

# Productivity Plan: Call for Evidence response

## 1. Introduction to Advanced manufacturing and engineering (AME)

We are Semta, the Sector Skills Council (SSC) for the advanced manufacturing and engineering (AME) sector. We are a not-for-profit employer partnership which brings employers from across the sector together to address their skills needs.

[BRES data shows](#) that turnover per year in AME is £321bn per year, 9% of the UK total, despite the sector employing just 6% of the total UK workforce (1.7m people), which works out at £189,400 per employee compared with £157,700 per employee for the economy as a whole. Gross value added in AME is £110bn per year, 11% of the UK total, which works out as £64,600 per employee (against £45,200 across the whole workforce).

Advanced manufacturing and engineering is a high-skill, high-value sector – and there is a clear link between the two sides of that equation. We have read through the government's productivity plan with interest and present our conclusions below.

## 2. Industrial strategy/approach

The phrase 'industrial strategy' does not feature within the productivity plan. Without thinking sectorally, and ensuring that there are coordinated and sustained efforts by government and employers within individual sectors, we will not meet their skills needs.

In AME, some sectors are creating their own structures to ensure that their skills needs are met regardless of support from within government. For example, the [Automotive Industrial Partnership](#) is bringing together manufacturers from across the automotive sector to create a more coordinated approach to skills which takes into account the needs of all sizes of employer in all sections of the supply chain.

However, while we strongly back individual sectors taking action to meet their own skills needs (we are involved in the running of the Automotive IP), having official governmental recognition through the industrial strategy has been a clear indication to employers at home and investors overseas that the UK is serious about boosting its high-value, high-skill industries. The danger of losing this targeted approach is that the UK will lose ground in high-value, high-skill sectors like AME against countries such as Germany where government coordination of industrial priorities is accepted and backed across the political divide. Without government to coordinate sectoral approaches to investment, it will be much more difficult to implement pan-sectoral solutions to skills-related issues which affect whole sectors.

The government's cooling off on the industrial strategy is confusing from a skills point of view given that the new National Colleges have been set up with a sectoral remit. Without integrating sectoral skills needs into a wider strategy around investment and growth, there is a real danger of skills mismatches occurring. Without government to horizon scan and identify key future industries for growth (in AME, an example would be additive manufacturing, i.e. 3D printing), we could end up with a skills systems which meet the needs of today's skills shortages and not set sectors up for future ones.

## 3. Encouraging girls to pursue STEM interests

We will be submitting a response to the current consultation on the new GCSE in Engineering. We welcome the year on year rise in the numbers sitting it this year and especially welcome the [high proportion of girls who achieved an A\\*](#) (5.3%).

We welcome the government's focus on getting more girls into STEM subjects. As the recent [Inspiring the next generation report](#) by the IET makes clear, children's career aspirations play to gender stereotypes and parental bias and lack of knowledge contribute to that. There is a gender gap when it comes to enjoyment of different subjects, with boys enjoying STEM subjects most and girls enjoying arts subjects. Designing curricula which inspire girls by emphasising the creative and experimental nature of STEM subjects, characteristics which children of both genders who like STEM subjects say they enjoy, is key.

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The report also shows that when presented with the wide range of engineering careers, girls are as impressed at the breadth of options as boys, but more than half of girls see engineering as a career for boys only; this is why careers advice is so important and why our recent submission to the Comprehensive Spending Review call for evidence focused on it. If the number of women working in STEM was equal to the number of men, it'd wipe out the skills shortage and [according to WISE](#) would generate an additional £2bn for the economy – that's why it's important that girls who are interested in STEM are given every encouragement possible to pursue that interest.

The [Baker Dearing Educational Trust's research](#) shows that at University Technical Colleges (UTCs) nearly two thirds of girls feel they have the same job opportunities in engineering as boys enjoy, so encouraging more girls to pursue their STEM interests at these institutions could help to get more into the sector. [With some UTCs having as few as 1 in 20 pupils being female](#), much more needs to be done to encourage girls to consider studying at them. We have previously called on perverse funding incentives for schools to 'hang onto' pupils at their own sixth forms to be scrapped, and STEM-inclined girls should be given mentoring and work shadowing opportunities with women in STEM sectors so that they have role models to aspire to be.

### 4. Apprenticeships and their link to productivity and higher earnings

[The UK has a far lower proportion of apprentices than other advanced economies.](#) In Germany, for example, there are 40 apprentices per 1,000 employees, and in Switzerland there are 43, while in the UK there are just six. The government has rightly recognised that the UK's flagging productivity is directly linked with its relatively low skill levels, with an expanded apprenticeship programme at the heart of its solution and a headline target of 3 million new apprenticeship places across the duration of this Parliament.

We welcome the government's focus on apprenticeships as the means through which the UK can move from a low-skill, low-wage economy to a high-skill, high-wage economy. 26% of the UK AME workforce has completed an apprenticeship, against just 10% of the whole workforce, which helps to explain why the sector is so much more productive than the economy as a whole.

[There is a clear material benefit to those who undertake apprenticeships](#); the lifetime benefits of getting an apprenticeship are between £48,700-£74,000 for a foundation (Level 2) apprenticeship and between £77,000-£117,000 for an advanced (Level 3) apprenticeship. Much is made of the graduate earnings premium, but young people who are not suited to further academic study must be made aware of the earnings boost they could expect if they completed an apprenticeship.

The high performance of the AME sector is threatened by a looming skills shortage. [The Royal Academy of Engineering estimates](#) that by 2020 the UK will need 830,000 new science, engineering and technology (SET) technicians to keep up with employer demand. Without the right skills, employers in our sector will find their productivity hit and the UK economy will take a hit as a result.

We welcome the government's reconsideration of its previous proposal to have employers directly handling funding for apprenticeships, which would have placed an undue administrative burden upon the micro businesses and SMEs which make up over 99% of the businesses in AME and between them employ 57% of the 1.7m people working in the sector. We believe that having one easy to use digital voucher system which covers all employers would be sensible, with funding passed directly from government to training providers.

It is surprising to find no mentions of higher (Level 4) apprenticeships within the productivity plan. The 'grow your own' approach they offer has [previously been reported by UKCES](#) as being seen by government as 'a mechanism by which employers can more effectively access the specific skills that they need', and a 2013 ICM report showed that they are the [qualifications most valued by employers](#). More can and should be done to promote higher apprenticeships, especially now that the new degree apprenticeships (Level 6) have been introduced – higher apprenticeships could be promoted as a staging post on the route towards a degree apprenticeship in the way that foundation degrees have previously been promoted as the first step towards a full honours degree.



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We welcome the government's policy to protect the term 'apprenticeship' in law. 98% of the apprentices who responded to [the latest \(2015\) Industry Apprenticeship Council \(IAC\) annual survey](#) said they were pleased to do their apprenticeships, while 74% of apprentices' friends and family thought more highly of apprenticeships after their decisions to undertake one. We are delighted with these results and would not want 'bogus' apprenticeships in our sector to have an adverse effect on that level of support. However, 50% of respondents to that survey said some apprenticeships damage the nationwide reputation of apprenticeships and a legally protected definition will help to reduce that figure.

We do not believe that forcing young people to apply for apprenticeships and traineeships after six months of claiming Universal Credit is the right approach, as this implies that doing an apprenticeship or traineeship is a punishment for failing to find a job where it should be seen as a positive way of starting out in a young person's chosen career. Instead, we believe the right way to boost the numbers of young people taking up apprenticeships is to sell their benefits in schools and colleges. In addition, lack of appropriate attitudes and aptitudes was cited by 44% of respondents to the [CBI/Pearson Education and Skills survey](#) as a barrier to STEM recruitment, so this is where the government's focus should be.

We will be submitting a full response on behalf of the AME sector to the consultation on the proposed apprenticeship levy on larger employers, and are currently consulting with employers to find out their views of this policy.

### 5. Professional and technical education

The key difference between countries like Germany and the UK is the relative esteem in which vocational routes into work like apprenticeships are held. [In the tripartite German system, only around 30% of young people go to university](#), and technical skills are held in high regard; the Meisterbrief is held as equivalent to a bachelor's degree. By contrast, the tripartite system of schools introduced in the 1946 Education Act (the so-called Butler Act) never really took root, with only a small number of technical schools ever opening.

We welcome the government's explicit focus on boosting the stature and availability of vocational education routes through initiatives like the University Technical Colleges and studio schools. However, more needs to be done to ensure that young people really do believe that their vocational studies will be held in as high a regard by employers as their academic pursuits. To give a clear indication of the equal worth of vocational and academic qualifications, we would recommend rebranding Level 3 vocational qualifications and bringing them under the umbrella of A Levels. A Levels are a trusted 'gold standard' brand, and if there is a resultant increase in the numbers studying vocational STEM qualifications as a result of their rebranding, there will be a healthier talent pipeline for employers within our sector to tap into.

We are cautiously optimistic about the government's proposal to introduce a new national system of Institutes of Technology and welcome the employer-backed approach the government intends to take. We welcome the focus on higher-level skills, which are crucial to AME. However, the government must take care to ensure that the mistakes of the polytechnics are not repeated, where a noble desire to provide elite vocational education was tempered with a perception of inferiority and lesser desirability when compared with universities.

### 6. Graduate and postgraduate skills

Government has a big role to play in ensuring that the AME sector has access to the higher level skills it needs. Our submission to the Comprehensive Spending Review call for evidence focused on joined-up and employer-led careers advice, which would help to overcome the perception gap around the sector that exists amongst many teachers and parents. Encouraging more young people, particularly girls, to take up Physics at A Level would also be welcome given the long term decline in the numbers studying the subject.

The number of UK-based students achieving engineering degrees has remained almost static over the past eight years, [according to a recent Technopolis report](#), with 12,700 in 2004 and 13,700 in 2012. There has been an increase in the number of non-EU international engineering students completing engineering

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degrees in the UK, however, from 3,200 in 2004 to 5,500 – an increase of 70%. Our universities have an excellent reputation abroad, which we welcome.

We must consider the rate at which other countries are producing graduates in high value disciplines – India, for example, turns out 1.5 million engineering graduates each year, while China is managing to turn out 1.1 million. Many of those are then coming to the UK to undertake postgraduate study – [according to RAEng](#), non-EU international students account for 75% of postgraduate engineering degrees achieved at UK institutions.

Despite this stagnation in the numbers of graduates being produced, UKCES evidence suggests that there is not actually a shortage of engineering graduates being produced by the UK at present. However, the issue is that many of those graduates are not being retained within the engineering or wider STEM sector upon graduation – for example, there are 12,000 engineering graduates working in the financial services sector. The skills and aptitudes acquired and demonstrated through the completion of an engineering degree are clearly highly sought after by employers across the economy. This is borne out by the [2015 Association of Graduate Recruiters \(AGR\) report](#), which shows that 16.9% of job offers made by engineering firms to graduates are turned down – an above-average percentage.

Demand for higher level skills is also expected to increase within the AME sector, according to the recent CBI/Pearson Education and Skills Survey. A majority of employers within the sector also expect to grow the numbers of people they employ in higher-skilled roles. The increase in the proportion of businesses reporting difficulties in recruiting STEM graduates is therefore a major concern – it has increased from 12% in 2013 to 26% this year (26% is also the proportion of engineering firms having difficulties in recruiting graduates).

We will look forward to the publication of the Teaching Excellence Framework. ‘Aligning graduate skills and expectations with the needs of employers’ is hugely important to the AME sector - we have had a number of employers express concern about the work readiness of their graduate recruits. We have submitted a response to the Hefce [Wakeham Review of higher STEM skills](#) and hope that the recommendations of the report are taken into account by government when it is published. The recent reappearance of ‘sandwich’ courses which include a year in industry is welcome; although according to AGR a below-average 21.4% of engineering graduates had previously worked with the employer that hired them, being able to demonstrate industrial experience would enable graduates to allay AME employers’ fears about their readiness for work.

UK research is world class. 15% of all UK engineering research outputs in the [Research Excellence Framework 2014](#) were rated as world-leading, or 4\*, *Quality that is world-leading in terms of originality, significance and rigour*. In contrast, only 4% of submitted outputs were rated as 1\*, *Quality that is recognised nationally in terms of originality, significance and rigour*. This research is of great importance to AME – the recent Dowling Review showed that around one in four industry/university collaborative research projects at UK universities are in engineering and physical sciences.

We therefore welcome the government’s plans to provide loans for postgraduate study, which will help to open it up to a much wider range of individuals and will increase the talent pool available to universities for research projects. We are however concerned about the government’s plans to make foreign graduates leave the UK after completion of their studies – given the high proportion of international students completing postgraduate engineering degrees in the UK, this policy could do real harm to our sector’s ability to innovate and stay ahead of the curve.

## 7. Conclusion

There is much within the government’s productivity plan for our sector to welcome from a skills perspective, and much which could be of real benefit if the details are right. We welcome the fact that the government is taking the UK’s productivity gap seriously, and we welcome the focus on skills as a key driver of increasing productivity.



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However, we are concerned that although the focus is the correct one, without an overarching industrial strategy approach embedded in to the productivity plan to binding all of the elements of the plan together on a sectoral level, this collection of well-intentioned policies will not have the impact needed to meet the country's skills needs and maintain the relatively strong international position of key growth industries like AME.