

Advanced Engineering and Aerospace
West of England Local Sector
Skills Statement 2017



Working together to develop the current
and future skills of the sector.

Advanced Engineering and Aerospace Local Sector Overview

Advanced engineering and aerospace is a highly dynamic and diverse industry, that employs over 5 million people (two thirds of whom are practising engineers and technicians) and supports 14.5 million jobs in the UK.

The West of England is home to the UK's largest aerospace cluster and one of the largest concentrations of aerospace activities in the European Union. The region has a prominent group of companies on the north fringe of Bristol (in South Gloucestershire Local Authority area) with most internationally recognised aerospace companies located here, supported by a strong supply chain of smaller and locally developed companies.

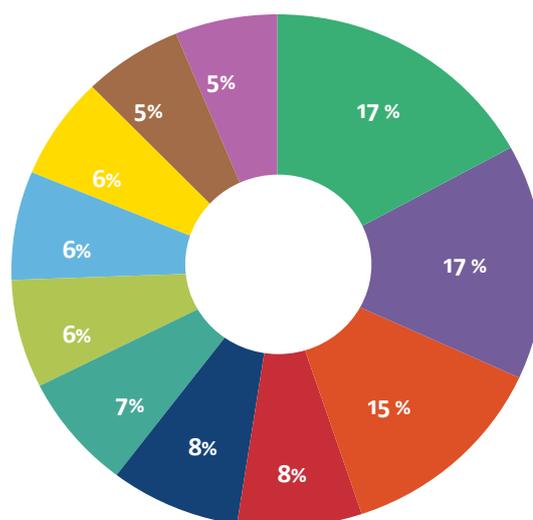
There are a total of 31,179 people employed in the advanced engineering and aerospace sector in the West of England, up from 23,000 in 2012.⁽²⁾

Employment in the engineering sector is forecast to grow. Working Futures 2012-2022 shows that over this period, engineering companies will need to recruit 2.56 million people, with 257,000 of them being new vacancies and some in new and emerging areas not currently recognised.⁽³⁾

Engineering sectors produce the majority of the nation's exports and play an essential role in supporting the UK's international competitiveness by investing in research and development and innovation.

Employment Areas

- Development and Design Engineer
- Mechanical Engineer
- Production Managers
- Engineering Professionals
- Metal Working Production
- Engineering Technicians
- Aircraft Maintenance
- Civil Engineers
- Sales Accounts and Business Management
- Electricians and Electrical Fitters
- Other Administrative Occupations



All data represents the West of England

Our annual Local Sector Skills Statements report on local sector knowledge and expertise, plus wider regional and national intelligence. Gain insight about skills challenges in your sector, notable achievements and skills priorities and objectives for 2017. The themes have been defined by the West of England Local Enterprise Partnership (LEP). This report has been designed for education providers and businesses to inform decisions and identify objectives for investment in training and development of curriculums.

Key Facts



THE ENGINEERING SECTOR CONTRIBUTED AN ESTIMATED **£486 BILLION TO THE UK'S GDP IN 2015 (26% TOTAL)**. THIS CONTRIBUTION IS EXPECTED TO INCREASE TO **£608.1 BILLION BY 2022.**⁽¹⁾



THE WEST OF ENGLAND LEP EMPLOYER SKILLS SURVEY (2016) HIGHLIGHTED THAT **ADVANCED ENGINEERING AND AEROSPACE BUSINESSES OFFERED THE MOST APPRENTICESHIPS PER SECTOR.**⁽¹¹⁾



90% OF RESPONDENTS FROM THE ADVANCED ENGINEERING AND AEROSPACE SECTOR TO THE WEST OF ENGLAND LEP EMPLOYER SKILLS SURVEY (2016) **RANKED TECHNICAL SKILLS AS MOST IMPORTANT** FOR BUSINESS GROWTH, AHEAD OF LEADERSHIP AND MANAGEMENT AND GENERIC BUSINESS SKILLS.⁽¹¹⁾



THE WEST OF ENGLAND LEP EMPLOYER SKILLS SURVEY (2016) SHOWED THAT OF THOSE RESPONDING BUSINESSES THAT HAD VACANCIES IN THE LAST 12 MONTHS, **74% HAD FOUND THOSE VACANCIES HARD TO FILL.**⁽¹¹⁾

THE UK IS THE EUROPEAN UNION'S LEADING AEROSPACE MANUFACTURING NATION

SECOND ONLY TO THE UNITED STATES, PRODUCTIVITY HAS GROWN BY 39% SINCE 2010 WITH EXPORTS **EARNING £27 BILLION A YEAR.**⁽³⁾



INCREASED GLOBAL AVIATION TRAFFIC DEMAND IS EXPECTED TO DRIVE GROWTH IN THE CIVIL AEROSPACE SECTOR IN THE MEDIUM TERM, WITH **FORECASTED DEMAND EQUATING TO 33,000 NEW AIRCRAFT UP TO 2034.**⁽³⁾



GROWTH IN DEMAND FOR ENGINEERS WILL RESULT IN **56,000 JOBS PER YEAR NEEDED AT LEVEL 3** (ADVANCED APPRENTICESHIP) AND **107,000 AT LEVEL 4+** (HND/C, FOUNDATION DEGREE, UNDERGRADUATE OR POSTGRADUATE OR EQUIVALENT). **ANALYSIS OF SUPPLY DATA SHOWS AN ANNUAL SHORTFALL OF 29,000 PEOPLE WITH LEVEL 3 SKILLS AND 40,000 WITH LEVEL 4+ SKILLS.**⁽¹⁾



THE WEST OF ENGLAND LEP EMPLOYER SKILLS SURVEY **HIGHLIGHTED TECHNICAL SECTOR SPECIFIC SKILLS GAPS**, ALONG WITH ABOVE AVERAGE SKILLS GAPS IN THE AREAS OF LEADERSHIP AND MANAGEMENT.⁽¹¹⁾



1.74 JOBS SUPPORTED BY EVERY PERSON EMPLOYED IN ENGINEERING

(A MULTIPLIER EFFECT OF 2.74)⁽⁴⁾



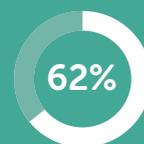
9% INCREASE IN THE NUMBER OF PEOPLE STARTING HIGHER LEVEL ENGINEERING APPRENTICESHIPS IN 2015/16 ACADEMIC YEAR AND AN **OVERALL INCREASE IN APPRENTICESHIP STARTS** FROM 820 IN 2014/15 TO 1254 IN 2015/16.⁽¹²⁾



SINCE THE EDUCATION REFORMS, ENTRIES TO THE MORE TRADITIONAL – AND CHALLENGING – SCIENCE SUBJECTS HAVE FALLEN. ENTRIES TO GCSE CHEMISTRY HAS FALLEN BY **3.3%**. BIOLOGY ENTRIES ARE ALSO **1.9%** DOWN. SIGNIFICANTLY, PHYSICS ENTRIES HAVE FALLEN BY **2.6%**, FROM **137,227** TO **133,610.**⁽¹⁾



2009



2015

62% OF UK AEROSPACE COMPANIES PROVIDED APPRENTICESHIPS AND TRAINEESHIP IN 2015 COMPARED TO ONLY 15% IN 2009.⁽⁵⁾



YOUNG PEOPLE'S PERCEPTIONS OF ENGINEERING CAREERS ARE IMPROVING ACROSS A RANGE OF METRICS. IN 2015, **43% OF 11 TO 14 YEAR OLDS** BELIEVED THAT A CAREER IN ENGINEERING WAS DESIRABLE, WHILST **49% OF 15 TO 16 YEAR OLDS** SAY THAT THEY WOULD CONSIDER A CAREER IN ENGINEERING. JUST FIVE YEARS AGO, THE CORRESPONDING FIGURES WERE **27%** FOR DESIRABILITY AND **37%** FOR CONSIDERATION OF A CAREER.⁽¹⁾

Notable Local Sector Achievements



National Careers Service and West of England Careers (via N-Gaged Training) continue to deliver a Pathways to Professions event for the engineering sector offering careers advisers, and those giving advice to young people in the West of England, the opportunity to hear from key industry professionals including Engineering UK, Tomorrows Engineers, Highways England, Wessex Water, Buro-Happold and BEMA (British Engineering Manufacturers Association).



iAero launched a collaboration between the region's leading aerospace players to deliver a regional platform for innovation and growth. Phase 1 will see the development of two technology and supply chain clusters, located on the Filton site in South Gloucestershire for fixed wing technologies and the other in Yeovil for rotary flight technologies. The Yeovil hub has already received budget approval and should be operational in Q2 2019."



North Somerset Enterprise and Technology College moved into the £12 million Weston College Academy located within the J21 Enterprise Area. The state-of-the-art campus includes a purpose-built science floor complete with super-labs, a terrace where students can conduct outdoor experiments along with technology and enterprise spaces.

Aerospace MSc Bursary Scheme, announced by the Prime Minister at the 2012 Farnborough International Air Show, awarded its 500th bursary last September.⁽⁵⁾ 15% of bursaries awarded by the Aerospace MSc Bursary Scheme have gone to women, significantly higher than other programmes.



Government approval has been received for the **Hinkley Point C** project - the first in a new generation of safe, secure nuclear power stations in the UK. The project will create some 25,000 employment opportunities and aims to create 1,000 apprenticeships. Hinkley Point C is also providing educational learning programmes across local schools, encouraging students to explore STEM subjects and careers.



UWE Bristol's Future Space newly-created offices, workshops and lab-space for science and tech-based businesses in the University Enterprise Zone (UEZ) has been explicitly designed to encourage innovation, collaboration and inspiration. Situated on Frenchay Campus, Future Space supports businesses working in high-tech areas such as robotics, digital and creative technologies, health tech and biosciences.



The 98 hectare Bath City Riverside Enterprise Area and 13.5 hectares at Old Mills in the Somer Valley form the **Bath & Somer Valley Enterprise Zone**, providing the potential for up to 10,000 new jobs. A new central business district at Bath Quays, with 30,000 sq m of grade A office accommodation and creative workspace connected by a new pedestrian/cycle bridge, plus 54,000 sq m of new employment floor space at Old Mills in the Somer Valley will encourage more of the advanced engineering activity already seen through Bath University and attract professional and creative sectors which underpin that activity.

Skills Priorities 2017



1. Improve Careers Education Information Advice and Guidance (CEIAG)

Issue:

Young people and those advising them in education do not understand the breadth, depth or accessibility of career opportunities across the engineering sector. The current knowledge of engineering careers among STEM teachers is particularly concerning; the Engineers and Engineering Brand Monitor (EEBM) has revealed that while three in five (58%) of those who teach 14 to 19 year olds have been asked for careers advice about a job in engineering in the last year, just two in five of all STEM teachers (37%) felt confident giving advice on engineering careers⁽¹²⁾. Engineering UK has the following recommendations in this area:

1. Provision of high quality, engineering engagement interventions and careers inspiration for all 11 to 14 year olds. This inspiration must highlight the value placed on STEM skills, promote the diversity of engineering careers available and provide real life engineering context.
2. Support for teachers and careers advisers delivering careers information so they understand the range of modern scientific, technological and engineering career paths, including vocational/technical roles.

Objectives:

- Support a co-ordinated approach to engagement in schools, utilising existing initiatives. Add value to these engagements by delivering an industry-led careers activity in partnership with national or local initiatives.
- Engagement with education should offer opportunities for STEM teachers and careers advisers to improve their knowledge of career opportunities across the sector and the value that employers place on STEM subjects.
- Support the government's skills plan in establishing career paths that bridge technical and academic education, to ensure that young people have access to high level opportunities within the advanced engineering and aerospace sector.



2. Improve quality and local responsiveness of education and training

Issue:

A recent aerospace supply chain study conducted by WEAFA identified a shortage of skilled manufacturing and advanced technology skills in the UK. It is felt by the industry that poor provision for these skills in education is one of the main contributing factors⁽²⁾. The West of England LEP Employer Skills Survey (2016) illustrates that respondents from the advanced engineering and aerospace sector have a higher rate than average of experiencing difficulties recruiting young people with the right technology skills (50%).⁽¹¹⁾

With the advancement of new technologies such as additive layer manufacture and composites, moving to a stage of main stream, mass production and commercialisation, the industry needs to prepare for the future skills needs now. The West of England LEP Employer Skills Survey (2016) expressed fairly high levels of satisfaction in further and higher education provision (83% and 75% respectively), but this is still below average for all sectors⁽¹¹⁾. In addition, the critical shortfall of specialist STEM teachers trained to a sufficient level remains a threat to meeting the forecasted demand for engineers and technicians⁽⁶⁾. 17% of respondents to the West of England LEP Employer Skills Survey (2016) from the advanced engineering and aerospace sector, found it harder to address skills needs than two years ago and 78% have seen no difference. Only 4% felt that it had become easier⁽¹¹⁾.

Objectives:

- Employers should work with education providers to create technical education provision that supports the government's ambition to ensure that every young person is presented with the option of world-class technical education on par with academic education.
- Provide opportunity for ongoing CPD for STEM teachers. Create and support more engagement and interaction between education and business to bring the latest technical developments into the classroom and produce engineering students with relevant technical skills. Support colleges in achieving national STEM accreditation to provide consistency and high quality provision in the region.
- Utilise the information provided in the 2016 West of England Engineering Education and Training Research Initiative Report to increase variety of future specialist provision rather than duplicate it.

Skills Priorities 2017



3. Increase apprenticeship starts and availability of higher apprenticeships

Issue:

The local provision landscape is complex and the industry finds it difficult to navigate. In addition, institutions fear that the Apprenticeship Levy and reforms, whilst a worthy initiative, may have an unintended consequence in setting up more fragmented and competing providers, more apprenticeship standards and more accreditation bodies. This adds to the confusion rather than clarifies the situation. New standards are taking time to come online and End Point Assessment is not yet clarified across all standards. Also the delayed timelines in the establishment of the new ROATP (Register of Apprenticeship Training Providers) has also led to some standards not being delivered in some areas.

Supporting facts:

2015/16 saw an increase in the number of overall apprenticeship starts with a 9% increase in those starting higher level apprenticeships and 8.9% females up from 6% in 2014/15.

The West of England LEP Employer Skills Survey 2016 showed that of the respondents currently offering apprenticeships, advanced engineering and aerospace businesses offered the most per sector (35%).⁽¹¹⁾

Engineering Employers Federation (EEF), in their 2016 Skills Manifesto, aim to increase the number of UK advanced and higher engineering and manufacturing apprenticeship achievements by 25%.⁽⁶⁾

Objective:

- To support the West of England Apprenticeship Ambition 2020, aligned with the government's ambition to promote, develop and support the evolution of the local apprenticeship offer for advanced engineering and aerospace, ensuring that provision meets the needs of local people and local employers. Work to promote apprenticeships as a high quality vocational route for everybody to enter the sector with specific emphasis on promoting engineering apprenticeships to females.
- Support businesses ahead of the introduction of the Apprenticeship Levy and reforms. Aim to increase SME uptake of apprentices by working with leading firms to explore the possibilities of introducing skills and training requirements with the procurement process, taking learning from public sector best practice, developments in the construction industries and national research and benchmarks.

4. Engage SMEs to boost productivity and build capacity for growth



Issue:

Whilst the UK aerospace industry is growing, it is not keeping pace with global growth. Growth in procurement spend globally is 5.2%, whilst within the UK this is just 1.4%, indicating that the UK is losing market share to overseas suppliers. A recent aerospace supply chain study highlighted that the main barriers to growth in the UK aerospace supply chain are the length of contracts with prime contractors and the availability of skills and training⁽²⁾.

Supporting facts:

In the West of England the advanced engineering and aerospace sector has a higher than average age distribution with the average age of its workforce being 44 years. This represents challenges for growth in the future.

The Prime and Tier 1 procurement requirements, within the engineering sector, do not encourage training and lifelong learning. Therefore SMEs within the supply chain are not obliged to provide training opportunities.

UKCES identified encouraging employers to invest in up-skilling and developing their workforce as a key action for the future.⁽³⁾

Objectives:

- Improve understanding amongst SMEs of the changes in apprenticeships and the benefits brought about by the Apprenticeship Levy and reforms, in particular the new online Apprenticeship Service.
- Encourage growth amongst the sector's SMEs through the work of the West of England Growth Hub and aim to increase the number of SMEs investing in training in order to increase productivity.
- Work with providers to ensure that training provision is employer-led and is relevant to the skills required by industry in order to increase productivity.
- On a national level, EEF have recommended ensuring that the Employer Ownership of Skills agenda is accessible to SMEs both through awareness-raising campaigns and the introduction of new thresholds and criteria more realistic for SMEs.⁽⁶⁾

Skills Priorities 2017

5. Enhance equality and diversity through multiple career pathways



Issue:

Diversity within the engineering industry remains a concern locally and nationally. There are still a disproportionate number of white males entering the industry through the apprenticeship route to the detriment of Black, Asian and Ethnic Minorities (BAME) communities and females. Additionally, the advanced engineering and aerospace sector in the West of England has a higher than average age distribution with the average age being 44 years. This represents challenges for succession planning in the future.

Many businesses in the aerospace industry also rely on skilled workers from the EU. According to ADS, 7% of EU citizens in the UK – some 16,000 people – work in the aerospace industry. Therefore change to the freedom of movement of these workers, as a result of the UK leaving the EU, may have a significant impact on the industry.⁽¹⁰⁾

Supporting facts:

Objectives:

- We would like to stipulate that all school's engagements should aim to see a 50% female/male ratio (except in single sex schools).
- In order to encourage more young people from a wider range of backgrounds into engineering, we will create an Apprentice Ambassador network to enable all schools to access apprentice speakers. This will include utilising the support of existing networks and STEM initiatives.
- Focus on working with community groups. Review current unemployment initiatives, in order to develop an effective means of providing those detached from the labour market with the skill-sets to enter into the advanced engineering and aerospace industry. The sector should strive to ensure that every young person and adult in the West of England is confident that all career routes are open to them regardless of age, gender, race, disability, sexual orientation, sexual identity or any other factor beyond their control.
- Support should be given to national campaigns to encourage young people and especially women into engineering including Tomorrow's Engineers Week, Your Life and the Big Bang Fair.

Regional Centres of Excellence and Research

- The Advanced Composites Collaboration for Innovation and Science
- Aerospace Engineering Research Centre, University of the West of England (UWE Bristol)
- Bristol Robotics Laboratory, University of the West of England (UWE Bristol)
- Centre for Nanoscience and Quantum Computing, University of Bristol
- Centre for Quantum Engineering
- Centre for Energy and the Design of Environments, University of Bristol
- National Composites Centre
- Engineering, Modelling and Simulation Group, University of the West of England (UWE Bristol)

Key Providers

- University of the West of England (UWE Bristol)
- University of Bath
- University of Bristol
- City of Bristol College
- Bath College
- British Engineering Manufacturing Association
- Bristol Technology and Engineering Academy
- South Gloucestershire and Stroud College

Professional Networks and Organisations

- Engineering Employers Federation (EEF)
- West of England Aerospace Forum (WEAF)
- iAero
- SWMAS
- Aerospace Growth Partnership
- Science Engineering and Manufacturing Technologies Alliance (SEMTA)

Reference Documents

- 1) Engineering UK: The State of Engineering, 2016
- 2) WEAFA South West Skills Survey Report, 2016
- 3) UKCES Sector Insights: Skills and performance challenges in the advanced manufacturing sector, 2015
- 4) Engineering UK, State of Engineering, 2017
- 5) Means of Ascent – The Aerospace Growth Partnership's Industrial Strategy for UK Aerospace, 2016
- 6) EEF Manifesto – Securing a Manufacturing Renaissance, 2015
- 7) UKCES - Employer Skills Survey – Skills in the labour market, 2015
- 8) Post 16 – Skills Plan. Department for Business Innovation and Skills, July 2016
- 9) West of England Engineering Education and Training Research Initiative Report, March 2016
- 10) Brexit and defence, aerospace and advanced engineering - the legal implications; Thrings Solicitors, July 2016
- 11) West of England LEP Employer Skills Survey, 2016
- 12) Skills Funding Agency data cube 2014/15 and 2015/16 - provided by the West of England LEP

Employment Areas Chart – NGaged Training / LMI Statement 2017 based on Labour Insights, May 2016 - May 2017 & EMSI

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The West of England Combined Authority (WECA) covers Bath & North East Somerset, Bristol and South Gloucestershire. WECA also supports the Local Enterprise Partnership, which includes North Somerset.