

### The Science Council

1. The Science Council is an umbrella organisation of over 30 learned societies and professional bodies in the UK drawn from across science and its applications: a list of member organisations is attached.
2. In addition to providing a mechanism for the sector to work collectively, the Science Council develops and leads collaborative projects working with member bodies and the wider scientific community: examples include the Future Morph<sup>1</sup> web site designed to provide information about careers opportunities, and LMI analysis of the UK Science Workforce.<sup>2</sup>
3. The Science Council also works to advance the professional practice of science and since 2004 has awarded the professional qualification of Chartered Scientist (CSci). It is now leading an initiative that aims to raise the profile, aspirations and retention of technician and graduate scientists by developing new professional registers at these levels (Registered Scientist and Registered Science Technician) which will be launched early in 2012.
4. Collectively our member bodies represent more than 400,000 individual members, including scientists, teachers and senior executives in industry, academia and the public sector.
5. The Science Council has consulted its member organisations in the preparation of this submission.

### General questions

#### ***What is the definition of a STEM subject, and a STEM job?***

6. STEM is a confusing term. Although the acronym specifically includes science, technology, engineering and mathematics, many remain unsure whether specific subject disciplines and professions are included or not. It is noted that there is considerable overlap between science, technology and engineering.
7. Within the Science Council we have chosen to focus on science, pure and applied. We often also make reference to the 'core disciplines' of science, i.e. physics, chemistry and biology, and mathematics. The Science Council has defined science as a methodology<sup>3</sup>, rather than as a subject or group of subjects. In our definition the term 'science' embraces a wide range of both pure and applied subjects as well as professional sectors including technology, engineering and medicine. There are several different approaches even within government as to what is, and what is not, included as a STEM subject and in LMI research there are a further set of variances. The Science Council supports the BIS Science for Careers group recommended in its report published in March 2010 that there should be greater consistency in the definition of what is and is not STEM.<sup>4</sup>

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<sup>1</sup> [www.futuremorph.org](http://www.futuremorph.org)

<sup>2</sup> <http://www.sciencecouncil.org/content/science-workforce>

<sup>3</sup> Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.

<sup>4</sup> Science for Careers: Report of the BIS Science and Society Expert Group March 2010

8. In general, we do not find the term 'STEM' particularly helpful and rarely use it when working with external audiences.
9. Many, particularly within academia, tend to think of 'scientists' as those with PhDs working in academia or research, describing individuals as 'leaving' science if they work in other sectors. The Science Council takes a much broader view of what a professional scientist might be and includes applied scientists. The most obvious ways to define different types of scientists is to draw on the central discipline underpinning their work: physics, chemistry, biology, soil science, psychology etc. Professional bodies also work around sectors such as energy or water but this does not help to describe what people actually do in their work. In order to give some shape to this the Science Council has developed descriptors of 10 types of scientist:<sup>5</sup> These are:
  - Explorer
  - Investigator
  - Developer/Translational
  - Service provider/operational
  - Monitor/regulator
  - Entrepreneur
  - Communicator
  - Teacher
  - Business/Marketing
  - Policy maker
10. Many of these roles will have a common underpinning in terms of the essential scientific knowledge but they will be combined with a different range of skills and aptitudes. These definitions have proved to be most helpful in exploring policy and training needs for scientists working in different sectors and types of role, as well as in developing discussion about career opportunities.
11. There is also an unhelpful tendency to use the language of vocations when talking about degrees in science, technology, engineering and maths (STEM), something that is not done when discussing humanities and arts degrees. Medicine, dentistry, veterinary science, nursing etc can properly be considered 'vocational' where the qualification is also a license to practice, or the first step towards this: typically 90% or more of these graduates would enter the linked occupations. Having a degree in physics, chemistry, biology, natural sciences or mathematics does not automatically create a physicist, chemist, biologist, natural scientist or mathematician in a career or professional sense and is no more 'vocational' than a history, anthropology, classics, a language or philosophy degree. While those who wish to enter research careers in these areas are likely to require a specialist degree in the subject, for the most part the preparation will be good grounding for a very wide range of both science and non science career options.
12. STEM graduates provide value in employment across the economy, not just within academic and research sectors. These "hidden" aspects of the demand for graduates add to the difficulty of quantifying the numbers required, but all indications are that demand from all sectors is steady or increasing. The Science Council believes that there is real value in people having a science based degree and for them to take that knowledge and skill into all areas of the economy. Some people describe these graduates as 'leaving' science and some complain that the best science students are going to well paid jobs in accountancy and finance rather than staying in research. The data does not support that argument: just 4% of physical science graduates go into finance and 2% of engineers and it is unsurprising that 20% of mathematics graduates move into financial sectors where their specific skills are in high demand.<sup>6</sup>

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<sup>5</sup> <http://www.sciencecouncil.org/content/10-types-scientist-%E2%80%93-science-jobs-are-not-all-same>

<sup>6</sup> DIUS, 2009. "The Demand for Science, Technology, Engineering and Mathematics (STEM) Skills"

13. Recent research undertaken for the Science Council shows that science skills have become increasingly important across all sectors of the UK economy and society, with 5.8 million people now employed in science-based roles: this is projected to increase to 7.1 million people by 2030. This research looked at the UK workforce in its entirety, thus enabling an understanding of the true size and scope of the science workforce across the whole economy, rather than limiting the research to considering only those working in a narrow band of so-called science sectors.
14. In this research the definitions used were:

**Primary science workers:** workers in occupations that are purely science based and require the consistent application of scientific knowledge and skills in order to execute the role effectively, for example, Biochemists, Chemical Engineers, Science and Engineering Technicians and Medical Radiographers.

**Secondary science workers:** workers in occupations that are science related and require a mixed application of scientific knowledge and skills alongside other skill sets, which are often of greater importance to executing the role effectively: for example, actuaries, Animal Husbandry Managers, Chiropodists, Civil Engineers, Environmental Protection Officers, Pharmaceutical Dispensers, Teaching Professionals and Software Professionals.

**Non-science workers:** workers in occupations that are not science based and have no requirement for science based knowledge or skills, for example, Travel Agents, Musicians, Legal Professionals and Housing and Welfare Officers.

**Core science sectors:** sectors that are primarily science based in their core activity.

**Related science sectors:** sectors in which the primary activity is not necessarily science based, but has a strong relationship to science.

**Non-science sectors:** sectors which have no science based or related activity.

15. The research identified that 20% of the current workforce is employed in science roles, a total of 5.8 million people (1.2m primary science workers and 4.6m secondary science workers). The research results serve to emphasise the interconnectedness and cross-disciplinarity of science in today's economy and highlight the proliferation of secondary science workers, people who are dependent on science knowledge and skills as part of their role and who will not previously have been identified as part of the science workforce. Significant numbers of scientists were found in employment sectors as diverse as health and social care, education, food and farming, communications, finance, retail and public sector services.
16. The science workforce consists of those with postgraduate qualifications and graduates as well as people with non-graduate qualifications. Within the science sectors (core and related) 34% of the science workforce is non-graduate (with 17% QCF level 3&4); 32% are graduate and 26% are postgraduate. In comparison with the non science sectors and the economy as a whole there are significantly more graduates and postgraduates in the core and related science workforce.

***Do we understand demand for STEM graduates and how this could be used to influence supply?***

***Is the current number of STEM students and graduates (from the UK, EU and overseas) sufficient to meet the needs of industry, the research base, and other sectors not directly connected with STEM?***

17. The wide distribution of science graduates across workforce sectors illustrated by the Science Council workforce research indicates that the demand for graduates goes beyond the traditional science employers. We also know from some research currently in progress that 58 % of STEM

graduates are employed by SMEs. These factors indicate a substantial need for STEM graduates but one that it is very hard to quantify due to the nature of the “hidden” sectors and with the way most LMI is currently generated around SIC and SOC codes. The CBI and others have voiced their concerns regarding the supply of graduates and made some statements regarding the anticipated growth in demand. The CBI’s Building for Growth education and skills survey 2011<sup>7</sup> stated that 52% of employers expect difficulty recruiting STEM staff in the next three years.

18. The 2010 UKCES National Strategic Skills Audit<sup>8</sup> highlights areas of growth in the economy including the following STEM related sectors: advanced manufacturing, life sciences and pharmaceuticals, low carbon economy, professional and financial services, digital economy, and engineering and construction. In addition the UK will need to develop a new generation of wealth creation sectors in such areas as fashion, creative industries and energy generation, all of which are likely to increase demand for graduates with STEM skills and awareness. Other areas identified with growing demand include health, agriculture and aquaculture and environmental sciences.
19. A number of sectors have a looming problem with an aging workforce, for example, agriculture and aquaculture, metals and professional organisations and consultancy where an above average proportion of science workers are in older age groups. Some of the ageing effects also have strong regional dimensions. Another indication of this problem is the length of time workers have held their current role and with sectors such as agriculture and aquaculture data shows that an above average proportion of workers have been in their role for more than 20 years.<sup>9</sup>
20. It should also be noted here that recent BIS research<sup>10</sup> looking at the motivations for students choosing STEM degree courses has shown that interest in the subject and enjoyment are given greater emphasis (77% and 67% respectively) than the career opportunities afforded by the course (52%).
21. In some specific areas shortages are already apparent. For example, in food science and technology it is evident that demand exceeds supply for UK-derived graduates; this evidence is from research conducted jointly by the Institute of Food Science and Technology and Improve Ltd (the Food & Drink Industry Sector Skills Council). Food industry companies have developed some strategies to ensure maintain the supply of graduates to meet their own needs. This includes direct interactions with undergraduate students before graduation as well as recruiting from the EU and overseas, (but it must be remembered that recruiting from overseas from a finite student market can hinder the agri-food development of third world countries).
22. Responses to our consultation commented that workforce planning was rarely a precise process and that it was very difficult to aim for ‘just enough’ STEM graduates, especially when these skills were clearly sought after in many non STEM areas of the economy. A larger pool of STEM graduates enables employers to choose the best and most able to undertake key science and technical roles, something that was largely welcomed by our respondents. It is also worth noting that only the best graduates will be able to compete at the highest level with the competition from China, India and elsewhere for jobs with leading global science and technology employers.

## **16-18 supply**

***Are schools and colleges supplying the right numbers of STEM students and do they have the right skills to study STEM first degrees?***

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<sup>7</sup> <http://www.cbi.org.uk/business-issues/education-and-skills/in-focus/stem-skills/>

<sup>8</sup> <http://www.ukces.org.uk/ourwork/nssa>

<sup>9</sup> The current and future UK science workforce, TBR for the Science Council, Sept. 2011  
<http://www.sciencecouncil.org/content/science-workforce>

<sup>10</sup> STEM graduates in non-STEM jobs, BIS Research Paper Number 30, March 2011

23. In recent years we have seen increases in the numbers choosing to study STEM subjects post 16. However, all disciplines report a lack of mathematical skills and would like to see A levels and other post 16 qualifications preparing undergraduates for the mathematical content of degree courses.
24. Many individuals studying post 16 vocational or applied courses will progress to higher education. The validity of this route, where students have often had greater experience of independent study, and its potential to attract a broader range of students should not be forgotten.

***What have been the effects of earlier government initiatives on the uptake of STEM subjects at advanced level?***

25. We are starting to see encouraging increases in the uptake of STEM A levels and a wide range of factors will be playing a role in this, including an increased media focus on science which is leading to greater awareness of the opportunities. There are a great many initiatives aiming to increase the uptake of science and whilst many undertake evaluation it remains difficult to isolate evidence of effect for any one project. Investing in, and supporting science teacher will be a key part of the picture and is likely to have contributed to improvements.
26. There are risks associated with policies which reduce the number of routes through to advanced level study of science. While the increase in numbers studying three separate sciences is increasing, and there is correlation between triple science and take up of sciences post 16, this trend is not so strong for girls and most of the increase in post 16 science has been with boys. There are some indications that separate science GCSE's fail to encourage girls to progress to advanced level. The progression of girls post 16 is an issue that needs further research: the 2011 increase in A level candidates for physics was encouraging, however, 90% of the increase was accounted for by boys. Similar figures show that for mathematics 70% of the increase was male candidates and for chemistry it was 60%.<sup>11</sup> There is much more to be done to encourage girls and minority groups to pursue all areas of science.
27. Focusing on the study of three separate sciences will, due to timetable constraints, inevitably reduce the subject options for young people: it may therefore have the unintended consequence of reducing the uptake of science study post 16. There may also be a link between the preference of girls to be interested in, and motivated by, wider, multi-disciplinary topics in science and the relevance of science to the world in which they live.<sup>12 13</sup>
28. For those not yet clear about the direction of their future careers options, the possibility that a substantial proportion of their overall curriculum will be taken up with science could make the study of science less attractive at a time when the UK needs to encourage more students to study science. We believe therefore that effects of the drive for three separate science subjects at GCSE should be closely monitored.

***What effect, if any, will the English Baccalaureate have on the study of STEM subjects in higher education?***

29. It is hard to predict the effect of the English Baccalaureate at such an early stage but the profile it provides for science as an essential subject for any future path is helpful. The measure may have a positive effect in driving demand for specialist science teachers to deliver separate sciences and it is very helpful that the detail of the requirements discourage pupils from dropping any of the sciences since study of all three core sciences pre-16 is important for those who pursue further study of science.

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<sup>11</sup> [http://www.jcq.org.uk/national\\_results/alevels/](http://www.jcq.org.uk/national_results/alevels/)

<sup>12</sup> The Relevance of Science Education Project (ROSE) in England: a summary of findings E.W. Jenkins and R.G. Pell, 2006

<sup>13</sup> 'Science in my future' conducted by the Nestlé Social Research Programme

30. However, there is also potential to narrow the number of routes in to science A levels at a time when we need to be broadening the cohort attracted to studying science, for example, to include those who engage best with applied learning.

### **Graduate supply**

***Is the current number of STEM students and graduates (from the UK, EU and overseas) sufficient to meet the needs of industry, the research base, and other sectors not directly connected with STEM?***

See paragraphs 16-21 above.

31. As discussed above the employment destinations of STEM graduates and as indicated above almost all workforce surveys indicate strong current and future demand for graduates with science skills. Although difficult to quantify, the demand for STEM graduates from new and existing employment sectors is highly likely to grow.

***Is the quality of STEM graduates emerging from higher education sufficiently high, and if not, why not?***

32. The responses from our Member Bodies to our consultation on this aspect have been largely positive with regard to the overall quality of graduates in their respective areas of interest.
33. Input from Member Bodies indicate a general acceptance that they would not expect HE to produce BSc graduates with exactly the right knowledge and skills base for every specific industry sub-sector. However, there is a clear consensus that there needs to be the right range of tailored MSc courses to enable graduates to specialise for particular sectors of the economy and for specific roles and careers. This is also important in areas where the science is changing and there is a need to update skills. Examples include, environmental science, renewable energy, food and farming and many areas in health sciences.
34. One particular area of concern therefore is funding for Masters courses. It is noted that NERC has recently abandoned its MSc sponsorship, even in areas where there are skills shortages. Students who originally select to study for a three year BSc programme rather than a 4 year MSc programme find that they cannot change this later in the course and are disadvantaged by not being able to access student loans for an single year Masters course. Changing this restriction, and additionally providing Government funding for MSc courses, would enable many more students to explore the potential of science based careers: we consider a measure of this kind would also increase the potential for encouraging more young women to remain in science and attract back those who may have moved away from technical based science roles.

***Do STEM graduates have the right skills for their next career move, be it research, industry or more broadly within the economy?***

35. STEM courses undoubtedly develop skills alongside subject knowledge but there is a lack of clarity about the skills gained and those required for scientific or technical careers and those skills that have broader currency and may take individuals to careers 'from' and 'in' science rather than 'as' a scientist. Inconsistency in the language used to describe skills across sectors, HE, colleges, schools and employers adds to the confusion and can perpetuate the myth of lack of transferability of skills.
36. A growing emphasis on translational mechanisms for science research will bring with it particular skills needs both for graduates and post graduates including multidisciplinary working.
37. It is often stated by employers that STEM graduates lack the practical skills needed for employment in science and technology environments, particularly in relation to laboratory skills.

With this in mind the Science Council commissioned to look at the availability of work experience for STEM students and graduates.<sup>14</sup>

38. The research identified that for graduate internships, the number of vacancies in STEM industries seems to be much lower than in many other sectors, including finance and business and that it is easier for a STEM graduate to find an internship in a business-oriented environment than in a scientific or technical one. The research also identified that while STEM students are more likely than non-STEM students to undertake a sandwich placement (approximately 14,000-17,500) not all sandwich study opportunities are taken up and STEM graduates appear to be less likely than other graduates to pursue internships.
39. Given the call from employers for graduates with higher levels of practical and technical skills, it was surprising therefore that there are very few genuinely scientific or technical internships for graduates: STEM undergraduates seeking to develop their technical and scientific skills are more likely to be able to find an appropriate work placement as an undergraduate than after graduation.

***What effect will higher education reforms have on the quality of teaching, the quality of degrees and the supply of STEM courses in higher education institutions?***

40. The reforms of higher education will impact on student choice strengthening the need for quality information to support informed decision making. The Science Council is pleased that HEFCE's Key Information Set (KIS) acknowledges the value of accreditation of courses by professional bodies as a mark of quality and transferability. However, in some disciplines there is limited market penetration for this activity which provides opportunity for confusion. Where accreditation is unavailable other measures will need to be considered.
41. The Science Council supports the need for measures of external quality control for STEM degrees and the need for increased information to enable both students and employers to make an informed choice about degree options. There is, however, a danger that this will turn into a drive towards 'kite marking' of degrees for particular employers or employment sectors which could become bureaucratic, costly and fragmented and thereby fail to respond to the needs of either students and a very broad range of science employers.
42. Specific approaches such as kite-marking may be appropriate for vocational degrees where graduates are being prepared for a particular career or employer/industry sector, such as medicine, nursing or law. In reality, few science/STEM degrees fit such criteria. However, accreditation for a professional qualification (such as Chartered Chemist, Physicist, Chartered Scientist or Registered Scientist) is a very different exercise indicating the acceptability of a degree as part of the qualification route to professional status, something that has built-in transferability. One of the benefits of professional accreditation is that it is informed by the needs of employers but is independent of any individual employer. Accreditation by an overarching professional body (such as the Science Council) is one way to achieve consistency across broad areas – both of subjects and employment sectors. This system is working effectively in engineering and is being implemented in many science areas such as Life Sciences (led by the Society of Biology): the Science Council recognises that there is more to be done to include cross-disciplinary and multi-disciplinary subject areas in the accreditation process and is currently considering options to address this.
43. Our member organisations are concerned by the proposals allowing HEI's to freely recruit as many AAB+ students as they wish since there could be a temptation for HEI's to prioritise recruitment to non-science subjects. The additional laboratory costs of science subjects increase the cost of teaching and therefore by recruiting to non-science subjects the HEI's will be better able to cover the cost of teaching with the income from tuition fees. HEFCE has made some

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adjustments to the model for this proposal to protect SIV subjects, however, some sciences such as the majority of the biosciences and geophysics are not categorised as SIV.

44. The Science Council member bodies are concerned about the potential effects of HE reform on funding for STEM subjects and many have responded to the consultation on the proposals with detailed input relevant to their subject areas.

***What effect does “research assessment” have upon the ability to develop new and cross-disciplinary STEM degrees?***

45. There are some concerns that the development of cross disciplinary STEM courses is stifled by the RAE which puts pressure on HEI's to focus on their research strengths and may not fully recognise the value of cross-disciplinary research.
46. However, feedback from member bodies suggest that research assessment has not had a negative effect on the ability of HE to develop degrees that are appropriate for specific sectors and the IFST told us that in their area which by its very nature is multidisciplinary, they have not detected a problem and comment that many HE units which provide for such degrees have achieved high gradings in Research Assessment.

***What is the relationship between teaching and research? Is it necessary for all universities to teach undergraduates and post graduates and conduct research? What other delivery model should be considered?***

47. The Science Council would also support the case that the best teaching is research-led.

***Does the UK have a sufficient geographical spread of higher education institutions offering STEM courses?***

48. We have no evidence to suggest geographical distribution is an issue in the supply of STEM courses. Science Council member bodies recognise that science based courses are expensive to develop and deliver and, particularly with regard to multi-disciplinary courses, may be dependent on relatively small specialist departments that can be sensitive to cut backs. However, if cutbacks occur in essential subject disciplines, then the knock on effect is to call into question the educational effectiveness of many multi-disciplinary courses.

***What is being done and what ought to be done to increase the diversity of STEM graduates in terms of gender, ethnic origin and socio-economic background?***

49. Leadership is necessary from within science/STEM if good practice is to be embedded across the sectors. This will not necessarily mean that gender must be separated from wider diversity issues, and indeed there is potentially much to gain from embedding ambitions regarding women's participation in STEM within the wider programmes.
50. However, it will still be important for there to be a pan-STEM UK-wide approach to the issues, especially with regard to collection of data and monitoring progress. With the demise of the UKRC it remains unclear how this will be achieved: we understand from BIS that the intention is that the Royal Academy of Engineering will provide leadership and development for engineering and technology, and the Royal Society will do the same for science. At this time strategies and priorities from these two bodies are still unclear.
51. Professional bodies and learned societies recognise that they have a key role to play in developing and supporting women pursuing careers in science. Almost all Science Council member bodies have specific programmes and activities which aim to support women in science. Some examples of the specific programmes are:
- BCS the Chartered Institute for IT, which has run its BCS Women egroup for over ten years and holds regular events for women
  - Royal Society of Chemistry has a women members network



- Institute of Physics has been very active for many years through research and providing support, this has included site visits for university physics departments and resources for school teachers.
52. It should not be forgotten that there are a very large number of organisations working to increase the numbers of women in the STEM workforce. Many of these organisations focus on a single aspect of the issue such as an employment sector, geographical area, age group or similar. Many are very effective in this and Science Council member bodies are some excellent examples.
53. Many of the smaller specialist organisations feel undervalued, isolated and marginalised from government and from the larger public sector led initiatives and yet they have continued to offer a wide range of services and support for women across the UK. Most are not engaged directly with either the Royal Academy of Engineering or the Royal Society. It will be important that a central point of contact and network is established as we move forward, and that this central resource is able to facilitate and encourage the smaller specialist organisations to work together and to share expertise, resources and insights.
54. The Research Excellence Framework (REF) risked penalising women taking maternity leave and we welcome the changes to the panel criteria adopted by all four UK funding bodies which will allow one less output per submission for each period of leave.

### **Post-graduate supply**

***Is the current training of PhD students sensitive to the range of careers they subsequently undertake?***

***Are we currently supporting the right number of PhD studentships to maintain the research base and are they of sufficient quality?***

55. The EPSRC has discontinued project studentships on its research grants from 31 Jan 2011, this and other measures including a focus on strategic initiatives is likely to impact on the number of PhD studentships.
56. There is some concern within the sciences that UK post-graduates are failing to compete with international applicants for research positions as overseas students are seen as having had a greater length of training in research.
57. Many individual member bodies are responding specifically with regard to PhD training in their fields.

***What impact have Doctoral Training Centres had on the quality and number of PhD students? Are there alternative delivery models?***

***Should state funding be used to promote Masters degrees and is the balance right between the number of Masters degree students and PhD students?***

58. Conversion Masters are a very effective way of meeting demand in some areas and at the same time these increase the employment opportunities of those taking these Masters courses. Two important examples of STEM based professions where individuals often enter following conversion from a non-STEM first degree are meteorology and environmental science. Subjects such as marine science, climate change, and meteorology are mainly taught in the Geography curriculum in schools and there is frustration that these topics are not covered more often within the chemistry or physics curricula. Many of those who would then like to pursue a career in these areas enter the HE system through a non-STEM subject (often as a result of poor careers advice) but find that they can 'convert' to meteorology, environmental science or agricultural science through a specific Masters programme. A Royal Meteorology Society survey of weather service providers found that they struggle to find enough first degree STEM graduates to meet their

requirements but that this is being addressed by the development of Masters courses in meteorology with strong mathematics and physics content. These Masters programmes also need to be supplemented with further vocational qualifications and courses offering deeper science content and updating for professionals.

***What impact will higher education reforms have on the willingness of graduates to pursue a research career?***

59. The EPSRC has previously withdrawn funding for MSc courses which has had an impact on the viability of courses such as those designed for the nuclear industry. In 2011 NERC has also made a decision to withdraw funding for taught MSc courses, despite the importance of these postgraduates to industry. There seems little prospect of private companies offering financial support on the same scale and we suggest that NERC should review and if necessary reconsider this action once its full impact becomes clear.
60. In the biosciences there are early signs of a trend towards HEIs preferentially taking PhD students holding Masters degrees and the integrated Masters is already the preferred route for some sciences. If this trend continues the funding model for Masters degrees could impact on the numbers of PhD students. The acquisition of further debt may dissuade students from choosing a four year integrated Masters option impacting on their opportunities to move on to postgraduate study, since this is now the preferred route.
61. The fact that loans will be accruing interest during years of further study may also be a disincentive to delaying repayments in favour of additional study.

**Industry**

***What incentives should industry offer to STEM graduates in order to attract them?***

***What steps are industry and universities taking together to ensure that demand for STEM graduates matches supply in terms of numbers, skills and quality of graduates?***

62. Our consultation showed some optimism with regard to the potential for industry and other employers to sponsor students at both undergraduate and Masters levels but we are unable to comment further at this time.

16th December 2011

## Appendix I

### Member Bodies of the Science Council December 2011

1. Association for Clinical Biochemistry\*
2. Association of Neurophysiological Scientists\*
3. Association for Science Education\*\*
4. British Academy of Audiology
5. British Computer Society\*
6. British Psychological Society\*
7. Chartered Institution of Water and Environmental Management\*
8. Energy Institute\*
9. Geological Society of London\*
10. Institute of Biomedical Science\*
11. Institute of Brewing and Distilling\*
12. Institute of Clinical Research\*
13. Institute of Corrosion\*
14. Institute of Food Science and Technology\*
15. Institute of Marine Engineering, Science and Technology\*
16. Institute of Materials, Minerals and Mining\*
17. Institute of Mathematics and its Applications\*
18. Institute of Measurement and Control
19. Institute of Physics and Engineering in Medicine\*
20. Institute of Physics\*
21. Institute of Professional Soil Scientists\*
22. Institution of Chemical Engineers\*
23. Institution of Environmental Sciences\*
24. London Mathematical Society
25. Mineralogical Society\*
26. Nuclear Institute\*
27. Oil and Colour Chemists' Association\*
28. Royal Astronomical Society
29. Royal Meteorological Society
30. Royal Society of Chemistry\*
31. Royal Statistical Society
32. Society for General Microbiology
33. Society of Biology
34. Society for Cardiological Science and Technology
35. Society of Dyers & Colourists

\* Licensed to award Chartered Scientist – CSci

\*\* Licensed to award Chartered Science Teacher - CSciTeach