# Aerospace Sector Deal

## *One Year On*

AGP
Aerospace Growth Partnership
CELEBRATING 10 YEARS

# Foreword

The UK aerospace sector brings innovation, expertise and experience to developing and manufacturing advanced technologies at the heart of modern commercial aviation.

Aviation is essential to connecting people across the UK and around the world, and the industry has been working consistently for decades to reduce fuel use.

Driven by technology, each new generation of aircraft is on average 20 percent more fuel efficient than the generation before, and the UK aerospace sector has played a key role in driving these efficiencies.

Now worth £36bn a year to our economy, this industry directly employs over 111,000 highly skilled people in jobs that pay 45 percent above the national average and are spread across the breadth of the UK.

As a result, this is a sector that 'levels up' the economy – with 92 percent of the sector based outside of London and the South East.

Since the Government and industry first came together at the end of 2010 to create the Aerospace Growth Partnership, we have seen UK aerospace employment grow by 15 percent, while exports from the sector have increased from £18bn in 2011 to more than £34bn a year in 2018.

The Aerospace Sector Deal launched in December 2018 was another landmark event in the partnership between government and industry, which ensures we can attract the investment for the UK to remain a world leader in this sector and to develop the skills we need to thrive.

In the last year, we have seen the Sector Deal's key programmes get underway. The third round of the National Aerospace Technology Exploitation Programme was launched in June at the Paris Airshow, supporting innovation in the supply chain.

The Future Flight Challenge, a gross £300m industry and government funded programme, is starting to build UK consortia of the best proposals for developing low carbon, environmentally friendly, advanced aerospace technologies of the future, adding to the high technology programmes being run by the successful UK Aerospace Research and Technology programme delivered through the Aerospace Technology Institute.

**Colin Smith CBE – Co-Chair, Aerospace Growth Partnership**

Reducing carbon emissions and achieving Net Zero by 2050 will be at the heart of Government's economic strategy. Clean growth presents an opportunity across the whole UK to improve productivity, drive economic growth and reduce inequality, particularly for left behind places. As we look to the future of aviation, our whole industry needs to be focussed on solving the challenge of reducing the environmental impact of flying, even as global air travel continues to grow.

The rest of the world is accelerating towards a more electric future; large government-backed investments are being made today in the USA, Germany, France, China and Japan, and the UK risks being left behind if we do not invest at scale and pace.

The range of programmes now taking place, underpinned by the portfolio of research and technology co-funded through the Aerospace Technology Institute programme - which now totals £2.6bn and involves 331 partners including 203 small and medium sized enterprises - will all be vital to achieving this goal.

The UK Aerospace Research Consortium is providing the global aerospace community with a centralised point of engagement to our top university aerospace research capabilities.

The strength of our sectors lies not only in the ability to operate at the cutting edge of technology but in the potential of small and medium sized enterprises in our supply chains to compete as world leaders.

Realising the success of investing in the next generation of technologies and shaping future markets, relies on a competitive and capable UK supply chain that is positioned to exploit these opportunities.

A robust civil aerospace supply chain in the UK is also essential to support our capabilities in defence, given that suppliers cater to both industries.

Supply Chains for the 21st Century is helping small and medium sized companies to continually improve their productivity and competitiveness.

We are also focussed on making sure our industry is attracting the full range of talent we need to continue succeeding.

The Women in Aviation & Aerospace Charter now has now grown to more than 133 signatory organisations and we are working hard through a range of initiatives to promote science, technology, engineering, and mathematics subjects and careers to young people, helping to increase the UK's engineering talent pool.

The Sector Deal has helped drive our industry forward over the past year, building on the success of our industrial strategy for aerospace.

We look forward to the Aerospace Growth Partnership, between industry and Government, building further continuing tackling barriers to growth, driving the green aviation agenda and making sure the UK is the best investment location in the world for aerospace.

# Background to the Sector Deal

At the Farnborough International Airshow in July 2018, the Prime Minister - Theresa May, called for industry to work with government on an ambitious civil Aerospace Sector Deal, to build on the strong relationship government has with industry through the Aerospace Growth Partnership (AGP) and support the Industrial Strategy's Grand Challenges, regional prosperity and the delivery of the government's skills priorities.

She also called on the sector to embed a Women in Aviation & Aerospace (WiAA) Charter to bring greater gender equality to the industry.

The UK's Civil Aerospace industry is a world leader in the development and production of engines, wings and advanced systems for aircraft. It is a sector that has a strong record of working in close partnership with government to boost that competitive advantage.

The Sector Deal builds on our successes by positioning the UK to take advantage of the global move towards hybrid-electric and electric propulsion and to exploit related new markets – drones and Urban Air Mobility (UAM) vehicles and signals the government's intention to position the UK at the forefront of valuable emerging markets.

The Sector Deal does this by:

- Boosting innovation through a joint industry and government investment in the Future Flight challenge, with up to £125m of funding from the Industrial Strategy Challenge Fund, matched by industry. This programme will invest in developing demonstrators of new aircraft (such as drones and other electric aircraft), new models of airspace management, new approaches to ground support infrastructure and new markets for aircraft in local areas.
- Expanding our successful National Aerospace Technology Exploitation Programme (NATEP) with joint funding from government and industry to boost research and development (R&D) projects led by small and medium sized enterprises (SMEs).
- Supporting SMEs in the UK aerospace supply chain to boost their competitiveness through a new productivity improvement programme.
- Committing the industry to embed a WiAA Charter to increase diversity and inclusion in the sector.
- Enhancing the joint working between the aerospace industry and education providers to ensure a strong future pipeline of talented people are available to ensure the UK aerospace sector remains globally competitive.

The Sector Deal builds on the strong relationship between the aerospace sector and the UK government and success of this relationship has led the way to help inform the development of sector deals in other parts of the economy.

Looking forward, we have an opportunity to lead the world and position the UK as the global hub for low carbon technologies, including sustainable aviation fuels and electric flight.

We look forward to working more closely with government, the wider aviation sector, academia, and other collaborators, to provide solutions to help tackle climate change and to drive sustainable economic growth in aviation.

We welcome the Aerospace Technology Institute's (ATI) revised technology strategy for the UK - 'Accelerating Ambition', which provides a roadmap of the innovation necessary to make sure that the UK can continue to be a global leader.

# Progress of Sector Deal Activities

Commitments were made by government and industry as part of the Sector Deal and these have been tabled in the following sections with a summary of progress against them.

## Ideas

| Industry action to support the aerospace sector | Government action to support the aerospace sector |
|---|---|
| **Research and Technology (R&T) grant support**<br>➢ Match funding of government's £1.95bn R&D programme to 2026.<br>➢ Industry will match fund government grant support to take forward R&D. Individual grants awarded to companies will result in follow-on investments by those companies.<br><br>**Electrification and Autonomy**<br>➢ Industry will co-fund government support of up to £125m, Industry will also make follow on commitments in the knowledge that follow on R&D and capital/ infrastructure investments will be needed to develop and exploit the initial government supported activities.<br><br>**National Aerospace Technology Exploitation Programme**<br>➢ Industry commit to match funding of £10m and delivery of high valued jobs in the long term.<br>➢ Prime, Tier 1's and other larger companies will provide support to assist small and medium sized enterprises in the co-funded development of technologies towards commercialisation.<br>➢ Industry will encourage greater participation in NATEP from companies in the devolved administrations. | **Research and Technology (R&T) grant support**<br>➢ Match funding R&D programme support of £1.95bn between 2013-2026.<br>➢ Government will look to work with industry to consider how best to take forward R&D and improving the effectiveness of supply chains as the aerospace sector moves towards more disruptive technologies.<br><br>**Electrification and Autonomy**<br>➢ Up to £125m Industrial Strategy Challenge Fund funding for the Future Flight Challenge which will implement activities to deliver more electric, autonomous and environmentally friendly aviation and aerospace sectors.<br>➢ It will offer new options for how people and goods could move around in the future and showcase the UK as driving new mobility solutions.<br><br>**Small and Medium sized Enterprises engagement in R&D activities**<br>➢ SMEs already benefit from R&D funding support through the ATI programme.<br>➢ To complement this and encourage more SMEs to undertake R&D, further ATI R&D support is offered for open calls.<br>➢ £13.7m funding for further rounds of NATEP to bring small and medium sized employers and customer companies together to help SMEs develop technologies and bring them to market. |

| Industry action to support the aerospace sector | Government action to support the aerospace sector |
|---|---|
| UK Aerospace Research Consortium (UK ARC)<br>➢ UK ARC will work in partnership with industry, the ATI, research councils and government to seek to create a UK-wide infrastructure of accessible, integrated and world-class university strategic facilities that align with industry's priorities. | UK Aerospace Research Consortium (UK ARC)<br>➢ Government welcomes the establishment of this consortium which will bring a more coherent approach to university research in the UK and better align R&D activities with industry.<br><br>Cyber and Digital Security<br>➢ Government welcomes the ongoing activity the UK aerospace sector has undertaken around cyber security, data and digital connectivity, and encourage the sector to progress this work further. |

## R&T Grant Support through the ATI

Since the announcement of the Aerospace Sector Deal, the ATI Programme has continued to accelerate priority technologies in composite wings, smart electrical systems and next generation turbo fan engines for large aircraft. It has also supported a rapid increase in technology development for radical electric and hybrid-electric propulsion systems.

This expansion in research has seen 34 new organisations join the programme, 25 of which are small, highly innovative businesses, taking the total to over 260 unique entities engaged in this national technology drive.

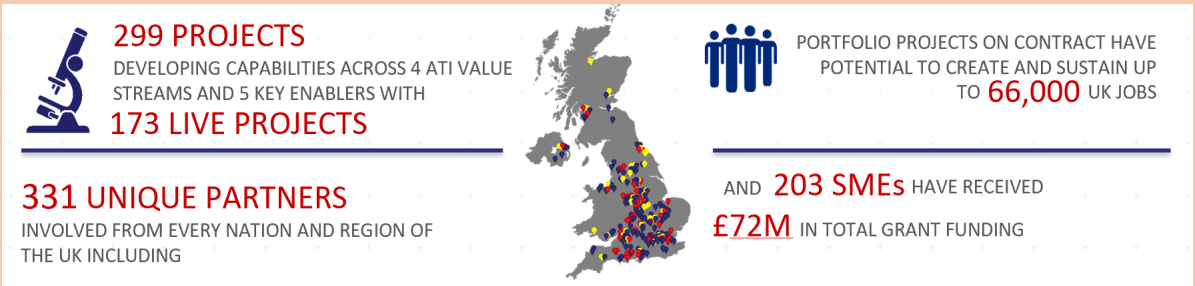
This is in addition to companies receiving innovation support through NATEP which is funded under the ATI Programme.

The reach of the ATI Programme remains fully national, with leading edge research taking place across the UK, securing high value jobs.

The R&T grant support through the ATI has been very complimentary to the Government's ambition to raising R&D investment to 2.4 percent of GDP by 2027 and the longer-term goal of 3 percent as a proportion of GDP.

## ATI Programme Statistics

To date, industry and government have each committed £1.3bn through the ATI, bringing the programme to a total of £2.6bn worth of research activity since 2013. ATI assess this investment as delivering £78bn in value add and spillovers across the UK.




*As at January 2020*

Significant technological progress has been achieved, with major wing and engine programmes approaching technology readiness level (TRL) 6. These programmes are entering a critical phase of development involving full-scale assemblies and extensive testing that will take place over the next three years.

This includes the first operation of an entirely new engine core by Rolls-Royce as part of the UltraFan programme and delivery of new advanced manufacturing methods for large-scale composite wing structures by GKN Aerospace, Airbus and Spirit as part of the Wing of Tomorrow programme.

The UltraFan programme provides a platform for industry to understand how to make new engine systems more efficient and facilitate the adoption of electric technologies.

Securing this work in the UK helps continue Rolls-Royce's presence across the UK from Bristol to Inchinnan in Scotland.

The UK has taken a lead in the development of electric and hybrid-electric aircraft involving established aerospace companies as well as new entrants bringing technology from other sectors. These programmes cover kilowatt and megawatt class hybrid-electric demonstrator aircraft that deliver significant further improvements in environmental performance of aircraft.

The ATI programme's ambition and approach to electrification is capturing global attention and aligns with the Future Flight Challenge supported through UK Research and Innovation (UKRI).

Some examples of ATI funded projects are provided below:

| **ATI led Projects starting in 2019** | **ATI led Project Concluding in 2019** |
|---|---|
| **HyFlyer** – ZeroAvia with Intelligent Energy as consortia partner (2 new entrants) is developing a new automotive hydrogen fuel cell tech into the aerospace world for zero emission flight in light aircraft.<br><br>**Fresson** - Cranfield Aerospace are leading a consortium with Britten-Norman, Rolls-Royce, Denis Ferranti, Delta Motorsport and Warwick Manufacturing Group to develop a 9-seat aircraft capable of all-electric, emission free, flight. This project will advance technology for hybrid electric propulsion of a larger 19-seater airliner, delivering significant environmental benefits in this class of aircraft.<br><br>**AirTek** – Williams Advanced Engineering, JPA design and SWS Certification (3 new entrants) will develop innovative composites to create significantly lighter seats based on supercar technology, potentially saving up to 78,500kg of CO2 per year for each aircraft fitted. | **SECT-AIR** aimed to reduce aerospace software development costs through increased automation, greater reuse of artefacts and methods, and by developing new technologies to reduce the costs of obsolescence that afflict the aerospace software industry. The project involved around half of the UK total aerospace industry.<br><br>The project will secure the UK's role as an aerospace software centre of excellence, reduce cost and time to market for UK systems, reduce risk in new systems development and increase high-value jobs in the sector. |

## Next Steps

The ATI published its new technology strategy, Accelerating Ambition, that sets out fresh priorities for the programme (https://www.ati.org.uk/publications-tools/publications/).

This ambitious agenda seeks to put the UK at the forefront of delivering technology for the most efficient commercial aircraft. This strategy will push for technologies that help mitigate aerospace's environmental impact and will open new markets for urban and regional aircraft, in addition to new large passenger aircraft expected in the coming decades.

### ATI Project Case Study

Following R&D support provided through the ATI Programme in 2015, Spirit AeroSystems were able to develop a new composite technology that increased automation and out of autoclave manufacturing processes for a spoiler component.

This project was the first industrialisation of this new composite technology in the UK aerospace sector and helped repatriate a work package and create 100 jobs back to Spirit's Prestwick facility from a low-labour cost country in 2020.

This is a demonstration of how investing in R&D can develop cost effective new technologies and manufacturing processes that create jobs and help the UK stay globally competitive.

*Courtesy: Spirit AeroSystems*

## Future Flight Programme - Electrification and Autonomy

The Industrial Strategy Challenge Fund - Future Flight Challenge, was launched in August 2019 with an aim to revolutionise the way people, goods and services fly, positioning the UK as a world leader in aviation products and markets worth over £500bn to 2050.

International activity around electrification, autonomy and UAM, remains high, it is crucial therefore that the UK also participates. For example, Volocopter of Germany, demonstrated passenger carrying capability at the Singapore Intelligent Transport System Expo and indeed, Vertical Aerospace, a Bristol based organisation, are now executing early flight testing. Cities such as Paris are also encouraging organisations to step forward to enable utilisation of UAM solutions at the Paris Olympics 2024 in temporary airspace corridors.

Future Flight is positioning the UK as uniquely innovative and collaborative in developing and incorporating autonomous and electric capabilities, attracting investments from international organisations in the UK.

The approach, whilst involving academia, is being acknowledged for its industrial contribution to drive forward commercialisation of innovations in aerospace into the wider aviation sector.

Future Flight will cover four areas of activity:

- **Control and regulation:** new models of airspace management and anticipatory regulation that can integrate remotely piloted and/or highly autonomous aircraft.
- **New operating models:** new operating models for users and commercial operators.
- **Ground infrastructure:** ground to air infrastructure systems and service models, integrated with multi-modal transport links that integrate drones into cities and create local take-off and landing points equipped to accommodate new forms of aviation.
- **New aircraft:** novel aircraft and drone designs featuring autonomous and electrical technologies producing clean, quieter and cost-effective aircraft for regional and urban use.

Industry engagement with aerospace and the broader aviation community has been extensive. The programme is working and well placed to continue in 2020. Phase I of the programme closed in November 2019, with more than 200 organisations submitting expressions of interest.

Following independent evaluation, 150 participants representing over 110 organisations and new entrants were shortlisted to attend a 2-day workshop in February to continue to develop project proposals. Representation is diverse in terms of organisations size, geography and capabilities. Phase II seeks to invest up to around £60m of government and industry money over 12 to 18 months starting Autumn 2020.

A deepening relationship between the Future Flight Challenge and the Civil Aviation Authority (CAA) is taking shape; regulatory development in the sector is lynch pin to commercial development. The CAA has established an Innovation Hub to facilitate early and ongoing engagement with innovators, including new entrants to the aviation market. The CAA will also be working closely with the Future Flight Challenge to ensure that safety is central to the development of new aviation technology. This should put the UK in pole position to lead international developments.

## Developing Strategic Competencies

Given the global aerospace sector is technology led, understanding future technology and capability needs is critical to ensure the supply chain maintains a competitive advantage.

The strategic competency analysis (SCA) conducted by the AGP has identified strategic capability gaps, and suggested activities to drive more collaboration and business opportunities, create highly skilled jobs, and to make the UK more competitive so British businesses can compete with rising economies.

Through 2018 and 2019, several industry-led workshops were held to develop the SCA themes, with the ATI and High Value Manufacturing Catapults (HVMC). These workshops included the research networks as well as regional alliances to ensure all parts of the UK's aerospace ecosystem were agreed with the approach and outcomes.

9 key product areas were assigned UK company leads to develop initial position papers focussing on validating market opportunities. Subsequent business cases have been developed, identifying capability gaps and a quantifying feasibility of investment.

The SCA activity found that through an approximate £1.6Bn investment there is a potential market opportunity of over £37Bn. The activity identified several investment opportunities in the Single Aisle, UAM, autonomy and other markets and their requirements in infrastructure, equipment and technology development that will enable their success.

The SCA activity is now complete, with 2020 onwards looking to address the identified capability gaps, through further collaboration, particularly in the linking of all the tiers of the supply chain, including SMEs.

## National Aerospace Technology Exploitation Programme

Announced in the Sector Deal, NATEP 3 continues to encourage small businesses into a structured R&D environment. This is a vital step in ensuring the UK has a competitive supply chain to support customer companies and help anchor them in the UK.

There have been three rounds of NATEP funded by the Government (and Invest Northern Ireland for Northern Ireland) and industry. During 2019/20, the NATEP 2 programme will continue through to conclusion as activities in the NATEP 3 programme increase.

The NATEP approach of Government working with SMEs to provide industrial mentoring is seen as a key approach to introducing the SME to structured R&D programmes.

NATEP continues to be an in-demand programme with 35 projects being delivered through NATEP 2 which includes 96 funded partners and 53 end users across England and Scotland.

This builds on NATEP 1 which supported 224 funded partners and 84 end users. The most recent NATEP programme, NATEP 3, launched in August 2019 with £10m support from Government, matched by industry to create a £20m programme, aimed at funding ~64 projects over 4years.

The initial call in July 2019 targeting 16 projects generated 30 project proposals of which 17 have progressed to the formal review stage. A second call concluded in early December with 24 expressions of interest.

## NATEP Case Study

With support from NATEP, INSPHERE, based in Bristol, developed the BASELINE system. Their partners in the project are Hexagon Manufacturing Intelligence, the Nuclear Advanced Manufacturing Research Centre (AMRC) and end-user, Rolls-Royce.

**BASELINE** provides full verification of large machines in less than an hour. This helps reduce downtime and waste thereby reducing costs and reducing the impacts on the environment. Since its launch, there have been expressions of interest across UK from aerospace, automotive, nuclear and oil and gas sectors.

**INSPHERE** has already expanded to 10 employees and plans to employ more people as its growth accelerates. The new roles will range from application and software engineering to sales and customer support functions.


*BASELINE system developed through NATEP support*

## UK Aerospace Research Consortium

There are now 11 Universities forming the UK ARC – Bristol, Cambridge, Cranfield, Imperial College, Manchester, Nottingham, Queens Belfast, Sheffield, Southampton, Strathclyde and Swansea all committed to bring the U.K.'s leading aerospace universities together.

2019 has been spent getting the foundations in place, agreeing research priorities, collaborative arrangements and the future work plans. UK ARC is now formally represented on the AGP. There have been good discussions with the ATI and Engineering and Physical Sciences Research Council (EPSRC) on how to improve the alignment between business and university objectives, where appropriate.

The UK ARC has been working together in the aerospace and aviation policy space and for the green paper consultation around aviation 2050. UK ARC responded for the very first time with a collective voice, something it will be looking to do increasingly as the consortium develops.

This bid into the Future Flight Challenge provides strong commitment of the UK aerospace research universities and offers a 'one-stop-shop' structure and collective research strengths and capabilities for businesses involved in the Challenge at a level never seen in the UK.

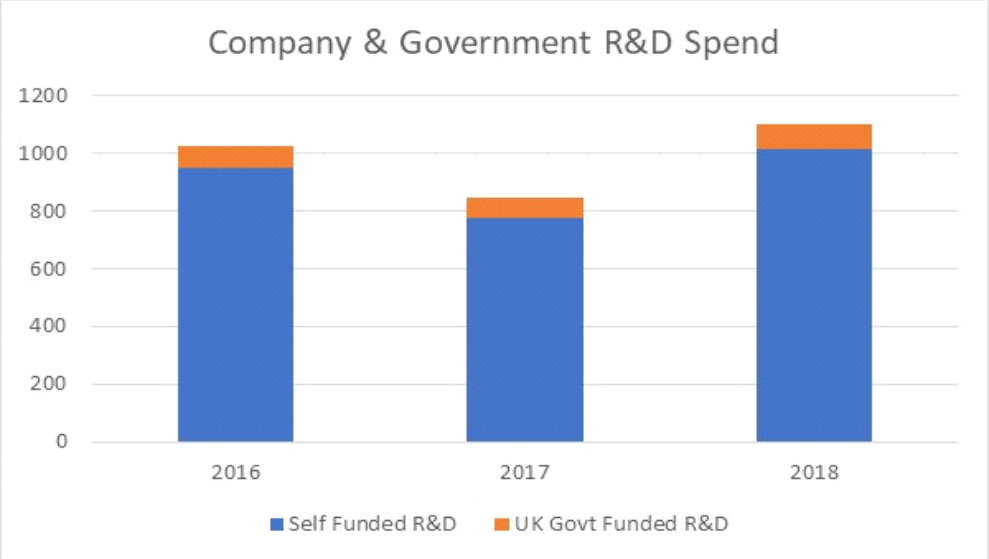
This bid offers the potential to leverage more effectively the wealth of world-leading Research and Test Facilities.

The UK ARC will play a key role in framing UK aerospace research capabilities around the demonstrators and system development requirements of the UK sector and catalyse the research programme. It will also support the accelerated realisation of new aircraft platforms with hybrid electric propulsion and optimised autonomous operation.

## Conclusion

The success of the UK's aerospace sector is underpinned by the development and subsequent manufacturing of cutting-edge technologies. This is increasingly important as the sector becomes more globalised and the drive to tackle climate change continues.

Following the survey work[1] undertaken by BEIS in 2019 with industry[2] an indication of the level of R&D undertaken compared to that which receives government support is given in the chart below.




It is also recognised that industry undertakes a great deal of privately funded R&D activities that do not receive any government support.

[1] BEIS undertook a survey of certain companies in the UK aerospace sector to ascertain information relating to the subject areas of the sector deal. Not all companies provided responses to all sections or information provided was not consistent with other information previously provided to BEIS by industry, therefore the data received and presented in this document should be considered as illustrative only.

[2] Airbus, Boeing, Bombardier, Collins Aerospace, GE, GKN, JJ Churchill, Leonardo, Meggitt, Rolls-Royce, Safran Helicopter Engines, Safran Landing Systems, Safran Nacelles, Safran Power, Safran Seats, Spirit, Thales & TT Electronics.

## People

| Industry action to support the aerospace sector | Government action to support the aerospace sector |
|---|---|
| Women in Aviation & Aerospace Charter<br><br>Key activities include:<br>➢ Committing to the progression of women into senior roles.<br>➢ Having one member of the Senior Executive responsible for gender diversity and inclusion.<br>➢ Setting internal targets (where appropriate) for gender diversity in senior management, publishing progress against targets annually.<br>➢ Industry commits to publicly reporting on the implementation of the Charter.<br><br>Delivery of apprenticeship standards<br>➢ Industry commits to working with Institute for Apprenticeships and devolved administrations to deliver apprenticeship level 3, 4 and 5 standards and develop clear progression routes.<br>➢ Industry commits to identifying its current apprenticeship cohort and maximise the number of apprenticeships starts.<br>➢ Industry will engage in the review of level 4 and 5 training and provide evidence as appropriate.<br>➢ Building on the current suite of activities industry already carry out they commit to helping design a programme of school-based employer encounters and set out a programme of short-term work placements.<br>➢ Industry will commit to the development of T-level standards appropriate to the activities of the sector.<br>➢ Industry will provide industry placements. | Women in Aviation & Aerospace Charter<br>➢ The aviation and aerospace industry, supported by the Department for Business, Energy and Industrial Strategy (BEIS) and the Department for Transport (DfT), have developed a charter that commits them to work together to increase the levels of diversity and gender balance in their companies.<br><br>Development of Apprenticeship standards<br>➢ Government and the devolved administrations are keen that people have the right skills to secure high-paying jobs. To that end the Institute for Apprenticeships are working with Trailblazer Groups to put in place apprenticeship standards. These will help deliver the skilled individuals needed by the UK for it to prosper.<br>➢ Government will work with employers to monitor the impact of the apprenticeship levy and continue to analyse all apprenticeship starts.<br>➢ Government considers that school children should be introduced to industry at an early age to better inform them about career choices. As a result, government is putting in place school-based employer encounters and short-term work placements. |

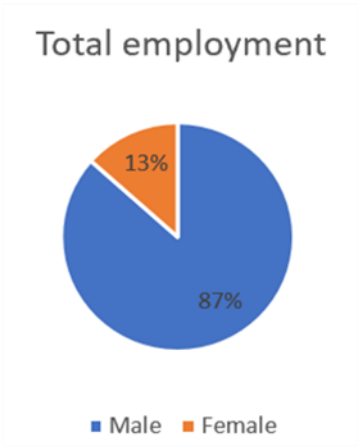
Education and diversity in the sector are areas of focus. Only by attracting and retaining skilled and talented individuals to the sector will the UK be able to exploit the benefits of having a globally competitive aerospace industry. Encouraging young people into the sector is critical to ensuring the continuation of knowledge and capability.

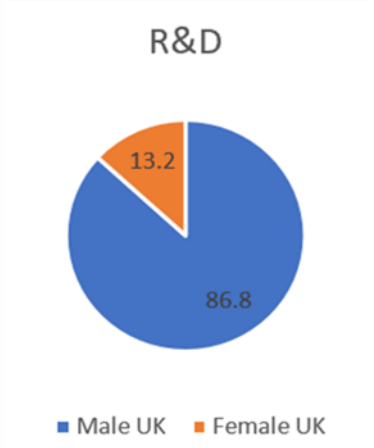
The BEIS 2019 aerospace survey shows the average age of aerospace workers in the UK as 49.3yrs for men and 45.6 for women. This suggests that the UK's aerospace sector is on the cusp of having an aging workforce - school and apprenticeship programmes can be used to attract younger workers to the sector and overcome this issue.

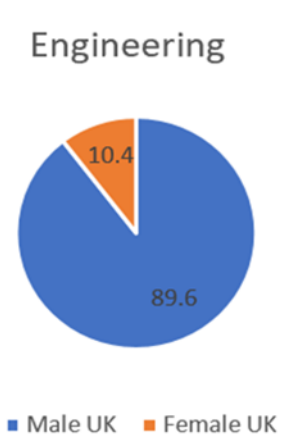
The survey indicates that the sector undertakes a great deal of company outreach work already through attending national exhibitions encouraging the take up of Science, Technology, Engineering and Maths (STEM) subjects, aerospace specific events like Airshows and also direct outreach and talks at schools and colleges. Industry will now consider if there are activities where a joined-up approach to outreach might be more effective.

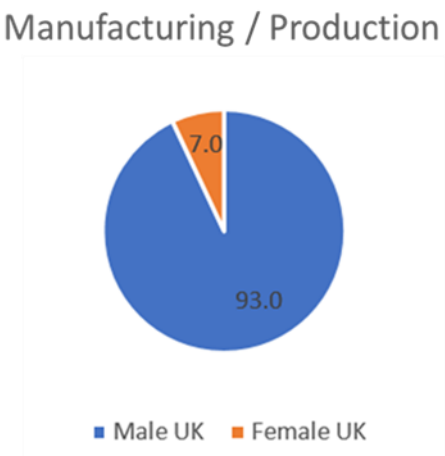
Gender diversity is also an area where the sector recognises more needs to be done. The Women in Aviation & Aerospace Charter (further detail available on the next page) has committed to undertake research in this area, enable greater networking opportunities and share best practice; all with a view of developing a more balanced and fair industry and supporting women into more senior roles.

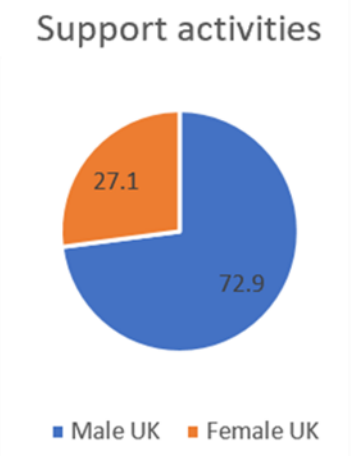
The BEIS 2019 survey highlighted the below diversity in the sector, this, alongside the work to be undertaken by the Charter group, is the first step in understanding the current position and putting actions in place to improve it.

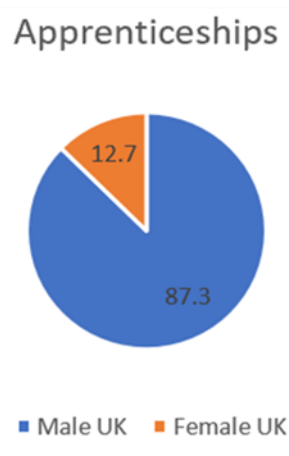


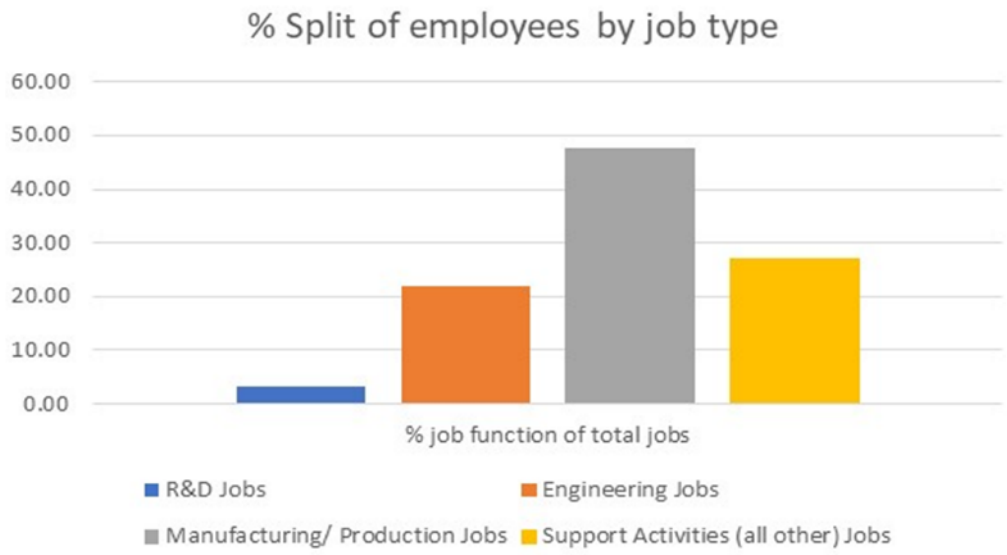



The data provided by industry also allows us to set out the percentage of employees who (broadly) are connected to taking forward R&D activity. This is relevant given Government's ambitions to increase R&D investments to 2.4 percent. The results are consistent with the aerospace industry being R&D intensive and provides the basis for the UK to reach government's 2.4 percent R&D investment target.




## The Women in Aviation & Aerospace Charter

The Women in Aviation & Aerospace (WiAA) Charter was officially launched in July 2018. With support from BEIS and DfT the WiAA Charter now has some 133 Signatories, 43 supporting organizations, a Steering Committee and a facilitation team to drive the Charter forward.

The WiAA Charter work programme has five main pillars: Research & Report, Networking & Communications, Best Practice Sharing, Driving the Charter & Signatory Development, and Financing & Funding Strategy.

In addition to the Aerospace Sector Deal, the Charter has also been embedded within the DfT's "Aviation 2050 - The Future of UK Aviation" consultation which was launched in December 2018).

The Charter has provided active support to other industries embarking on their own gender diversity journeys such as the Women in Maritime Charter (launched in September 2018), the Women in Technology Charter, and the Women in Defence Charter (launched in September 2019).

Moving forward, the Charter will continue its work with the Government's Equalities Office with respect to co-ordination with other Charters to share synergies. A key focus of the Charter team is to publish a review of the current gender diversity within both the aviation and aerospace sectors in time for International Women's Day on 8 March 2020. In addition, the Charter is looking to agree reporting metrics for member companies.

## Skills Development

The aerospace sector is highly technical and at the forefront of developing and manufacturing cutting edge new technologies that can be exploited across sectors beyond aerospace. To deliver this a good supply of highly skilled people are needed to meet the demands. This process starts at school and ends with people working in the sector and continuing to learn 'on the job'. In return, employees in the sector can expect to be well paid with wages typically ~40 percent higher than the national average.

A key vehicle for attracting people to the sector is through apprenticeships and apprenticeship standards. Industry has made substantial progress on developing relevant apprenticeship standards, three new standards have been introduced; an Engineering and Manufacturing Technician Standard, an Aerospace Software Development Engineering Standard, which has been incorporated within the Digital standard, and a Level 6 Airworthiness Maintenance Standard.

An end point assessment for the level 4 apprenticeships has also been introduced. In conjunction with these introductions to industry, development towards a Space Engineering Technician Level 4 standard is underway.

In total, the industry has seen 7,124 apprenticeship start-ups in 2019 from 11 different companies across the 'Aerospace Airworthiness' with a mix between Primes and SME's. For example, Airbus has employed 15 postgraduate apprentices in engineering (Level 7 standard).

The Group Training Associations England organisation (GTA) consider that SME's have had a total start-up of 5,621 with all Level 3 standards from Engineering Technician to Engineering Operative. Lastly, in leadership apprenticeship standards, 22 apprentices have been enrolled in 'Project management level 6 standards' and 3 have been taken up for the 'Team leader level 3 standard'.

Semta Clearing House Pilot has been developed and introduced to the industry. This is an online platform designed for aspiring apprentices who have been unsuccessful in their application for an apprenticeship at Prime companies, to have their application passed throughout the supply chain. Over 200 candidates have signed up to the online platform over the past 6 months.

## Industrial Cadets programme

Through the AGP, a sectoral approach for Industrial Cadets was piloted, encouraging Aerospace employers to channel early careers activity through the Industrial Cadets framework approach. The pilot more than doubled the numbers of young people going through the Aerospace Industrial Cadets Programme, from 800 in 2016/2017 to 2000 in 2018/19

Through the Industrial Cadets framework young people take part in quality benchmarked experiences, supported and mentored by industry (at Industrial Cadets levels: Challenger, Bronze, Silver, Gold and Platinum, which range from 5 hour experiences to 1 year placements) and become nationally recognised Industrial Cadets, resulting in an award for the young person and recognition for Aerospace employers. Overall, 91 percent of Industrial Cadets agreed that they have improved their skills as a result of their Industrial Cadets experience.

STEM engagement and educational outreach activity is utilised by employers to enhance and develop talent pipelines, support recruitment and deliver Corporate Social Responsibility strategic objectives.

Working in collaboration, the AGP is creating a proficient future workforce by encouraging and supporting employers within the sector to develop and deliver quality schemes; helping to develop skills, raising awareness of careers and all routes to employment and supporting young people to make informed choices about their future career pathways.

## Future Skills Requirements for the Aerospace sector

With new technologies being adopted at pace to deliver new products and improvements in manufacturing processes, the need to upskill the existing workforce at the same time as identifying future skills requirements, is critical to the success to the aerospace sector.

Work to do this will provide evidence to support employer-led revisions to standards and identify new standards. It will also help the sector develop training materials to enable the training and upskilling of its existing workforce.

Other sectors have also recognised this and are undertaking similar review activities (defence and automotive) of their training demand. It is expected that there will be a high degree of commonality in the skills requirements needed across these sectors and the aerospace sector, how the sectors collaborate will therefore be important.

The AGP Skills Group is continuing work to build an understanding of the future skills requirements of the sector and create a route to close the gap. A paper has been circulated to industry and academic stakeholders that sets out the group's view of the key areas of future skills development needed to support productivity and adoption of emerging technologies. The paper identifies at a high level the areas of skills development across four groups 'Manufacturing Fundamentals, Emerging Technology, Business Management and Industrial Digitalisation'.

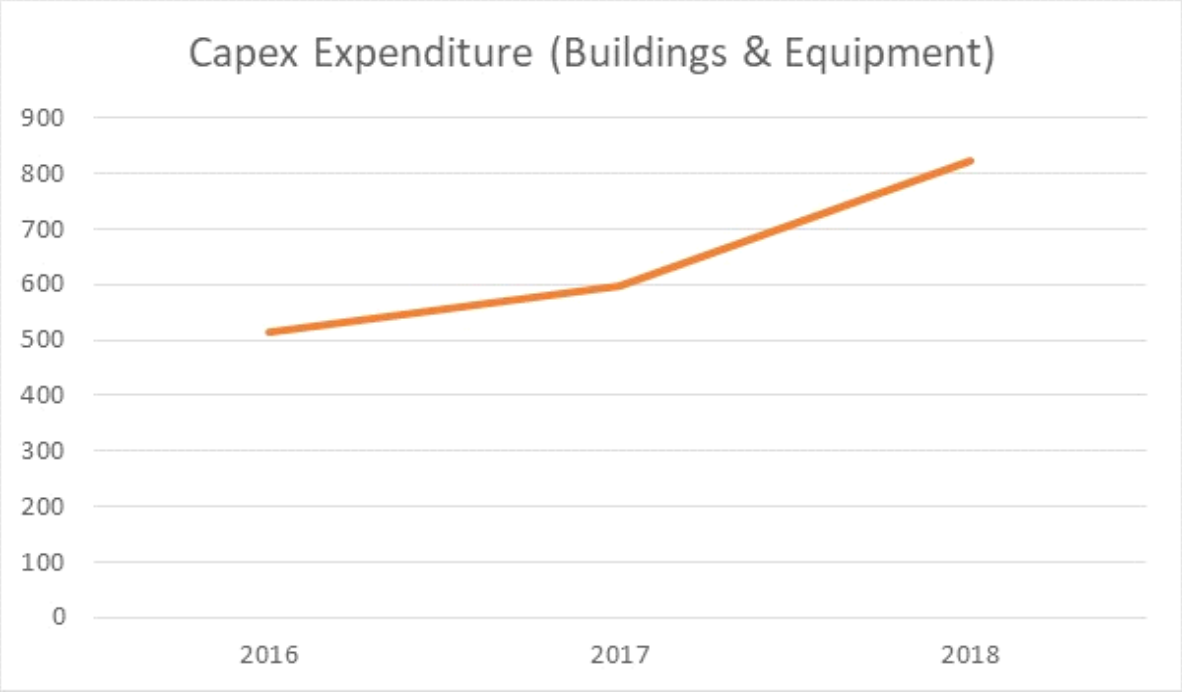
Work identifying the skills needed to deliver future technologies will continue through 2020 with a series of Foresighting Workshops. The aim of these is for stakeholders to agree the roles, occupations and standards required to meet the future needs of the sector. This will be used to inform the review and amendment of standards by the Institute for Apprenticeships and Technical Education, ensuring technical education provision is fit for purpose in the future.

## Infrastructure

| Industry action to support the aerospace sector | Government action to support the aerospace sector |
|---|---|
| Infrastructure<br>➢ Industry commits to increase investment to commercialise R&D and related activities and / or productivity improvement activities. | Infrastructure<br>Future Flight Industrial Strategy Challenge Fund programme<br>➢ As a result of the funding provided by government to help industry deliver the Future Flight Challenge, we expect there to be investments in infrastructure / equipment. |

The aerospace industry is an infrastructure 'heavy' sector with significant investments in facilities and equipment. This is usually somewhat mitigated by the often-longitudinal nature of work. The trend in infrastructure investments is an important signifier of industries commitment to the UK aerospace sector.

The BEIS 2019 survey asked companies to set out their level of infrastructure spend over recent years and the data shows a healthy increase in overall infrastructure spending in the sector.



## Infrastructure Case Study

GKN Aerospace's new Global Technology Centre in Bristol will be a hub for world-class innovative technology for the next generation of fuel-efficient aircraft.

Opening autumn 2020, the new centre is funded by investment of £17m from GKN Aerospace and £15m from the UK Government through the ATI.

The centre will host 300 engineers and focus on advanced composites, additive manufacturing and industry 4.0 processes to enable the high rate production of aircraft structures.

## Business Environment

| Industry action to support the aerospace sector | Government action to support the aerospace sector |
|---|---|
| Supply Chain Spend<br>➢ Industry aspire to raise annual growth in the UK supply chain spend from 1 percent towards 4 percent[3] (closer to the most recent global average spend rate).<br><br>New Supply Chain Competitiveness programme<br>➢ Industry commit to match government support £10m.<br><br>Promotion of Structured Support Activity<br>➢ Industry commit to promoting structured activity building on the aerospace Supply Chain Charter and helping SMEs to strategically exploit the support available through AGP activities (SCA and productivity improvement programmes for example).<br><br>Implementation of government's Export Strategy<br>➢ Industry commits to working with Department for International Trade (DIT) and BEIS to support the government's Export Strategy including identifying sectoral Export Champions to help promote the benefits of exporting to others. | SME and customer engagement in productivity improvement programmes<br>➢ SME and customer engagement in productivity improvement programmes.<br>➢ Government is supporting the implementation of a new supply chain Competitiveness programme to assist SMEs who want to improve productivity and competitiveness.<br><br>Implementation of government's Export Strategy<br>➢ Government has published its Export Strategy, which sets out measures to encourage, inform, connect and finance UK firms to export. It is looking to business to support this by contributing to the development and promotion of export related activities.<br>➢ Through UK Export Finance, ensure that no viable UK export fails for lack of finance or insurance from the private sector, helping businesses address lack of access to finance and manage the risks of exporting. |

[3] Numbers derived from the BEIS UK Aerospace supply chain survey 2016.

Having an attractive business environment is key to ensuring Primes, Tier 1's and Original Equipment Manufacturers continue to invest in the UK and attract a competitive supply chain to service their needs.

The level of spend the UK supply chain receives versus that spent in rest of world, is a key indication of how competitive the UK aerospace market is. Government is supporting the delivery of two productivity improvement programmes, SiG and Supply Chain 21 (SC21) – Competitiveness & Growth (C&G). Government seeks to make the UK the best place to start and grow a business.

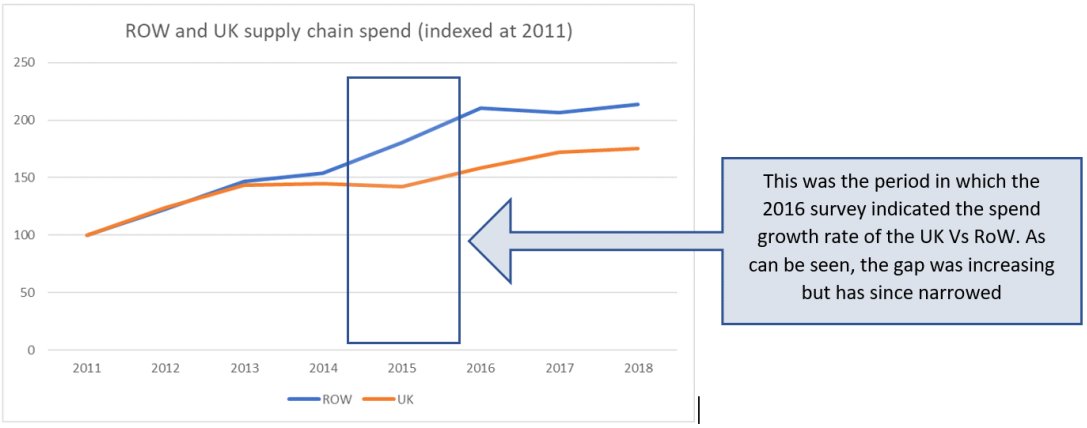
However, analysis indicates that growth in the UK aerospace sector has failed to keep pace with the rate of growth being experienced in the global aerospace sector – this is leading to missed opportunities for the UK including missed opportunities for growth in those aerospace clusters outside of the South East of England (South West, Midlands and North West).

Following the BEIS led 2016 Aerospace Supply Chain survey, the data indicated that growth of spend in the global supply chain was ~5 percent but that growth of spend in the UK's supply chain was ~1.4 percent.

Using the data obtained through that exercise and recent survey data[4] the chart below illustrates that the gap between global and UK spend growth is starting to narrow.

The increase in spend in the UK can be viewed as a proxy for competitiveness, that is, only by being more competitive will UK suppliers secure more work.

A further indicator of how competitive the UK supply base is, is the number of contracted suppliers upper tier companies have in the UK. The data from the 2019 BEIS survey illustrates an upward trend in the number of contracted suppliers although the data for 2018 appears to indicate the move of upper tier companies towards consolidating their supplier base.





[4] The data was supplied by companies and aggregated together. In certain instances, this data has appeared to be inconsistent with data supplied in earlier survey activities, BEIS has worked to 'smooth' this data out as far as is possible including removing inputs where they appear erroneous. Some of the inconsistency may have resulted in merger and acquisition activity or where work packages have been won or lost. These activities will result in increases or reductions in supply chain spend and will distort the trend lines.

## The UK Aerospace Supply Chain Competitiveness Charter

Further to the announcement of the Sector Deal the UK Aerospace Supply Chain Competitiveness Charter has received increased attention with Primes and Tier 1's further encouraged to increase their support to their UK suppliers. Through the principles of the Charter, Primes and Tier 1's have been further encouraged by the AGP to provide the UK supply chains with every possible opportunity to win new business. In March 2019 the AGP held a round table with the procurement heads of large aerospace companies supported by data gathered from these organisations on their procurement spend and supply chain support activities in the UK. Individual meetings were subsequently held with 12 Primes and Tier 1's and over half of the Primes were considered active with half needing to improve. A second Head of Procurement meeting is planned for April 2020. Under the umbrella of the Charter, consideration is being given as to how supply chain support programmes are more aligned to deliver improvements in productivity and competitiveness of UK based suppliers.

## Supply Chain 21 – Competitiveness & Growth

The SC21 C&G programme is the intermediate step on the performance improvement Ladder between SC21 Operational Effectiveness (OE) (lower) and SiG (higher). It is specifically designed to focus on increasing competitiveness and improving organisational capability in the eyes of the customer. The programme uses the National Manufacturing Competitiveness Level (NMCL) system, which is common to the Automotive productivity programme NMCL Auto. The programme's approach includes a capability assessment tool, Assessors, 122 Improvement Modules (Cross sector), Module Providers and a Programme Management Office.

The £10m of Government funding is planned to improve 78 Aerospace beneficiaries over three years. The programme was launched on 13 May 2019 at MEP Ltd, Aylesford and finishes on 30 March 2022 and is being used to support improvement activities in the Aerospace supply chain through training, coaching and mentoring. As of 24 Oct 2019, 103 individual Expressions of Interest have been received. These have fallen into the following primary technologies: 34 percent Systems and Equipment, 31 percent Aerostructures, 24 percent Processes and Materials, 7 percent Propulsion, 3 percent Civil Engine, 1 percent other. This includes SME businesses from across the UK mainland and Northern Ireland.

### Programme Progress

Companies have yet to enter the Improvement Plan phase, however feedback from potential beneficiaries who have experience of other diagnostic tools has been extremely positive, and benchmark well against SC21 OE, European Foundation for Quality Management (EFQM) and SiG. The launch of the above programme generated an upsurge of interest in the SC21 OE programme, which continues to support the development of more than 250 businesses.

### Next Steps

Under the umbrella of the Supply Chain Charter, a supply chain improvement programme has been conceived. The programme labelled 'Supply Chain 2025 - 300', has an objective to deliver a supply chain with increased critical mass capable of competing globally for work. This will involve delivering 300 suppliers performing and innovating to a world-leading level. This will necessitate extending the current set of improvement programmes in a more aligned and strategic manner and will create a pull on the Charter commitments.

## Export Strategy and Trade Promotion Activities

Since the launch of the Sector Deal, Government has extended its support to business to assist them in their exporting ambitions. Leveraging various elements of the Sector Deal around Technology, Competitiveness and Productivity, across Government in BEIS, Ministry of Defence (MoD) and DIT, in collaboration with Aerospace, Defence, Security and Space (ADS) Group and the regional trade associations, there has been a marked increase in export focussed events and activity.

Principal international engagement has focussed on Government led trade missions to key customers, and a strong Government and industry presence at major global events including the Paris Air Show in June 2019.

Whilst business wins take time to manifest, these missions have allowed suppliers to demonstrate the strength and depth of the UK's offer to this global sector where it might not otherwise have been possible.

In the year since the Sector Deal was announced, the Government has delivered international trade missions to Collins Aerospace, Pratt & Whitney Canada, Gulfstream and Spirit AeroSystems as well as the Government's continued strategic engagement with Boeing through the Prosperity Partnership culminating in the 3rd major trade mission to Boeing in September this year.

As a result of these events and Government engagement, we now have evidence of where the Sector Deal and the underpinning AGP activity is supporting business to thrive overseas.

Companies who have completed SC21, and those with Silver or Gold status and those benefiting from SiG are more likely to be selected for Government sponsored trade missions, all of whom are specifically selected by the customer.

Our shared objectives for supporting industry in securing new export contracts in the next year is to continue to build on these successes by:

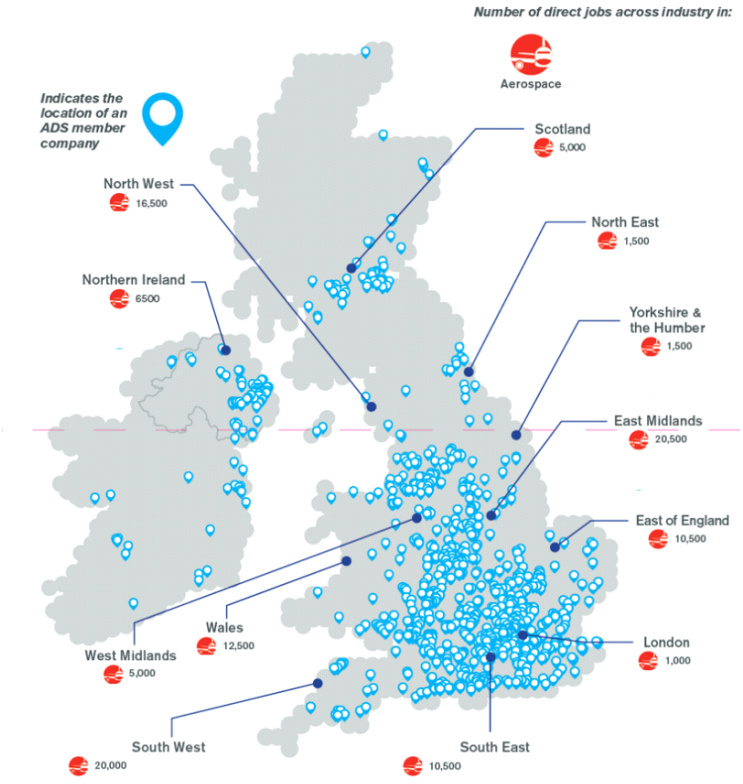
- Opening markets to new customers for existing and new exporters in the UK.
- Promoting the UK's strengths in technology leadership and innovation to grow exports.
- Making the case for competitiveness and productivity improvements as a path to successful exporting.

We will be continuing to pursue export opportunities in the core aerospace markets in Europe and North America as well as emerging opportunities in China and Brazil where government can add value to UK businesses seeking to access these markets.

# Place

| Industry action to support the aerospace sector | Government action to support the aerospace sector |
|---|---|
| **Local Industrial Strategies**<br>➢ Industry will work with local and national government to deliver Local Industrial Strategies that assist the sector in becoming more productive and competitive.<br><br>**Devolved Administrations (DA)**<br>➢ Industry will continue to engage with the DAs encouraging them to support and participate in AGP supported activities. | **Local Industrial Strategies**<br>➢ Local Authorities and Local Enterprise Partnerships have been commissioned to develop and agree investment strategies for their areas that set out, strategically, how they propose to attract and develop investments in their area.<br><br>**Devolved Administrations (DA)**<br>➢ Government seeks to build on its strong relationship with the DAs to ensure a coherent approach to business support activities for aerospace across the UK, including delivery of the UK Aerospace Strategy. |

The UK's aerospace sector is geographically spread with a large proportion of businesses located outside of London and the South East, it therefore contributes a great deal of high-paying employment across the country including the DAs. The map below form ADS illustrates the spread of companies, and employment, in the UK's aerospace sector.




*Credit: ADS, based on 2018 Office for National Statistics data*

Government and industry recognise the value of the sector to the Devolved areas: Northern Ireland, Scotland and Wales. As a result, Government works collaboratively with these administrations to ensure industry continues to invest and that these areas benefit from national activities as far as is possible. Similarly, these areas have agreed to promote the national Aerospace Strategy, developed through the AGP, to ensure alignment for industry and so ensure the UK speaks with one voice.

As well as working with the DAs, Government and industry are engaging with the regional powerhouses – Midlands Engine, Northern Powerhouse and Western Gateway. These regional vehicles align with the aerospace industrial clusters, it is therefore critical that national and regional strategies work together, avoid duplication and deliver as many benefits as possible.

## Local Industrial Strategies

The aerospace industry, through the AGP continues to work with LEPs to deliver Local Industrial Strategies that assist the sector in becoming more productive and competitive.

A conference was held in 2017 focussing on LEP / AGP engagement with attendance from AGP Board members, Regional Aerospace Alliances (RAA), DAs and LEPs. The conference received positive feedback, a clear overview of the AGP and ATI strategies were presented and opportunities to collaborate were reviewed.

Since then, the AGP and LEPs have continued to work together. Building on the 2017 engagement, a further AGP - LEP and Regionals meeting was held in July 2019 at Derby. The meeting was attended by LEPs with a specific interest in aerospace activities, as well as Regional Aerospace Alliances. It provided an opportunity to present the AGP strategy focussing on innovation & technology, skills development, supply chain competitiveness and clean growth and environment.

Moving forward, the AGP and the Auto Council held a further session in January 2020. This followed recognition that both the sectors have common requirements and agendas and a similar structure and approach to engaging with local and devolved governments.

## Place Case Study

Leonardo Helicopters (LH) MW Ltd, based in Yeovil, Somerset, and Government invested more than £100m, through the Regional Growth Fund (RGF), to transform a predominantly defence focussed facility into a civil manufacturing hub.

This investment generated greater business for the local supply chain and helped create / safeguard 500 jobs. It also upskilled engineers and manufacturing roles which, in turn, have seen crucial contributions to platforms like the AW169 helicopter.

Helicopters like the AW169 perform Emergency Medical Services missions in the UK to far-reaching communities as well as conducting police operations.

*Leonardo AW169 – Kent, Surrey & Sussex Air Ambulance, Lincs & Notts Air Ambulance and Dorset & Somerset Air Ambulance Services. Photo by Simon Pryor/ Leonardo Helicopters.*

# Devolved Administrations

## Northern Ireland

Northern Ireland is a global leader in aerospace technology and has a dynamic, rapidly growing international aerospace industry founded on a strong engineering heritage that is rich in knowledge, skills and experience.

### Performance

In 2019, it was announced that from 2014-2019, Northern Ireland Aerospace annual revenue increased by 90 per cent from £1bn to £1.9bn. Employment also increased from 8,000 to 10,000 skilled staff during the same period. This represents tremendous growth against the Northern Ireland Partnering for Growth 2024 target outcomes to double revenues from £1bn to £2bn and increase employment from 8,000 to 12,000 skilled staff.

Northern Ireland Aerospace looks forward to continuing this exceptional performance and growth. Every major commercial aircraft programme depends on structures, components and services from Northern Ireland and provides a third of the world's commercial aircraft seats. Delivering the award winning advanced composite wings for the A220 and the increasingly important interiors segment will help drive the future of Northern Ireland's aerospace sector.

To support further growth, in March 2019 the UK Government and Belfast Region Councils announced a £500m Belfast Region City Deal, which included a proposal to create an Advanced Manufacturing Innovation Centre. The centre will work with industry and academia, including Northern Ireland's critical aerospace sector to accelerate the development of new manufacturing technologies.

**Devolved Administration Case Study**

Production ramp-up is well under way in Bombardier's Belfast operation on the award-winning advanced composite wings for the A220 aircraft. The wings minimise the aircraft's environmental impact by reducing both weight and fuel burn in flight, as well as reduced waste during manufacture. The A220 is amongst the latest generation of fuel-efficient aircraft, contributing to the progressive decarbonisation of the air transport industry.

## Focus

Northern Ireland Aerospace remains focussed on increasing its global reach and improving its competitive position. In addition to maintaining a strong commitment to investment in R&T, Northern Ireland Aerospace will place an increased focus on enhancing the performance of the sector throughout 2020. This will be actioned through skills development, apprenticeships and by providing encouragement to ensure aerospace attracts and develops the right talent to achieve future growth.

## SC21 - Supply Chain Improvement Programme in Northern Ireland

Northern Ireland continues to make significant progress in the UK's leading supply chain improvement programme - SC21. Three Northern Ireland manufacturing companies, IPC Mouldings, Denroy Plastics and Moyola Precision Engineering have achieved SC21 Gold Award status. This corresponds to 75 percent of all SC21 Gold manufacturing awards in the UK, being achieved by the Northern Ireland supply chain. Fifteen Northern Ireland companies continue to maintain silver and eight companies bronze status.

To build on the success already achieved, Northern Ireland Aerospace will remain strongly engaged with its award-winning supply chain which remains central to its growth strategy.

## Looking ahead

Northern Ireland Aerospace will continue to enhance its partnerships with BEIS and DIT and to build ever closer relationships with the ATI, the AGP, and the UK and European aerospace clusters. The international trade programme for 2020 will include visits to Aerospace & Defence Supplier Summit Seattle, Aircraft Interiors, Hamburg, Farnborough International Airshow and Aeromart Toulouse.

## Scotland

The last year has been one of growth for the aerospace industry in Scotland with a number of major investments and business opportunities being secured. Scottish Enterprise (SE) and partners continue to explore the strategic opportunities within the sector and support industrial and academic players to engage with them.

Highlights:

### Spirit AeroSystems Aerospace Innovation Centre

- SE has invested £4.8m with Spirit in a new open access research centre into composite materials for aerospace and other sectors.

### Castle Precision and Rolls-Royce

- Castle (a SiG beneficiary) and Rolls-Royce announced a new £80m contract extending the scope and length of their current relationship (see photo below).

### Opening of Lightweight Manufacturing Centre

- SE and the University of Strathclyde announced the opening of the Lightweight Manufacturing Centre (LMC) (a forerunner of the National Manufacturing Institute for Scotland) with an SE investment of £8.9m.

### Ayrshire Growth Deal

- The UK and Scottish Governments announced the £250m Ayrshire Growth Deal in March 2019which includes a major focus on the aerospace sector at Prestwick and the ambition of Prestwick International Airport to become a UK Spaceport for horizontal launch.

### Martin Aerospace and Rolls-Royce

- SME, Martin Aerospace (a SiG beneficiary) secured a £140,000 long term relationship with Rolls-Royce in December 2019.

### Project Fresson and Loganair

- The £10m consortium for Project Fresson announced in June 2019, the trial with Loganair in Scotland for the conversion to electric propulsion of the island-hopping services using Scotland as a testbed for the global market for this type of aircraft.

In the coming year it is anticipated that several projects will be announced in Scotland, building on those listed here and further demonstrating the strength of the sector in Scotland and the Scottish Government's support of it.


*Warren East, CEO Rolls-Royce & Yan Tiefenbrun, Managing Director Castle Precision*

## Wales

The aerospace industry in Wales remains a cornerstone of UK civil aerospace sector. The past 12 months, since the launch of the Aerospace Sector Deal, has demonstrated a commitment to build on its R&T infrastructure, crucial to future prosperity.

The following centres are examples of current capacity and capability building in Wales:

### Advanced Manufacturing Research Centre (AMRC) Wales

- Opened on 28 November 2019, the AMRC will offer cutting edge research providing game-changing support to businesses and act as a catalyst for industry and academic collaborations across multiple advanced manufacturing sectors. Airbus is the first major tenant and AMRC Wales is providing a platform to develop its next-generation wing technologies aligned to the Wing of Tomorrow programme.

*AMRC Cymru/Wales at Broughton*

### The Compound Semiconductor Applications Catapult

- The Catapult is in the heart of the world's first compound semiconductor cluster, building on a £350m cluster investment and moving into facilities in the centre of the compound semiconductor district in Newport, South Wales. It has introduced 4 high-growth inward-investment companies to South Wales. It has led a South West consortium of industrial partners for the Industrial Strategy 'Driving the Electric Revolution' which will focus on the challenges around power electronics, motors and drives for all modes of transport.

### Coleg Gwent Dennison Advanced Materials Centre (DAMC)

- In 2018, the Welsh Government invested in a state-of-the-art DAMC at the Blaenau Gwent Learning Zone. The Centre is one of a limited number of further education colleges in the UK that can provide advanced composite training as part of its Aeronautical and Motorsport Engineering Courses.

### Thales National Digital Exploitation Centre (NDEC)

- The Welsh Government is working with Thales to establish a £20m cyber centre, focused on critical national infrastructure, which sits at the heart of the Tech Valleys programme. This will be the first of its kind in Wales. NDEC provides facilities for large, SME and microbusinesses to test and develop their digital concepts. The official opening of the centre is planned for 24th February 2020, and subsequently, a new build will be completed in 2021.

### The Welding Institute (TWI) Advanced Engineering and Materials Research Institute (AEMRI)

- The AEMRI is a state-of-the-art engineering inspection and validation facility at TWI Wales in Port Talbot whose technical facilities are scheduled for completion in 2020. The facility will support dynamic sectors including aerospace, automotive, electronics, and nuclear and renewable energy.

### University Wales Trinity St. David (UWTSD) Manufacture. Advanced Design. Engineering (MADE)

- MADE was launched in 2019 and is a suite of European Union funded projects delivered by UWTSD through its Centre for Advanced Batch Manufacture (CBM), tailor-made for Welsh SMEs and individuals to plug into the power of disruptive technologies, in order to boost productivity.

### Swansea University Institute for Innovative Materials, Processing and Numerical Technologies (IMPACT)

- Swansea University is part of the UK ARC and IMPACT is a state-of-the-art research centre of excellence. The building was completed in May 2019 and its official opening will be held on 6th February 2020. This is a unique colocation facility and will deliver a high impact, transformative research environment for industry and academia to collaborate in advanced engineering and materials.

### Cardiff University Artificial Intelligence, Robotics and Human Machine Systems (IROHMS)

- Cardiff University launched their £3.5m IROHMS Centre on 19 September 2019, supported by £1.8m of European funding through the Welsh Government. It is a Centre for cutting-edge technologies, from robots and automated vehicles to virtual reality, artificial intelligence and cyber-physical systems.

# Priorities For The Future

The Aerospace Sector Deal was a shot in the arm for the UK aerospace sector by offering support to the sector to, accelerate autonomous and electric capabilities, through the Future Flight Challenge, continue driving productivity through SC21, and encouraging bottom up innovation from supply chain companies through NATEP, whilst driving diversity in the sector through the Women in Aviation & Aerospace Charter.

Having established these programmes successfully, we now have the opportunity to go further, and make the UK the most attractive aerospace location in the world.

This can only be achieved through government and industry continuing to work together to make the UK industry a global leader, by delivering sustainability through increasing investment in innovation, and continuing to improve our supply chain competitiveness.

## Delivering sustainability through increasing investment in Innovation

The aerospace sector in the UK is working with government to deliver net zero carbon emissions in UK aviation by 2050. This provides an industrial opportunity for the UK to become a world-leader in sustainable aerospace technology.

Delivering this ambition requires us to recommit to the successful joint investment model of the ATI. With further funding from Government, thereby giving industry continued certainty, there would be renewed commitments from industry to invest in 3rd generation of technology.

Whilst sustaining core technologies, this will allow industry to accelerate progress in delivering 3rd generation technologies, through stimulating the development of hybrid and electric flight demonstrators, providing a basis for exploring alternative propulsion systems, supporting air transport system optimisation and enabling market pull measures to drive uptake of new technology. Successful commercialisation of large-scale demonstrators also has the potential to bring back whole aircraft development in the UK, driving economic prosperity across the country.

Alongside future technologies, industry and government will also look to work together to explore solutions that can be scaled-up to reduce emissions in the nearer-term, including accelerating the uptake of sustainable aviation fuels.

## Equipping businesses to win by investing in Competitiveness

Realising the success of investing in the next generation of technologies and shaping future markets, relies on a competitive and capable UK supply chain that is positioned to exploit these opportunities.

Programmes, such as SC21 C&G, NATEP and SiG, have been successful in equipping small businesses in the supply chain to win new business by improving their capabilities and competitiveness. However, more needs to be done to equip UK businesses to win against increasing global competition.

Working with government, we will now create a long-term, focused approach to developing a critical mass of innovative and competitive UK suppliers, essential to address capability gaps in the supply chain and to create high performing businesses of scale. We will also continue to identify strategic competencies worth developing in order to give the UK a leading competitive advantage.

Aligned to this will be the pursuit of ‘High Value Design’, a process where the Digital Engineering Environment will optimise product performance from inception to disposal, enhancing manufacturability through transformation in engineering productivity. Bold action by both industry and government is required to co-invest to deliver High-Value Design through the “Brunel Challenge”.

## Delivering Future Skills

Delivering new technologies and maintaining competitiveness requires a sustainable pipeline of talent with the right skills.

Through the AGP, and by working in partnership with education providers and sector partners such as the Engineering Development Trust (EDT) and the Royal Aeronautical engineering Society, industry will increase its STEM outreach activities to attract a sustainable pipeline of diverse talent into the aerospace industry.

In 2020, industry will also look to continue the Jon Dennison Bursary, set up in memory of Jon Dennison to encourage the next generation of aerospace engineers by offering selected young people free places on EDT Headstart Courses, with a focus on young people from disadvantaged backgrounds.

By working with the Institute for Apprenticeships and Technical Education and academia, the sector will continue to deliver new standards for apprenticeship starts in line with changing markets and technology.

Working with regional trade associations and local governments, the AGP will continue to integrate the needs of SMEs in its skills activities whilst supporting the delivery of regional / local skills programmes.

Most importantly, the AGP will look to identify and implement strategy for upskilling and reskilling of existing workforce informed by future workforce requirements.

Working with other sectors and the Department for Education, the AGP will explore flexible use of the apprentice levies, and will look to ensure cross-sectoral collaboration, particularly on workforce upskilling with new technologies.

AGP
Aerospace Growth Partnership
CELEBRATING 10 YEARS

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