ANNEX B: TERMS OF REFERENCE FOR THE REVIEW

The study should:

1. compare the current demand for, and supply of, high-level scientific and technical skills in the UK, focusing on the type of skills required by businesses to lead and underpin their research and development activities (including examining the demand for highly specialised knowledge and skills in particular fields; for broad subject knowledge and for more generic skills);

2. investigate how the demand for, and supply of, these skills is likely to evolve over the next ten years by identifying the major sources of demand (including non science-related employment);

3. understand any factors (other than shortfalls in overall supply) that may hinder innovative companies in recruiting and retaining the highly skilled scientists and engineers with the relevant skills;

4. investigate the mechanisms through which businesses in the UK identify their needs for specific high-level scientific and technical skills and communicate these needs to the higher education sector (primarily, but not exclusively, higher education establishments and organisations in the UK);

5. investigate the way in which the higher education sector – in collaboration with other sections of the education sector – currently responds to these demands (including the process by which those in higher education can access the academic and business research opportunities available to them);

6. propose improvements, if necessary, to these mechanisms to ensure that the higher education sector can and does respond effectively to future shifts in the demand of businesses for particular skills; and

7. analyse whether, over and above any such proposals to improve to these mechanisms, more needs to be done in the short term to seek to address:

    i. any mismatch between the overall demand for particular scientific and technical skills and their overall supply; and

    ii. any factors that hinder the ability of innovative businesses to recruit and retain scientists and engineers with the relevant skills.

ANNEX C: GLOSSARY

This list includes abbreviations and acronyms commonly used throughout this report, as well as further information about some of the terms used.

AGCAS	**Association of Graduate Careers Advisory Services**
AGR	**Association of Graduate Recruiters**
AMAs	**Advanced Modern Apprenticeships**
ANRSE	A database (**Analytical Researchers, Scientists and Engineers**) maintained by the OECD – a data-set on human resources working on R&D in the business enterprise sector.
ARCS	**Academic Research Careers in Scotland** (a survey)
AST	**Advanced Skills Teacher** (Teachers who are deemed 'excellent' in a range of skills' in which they train colleagues).
BBSRC	**Biotechnology and Biological Sciences Research Council**
BCIS	**Building Cost Information Service Ltd** (Information services of The Royal Institution of Chartered Surveyors)
BCS	**British Computer Society**
BERA	**British Educational Research Association** (The aim of the Association is to sustain and promote a research culture in education.)
BERD	**Business Enterprise expenditure on Research and Development** (statistic)
CASE	**Co-operative Awards in Science and Engineering** (CASE projects aim to link universities, students and business employers in SET, and involve research students working on projects of one to three years in duration which are of direct relevance to a particular industry.)
Connexions Service	The government's support service for young people aged 13 – 19 in England, which aims to provide integrated advice, guidance and access to personal development opportunities.
CPD	**Continuing Professional Development**

CRC	**Cooperative Research Centres** (An Australian research centre programme which has five main areas of activity – manufacturing, information technology, mining and energy, agriculture-based industry, environment, medical science and technology.)
CRS	**Contract Research Staff**
CST	**Council for Science and Technology**
CSU	**Higher Education Careers Services Unit**
DfEE	**Department for Education and Employment** (the predecessor to the Department for Education and Skills).
DfES	**Department for Education and Skills**
D&T	**Design and Technology**
DTI	**Department of Trade and Industry**
doctorate	A qualification denoting training and achievement in original research; often a PhD/DPhil but also including EngD, DSc (Doctor of Science) etc. The 'new route PhD' is an experimental four-year PhD programme.
EEA	**European Economic Area**
EPSRC	**Engineering and Physical Sciences Research Council**
ESRC	**Economic and Social Research Council**
ETB	**Engineering and Technology Board**
Faraday Partnerships	Faraday Partnerships improve the flow of technology and skilled people between the science base and industry. Partnerships exist between industrially oriented research organisations and the science and engineering base, to carry out core research and provide industrially relevant postgraduate training.
FE	**Further Education**
FRESAs	**Frameworks for Regional Employment and Skills Action**
FTE	**Full-time equivalent**
GCE	**General Certificate of Education**
GCSE	**General Certificate of Secondary Education**
GNVQ	**General National Vocational Qualification**

GTP	**Graduate Teacher Programme** (This programme is designed to allow schools to employ unqualified teachers who are preparing for QTS assessment, assess them against the standards for the award of QTS, and devise individual training plans for them.)
grade drift	The movement of a member of staff from a lower pay-scale "grade" to a higher one in order to increase his or her salary, perhaps occurring when it is not possible to better pay the members of staff concerned on the lower scale (determined by national pay scale bargaining).
H&S	**Health and Safety**
HE	**Higher Education**
HEIs	**Higher Education Institutions** (encompassing colleges of higher education as well as universities).
HEIF	**Higher Education Innovation Fund** (A DTI Knowledge transfer/exploitation fund *(England only)* supporting the interaction of HEIs with businesses and the wider community.)
HEFCE	**Higher Education Funding Council for England**
HESA	**Higher Education Statistics Agency**
ICT	**Information and Communication Technology: telecommunication and computer technology**
IENG	**Incorporated Engineering degree**
IIES	**Institute of Employment Studies**
IMRCs	**Innovative Manufacturing Research Centres**
INSET	**In-Service Education of Teachers**
IoP	**Institute of Physics**
IT	**Information Technology**
ITT	**Initial Teacher Training** (required to attain QTS – see below).
JIF	**Joint Infrastructure Fund**
KT	**Knowledge Transfer**
LEAs	**Local Education Authorities**
MASN	**Maximum Allowable Student Numbers** (a term formerly used by HEFCE to determine the number of students allowed per HEI).

Master's degree (MSc/MPhil)	MSc degrees are awarded to graduates who have degree undertaken a further course of study, after an honours degree, either full or part-time. Master's degrees may be taken following a period of work experience and some courses take the form of company training programmes. MPhil degrees may be awarded following a period of research rather than a course of study. The Master of Research (MRes) degree is a one year full-time course with postgraduate training in methods and practice of research and in relevant transferable skills that are not normally offered in MSc courses.
MPhys/MEng	These are both examples of four-year undergraduate degrees whereby the fourth year of the courses leads to a Master's qualification usually required for advanced professional work (physics) and chartered status for engineers.
MRC	**Medical Research Council**
MSP	**Maths and Science Partnership Programme** (which supports schools working with universities and community to improve science, technology and mathematics education.)
NATFHE	**National Association of Teachers in Further & Higher Education** (The University and College Lecturers' Union)
NBER	**National Bureau of Economic Research**
NERC	**Natural Environment Research Council**
NICEC	**National Institute for Careers Education and Counsellin**g (based at Lucy Cavendish College, Cambridge).
NMW	**National Minimum Wage**
Neighbourhood Engineers Programme	The Neighbourhood Engineers Programme (NEP) aims to enhance young people's scientific and technical capability and raise awareness of the importance of engineering to the economy and society. Neighbourhood Engineers (NEs) attend schools to enthuse young people by practically assisting with curriculum linked activities. It is financially supported by the ETB.
OECD	**Organisation for Economic Co-operation and Development**
OFSTED	**Office for Standards in Education** (officially the Office of Her Majesty's Chief Inspector of Schools in England).
OST	**Office of Science and Technology**

PGCE	**Postgraduate Certificate in Education** (generally a one year postgraduate qualification) leading to Qualified Teacher Status.
PI	**Principal Investigator** (an academic who obtains funds to carry out a research project from Research Council or other funding).
PISA	**Programme for International Student Assessment** (carried out by the OECD)
postgraduate	A student on a course which normally requires a first degree as a condition of entry.
PPARC	**Particle Physics & Astronomy Research Council**
PSREs	**Public Sector Research Establishments**
QAA	The **Quality Assurance Agency** for Higher Education which assesses teaching quality in universities and HE colleges.
QCA	**Qualifications and Curriculum Authority** (a national body which determines the national curriculum and contributes to the design of national examinations).
QR	**Quality-related Research funding** – part of the block grant of state funding given to English HEIs by HEFCE.
QSEs	**Qualified Scientists and Engineers**
QTS	**Qualified Teacher Status** (required by teachers to work in maintained schools in England).
RAE	**Research Assessment Exercise** – The process of assessing the quality of research in UK HEIs for funding purposes. The RAE is carried out every few years by the four UK funding bodies. The last RAE was in 2001.
RAIS	**Research Assistants Industrial Secondments** scheme
RCs	**Research Councils**
RCI	**Research Careers Initiative** (This is to monitor progress towards meeting the agreed concordat on contract research staff concerning the management of staff appointed on fixed term contracts – set up in 1996).
RCGSP	**Research Councils Graduate Skills Programme**
RDAs	**Regional Development Agencies**
Researchers in Residence	A scheme run by a number of the Research Councils and the Wellcome Trust, in collaboration with Sheffield Hallam University, which allows PhD students to support school science to make it relevant and exciting for young people.

R&D	**Research and Development**
RDS	**Research Defence Society**
RTOs	**Research and Technology Organisations**
RTP	**Registered Teacher Programme** – a DfES programme for people that have completed recognised teacher training overseas, and who have been accepted onto a UK course leading to a first degree (or equivalent qualification). Schools employ RTP trainees, working in partnership with HEIs, since participants must complete a degree at the same time as qualifying as a teacher. This programme requires maths, English and science standards.
SARTOR	**Standards and Routes to Registration for engineers**
SBS	**Small Business Service**
SCAA	**School Curriculum and Assessment Authority** (predecessor to QCA)
SCOEG	**Standing Committee on the Employment of Graduates** (predecessor to AGCAS)
scientists and engineers	Often used in this report as shorthand for 'scientists, engineers, technologists and mathematicians'.
SEAs	**Science and Engineering Ambassadors programme** – this is sponsored by DTI and DfES, and encourages scientists and engineers to help in schools.
SET	**Science, Engineering and Technology** (including the mathematical sciences).
SETNET	**Science, Engineering Technology and Mathematics Network** (a network, funded in part by Government, which aims to act as an enabling interface between businesses and schools in the areas of science, technology, engineering and mathematics).
SETPoints	The regional branches of SETNET (above).
SHEFC	**Scottish Higher Education Funding Council**
SME	**Small or Medium Enterprise**
SRIF	**Science Research Investment Fund**
STEM	**Science, Technology, Engineering and Mathematics**
STEP	**Shell Technology Enterprise Programme**

stipend	A grant paid to PhD students to fund them while they carry out their research projects – often awarded by Research Councils.
TCS	A Government programme, formerly known as the **Teaching Company Scheme**.
TTA	**Teacher Training Agency**
third stream activity/funding	Colloquially, activity by HEIs which is not funded as teaching or research; in this report, principally refers to funding for HEIs to engage in joint activity with businesses.
UCAS	**Universities and Colleges Admissions Service**
UCEA	**Universities and Colleges Employers Association**
undergraduate	Student working towards a first degree, higher education certificate or diploma or equivalent.
UUK	**Universities UK** (formerly CVCP – Committee of Vice-Chancellors and Principals).
VCE	**Vocational Certificate of Education**
Wellcome Trust	An independent medical research-funding charity, established under the will of Sir Henry Wellcome in 1936, and funded from a private endowment.

LIST OF TABLES

LIST OF FIGURES