The Royal Society Science Higher Education in 2015 and beyond

The EPC share your concern about the mismatch between the prior knowledge expected of entrants to engineering degrees and the actual knowledge of new undergraduates. The situation is such that the majority of our members report various remedial endeavours designed to bring first year students up to the standard required particularly in mathematics but also in physics.
When this is combined with the pressures which professional accreditation requirements place on engineering degrees to put in more and more subject specific knowledge, it is clear that this inevitably leads to increased pressure on staff, students and resources.
Engineering courses prepare students for a wide variety of careers and it is clear that a whole range of employers actively recruits our graduates. We believe that they value their numerical and analytical skills as well as the other subject specific and generic skills that are acquired during their degrees.
The four year integrated Masters Course which leads to the M.Eng is now well established in engineering departments. We have some concerns as to the possible influence that further alignment with the Bologna accord will have on it unless resources are improved to facilitate this.
We understand the reasons for the criticism of UK Ph.D.s, however we believe that the traditional UK programme which produces a Ph.D. graduate in three or three and a half years does produce well-qualified research staff for industry or entrants to academia. Clearly if longer time is spent on gaining the qualification there is more time to absorb and master new knowledge as well as allow for maturity of both the graduate and the subject understanding. However, a change in our existing system would have enormous financial implications.

Answers to the identified issues
A. Engineering graduates can we believe have the best of both worlds. Their degree courses prepare them for interesting jobs in industry, which rate highly in graduate satisfaction surveys. They are also sought after by a range of other employers particularly those in the financial sector who value the numerical and analytical skills of engineering graduates.
B. It is really hard to get accurate figures as the demand for engineering graduates can change markedly from year to year; however, it would appear that demand is increasing at the same time as the total number of engineering graduates is decreasing.
C. We believe that the quality of those graduating is high at both undergraduate and postgraduate levels, though we have concerns about the total numbers. We would like to see more people studying engineering. In particular we think that the effect of satisfying accreditation requirements for undergraduate degrees has a beneficial effect. The Engineering Doctorate scheme seems to produce graduates who are particularly well suited to meet the needs of industry.
D. We are concerned about the implications of the Bologna accord and given the problems with the intake standards particularly in mathematics and science we can see a case for extending our M.Eng to be five years in duration. However, we think the financial implications of this are considerable both for our universities and also for the students themselves. Some institutions already run a foundation year, which enables students to get up to the

standard required for entry to their first year programme. Some of these are in local FE colleges whilst others are run by the university 'in house'.
E. A number of general engineering degrees are offered. However in practice the majority of students normally end up specialising in one area. The quantity of information required in any one area makes it very difficult to remain a generalist.
F. This has really been answered above in the steps taken to address deficiencies in mathematics and physics.
G. We fully support students having a free choice and flexibility in looking at future options. However, the flexibility and financial rewards offered by non-engineering careers particularly those in the city are such that our graduates will only really have a free choice when UK industry is able to offer similar opportunities.
H. In engineering we really do not see this as a major problem. There are relatively few students in this category and considerable provision of part time courses.
I. No-one yet knows the impact of the new 'top-up' fees on students. However, we believe that engineering graduates will be better placed than many students from other disciplines because of the demand that there is for them from employers.
J, Engineering benefits financially from the relatively large number of overseas students who come to study in the UK. If, as seems likely, this flow reduces in future years then it is likely that it will be harder to maintain current standards. The additional fees paid by overseas students effectively subsidise engineering degree courses.
The implications of Bologna may well also affect this market for instance for one year Masters courses and also if UK degrees are seen as not being Bologna compliant in the rest of the world.
Engineering is clearly a global activity and affected by the worldwide market place. It is clear that other countries are competing for the overseas market, for instance other European countries offering courses taught in English.
K. There are a variety of changes which impact on HE. Such as the aim of getting 50% of the age group to experience HE and the economic needs within the UK. It is very difficult for HE to respond quickly to change. We see a need for a wider variety of different sorts of qualifications to meet the needs of all employers.