The current and future UK science workforce

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The current and future UK science workforce

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Prepared by TBR's Skills and Labour Market Team

Enquiries about this report can be addressed to:

Fiona Dodd, Head of Research

Jon Guest, Research Consultant

Andrew License, Senior Research Analyst

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Suite One Top Floor, Burgess House,
93-105 St James Boulevard,
Newcastle upon Tyne, NE1 4BW

Telephone: +44 (0) 191 279 0900
Fax: +44 (0) 191 221 2220
Email: fiona.dodd@tbr.co.uk
www.tbr.co.uk

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Table of Contents

Foreword

Science and the practice of science are becoming increasingly important across all sectors of the UK economy and society so it is crucial that we understand more about where and how science skills are currently used in the economy as well as how this is likely to change in the future.

The Science Council works to support the professional practice of science at all levels and across the whole economy. We know from graduate destinations data that an increasing proportion of those with science qualifications were reportedly taking up employment in what are traditionally considered to be non-science occupations, so through our register of 15,000 Chartered Scientists we explored the wide range of roles that scientists currently undertake. This found that use of the term 'scientist' was commonly restricted to academics or researchers or those wearing white coats. The reality was very different and our work has led to a description of 10 types of scientist. We also identified a mismatch with the labour market analysis of the science workforce which tended to focus narrowly on the traditional science sectors such as research and development.

This research is a starting point in providing greater depth of data on the size, shape, distribution and qualifications of the UK science workforce today as well as giving some projections of future changes. And it takes into account the complexities of today's science workforce, both *in* science and *from* science. There were, inevitably, limitations in the data sources available, but the new methodology takes account of the workforce across the entire economy, rather than looking at total employees within science based industries. This enables an understanding of the true size and scope of the science workforce across the economy, rather than limiting the research to considering scientists working in a narrow band of science sectors: it has been able to identify the science workforce in employment sectors as diverse as health and social care, education, food and farming, communications, finance, retail and public sector services.

A key headline from the research results is that 20% of the workforce is employed in science roles, a total of 5.8 million people (1.2m primary science workers and 4.6m secondary science workers). We can also see that the science workforce consists not just of those with postgraduate qualifications, but a significant proportion of graduates as well as people with non-graduate qualifications. It therefore includes the often forgotten people utilising their science knowledge and skills within technician level roles - from pharmaceuticals to food and from biotechnology to retailing - playing an essential part in the delivery of science.

This begins to explain why there is such huge demand for people with science qualifications at every level, and demonstrates the value of studying science – a message that underpins our careers awareness work and the website Future Morph. The results also 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. Secondary scientists can be found, literally, everywhere in the economy.

For the workforce research the science workforce was then segmented to reveal interesting data on the different sectors on a whole range of demographics such as salary, gender balance and qualification profile. This published report is supplemented by a series of data workbooks which are available to interested parties to allow them to drill down into data on their own sector and draw comparisons with other sectors.

As well as helping to understanding the landscape for investment in education and skills, this data will enable us to develop benchmarks for the first time which we can revisit in future years, enabling us to monitor demographic and other changes that may have policy implications.

Diana Garnham, Chief Executive, The Science Council, August 2011

Executive Summary

Since 2004 the Science Council has operated the Chartered Scientist register (CSci), which recognises high levels of professionalism and competence in science. CSci is open to scientists with a masters-level qualification or equivalent. This research was commissioned by the Science Council to support the exploration of the potential market for new registers in science and thereby provide professional recognition for those who are not practising at the level of Chartered Scientist.

The objectives of this research were to explore the potential for expanding registration to technician and intermediate levels by developing comprehensive data on the current UK science workforce, understanding the profile of employment across the skills levels and providing a view on the future workforce and where demand is likely to be the highest.

Methodology

This research uses a new analysis considering the science workforce across the entire economy, rather than looking at total employees within science based industries. This innovative approach enables an understanding of the true size and scope of the science workforce across the economy, rather than limiting the research to considering scientists working in a narrow band of science sectors.

The definitions of the science workforce used for this report are:

- 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.
- 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.
- Non-science workers: workers in occupations that are not science based and have no requirement for science based knowledge or skills.

Sectors are also classified as:

- 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.

The current UK science workforce

There are 5.8m people employed in science based occupations (1.2m primary science workers and 4.6m secondary science workers). This equates to 20% of the UK workforce employed in science roles. This 'permeation' of science workers across the economy means that this employment distribution is very similar to total economy averages.

- Of the science workforce: 37.4% (2.1m) is located in the East, the South East and London. In comparison, 36.7% of the entire UK economy workforce is located in these regions. The North West, Scotland and the South West are notable employment locations outside of the South Eastern 'hub' for the science workforce.

The Health and Education sectors employ 60% of the science workforce and the remaining 40% of the science workforce is distributed across a range of sectors.

Primary science occupations make up the largest share of the workforce in the Research & Development, Pharmaceuticals and Chemical sectors.

Secondary science occupations make up the largest share of the workforce in the Education, ICT, Health and Consultancy sectors.

The qualification profile of the science workforce

A much higher proportion of employees in science based roles (compared to the non-science and the all economy average) are qualified to post-graduate level (25%).

Education, Research & Development and Consultancy all have a much higher than average proportion of the science workforce qualified to post-graduate level. These sectors also tend to have a relatively high proportion of the workforce qualified to graduate level, but low proportions at non-graduate and with unknown or other qualifications.

Advanced manufacturing, Energy & Environmental, Construction & Installation, Manufacturing, Metals and Rubber and Plastics all show high levels of non-graduate employment (in each sector greater than 55% of the science workforce is qualified at this level).

ICT has the highest proportion of science workers whose highest qualification is at graduate level (47%), followed by Consultancy, the Public Sector and Professional Organisations.

Workforce characteristics

Overall, the primary science workforce has a gender balance of 60/40 (male/female). This is similar to the UK working population, which is 54/46 (male/female). Only the Health sector has more female science workers than male and only a few sectors are close to a 50/50 distribution between female and male workers. A number of sub-sectors have much higher proportions of male employees than female employees including:

- Manufacturing where 96% of employees are male.
- Construction & Installation and Military where 94% of employees are male.
- ICT where 91% of employees are male.

This varies slightly when considering the secondary science workforce. A higher proportion of women take up secondary science roles, with the gender balance being 44% male and 56% female. There are some interesting nuances by sector including:

- A far greater proportion of women work in secondary science roles compared to primary science roles in Textiles, Health, Pharmaceuticals and Education.
- A far smaller proportion of women work in secondary science roles in Agriculture & Aquaculture
- The gender balance in Metals is virtually identical in both primary and secondary science occupations.

Though the overall gender balance is similar for science workers, in science based sectors, there is an extreme difference in the gender balance for science based workers in non-science sectors. There are just over 720k core and secondary science workers employed in non-science sectors, of which 73% are male and 27% are female. This suggests that there is a strong bias towards employing men in science roles where the core activity of the organisation is not science based.

Age

The primary workforce is slightly younger than the secondary science workforce, with an average age of 41 compared to 43. Whilst a high proportion of both primary and secondary workers tend to be aged between 35 and 54, a much greater proportion of primary workers are aged between 16 and 34 and a smaller proportion are aged over 55.

Food & Drink, Rubber & Plastics, Textiles and the Military employ the highest proportion of 16-24 year old science workers. In the 25-34 age group, ICT, the Military, Research & Development and Rubber & Plastics are all top employers. Agriculture & Aquaculture, Metals and Professional Organisations and Consultancy all employ an above average proportion of science workers in the over 65 age group.

If the typical graduate age is taken to be 21–22, the main sector in which science workers of this age group (16-24) are distinctly under represented is the Public Sector. Considering the first few years of graduate employment up to the age of perhaps 26-27, science workers of this age group (24-34) tend to be under represented to a greater extent in Agriculture & Aquaculture and Construction & Installation.

Length of time in sector

The amount of time an individual has been working in their role is indicative of their employment choices and movement. Approximately 30% of the science workforce has been in their current role for between 1 and 5 years and 40% for between 6 and 20 years.

Research & Development has by far the largest proportion of science workers who have been in employed in their current position for less than 1 year. Agriculture & Aquaculture has the largest proportion of workers who have been in their current role for more than 20 years. The Textiles sector has a much higher than average proportion of the workforce remaining in the same position for between 6 and 20 years.

Salary and wage

The variation in the average wage per hour earned by science workers alongside averages for primary science workers, secondary science workers and those employed in non-science roles in science based sectors has some interesting components:

- The highest paid primary science workers are employed in the Public Sector. The lowest paid work in the Textiles sector.
- The highest paid secondary science workers are employed in Education. The lowest paid work is again in the Textiles sector, closely followed by Agriculture & Aquaculture.
- In related science sectors, workers employed in secondary science roles earn more per hour than primary science workers.
- In ICT, the Military and to a lesser extent the Consultancy sectors, non-science workers earn more than primary science workers.
- There are more instances of non-science workers being paid above the science sector average wage for non-science workers, than there are primary or secondary science workers being paid above their respective science sector averages.
- The average science wages are generally higher than the average wage across the whole economy.

Science workers who are employed in non-science sectors are generally paid a lower average wage than their peers in science based sectors. However, the average wage for a primary science worker is not very dissimilar to that earned by a primary science worker in a core science sector.

Workforce in the future

The UKCES 2010 National Strategic Skills Audit provides an insight into the growth areas of the economy, highlighting where new jobs are anticipated. The areas of the economy which are predicted to grow include the following, all of which are relevant to the core and/or related sectors detailed in this study:

- Advanced manufacturing
- Low carbon economy
- Digital economy
- Life sciences and pharmaceuticals
- Professional and financial services
- Engineering/construction

A number of studies and reports have been produced that investigate the future demand for STEM graduates. However, at the time of writing there are no specific forecasts available to provide occupational level data on the future science workforce. In the absence of forecasts, this research uses employment projections based on employment trends demonstrated in the last five years.

Projections show that if increases continue, 7.1m people will be employed in either a primary or secondary science role by 2030.

Between 2009 and 2030, the Core Science Sectors will grow by 301,180 workers. Of these new workers, 60% will be in Non Science Occupations (183k), 26% in secondary science workers (78k) and 14% in primary science occupations (42k).

Between 2009 and 2030, the Related Science Sectors will grow by 620,740 workers. Of these new workers, 73% will be in Non Science Occupations (453k), 24% in secondary science workers (149k) and 3% in primary science occupations (18k).

1. Introduction

Since 2004 the Science Council has operated the Chartered Scientist register (CSci), which recognises high levels of professionalism and competence in science. CSci is a voluntary registration scheme that operates under the license of its 23 Licensed Bodies and is open to scientists with a Masters-level qualification or equivalent together with professional development sufficient to demonstrate they have attained a specified set of competencies.

This research was commissioned to explore the potential market for new registers in science to provide professional recognition for those who are not practicing at the level of Chartered Scientist. The ambition is for two additional registration levels to be created, broadly described as *technician* and *intermediate*, to sit alongside the CSci qualification.

The aim of expanding the current system of registration is to raise the professional standing of those working in science and its applications at all levels. It is also a useful tool in ensuring that opportunities for further training and professional development for workers in science exist. The new registration levels would seek to provide a progression route for individuals and to allow professional registration for scientists across all sectors of the economy.

With this in mind, the specific objectives of this particular piece of research were to provide labour market intelligence of the current and future UK science workforce by:

- Developing comprehensive data on the current UK science workforce.
- Understanding the profile of employment across the skills levels.
- Providing a view on the future workforce and where demand for graduates is likely to be the highest.

Once the evidence base has been established it can then be used to aid in exploring the potential for expanding registration to technician and intermediate level. To this end, a separate report will then be produced that recommends the best course of action in terms of registration expansion. This recommendations report will be based on key findings from this evidence report on the current and likely future profile of employment within the science workforce.

A linked piece of work, also commissioned by the Science Council, explores the perceptions of individuals and employers towards professional body membership and registration and seeks to understand their professional development needs. Together these projects will deliver the detailed evidence necessary to establish the business case for new registers.

2. Methodology

Two key principles underpin the methodological approach taken in this study:

1. The analysis must be robust, consistent and replicable, such that the data can be compared to other LMI and workforce studies, and could be updated in the future.

2. Science workers transcend traditional sectoral definitions. Science is not a niche activity; it is not easily defined by a small number of occupations and it is not represented only in a small number of sectors.

The first principle drove the decision to create a new analysis, using a few data sources consistently, rather than attempting to draw information from disparate existing reports, with different methodological approaches.

The second principle supported the decision for this research to take a novel approach, presenting a view of the science workforce across the entire economy, rather than looking at total employees within science based industries.

The research uses data from the Annual Population Survey (APS) in an 'industry/occupation matrix' which identifies for each science occupation, the sector in which that scientist is most likely to work. This is an innovative approach, enabling an understanding of the true size and scope of the science workforce across the economy, rather than limiting the research to considering scientists working in a narrow band of science sectors. TBR has employed this methodology to great effect when conducting workforce studies in other sectors, perhaps most notably for creative occupations, which are notoriously difficult to measure and are not easily confined to sectoral definitions.

In order to consider likely future employment, the research draws on forecast information available from the existing literature and also uses historical data from the APS to model employment projections for key sub-sectors and the science workforce as a whole.

To analyse the trends and project them forwards over the next 10 years, the research employs a simple linear regression '*Least Squares Approximation*'. This method attempts to find a 'line of best fit' for the data series in question. The premise is that the line is used as an estimator, and the best estimator is the line that produces the smallest difference from the actual values to the estimated values. The line that produces the smallest difference is then used to estimate future values in the data series, and provides an approximation that is more accurate than that of comparative annual growth rate.

Whilst this report does significantly advance the Science Council's understanding of the science workforce, it is important to note some limitations of the methodology:

- The APS does not allow for an understanding of the subject taught by teachers in the education sector. As such, it has not been possible to specifically isolate science teachers in the data.

- The APS variable used to understand an individual's highest qualification (HIQUAL) does not allow for the separation between a foundation degree and a first degree. Whilst this is not particularly problematic, a separation would have been interesting.

- It is important to note that this highest qualification level does not necessarily align with the current employment level. It is feasible that a person whose highest qualification is at post-graduate level may well be employed in a graduate level role.

- The approach uses projections, not forecasts. As such they are based purely on trends demonstrated in previous years and do not draw in any external data to moderate the projection.

2.1 Definitions

In order to develop a definition for the science workforce, the research consulted with the Science Council's New Registers Advisory Group which guided the identification of:

- 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. E.g. Chemists, Science & Engineering Technicians, Pharmacists & Pharmacologists or Bio Scientists and Biochemists.
- 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. E.g. Civil and Mechanical Engineers, Conservation & Environmental Protection Officers, Environmental Health Officers, Teaching Professionals.
- Non-science workers: workers in occupations that are not science based and have no requirement for science based knowledge or skills. E.g. Travel Agents, Town Planners, Musicians, Legal Professionals, and Housing & Welfare Officers.

Similarly the group also provided guidance on the classification of sectors into:

- 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.

With this in mind the following tables provide an overview of the 'core' and 'related' sector definitions used as the starting point to consider how many of the workers employed in the sector are in 'primary' or 'secondary' science occupations.

Additional tables detailing the primary and secondary occupations, as well as the remaining activity classified as 'non-science', are available from the Science Council on request.

It should be noted that throughout the report, unless specifically noted, data are presented for the 'aggregated' science workforce. I.e. primary and secondary science workers combined.

Table 1: Core science sectors

Sub-Sector	Segment
Advanced Manufacturing	Aerospace
	Measuring, Testing & Navigation Instruments
Chemicals	Agrochemicals
	Basic Chemicals
	Other Chemicals
	Paints, Varnishes & Coatings
	Retail
	Soap & Detergents
	Wholesale
Energy & Environmental	Energy
	Environmental
Health	Freelancers & Specialists
	Hospitals
	Retail
	Social Work
	Veterinary
Pharmaceuticals	Manufacturing
	Retail
	Wholesale
Research & Development	Natural Sciences
	Social Sciences
	Technical Testing

Table 2: Related science sectors

Sub-Sector	Segment
Agriculture & Aquaculture	Agriculture
	Aquaculture
Construction & Installation	Construction
	Installation
Consultancy	Architectural & Engineering
	Management
Education	Higher
	Other
	Primary
	Secondary
Food & Drink	Drink
	Food
ICT	Computer Programming & Services
	Data Processing & Services
Manufacturing	Electronics
	Hydraulics
	Motor Vehicles
Metals	Casting
	Ferrous Metals
	Non-Ferrous Metals
	Repair
Military	Defence
Professional Organisations	Business, Employers, Professional Organisations
	Other
Public Sector	Policy & Planning
	Regulation
	Services
Rubber & Plastics	Plastics
	Rubber
Textiles	Manufacture of leather products
	Manufacture of Textiles
	Manufacture of wearing apparel

3. The current UK science workforce

The diagram below provides an overview of the distribution of the science workforce across the economy, showing the number of people employed in core, related and non-science sectors and the distribution of employment within these sectors provided by primary, secondary and non-science workers.

The core science sector employs approximately 5.4m workers, of which 734k are in primary science roles. However, there are an additional 470K primary workers employed in related and non-science sectors.

Workers	In the related sector
Primary	335,410
Secondary	2,624,170
Non-Science	7,974,400
Total	**10,933,980**

Workers	In the core sector
Primary	733,980
Secondary	1,378,490
Non-Science	3,267,710
Total	**5,380,180**

Workers	In the non-science sector
Primary	135,170
Secondary	584,150
Non-Science	11,610,100
Total	**12,329,420**

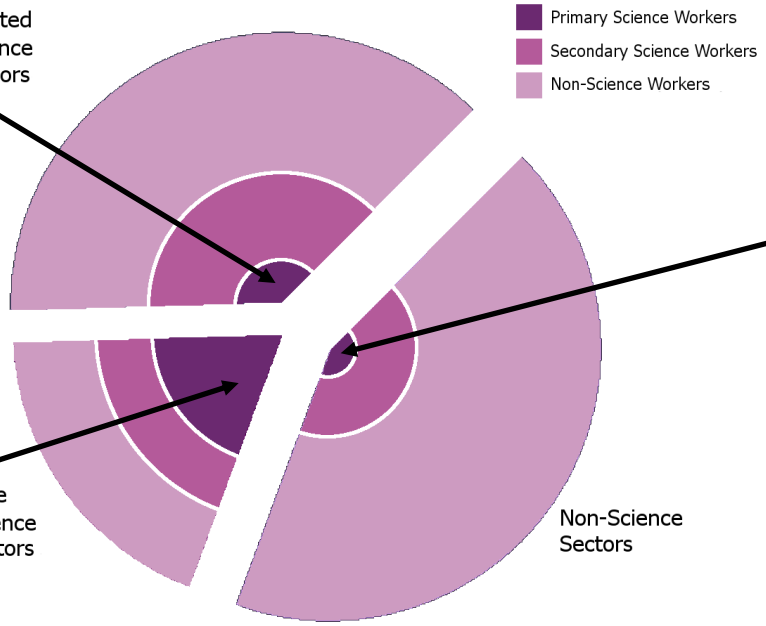


Table 3 (below) provides a detailed overview of the breakdown of employment by primary and secondary science occupations, across the core and related science sub-sectors[1]. Key headlines from the data are:

- 5.8m people are employed in science based occupations
    - 1.2m primary science workers
    - 4.6m secondary science workers
- This equates to 20% of the UK workforce employed in science roles
    - 4% in primary science occupations
    - 16% in secondary science occupations
- This 'permeation' of science workers across the economy means that the employment distribution is very similar to total economy averages
- 37.4% (2.1m) of the science workforce is located in the East, the South East and London. In comparison, 36.7% of the entire UK economy workforce is located in these regions
    - 36.5% (439k) of the primary science workforce is working in these regions
    - 37.7% (1.7m) of the secondary science workforce is working in these regions
- The North West, Scotland and the South West are notable employment locations outside of the South Eastern 'hub'
    - 11.9% of the primary science workforce in North West (compared to 10.8% of the entire UK economy workforce in this region)
    - 9.5% of the primary science workforce in Scotland (compared to 8.7% of entire UK economy workforce in this nation)
    - 9% of the primary science workforce in the South West (compared to 8.8% of the entire UK economy workforce in this region)
- The Health and Education sectors employ 60% of the science workforce
    - Health = 1.6m science workers (474k primary and 1.2m secondary)
    - Education = 1.3m science workers (72k primary and 1.3m secondary)
- The remaining 40% of the science workforce is distributed across a range of sectors, with Construction & Installation, the Public Sector, ICT and Consultancy combined accounting for 22%:
    - Construction = 8% (63k primary and 300k secondary)
    - Public sector = 5% (43k primary and 227k secondary)
    - ICT = 5% (7k primary and 224k secondary)
    - Consultancy = 5% (50k primary and 178k secondary)

[1] Further detailed tables are available from the Science Council on request.

- Primary science occupations make up the largest share of the workforce in the Research & Development (R&D), Pharmaceuticals and Chemical sectors. People in primary science roles equate to:
    - 30% of the R&D workforce
    - 23% of the Pharmaceuticals workforce
    - 21% of the Chemical sector workforce
- Secondary science occupations make up the largest share of the workforce in the Education, ICT, Health and Consultancy sectors. People in secondary roles equate to:
    - 46% of the Education workforce
    - 45% of the ICT workforce
    - 30% of the Health workforce
    - 25% of the Consultancy workforce

Table 3: Breakdown of employment across the economy

Sector		Primary science workers	Secondary science workers	Non-Science workers	Total workers	% Primary	% Secon-dary	% Non-Science
Core	Health	474,050	1,162,970	2,223,080	3,860,100	12%	30%	58%
	Energy & Environmental	47,220	66,910	391,160	505,290	9%	13%	77%
	Pharmaceuticals	67,340	47,820	181,000	296,160	23%	16%	61%
	Research & Development	84,920	46,760	153,370	285,050	30%	16%	54%
	Advanced Manufacturing	26,310	43,150	199,940	269,400	10%	16%	74%
	Chemicals	34,150	10,890	119,140	164,180	21%	7%	73%
Total employed in core science sectors		733,980	1,378,490	3,267,710	5,380,180	14%	26%	61%
Related	Education	72,250	1,349,750	1,532,090	2,954,090	2%	46%	52%
	Construction & Installation	63,160	300,350	2,033,880	2,397,390	3%	13%	85%
	Public Sector	43,840	227,960	1,419,640	1,691,440	3%	13%	84%
	Manufacturing	23,120	87,220	696,720	807,060	3%	11%	86%
	Consultancy	50,590	178,950	497,890	727,430	7%	25%	68%
	Food & Drink	21,380	117,180	581,160	719,720	3%	16%	81%
	ICT	7,560	224,710	262,530	494,800	2%	45%	53%
	Agriculture & Aquaculture	4,270	44,610	254,750	303,630	1%	15%	84%
	Military	21,240	26,030	206,630	253,900	8%	10%	81%
	Professional Organisations	10,190	30,730	198,200	239,120	4%	13%	83%
	Textiles	3,440	4,090	109,330	116,860	3%	3%	94%
	Rubber & Plastics	8,030	26,850	79,870	114,750	7%	23%	70%
	Metals	6,320	5,730	101,710	113,760	6%	5%	89%
Total employed in related science sectors		335,410	2,624,170	7,974,400	10,933,980	3%	24%	73%
Total employed in all science sectors		1,069,780	4,000,200	11,231,570	16,301,560	7%	25%	69%
Total employed in non-science sectors		135,170	584,150	11,610,100	12,329,420	1%	5%	94%
Total employed across economy		**1,204,560**	**4,586,810**	**22,852,210**	**28,643,580**	**4%**	**16%**	**80%**

Source: APS 2009 (TBR Ref: W1, S0)

3.1 The education workforce

Unfortunately, due to the way that teachers are classified in the SOC system, there is no way to ascertain whether employees are science based teachers or not. As such, it is important to note here that in the education sector all teachers are included as secondary science workers, including those who are science teachers.

However, additional research by the Science Council, suggests that there are approximately 70,000-100,000 science teachers working across the UK. These individuals should be counted as primary science workers, as opposed to secondary science workers.

In order to retain the consistency of the methodology, this figure has not been integrated into the main data analysis. However, Table 4 below shows how the distribution of the science workforce in Education would change if a minimum of 70,000 science teachers identified in the research were to be included as primary science workers.

Table 4: Education workforce: science teachers as primary science workers

Sector	Primary science workers	Secondary science workers	Non-Science workers	Total workers	% Primary	% Secon-dary	% Non-Science
Education	142,250	1,279,750	1,532,090	2,954,090	5%	43%	52%

Source: APS 2009 (TBR Ref: W1, S0)

It interesting to note that this pushes the proportion of primary workers in the Education sector to 5%, which is above the average proportion of primary science workers across the economy (4%).

It should be noted though that those science researchers who work in higher education establishments are captured and will be categorised as primary science workers within the education sector (i.e. incorporated in the 72,250 workers in Table 3). Similarly teaching professionals who work in higher education establishments are captures and catergorised as secondary science workers within the education sector.

4. The qualification profile of the science workforce

This section considers the highest qualifications held by employees across the science workforce, grouping qualifications as follows:

- Pre-graduate = qualifications up to and including QCF level 4
    - This is split between QCF Levels 1&2 combined and QCF Levels 3&4 combined
- Graduate = foundation and first degrees (QCF levels 5 and 6) [2]
- Postgraduate = post graduate diplomas, masters, doctorates (QCF levels 7 and 8)

It should be noted that the highest qualification held by an individual may not necessarily be a science based qualification, it is just the highest level of qualification that an individual has.

A complication of assessing the qualification level of the workforce in this way is that the analysis tends to reflect the qualifications available to the sector, rather than the qualifications required to work in the sector. This is particularly apparent when looking at sectoral differences in the qualifications profile. It is important, therefore to remember that the qualification level does not necessarily align with the employment level. It is feasible that a person whose highest qualification is at post-graduate level may be employed in a graduate level role. This is a common feature across sectors and a well documented challenge for employers.

As shown in Table 5 below, a much higher proportion of employees in science based roles (compared to the non-science and all economy average) are qualified to post-graduate level. However, more than two thirds of primary science and secondary science workers have a highest qualification that is either at pre-graduate or graduate level.

There are also variations by sector:

- Education, Research & Development and Consultancy all have a higher than average proportion of the science workforce qualified to post-graduate level (53%, 39% and 31% respectively).
    - These sectors also tend to have a relatively high proportion of the workforce qualified to graduate level, but low proportions at pre-graduate and with unknown or other qualifications. This is likely to be a reflection of the qualification pathways into employment (particularly in Education where a post-graduate qualification is the mandatory route into teaching).
- Advanced Manufacturing, Energy & Environmental, Construction & Installation, Manufacturing, Metals and Rubber and Plastics all show high levels of pre-graduate employment (in each sector greater than 55% of the science workforce is qualified at this level).
    - In a similar 'polarising' pattern to that seen above, these sectors all tend to employ a low level of post-graduate qualified science workers. Again, this is likely to be a reflection of the qualifications available and the pathways into employment.
- There tend to be fewer extremes in terms of sectors with above average levels of graduate employment. ICT has the highest proportion of science workers whose highest qualification is at this level (47%), followed by Consultancy, the Public Sector and Professional Organisations (38%, 37% and 36% respectively).
    - When compared to the non-science and all economy averages (18% and 15% respectively), the proportion of science workers qualified to graduate level is much

[2] We recognise that foundation and first degrees differ in level on the QCF. However, the highest qualification variable in the APS groups these qualifications together.

higher (31% primary and 32% secondary). Health, Pharmaceuticals, R&D and the Military all employ at least double the non-science worker average of graduates.

Table 5: Science workforce qualification profile by sector - proportions

Sector		Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown /No Qual	Total
Core	Advanced Manufacturing	18%	45%	20%	9%	4%	4%	100%
	Chemicals	23%	28%	20%	10%	12%	8%	100%
	Energy & Environmental	16%	41%	24%	11%	6%	3%	100%
	Health	12%	32%	33%	16%	5%	2%	100%
	Pharmaceuticals	18%	25%	34%	17%	4%	2%	100%
	Research & Development	7%	14%	34%	39%	5%	1%	100%
Core science sectors average		**12%**	**32%**	**32%**	**17%**	**5%**	**2%**	**100%**
Related	Agriculture & Aquaculture	23%	31%	11%	3%	13%	19%	100%
	Construction & Installation	22%	37%	22%	7%	7%	5%	100%
	Consultancy	9%	19%	38%	31%	3%	1%	100%
	Education	3%	6%	35%	53%	2%	1%	100%
	Food & Drink	31%	19%	8%	2%	22%	19%	100%
	ICT	7%	18%	47%	18%	8%	2%	100%
	Manufacturing	28%	30%	14%	9%	9%	11%	100%
	Metals	19%	38%	19%	13%	6%	5%	100%
	Military	14%	31%	32%	18%	3%	2%	100%
	Professional Organisations	16%	20%	36%	23%	5%	0%	100%
	Public Sector	10%	24%	37%	23%	3%	2%	100%
	Rubber & Plastics	32%	26%	7%	0%	14%	21%	100%
	Textiles	25%	24%	4%	1%	16%	29%	100%
Related science sectors average		**10%**	**17%**	**32%**	**34%**	**5%**	**3%**	**100%**
Combined science sectors average		**11%**	**23%**	**32%**	**26%**	**5%**	**3%**	**100%**
Non-science sectors average		**20%**	**27%**	**28%**	**13%**	**5%**	**6%**	**100%**
Total economy average		**29%**	**27%**	**18%**	**9%**	**8%**	**9%**	**100%**

Source: APS 2009 (ref: W11/S1) *Primary and Secondary workers combined*

When considering the table above by occupation regardless of sector, the following results are seen.

Table 6: Qualification profile by workforce - proportions

Sector	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown /No Qual	Total
Primary science worker average	12%	25%	31%	25%	5%	2%	100%
Secondary science worker average	12%	23%	32%	25%	5%	4%	100%
Non-science worker average	33%	28%	15%	5%	8%	11%	100%
Total economy average	**29%**	**27%**	**18%**	**9%**	**8%**	**9%**	**100%**

Source: APS 2009 (ref: W11/S1)

Table 7: Science workforce qualification profile by sector - figures

Sector		Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown /No Qual	Total
Core	Advanced Manufacturing	12,590	30,920	13,990	6,420	2,740	2,830	69,460
	Chemicals	10,410	12,450	8,870	4,290	5,620	3,390	45,040
	Energy & Environmental	18,240	46,610	27,000	12,100	6,320	3,860	114,130
	Health	188,730	531,820	544,340	258,080	76,350	37,690	1,637,020
	Pharmaceuticals	20,530	28,450	39,600	19,890	4,670	2,000	115,160
	Research & Development	8,810	18,970	44,610	51,760	5,930	1,580	131,680
Total employed in core science sectors		259,320	669,210	678,420	352,530	101,660	51,350	2,112,470
Related	Agriculture & Aquaculture	11,300	15,170	5,300	1,440	6,550	9,130	48,880
	Construction & Installation	80,990	134,190	79,010	26,330	24,940	18,070	363,510
	Consultancy	20,420	44,440	86,830	70,150	6,190	1,510	229,540
	Education	48,980	88,500	495,670	754,660	22,960	11,230	1,422,000
	Food & Drink	42,440	25,880	10,550	2,930	29,910	26,830	138,560
	ICT	15,700	42,200	106,680	42,370	18,320	4,100	229,400
	Manufacturing	30,530	33,530	15,340	9,500	9,420	12,040	110,340
	Metals	2,280	4,610	2,270	1,540	700	660	12,050
	Military	6,890	15,050	15,220	8,670	1,360	870	48,080
	Professional Organisations	6,610	8,000	14,790	9,350	2,160	0	40,920
	Public Sector	26,630	66,020	101,730	63,780	8,720	4,910	271,800
	Rubber & Plastics	11,180	9,060	2,320	170	4,810	7,350	34,880
	Textiles	1,860	1,830	330	60	1,230	2,220	7,530
Total employed in related science sectors		305,830	488,490	936,080	990,960	137,260	98,910	2,957,510
Total employed in all science sectors		565,150	1,157,700	1,614,500	1,343,490	238,920	150,260	5,069,980
Total employed in non-science sectors		146,600	195,590	199,600	95,050	38,160	46,380	721,390
Total employed across economy		**8,208,720**	**7,772,340**	**5,269,760**	**2,565,670**	**2,187,900**	**2,639,190**	**28,643,580**

Source: APS 2009 (ref: W11/S1) *Primary and Secondary workers combined*

When considering the table above by occupation regardless of sector, the following results are seen.

Table 8: Qualification profile by workforce - figures

Sector	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown /No Qual	Total
Primary science worker total	149,330	298,530	367,630	299,180	60,000	29,900	1,204,560
Secondary science worker total	562,420	1,054,760	1,446,450	1,139,350	217,090	166,730	4,586,810
Non-science worker total	7,496,970	6,419,050	3,455,680	1,127,140	1,910,810	2,442,560	22,852,210
Total employed across economy	**8,208,720**	**7,772,340**	**5,269,760**	**2,565,670**	**2,187,900**	**2,639,190**	**28,643,580**

Source: APS 2009 (ref: W11/S1)

5. Workforce characteristics

In order to provide further insight on the characteristics of the science workforce, the following section provides data on:

- Gender
- Age
- Length of time working in the sector and
- Wages.

5.1 Gender

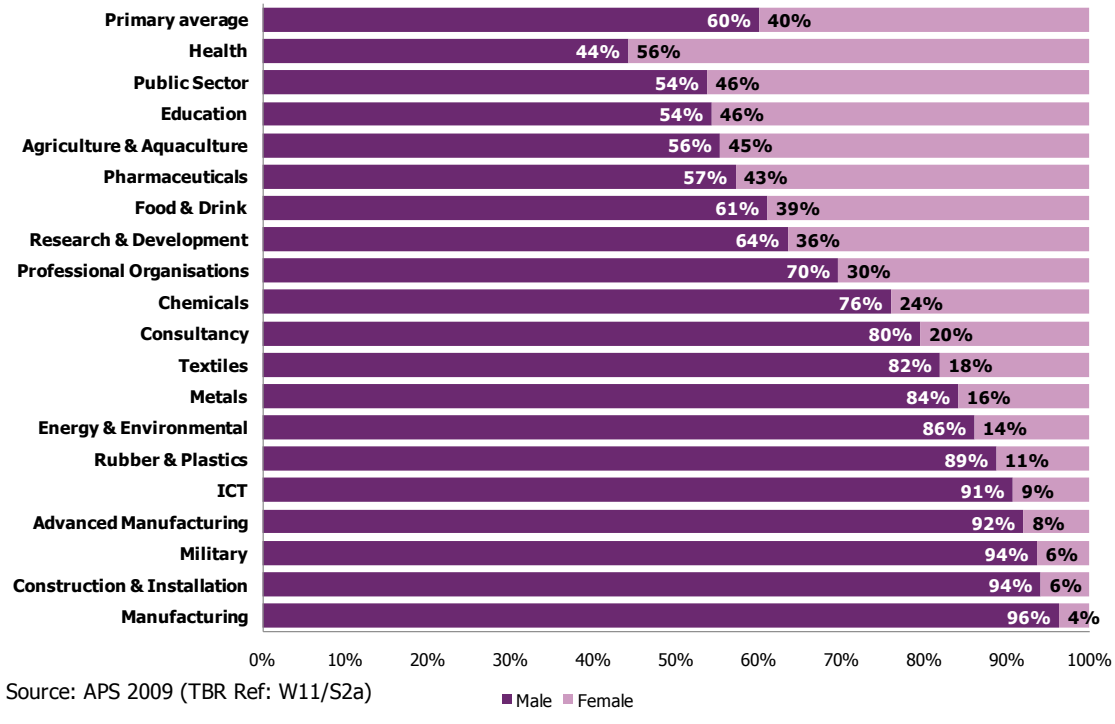
The analysis in this section considers the gender balance of primary and secondary science workers who are employed in science based sectors.

The primary science workforce has a relatively even gender balance, with a 10% skew to male workers. Only the Health sector has more female science workers than male. However, a number of sectors including Agriculture and Aquaculture, Public Sector, Pharmaceuticals and Education are close to a 50/50 distribution between female and male workers. The UK working population has a 54% male and 46% female split (APS 2009) showing that these sectors are close to the national average.

A number of other sub-sectors have much higher proportions of male employees than female employees including:

- Manufacturing where 96% of employees are male (92% in Advanced Manufacturing are Male)
- Construction and Installation and Military where 94% of employees are male
- ICT where 91% of employees are male

Figure 1: The primary science workforce gender split



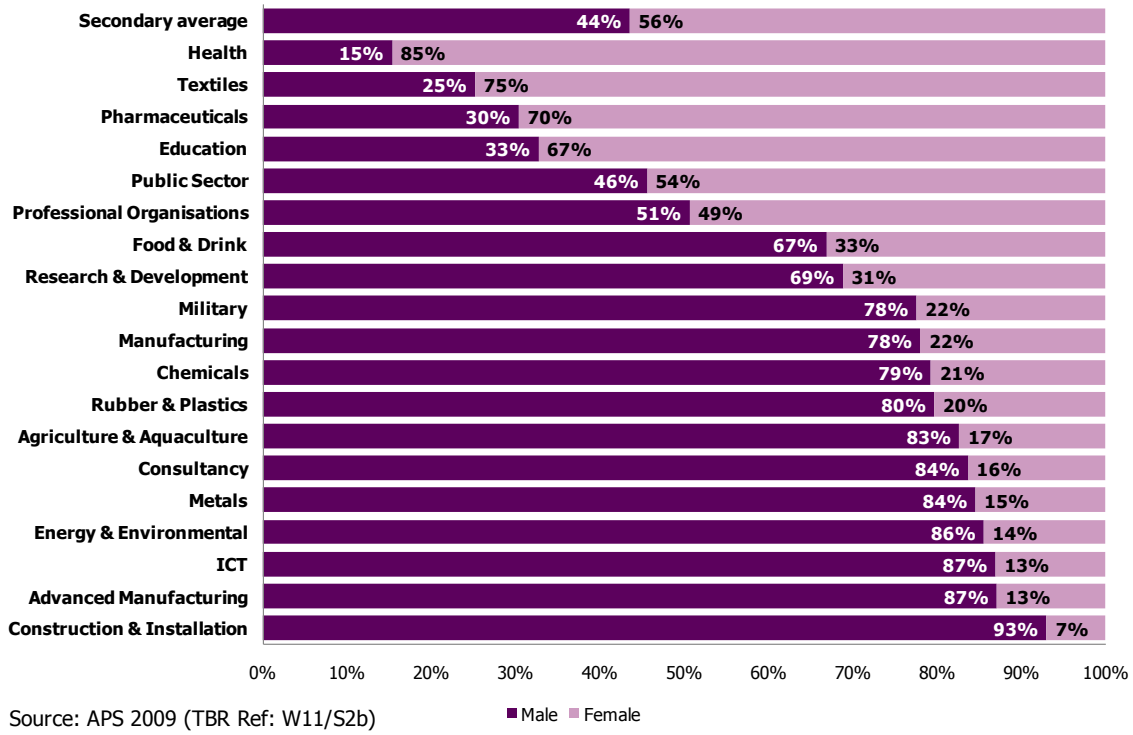
Source: APS 2009 (TBR Ref: W11/S2a)

This varies slightly when considering the secondary science workforce. A higher proportion of women take up secondary science roles, with the gender balance being 44% male and 56% female (compared to 40% female above).

However, there are some interesting differences by sector:

- A far greater proportion of women work in secondary science roles compared to primary science roles in Textiles, Health, Pharmaceuticals and Education.
- A far smaller proportion of women work in secondary science roles in Agriculture & Aquaculture.
- The gender balance in Metals is virtually identical in both primary and secondary science occupations.

Figure 2: The secondary science workforce gender split



Source: APS 2009 (TBR Ref: W11/S2b)

5.1.1 The gender balance in non-science sectors

It is interesting to note the extreme difference in the gender balance for science based workers in non-science sectors. There are just over 720k core and secondary science workers employed in non-science sectors, of which 73% are male and 27% are female.

That this is so different to the gender balance within science based sectors suggests that there is a strong bias towards employing men in science roles where the main activity of the organisation is not science based.

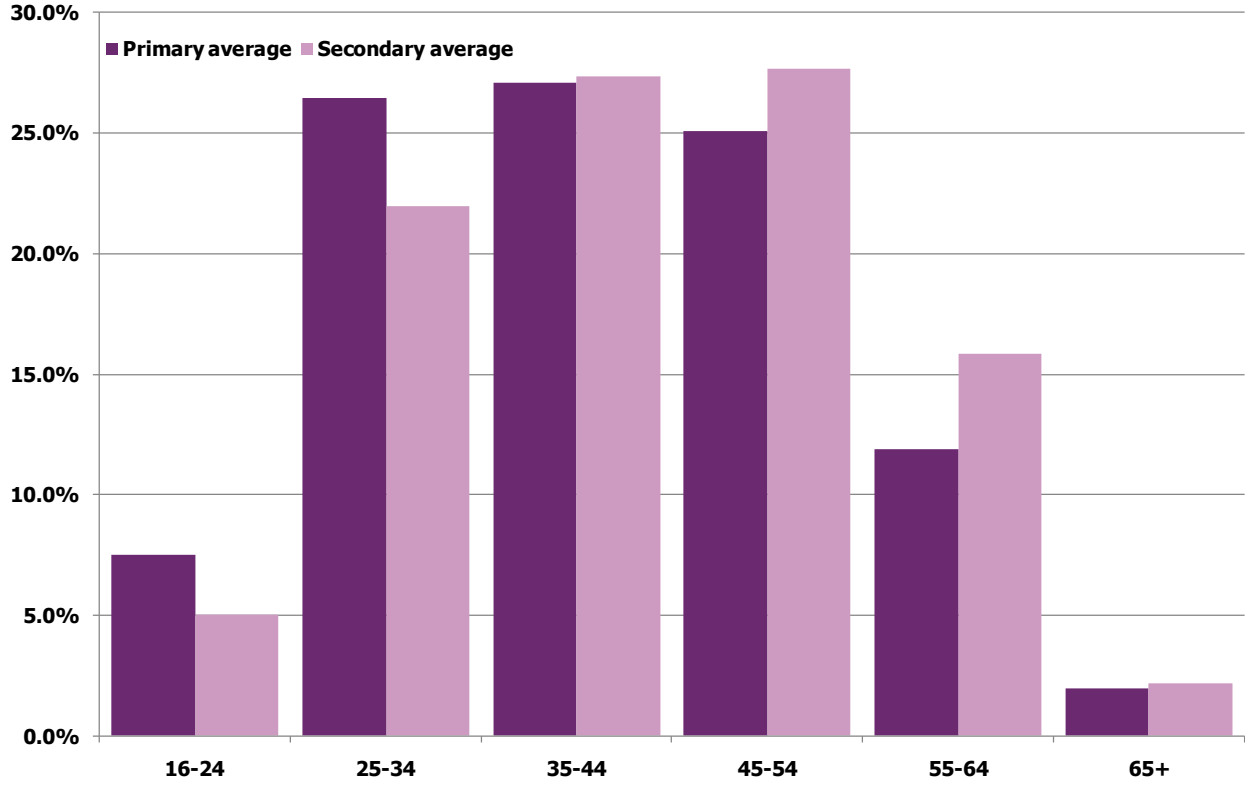
5.2 Age

The analysis in this section considers the age distribution of primary and secondary workers who are employed in science based sectors.

The primary workforce is slightly younger than the secondary science workforce, with an average age of 41 compared to 43.

As shown in Figure 3 (below) whilst a high proportion of both primary and secondary workers tend to be aged between 35 and 54, a much greater proportion of primary workers are aged between 16 and 34 and a smaller proportion are aged over 55.

Figure 3: The age distribution of the science workforce



Source: APS 2009 (TBR ref: W11/S3a)

Table 9 below presents the age distribution of the science workforce as a whole by sector. Cells in the table have been highlighted where the sector employs a higher than average proportion of all science workers in a particular age bracket: The table shows that:

- Food & Drink, Rubber & Plastics, Textiles and the Military employ the highest proportion of 16-24 year old science workers. All have approximately double the average proportion of workers in this age group.
- ICT, the Military, Research & Development and Rubber & Plastics are all top employers in the 25-34 age group. Whilst a number of sectors employ above the average in this age category, these are all close to 7% points above the average.
- Agriculture & Aquaculture, Metals and Professional Organisations and Consultancy all employ an above average proportion of science workers in the over 65 age group. Agriculture and Metals particularly have a much higher proportion of workers above the traditional retirement age.
- If the typical graduate age is taken to be 21–22, the main sector in which science workers of this age group (16-24) are distinctly under represented is the Public Sector. Considering the first few years of graduate employment up to the age of perhaps 26-27, science workers of this age group (24-34) tend to be under represented to a greater extent in Agriculture & Aquaculture and Construction & Installation.

Table 9: Science workforce age distribution by sector

Sector		16-24	25-34	35-44	45-54	55-64	65+	Total
Core	Advanced Manufacturing	4.7%	**23.4%**	**30.4%**	**28.3%**	11.4%	1.8%	100%
	Chemicals	5.3%	18.5%	**28.4%**	**31.9%**	14.1%	1.8%	100%
	Energy & Environmental	**7.1%**	22.7%	26.2%	**27.2%**	**15.5%**	1.3%	100%
	Health	5.4%	21.7%	**29.1%**	**29.1%**	13.1%	1.7%	100%
	Pharmaceuticals	**8.1%**	**27.3%**	**32.8%**	21.2%	9.3%	1.3%	100%
	Research & Development	**9.3%**	**29.6%**	**27.6%**	22.4%	9.8%	1.4%	100%
Core science sectors average		**5.8%**	**22.5%**	**29.1%**	**28.1%**	**12.8%**	**1.6%**	**100%**
Related	Agriculture & Aquaculture	**6.3%**	14.4%	17.3%	**29.5%**	**22.8%**	**9.7%**	100%
	Construction & Installation	**6.4%**	16.9%	**31.5%**	27.0%	**15.5%**	**2.7%**	100%
	Consultancy	4.6%	**23.7%**	26.7%	23.5%	**16.6%**	**4.9%**	100%
	Education	4.5%	**23.5%**	23.9%	26.6%	**19.2%**	**2.3%**	100%
	Food & Drink	**13.3%**	**26.1%**	22.9%	23.9%	12.9%	0.9%	100%
	ICT	4.7%	**32.8%**	**32.7%**	22.0%	6.8%	1.0%	100%
	Manufacturing	5.2%	**25.6%**	**27.4%**	27.1%	13.8%	0.9%	100%
	Metals	**7.5%**	21.6%	**34.4%**	22.9%	6.2%	**7.3%**	100%
	Military	**10.0%**	**30.0%**	22.4%	**29.1%**	8.5%	0.0%	100%
	Professional Organisations	**9.0%**	19.2%	23.7%	26.1%	**16.8%**	**5.1%**	100%
	Public Sector	2.6%	19.6%	**27.6%**	**31.2%**	**16.7%**	**2.2%**	100%
	Rubber & Plastics	**12.2%**	**28.1%**	22.5%	25.5%	11.4%	0.2%	100%
	Textiles	**11.3%**	19.7%	18.1%	**32.1%**	**18.1%**	0.8%	100%
Related science sectors average		**5.3%**	**23.2%**	**26.0%**	**26.4%**	**16.6%**	**2.5%**	**100%**
Combined science sectors average		**5.5%**	**22.9%**	**27.3%**	**27.2%**	**15.0%**	**2.1%**	**100%**
Non-science sectors average		**7.3%**	**25.0%**	**30.1%**	**23.1%**	**12.3%**	**2.3%**	**100%**
Total economy average		**13.4%**	**21.3%**	**25.1%**	**23.4%**	**14.4%**	**2.5%**	**100%**

Source: APS 2009 (TBR Ref: W11, S3) *Primary and Secondary workers combined*

When considering the table above by occupation regardless of sector, the following results are seen.

Table 10: Age distribution of each workforce

Sector	16-24	25-34	35-44	45-54	55-64	65+	Total
Primary science worker average	7.8%	25.6%	27.4%	24.9%	12.6%	1.8%	100%
Secondary science worker average	5.2%	22.6%	27.7%	27.1%	15.2%	2.2%	100%
Non-science worker average	15.3%	20.9%	24.5%	22.6%	14.3%	2.5%	100%
Total economy average	**13.4%**	**21.3%**	**25.1%**	**23.4%**	**14.4%**	**2.5%**	**100%**

Source: APS 2009 (TBR Ref: W11, S3)

5.2.1 The age distribution in non-science sectors

Table 11 below shows the age distribution of primary and secondary science workers employed in non-science sectors. The differences here are less extreme than those seen in the gender data. However, they do point to a tendency for non-science sectors to employ slightly younger science workers.

Table 11: Non-science sector age distribution

Age band	Science workers in non science sectors	% point difference to science average
16-24	7%	+2%
25-34	25%	+3%
35-44	30%	+3%
45-54	23%	-5%
55-64	12%	-4%
65+	2%	0%
Total	**100%**	**n/a**

Source: APS 2009 (TBR Ref: W11, S3)

5.2.2 The age distribution across qualification levels

This section provides details on how the science workforce is broken down across different qualification levels and age groups. Due to limitations in the data it is only possible to show this analysis for the combined science workforce across **all** sectors of the economy rather than just core and related sectors.

The table below displays the following key findings:

- Over 1.8m people in the science workforce have a degree (first or foundation), which equates to over 31% of the total science workforce. This compares to just 18% of the workforce in the whole economy.
- Nearly 1.4m science workers are qualified to post-graduate level, which is the equivalent of 25% of the science workforce. In comparison, only 9% of workers in the whole economy are qualified to this level.
- The science workforce is generally older than the rest of the economy, with 3.1m people (54% of the science workforce) being aged between 30 and 49, compared to 48% of the whole economy.

Table 12: Science workforce distribution by age & highest qualification achieved

Sector	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown/ No Qual	Total
16 to 17	6,240	1,370	0	0	0	1,670	9,270
18 to 19	13,030	7,750	190	0	3,730	1,320	26,020
20 to 24	44,450	89,180	100,120	37,160	14,460	12,770	298,140
25 to 29	53,380	103,990	248,880	169,630	34,650	17,460	627,990
30 to 34	54,070	119,630	274,200	212,780	42,400	12,380	715,470
35 to 39	84,810	181,780	265,300	202,200	34,460	19,550	788,100
40 to 44	123,580	204,460	244,060	185,000	32,210	24,700	814,030
45 to 49	119,780	217,790	242,560	187,970	28,200	21,970	818,270
50 to 54	97,970	187,340	195,370	184,760	31,150	27,310	723,900
55 to 59	69,320	132,150	139,760	152,950	26,840	27,420	548,440
60 to 64	35,840	76,950	67,150	78,970	17,930	21,860	298,700
65+	8,820	26,180	37,470	31,240	11,170	8,170	123,040
All Science Workers	**711,300**	**1,348,580**	**1,815,060**	**1,442,660**	**277,200**	**196,580**	**5,791,370**

Source: APS 2009 (TBR Ref: W11, S6a) *Primary and Secondary workers combined*

When looking at the distribution of the science workforce within each age group across each qualification type a very different picture occurs to that seen in the rest of the economy. The table below highlights where the proportion of individuals in each age band that have a certain qualification is more (highlighted purple) or less (highlighted pink) than the total economy average. For example:

- In the 16 to 17 age group, the proportion of people in the science workforce of this age who are qualified to QCF level 3 & 4 is 8 percentage points higher than the proportion of all workers in the economy (regardless of sector or job type) that are qualified to the same level.
- Similarly in the 16 to 17 age group, the proportion of people in the science workforce who are qualified to QCF level 1 & 2 is nearly 13 percentage points lower than the corresponding proportion of all workers in the economy. These two points combined suggest that in the 16 to 17 age group, science workers are generally better qualified at this age than the rest of the economy.

Table 13: Difference between whole economy and science workforce distributions

Age group	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown/ No Qual	Total
16 to 17	**-12.9%**	**8.0%**	-0.2%	0.0%	-1.3%	**6.5%**	0.0%
18 to 19	-2.8%	**-9.5%**	-0.4%	0.0%	**12.2%**	0.4%	0.0%
20 to 24	**-15.5%**	**-7.2%**	**14.8%**	**9.6%**	-0.2%	-1.4%	0.0%
25 to 29	**-14.2%**	**-9.3%**	**12.5%**	**16.6%**	-2.9%	-2.7%	0.0%
30 to 34	**-13.4%**	**-8.2%**	**11.8%**	**16.5%**	-2.4%	-4.4%	0.0%
35 to 39	**-17.0%**	-3.1%	**11.8%**	**15.2%**	-2.7%	-4.2%	0.0%
40 to 44	**-17.7%**	-1.3%	**12.3%**	**13.6%**	-2.3%	-4.5%	0.0%
45 to 49	**-17.7%**	-0.4%	**12.6%**	**14.0%**	-2.7%	**-5.8%**	0.0%
50 to 54	**-14.2%**	-1.0%	**11.7%**	**16.0%**	-4.1%	**-8.3%**	0.0%
55 to 59	**-12.8%**	-2.4%	**11.5%**	**17.8%**	-4.8%	**-9.3%**	0.0%
60 to 64	**-10.6%**	1.1%	**11.3%**	**18.0%**	**-7.4%**	**-12.4%**	0.0%
65+	**-10.3%**	1.9%	**18.1%**	**16.2%**	**-6.1%**	**-19.8%**	0.0%
Difference	**-16.4%**	-3.8%	**13.0%**	**15.9%**	-2.9%	**-5.8%**	0.0%

Source: APS 2009 (TBR Ref: W11, S6a)

Overall, there are much higher proportions of graduate and post-graduates in the science workforce in all employees aged over 20. There are also significantly lower proportions of pre-graduate level 1&2 employees in the science workforce compared to the whole economy, on average the proportion is 16 percentage points lower.

The appendix provides similar breakdowns to Table 12 for the whole economy and also provides details on the proportional breakdowns for the whole economy and the science workforce and the differences between them.

5.3 Length of time in current role

The analysis in this section considers the length of time primary and secondary science workers have been employed in their current role, within science based sectors.

Table 14: Length of time in current role – science workforce

Sector		Less than 1 year	1 to 5 years	6 to 20 years	20 years plus	Total
Core	Advanced Manufacturing	7%	31%	37%	24%	100%
	Chemicals	6%	24%	47%	23%	100%
	Energy & Environmental	7%	32%	36%	24%	100%
	Health	10%	28%	44%	18%	100%
	Pharmaceuticals	12%	30%	45%	12%	100%
	Research & Development	20%	37%	32%	11%	100%
Core science sectors average		**10%**	**29%**	**43%**	**18%**	**100%**
Related	Agriculture & Aquaculture	9%	15%	39%	37%	100%
	Construction & Installation	7%	31%	41%	20%	100%
	Consultancy	14%	41%	36%	9%	100%
	Education	13%	32%	40%	15%	100%
	Food & Drink	12%	42%	36%	9%	100%
	ICT	15%	39%	38%	7%	100%
	Manufacturing	10%	33%	40%	18%	100%
	Metals	14%	28%	33%	22%	100%
	Military	7%	21%	47%	25%	100%
	Professional Organisations	15%	30%	43%	10%	100%
	Public Sector	9%	30%	42%	18%	100%
	Rubber & Plastics	9%	35%	44%	10%	100%
	Textiles	9%	16%	63%	11%	100%
Related science sectors average		**12%**	**33%**	**40%**	**15%**	**100%**
Combined science sectors average		**11%**	**31%**	**41%**	**16%**	**100%**
Non-science sectors average		**12%**	**35%**	**38%**	**14%**	**100%**
Total economy average		**14%**	**35%**	**37%**	**13%**	**100%**

Source: APS 2009 (ref: W11/S4) *Primary and Secondary workers combined*

When considering the table above by occupation regardless of sector, the following results are seen.

Table 15: Length of time in current role for each workforce

Sector	Less than 1 year	1 to 5 years	6 to 20 years	20 years plus	Total
Primary science worker average	12%	32%	39%	16%	100%
Secondary science worker average	11%	31%	41%	16%	100%
Non-science worker average	15%	36%	36%	12%	100%
Total economy average	14%	35%	37%	13%	100%

Source: APS 2009 (ref: W11/S4)

The amount of time an individual has been working in their role is indicative of their employment choices and movement. This characteristic is necessarily slightly skewed by the age of employees but nevertheless demonstrates that:

- There is little difference across primary and secondary occupations in the time spent in the current role. Approximately 30% of the science workforce has been in their current role for between 1 and 5 years and 40% for between 6 and 20 years.
- Research & Development has by far the largest proportion of science workers who have been in employed in their current position for less than 1 year.
- As one might expect given the statistics on age previously presented, Agriculture & Aquaculture has the largest proportion of workers who have been in their current role for more than 20 years.
- The Textiles sector has a much higher than average proportion of the workforce remaining in the same position for between 6 and 20 years.

These results can help to focus upon sectors where employees tend to remain in the same role for a long period of time and those where movement between roles is more common.

5.3.1 The length of time in role in non-science sectors

The penultimate row in Table 14 shows the length of time primary and secondary science workers have been employed in their current positions in non-science sectors. There are relatively few differences, slightly fewer people tend to stay in their role for 6-20 years, more people tend to be in the 1-5 group.

5.4 Salary and Wage

The analysis in this section considers the variation in the average wage per hour earned by science workers alongside averages for primary science workers, secondary science workers and those employed in non-science roles in science based sectors.

Table 16 below highlights the cells where wages are more than the average science wage at the bottom of the table. The table shows that:

- The average science wages are generally higher than the average wage across the whole economy.
- The highest paid primary science workers are employed in the Public Sector. The lowest paid work in the Textiles sector.
    - Secondary science workers in the Public sector have a significantly lower, but still above average wage, compared to primary workers.
- The highest paid secondary science workers are employed in Education. The lowest paid work is again in the Textiles sector, closely followed by Agriculture & Aquaculture.
- In related science sectors, workers employed in secondary science roles earn more per hour than primary science workers.
- In ICT, the Military and to a lesser extent the Consultancy sectors, non-science workers earn more than primary science workers.
    - In ICT and Consultancy particularly, primary workers earn a much lower average wage per hour than secondary science workers.
- There are more instances of non-science workers being paid above the science sector average wage for non-science workers, than there are primary or secondary science workers being paid above their respective science sector averages

Table 16: Salary & wage per hour

Sector		Primary science worker	Secondary science worker	Non-Science worker	Total workforce average
Core	Advanced Manufacturing	£14.81	£12.29	**£11.39**	**£11.94**
	Chemicals	£9.28	£9.59	£7.43	£7.95
	Energy & Environmental	£13.99	**£16.00**	**£10.40**	**£10.99**
	Health	£12.93	£11.84	£7.65	£9.05
	Pharmaceuticals	£13.24	£8.84	£7.41	£8.56
	Research & Development	£14.86	£10.36	**£11.86**	**£12.42**
Core science sectors average		**£12.95**	**£11.76**	**£8.03**	**£9.26**
Related	Agriculture & Aquaculture	*	£7.11	£7.39	£7.34
	Construction & Installation	£11.36	£11.13	**£10.31**	**£10.37**
	Consultancy	£12.36	**£18.65**	**£12.41**	**£13.30**
	Education	£10.98	**£22.36**	£8.06	**£10.85**
	Food & Drink	£10.62	£7.50	£7.01	£7.17
	ICT	£12.48	**£17.75**	**£15.19**	**£15.74**
	Manufacturing	**£16.96**	£9.86	**£8.73**	£9.07
	Metals	£11.01	£9.40	**£9.55**	£9.58
	Military	£10.75	**£14.13**	**£11.16**	**£11.56**
	Professional Organisations	**£15.99**	£12.68	£8.15	£8.48
	Public Sector	**£18.53**	**£13.77**	**£10.51**	**£11.15**
	Rubber & Plastics	£9.98	£7.94	£8.53	£8.38
	Textiles	£7.73	£7.06	£7.14	£7.17
Core science sectors average		**£13.75**	**£15.15**	**£9.01**	**£9.98**
Combined science sectors average		**£15.18**	**£13.06**	**£8.59**	**£9.64**
Non-science sectors average		**£12.74**	**£9.89**	**£7.49**	**£7.58**
Total economy average		**£14.83**	**£12.72**	**£8.00**	**£8.65**

Source: APS 2009 (TBR ref: W4/S0)

It is important to keep in mind here that the average wage for Education workers currently shows all teachers in the secondary science worker column (see note after Table 3, page 14). If science teachers were included as primary science workers, rather than secondary, this would increase the average wage of primary science workers in Education.

5.4.1 Average wage per hour in non-science sectors

As shown in Table 16 above, science workers who are employed in non-science sectors are generally paid a lower average wage than their peers in science based sectors. However, the average wage for a primary science worker in a non-science sector is not very dissimilar to that earned by a primary science worker in a core science sector.

6. The workforce of the future

At time of writing there are no specific forecasts available to provide occupational level data on the future of the science workforce in the UK. However, a number of reports and forecasts have identified trends that can be used to form an understanding of the future science workforce. As such, this section presents key messages from the existing literature and employment projections[3] developed using historic data from the APS.

6.1 Evidence from the existing literature

The UKCES Working Futures produces projections of the UK workforce between 2007 and 2017, which provides a comprehensive analysis of the changing trends in the labour market.[4] The analysis is broken down by industry and spatial area. As such, although we can understand how the labour market in different areas and broad industries will change, there is no insight into how the science workforce will develop in the future.

The UKCES 2010 National Strategic Skills Audit also provides an insight into the growth areas of the economy, highlighting where new jobs are anticipated. The areas of the economy that are predicted to grow include the following, all of which are relevant to the core and/or related sectors detailed in this study:

- Advanced manufacturing
- Low carbon economy
- Digital economy
- Life sciences and pharmaceuticals
- Professional and financial services
- Engineering/construction

Within these emerging sectors it is anticipated that workers with science skills will be in key demand.

6.1.1 Demand for science graduates and pre-graduates

A number of studies and reports have been produced that investigate the future demand for STEM graduates. Perhaps owing to the lack of detailed forecasts, the majority investigate this from the supply perspective; outlining subject areas that are showing a decline in participation and therefore are likely to see a decline in available labour and subsequently higher demand for related skills.

For example, The Royal Society identified the following trends in STEM students between 1992 and 2006[5]:

- Despite A-level entries in the UK growing by 10% between 1992 and 2006 (from 731,000 to 806,000) there were decreases of 6% in the number of entries to chemistry, 34% in physics and 13% in mathematics and further mathematics, with the decrease occurring mainly in mathematics rather than further mathematics. Entries to biology A-level have fluctuated but increased 13% overall during this period.

[3] Please see the methodology, section 2 (page 7) for further information on the approach to developing projections.

[4] Working Futures is due to release an update 2010-2020 version later this year. It will be interesting to see whether any further detailed is provided on science occupations, or at least STEM occupations as a whole that might provide further insight.

[5] The Royal Society (2006) A degree of concern

Within Higher Education, the results are more complicated and demonstrate the importance of looking beyond the headline. The Royal Society report that an increasing proportion of first degrees are being awarded in the sciences. Although upon further investigation, much of the rise is attributable to computer science. Other growth was recorded in biological sciences (5.7% to 9.5%). Within this, psychology and sports science increased whilst the proportion of biology students dropped. Similarly, the drop in the physical sciences category from 6.2% to 4.4% has seen a drop in chemistry and an increase in forensic & archaeological science. Whilst these are clearly all science related subjects, the declines appear to be in the core science category and the increases in related science.

The University and College Union investigated science and maths courses and found that[6]:

- Between 1997 and 2007, there was a 10% reduction in the number of single honours, science and maths degree courses offered by UK higher education institutions. Specifically, chemistry and physics.
- [At the time the report was published] In the North East of England and in Northern Ireland, there was only one institution providing single honours physics.
- Conversely, the number of higher education institutions providing single honours biology courses has increased over the decade.
- There were more than three times the number of young people per single honours science and maths course in East England compared with Scotland.

Studies such as the Supply and Demand for STEM in the UK[7] have found that the stock of graduate scientists is increasing at a steady rate. However, whilst the entrants to higher education are steady, there are falling numbers of UK-domiciled degree entrants in Engineering and the Physical Sciences, particularly Chemistry. Most pertinently, whilst there may be larger 'stock' of STEM graduates by 2014, these graduates are more likely to be international students.

6.2 Employment projections

In the absence of specific forecasts the table below presents employment projections for primary and secondary science workers to 2030. It should be emphasised that the results in this section are projections and **not** forecasts, in that they are based entirely on the employment trends that have occurred over the past 5 years. They do not take into account any other factors such as financial investment or cuts (e.g. in public sector employment) in a particular sector or development programmes used to promote growth.

Given the increases in the number of people employed in science based roles over the last 5 years, the projections continue this steady rise, to a point where 7.1m people are employed in either a primary or secondary science role by 2030.

This is equivalent to 22% of the 2030 workforce and an additional 1.4m science workers.

Employment of science workers in non-science based sectors will also see a significant increase, with 64% more scientists employed outside of core and related science sectors by 2030.

[6] University and College Union (November 2006) Degrees of decline? Core science and mathematics degree courses in the UK between 1998-2007

[7] Department for Education and Skills (2006) Supply and Demand for Science, Technology, Engineering and Mathematics Skills in the UK Economy

NB. Table 17, Figure 4 and Table 18 all display annual results for 2005 to 2009, but then move forward in three-year iterations from 2009 to 2015 and then five-year iterations from 2015 up to 2030.

Table 17: Employment projections to 2030

Year	Primary science workers	Secondary science workers	Total science workers		Non-science	Total economy	% of total economy workforce in Science
2005	1,138,130	4,372,180	5,510,310		22,287,550	27,797,860	20%
2006	1,157,410	4,464,570	5,621,980		22,293,550	27,915,530	20%
2007	1,169,920	4,487,600	5,657,520		22,511,030	28,168,550	20%
2008	1,188,660	4,529,100	5,717,760		22,740,470	28,458,230	20%
2009	1,204,560	4,586,810	5,791,370		22,852,210	28,643,580	20%
2012	1,253,790	4,734,940	5,988,730		23,325,070	29,313,800	20%
2015	1,303,030	4,883,080	6,186,110		23,797,930	29,984,040	21%
2020	1,385,080	5,129,970	6,515,050		24,586,040	31,101,090	21%
2025	1,467,140	5,376,860	6,844,000		25,374,150	32,218,150	21%
2030	1,549,200	5,623,760	7,172,960		26,162,260	33,335,220	22%

Source: APS 2005 - 2009 (TBR Ref: W3, S1)

The trends in the above table are also displayed in the following chart. To show the trends for primary, secondary and non-science workers along with the whole economy on one chart, the results have been indexed to the year 2005, with 2005 equalling 100. For example, in the primary science workforce:

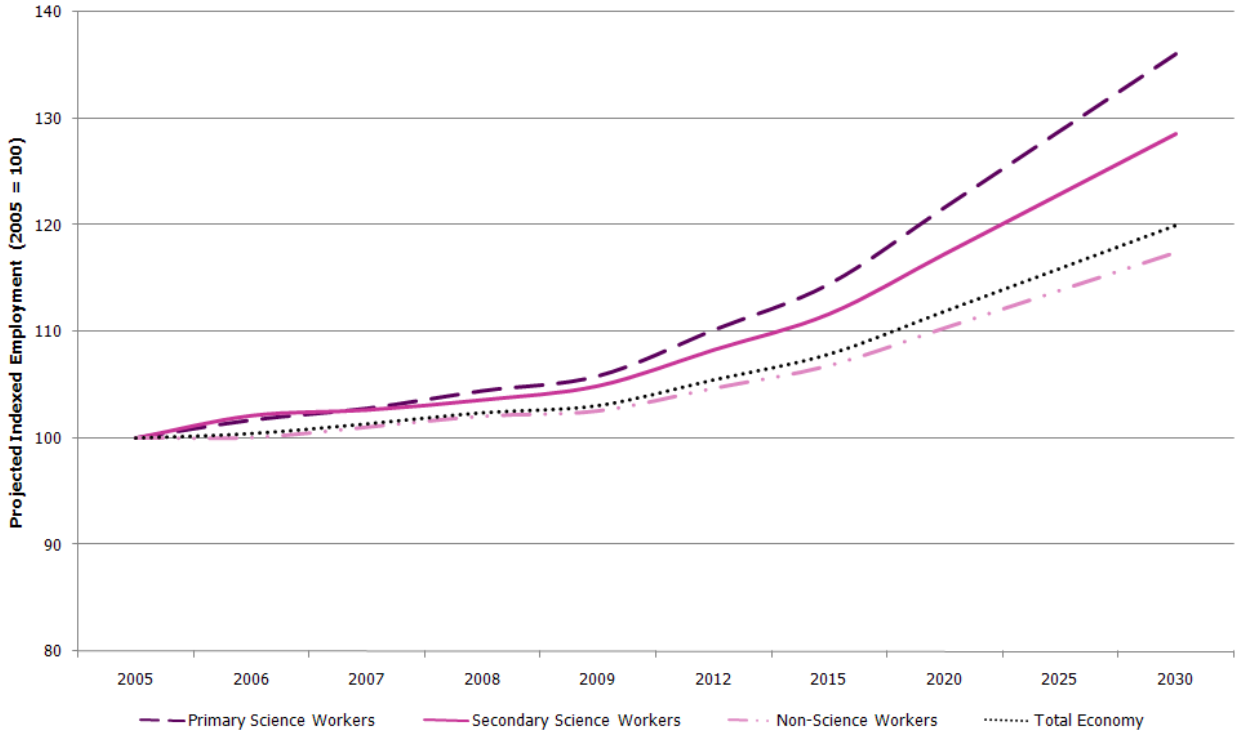
- In 2005 there were 1.13m workers, for the purposes of the graph this is given the value of 100.
- In 2006 this figure raised to 1.16m workers, so in relation to the index of 100 for 2005, the value for 2006 on the chart is 101.6 (achieved by calculating 1.16m/1.13m and multiplying by 100).
- Each year on the graph is then calculated based on its relationship to the year 2005 value of 100, with the final value for 2030 on the chart being 136.1

The benefit of this method is that it helps identify which workforces are due to increase at a rate greater (or less) than the whole economy.

When investigating the trends that occur across each workforce, it is clear that the primary science workforce is likely to see a much sharper increase in employment over the next 20 years than the increase seen for the total economy. The primary science workforce is also set to increase at a much greater rate than both the secondary science workforce and the non-science workforce.

The secondary science workforce is also due to increase at a rate greater than the non-science workforce and the total economy. This suggests that science occupations are going to become increasingly important to the total economy over the coming years. This is also evidenced by Table 17 which shows that the proportion of the total economy that are science workers is due to rise from 20% in 2009 to 22% in 2030.

Figure 4: Indexed change in each workforce's employment from 2005 to 2030



Source: APS 2009 (TBR ref: W3/S3-C1)

Looking in greater detail at the projections, changes in employment are broken down in Table 18 below to provide a view on the likely future employment scenario by sector. The key messages for future workforce size (based on percentage change between 2009 and 2030) in the core and related sectors are explored separately following Table 18.

Table 18: Employment projections by sector to 2030

Sector		2005	2006	2007	2008	2009	2012	2015	2020	2025	2030
Core	Advanced Manufacturing	70,330	62,910	67,720	70,760	69,460	71,300	73,140	76,190	79,260	82,320
	Chemicals	46,580	48,780	43,420	46,620	45,040	43,470	41,880	39,260	36,630	33,990
	Energy & Environmental	97,580	101,440	104,000	110,920	114,130	126,900	139,680	160,960	182,240	203,540
	Health	1,593,940	1,635,800	1,614,010	1,626,980	1,637,020	1,660,210	1,683,410	1,722,070	1,760,740	1,799,400
	Pharmaceuticals	102,690	116,780	119,900	106,540	115,160	119,560	123,970	131,320	138,670	146,030
	Research & Development	131,680	124,680	129,780	132,630	131,680	134,060	136,450	140,420	144,400	148,370
Core science sectors total		**2,042,800**	**2,090,410**	**2,078,840**	**2,094,460**	**2,112,470**	**2,155,500**	**2,198,520**	**2,270,240**	**2,341,940**	**2,413,650**
Related	Agriculture & Aquaculture	47,140	48,920	48,500	48,210	48,880	49,720	50,550	51,950	53,330	54,710
	Construction & Installation	353,530	359,280	361,760	359,390	363,510	369,520	375,550	385,590	395,620	405,660
	Consultancy	178,870	179,890	200,630	218,660	229,540	271,580	313,620	383,690	453,750	523,810
	Education	1,389,840	1,402,090	1,400,960	1,416,450	1,422,000	1,445,620	1,469,220	1,508,560	1,547,900	1,587,250
	Food & Drink	135,190	136,510	133,080	139,620	138,560	141,510	144,470	149,380	154,300	159,220
	ICT	206,610	225,810	219,080	223,160	229,400	242,270	255,140	276,600	298,060	319,520
	Manufacturing	118,660	116,260	111,490	113,930	110,340	104,670	98,980	89,500	80,030	70,550
	Metals	10,010	10,600	9,850	12,130	12,050	13,730	15,400	18,200	20,990	23,790
	Military	38,520	43,250	43,890	45,400	48,080	54,460	60,830	71,460	82,090	92,720
	Professional Organisations	44,480	36,800	45,670	40,320	40,920	39,830	38,750	36,930	35,130	33,310
	Public Sector	271,860	275,340	279,710	267,880	271,800	269,530	267,260	263,470	259,670	255,890
	Rubber & Plastics	34,130	34,430	34,430	34,730	34,880	35,420	35,960	36,870	37,770	38,670
	Textiles	6,270	6,830	7,380	6,980	7,530	8,330	9,130	10,470	11,810	13,150
Related science sectors total		**2,835,130**	**2,876,020**	**2,896,450**	**2,926,850**	**2,957,510**	**3,046,180**	**3,134,860**	**3,282,660**	**3,430,460**	**3,578,250**
Science workers in non science sectors		632,380	655,570	682,240	696,450	721,390	787,050	852,720	962,170	1,071,620	1,181,060
Total science workforce		**5,510,310**	**5,621,980**	**5,657,520**	**5,717,760**	**5,791,370**	**5,988,730**	**6,186,110**	**6,515,050**	**6,844,000**	**7,172,960**

Source: APS 2005 - 2009 (TBR Ref: W3, S3)

7. Appendix

7.1 Summary of future scenarios for Core and Related sectors

7.1.1 Core sector scenarios

Between 2009 and 2030, the Core Science Sectors will grow by 301,180 workers. Of these new workers, 60% will be in Non Science Occupations (183k), 26% in secondary science workers (78k) and 14% in primary science occupations (42k).

The following tables break the projection scenarios down by each of the core science sectors.

Health employment is projected to increase by 10% to 1.8m science workers.	**Energy & Environmental employment is projected to increase by 78% to 203k science workers.**
• Of the extra 162,380 workers expected by 2030 in this sector, 87,690 will be in non-science occupations, 48,710 will be primary and 25,980 will be in secondary. • The majority (53,590) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be female (currently 76% of the sector are female) • Based on the current figures, the majority of the workforce will be in the 35-44 or 45-54 age group.	• Of the extra 89,410 workers expected by 2030 in this sector, 54,540 will be in non-science occupations, 20,560 will be primary and 14,310 will be secondary. • The majority (36,660) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be Male (currently 86% of the sector are male) • Based on current figures the majority of the workforce will be in 45-54 age group.
Research & Development employment is projected to increase by 13% to 148k science workers.	**Pharmaceuticals employment is expected to increase by 27% to 146k science workers.**
• Of the extra 16,860 workers expected by 2030 in this sector, 12,180 will be in non-science occupations, 3,510 will be primary and 1,170 will be in secondary. • The majority 6,510 will be qualified to post-graduate level. • Likely to be male (currently 65% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 25-34 age group.	• Of the extra 30,870 workers expected by 2030 in this sector, 22,840 will be in non-science occupations, 4,940 will be secondary and 3,090 will be in primary. • The majority (10,500) will be qualified to graduate level. • Likely to be female (currently 54% of the sector are female) • Based on the current figures, the majority of the workforce will be in the 35-44 age group.
Advanced Manufacturing employment is projected to increase by 19% to 82k science workers.	**Chemicals employment is expected to decrease by 25% to 34k science workers.**
• Of the extra 12,860 workers expected by 2030 in this sector, 7,460 will be in non-science occupations, 3,860 will be secondary and 1,540 will be in primary. • The majority (5,790) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 89% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 35-44 age group.	• Of the 33,990 workers expected by 2030 in this sector, 26,170 will be in non-science occupations, 4,420 will be secondary and 3,060 will be in primary. • The majority (9,520) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 77% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 45-54 age group.

7.1.2 Related sector scenarios

Between 2009 and 2030, the Related Science Sectors will grow by 620,740 workers. Of these new workers, 73% will be in Non Science Occupations (453k), 24% in secondary science workers (149k) and 3% in primary science occupations (18k).

The following tables break the projection scenarios down by each of the related sectors.

Education employment is projected to increase by 12% to 1.6m science workers	**ICT employment is projected to increase by 39% to 319k science workers.**
• Of the 165,250 workers expected to be employed in the public sector in 2030 in this sector, 142,120 will be in non-science occupations, 18,180 will be secondary and will be in 4,960 primary. • The majority (87,580) will be qualified to post graduate level. • Highly likely to be female (currently 66% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 45-54 age group.	• Of the extra 90,120 workers expected by 2030 in this sector, 73,000 will be in non-science occupations, 14,420 will be in secondary and 2,700 will be in primary. • The majority (42,360) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 87% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 25-34 age group.
Consultancy employment is projected to increase by 128% to 523k science workers.	**Public Sector employment is projected to decrease by 6% to 255k science workers.**
• Of the extra 294,270 workers expected by 2030 in this sector, 247,190 will be in non-science occupations, 38,260 will be in secondary and 8,830 in primary. • The majority 111,820 will be qualified to graduate level. • Highly likely to be Male (currently 83% of the sector are male) • Based on current figures the majority of the workforce will be in 35-44 age group.	• Of the 255,890 workers expected to be employed in the public sector in 2030 in this sector, 240,540 will be in non-science occupations, 7,680 will be in secondary and the same figure in primary too. • The majority 94,680 will be qualified to pre graduate (QCF 3 & 4) level. • Slightly more likely to be female (currently 53% of the sector are female) • Based on the current figures, the majority of the workforce will be in the 45-54 age group.
Construction & Installation employment is projected to increase by 12% to 405k science workers.	**Food and Drink employment is expected to increase by 15% to 158k science workers.**
• Of the extra 42,150 workers expected by 2030 in this sector, 35,830 will be in non-science occupations, 5,480 will be in secondary and 1,270 will be in primary. • The majority 15,600 will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 93% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 35-44 age group.	• Of the extra 20,660 workers expected by 2030 in this sector, 14,050 will be in non-science occupations, 5,170 will be in secondary and 1,450 will be in primary. • The majority (6,410) will be qualified to pre graduate (QCF 1 & 2) level. • Highly likely to be male (currently 66% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 25-34 age group.

Military employment is projected to increase by 93% to 93k science workers.	**Professional Organisations employment is projected to decrease by 19% to 33k science workers.**
• Of the extra 44,190 workers expected by 2030 in this sector, 36,160 will be in non-science occupations, 4,460 will be in secondary and only 270 will be in primary. • The majority (4,460) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 85% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 25-34 age group.	• Of the 33,310 workers expected to be employed in the sector in 2030 in this sector, 27,650 will be in non-science occupations, 4,330 will be in secondary and only 1,330 will be in primary. • The majority (11,990) will be qualified to pre graduate (QCF 3 & 4) level. • Slightly more likely to be male (currently 55% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 45-54 age group.
Manufacturing employment is projected to decrease by 36% to 70k science workers.	**Metals employment is projected to increase by 97% to 24k science workers.**
• Of the 70k workers expected to be employed in the sector in 2030 in this sector, 37,390 will be in non-science occupations, 31,750 will be in secondary and only 1,410 will be in primary. • The majority (21,170) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 82% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 35-44 age group.	• Of the extra 11,740 workers expected by 2030 in this sector 9,860 will be in non-science occupations, 1,760 will be in secondary and only 120 will be in primary. • The majority (4,460) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 84% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 35-44 age group.
Rubber and plastics employment is projected to increase by 11% to 38k science workers.	**Textiles employment is projected to increase by 75% to 13k science workers.**
• Of the extra 3,790 workers expected by 2030 in this sector, 2,650 will be in non-science occupations, 870 will be in secondary and only 270 will be in primary. • The majority (990) will be qualified to pre graduate (QCF 3 & 4) level. • Highly likely to be male (currently 82% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 25-34 age group.	• Of the extra 5,560 workers expected by 2030 in this sector, 5,000 will be in non-science occupations, 340 will be in primary and 280 will be in secondary. • The majority (1,630) will have none or unknown qualifications. • Likely to be male (currently 51% of the sector are male) • Based on the current figures, the majority of the workforce will be in the 45-54 age group.

7.2 Additional age and qualification distributions

Table 19: Distribution of science workforce within each age band across qualifications

Age group	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown/ No Qual	Total
16 to 17	67%	15%	0%	0%	0%	18%	100%
18 to 19	50%	30%	1%	0%	14%	5%	100%
20 to 24	15%	30%	34%	12%	5%	4%	100%
25 to 29	9%	17%	40%	27%	6%	3%	100%
30 to 34	8%	17%	38%	30%	6%	2%	100%
35 to 39	11%	23%	34%	26%	4%	2%	100%
40 to 44	15%	25%	30%	23%	4%	3%	100%
45 to 49	15%	27%	30%	23%	3%	3%	100%
50 to 54	14%	26%	27%	26%	4%	4%	100%
55 to 59	13%	24%	25%	28%	5%	5%	100%
60 to 64	12%	26%	22%	26%	6%	7%	100%
65+	7%	21%	30%	25%	9%	7%	100%
All Science Workers	**12%**	**23%**	**31%**	**25%**	**5%**	**3%**	**100%**

Source: APS 2009 (TBR Ref: W11, S6a)

Table 20: Whole economy employment by age & highest qualification achieved

Age group	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown/ No Qual	Total
16 to 17	314,850	26,630	640	0	5,220	45,310	392,640
18 to 19	416,810	309,400	8,800	0	16,540	36,720	788,260
20 to 24	804,980	982,390	497,400	75,360	133,150	150,680	2,643,960
25 to 29	707,050	805,230	847,530	325,650	261,610	171,890	3,118,950
30 to 34	624,420	742,560	791,260	394,070	248,560	181,360	2,982,230
35 to 39	948,540	895,200	748,800	356,060	241,930	227,590	3,418,120
40 to 44	1,243,120	998,010	668,520	343,680	237,930	285,240	3,776,490
45 to 49	1,176,700	982,900	617,770	326,450	221,670	308,490	3,633,990
50 to 54	852,380	826,570	470,990	294,160	259,830	370,910	3,074,840
55 to 59	628,500	655,790	345,410	248,790	239,300	353,820	2,471,610
60 to 64	371,270	405,420	182,860	139,100	219,930	323,360	1,641,950
65+	122,100	135,470	86,530	64,480	106,440	185,520	700,540
All Economy	**8,210,710**	**7,765,550**	**5,266,520**	**2,567,800**	**2,192,120**	**2,640,880**	**28,643,570**

Source: APS 2009 (TBR Ref: W11, S6b)

Table 21: Distribution of whole economy within each qualification across age bands

Age group	Pre-Grad QCF 1&2	Pre-Grad QCF 3&4	Graduate	Post-Graduate	Other	Unknown/ No Qual	Total
16 to 17	80%	7%	0%	0%	1%	12%	100%
18 to 19	53%	39%	1%	0%	2%	5%	100%
20 to 24	30%	37%	19%	3%	5%	6%	100%
25 to 29	23%	26%	27%	10%	8%	6%	100%
30 to 34	21%	25%	27%	13%	8%	6%	100%
35 to 39	28%	26%	22%	10%	7%	7%	100%
40 to 44	33%	26%	18%	9%	6%	8%	100%
45 to 49	32%	27%	17%	9%	6%	8%	100%
50 to 54	28%	27%	15%	10%	8%	12%	100%
55 to 59	25%	27%	14%	10%	10%	14%	100%
60 to 64	23%	25%	11%	8%	13%	20%	100%
65+	17%	19%	12%	9%	15%	26%	100%
All Economy	**29%**	**27%**	**18%**	**9%**	**8%**	**9%**	**100%**

Source: APS 2009 (TBR Ref: W11, S6a)