Italy announced the Global Combat Air Programme (GCAP); a major new partnership with the goal to deliver the next generation of combat aircraft.⁶⁶ BAE Systems is the lead

industrial partner for the UK on GCAP; supporting ongoing government discussions and acting on behalf of UK industry to integrate design, development and production capabilities and new technologies. BAE Systems will work alongside Team Tempest partners to build on the recent concepting work and mature the design and development of Tempest; a common next-generation

combat fighter for the Global Combat Air Programme.

New processes to increase the efficiency of building next-generation jets are being developed at BAE Systems' Factory of the Future at Warton in Lancashire. Technologies such as robotic automation have been tested there, with 65% of a representative aircraft structure built using guided manufacturing.⁶⁷ Other

technologies at the facility such as connecting machinery to wireless networks and using additive manufacturing (otherwise known as 3D printing) instead of traditional casting and machining processes are intended to save costs through shortening design and build times. This also allows the same spaces to be used for manufacturing multiple products, saving factory space.

⁶⁶ Ministry of Defence, PM announces new international coalition to develop the next generation of combat aircraft

⁶⁷ BAE Systems, UK industry to play key role in new Global Combat Air Programme



Ellis Folan works at BAE Systems Naval Ships business in Glasgow as a project controller and was awarded BAE Systems' Apprentice of the Year accolade in 2023.

6. REGIONAL IMPACTS

BAE Systems has major sites at more than 30 locations around the UK, with the Company defining a major site as one which employs more than 50 people. As highlighted in previous chapters, it procures from supply chains right across the country, as highlighted in previous chapters. We set out the Company's impacts on employment (on an FTE basis) around the regions and nations of the UK in this chapter,⁶⁸ with a focus on the following.⁶⁹

- **The North West of England:** BAE Systems has key areas of operations in the North West including at the submarine-building facility in Barrow-in-Furness and military aircraft engineering, design and manufacturing sites in Lancashire. The Company has administrative offices in Preston and a munitions manufacturing facility outside Crewe in Radway Green.
- **The North East of England and Yorkshire and Humber:** The Company has a centre for digital engineering in Brough, near Hull; an office for its Digital Intelligence business in Leeds; and munitions production and testing sites at Washington, Tyne & Wear and Ridsdale, Northumberland.
- **London and the South East:** BAE Systems has major operations around Portsmouth, including at His Majesty's Naval Base there. Other sites include offices in Frimley and Farnborough; offices in central London; an electronics design and manufacturing facility in Rochester, Kent; and Digital Intelligence operations in Guildford.
- **The South West of England:** BAE Systems has sites specialising in software development, communications technology and submarine engineering in Yeovil, Christchurch, and Weymouth, as well as programme management alongside MOD staff outside Bristol. Further Digital Intelligence offices are located in Gloucester and Dorchester.
- **Scotland:** Shipbuilding is a major focus of the Company's sites in Scotland, with two shipyards in Glasgow. The Company also specialises in electronics development and manufacturing staff at a site outside Dunfermline, a regional aircraft engineering support facility in Prestwick, munitions testing and evaluation in Bishopton, and employees supporting the Typhoon fleet at RAF Lossiemouth.
- **Wales:** A munitions factory in Glascoed, Monmouthshire, is the largest BAE Systems site in Wales, with a smaller number of workers supporting jet pilot training at RAF Valley on Anglesey.

⁶⁸ In this chapter and elsewhere in this report, we provide figures on the number of BAE Systems employees at each worksite. This is based directly on information provided by the Company. However, there are a number of workers in this dataset who are transient. When running our analysis at the regional level, we have allocated these unassigned workers to each area of the UK on a proportional basis. As such, if the reader were to manually sum the raw number of workers at each worksite in a region, this will not match the adjusted regional totals we are using.

⁶⁹ A full list of BAE Systems' 50 largest UK sites can be found in Appendix A.

Fig. 18: The regions assessed in this chapter⁷¹



Source: Oxford Economics

These focus areas cover almost all of BAE Systems' operations in the UK. However, outside of these regions, the Company also has significant operations at RAF Coningsby in the East Midlands, with more than 650 staff supporting RAF Typhoons based there. A further 220 staff are based at the R&D labs of the Digital Intelligence business in Great Baddow, in the East of England, and 70 employees are based in Milton Keynes. BAE Systems also has 120 staff at RAF Marham in the East of England, and a small number of workers at other RAF bases across the Midlands.

BAE Systems' facility at Brough in East Yorkshire is a centre of excellence for digital engineering and structural testing. Activity at the site brings together the design and test of synthetic modelling and model based systems, and the structural testing of military aircraft – including the Typhoon.





The Company is delivering advanced synthetic training for pilots training to fly the Typhoon aircraft. Ten high fidelity, immersive simulators, and advanced training facilities are being developed at RAF Coningsby in Lincolnshire and RAF Lossiemouth in Moray, Scotland.

6.1 NORTH WEST OF ENGLAND

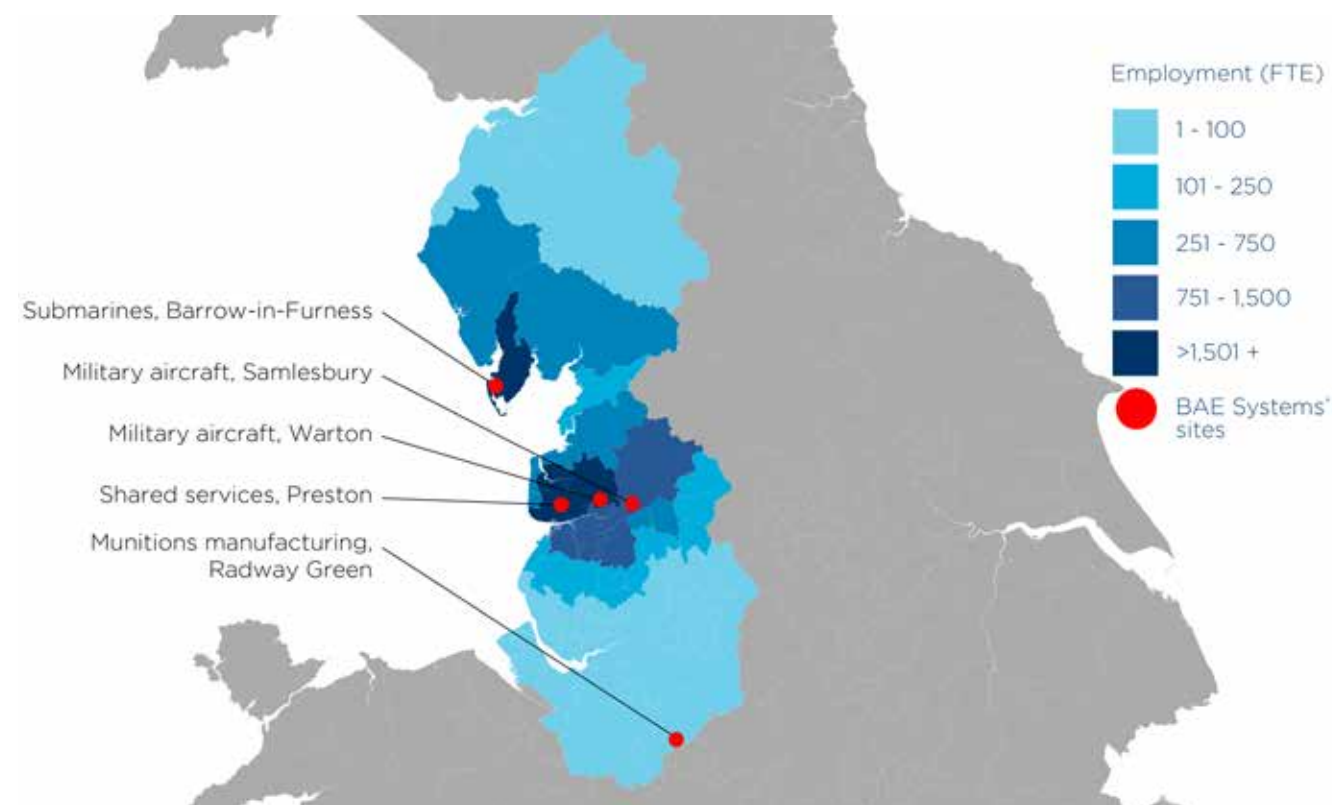
The North West of England is home to BAE Systems' significant submarines facility in Barrow-in-Furness, in Cumbria, where all of the submarines currently in service with the Royal Navy were built. The site has approximately 9,500 employees working there, currently building the first three of the Dreadnought class, (see case study on page 10) and continuing work on the final two boats of the Astute class,

with the latest, HMS Anson, commissioned into the Royal Navy in 2022.

Work is also ongoing for a replacement for the Astute class, previously known as the Submersible Ship Nuclear Replacement (SSNR). In March, it was announced that the UK, US and Australia will deliver a trilaterally developed submarine, based on the SSNR design, the first major AUKUS initiative. Australia and the UK will operate SSN-AUKUS, as it will be known, incorporating

technology from all three nations to ensure commonality across the fleets. BAE Systems will commence construction of SSN-AUKUS in Barrow later this decade, with the first of class expected to be delivered to the Royal Navy in the late 2030s. More than £1 billion has been invested in technology and infrastructure at the Barrow shipyard to support the delivery of these programmes. As discussed further in section 3.2, BAE Systems has also contributed £200,000 towards the local #BrilliantBarrow

Fig. 19: BAE Systems' employees, by parliamentary constituency of residence, North West of England, 2022



Source: Oxford Economics

programme of regeneration and development. The Company is also working with the University of Cumbria and the local council on the construction of a new university campus on the Barrow site.

BAE Systems is a significant contributor to the UK's sovereign combat air capability with two major facilities in the North West of England, Warton and Samlesbury, with combined employment of more than 10,000. In Warton, near Preston, advanced engineering, R&D, human factors and flight testing is conducted, including upgrade work and capability development on the Typhoon aircraft. Employees at Warton are developing and testing advanced military aircraft manufacturing capabilities in its experimental "Factory of the Future", contributing to the development of the UK's next generation combat aircraft system – read more in the case study on page 72.

The site at Samlesbury is an advanced manufacturing facility involved in manufacturing major components for the Typhoon aircraft and building the rear fuselage for every F-35 military aircraft on order with Lockheed Martin. In 2022, the site completed the assembly of 150 rear fuselages and since 2005, over 1,000 have been delivered to Lockheed Martin.⁷¹ 76 Samlesbury also houses the Company's Academy for Skills and Knowledge, which trains apprentices and graduates in aircraft manufacturing

techniques such as welding and coppersmithing as well as digital capabilities including robotics and 3D printing.

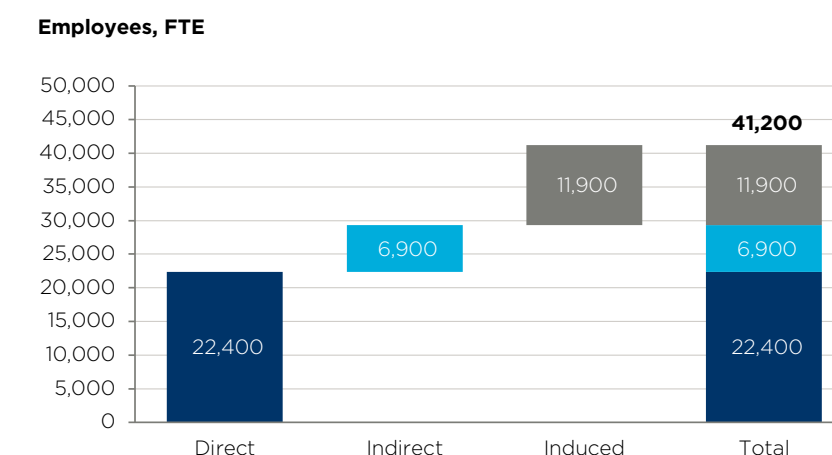
Aside from these major business locations, BAE Systems has a presence in the North West in Preston itself, with more than 900 employees focused on central business support activities. The Company's munitions business also has a facility at Radway Green outside Crewe, with 300 employees manufacturing and testing ammunition for small arms.

A total of 22,000 BAE Systems employees work in the North West of England, representing 57% of total UK-based BAE Systems employment. This employment makes an important contribution to economic activity within the

region, representing 7.6% of the region's manufacturing employment and 0.8% of overall FTE workforce jobs.

Economic activity in the region is also supported by the Company's procurement spending of more than £450 million from over 750 suppliers in the area in 2022. This procurement spending and the economic activity generated in supporting BAE Systems procurement in neighbouring regions sustained the employment of a further 6,900 workers within the region. Factoring in the economic activity stimulated by these workers and BAE Systems employees spending their wages in the wider economy, the Company supported total employment of over 41,000 jobs within the region in 2022.

Fig. 20: BAE Systems' contribution to employment in the North West of England, 2022



Source: Oxford Economics

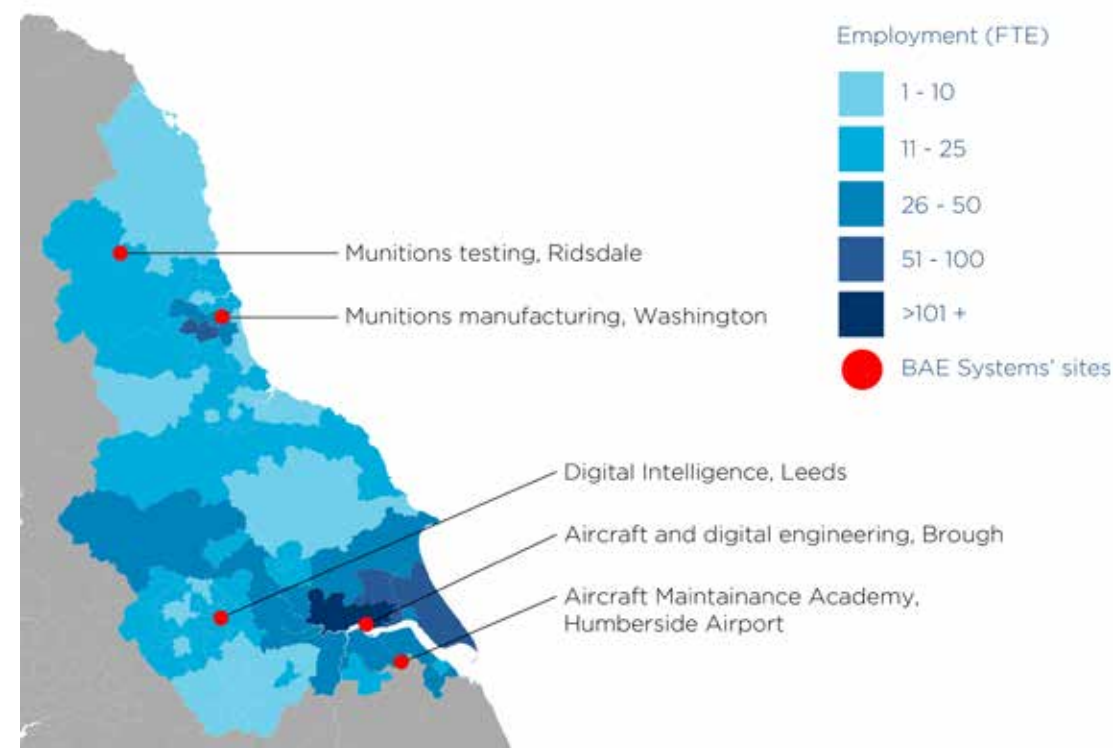
⁷¹ BAE Systems, BAE Systems delivers 1,000th F-35 Lightning II fuselage, February 2023

6.2 NORTH EAST OF ENGLAND AND YORKSHIRE AND THE HUMBER

BAE Systems has several businesses in these regions of the country, the largest of which is in Brough, near Hull, where more than 600 workers are based. The site is one of the Company's main aircraft and digital engineering hubs, supporting the delivery of major programmes such as the Dreadnought submarine and the Future Combat Air System next generation combat aircraft.

Leeds is home to more than 250 workers in the Digital Intelligence business, which provides cyber security and data analysis support for governments and businesses. The Company's Aircraft Maintenance Academy is located at Humberside Airport, where apprentices learn to work in maintenance roles on RAF bases around the UK, with approximately 100 graduating each year through the facility.

Fig. 21: BAE Systems' employees, by parliamentary constituency of residence, North East of England and Yorkshire and the Humber, 2022

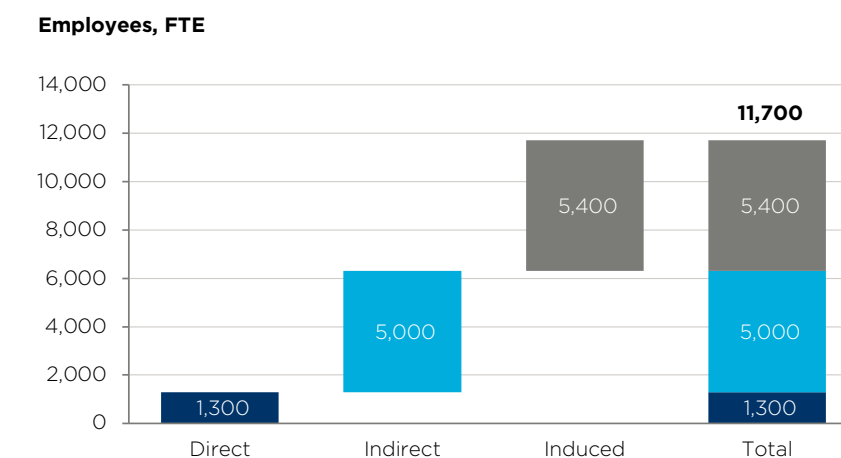


Source: Oxford Economics

In addition, BAE Systems operates two munitions sites in the North East. Washington, near Sunderland, has a focus on heavy ammunition for artillery and tanks, with 260 employees on site, and Ridsdale in Northumberland is home to a munitions testing and evaluation site.

In 2022, through direct, indirect and induced impacts, BAE Systems supported the employment of almost 12,000 workers in the North East of England and Yorkshire and the Humber. Through its worksites across the North East of England and Yorkshire and the Humber, BAE Systems directly employed a total of 1,300 staff. Driven by £260 million of BAE Systems' procurement in the two regions, the indirect output generated by the Company sustained the employment of 5,000 workers. An estimated 5,400 employees were supported through induced consumer spending impacts in 2022.

Fig. 22: BAE Systems' contribution to employment in the North East of England and Yorkshire and the Humber, 2022



Source: Oxford Economics

6.3 LONDON AND SOUTH EAST OF ENGLAND

The South East of England includes several major sites working across the defence spectrum.

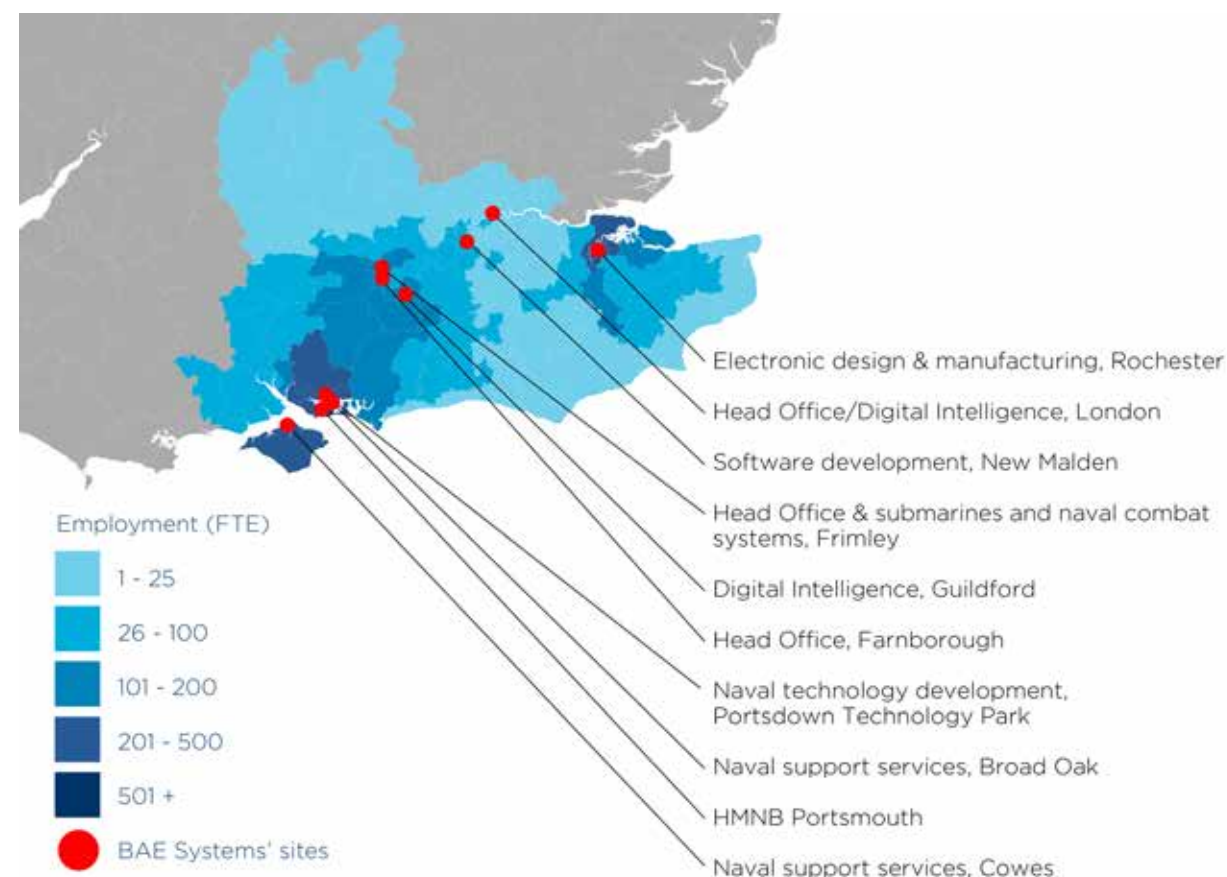
Portsmouth in Hampshire and the surrounding area has the highest concentration of BAE Systems workers within the region, with more than 3,500 people. This includes His Majesty's Naval Base

(HMNB), Portsmouth, at which the Company delivers warship support and manages waterfront services and infrastructure projects for the Naval Base, through a joint venture with engineering and technical consulting firm KBR. The majority of the Royal Navy's ships are based at this location, including the two Queen Elizabeth-class aircraft carriers. Near to the Naval Base is an engineering and manufacturing facility

for naval systems in Broad Oak, a radar technology development site on the Isle of Wight, and the Maritime Integration and Support Centre in Portsdown Technology Park discussed in section 4.2.

Away from the coast, BAE Systems' Head Office functions are divided between central London, Frimley in Surrey, and Farnborough in Hampshire,⁷² with staff based

Fig. 23: BAE Systems' employees, by parliamentary constituency of residence, London and South East of England, 2022



Source: Oxford Economics

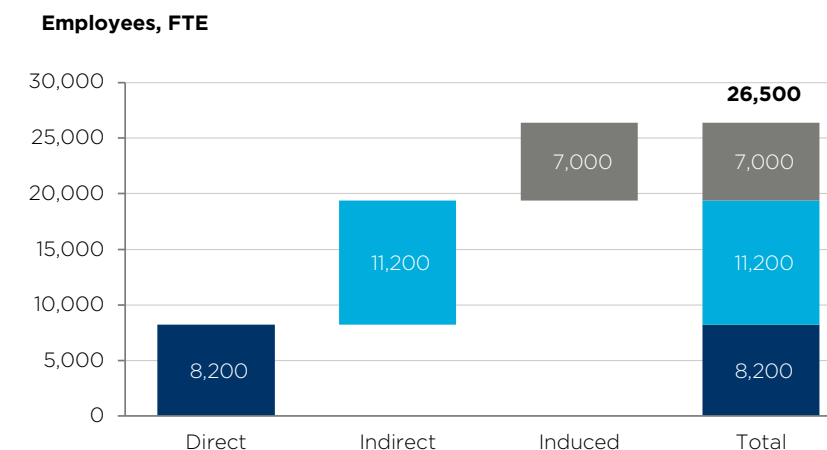
at Frimley also working on submarine and naval combat systems. The Company also has 1,400 workers at an electronics development and manufacturing facility in Rochester focused on aviation electronic technologies, such as a helmet-mounted display, and 240 staff in New Malden, in outer London. The Company's Digital Intelligence business has nearly 1,500 workers at offices in central London and Guildford in Surrey.

BAE Systems directly employs more than 7,000 employees across the South East of England, with a further 1,100 working in London.

BAE Systems' UK-based operations procured nearly £400 million from businesses in London and £750 million from firms in the South East of England in 2022. This procurement sustained employment for more than 11,000 workers within the

two regions. Another 7,000 workers were supported by the consumer spending stimulus of the Company's employees and the employees of the businesses which make up its supply chain. Factoring in the Company's indirect and induced impacts, BAE Systems supported a total of nearly 27,000 workers across the two regions.

Fig. 24: BAE Systems' contribution to employment in London and the South East of England, 2022



Source: Oxford Economics
Totals do not sum due to rounding



At His Majesty's Naval Base, Portsmouth, BAE Systems' Emergency Response Team (ERT) are all volunteers who have learnt specialist skills to respond to all emergencies on the site. As trained specialists, the team are additionally a co-responding unit for South Central Ambulance Service, and support all types of incidents including medical emergencies, chemical spills, and rescues at height or from a confined space. Outside of the Base, members of the ERT use their skills to assist their local communities and neighbours.

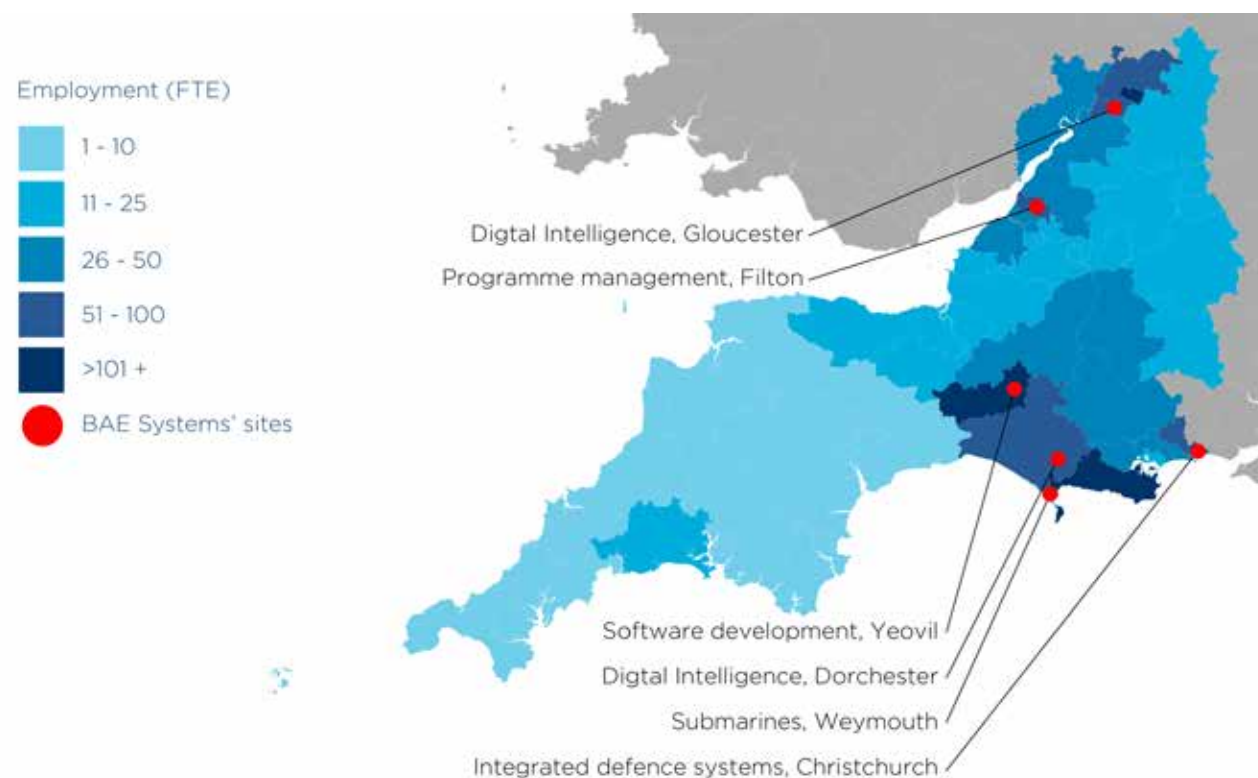
6.4 SOUTH WEST OF ENGLAND

BAE Systems has operations in six locations in the South West of England. The Company has nearly 500 workers across a Company site and MOD facilities in Filton and Abbey Wood outside Bristol, managing defence programmes and working on joint project teams with MOD staff. In Christchurch, 280 employees focus on developing integrated defence systems.

A further 230 employees are based in Yeovil, specialising in aerospace and defence software systems for aspects such as mission planning and support, and Weymouth is home to 150 workers in submarine design. Lastly, BAE Systems' Digital Intelligence business has more than 500 workers across sites in Dorchester and Gloucester. Across all its sites in the South West, BAE Systems directly employed 1,800 workers in 2022.

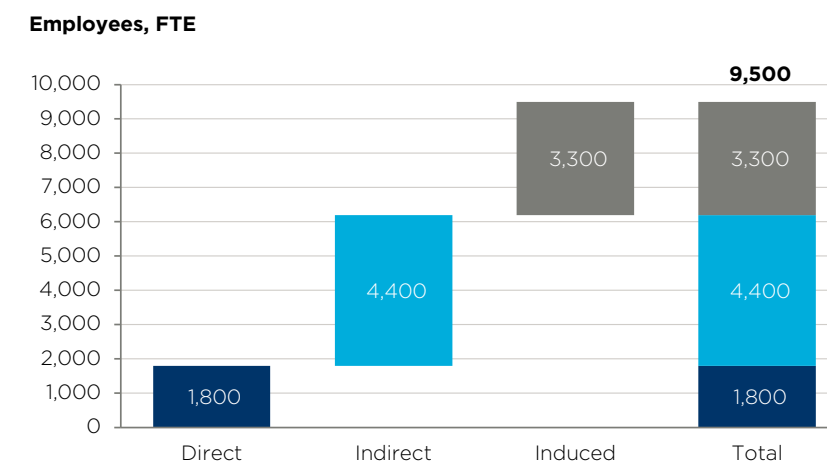
In 2022, BAE Systems were estimated to have supported the employment of 9,500 workers in the South West of England. Of these, 4,400 were supported by BAE Systems' supply-chain spending of over £400 million with almost 500 suppliers in the region. The employment of the remaining 3,300 was sustained by the economic activity stimulated by wage payments to BAE Systems' employees and the employees of its suppliers.

Fig. 25: BAE Systems' employees, by parliamentary constituency of residence, South West of England, 2022



Source: Oxford Economics

Fig. 26: BAE Systems' contribution to employment in the South West of England, 2022



Source: Oxford Economics



HMS Glasgow, the first of eight Type 26 frigates, entered the water for the first time in November 2022 from BAE Systems shipyard in Govan in Glasgow.

6.5 SCOTLAND

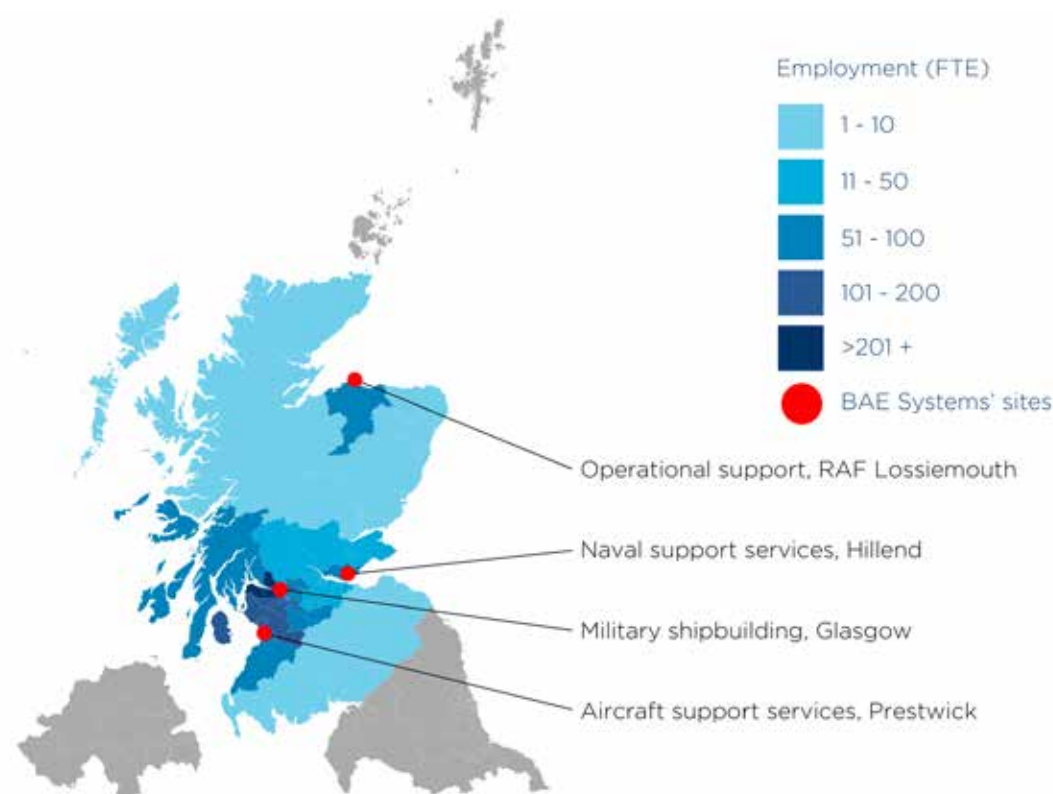
BAE Systems' operations in Scotland are largely focused on shipbuilding in Glasgow, with two major shipyards on the River Clyde at Govan and Scotstoun employing more than 3,200 people between them. As described further in the case study on page 66, these facilities are currently building Type 26 frigates for the Royal Navy. An investment of more than £100 million is being made in the Govan site on a new combined drydock and assembly hall,

enabling two ships at once to be built under cover and protected from the elements.⁷³ BAE Systems is also investing approximately £15 million in an Applied Shipbuilding Academy in Glasgow to support skills development of the entire shipbuilding business, from apprentices to senior leaders.⁷⁴

The Company provides support to the RAF's Typhoon squadron at Lossiemouth, home to 60 BAE Systems workers, with activity recently rising due to increased air policing carried out in

Eastern Europe. A further 170 workers in Hillend outside Dunfermline specialise in electronics development and manufacturing, and Prestwick is home to the BAE Systems' regional aircraft business, with 170 employees providing engineering support to a fleet of 800 civilian planes previously manufactured by the Company.

Fig. 27: BAE Systems' employees, by parliamentary constituency of residence, Scotland, 2022



Source: Oxford Economics

⁷³ UK Defence Journal, Huge Glasgow 'frigate factory' planning permission granted, February 2023

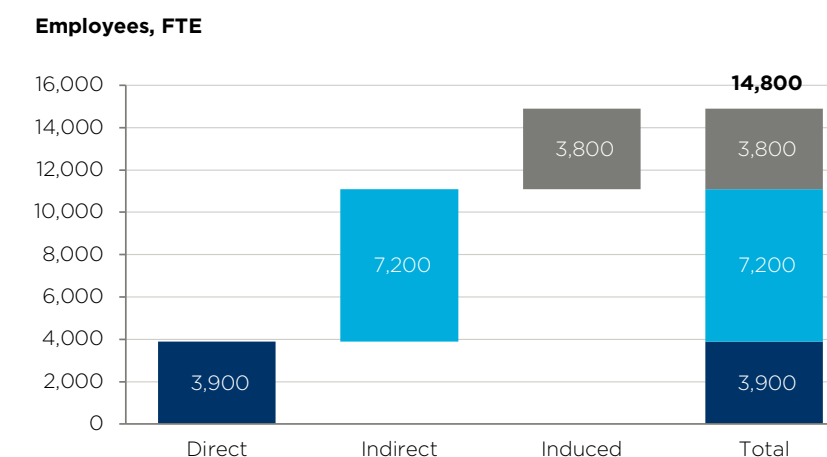
⁷⁴ BAE Systems, Construction begins on Royal Navy's fourth Type 26 frigate, April 2023

The Company is also in the process of converting eight square kilometres of the former Royal Ordnance Factory at Bishopton outside Glasgow into a new village, which will provide 4,000 new homes by the time it is complete in 2034. The site is also home to 30 workers at the Company's principal facility for testing and evaluation of munitions.

In 2022, 13% of BAE Systems' domestic procurement was supplied by Scottish companies, with over £500

million spent in the country. This significant spending generated output that supported the employment of 7,200 workers. The wage expenditure of these workers and the 3,900 directly employed by the Company at Scottish worksites supported the employment of a further 3,800 workers. In total, BAE Systems supports employment for almost 15,000 workers in Scotland through the direct, indirect, and induced channels.

Fig. 28: BAE Systems' contribution to employment in Scotland, 2022



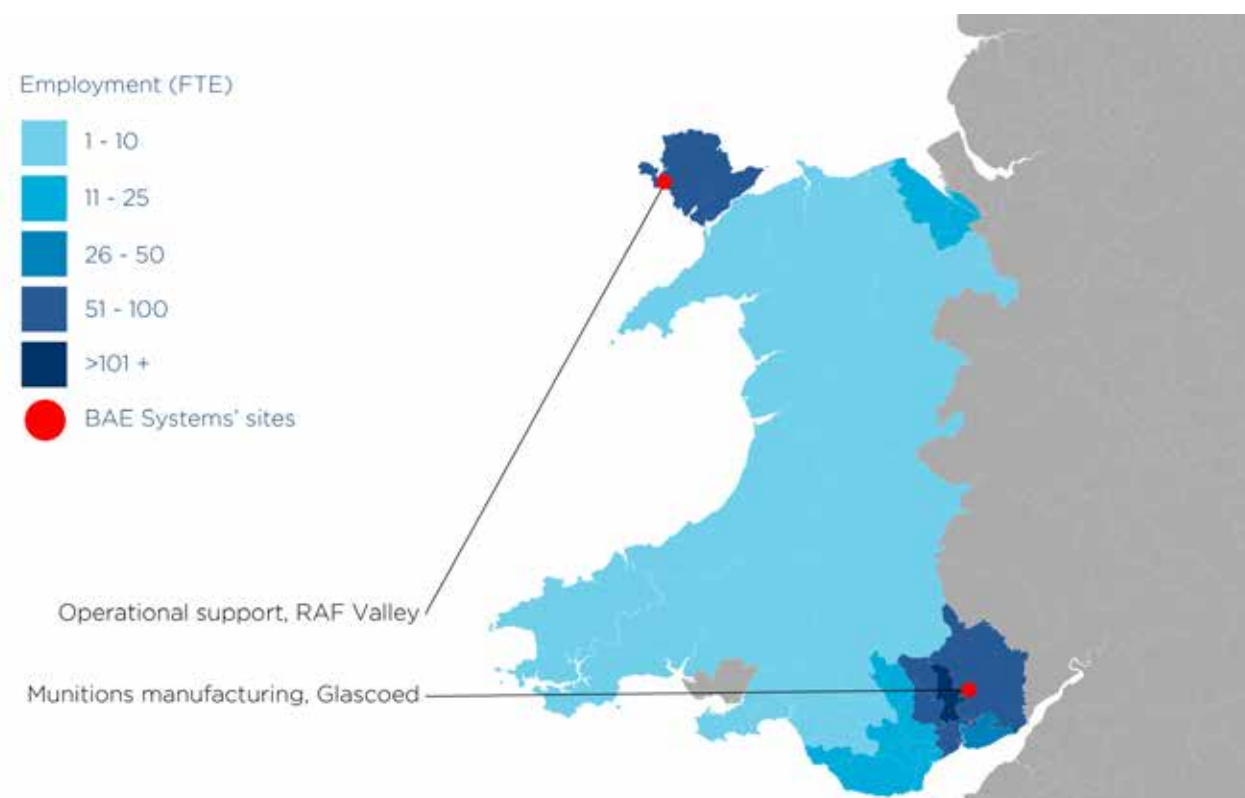
Source: Oxford Economics
Totals do not sum due to rounding

6.6 WALES

The majority of BAE Systems' employment in Wales is located at a munitions factory in Glascoed, Monmouthshire, with 650 workers. Originally built as a Royal Ordnance Factory in preparation for World War II, the facility has now been in operation for more than 80 years, and together with the two other BAE Systems munitions sites in the UK, supplies 80% of the general munitions used by the UK's armed forces for training and frontline operations.⁷⁵

The Company also employs approximately 90 staff at RAF Valley, an airfield on the island of Anglesey that specialises in fast jet and helicopter flying training as well as mountain rescue.⁷⁶ The Company has recently renewed its contract with the MOD to provide support for the Hawk trainer jets located here. BAE Systems employed 780 workers across its Wales sites in 2022.

Fig. 29: BAE Systems' employees, by parliamentary constituency of residence, Wales, 2022

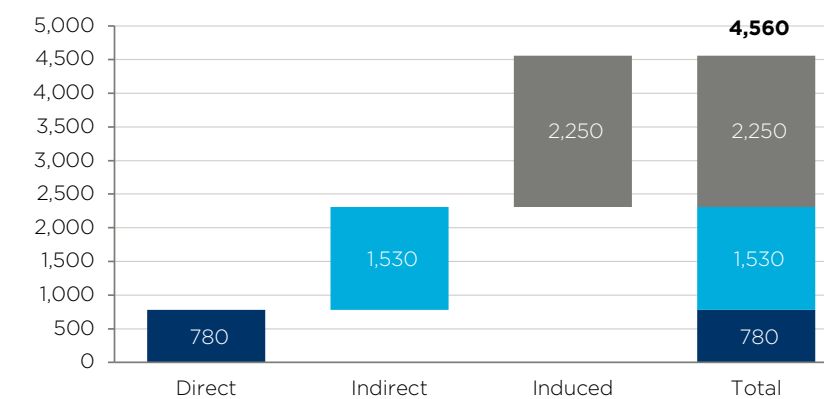


Source: Oxford Economics

The Company spent over £50 million in procurement from more than 150 businesses in Wales in 2022, helping to support employment for an estimated 1,500 workers. In Wales, the total employment contributions of BAE Systems' UK-based operations were estimated to be almost 4,600 workers in 2022.

Fig. 30: BAE Systems' contribution to employment in Wales, 2022

Employees, FTE



Source: Oxford Economics

In 2022 BAE Systems handed an Avro Anson, a De Havilland DH60 Cirrus Moth, and a Blackburn B2 from its heritage collection to the Shuttleworth Trust. The Trust is a working aeronautical and automotive museum collection at Bedfordshire, England. Here the aircraft are being restored to their former glory and flown for audiences to enjoy. Read more about BAE Systems' heritage on page 50. Pictured here is the Avro Anson.



APPENDIX A:
DETAILED LOCAL FINDINGS

Fig. 31: BAE Systems' procurement spending by top 50 parliamentary constituencies, 2022

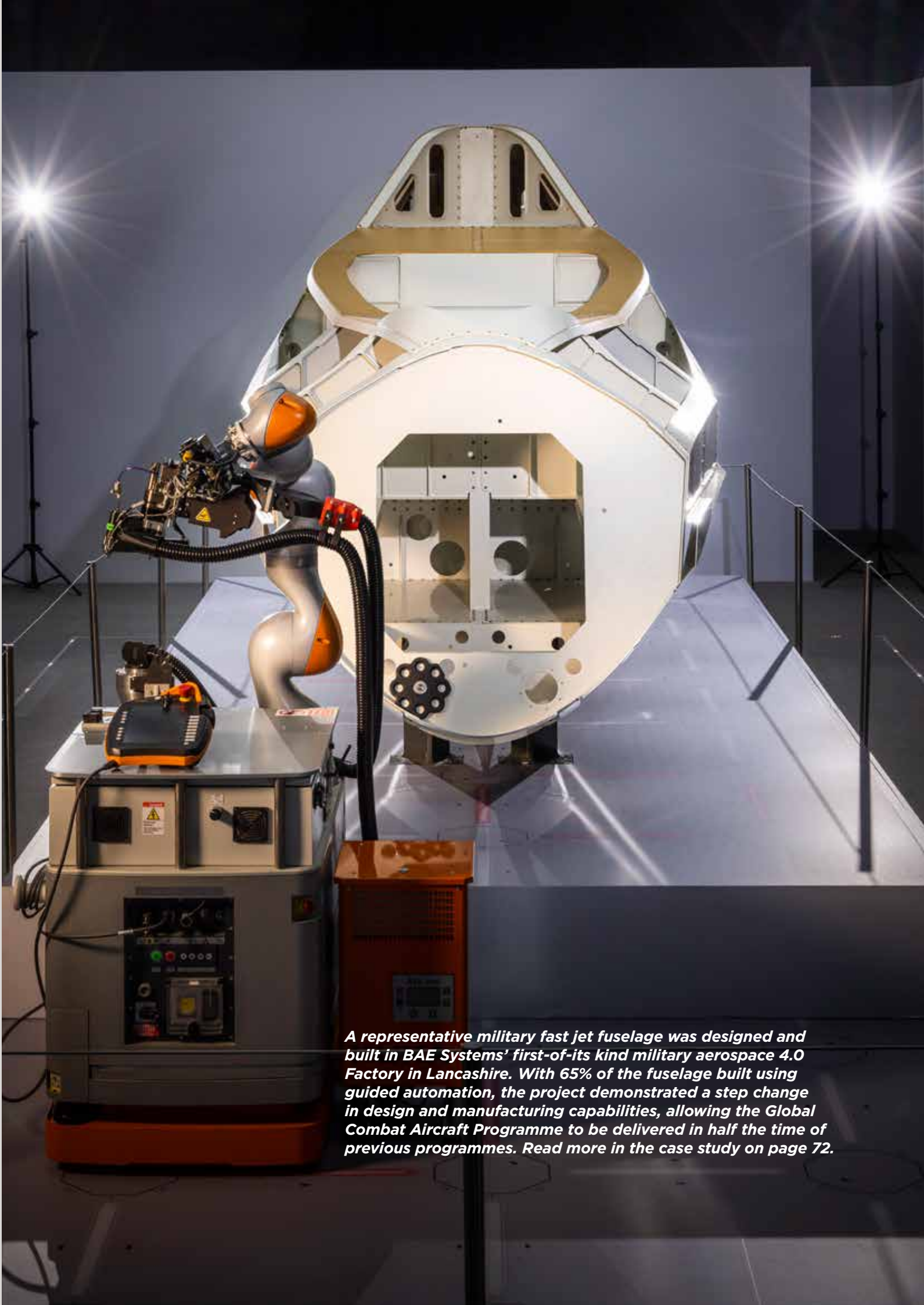
Rank by spend	Parliamentary constituency	Procurement spend, £m	Count of suppliers
1	Edinburgh North and Leith	328	12
2	Luton South	243	9
3	Cities of London and Westminster	233	301
4	Stevenage	140	19
5	Salford and Eccles	132	12
6	Basildon and Billericay	110	11
7	Cheadle	78	12
8	Woking	77	15
9	Aldershot	71	69
10	Portsmouth North	70	40
11	Ribble Valley	62	29
12	Mid Derbyshire	61	3
13	Barrow and Furness	56	68
14	Yeovil	52	18
15	Derby South	48	7
16	Birkenhead	45	8
17	Beaconsfield	44	14
18	Harlow	42	11
19	Rugby	41	15
20	South Antrim	37	2
21	Glasgow Central	36	56
22	Meon Valley	36	37
23	Filton and Bradley Stoke	35	21
24	Sheffield Central	33	14
25	Bristol South	32	6
26	Tewkesbury	32	30
27	Wythenshawe and Sale East	32	17
28	Birmingham, Ladywood	31	35
29	Romsey and Southampton North	30	17
30	South Dorset	30	13
31	Bermondsey and Old Southwark	29	42
32	Glasgow South West	29	10
33	Fareham	28	48
34	Cannock Chase	27	8
35	Wantage	26	23
36	Crawley	26	23
37	North Swindon	24	11
38	Eastleigh	23	27
39	North East Somerset	22	5
40	Surrey Heath	22	27
41	Colne Valley	21	4
42	Somerton and Frome	21	8
43	Elmet and Rothwell	20	5
44	North East Hampshire	20	22
45	Mid Dorset and North Poole	20	7
46	Preston	20	52
47	Bristol West	19	35
48	Windsor	18	19
49	Salisbury	18	17
50	Stockton North	16	6

Fig. 32: BAE Systems' employees by top 50 Company and customer worksites, 2022

Rank by employees FTEs	Company worksite/customer site	Employees, FTEs
1	Barrow-in-Furness	9,500
2	Warton	5,300
3	Samlesbury	5,100
4	Portsmouth	3,300
5	Glasgow	3,200
6	Rochester	1,400
7	Preston	940
8	London	810
9	Guildford	720
10	RAF Coningsby	670
11	Glascoed	650
12	Brough	610
13	Frimley	530
14	Gloucester	490
15	Filton	470
16	Farnborough	460
17	Radway Green	300
18	Christchurch	280
19	Leeds	270
20	Washington	260
21	New Malden	240
22	Yeovil	230
23	Cowes	220
24	Great Baddow	220
25	Hillend	170
26	Prestwick	170
27	Weymouth	150
28	RAF Marham	120
29	Manchester	98
30	RAF Valley	88
31	Humberside	83
32	Milton Keynes	69
33	RAF Lossiemouth	61
34	Burwood House	47
35	Dorchester	45
36	Bishopton	31
37	Adam	29
38	Plymouth	16
39	Aylesbury	15
40	Coventry	15
41	Faslane Naval Base	14
42	Ridsdale	14
43	RAF Leeming	13
44	Corsham	7
45	Derby	5
46	Newcastle	3
47	RAF Stafford	3
48	RAF Waddington	3
49	Bristol	3
50	Cambridge	3

Fig. 33: BAE Systems' employees by top 50 parliamentary constituencies of residence, 2022

Rank by employees FTEs	Company worksite/customer site	Employees, FTEs
1	Barrow and Furness	8,400
2	Fylde	1,800
3	Wyre and Preston North	1,700
4	Ribble Valley	1,200
5	South Ribble	1,200
6	Chorley	820
7	Preston	790
8	Portsmouth North	590
9	Blackburn	530
10	Portsmouth South	510
11	Blackpool North and Cleveleys	430
12	Fareham	420
13	Gosport	410
14	Meon Valley	410
15	West Dunbartonshire	370
16	Blackpool South	360
17	Westmorland and Lonsdale	350
18	Paisley and Renfrewshire North	340
19	Inverclyde	340
20	Copeland	310
21	Isle of Wight	310
22	Chatham and Aylesford	310
23	Havant	290
24	Lancaster and Fleetwood	290
25	Rochester and Strood	290
26	Haltemprice and Howden	280
27	Glasgow North West	270
28	Hyndburn	250
29	Louth and Horncastle	250
30	Gillingham and Rainham	230
31	Rossendale and Darwen	230
32	Morecambe and Lunesdale	220
33	Torfaen	220
34	Sleaford and North Hykeham	210
35	Aldershot	190
36	Burnley	190
37	Paisley and Renfrewshire South	180
38	Guildford	170
39	East Dunbartonshire	170
40	Yeovil	170
41	North East Hampshire	170
42	Glasgow South West	170
43	Wigan	160
44	East Hampshire	150
45	Rutherglen and Hamilton West	150
46	Eastleigh	140
47	Surrey Heath	130
48	Central Ayrshire	130
49	East Renfrewshire	130
50	Kilmarnock and Loudoun	130



A representative military fast jet fuselage was designed and built in BAE Systems' first-of-its kind military aerospace 4.0 Factory in Lancashire. With 65% of the fuselage built using guided automation, the project demonstrated a step change in design and manufacturing capabilities, allowing the Global Combat Aircraft Programme to be delivered in half the time of previous programmes. Read more in the case study on page 72.

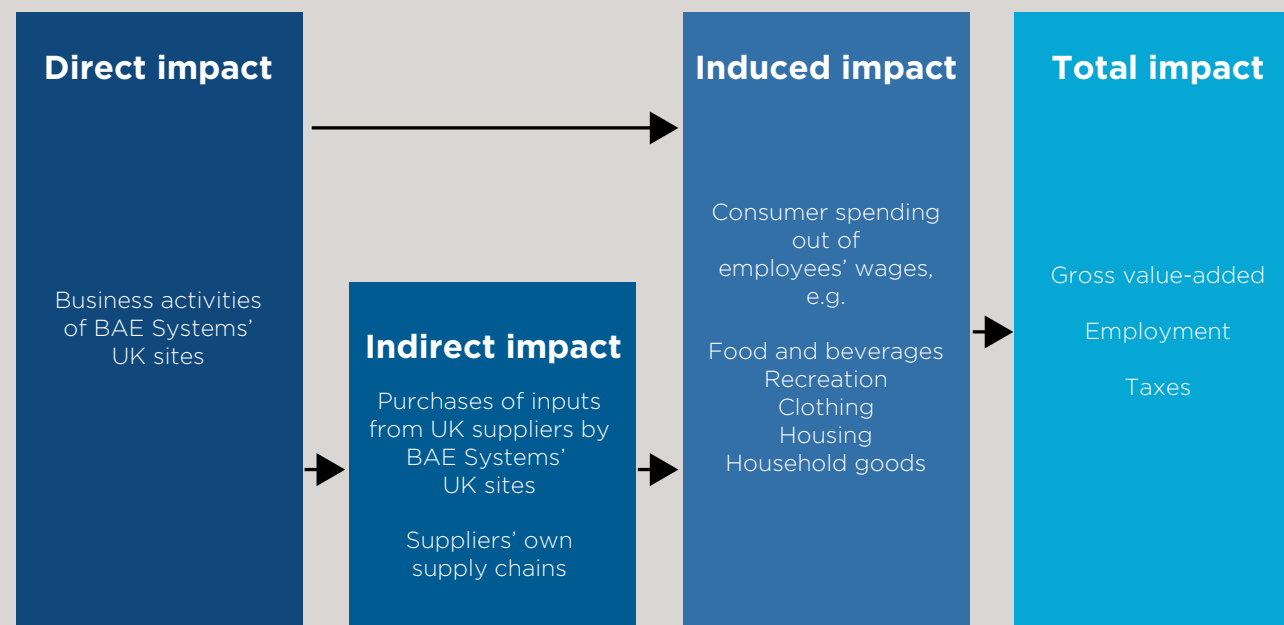
APPENDIX B: ECONOMIC IMPACT METHODOLOGY

ECONOMIC IMPACT MODELLING

Economic impact modelling is a standard tool used to quantify the economic contribution of an investment or a company. Impact analysis traces the economic contribution of an investment through three separate channels:

- **Direct impact**—refers to activity conducted directly by BAE Systems in the UK.
- **Indirect impact**—consists of activity that is supported as a result of the procurement of goods and services by BAE Systems in the UK, purchases by those companies in turn, and so on.
- **Induced impact**—reflects activity supported by the spending of wage income by direct and indirect employees.

Fig. 34: Direct, indirect, induced, and total economic impacts



Direct impacts

The direct value added of BAE Systems is calculated as total UK revenues minus the cost of goods and services bought in, either domestically or from abroad. Value added per employee, a measure of productivity, is a figure derived from dividing direct value added by the number of FTE employees. Direct employment is comprised of workers employed by BAE Systems at year end 2022, and direct tax contributions represent the taxes paid by the Company over the year.

Indirect and induced impacts

Indirect and induced impacts are estimated using an input-output model. An input-output model gives a snapshot of an economy at any point in time. The model shows the major spending flows from “final demand” (i.e., consumer spending, government spending investment, and exports to the rest of the world); intermediate spending patterns (i.e., what each sector buys from every other sector—in other words, the supply chain); how much of that spending stays within the economy; and the distribution of income between employment and other forms such as corporate profits.

An input-output model uses a matrix representation of a nation's interconnected economy to calculate the effect of changes by consumers, by an industry, or by others, on other industries and therefore on the economy as a whole. These input-output tables ultimately measure “multiplier effects” of an industry by tracing the effects of its inter-industry transactions—that is the number value of goods and services that are needed (inputs) to produce each pound of output for the individual sector being studied. These models can be used to measure the relationship between an economic change or “shock,” and the final outcome across the whole of the economy.

In essence, an input-output model is a table which shows who buys what from whom in the economy.

Oxford Economics used the input-output analytical table for the United Kingdom for 2018, published by the ONS in 2022, for this analysis. This was the most recent dataset available at the time of analysis.

Direct, indirect, and induced employment figures in this report have been rounded, generally to two significant figures. The multipliers quoted in the report represent the multiple of direct impacts that account for total impacts. For instance, if 20 FTE jobs were direct impacts and the total impact multiplier was 2, then the total impact would be 40 FTE jobs. These multipliers are calculated from the input-output model results.

Indirect jobs are presented including the contingent labour or contractors that BAE Systems hires. Data on these workers are obtained from the Company's HR systems, and spending on these workers from the Company's procurement systems. We assume that 10% of the spending on these workers is retained by employment agencies and inputted into our model as revenue for those firms. The remaining 90% is taken as employment income for the contractors, added to the Company's indirect GVA contribution, and also modelled as part of the induced impact as the contractors spend their income.

Industry breakdowns

The UK 2018 input-output analytical table is divided into 105 different industry sectors, and the table shows how each sector interacts with the 104 other sectors. For purposes of illustration to show value added and employment supported across different sectors, the 105 different industries have been pooled into broad industry categories. For example, the professional services industry amalgamates the following sectors:

- Legal services
- Accounting, bookkeeping, and auditing services; tax consulting services
- Services of head offices; management consulting services
- Architectural and engineering services; technical testing and analysis services
- Scientific research and development services
- Advertising and market research services
- Other professional, scientific, and technical services

Regional models

The regional analysis in this study utilises a suite of bespoke input-output I-O models. These are based on the national UK input-output tables, as published by the ONS, but Oxford Economics then uses official regional employment data to adjust these, reflecting the industrial structure and productive capacity of each area.

Our methodology utilises so-called ‘Flegg-adjusted Location Quotients (FLQs)’, which are consistent with the latest approaches and evidence in regional I-O modelling and regional science.” These I-O models quantify the impact of supply chain demands over their entire length, including suppliers to these suppliers, and so on. The regional modules estimate the extent to which these demands can be met within each region or elsewhere in the UK.

ABOUT OXFORD ECONOMICS

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, we have become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on more than 200 countries, 100 industries, and 8,000 cities and regions. Our best-in-class global economic and industry models and analytical tools give us an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

Headquartered in Oxford, England, with regional centres in New York, London, Frankfurt, and Singapore, Oxford Economics has offices across the globe in Belfast, Boston, Cape Town, Chicago, Dubai, Dublin, Hong Kong, Los Angeles, Mexico City, Milan, Paris, Philadelphia, Stockholm, Sydney, Tokyo, and Toronto. We employ 450 staff, including more than 300 professional economists, industry experts, and business editors—one of the largest teams of macroeconomists and thought leadership specialists. Our global team is highly skilled in a full range of research techniques and thought leadership capabilities from econometric modelling, scenario framing, and economic impact analysis to market surveys, case studies, expert panels, and web analytics.

Oxford Economics is a key adviser to corporate, financial and government decision-makers and thought leaders. Our worldwide client base now comprises over 2,000 international organisations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies, and think tanks.

June 2023

All data shown in tables and charts are Oxford Economics' own data, except where otherwise stated and cited in footnotes, and are copyright © Oxford Economics Ltd.

This report is confidential to BAE Systems and may not be published or distributed without their prior written permission.

The modelling and results presented here are based on information provided by third parties, upon which Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

To discuss the report further please contact:

Rob Harbron, Associate Director:
rharbron@oxfordeconomics.com

Oxford Economics,
4 Millbank,
Westminster,
London,
SW1P 3JA

Tel: +44 (0)203 910 8061

www.oxfordeconomics.com

Alexa is a Graduate Hardware Engineer developing new technologies to verify augmented reality helmet systems for fast jet pilots. She is based at BAE Systems Electronic Systems in Rochester, Kent and worked as a summer intern before completing her Masters degree. Alexa also works with schools and runs engineering taster days to help promote women in engineering and inspire more young people about careers in science, technology, engineering, and maths.



**Global headquarters**

Oxford Economics Ltd
Abbey House
121 St Aldates
Oxford, OX1 1HB
UK

Tel: +44 (0)1865 268900

London

4 Millbank
London. SW1P 3JA
UK

Tel: +44 (0)203 910 8000

Frankfurt

Marienstr. 15
60329 Frankfurt am Main
Germany

Tel: +49 69 96 758 658

New York

5 Hanover Square, 8th Floor
New York, NY 10004
USA

Tel: +1 (646) 786 1879

Singapore

6 Battery Road
#38-05
Singapore 049909

Tel: +65 6850 0110

Europe, Middle East and Africa

Oxford
London
Belfast
Dublin
Frankfurt
Paris
Milan
Stockholm
Cape Town
Dubai

Americas

New York
Philadelphia
Boston
Chicago
Los Angeles
Toronto
Mexico City

Asia Pacific

Singapore
Hong Kong
Tokyo
Sydney

Email:

mailbox@oxfordeconomics.com

Website:

www.oxfordeconomics.com

Further contact details:

[www.oxfordeconomics.com/
about-us/worldwide-offices](http://www.oxfordeconomics.com/about-us/worldwide-offices)