

March 2021

Prosperity Spotlight Report

# Dreadnought

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# Foreword

Few countries in the world have the capability to design and build nuclear submarines. The design is intricate, the technology is highly sensitive and the manufacturing is precise. They must operate in silence and remain undetected for months.

The Dreadnought programme will deliver four next generation nuclear submarines to the Royal Navy. Technological advances, threat changes, and new methods of production mean the Dreadnought class will be a completely new design. It is one of the largest and most complex engineering projects in the world.

As the industrial lead we are committed to maximising our contribution to the UK's national security and prosperity. We are working with our partners Rolls-Royce and the Submarine Delivery Agency (SDA) as part of the Dreadnought Alliance. BAE Systems is the lead for the submarine design and build, and the technical authority.

Our vision for prosperity and social value is to:



**For reference:** Throughout this report reference is made to the 'Dreadnought programme'. For clarity, all prosperity focused social value and economic based figures stated in this report relate to BAE Systems' contribution to the delivery of the Government's wider Dreadnought Submarine programme.

- > At its peak the Dreadnought programme will support almost 30,000\* UK jobs, including almost 8,000 employed directly by BAE Systems.

In the year that we celebrate our Barrow shipyard's 150th anniversary, we remain as committed as ever to delivering our programmes and building on our proud history.

With four Dreadnought class submarines to deliver, alongside the remaining three Astute boats, we have an exciting future ahead of us and the opportunity to create our own, long lasting legacy.

The Dreadnought programme is a national endeavour and, at its peak, will support almost 30,000 UK jobs. It is estimated that around half of these jobs are in the North West of England, therefore making a significant contribution to the Government's levelling-up agenda. With suppliers based right across the UK - the economic impact of Dreadnought is felt across the country.

This is a once-in-a-generation opportunity to boost education, infrastructure and technology, to enhance the UK's maritime supply chain and sustain one of our most critical defence capabilities.

In this document we elaborate on the public value that the Dreadnought programme and the Submarine Industrial Base contribute to the UK's prosperity, and the communities in which we live and work. We are proud and excited to share this story with you.

Finally, I would like to take this opportunity to personally thank all of my BAE Systems colleagues, our supply chain partners, customers and everyone involved in the delivery of the Dreadnought programme for their continued hard work and commitment.



**Steve Timms**

Managing Director  
BAE Systems, Submarines



\*In January 2021 it was independently estimated by Oxford Economics that in 2021, including all impact channels, the Dreadnought programme supports almost 30,000 jobs around the UK.

# Introduction – Sovereign Capability and Future Impact



## Continuing a long history of sovereign capability

As the Barrow shipyard celebrates its 150th year of operation, we're proud that this business - which started life as the Iron Shipbuilding Company back in 1871 - has been a key player in the industry for such a long time. It has been its ability to remain at the forefront of technology and engineering expertise which has sustained its relationship with the Royal Navy - from its very first Admiralty contract, HMS Foxhound, in the 1870s - up to its current role in designing and building some of the most complex products in the world (both Dreadnought and Astute submarines).

Generations of Royal Navy Submariners, their families, support workers and industry partners have contributed to the delivery of Continuous At Sea Deterrence (CASD), making it a truly national endeavour. At 52 years and counting, Operation Relentless is also the longest ongoing operation ever delivered by the Ministry of Defence (MOD). This also marks over five decades of the special nuclear relationship between the UK and the USA.

The Dreadnought class will begin to replace the Vanguard class in the 2030s, ushering in a new era of at-sea deterrence, protecting the nation well into the 2060s and providing the ultimate guarantee of our national security.

Since launching the first submarine in 1901, over 300 boats have rolled off the production line in Barrow-in-Furness, representing the output of a unique and regionally dispersed industrial base. Today our main focus is on Astute and Dreadnought, and we are beginning to plan for a future generation of submarines with the aim of sustaining our industrial capability for decades to come.

## Political background

The Government of the United Kingdom announced its decision to maintain the UK's nuclear deterrence with a new generation of four ballistic missile submarines in 2006. In 2007 this was authorised by Parliament with a majority of 248 and the Government invested £900 million in concept designs for the submarine and the nuclear reactor.

In 2011 the programme reached its first major milestone, known as Initial Gate, and the Government reported to Parliament its intention to invest further in new technology, detailed design and engineering work, long-lead items and preparations for production.

In 2016 the programme reached Main Gate and Parliament voted, with a majority of 355, to maintain Continuous At Sea Deterrence and start manufacturing the four submarines. Later that year, a £1.3 billion contract was signed for Delivery Phase 1 (DP1), steel was cut on the first boat and the class was named Dreadnought.

The programme has continued at pace and, in 2018, a £900 million contract for Delivery Phase 2 (DP2) was signed. We are now preparing for the next phase of delivery.



## Submarine industrial base

The industrial capability to design and build nuclear submarines is a fundamental input to sovereignty and the Royal Navy's freedom of action. This assures the security of the technology, the ability to communicate with the submarine, the ability to detect and avoid threats, and the ability to update and upgrade the boats in-service. Ultimately, this ensures the integrity and performance of the nuclear deterrence.

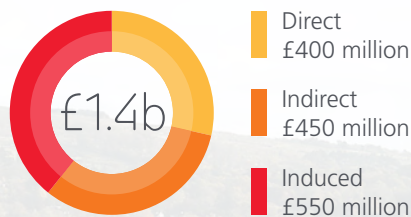
The industrial capability is comprised of skills, facilities, technology and intellectual property, over and above what is usually seen in commercial or naval shipbuilding, and unique to nuclear submarines. The industrial impact of the Dreadnought programme reaches out beyond the Barrow-in-Furness shipyard

and our sites in Surrey, Dorset and Gloucestershire, and includes a diverse range of companies in the UK supplying equipment and materials, including nuclear propulsion, weapons and sonar systems.

The industrial base is dependent on a large volume of STEM (Science, Technology, Engineering, and Mathematics) and nuclear skills. A continuous programme of work is required to preserve and practise these skills. The same principle applies to sustaining the MOD's expertise in governance and oversight. These skills contribute to the development of new technology, and many disciplines are transferable across the defence and manufacturing sectors.

## Economic impact

It is estimated that the Dreadnought programme contributed a total of £1.4 billion to the UK economy in 2019, through three channels of impact: direct, indirect and induced.



Analysis of the Dreadnought programme, by Oxford Economics, considering employment supported directly, and through wider supply chain and worker spending "multiplier" effects, suggests 2021 will be the peak year for jobs supported by the programme.

While employment is expected to peak in 2021, ongoing design and build activity mean that the programme will continue to support jobs in coming years. For example, in 2027, the programme will support in excess of 20,000 jobs and in the final years of the programme (2033 to 2035), around 9,000 UK based jobs will be supported.

**Note:** Utilising Oxford Economic impact models to estimate the employment supported in the wider economy through "multiplier effects". This section additionally forecasts the impact of the programme on UK employment to 2035.

Direct GDP was calculated by Oxford Economics using the "output" approach to estimating GDP which involves subtracting the total cost of intermediate goods and services from revenue. Supply chain and workers' spending impacts are estimated using an input-output model to estimate the GDP supported by procurement spending and workers spending.

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# About the Dreadnought Submarine

## Designing the Royal Navy's largest ever submarine

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Dreadnought will be equipped with a new generation of nuclear reactor to provide power and propulsion which operates as quietly as an idling car. Dreadnought must be able to navigate and remain undetected for months on end, maintain communications with shore authorities at all times, and be able to defend itself. The design therefore incorporates a range of sophisticated electronic systems, sensors and tactical weapons. The design must also minimise noise and vibration so that it can remain undetected by sonar.

Over 130 men and women of the Royal Navy will operate the submarine each time it sails on patrol and must work, eat, sleep and exercise in the unique confines of a dived submarine at sea for many weeks.

We have one of the largest human factors engineering teams in the country working on features to improve accommodation, ergonomics and crew wellbeing.

The operation of systems and accommodation on Dreadnought has been designed to accommodate both male and female submariners.

## Protecting the marine environment

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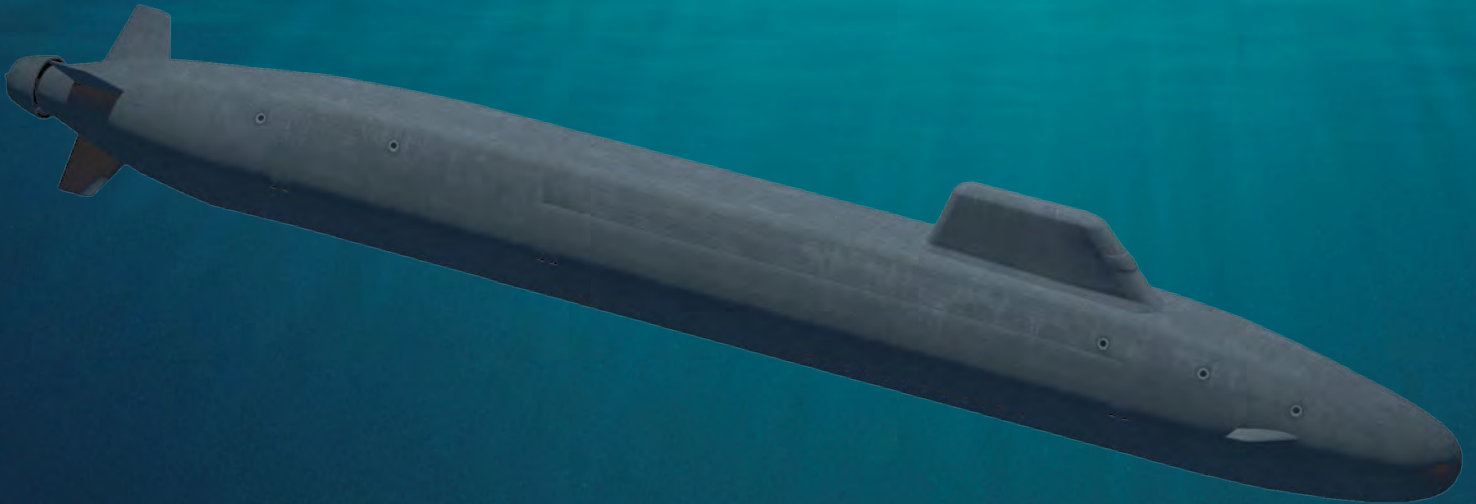
We have also taken steps to reduce the impact of the submarine on its operating environment, including:

- A waste management system that enables storage and segregation of solid waste (including plastics) for processing when back alongside;
- An internal tank to ensure waste oil can be contained during the course of a patrol;
- A change in the gas used in refrigeration systems to one with much lower emissions;
- Modified battery cell design to increase capacity, extend cell life and minimise dimensions and weight.



# Dreadnought class

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153.6 metres long - the approximate length of 3 Olympic swimming pools



42.5km of piping



The doctor works from a designated 'sick bay'. Here they'll conduct routine check-ups, dispense medicines, and could care for a major casualty if required



The largest submarine ever built for the Royal Navy with a displacement of 17,200 tonnes



Almost 13,000 electrical items



Generates its own oxygen and fresh water



For the first time on a Royal Navy submarine, there will be a dedicated classroom / study area



Over 20,000 cables on board which equates to 347km, further than the distance from London to Leeds



This is the first Royal Navy submarine to be built with separate male and female crew quarters, toilets and washing facilities

# A Vibrant and Diverse Supply Chain

> The Dreadnought programme secures a vibrant and diverse supply chain. Over **90%** of Dreadnought related work will reside in the UK, and around half of the programme's total economic value will be delivered by our supply chain.

## Nationwide supply chain

The next phase of the Dreadnought programme will bring long-term stability to the supply chain. BAE Systems estimates that, over the life of the programme, it will spend in the region of £7.5 billion with suppliers in England, Scotland, Wales and Northern Ireland. This includes 1,500 companies in the first and second tier supply chain.

In 2021 it is estimated that the Dreadnought programme will support over 13,500 jobs in the North West of England, and a further 16,300 spread across the rest of the UK.

Note: All employment figures within this section have been estimated by Oxford Economics.

Submarine supply chain in the news:

February 2019

### **Defence Secretary Announces £235 Million Submarine Nuclear Propulsion Deal**

The multi-million-pound deal with Rolls-Royce Submarines Limited will provide the support, advice and material required to ensure the continued safety and availability of the systems on board the current fleet of Trafalgar, Vanguard and Astute class submarines until 2022. The contract will sustain around 500 UK jobs.

February 2020

### **£330-million sonar contract for Dreadnought submarines**

BAE Systems Submarines, which is building 4 nuclear submarines for the Royal Navy, has awarded work worth around £330-million to Thales UK.

## Supply chain capability

Supply chain purchases associated with the programme are also shown to occur right across the country, and so the economic impact is felt in all regions and nations of the UK to varying degrees.

Our supply chain strategy balances security of supply with technical capability, value for money and risk. With a single customer, unique technical requirements and the high level of security, many of our supply chain categories are limited to a few sources of supply.

The long-term programme will therefore sustain and attract investment in a range of strategic capabilities including:

- Platform systems such as steering gear, stabilisers, electrical integration, air conditioning, firefighting systems, accommodation and instrumentation;
- Combat systems including communications, navigation, sonar, optronic masts and electronic warfare;
- A range of specialist manufacturing products such as hydraulic systems, pumps, valves and brackets that are designed to meet high-end noise and vibration requirements.



## Supporting the spirit of the National Shipbuilding Strategy

Although submarines do not officially form part of the Government's National Shipbuilding Strategy, Dreadnought does support its spirit and wider intention. BAE Systems plays a key role, both as a primary supplier and through its supply chain, in supporting the strategy through boosting innovation, skills, jobs, and productivity across the UK. We work with other shipyards to manage capacity across the industry.

## Small and Medium Sized Enterprises (SMEs)

We recognise the contribution SMEs make to our industry. The MOD target is for up to 25% of MOD procurement spend.

## Contributing in the long term to UK employment

Dreadnought will have a sustained and lasting impact on UK employment. It is forecast the programme will support jobs across all UK regions and nations to at least 2035, to varying degrees. In 2021, almost half of the total employment impact will accrue in the North West of England, due to the region being host to over 90% of the programme's direct employment and the programme's strong supply-links within the region.

To undertake its activities on the Dreadnought programme, BAE Systems purchases many goods and services it needs in the domestic market. Through this, its procurement supports significant economic activity and employment across the UK. The Dreadnought programme spent over £600 million with UK suppliers in 2019. The majority of this spend was on manufacturing (58%), followed by construction (16%) and engineering (15%).



Image taken September 2019

# National Supply Chain Focus

## Dreadnought supply chain expenditure

£2.5 billion committed

£5 billion outstanding

Total £7.5 billion

## A national endeavour

Our planned supply chain includes the following highlights across the country:

- Submarine structures, power systems and sensors from the North West;
- Gearboxes and steel from Yorkshire;
- Nuclear steam raising plant and mechanical handling systems from the East Midlands;
- Engines from the West Midlands;
- Command and control systems from London;
- Electrical systems, antenna systems and control panels from the South East;
- Sonar and communications equipment from the South West;
- Periscope from Scotland.

## Regional prosperity and contribution to employment

To date BAE Systems has spent £2.5 billion with our supply chain, including in the following ten regions.

Figures expressed as a bar chart relate to the Dreadnought programme's estimated contribution to employment by UK regions in 2021.

- Direct impact
- Indirect impact
- Induced impact

**Note:** Wales and Northern Ireland figures have been excluded to ensure non-disclosure of potentially commercially sensitive information in these two nations.

**Note:** Direct impact, which relates to the economic benefit of BAE Systems' operations and activities in the UK that relate to the Dreadnought programme.

Indirect impact, which encapsulates the economic benefit and employment supported in the BAE Systems supply chain as a result of its procurement of goods and services for the Dreadnought programme.

Induced impact, comprising the wider economic benefit that arises when employees within BAE Systems working on the Dreadnought programme and the programme's supply chain spend their earnings, for example, in local retail and leisure establishments.

1. North West - £400m 13,500 jobs

2. South East - £235m 2,500 jobs

3. Yorkshire and Humber - £350m 2,500 jobs

4. Scotland - £215m 2,000 jobs

5. South West - £25m 1,800 jobs

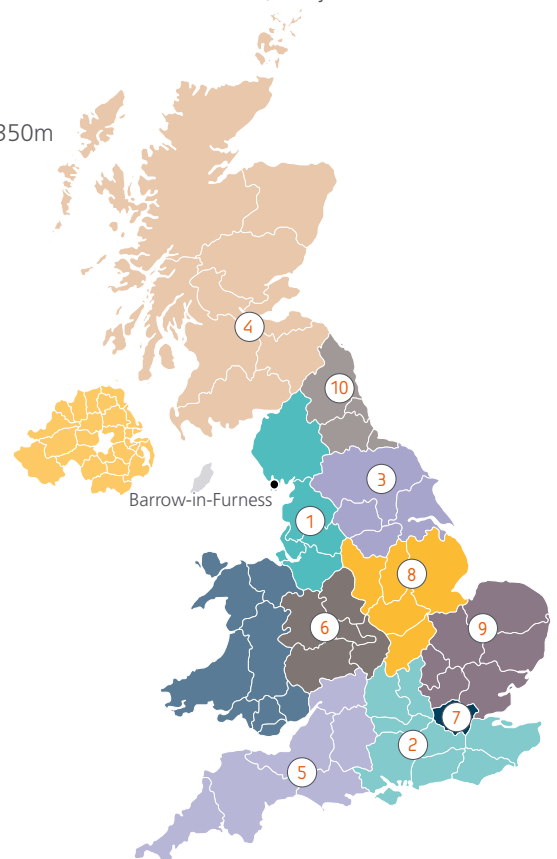
6. West Midlands - £470m 1,700 jobs

7. London - £110m 1,400 jobs

8. East Midlands - £245m 1,400 jobs

9. East of England - £100m 1,300 jobs

10. North East - £25m 800 jobs





# Driving Economic Development

- > Empowered by the longevity of the Dreadnought programme, we are working with local stakeholders to transform the future of Barrow-in-Furness. This includes both the Future High Streets Fund\* and the Town Deal Fund\*.

## Maximising our impact and reach in Cumbria

The English Indices of Deprivation (2019), published by the Ministry of Housing, Communities and Local Government (MHCLG), confirms that Barrow-in-Furness is a comparatively deprived area. It is home to three of the country's most deprived wards, and where average household income is well below the national average.

Working with Barrow Borough Council and regional government we have co-developed a regeneration plan that will improve the town and its infrastructure, with the aim of attracting more investment and people to the region.

We work collaboratively with our partners from public, private and voluntary sector organisations to help achieve inclusive growth for the local area. BAE Systems has been a central contributor to the development of bids for both the Future High Streets Fund and Town Deal Fund; in relation to the latter Barrow was successfully awarded £25m in autumn 2020. As part of the Town Deal Programme, we are actively working with further and higher education providers to support the Barrow Learning Quarter project - a partnership between the local authority, academia and industry to develop a higher education campus and skills hub that will enhance progression into, and participation in, higher education, improving regional capability.

Demonstrable long-term commitment from the private sector and partnership working with the local authority will be instrumental in achieving

success with these bids. Furthermore, we believe the committed spend on the Dreadnought programme will give confidence to the MHCLG that Barrow-in-Furness is the right place to inject investment.

Such investment would deliver visible infrastructure improvements and encourage further ventures such as a marina village. These game-changing improvements for Barrow-in-Furness will help to shift negative perceptions often associated with this geographically isolated part of the country, a factor which does impact our ability to attract and retain suitably skilled employees.

Our proposed Modern Campus Facility is one of six major projects of a regeneration portfolio set to transform Barrow-in-Furness. Along with Marina Village (a housing site of more than 450 new homes); the town centre improvement programmes and the developments of the adjacent Buccleuch Dock area (with a campus and public realm enhancement) this means there has never been a more exciting time for Barrow-in-Furness in terms of infrastructure investment.

We continue to develop our employees through long-standing relationships with a variety of higher education providers and training organisations. We will continue to grow and build positive relationships with other local education providers with an ambition to upskill not only our workforce but the wider community, enabling more people to access higher skilled opportunities associated with STEM careers.

### Note:\*

1. Future High Streets Fund - Overseen by the MHCLG, this national programme, launched in December 2018, aims to support high streets and town centres throughout England, co-funding renovation and structural projects to adapt to changes and meet the expectations of communities now and in the future.

2. Town Deal Programme - Overseen by the MHCLG, the Town Deal Fund will invest £3.6 billion into over 100 towns, as part of the Government's plan to level up our regions.



## Addressing the shortage of STEM skills

We employ an end-to-end education strategy to raise interest, investment and attainment in STEM subjects.

This begins with schools where we invite our employees to volunteer as STEM Ambassadors. In 2019, 300 Ambassadors contributed 3,500 hours to 150 events delivered in local schools. In 2020 (faced with the challenges of the Covid-19 pandemic), Ambassadors still delivered some face to face activities between January and March. However the majority of the support after that point was provided through virtual or remote learning, facilitating nearly 60 events and almost 700 hours of STEM Ambassador support.

When they leave education, a high proportion of the population in Barrow are caught in low income employment, often because they have not been able to progress into Higher or Further Education (HE/FE).

One of the largest comprehensive schools in Barrow-in-Furness is Furness Academy which, in 2014, was in special measures. We committed to supporting the school to raise standards including participating in the governing body, sponsoring activities to raise the aspiration of school leavers and boosting employability skills. The Academy is now rated good and is oversubscribed with applications.

## Youth unemployment

The rate of youth unemployment in Barrow-in-Furness is marginally worse than the national average. As such we are highly motivated to create further opportunities for those Not in Education, Employment or Training (NEET).

We are a founding member of a programme called Movement to Work, which offers work experience and training opportunities to NEET individuals in association with The Prince's Trust. To date we have offered in the region of 150 placements to young people in Barrow-in-Furness, two thirds of whom have transitioned onto an apprenticeship. Over the next ten years we aim to create a further 150 job opportunities for NEET individuals.

# Physical and Digital Infrastructure

- > Our physical and digital infrastructure is being transformed through investment in the site, new technology and new processes worth over **£1.4 billion**.

## Investing in the digital shipyard

£1 billion has already been invested in the redevelopment of the Barrow shipyard.

Over the life of the Dreadnought programme we will oversee further investment in the region of £450 million to adopt advanced manufacturing technologies that reduce cost and lead time, and increase quality and safety.

We are enhancing the integration of design, planning, procurement and production systems, including 3D visualisation of the submarine design, supported by a £200 million investment in IT and software. Over the next five years a further £250 million has been allocated to capital expenditure. This funding aims to:

- Introduce a cloud-based design process;
- Connect machine shops and manufacturing assets to improve data-based decision making;
- Expand secure WiFi and the use of mobile devices;
- Increase automation;
- Increase network capacity including local broadband infrastructure in Barrow-in-Furness.

## Climate change and contributing to Net Zero targets

We recognise that, through the energy we use and the waste we generate, we have an impact on the environment. We have set ourselves the target of achieving net zero greenhouse gas emissions across BAE Systems' operations by 2030.

To contribute towards the company's and national Net Zero targets, measures we are taking in the Submarines business include:

- Recycling the vast majority of our production waste;
- Enhancing our building management systems including, for example, motion sensor lights;
- Promoting walking and cycling to work, and supporting community initiatives in Barrow-in-Furness to redevelop green spaces;
- Investigating renewable energy sources;
- Encouraging suppliers to prioritise locally-sourced food to reduce food miles;
- Exploring the implementation of electric charging points for cars;
- Reviewing sustainability training and ways of implementing this for all employees.

# Investing in Skills and Training

> In 2021 we are recruiting over 350 apprentices and approximately 75 graduates and 45 undergraduates in our Submarines business (with the vast majority based at our Barrow site).

## Creating and sustaining skilled engineering and manufacturing jobs

As the programme progresses, the total number of jobs supported by the programme remains above 20,000 up to 2027. In the final years the programme will level off to around 10,000 jobs.

See examples of both Design and Engineering and Production skills below:

Design and Engineering skills	Production skills
<p>BAE Systems engineers across 40 disciplines will be involved in delivering the next phase of the Dreadnought programme, including:</p> <ul style="list-style-type: none"><li>- Naval architecture;</li><li>- Marine engineering;</li><li>- Structural, weights and stress;</li><li>- Noise and vibration;</li><li>- Metallurgy and welding;</li><li>- Nuclear safety and radiation shielding;</li><li>- Software and systems integration.</li></ul> <p>We have a long-term plan to sustain skills in each discipline aligned to a technology map.</p>	<p>The vast majority of production staff involved in constructing the submarines under the next phase of the Dreadnought programme come from the following trades:</p> <ul style="list-style-type: none"><li>- Steel work and welding;</li><li>- Mechanical fitting;</li><li>- Electrical fitting;</li><li>- Pipe fabrication and fitting;</li><li>- Rigging and shipwrights.</li></ul> <p>Continuous work is necessary to maintain trade certifications and nuclear qualifications.</p>

Note: \* In January 2021 it was independently estimated by Oxford Economics that in 2021, including all impact channels, the Dreadnought programme supports almost 30,000 jobs around the UK.



> A £25 million investment in the state-of-the-art Submarines Academy for Skills and Knowledge (SASK) will drive future talent programmes and provide life-long learning opportunities for our workforce. The facility boasts 10 workshops, 30 classrooms and a virtual reality suite.

## Award-winning early careers programmes

Throughout the Dreadnought programme we will continue investing in our talent pipeline and creating exciting career opportunities for young people in the North West. We currently have well over 800 apprentices and more than 70 graduates, representing around one in ten of the Submarines workforce and an annual investment of approximately £30 million.

Over the next five years we plan to recruit over 200 additional graduates and approximately 1,500 apprentices. This includes degree apprenticeships

in subjects such as nuclear engineering. This offers school leavers a vocational alternative to obtaining a university-level education. Our apprenticeship programme is judged by Ofsted as “outstanding” and completion rates are in the region of 95%.

We coordinate this skills strategy with the Nuclear Energy Skills Alliance to ensure we complement other efforts across the private and public sector, including Civil Nuclear.



BAE Systems' SASK

# Technology and Advanced Manufacturing

- > Over the next five years we are planning to invest **£40 million** in new technology to optimise our design and manufacturing processes and enhance the capability of the submarine.

## Investing in discovery science through to applied technology

A technological advantage is critical to the invulnerability and integrity of a nuclear submarine patrol. Innovation also drives our manufacturing efficiency and the affordability of the programme. It is therefore a priority to continue our long history of research and development in the underwater battlespace arena.

## Enhancing Submarine capability through R&D

We work with a range of academic institutions and currently sponsor 25 PhDs with our strategic university partners including Southampton, Manchester and Cranfield. Examples of this research include:

Priority	Research	Goal
Stealth and survivability	Signature management, multi-hazard modelling and shock studies	Low signature and increased resilience to maintain an operational advantage
Combat system	Autonomy, AI (Artificial Intelligence), command and control, quantum technology, wearables, data analytics and HCI (Human Computer Interface)	Improve lethality, sensing and detection and enhance information processing
Platform systems	Alternative propulsion, energy generation, battery technology, systems integration and testing, modelling and data analysis	Improve submarine performance, reduce cost and carbon footprint, and facilitate data-based decision making



## Optimising design and production through Industry 4.0

We are embracing the fourth industrial revolution to transform our productivity by improving utilisation, automating repeatable processes and improving accuracy. Production tasks will be based on controlling robots and tracking processes, and this offers employees improved care and protection, and reduced exposure to safety risks.

Our plans to adopt new industrial technology include:

Theme	Detail	Goal
Connectivity	Connecting machines to understand utilisation and whole boat visualisation	Improving process and business efficiency and exploiting data
Automation	Introducing mobile robotic welding	Reducing time and cost by removing repetitive actions
Tooling	Quantum metrology and asset tracking	Manufacturing enhancements to improve quality and efficiency
Additive manufacturing	Metallic additive layer manufacturing	Increasing the scale and complexity of 3D metallic and polymer parts
Metal processing	Advanced welding and non-destructive examination	Improving production and assembly in forming, machining and joining
Materials	Alternative materials and investigating corrosion	Identifying coatings and composites to increase strength and reduce weight
Testing and quality control	Laser projection of 3D models and potential use of drones to conduct scans	Optimising test and analysis and smart sentencing techniques



We are increasingly using robotics and automation to enhance our processes.

Image taken June 2019

# Improving Social Welfare

- > Over the life of the Dreadnought programme we will invigorate the economic development of Barrow-in-Furness by attracting public and private sector investment in the town.

## Accelerating diversity and fostering inclusion

BAE Systems is an inclusive organisation with a diverse workforce that reflects the global communities in which we work. We believe that developing an inclusive, diverse workplace in which all employees can be their best selves and contribute their unique experiences, beliefs and insights helps us drive innovation, enhance employee engagement and accelerate our performance. It's not just the right thing to do, it will differentiate and strengthen our competitive advantage for the future.

We have two clear, common objectives to accelerate diversity and foster inclusion, to help fulfil our potential and deliver our business strategy.

Our goals are to:

- Attract and retain a diverse workforce that reflects market availability at all levels of the organisation;
- Advance an inclusive workplace where leaders can effectively retain key talent, and employees feel that their differences are valued. This means, for example, having a target to increase the number of women in senior roles and decrease attrition of underrepresented groups.

To support the achievement of these targets at BAE Systems, we have signed the Women in Maritime Pledge and have made a commitment to sign the Women in Maritime Charter. We have also signed the Diversity in Maritime Charter. To advance gender equality we support the Women's Engineering Society with a STEM Returners Programme, encouraging women who have been out of the workplace for two years or more to return to work.

We also expect our senior leaders to act as visible advocates for diversity and inclusion. We have appointed sponsors at Executive Board and Sector levels with a specific focus on gender, ethnicity, sexual orientation, disability, mental health, veterans and inclusion.

We actively support the six BAE Systems Employee Resource Groups - GEN (gender), OutLinkUK (LGBTQ+), ENabled UK (disability), Embrace UK (Cultural and Ethnicity), VetNet (Veterans) and MindSet (Mental Health). The groups work with the company to address specific issues, promote diversity events, and assist with benchmarking activity. For example, our aim is to reach the Top 100 in the Stonewall UK Workplace Equality Index by 2025. The groups are positioned as valued stakeholders and sounding boards in the development of inclusive policies and processes.

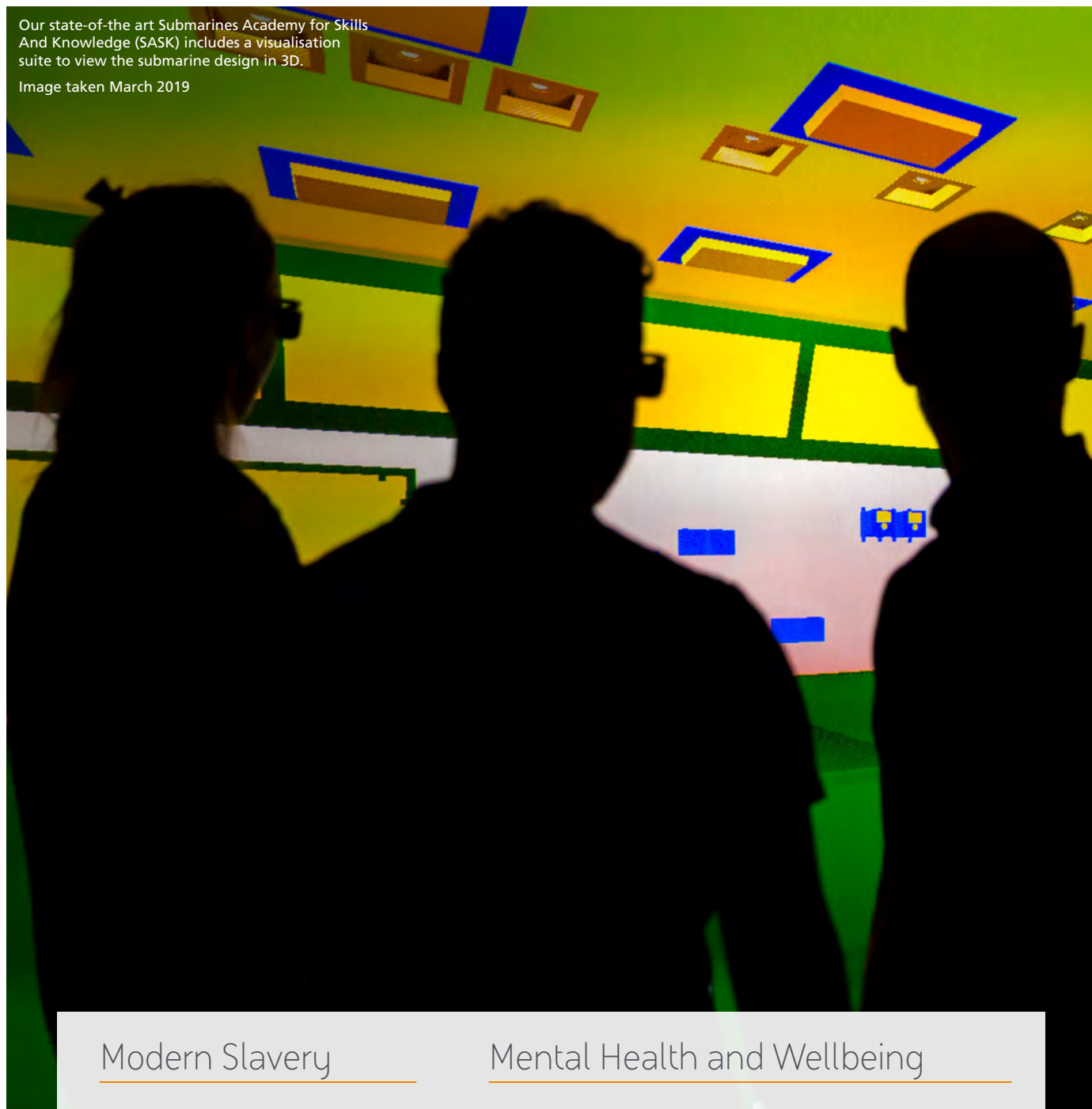
We are reviewing the demographic profile of the local populations across our business site locations. We will use this information to measure our recruitment performance and look to create an inclusive working environment for all our employees.

We are also committed to using our apprenticeship and graduates programmes as vehicles to help make programmes like Dreadnought more diverse and inclusive. Our target is to exceed the industry average and seek to ensure that 30% of our apprentice and graduate intake are female. In 2020, nearly one in three apprentices and more than a quarter of graduates recruited were female.



Our state-of-the-art Submarines Academy for Skills And Knowledge (SASK) includes a visualisation suite to view the submarine design in 3D.

Image taken March 2019



## Modern Slavery

We are committed to preventing slavery and human trafficking in our supply chain; a complex and hidden crime that crosses borders. All our employees and contractors undergo pre-employment vetting and we conduct due diligence checks on suppliers.

## Mental Health and Wellbeing

We recognise the importance of our responsibility to protect the psychological and behavioural well-being of our employees. We offer monthly Health MOTs, carried out by the Occupational Health team, to all core employees.

We operate a mandatory health surveillance programme for production staff, and all our employees in the shipyard have access to 240 Wellbeing Champions and around 50 Mental Health First Aiders. We also continue to work with organisations such as Cumbria Alcohol and Drug Addiction Service, Mind and First Steps to maximise the support to our employees and help them remain at or return to work.

We are also encouraging healthy eating to reduce absence, energise our staff and improve our employment proposition with drop-in nutritionists.

# Supporting the Armed Forces

- > Employees working on the Dreadnought programme continue to help us deliver on our Armed Forces Covenant commitments and are proud of our MOD Employer Recognition Scheme Gold Award.

## Armed Forces Covenant

We recognise the contribution our Armed Forces make to society. BAE Systems was the first defence company to sign the Covenant, and the first company to renew and expand its commitment. We were one of the first six winners of the MOD Employer Recognition Scheme Gold Award, by which the Defence Relationship Management team recognises an organisation's commitment to the Armed Forces Covenant, and we have held this status continuously since then. In addition we:

- Recognise the skills and experience of service leavers, veterans and family members of UK military personnel by flowing externally advertised job opportunities to the Career Transition Partnership and Forces Families Jobs websites;
- Enable those employees who are active members of the Reserve Forces to maintain their training commitments by providing fifteen days per annum of special paid leave;
- Support Adult Cadet Force Volunteers by providing special paid leave on the same basis as Reservist employees;
- Adopt a sympathetic and flexible approach to requests for leave from service families working on Dreadnought, including offering special paid leave in the event that an immediate family member is deployed on operations;
- Promote Armed Forces Day, Reserves Day and Remembrance Day, and support Armed Forces parades in Barrow-in-Furness and Kendal;
- Support Dreadnought employees who are Veterans or Reservists by offering membership of our Veterans' Network.

## Armed Forces Charities

We take great pride in our association with the Armed Forces and supports a number of military charities. In 2020 we gave £2.8 million globally to Armed Forces charities and not-for-profit organisations.

Our commitments in the UK include:

- Presenting partner for the Invictus Team UK through to the Invictus Games The Hague (postponed to Spring 2022) and for which we encouraged our employees to volunteer at the first UK Trials in 2019 whilst supporting them with special paid leave;
- Headline sponsorship of The Sun Military Awards (the Millies) to celebrate the character, selflessness, bravery and dedication of the Armed Forces;
- Corporate partner of The Open University's (OU) Disabled Veterans' Scholarships Fund (DVSF) to help further the education of those who have become disabled as a result of military service, and have so far sponsored 18 veterans through their studies;
- Founding donor of the new Defence and National Rehabilitation Centre at Stanford Hall with a £5 million commitment.

We also work closely on initiatives with ABF The Soldiers' Charity, Combat Stress, the RAF Benevolent Fund, the RNRMC (Royal Navy and Royal Marines Charity) and SSAFA (Soldiers, Sailors, Airmen and Families Association).

We have supported a number of maritime related charities and initiatives including the Royal Navy Sports Charity, the Sea Cadets science challenge, HMS Oardacious, and the Talisker Whisky Atlantic Challenge. In addition we continue to encourage our employees on Dreadnought to volunteer and fundraise in support of such initiatives.



# Conclusion

> The Dreadnought programme sits at the confluence of national security and prosperity. As the industrial lead for the Dreadnought programme, our role within the Alliance is to deliver the programme, bear a level of risk and be clearly accountable for our commitments. This means ensuring the performance of the submarine, underpinning the safety of its operation, and forming a schedule and cost outcome that delivers value for money.

To do this, we are required to invest alongside the Government in infrastructure and technology, and assemble a range of skills across project management, systems and software engineering, specialist engineering disciplines and financial management.

Many new employees will join us over the course of the Dreadnought programme, turning the aspiration of training and a sustainable job into a reality. Combined with our nationwide supply chain, this programme will invigorate the Government's priority of levelling-up economic opportunity across the country.

The transformation of our digital shipyard, and investments in underwater technology and environmental sustainability, also support the Government's goals of increasing R&D intensity and tackling the challenges of climate change.



Aerial photograph of the Barrow-in-Furness BAE Systems shipyard and surrounding area.

➤ Over the life of the Dreadnought Programme we endeavour to:

- **Create and sustain.** At its peak the Dreadnought programme will support almost 30,000 UK jobs, including almost 8,000 employed directly by BAE Systems;
- **Secure a vibrant and diverse supply chain.** Over 90% of expenditure on the Dreadnought programme will reside in the UK, and we plan to spend £7.5 billion with 1,500 suppliers;
- **Drive economic development** and work with local stakeholders to transform the future of Barrow-in-Furness. This includes the Future High Streets Fund and the Town Deal Fund;
- **Transform our physical and digital infrastructure,** including an investment in the region of £450 million to adopt advanced manufacturing technologies that will reduce cost and lead time, and increase quality and safety;
- **Invest in skills and training** to create a talent pipeline. We will recruit 200 graduates and 1,500 apprentices over the next five years;
- **Invest £40 million** in new technology to optimise our design and manufacturing processes, and enhance the capability of our submarines;
- **Improve social welfare** in Barrow-in-Furness by attracting public and private sector investment to the town, and create opportunities for the long-term unemployed;
- **Support the Armed Forces** by continuing to deliver on our commitments to the Armed Forces Covenant and maintain our MOD Gold Award.

“ Our legacy will be delivering four submarines on schedule to maintain CASD for decades to come. In doing so we are proud that we will deliver a profound contribution to economic and social value across the country. ”



**Gavin Leckie**

Dreadnought  
Programme Director  
BAE Systems, Submarines



**Note:** The majority of the content of this document has been sourced / generated by BAE Systems subject matter experts (including layout and graphic content). Specific references within this report to economic and employment impacts in relation to the Dreadnought programme are based on analysis and modelling commissioned by BAE Systems and undertaken by Oxford Economics (January 2021).

#### **About Oxford Economics**

Headquartered in Oxford (England), 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. Modelling and results are based on information provided by third parties, upon which Oxford Economics has relied on in producing its forecasts in good faith. It is further noted that any subsequent revision or update of those data will affect the assessments and projections made.

#### **Key Assumptions and Limitations**

At the time of publication 'best available' data was used in order to understand the future nature of work and employment associated with the Dreadnought programme. As such, Oxford Economics has had to make certain simplifying assumptions to generate the forecasts contained in this report. In particular, while spending and employment on the programme will vary over time, assumptions that the composition of supply chain spending, the type of jobs supported, and the locations of jobs remain consistent throughout the forecast period. To the extent that such factors vary as the focus of the programme shifts from production to maintenance and support, then the amount and location of employment supported may differ from that presented in this report.

