Written evidence submitted by E4E to the Sub-Committee on Education, Skills and the Economy inquiry on Careers Advice, Information and Guidance

1. Education for Engineering (E4E) is the body through which the engineering profession offers coordinated advice on education and skills policy to UK Government and the devolved Assemblies. It deals with all aspects of learning that underpin engineering.
2. It is hosted by The Royal Academy of Engineering with membership drawn from the professional engineering community including all 35 Professional Engineering Institutions, Engineering Council and EngineeringUK.
3. Submissions and responses are formulated through consultation with all PEIs, and individual PEIs are able to specifically endorse those which are of particular interest to them.
4. Endorsers of this submission are: Institute of Water, Institution of Civil Engineers, The Engineering Council, the Institution of Engineering and Technology, Institution of Structural Engineers, Institution of Mechanical Engineers, The Royal Aeronautical Society.

Introduction

5. E4E is pleased to contribute to the new Sub-Committee's first inquiry. E4E is primarily concerned with education policy which affects 'professional formation', ie that which encourages and support individuals to consider, pursue, and achieve professional engineering roles and status. There are many aspects of policy which contribute to this, such as:
   - Curriculum content in subjects which support engineering (such as Design & Technology, Mathematics, Physics)
   - Availability of qualifications in these subjects
   - Supply of excellent teachers in these subjects
   - Public perception of engineering as a career and a sector
   - Careers guidance for both adults and young people which informs and inspires
6. We are therefore delighted that the new Sub-Committee is looking at this important subject. We hope that you will find the evidence and information following useful in your examination of the effectiveness of careers guidance as an essential part of young people's decision-making processes. Many of the Professional Engineering Institutions (PEIs) which constitute E4E have direct experience of working with schools on Science, Technology, Engineering, and Mathematics (STEM) activities, which are key elements in careers *inspiration*.

Comments on the quality and impartiality of current provision

7. E4E has little evidence that careers guidance provision has improved since the 2013 Education Committee report. The schools with which (PEIs) deal directly are reporting continuing pressure on budgets, with little resource available to secure truly effective, independent programmes of guidance for students. Neither the inspection process, nor the schools performance measurement system are incentivising or recognising effectively those who are engaging with employers to give students real world insight and inspiration.
8. Engineering companies are not reporting a strong improvement in apprenticeship applications. There is still a very mixed picture in terms of apprenticeship, with large companies, and those in traditionally strong apprenticeship geographical regions reporting little difficulty in finding excellent candidates. However, small firms, remote firms, and those in localities where there has not traditionally been a strong apprenticeship population, are still reporting great problems in recruiting to their schemes. There has been

no significant reported shift in school attitudes to promoting alternatives to full-time academic study at 16 and 18, particularly where the school has a sixth form.

9. Interestingly, we are hearing that the situation in Scotland is improving, with College/ University/ School partnerships which in turn are developing new pathways, under the leadership of Skill Development Scotland. They are delivering pathfinders in the senior phase of school which enable employers/ Colleges/ Universities to have a greater presence in the senior phase of school, helping to pass on careers advice and experiences. Similarly universities and FE Colleges are collaborating to ensure progression from Higher Nationals into degree programmes, with universities supporting FE teaching. The group clustered around Edinburgh Napier University is a particularly good example of this approach. Careers advice in schools and colleges can thus be used to match skills with labour market by using employers professional bodies and training boards (where they exist) to advise and support students. Pathway programmes and apprenticeships, including advanced and graduate apprenticeships, help to increase involvement with employers and professional bodies keeping the area up to date and current. This contrasts with the situation in England, where focus on the e-bacc subjects is continuing to limit schools' ability and willingness to be innovative.

10. This is an area where the inspection regime could be more effective. While there are challenges in accurately measuring the true impact and effectiveness of careers guidance, inspection should look for evidence that all students (including the high achievers) have received unbiased information about all potential progression routes at 16 and 18.

11. PEIs are also interested in the place of schools in the overall 'education' of an individual, and in the concept that schools are no longer simply a place of academic instruction, but have a part to play in wider challenges such as social mobility. For example, the IMechE has a policy statement on Social Mobility and the Engineering Profession[1] which specifically recommends that Government makes schools and colleges fully accountable for the provision of structured careers advice through the compulsory publication of student destinations. This is a view shared by other PEIs, who think this accountability would incentivise careers activity in schools and colleges. It was also a recommendation in the STEM Careers Review in 2010.

12. The STEM Careers Review[2] contained many specific recommendations which have not really been implemented, for example, the need to embed careers information to make the curriculum relevant, and the importance of careers-related Continuing Professional Development for teachers. While schemes such as TIPS (see later point) have been created, and the Professional Engineering Institutions have come together in the Tomorrow's Engineers programme[3], too many of the structural and national recommendations remain aspirational.

13. Tomorrow's Engineers is funded by individual engineers through their professional registration fees. Major resource into schools comes from business, which also commits funding to the programme which is coordinated by EngineeringUK.

14. Research carried out by BCG for EngineeringUK showed that employers saw value in a coordinated approach to schools outreach and 71% of employers would provide support, in the form of their employees, to a coordinated programme. The BCG analysis identified that sufficient (engineering outreach) capacity already existed so that a coordinated approach via a national programme could triple the number of young people reached. Tomorrow's Engineers provides this platform for employers to support the growth of the UK engineering talent pipeline as part of a coordinated approach aimed at improving the quality, reach, diversity and impact of their engagements with young people.

15. Tomorrow's Engineers also manages a Careers Working Group which brings together representatives from the PEIs including the IMechE, ICE, IOP and IET to develop careers materials for teachers and young people. These careers materials already have a reach of

[1] https://www.imeche.org/knowledge/themes/education/social-mobility
[2] http://www2.warwick.ac.uk/fac/soc/ier/ngrf/stem/movingon/research/500-stem_careers_review_nov_2010_holman.pdf
[3] www.tomorrowsengineers.org.uk

almost 1 million young people in the 2015-16 academic year alone and have been well received by young people, the teaching community and education organisations alike.

16. Part of the problem is the lack of engineering 'capital' in many families, and reflected in the media's portrayal of society. The ASPIRES report[4] is very clear that 'capital' is very important in the development of interest in science careers, and the same is true for engineering. Where a young person has no engineers in the family, or everyday exposure to an engineering environment, it is much more difficult to convince them that an engineering career is 'for them'. Young people can see doctors, police officers, lawyers, singers, and sports people on television every day, engineers (either real or fictional) are very hard to find.

17. The Gatsby Good Careers Guidance Report[5], published in 2013 as a further development of the STEM Careers Review, proposed the following benchmarks across guidance for all subjects and occupations:

    - A stable careers programme
    - Learning from career and labour market information
    - Addressing the needs of each pupil
    - Linking curriculum learning to careers
    - Encounters with employers and employees
    - Experiences of workplaces
    - Encounters with further and higher education
    - Personal guidance.

18. An examination of the statistics from Higher Education Statistics Agency (SN1: Percentage of young entrants to full-time first degree courses who are no longer in HE the following year by entry qualification and subject of study[6]) does show that students are increasingly less likely to drop out of Higher Education, both in engineering and technology subjects, and in general. While this may suggest improved guidance pre-18, it may also be a consequence of other measures, such as the impact of fees, and university retention/support programmes.

Year	Eng & Tech – no longer in HE	All subjects – no longer in HE
2012/13	6.9%	5.7%
2011/12	7.2%	5.8%
2010/11	8.0%	6.3%
2009/10	9.6%	7.2%
2008/09	8.8%	6.5%
2007/08	8.9%	7.2%
2006/07	9.2%	7.4%
2005/06	8.5%	7.1%
2004/05	9.1%	7.2%
2003/04	10.1%	7.7%
2002/03	10.0%	7.8%
2001/02	8.9%	7.3%

[4] http://www.kcl.ac.uk/sspp/departments/education/research/aspires/index.aspx
[5] http://www.gatsby.org.uk/education/programmes/good-career-guidance
[6] https://www.hesa.ac.uk/pis/noncon

How careers advice in schools and colleges can help to match skills with labour market needs

19. We accept that it is very difficult to run a 'predict and provide' model on any scale, as many factors in local markets are at work, and demand fluctuates over time. Engineering is actually at quite an advantage in some sub-sectors in this regard, as large-scale investments are usually planned months, if not years in advance. In addition, some sub-sectors experience strongly cyclical periods of growth, and are therefore able to be more strategic in their labour force planning.

20. The length of time it takes to bring an individual up to a professional engineering standard, whether at technician or graduate level, is significant. Advanced Apprenticeships in Engineering are typically 3+ years in duration, so both education and industry need to planning well in advance if the right skills are to be available at the right time, and in the right place. Added to which, engineering is not a subject taught in many schools, so it is not simply a question of a company signalling its need, and a school being able to 'deliver' students in a short timescale. Colleges are able to be more flexible and many private providers are exceptionally good at responding quickly to employer demand, by providing young people with exciting and relevant technical courses.

21. We have heard from local representatives that careers information and guidance works best where there is coordinated planning locally, for example through academy chains or local authority links. This achieves economies of scale, for example with careers fairs. We are interested in the effect which Local Enterprise Partnerships are having, as through our work on the Perkins Review of Engineering Skills, we came into contact with some which were thinking very proactively in terms of bringing together local engineering companies to articulate their needs, and also organise specific activities to attract young people to the sector. Tomorrow's Engineers is also working with the LEPs across the country to coordinate employer engagement with schools, pooling resources and sharing data to better target outreach to where the need is greatest and the impact largest.

22. We think it is worth considering the Government's wider ambition to 'rebalance' the economy and boost technical and manufacturing activity. Even where there is little immediate local demand for engineering and technical skills and training, young people should be hearing about the doors which are opened when the right subjects are studied. Roles in many sectors can be accessed through a scientific and technical education, and it could be suggested that a small surplus of these skills in a locality might attract investment from exactly the companies and sectors which lead to 'rebalancing'.

23. When Professor John Perkins published his Review of Engineering Skills, he identified the importance of work experience, for both students and teachers. This is a key element of careers information, as it enables individuals to see for themselves the opportunities and routes to fulfilling jobs which are available. As a result, E4E has worked with many organisations and experts to create additional resources to encourage work experience for young people and teachers. For students, we worked with Tomorrow's Engineers, and the Royal Academy of Engineering's Diversity Leadership Group, to create guidance for engineering employers, which addresses all their potential concerns, and makes it much easier to offer and run high quality placements. We have even created generic projects, which any engineering company could use and/or adapt to their particular needs. All this information is available through Tomorrow's Engineers[7].

24. The Teacher Industrial Partnership Scheme (TIPS)[8] has been created by two PEIs (IMechE and the IET), the Biochemical Society, and with support from Project Enthuse and the Science Learning Centres. It offers secondary and post-16 STEM teachers and careers specialists the chance to update their knowledge and awareness of STEM related careers through one or two week placements, and the initial evaluation suggests it is highly effective. In many respects, providing this experience to teachers can be more efficient than engaging directly with individual students, as teachers come into contact with large numbers of young people, and can be very influential in their decision-making.

[7] http://www.tomorrowsengineers.org.uk/employertoolkit/workexperience/
[8] https://www.stem.org.uk/tips

The role of the new Careers and Enterprise Company and its relationship with other bodies such as the National Careers Service

25. While we are pleased that the Careers and Enterprise Company has been created to improve the relationships between schools and local employers, we have some concerns that their remit has overlaps with existing schemes in engineering and technology. For example, the STEM Ambassadors programme, has a national database of individuals willing and trained to support science, technology, engineering and mathematics (STEM) enrichment activities. EngineeringUK's is already developing Tomorrow's Engineers activity to include a 'heat map' of engineering careers activities across the country through a national database that provides an accurate picture of what is happening locally. This allows cold spots to be identified and employer engagement targeted to these schools where the need is greatest. Tomorrow's Engineers is expanding into new regions helping companies directly to coordinate enhance their schools outreach programme. Tomorrow's Engineers is already working with many of the LEPs and is keen to work with Careers and Enterprise Company Enterprise Advisors and Coordinators across England.
26. It is imperative that the CEC does not impede these existing and developing relationships, but enhances them. We also believe that the fundamental improvement which needs to be made with careers advice is not more co-ordination, but addressing the culture in schools.
27. We will also be working with a new Digital Apprenticeship Service, and all these organisations are dealing with elements of information which is needs to be secure, whether it be on an individual or a company. Better co-ordination is welcome, but not at the expense of the effectiveness of the system (through irrelevant contacts from 'shared' contact lists).

The balance between national and local approaches to careers advice

28. Labour market information at a local level is extremely difficult to access at the moment, with many LEPs not yet on a statistically strong footing.
29. 'National' careers advice has tended to focus on graduate careers and progression to university. However, there are particular local concentrations of industry such as renewable energy construction centring on Hull and Humberside, nuclear energy in the SW and NW and High Speed Rail in Doncaster and Birmingham, which attract both national and local apprentices and graduates and it is important that advice and funding takes account of those seeking opportunities at L4 and above. Access to National Colleges must be available to all.
30. The particular demand for skills in engineering is at technician level (ie Level 3). Jobs at this level are extremely rewarding, and can be very well-paid. However, when training at this level, pay is not usually very high, so individuals are not able to be as mobile as those further on in their careers or entering at graduate level. This can lead to housing issues for young people. In practice, if you leave school and enter an Advanced Apprenticeship (the most common means of technician qualification), you are unlikely to be able to afford to move out of the parental home for a few years, at least until you are qualified. By then, you will have worked locally for some time, and probably put down more local roots. This makes understanding local opportunity especially important for young people entering apprenticeships – will there be local jobs at the right levels for them to progress when the time comes?
31. Even at graduate level, some PEIs report that their student and graduate members are not able to consider opportunities in London and the South East, due to the housing situation. Therefore, even if local approaches were able to identify conclusive need, unless they already based in London, graduates are not able to remain in the area.
32. There is one area where national advice is very useful – the engineering profession has nationally applicable routes to professional registration, and careers guidance should signpost information about recognised (in profession parlance, "approved" and "accredited") apprenticeships and qualifications. These apply wherever you are in the UK,

and can be useful in drawing individuals to the professional bodies, who operate both nationally and locally, and can provide detailed guidance on achieving professional status in a wide range of disciplines.

Careers advice and apprenticeships

33. We have already spoken about some of the particular challenges of recruiting apprentices from the cohort of young people (difficulty of promoting apprenticeships in schools with sixth forms, etc). We would like to add some further points as follows:

34. The mismatch in the experience of large and small companies is repeatedly commented on across the engineering sector. Some 'blue chip' engineering firms are oversubscribed many times over with quality candidates, while smaller companies struggle to attract. There are good examples of large firms working with their supply chains to create a more coherent process of apprentice recruitment, utilising the profile of the large firm to attract individuals, then assessing and encouraging quality candidates who are not successful into roles in their supply chain. Many young people are unaware of the role which smaller companies play in the overall process, and of the opportunities in SMEs to learn a wide range of skills in a single role.

35. We feel it is just as important that the wrong individuals are not encouraged to apply for engineering apprenticeships when they are not yet ready for the rigour of the programme. Careers guidance must make clear to young people that there are quite high entry requirements for engineering apprenticeships, due to the challenging nature of the programme. While the National Apprenticeship Vacancies Matching Service does make it very straightforward to apply, employers do not want to have to spend a lot of time sifting candidates who do not meet their entry standards. These young people should have received the message that they are not currently in a position to apply, but that there are many opportunities, through colleges, Traineeships, etc, to raise their skills and make themselves employable.

36. 2020 Vision for apprenticeships stated that: "from January 2018, apprenticeships results for 16-18 year olds will also be published as part of schools' performance tables." This is welcome but we would suggest it does not contain sufficient incentive for schools. We suggest that inspection elements might be weighted to secure a stronger incentive – some have suggested a school should not be graded Good or Outstanding if they are failing to provide the careers guidance necessary.

37. It is still very unclear what effect the new apprenticeship levy might have on the opportunities for young people. While the aspiration of Government to see 3m apprenticeships undertaken before 2020 is welcome, there will not be sufficient numbers of young people leaving school during this period to fill these roles, even if employers are able to create the opportunities. However, we will probably see employers in all sectors becoming more proactive in their approach to recruiting apprentices at all ages. Schools and colleges which fail to promote apprenticeships may find their relationships with local employers becoming more problematic, as any company with a payroll over £3m will be seriously considering how to recoup its levy contribution. They will need a supply of appropriate people, including school leavers, who are interested in and capable of completing an apprenticeship.

The potential for employers to play a greater role in careers advice

38. There is no doubt that employers can play and have played a key role in careers advice. In our experience, the key to getting employers involved is understanding the drivers on their business, and articulating their involvement in those terms. The main focus of a business is not to provide careers guidance for their sector. Therefore, it is crucial to identify 'what they want' and show that engagement (including explicit careers guidance) will provide this.

39. Research by the Education and Employers Taskforce in 2012 found that the more young people (aged 14-19) come in to contact with employers whilst they are at school, the less

likely they are to become NEET (19-24)[9] . This (alongside findings from the research carried out by BCG for EngineeringUK which identified that sufficient engineering outreach capacity already existed and that a coordinated approach via a national programme could triple the number of young people reached shows that programmes like Tomorrow's Engineers which allow employers to better coordinate their outreach into schools and increase the number and impact of encounters of young people with employers across England) provide one part of the solution in better careers advice for young people. Tomorrow's Engineers is a national programme delivered locally by Employer Support Managers working with businesses allowing Tomorrow's Engineers to reach 1.1m young people per year every year by 2020.

40. During E4E's work on the Perkins Review of Engineering Skills, we formulated several 'business cases' along these lines, to encourage engineering employers to get involved at all stages of education. You can see a particularly clear one hosted on the National Forum for Engineering[10] website, which is looking at how to bring engineering employers closer to Further Education. For every element of the 'vision', eg *FE students understand engineering career options*, there is information about why it is important for both FE and employers, and some ideas for making it happen.

41. It is imperative that employers are aware of the whole range of opportunities to get involved in careers advice, from providing role models, to offering work experience. We believe that there is more scope for employers to contribute, but it must be in a reciprocal environment, with educational establishments taking care to secure specific benefits for employers too. Employers are not single organism with one view and unlimited resources, so they require a focused 'ask' and set of benefits.

42. We believe that careers IAG has to be properly funded and professionally delivered through a combination of school- and industry-based activities. Industry has a role to play, but relying mainly on companies to deliver all the elements of careers education is not appropriate or feasible. The focus of improvement should be about cultural change in schools, rather than simply increasing companies' responsibility.

[9] [9] http://www.educationandemployers.org/wp-content/uploads/2014/06/its_who_you_meet_final_26_06_12.pdf

[10] http://www.nfec.org.uk/Perkins%20Review/Perkins/Perkins_index.html