



UK COMMISSION FOR  
EMPLOYMENT AND SKILLS

# Skills for Jobs: Today and Tomorrow



The National Strategic Skills  
Audit for England 2010

Volume 1:  
Key Findings



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# Foreword

There are signs that England is emerging from the longest recession on record. To aid recovery and drive growth, the Government has set out the need for a more active industrial policy. This involves looking strategically at the economy, ensuring opportunities and strengths are maximised, and creating the conditions needed for future economic success.

Skills are, of course, a crucial component of these conditions for success. We need to ensure that England has the skills that employers need now and in the future, that its employers are ambitious, and that its people are properly prepared for the opportunities that lie ahead.

A key role of the UK Commission for Employment and Skills is to provide expert, evidence-based advice on skills and employment issues. It is in this capacity we were asked by Government in 2009 to produce an annual National Strategic Skills Audit for England. This would involve a comprehensive analysis of England's current and future skill needs.

This report is the first National Strategic Skills Audit. It draws on information and intelligence from a range of existing evidence sources, as well as specially commissioned projects. The Audit provides insight and foresight on skill needs and imbalances. It also identifies the sectors, occupations and skills that we need to prioritise to meet the changing needs of the economy and labour market.

Like other UK Commission reports, the National Strategic Skills Audit provides a high quality analysis of the latest research evidence. It will be a useful resource for government, education and training providers, employers and individuals. To maximise impact and understanding, we are publishing this short document, summarising the key findings and messages, as well as a full evidence report.

On the basis of better information, people and organisations can make more effective choices. This first National Strategic Skills Audit has a valuable role to play here, in helping to make sure that the right skills are developed to maximise future jobs, productivity and economic success.



**Sir Mike Rake**

Chairman, UK Commission for Employment and Skills

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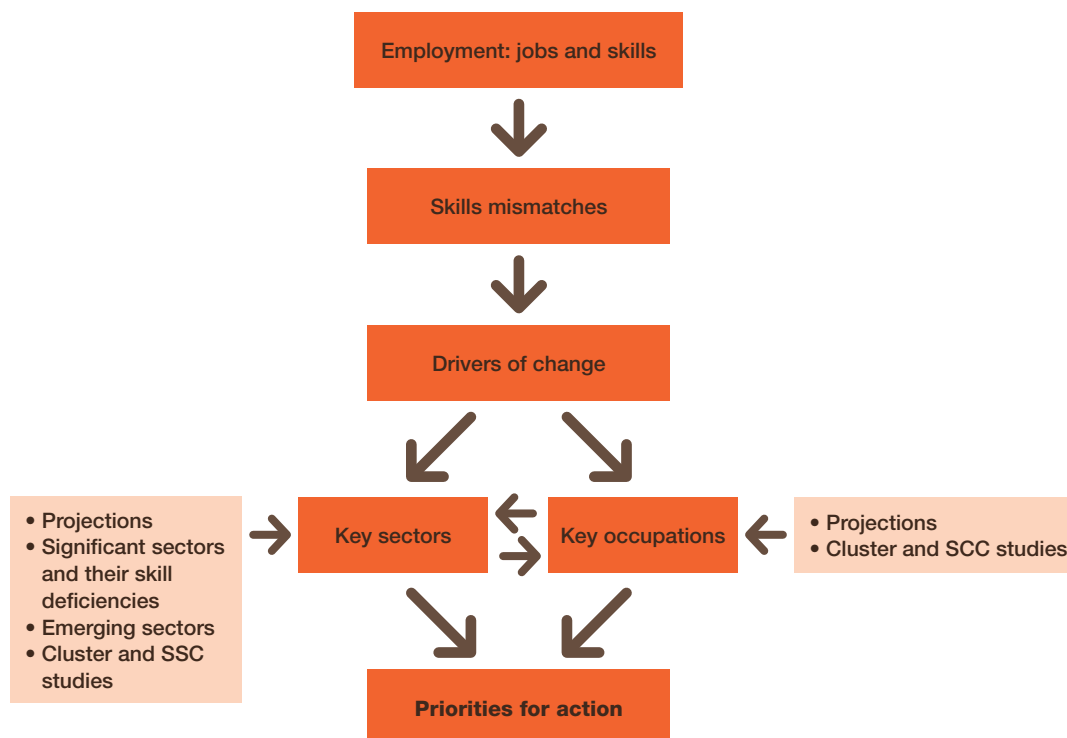
*Skills for Jobs: Today and Tomorrow*, Volume 2: The Evidence Report is available at: [www.ukces.org.uk](http://www.ukces.org.uk)  
For a hard copy, see ordering details on the back cover.

## The purpose of this report

This publication provides an overview of the key findings of the first National Strategic Skills Audit for England 2010: *Skills for Jobs: Today and Tomorrow*. The Audit aims to provide government, as well as employers, providers, individuals and public agencies with greater insight and foresight into England's existing and future skill needs. It identifies the sectors, occupations and skills on which we need to particularly focus so that we are able to effectively meet the changing needs of the economy and labour market.

The National Strategic Skills Audit focuses first on the extent to which England's current skill needs are being met, developing and using a framework for assessing the extent and nature of 'mismatch' between the skills we need and the skills available. In doing so, it makes full use of the new National Employer Skills Survey 2009 (Shury *et al*, 2010). The Audit then assesses the likely emerging, *future* skills needs which will arise from the evolution of the economy and labour market. This assessment is based on three things: an examination of the 'drivers of change'; a set of labour market projections; and detailed sectoral analysis (undertaken by Sector Skills Councils, as well as a number of specially commissioned studies) (see Figure 1).

**Figure 1: The National Strategic Skills Audit in outline**



Particular attention is given in the Audit to the sectors and occupations where most focus is likely to be required if we are to ensure that England has the skills we need for both today and tomorrow. We also provide an initial indication of regional differences.

We hope that the Audit will help those working in the skills system, employers and individuals not only to respond effectively to current needs, but to be better able to anticipate future requirements, and even to actively shape them. The Audit is strategic in the sense that it takes a long view; provides a systematic overview of skills needs and mismatches; and provides a sense of direction and priorities. In particular, it will be useful (when combined with the work of Regional Development Agencies (RDAs) in preparing their regional skills priorities statements), to the new Skills Funding Agency. We also hope it will inform the RDAs' own work, both in terms of the way we have approached the analysis, and the national issues and priorities for action that emerge from it. The Higher Education Funding Council (HEFCE) will also, we hope, find the Audit useful in preparing their priorities and funding decisions.

Skills are vitally important to individuals, employers, communities and the country as a whole. Rightly, England has ambitious objectives to be one of the best skilled countries in the world (UKCES, 2009; BIS, 2009). If such skills development is to have maximum impact on employment and productivity, as well as business and individual success, we need to seek to ensure that the skills we develop are those that we really need: the skills required to meet the needs of the economy and labour market.

**This overview of key findings, the full evidence report and all the associated studies that went into preparing the Audit are all available online at: [www.ukces.org.uk/our-work/research-and-policy/national-strategic-skills-audit](http://www.ukces.org.uk/our-work/research-and-policy/national-strategic-skills-audit)**

The information contained in the Audit is, as we have already noted, designed to assist all stakeholders in making their education, training and development decisions, by providing intelligence to inform choices and priorities. To this end, the UK Commission is not only making all the materials available, but will be hosting a series of events to disseminate both the key findings and the rich detail contained within the Audit. The Government will also respond to the National Strategic Skills Audit, setting out its own priorities for the skills system in light of the evidence presented. Whether England, as a country, will meet its current and future skill needs will depend, in the end, on how stakeholders respond to the challenges and opportunities we have set out. To change the world, we first have to understand it. We hope that the Audit provides a good basis for doing so.

## Summary of key messages

The key messages to emerge from the Audit are as follows:

### We need intelligent markets that anticipate needs

The National Strategic Skills Audit provides **comprehensive market intelligence** about the operation of the labour market to better inform current and future decisions of employers, individuals, providers and the skills system. It is **impossible to plan precisely** the number of skills that we need now and in the future in particular localities. But this high quality intelligence seeks to encourage actors to adapt their behaviour, to stimulate dialogue, and to identify and act on priorities. On the back of this intelligence it is then possible to provide **incentives** that influence the choices made by individuals and employers.

### Skills for jobs matter

Jobs growth is likely to be strong in a range of sectors and occupations, which raises issues for skills needs. To fully maximise economic performance, to generate real opportunity for individuals and for business success, **we need to ensure that we supply the 'right' skills which effectively meet the changing needs and requirements** of the labour market. This calls for a renewal of the commitment to **'economically valuable skills.'** With an ageing workforce, it also questions the appropriate mode of delivery in future to stimulate effective learning as well as type of learning.

### Demand matters as well as supply

There is a significant demand for highly skilled workers in the labour market, with the largest number of people employed now and in the future as managers, professionals, associate professionals and in technical roles, with associated requirements for higher level skills. Significant progress has been made in raising the qualification levels of the workforce and stimulating supply over the past 10 years, so that the supply of highly skilled people is likely to place the UK 10th in the OECD by 2020. This progress needs to be sustained to retain the UK's international position.

However, we also need to continue to stimulate our demand for, and growth of, high skilled jobs. A range of indicators question our level of employer ambition and whether relative to our international competitors, we have too few businesses adopting High Performance Working practices, investing in long term business development, treating skills as a long term investment, and seeking to operate in high value markets.

### High, intermediate and generic skills and jobs matter to future economic growth

The Audit identifies the fundamental importance of increasing skill levels to future economic growth over the *longer term*. In particular important skills areas include:

- **management and leadership skills**, and especially corporate managers across a wide range of sectors;
- **professional skills** in the computing and software sector, in parts of health and social care, in pharmaceutical and medical technology, in manufacturing (i.e. traditional and advanced), especially for STEM skills, and in teaching and research;
- **technician and equivalent skills** across many sectors, such as health and social care, utilities, chemicals, life sciences and pharmaceuticals, automotive engineering and broadcasting;
- **intermediate vocational skills** within sectors such as manufacturing, engineering, processing and construction associated with skilled trades as the current ageing workforce retires and emerging opportunities develop in some sectors and to support future demand at technician level;
- the ageing population will lead to increased demand for **care services with particularly significant volumes of staff in care assistant roles**, that will need greater understanding of ICT to support care users with assisted living technologies;
- **customer service** and **employability** skills will be of growing importance to the service sector, including retailing as well as with after-service and maintenance roles in manufacturing and the digital economy.

### But low skilled jobs are expected to persist

Despite the continued growth of highly skilled work within the labour market, and a substantial overall decline in recent years in lower skilled jobs, in the future significant employment is expected to remain in sectors traditionally requiring low skilled jobs. These jobs are important as a labour market entry point for many groups, such as those seeking to move out of unemployment for example. However, many of these jobs will be in need of up-skilling in order to make improvements in service/product quality and to meet changes in consumer demand.

## Jobs and skills in England

We first paint a broad brush picture of the key characteristics of jobs and skills, as this is the foundation for understanding skill requirements. England, before the recession, enjoyed a sustained period of long-term growth, often out-performing many other EU and OECD countries. Even as England tentatively emerges from the 18 months of recession, employment levels are more than three million higher than they were 15 years ago, though growth in the employment rate has recently stalled. This growing economy and labour market is also strongly globally connected and dependent, with both exports and imports each equivalent to well over a quarter of GDP (fully two-thirds more than 20 years ago), and with one in eight of the working age population having been born abroad, compared to one in 12 just 15 years ago.

England's economy and jobs are strongly regionally concentrated, with London and the South East alone accounting for nearly 40 per cent of England's GDP. There are also substantial variations in regional employment and productivity levels as well as in economic structure, both sectoral and occupational.

The employed workforce is ageing. Nearly 40 per cent are now aged 45 or over, and the numbers of those over 60 in employment has grown by 40 per cent in six years, though the age composition of different sectors does differ. Seven per cent of the workforce are of ethnic minority origin, and this has changed little in recent years. However, the proportion of employment accounted for those born outside the UK has doubled from around four per cent to eight per cent in the last ten years.

People also predominantly work full-time – around two-thirds do so, though 'atypical' employment is also considerable. One in five people work part-time; one in eight are self-employed; and six per cent are on temporary contracts. Whilst most companies are small, employing relatively few people (95% employ less than ten people), most people actually work in larger organisations. The people working in the 95 per cent of companies employing less than ten people, only account for just over a quarter of all jobs. People working in the 0.2 per cent of companies employing more than 250 people on the other hand account for over half of all jobs.



In terms of the things that people in England make and do – the ‘sectoral’ structure of employment – the largest sectors are public administration, education and health, together accounting for more than one job in four. Distribution, hotels and restaurants account for around another one job in five, and banking, finance and insurance a little less. Manufacturing accounts for one job in eight and construction one job in 12.

The occupations which employ the largest number of people are the three higher skilled groups of managers/senior officials; professionals and associate professional/technical jobs. Together, they account for 44 per cent of all jobs. It is important to note too that most occupations and sectors remain gendered.

Where have the new jobs in England come from in recent years? Table 1 lists the Top 20 fastest growing occupations since the turn of the 21st century, alongside the predominant qualification level for these jobs.

**Table 1: The fastest growing occupations in England 2001 to 2009**

Occupation category	Numbers (2001)	Numbers (2009)	Numerical change	% change since 2001	Predominant qualification level*
Conservation and environmental protection officers	11,797	26,470	14,673	124	Level 4
Paramedics	11,101	23,798	12,673	114	Level 4
Legal associate professionals	24,509	51,250	26,741	109	Level 3
Refuse and salvage occupations	21,750	44,393	22,643	104	Below level 2
Leisure and theme park attendants	11,101	22,471	11,370	102	Level 2
Town planners	13,886	26,931	13,045	94	Level 4
Educational assistants	252,358	482,979	230,621	91	Level 3
Driving instructors	23,265	44,494	21,229	91	Level 2
Registrars and senior educational administrators	25,195	44,210	19,015	75	Level 4
Purchasing managers	24,415	41,457	17,042	70	Level 4
Psychologists	20,947	35,080	14,133	67	Level 4
Undertakers and mortuary assistants	11,157	18,379	7,222	65	Level 3
Beauticians and related occupations	32,476	53,055	20,579	63	Level 3
Youth and community workers	70,868	114,992	44,124	62	Level 4
Senior officials in special interest organisations	17,767	28,385	10,618	60	Level 4
Housing and welfare officers	110,357	176,173	65,816	60	Level 4
Aircraft pilots and flight engineers	15,129	24,079	8,950	59	Level 4
Pharmaceutical dispensers	25,505	40,052	14,547	57	Level 3
Social service managers	32,201	50,463	18,262	57	Level 4
Statutory examiners	11,067	17,275	6,208	56	Level 3

Note: Data are taken from the Labour Force Survey April to June Quarter for each year and refer to occupations categorised at the ‘four digit’ level. Residual categories (i.e. ‘other’ occupations in a category not elsewhere specified) are excluded

\* i.e. over 50% of the people in this occupational group are qualified to this level

Source: ONS (2009) Labour Force Survey

More than half of the jobs that have grown fastest are in occupations that have at least a level 4 qualification as the dominant qualification.

Overall, the vast bulk of growth has been in managerial (+1.1 million), professional (+1.05 million) and associate professional/technical (+900,000), as well as personal service (+700,000) occupations.

By contrast, the 20 fastest declining occupations are identified in Table 2. More than half of the jobs that have declined the fastest are in occupations where the majority of people are qualified to level 2 or below.

Table 2: The 20 fastest declining occupations in England 2001 to 2009

Occupation category	Numbers (2001)	Numbers (2009)	Numerical change	% decrease since 2001	Predominant qualification level*
<b>Assemblers (electrical products)</b>	108,076	33,885	74,191	-69	Level 2
<b>Collector salespersons and credit agents</b>	26,735	9,794	16,941	-63	Level 2
<b>Assemblers (vehicles and metal goods)</b>	68,745	26,556	42,189	-61	Level 2
<b>Typists</b>	36,682	15,189	21,493	-59	Level 3
<b>Bookbinders and print finishers</b>	36,266	15,385	20,881	-58	Level 3
<b>Metal making and treating process operatives</b>	27,732	11,910	15,822	-57	Level 2
<b>Metal machine setter and setter-operators</b>	94,580	40,708	53,872	-57	Level 3
<b>Telephonists</b>	49,581	22,090	27,491	-55	Level 2
<b>Precious instrument makers and repairers</b>	35,907	16,348	19,559	-54	Level 3
<b>Sewing machinists</b>	74,480	35,757	38,723	-52	Below level 2
<b>Tool makers tool fitters and markers-out</b>	35,691	17,136	18,555	-52	Level 3
<b>Printing machine minders and assistants</b>	34,098	18,060	16,038	-47	Level 2
<b>Telephone salespersons</b>	93,014	52,020	40,994	-44	Level 2
<b>Rounds(wo)men and van salespersons</b>	35,300	20,092	15,208	-43	Level 2
<b>Plastics process operatives</b>	69,596	39,492	29,898	-43	Level 2
<b>Textiles and garment trades</b>	59,261	35,492	23,769	-40	Level 3
<b>Quality assurance technicians</b>	20,705	12,450	8,255	-40	Level 4
<b>Shopkeepers wholesale and retail dealers</b>	204,638	123,516	81,122	-40	Level 2
<b>Glaziers window fabric and fitters</b>	59,255	36,397	22,858	-39	Level 2
<b>Metal working machine operatives</b>	110,029	67,626	42,403	-39	Level 2

Note: Data are taken from the Labour Force Survey April to June Quarter for each year and refer to occupations categorised at the 'four digit' level. Residual categories (i.e. 'other' occupations in a category not elsewhere specified) are excluded

\* i.e. over 50% of the people in this occupational group are qualified to this level

Source: ONS (2009) Labour Force Survey

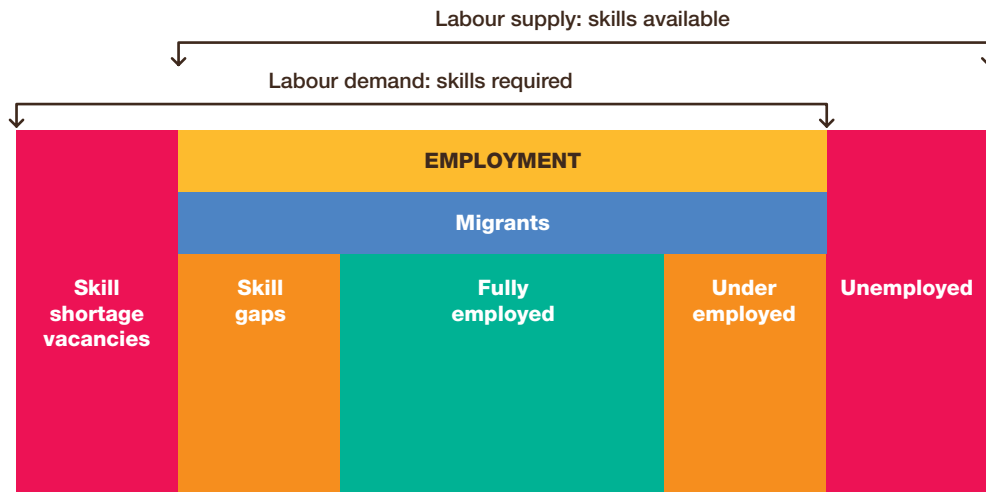
England is just emerging from the deepest recession for possibly 80 years, though the impact on unemployment has been less marked than in the recessions of the early 1980s and 1990s. Nonetheless, unemployment has risen significantly, in some regions more than others, and has particularly impacted on the employment prospects of young people. The recession has also impacted most, in terms of employment, on lower skilled and intermediate occupations, rather than on 'white collar' higher skilled occupations. Its sectoral impact has been most severe on manufacturing jobs.

In terms of the skills of the workforce in England, just over one in 10 have no qualifications, while nearly a third are qualified to level 4 and above. In order to reach our ambitious skills objectives for 2020 (see UKCES, 2009), a considerable growth in achievements at all levels is required. In particular, on the basis of recent trends and future projections, further improvements are most needed at level 3, in numeracy, and in acquiring at least some level of qualification.

## Current skills mismatches

What if employers are unable to, or have difficulty in, employing the people they need because they are not available in sufficient numbers with the skills they require? Such 'skill shortages' are important because they constrain organisations from being able to meet market needs, opportunities or public service objectives, and are a prime signal of a 'mismatch' between supply and demand, between the skills available and skills required. However, as we can see from Figure 2, the imbalances/mismatches in the labour market can also take a number of other forms.

**Figure 2: Skills mismatches: key components**



Taken together, this framework of skills mismatches is designed to give a systematic, coherent and complete picture of skills mismatch, showing where we need to concentrate in order to get a better balance between skill requirements and skill availability. It shows the balance between demand and supply in the labour market, and where the different mismatches and imbalances arise. It also takes us beyond a simple approach of skilling 'the workers without jobs to do the jobs without workers.' Rather, we need to 'edge' people into, up and through the labour market at every level.

We now turn to discuss the evidence on each of the elements of mismatch, beginning by looking at skill shortages, the most immediate manifestation of skills mismatch.

### Skill shortages

Overall, skill shortages are relatively small in England, totalling, we estimate, around 63,000 across the economy (Shury *et al*, 2010). Whilst the relatively small level of skill shortages in part reflects the recession, even prior to the recession, skill shortages amounted to only around 130,000 (LSC, 2008). One in 20 establishments suffered such shortages, and in sum they amounted to just 0.6 per cent of total employment.

Current skill shortages affect just three per cent of establishments, predominantly in small organisations: more than three in four occur where there are less than 25 staff. The highest proportion of skill shortages are found in skilled trades (31%) and professional occupations (25%), though they are also above average in managerial, associate professional, and personal service occupations. Their 'density' (i.e. relative to the numbers in the occupation), however, is greatest in associate professional/technical, skilled trades and personal service occupations. Indeed, nearly half of all skill shortage vacancies are in these three occupational groups, all of which require predominantly intermediate level skills.

Sectorally, skill shortages predominate, in terms of absolute numbers, in health/social work. More than a third of skill shortages are in just these two sectors. But, again, in terms of 'density' they are most significant in: agriculture; electricity, gas and water; and hotels/catering. Table 3 shows the profile of skill shortage vacancies in England by sector and occupation.

Table 3: Profile of skill-shortage vacancies in England by sector and occupation

Row percentages	Base: all SSVs		%										
	Unweighted	Weighted		Managers	Professionals	Associate professionals	Administrative	Skilled trades	Personal service	Sales	Operatives	Elementary	Unclassified
<b>Overall</b>	5,118	63,089	%	6	13	20	7	14	14	9	5	11	1
<b>Agriculture</b>	59	1,374	%	3	2	1	0	4	4	0	10	31	0
<b>Mining and quarrying</b>	9	43	%	1	1	1	1	1	1	1	1	1	1
<b>Manufacturing</b>	532	4,409	%	6	20	13	4	28	0	11	13	5	*
<b>Electricity, gas and water</b>	21	475	%	1	1	1	1	1	1	1	1	1	1
<b>Construction</b>	159	2,739	%	12	11	7	5	49	0	3	9	3	*
<b>Retail and wholesale</b>	484	7,672	%	8	1	14	7	26	*	30	9	4	0
<b>Hotels and catering</b>	441	6,347	%	7	0	2	3	29	2	3	1	55	0
<b>Transport, storage and communications</b>	247	2,758	%	3	1	13	16	4	2	11	48	3	1
<b>Financial intermediation</b>	153	2,201	%	6	1	46	26	0	1	16	0	0	4
<b>Business services</b>	851	13,170	%	8	20	25	11	7	2	9	6	11	1
<b>Public administration and defence</b>	145	1,287	%	7	9	22	11	39	0	2	4	6	0
<b>Education</b>	481	3,961	%	1	42	24	5	1	21	1	4	1	0
<b>Health and social work</b>	1,185	10,442	%	3	21	30	4	1	37	1	*	2	1
<b>Other services</b>	351	4,605	%	3	11	32	6	3	35	2	1	8	*

Base: All skill-shortage vacancies

Note: Percentages sum to 100 across each row (subject to rounding)

\* denotes a figure greater than 0% but less than 0.5%

! at least 20% of employers in a sector reporting SSVs for any given occupation

! is used where the base size was under 25

Source: National Employer Skills Survey, 2009

Regionally, skill shortages are disproportionately concentrated in London and the East of England, although there is no necessary relationship between the level of skill shortages and the skills of a region's workforce. For example, relatively high skill levels in London and the East of England regions co-exist with relatively high skill shortages, as do relatively low skill levels in the North East. Skill shortages are relatively low in the Midlands and the North West despite relatively low skill levels in these regions. Skill shortages reflect demand conditions as well as supply and, of course, the specific conditions and particularities of individual occupations and localities.

Recent work by the Migration Advisory Committee (MAC) uses a wider range of measures of skill shortage (see MAC, 2008), to establish a 'shortage' occupation list for use in the Government's Points Based Migration system. Their valuable work provides, though only for what they define as 'skilled' occupations, a more detailed and specific list of occupations, and indeed jobs, which are in shortage. This could be used as a crucial intelligence tool in tackling skill shortages. The full MAC recommended shortage list is too lengthy to set out here, but is contained in chapter three of the National Strategic Skills Audit Volume 2 report. In sum, it covers a range of shortages in science/technology and engineering occupations, particularly in the healthcare and electricity sectors, as well as a shortage of some education professionals, senior care workers, some fine arts occupations and skilled chefs.

### **Unemployment and skills**

Both the occupational characteristics and qualification levels of the unemployed are substantially different from those in work (and, indeed, from many sources of jobs growth). The unemployed are less well-qualified than those in work, and have a different occupational profile, being more oriented to relatively low skill occupations. This represents a fundamental mismatch between the skills that unemployed people have and those most required by the labour market. The problem is most severe for those on Jobseeker's Allowance and for the long-term unemployed.

Nonetheless, it is the case that some unemployed people have skills (both in terms of occupational background and qualification levels) that are more closely aligned to current and future labour market requirements. For example, nearly one in seven of the (ILO) unemployed have a degree; 40 per cent have a level 3 qualification or above; and more than one in five had a previous occupation in the managerial, professional or associate professional/technical groups.

### **Skill gaps**

Whilst skill shortages and unemployment represent skill deficiencies which arise in the 'external' labour market, skill gaps arise within the 'internal' labour market of organisations. Skill gaps occur when employees are not 'fully proficient' in their job, not having the skills required to undertake effectively the full range of duties expected.

Skill gaps now affect one in five employers, an increase of four percentage points since the 2007 National Employers Skill Survey (LSC, 2008). The proportion of the employed workforce estimated to exhibit a skill gap is around seven per cent – or 1.7 million workers. It is a particularly important issue in larger establishments, and, whilst it is pervasive across sectors and occupations, it is particularly noticeable in sales and elementary occupations and in the manufacturing; electricity/gas/water; and hotels/catering sectors, as can be seen in Table 4.

Table 4: Incidence and number of skills gaps in England by broad SIC sector

	% of establishments with any skill gaps	Number of employees not fully proficient (i.e. number of skill gaps)	% of staff reported as having skill gaps	Share of employment	Share of all skill gaps
	%		%	%	%
<b>Overall</b>	19	1,702,500	7	100	100
<b>Agriculture</b>	13	18,400	6	1	1
<b>Mining and quarrying</b>	16	1,500	6	0	0
<b>Manufacturing</b>	20	203,500	9	10	12
<b>Electricity, gas and water</b>	30	9,400	9	0	1
<b>Construction</b>	18	76,700	7	5	4
<b>Retail and wholesale</b>	20	292,900	8	17	17
<b>Hotels and catering</b>	26	164,700	11	6	10
<b>Transport, storage and communications</b>	17	89,000	7	6	5
<b>Financial intermediation</b>	22	82,100	8	4	5
<b>Business services</b>	15	298,300	7	19	17
<b>Public administration and defence</b>	23	59,100	5	5	3
<b>Education</b>	25	110,000	5	9	6
<b>Health and social work</b>	23	211,900	8	12	12
<b>Other services</b>	18	92,100	8	5	5

Base: First column all establishments, remainder all employment

Note: The number of employees not fully proficient has been rounded to the nearest 100

■ sectors with high or above average indicators of skills gaps

Source: National Employer Skills Survey, 2009

What sort of skill deficiencies predominate within workplaces? Technical/professional skills are the most common, and are found in more than 50 per cent of all workplaces, in every sector, with skill gaps. The proportions are highest in financial services, education, manufacturing, mining/quarrying and agriculture. In terms of generic skills, the most frequently reported deficiencies are in customer handling, team working and oral communication skills. The transport sector has the most pervasive generic skills issues.

In regional terms, skill gaps are highest in the South East, the South West and the West Midlands. It is interesting to note too, that the largest increase in skill gaps since 2007 occurred in the South West and the West Midlands. While the extent of deficiency in technical/practical skills varies little across the regions, literacy/numeracy issues disproportionately arise in the North West and the North East, numeracy in the West Midlands, and literacy in London.

## Underemployment

International evidence shows that the UK has more high skill jobs than high skill people, although this 'gap' is about average for the OECD. However, like most other OECD countries, the supply of skills in the UK has been increasing faster than demand. We find that the former has grown in recent years at fully six times the rate of the latter. Moreover, we find here that the UK's growth in skills demand is one of the lowest in the OECD. Such trends provide something of a 'lead indicator' of potential future imbalances between high level skills availability and skills demand. As such increasing demand for skills, as well as stimulating supply, will be important in the future.

More detailed analysis is needed to help better understand these trends in the demand and supply of high level skills, why they are occurring, and what the implications are for the labour market. The domestic evidence on the changing balance between skills supply and demand suggests a possible deficiency in demand which has fallen in recent years at level 3, but increased at level 4 and above. Such 'under-utilisation' of skills implies a need to make a sustained effort to make better use of the skills available in the workplace. It also points to a need to ensure that the balance is right in terms of supplying the right skills to match trends in labour market requirements and that action is taken to raise further the demand for higher skill levels.

## Migration

The inflow, outflow and 'net balance' of migration have all increased over the last decade. The proportion of the working age population born overseas has increased from nine per cent in 1998 to 13 per cent today. Whilst over two-thirds were born outside the EEA, the growth in numbers in recent years is accounted for largely by migration within the EEA.

Around 1.5 million workers have come to the UK from the Accession states since 2004, and the number of residents has increased by around 700,000. Migrants may be attracted by employment opportunities, may compete with domestic workers, be preferred to indigenous workers in some circumstances, or fill skill shortages or other hard-to-fill vacancies. In some senses then, migrant labour market participation reflects a response to a 'mismatch' between the skills required by the labour market, and those available in the domestic labour force. This will be especially true of jobs held by migrants from within the EEA and those entering the UK through the Points Based Migration system.

Non EEA migrants are particularly strongly represented in a number of, relatively high skilled, occupations, accounting for more than one in seven workers in high skill occupations like health professionals/associate professionals; ICT professionals; and research professionals. They are also, however, strongly represented in a number of less highly skilled occupations, accounting for one in five jobs in food preparation, and one in seven in security occupations. These 'migration intensive' occupations are paralleled by specific sectors where there is also a high penetration rate of non EEA migrants. The most migration intensive sectors are mining, clothing manufacture, recycling, hotels/restaurants and computers, each of which have more than one in seven of their workforce accounted for by non EEA migrants.

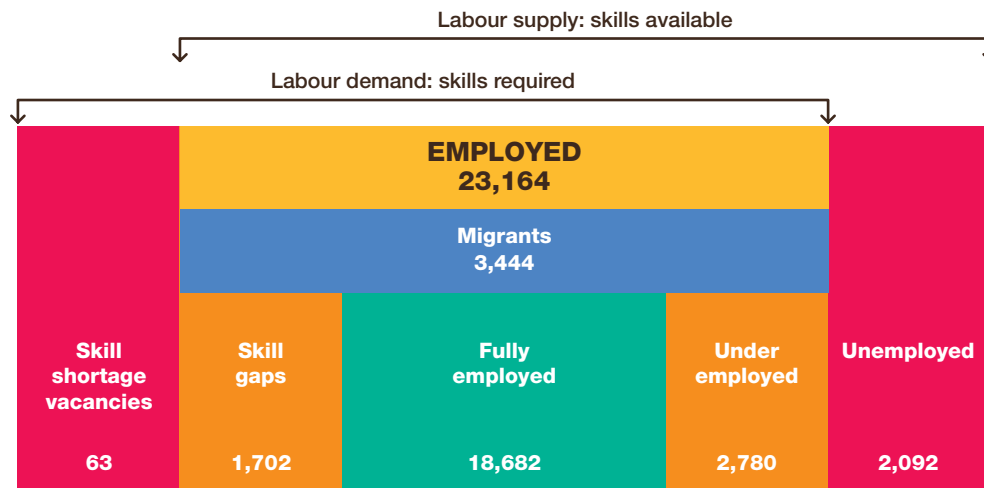
Turning to EEA migrants, the most migration intensive jobs are relatively low skilled – elementary process/plant occupations; process operatives; elementary agricultural assemblers and routine operatives; cleaning and storage.

Taken together, and in terms of absolute numbers, it is the health sector, business services, retail and hospitality sectors that employ the most migrants.

## The scale and importance of the different dimensions of mismatch

If we put all these aspects of labour market mismatch together (Figure 3), we can see how they stack up in relative terms and in terms of scale. It is clear that we need to address both ‘external’ and ‘internal’ mismatches, as well as both demand and supply issues. Quantitatively, at the moment, the issue is primarily one of unused/under-utilised skills, associated with a deficiency of demand, rather than one of skill needs that are currently unmet. Nevertheless, both are important, and the situation is of course dynamic, changing over time.

**Figure 3: Skills mismatches: key components**



Note: Numbers on this Figure are in thousands

## The drivers of change

So much for the present, what about the future? How is the demand for skills likely to change as labour markets change in response to structural trends and developments in the coming years?

We can gain an insight into the likely direction, type and nature of change, and how this may affect employment and skills by identifying the key drivers of change and reviewing potential developments in each of them (see Figure 4). Taken together, this will help us understand the forces that are stimulating change in our economy and labour market and their potential implications for skills. As a part of the Audit we undertook an extensive review of the horizon scanning and ‘futures’ literature, and commissioned an independent study from experts in the field (SAMI, 2010).

It is important to recognise that the interdependencies between each of the drivers, is important as they may reinforce, or mitigate, each others’ impact over time. Such a dynamic interplay inevitably means that the ‘outcomes’ in terms of jobs and skills are necessarily uncertain, and, in a precise sense, not knowable in advance. Indeed, in the end, future trends and ‘end states’ depend on the (changing) behaviour of all of us – individuals, employers, providers, government; our relations with the rest of the world; and on how these dynamics of change play out there too.

Nonetheless, an understanding of the key drivers, the forces that are shaping our present and that will define our future, will give us greater insight into how skill needs in England are most likely to change in the coming years. We can then put these dynamics and processes alongside our technical labour market forecasting to add value to our understanding of future skill needs and where the potential for the emergence or continuation of skill deficiencies might arise.



Figure 4: The key drivers of change



We identify seven key drivers of change:

### 1. Regulation and multi level governance

At the international level, the changing balance of global power between nations, and across levels of government, will be important. There are likely to be attempts to develop increasingly 'co-operative' international solutions to economic and political conflict as the interdependency of nations continues to increase in a global economy, with increasingly significant international and global institutions. The risks and challenges associated with potential conflicts will need to be managed if they are not to impact on economic expansion. At a more specific level, the development at the EU level of the Lisbon jobs agenda; the increasing role of skills within that (*New Skills for New Jobs*); and the newly established 2010 education and training benchmarks, may well become more important (Expert Group on New Skills for New Jobs, 2010).

At the national level, much will depend on the policy position of future governments to be elected in 2010 and perhaps 2015, not only in education/training policy but in economic, regional and industrial policy too, including the balance between markets and intervention and the ways in which public expenditure, taxation and borrowing are managed in the context of serious fiscal challenges. More specifically, the extent of 'compliance' in certain sectors; the 'growth' of the labour force as a result of the raising of the compulsory education leaving age and the pension age; and the impact of public procurement on skills through the contractors' provision of public services, will all be important.

## 2. Demography

The ageing population and workforce will impact on both the demand for, and supply of, skills. Increasing life expectancy and the increasing length of working lives will be important, as will the decline in the numbers of young adults. The continuing role of migration from within, and from without the EU, will also continue to be significant. Difficult labour market conditions, if they persist, may lead to pressure to preserve job opportunities for the domestic workforce. The high 'replacement rates' required for many jobs as the workforce retires are important, as is the potentially substantial increase in the volume of care and leisure needs required/demanded by the elderly.

## 3. Environment

The impact of climate change may be felt in the short term though more unpredictable and extreme weather conditions, which may impact on food supply and water availability. Pressure on natural resources, including an increased demand for energy, and, in particular, an increase demand for sustainable sources, may become more important as may demands to tackle environmental degradation, including pollution.

There will also be a continuing need to reduce CO<sub>2</sub> emissions, to diversify energy sources, and to build a 'low carbon' greener economy.

## 4. Economics and globalisation

The importance of securing a continuing edge in the pursuit of competitive advantage will be critical. The search for differentiation, and for products and services which meet changing consumer needs will continue. Value chains are likely to become increasingly global in nature and increasing national specialisation is likely in production and trade. There is likely to be a continuing or increasing focus on skills in high wage (and other) economies as a source of competitive advantage, as countries/companies seek to move up the value chain and into higher quality goods/services. Much will also depend on the management and leadership of companies in England.

The challenge of emerging economies, in particular the BRIC economies (Brazil, Russia, India and China), and from major trading partners within and without the EU, will continue, and much will depend in export and import intensive sectors, on exchange rate movements. The pace of recovery from the recession nationally and internationally will be important, as will the risk associated with global trade and saving imbalances.

Nonetheless, a large proportion of jobs will remain, particularly in the service sector, where goods/services are less tradeable. Also, economic uncertainty/instability may continue for a time as the national economy recovers from the recession, thus making the actual speed of recovery and jobs growth unclear. There are probably a wide range of possible economic growth trajectories.

## 5. Technology

Information and communication technologies are likely to continue to collapse space and time and to have an increasing impact on employer choices as to the location of work, which will enable further increases in the geographical specialisation of production, which will also be increasingly 'skill biased.'

Technological changes in a range of other areas may have significant impacts. In medical and life sciences, there is an increasing likelihood of developing more sophisticated customer treatments and mechanical devices to increase the quality of life of recipients. The further development of digital media, the use of e-commerce, and increasing availability of the range of products/services available online will be important. In addition, of course, developments towards a lower carbon economy will impact on energy production, construction, distribution and food production. There may well also be increasing demand for creativity and entrepreneurship, and the need for a range of generic skills linked to these.

## 6. Values and identities

There is likely to be a continuing, and perhaps increasing, impact of globalisation on culture, values, identity and beliefs. Individuals' affiliations will increasingly extend beyond a physical locality with relations and identities developing remotely and in virtual worlds. People are increasingly likely to develop multiple allegiances. This may lead to greater cultural plurality and complexity. It would appear that people in Britain are increasingly liberal in their attitudes.

Shifting values on 'environmental consciousness' will shape product choices in regard, for example, to organic foods, greener buildings/refurbishment, eco-friendly packaging and bagging. Much also will depend on whether individual and personal, rather than collective values remain in the ascendency, and this will influence attitudes to work and skill acquisition. Finally, the changing nature of family structures and composition of households is likely to continue to increase the demand for care of children and the elderly.

## 7. Consumer demand

It is ultimately the collective behaviour of millions of people in England and throughout the world that determine the volume and composition of the goods and services that become available, and the skills required to make/deliver them. As consumers become more sophisticated and as their disposable incomes rise, they are moving towards more high value added, higher quality, more personalised goods/services. The income elasticity of demand, changing tastes and preferences, the shaping of consumer wants by large global players, all are likely to generate more 'differentiated' patterns of consumption with low income communities and consumers 'relegated' to more standard, low value added goods/services. Fragmentation, segmentation and diversity may well become increasing features of markets, as individualisation of lifestyle demands increases choice and the development of 'niche' products/services. Moreover, an increasing number of services have a strong 'relational' content where customer care, personal attention and face-to-face interaction are important to success.

As the global economy grows, integrates and specialises, opportunities will develop in other parts of the world. The demand for environmentally benign goods may well continue to grow (by virtue of regulation as well as customer demand). It is also important to recognise government(s) in England and overseas, as important customers in their own right.

How these drivers and their impact finally play out can be associated with different 'scenarios' of the future. In these, the balance of each driver and the broad politico/social/economic environment will lead to different potential outcomes with potentially different employment and skill consequences. In practice, these are likely to be most relevant to the relatively long term, say 10 years, but their dynamic may have some impact in the shorter run. We identify three scenarios:

- The **'World Markets'** scenario – individual aspirations thrive in a global economy sustained by international co-operation. This reflects a world driven by aspirations of personal independence, personal and corporate wealth and mobility, to the exclusion of wider social goals; a belief in the continued efficacy of integrated global markets; and internationally co-ordinated policy, light regulation and a philosophy of 'minimal government.' DTI foresight scenario work (DTI, 2002), identifies likely fast growing sectors under this scenario as health/leisure; media/information; financial services; bio-nanotechnology.
- The **'National Enterprise'** scenario – individuals and governments seek autonomy and independence; people aspire to personal independence and material wealth, embracing liberalised markets to secure national self reliance and security; but political and cultural institutions are strengthened to buttress national autonomy in a more fragmented world, and international co-operation is limited. Fast growing sectors under 'national enterprise' are private health/education; domestic and personal services; tourism; retail; and defence.
- The **'Global Sustainability'** scenario – here there is a caring world where individuals value community and look to government for welfare and sustainability. People aspire to high levels of welfare within communities characterised by shared values, more equal distribution of opportunities and a sound environment; they believe these objectives are best achieved through active public policy and international co-operation; and markets are regulated to encourage competition. Fast growing sectors are education/training; large systems engineering; new and renewable energy; information services.

For more detail, see SAMI (2010).

There are many common trends which remain strong in each scenario, in particular, an increasing demand for skills and a drive towards quality, though there are also some important differences too.

## Key sectors

Which sectors are currently most significant in terms of their contribution to the economy and which are most likely to be of most significance in the future? In addition, which sectors have the most substantial skill deficiencies that need to be addressed?

'Key' sectors can be identified in terms of their current/potential strategic importance in terms of jobs, productivity and skills. The Audit first looks at likely growth sectors in terms of jobs and then we try to identify key sectors using a systematic approach to assessing their economic significance and skill needs, both now and in the future. We then draw attention to six key 'emerging' sectors identified by the Government as of great potential for the future, before identifying a further four, which have been referred to in other recent Government publications, and which emerge as key from our own sectoral studies.

Over the next few years, employment expansion is expected in a range of sectors (see Table 5).

Table 5: Projections of employment by 25 industry groups. Absolute levels and changes (000s)

	Levels			Changes		
	2007	2012	2017	2007-2012	2012-2017	2007-2017
<b>Agriculture, etc.</b>	453	398	353	-55	-45	-100
<b>Mining, quarrying and utilities</b>	180	165	150	-15	-15	-30
<b>Food, drink and tobacco</b>	429	418	402	-11	-17	-27
<b>Textiles and clothing</b>	137	110	94	-26	-17	-43
<b>Wood, paper and publishing</b>	509	480	467	-29	-13	-42
<b>Chemicals and non-metal minerals</b>	540	501	456	-40	-44	-84
<b>Metal and metal goods</b>	421	389	361	-32	-29	-61
<b>Engineering</b>	615	552	487	-63	-65	-128
<b>Transport equipment</b>	326	304	276	-22	-28	-50
<b>Manufacturing n.e.s. and recycling</b>	204	203	208	-1	4	4
<b>Construction</b>	2,187	2,285	2,361	98	76	175
<b>Distribution relating to motors</b>	644	654	663	11	9	19
<b>Wholesale distribution n.e.s.</b>	1,275	1,302	1,324	26	22	48
<b>Retailing distribution n.e.s.</b>	3,142	3,239	3,356	97	117	214
<b>Hotels and catering</b>	1,989	2,100	2,200	111	100	211
<b>Transport and storage</b>	1,346	1,370	1,406	23	37	60
<b>Post and telecommunications</b>	484	473	468	-12	-4	-16
<b>Banking and insurance</b>	1,107	1,160	1,196	53	36	89
<b>Professional services</b>	863	868	879	4	11	16
<b>Computing and related services</b>	581	629	706	48	77	125
<b>Other business services</b>	4,020	4,472	4,903	452	431	883
<b>Public administration and defence</b>	1,543	1,530	1,532	-13	2	-11
<b>Education</b>	2,553	2,617	2,662	64	45	109
<b>Health and social work</b>	3,684	3,902	4,079	218	177	395
<b>Miscellaneous services</b>	2,001	2,080	2,194	78	115	193
<b>Total</b>	31,234	32,200	33,184	966	984	1,949

Note: a) Because of their small size in terms of total employment, mining, quarrying, utilities and wood, paper, publishing have been combined for most of the reporting. Separate results are presented where the data are sufficiently robust, as is the case here

The abbreviation n.e.s. stands for 'not elsewhere specified'

■ sectors where employment is expected to fall by at least 100,000

■ sectors where employment is expected to rise by at least 200,000

Source: Working Futures 2007-2017 using CE/IER estimates, CE projections MDM C81F9A (revision 900), 25UK.xls, (Table 3.4a)

Business services (e.g. accountancy, law, consultancy, advertising and public relations, cleaning/facilities management, call centres) are expected to account for more than one third of total jobs growth. Health and social work are also expected to grow significantly, as are retail and hotels/catering. Together, these sectors already account for more than 40 per cent of jobs in England. It is likely that any existing skill shortages and gaps may be exacerbated by such future growth requirements.

These forecasts of jobs growth were made prior to the recession, and it may well be the case that the volumes of job growth may turn out to be lower than envisaged. It is important, however, not to confuse structural and cyclical trends and to recognise that recoveries from previous recessions have seen employment and the structure of the economy resume previous paths relatively quickly. It is likely that the relative magnitude of change across the sectors will remain, although it may be the case as recovery takes hold that financial services, and possibly construction, grow less than expected, although that said, growth is expected in these sectors from mid 2010 onwards. This might also be the case in parts of the public sector as a result of measures to significantly reduce the public deficit.

The Audit also undertakes an initial preliminary assessment to identify economically significant sectors of the economy which are also constrained by skill deficiencies.

Sectors can be defined as economically significant because of their level or growth in terms of productivity. Analysis from *Working Futures 2007-2017* shows that the three sectors with the highest levels of productivity are currently electricity, gas and water; real estate; and financial services. However, productivity is not the only criteria of economic significance. The level and growth of employment is also important. Here, the analysis shows undertaken for the Audit that business services; health and social care; and retail are the sectors with the highest employment levels.

The Audit combines the productivity and employment measures into one overall measure of 'economic significance'. We thus characterise economic significance in terms of productivity levels, productivity growth, employment levels and employment growth, and construct both a measure of 'current' significance and one of 'future' significance.

We also characterise sectors with skill deficiencies, and do this in terms of skill shortages, skill gaps and a measure of 'qualification/occupation' mismatch, for the current situation. Identifying skill deficiencies in the future is more problematic, and for this, we use the proxy of 'replacement' demand.

Tables 6 and 7 show the results of the analysis for economic significance and skill deficiency, today and tomorrow. We combine these into a 'priority matrix,' one in respect of the current situation, the other in terms of the future (Figures 5 and 6).

**Table 6: Current sectoral economic significance and skill deficiencies: the sectors ranked**

Highest scoring sectors (most significant first)	Economic significance	Skills deficits
1	Financial services	Hospitality
2	Business services	Transport equipment manufacture
3	Renting and real estate	Agriculture
4	Computing	Textiles manufacture
5	Health and social care	Computing
6	Retail	Vehicle maintenance, etc.
7	Post and telecoms	Food and drink manufacture
8	Electricity, gas and water	Retail
9	Construction	Wood and paper manufacture
10	Transport equipment manufacture	Construction
11	Hospitality	Miscellaneous services
12	Transport	Electricity, gas and water
13	Chemicals	Health and social care
14	Wholesale	Wholesale trade
15	Machinery, etc.	Mining and quarrying
16	Education	Printing and publishing
17	Miscellaneous services	Metals manufacture
18	Public administration	Machinery manufacture
19	Mining and quarrying	Other manufacturing
20	Food and drink manufacture	Transport
21	Vehicle maintenance	Chemicals
22	Metals manufacture	Renting and real estate
23	Textiles manufacture	Financial services
24	Publishing and printing	Post and telecoms
25	Other manufacturing	Business services
26	Agriculture	Education
27	Wood and paper manufacture	Public administration

Source: Institute for Employment Studies (IES)

Figure 5: A sector priority matrix – current

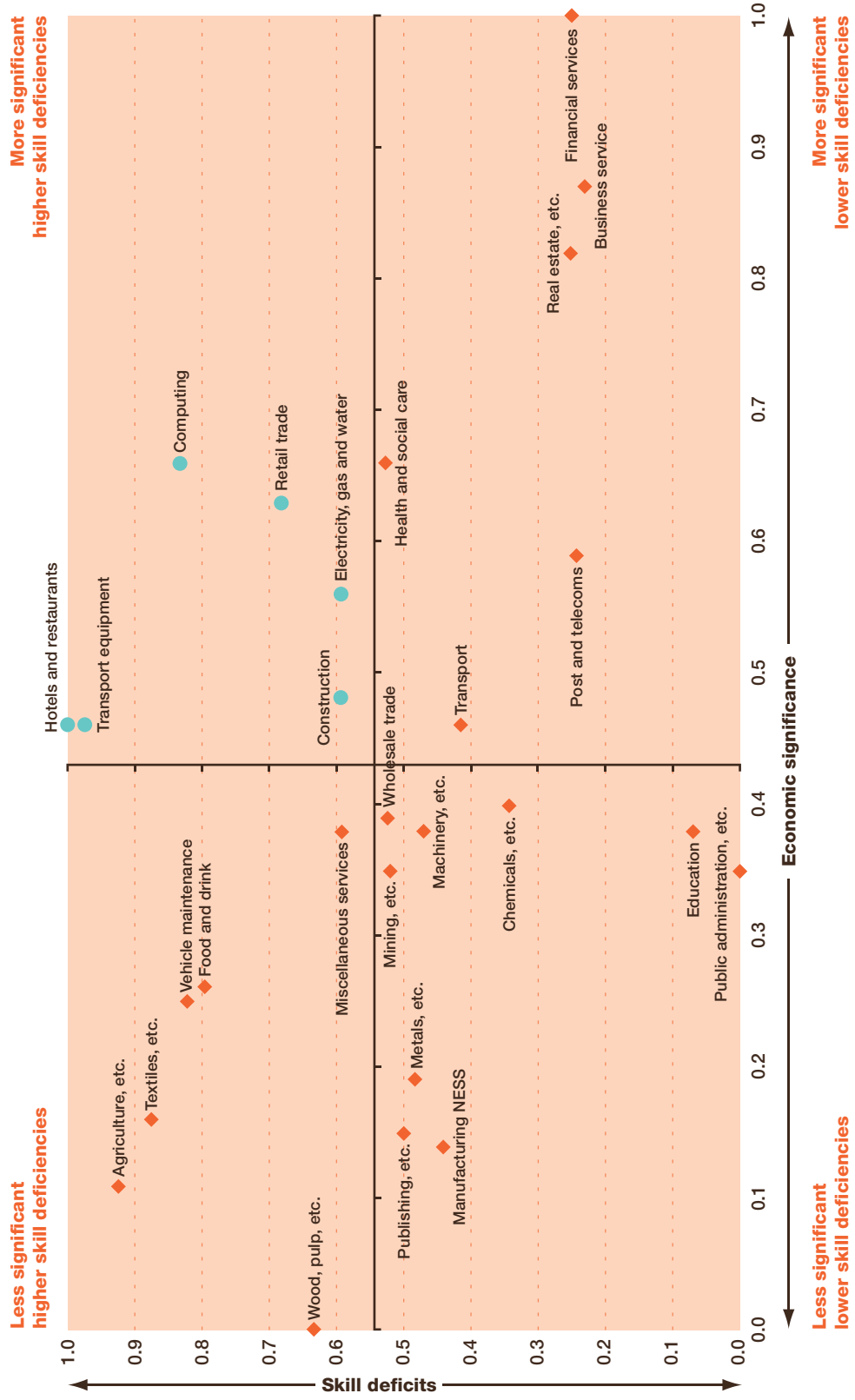


Table 7: Future sectoral economic significance and skills deficiencies: the sectors ranked

Highest scoring sectors (most significant first/ highest replacement demand first)	Overall economic significance	Replacement labour demand
1	Post and telecoms	Health and social care
2	Computing	Business services
3	Business services	Retail
4	Renting and real estate	Education
5	Financial services	Hospitality
6	Health and social care	Miscellaneous services
7	Electricity, gas and water	Construction
8	Retail	Public administration
9	Chemicals, etc.	Transport
10	Wholesale	Wholesale trade
11	Education	Financial services
12	Construction	Renting and real estate
13	Miscellaneous services	Vehicle maintenance
14	Transport	Machinery manufacture
15	Mining and quarrying	Computing
16	Transport equipment manufacture	Chemicals, etc.
17	Public administration	Agriculture
18	Hospitality	Post and telecoms
19	Machinery manufacture	Food and drink manufacture
20	Vehicle maintenance, etc.	Metals, etc.
21	Printing and publishing	Transport equipment manufacture
22	Food and drink manufacture	Printing and publishing
23	Other manufacturing	Wood and paper manufacture
24	Metals, etc.	Other manufacturing
25	Agriculture	Textiles manufacture
26	Wood and paper manufacture	Electricity, gas and water
27	Textiles manufacture	Mining and quarrying

Source: Institute for Employment Studies (IES)



Figure 6: A sector priority matrix – future



Taking the current situation first, it is those sectors in the top right hand quadrant of Figure 5 which exhibit both the greatest economic significance and greatest skill deficiency: computing, retail, electricity, gas and water, construction, hospitality, and the manufacture of transport equipment. Health and social care comes closest to also appearing in this quadrant.

In terms of the future, the sectors which combine growing significance and future skill needs are business services, health and social care, and retail. Education, financial services and wholesale distribution also appear in, or very close to, the top right hand quadrant (Figure 6).

We believe that this assessment of key sectors is valuable in its own right, and also offers insights into the sectors that merit attention in terms of action on skills. However, it is important to remember that this assessment is based on quantitative analysis of existing sectors only, and that qualitative data also offers valuable insights, particularly into new or 'emerging' sectors. The Audit draws on both types of data and also looks at both existing and emerging sectors. In addition, it is important to note that this is only an initial assessment which we need to review and develop over time, and we will work with BIS so that, in the 2011 National Strategic Skills Audit we will develop this work further, both to update and refine it, as well as to draw on the work BIS has undertaken to identify sectors of growth potential for the UK.

As noted above, the Audit analyses skill needs in emerging sectors as well as existing ones. In *New Industry, New Jobs* (BERR, 2009), the Government identified a number of sectors as ones of potential economic expansion and job opportunity. As part of the Audit, we paid particular attention to these sectors and have examined their skill needs in detail, drawing on 'cluster' studies undertaken by SSCs, and supplemented by three reports from consultants. The size, value and maturity of the sectors vary, but what is clear is that there is a degree of interdependence between them, with several sectors featuring in the supply chain for others, or forming parts of larger sectors, and that there are also a number of commonalities in their skill needs. This is a point worth emphasising as the interdependence of these sectors, and their interdependence with other sectors in the wider economy, means that growth in these sectors will be felt more widely – they are catalysts for growth in the wider economy. The six 'emerging sectors' are discussed below:

### **A low carbon economy**

Within this sector, a distinction can be made between low carbon energy generation and the more efficient use of energy in the economy. Wind, marine, micro generation, nuclear and carbon capture and storage comprise the low carbon energy generation sector, all of which, except nuclear, are in the early stages of development and implementation. Research and development and engineering activities are therefore prominent, and concomitant skills needs characterised by a dependence on high level STEM skills are reported. For example, there is a need for individuals with skills equivalent to levels 4 and 5 in the following engineering disciplines: mechanical, design, civil and structural, electrical, aeronautical, marine and geotechnical. The nuclear industry too is very much dependent on STEM skills, particularly a broad range of engineering disciplines and safety experts. Technicians are also required at levels 2-4 across the generation sector. More generically, there is also a need for project management, management and leadership, and technology transfer skills. Given sufficient government support and consumer demand, the low carbon energy generation employment has the potential to off-set the expected decline in traditional, carbon-intensive energy production.

Across the economy as a whole there is a need to reduce the use of energy in the production of goods and services. Whilst the prospects for job creation are expected to be more limited, demand for skills will, nevertheless, be created. From simply changing the way existing activities are carried out such as greener, more fuel efficient ways of driving in the logistics sector, to the scientific and technical skills needed to design, evaluate, monitor systems of energy use in manufacturing will necessitate the re-skilling and up-skilling of jobs. The ability to identify and apply developments in technology is likely to be key in achieving business process improvement (see Energy & Utility Skills *et al*, 2009).

## Advanced manufacturing

Six manufacturing sub-sectors have been identified by BIS as forming the advanced manufacturing sector: aerospace, silicon electronics, plastics/printed electronics, industrial biotechnology, composites and nanotechnology. In addition to forming part of the broader manufacturing sector, these sub-sectors contribute to the supply chain of numerous other sectors in the economy such as the digital economy and life sciences. Each of the sub-sectors also stands to make a contribution to the low carbon economy, either in its own right or as part of the low carbon sector supply chain.

For many of the sub-sectors economic data or precise labour market information is not available because of their nascent state. The UK aerospace sub-sector supplies, civil, defence and space markets, and with a 25 per cent share of the global aerospace market, the sub-sector has the second largest share behind the US.<sup>1</sup> The UK faces competition from other EU countries for high value aerospace research and development, the market for which was valued at £2.9 billion in 2007. In 2008, there were 600 UK aerospace employers, employing 112,000 people and generating £22.3 billion in turnover.<sup>2</sup> The sub-sector is high skilled and high value, as indicated by its occupational distribution and high salaries.

The UK has an international advantage in the silicon electronics sub-sector, founded upon the strength of its research and design collaborations with higher education, which have attracted two fifths of the sub-sector's firms Europe wide. Silicon technology is the basis for solar panels, a form of micro power generation in the low carbon sector, as well as compact antennae for aircraft or even brain implants. The sector's workforce is well qualified relative to other engineering sectors. Silicon electronics are likely to be replaced in the future by plastic electronics which have the potential to provide circuits which are much thinner than those which are silicon based. Again though, they will be central to the manufacture of solar panels along with other applications such as wafer thin batteries, electronic paper and medical equipment.

A key supplier to the pharmaceuticals sub-sector, industrial biotechnology has, in recent years diversified into the chemical industry with the manufacture of biofuels, biopesticides, and biologically based cleaning agents. Industry sources suggest that the full potential of industrial biotechnology has not yet been realised but that the market is already valued at up to £350 billion globally and up to £12 billion in the UK.

Composites combine two or more materials to create products which are given superior strength, durability and lower density. Composite materials stand to deliver increased productivity in their end use through enhanced performance and greater energy efficiency. Common applications include aircraft wings and fuselages, boat hulls, racing car bodies and wind turbines. As such the composites sub-sector is a feature of the supply chain for numerous other sectors. The value of the composites in the construction and automotive sectors alone is estimated to be £20 billion while the value of inputs to the UK's wind turbine market is estimated to be £5 billion. In recognition of its importance the Government has developed a Composite Strategy for the UK.<sup>3</sup>

Nanotechnology is the miniaturisation of systems at molecular or atomic levels creating the potential to embed electronic or mechanical systems into tiny applications. It will be of use in commercial, medical, and military applications to name but a few. International competition is fierce especially from Asia and the US with the global market being valued at \$81 billion.<sup>4</sup>

Technological research and development is the focus of activity in many parts of the advanced manufacturing sector and as a result the pace of technological change is rapid. High level skills in STEM subjects are reported as being the most critical. The innovations in technology which characterise the sector are created from cross-disciplinary fertilisation. This gives rise to the need for individuals with an understanding of multiple scientific disciplines, and the different target markets and supply chains that the innovations can supply. Management and leadership, new product development and commercialisation skills are important and will become more so as the sector develops (see Semta *et al*, 2009).

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1. A/D/S: The trade body advancing UK aerospace, defence and security

2. ABI 2008, ONS

3. BIS advanced manufacturing website 2009

4. Nanoposts 2008 report, nanomaterials and markets 2008-2015

## Engineering construction

The engineering construction industry plays a vital role in creating the industrial infrastructure for the UK and is therefore central to the success of other emerging sectors and, more generally, the UK as a modern economy. For example, it is important to the future of the UK's manufacturing sector, to delivering low carbon processing plants for the pharmaceutical, chemical and biotechnology sectors, and also to the emerging industries in the low carbon energy generation sector. The sector is the largest of its kind in Europe, and is second only to the US in size. Domestically, the £16 billion industry is fundamental to the economy, providing approximately 1.5 per cent of UK GDP and 0.4 per cent of GVA.

In 2008, the sector employed just under 75,000 people in the UK but with approximately 60 per cent of the sector's workforce projected to retire over the next decade, there is a replacement demand for 45,000 jobs, of which only 6,500 will be below the level of skilled craft workers. The largest share of these jobs will be required in the power generation sub-sector which is also acknowledged in the low carbon sector above. In terms of occupation, the largest shares of new jobs will be required in engineering design and project engineering (11,293), which broadly corresponds to associate professional roles, and skilled craft/technician roles (13,843). It is estimated that there will only be replacement demand for around 6,500 jobs at or below skilled craft workers.

Again the skills needs in this sector are STEM related, particularly chartered engineers and scientists, complemented by planners, project managers and designers, site construction managers, and safety specialists. Nearly 60 per cent of the UK workforce is expected to retire over the decade, exacerbating this demand (see *ConstructionSkills et al*, 2009).

## Financial and professional services

The financial and professional services sector has been a major engine of growth for UK the economy in the 21st century. London is a premier global financial centre, the UK's accountancy and legal services are world leaders, and the sector provides opportunities for some of the best graduate talent from the UK and abroad. The sector comprises the housing and property, architectural and engineering services, legal services, and financial services sub-sectors (*Skills for Justice et al*, 2009). The sector has been adversely affected by the global recession, none more so than the financial services sub-sector.

Within the financial services sub-sector there is likely to be greater emphasis on risk management among financial institutions as a consequence of the financial crisis and greater regulation, thereby increasing demand for accountants and actuaries which are already in short supply. Aligned with this will be the need for reporting and compliance roles at administrative and managerial levels. An increasing emphasis on product knowledge and advice, independent financial advice and customer handling skills is also anticipated. In detail, increasing needs for the following roles are anticipated in the future: actuaries, specialist underwriters, compliance staff, risk managers, capital modellers, accountants (all at level 5); retail bank managers at level 4; claims professionals, IT and legal staff at level 3 and; sales and customer service roles at levels 1-3. Generic skills that are required and are expected to become more important are management and leadership, industry and product knowledge, IT skills, literacy and numeracy skills and complex mathematic and statistical skills. Increasing knowledge of green issues is likely to be required and how they affect the sector.

In the other professional services sub-sectors there will be an increasing need for environmental related skills. Clearly these will vary according to each sub-sector, with sustainable development experts being required in housing and property, and knowledge of zero carbon building design and retrofitting in the architectural and engineering sub-sectors. There is expected to be a demand for valuation experts and surveyors in the housing and property sub-sector, and in the legal services sub-sector there will be a need to up-skill para-legals in transactional work along with enhanced procurement and tendering skills required in response to the introduction of market-based Legal Aid procurement.

There is also a need across the whole professional services sector for a broad range of management related skills such as finance and risk management, business management and commercial awareness and project management (see *Skills for Justice et al*, 2009).

## Digital economy

The digital sector makes a significant contribution to the economy and harnessing its potential will be key to the UK's future competitiveness and prosperity. It provides high levels of value added, and employs 2.5 million people (approximately one in 11 of the working population), many of whom are highly skilled. Estimates indicate that 55 per cent of UK GVA comes from technology-intensive sectors in the economy. Growth in technology occupations over the past ten years has been twice the average for the whole economy.

The sector consists of two broad components: technology and content activities. The technology sub-sector provides the infrastructure and platforms through which content is delivered. It is estimated to employ 1.57 million people and contributes 8.4 per cent of UK GVA (£71 billion). Content industries include creative media, covering: film, animation, commercials, pop promos, corporate production, facilities and interactive media, advertising, music and design. As such the content sub-sector has a close relationship with and will share many of the skills needs of the creative sector. Exports from this sub-sector total £7 billion per year and it employs approximately 930,000 people.

Both the technology and content components will need to respond effectively to the opportunities and threats posed by globalisation and advances in digital technology. Both will need increasingly high levels of skills and greater technical capability, and both will require business, creative and interpersonal skills.

Within the existing technology workforce, skills gaps affect over three quarters of technology professionals and relate to IT programme management, supplier management and service management and delivery at senior levels. In terms of content skills key gaps are the ability to produce multi-platform content; the monetisation of content; broadcast engineering skills and visualisation. Digital multi-skilling is also important. Fundamentally, individuals require IT user skills to interact socially, to seek and secure employment, and to engage with public and marketed services (see e-skills UK *et al*, 2009).

## Life sciences and pharmaceuticals

The UK is a global centre of excellence in the life sciences sector. Comprising the pharmaceutical, medical technology and medical biotechnology sub-sectors it is of significant economic value to the UK economy. In 2006 the sector had GVA of £7.45 billion, equivalent to £109,000 per employee, compared to the UK average of £31,419.

Until the financial crisis, output growth in the pharmaceutical industry had outpaced growth in the whole economy for most of the last 40 years. The pharmaceutical sub-sector is the largest investor in R&D in the UK, and of the top 25 R&D investors globally, eight are pharmaceuticals companies.

Total employment is estimated at 100,000 (BIS, 2010) and occupational employment in the sector largely reflects the pattern for the UK, except that machine and transport operatives are represented in the sector to a greater extent. This is the result of a significant amount of manufacturing activity in the sector, particularly the medical technology sub-sector.

The life sciences sector is based on STEM disciplines of biology, chemistry, chemical engineering, maths and statistics, and health economics. These disciplines will continue to be vital, but there will be demand for skills at higher levels, and more interdisciplinary skills. Skilled trades and machine operatives will continue to be essential to the production of medical technologies. Generic skills required include management and leadership, scientific and health regulation, negotiation, procurement and customer handling (Cogent *et al*, 2009).

Drawing on the work of the SSCs, who have all also produced summary reports on their sectors for this Audit, together with our work above on 'key' sectors and the emerging sectors identified in *New Industry, New Jobs*, we have also identified four other sectors which offer economic and jobs potential but which are currently or potentially constrained by skill deficiencies. These sectors are: creative, care, retail, tourism, hospitality and leisure.

## The creative sector

This sector involves companies in film, TV, radio, photo imaging, interactive content design, publishing, computer games, advertising, cultural heritage, music and the performing/visual arts.

The creative industries' contribution to the economy is around six per cent of GVA or around £60 billion per annum. They employ around 1.5 million people, predominantly in a very small number of large companies; a very large number of 'micro' enterprises employing less than ten people; and through a large number of sole traders/freelancers.

Jobs are predominantly concentrated in associate professional and technical roles, accounting for 43 per cent of all employment. The key drivers of change include globalisation, the growth of digitalisation, the development of user led content and market fragmentation.

Current skills issues include recruitment into the sector where there is an over-supply of potential entrants but mismatch between their skills and those the sector needs, this is particularly so with regard to production skills, intellectual property knowledge, commercial acumen, broadcast engineering, visual effect skills and managerial leadership. Also, important are issues around retention and the underemployment of women and minority ethnic communities. The workforce is also predominantly young.

The main skill gaps within the existing workforce relate to working with, and exploiting, digital technological advances, business skills generally, and management/leadership in particular. Higher and further education provision often do not provide sufficient specialism and commercial awareness.

As for the future and the considerable changes being brought about by the digital revolution, the following are of particular importance: multi-skilling; multi-platform skills; management, leadership, business and entrepreneurial skills; IP and monetisation of content; archiving and sales and marketing.

The effects of the recession may shape medium-term trends in consumer demand for 'experiential services' including live music, theatre and other entertainment events. Some reports suggest that the creative and cultural sector may be well placed to ride out the recession. Analysis suggests that consumers are still spending on film, music and theatre events and that growth in the sector is outperforming others.

## The care sector

The demand for childcare looks set to increase further. UK employment in childcare occupations increased by almost 40 per cent in the last decade to 840,000. At the same time, the effects of the ageing population will result in an increase in demand for health and social care provision for the elderly in both domiciliary and residential care. There is an ongoing need for senior managers, social workers and care assistants. Management skill needs include those required for new service delivery models. Increased qualifications are also needed to meet changing regulatory requirements.

Although service demand is expected to rise, public expenditure constraints in the coming years may limit employment growth. Conversely, there may be short-term skills needs in supporting elderly service users to commission their own care and to interface with telecare systems and automated technologies, which in the long-term could reduce the level of input required from human support.

Levels of labour turnover are often high in the relatively low skill occupations in this sector.

## The retail sector

The retail sector employs 2.8 million people, accounts for approximately eight per cent of UK GVA, and the industry is heavily characterised by large employers, with two-thirds of the workforce employed in 75 organisations. The dominant occupations within the sector are sales/customer service roles. Projections estimate more than 200,000 new retail jobs in the next 10 years, however, lower domestic consumer spending, increased productivity, and the net effect of e-commerce all may limit the employment expansion. 27 new shopping centres and retail park developments across the UK were planned between 2009 and 2014, but the economic downturn has resulted in one-third of developments being suspended, with only six completed so far.

Growth is most likely in customer-facing roles where there are concerns about customer handling and team working skills. The expansion of e-commerce will impact on logistics and distribution. There are also managerial and technical skill gaps including the need to improve product knowledge among frontline staff, and to understand customer trends on ethical sourcing. Levels of labour turnover are often high.

## Tourism, hospitality and leisure

Tourism and hospitality contribute over eight per cent of the UK's GDP and employ 2.6 million people in the UK. Projections of replacement and expansion demand for jobs lead to requirements for at least a further million additional workers in the sector by 2017, chiefly in managerial (where skill needs in particular focus on people and financial management) and elementary positions. The most serious gaps are in customer service roles including communication skills, literacy/numeracy, team working and customer engagement.

Specific occupations where there is an actual or potential shortage include sports coaches, instructors and officials; highly skilled chefs and play workers. Demand for some jobs may be created by sporting events including the Olympics, the Ryder Cup, and world cup competitions in cricket, rugby union and rugby league, although these events may create an employment legacy by boosting numbers of overseas visitors which could sustain demand. Analysis of skills needs for some of these events suggest skills gaps rather than labour shortages will be of most concern. There is likely to be a sufficient supply of labour to undertake the key roles required, but in order to secure beneficial legacy effects, concerns remain about the capacity of the workforce to deliver outstanding levels of customer service that will encourage repeat visits to the UK.

The ageing population and potentially high spending power of some sections of older people suggests there may be considerable potential to tailor leisure services to, for example around fitness and active ageing policies.

Volume 2 of the Audit reviews the skill needs of all the 10 sectors discussed above, including the regional dimensions. We also set out the key skills issues faced by all sectors as identified by the 25 SSCs.

In the 2011 National Strategic Skills Audit, we will undertake more detailed work on the four areas above – just as we did with the six emerging sectors in the current one. We may also identify further sectors that will repay more detailed study. Potential areas here include the education/training ('lifelong learning') sector and construction.

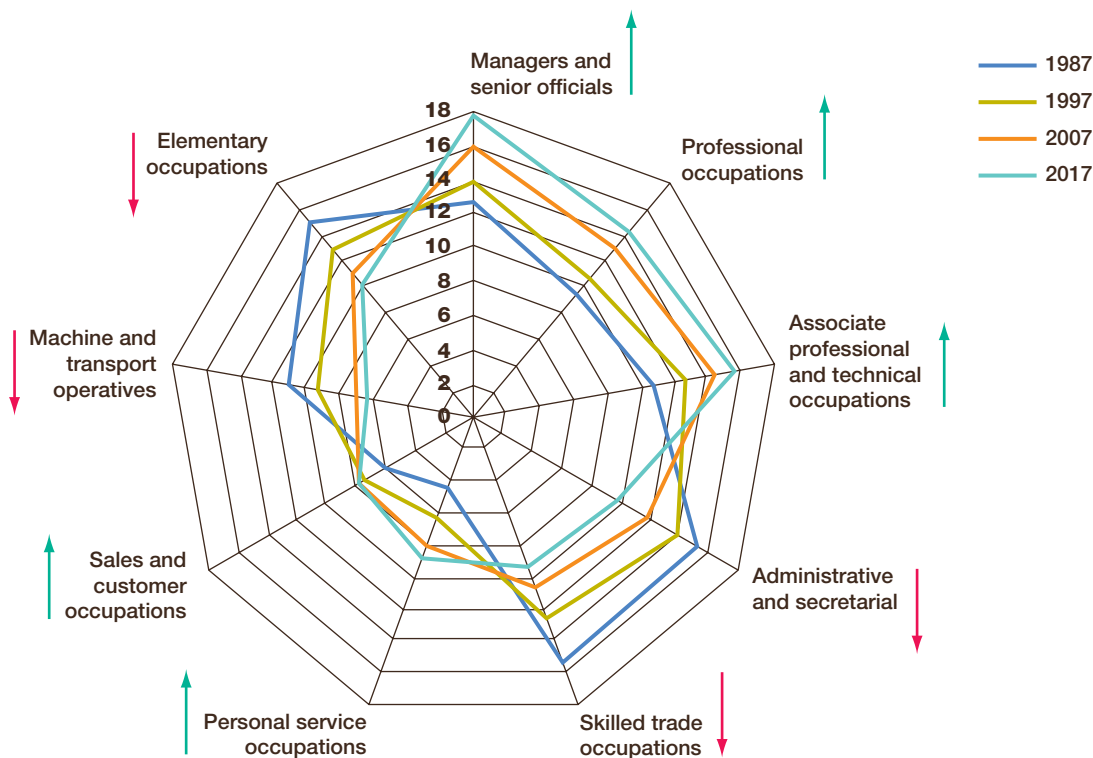
## Key occupations

Our forecasts suggest that, in broad terms, actual expansion in the number of jobs is most likely in the higher skilled occupations of managers, professionals and associate professional/technical occupations. Indeed, growth in these three groups over the next 10 years is likely to be equivalent to the whole net increase in employment for the economy as a whole. These groups account for 43 per cent of jobs today, and may well account for 47 per cent by 2017 – a growth of nearly 2.2 million new jobs. The other major growth area looks likely to be personal service occupations, where more than 400,000 additional jobs may arise.

On the other hand, a contraction of jobs is anticipated in administrative/secretarial, skilled manual trades and operative occupational groups. Nonetheless, it is expected that, by 2017, eight million jobs will still exist in the ‘bottom’ three occupational groups of sales/customer service, machine/transport operatives, and elementary occupations – a quarter of all jobs in the economy.

If we take a longer term view of both the past and the future, we can see the long term structural changes in occupational structure very clearly (see Figure 7).

**Figure 7: Changes in occupational structure in England 1987-2017 (% of employment)**



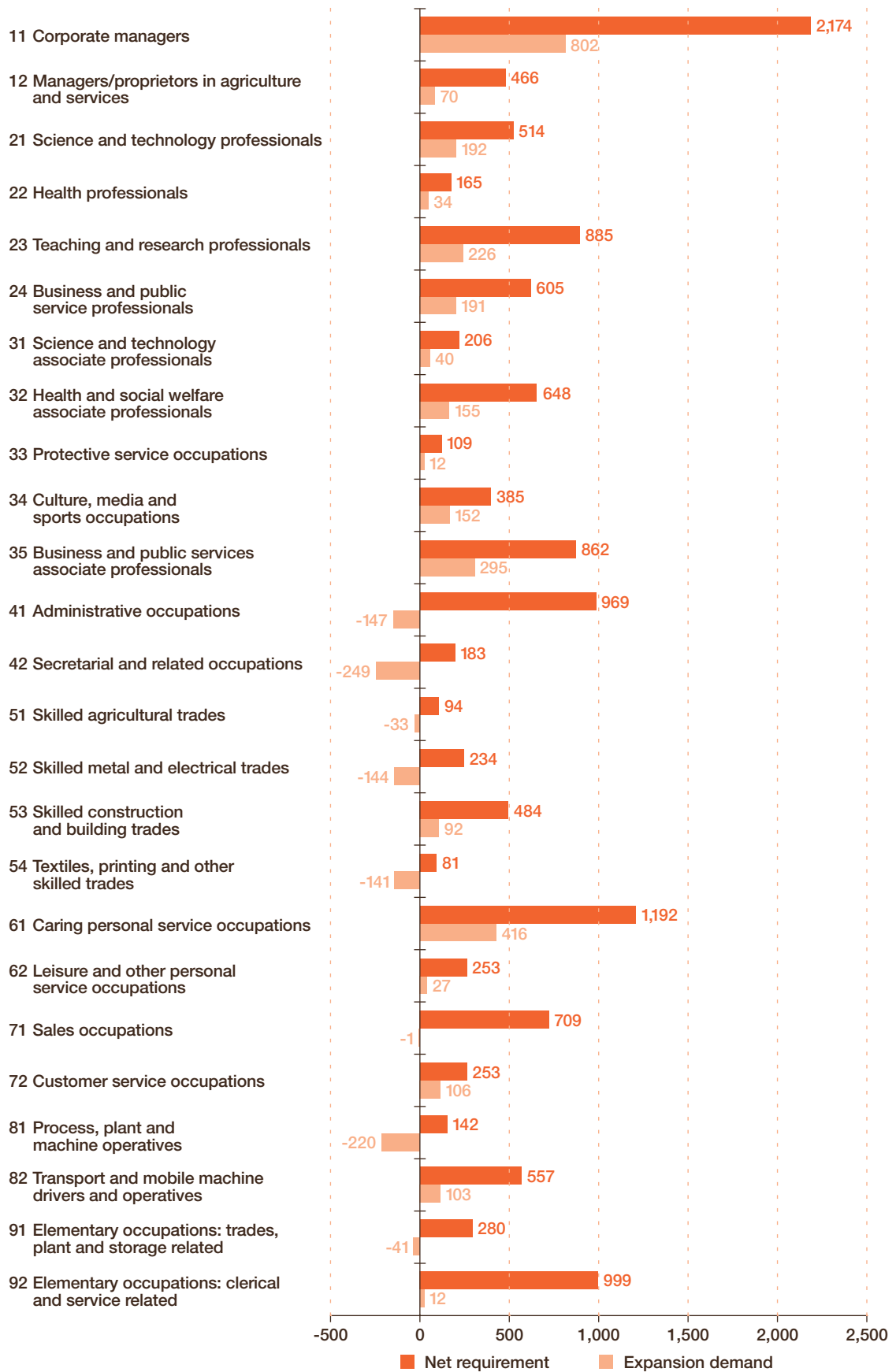
Source: Based on data from Working Futures 2007-2017

We can see the substantial growth in managerial, professional and associate professional/technical occupations as well as the growth in personal service occupations. The declines in administrative/secretarial and skilled grades are also clear.

However, it is important to recognise that these changes in overall growth (and decline) do not take full account of the total job requirements because, in addition to new additional jobs, it will be necessary to fill the job opportunities that arise as current jobholders retire. So, Figure 8 sets out both the anticipated additional ‘expansion demand’ and net requirements of occupations, which includes this replacement demand.



**Figure 8: Net requirements by Standard Occupational Classification (SOC) 2000 sub-major group, 2007-2017**



Source: Working Futures (2009)

Both sets of skill needs will need to be met. Replacement demand is especially important in several occupations: managerial; teaching/research professionals; business and public service associate professionals, administrative occupations, caring personal services and elementary occupations in services. Overall, less than two million of the potential 13 million job openings are 'new,' the bulk is to replace those leaving employment. This replacement demand can, of course, lead to an overall increase in jobs required to be filled even if total employment is declining.

We can also examine these occupational changes on a sector by sector basis to create a 'matrix' of occupation/industry requirements (see Table 8). This provides greater granularity in understanding.

**Table 8: High growth occupations by sector**

<p><b>High growth occupations in large sectors with expanding employment</b></p> <ul style="list-style-type: none"> <li>• Corporate managers and science and technology professionals in computing and related services and other business services.</li> <li>• Corporate managers in the health and social work sector.</li> <li>• Business and public service professionals, associate professionals, health associate professionals, culture/media/sport occupations, caring/personal service occupations and customer service occupations in other business services.</li> </ul>	<p><b>High growth occupations in sectors with expanding employment</b></p> <ul style="list-style-type: none"> <li>• Teaching and research professionals and business/public service professionals in hotels and catering.</li> <li>• Teaching and research professionals and business/public service professionals in computing and related services.</li> <li>• Culture/media/sport occupations and business/public service associate professionals in hotels and catering.</li> <li>• Culture/media/sport occupations and business/public service associate professionals in computing and related services.</li> <li>• Personal service/caring occupations in hotels and catering and computing and related services.</li> <li>• Customer service occupations in hotels and catering and computing and related services.</li> </ul>
<p><b>High growth occupations in large sectors</b></p> <ul style="list-style-type: none"> <li>• Corporate managers in distribution relating to motors and wholesale distribution, transport and storage, professional services, public administration/defence and education.</li> <li>• Teaching and research professionals in education.</li> <li>• Business/public service (associate) professionals and health associate professionals in health and social work.</li> <li>• Business/public service associate professionals in banking/insurance.</li> <li>• Caring/personal service occupations in education, health and social work and miscellaneous services.</li> </ul>	<p><b>High growth occupations in multiple sectors</b></p> <ul style="list-style-type: none"> <li>• Teaching and research professionals.</li> <li>• Culture/media/sports occupations.</li> <li>• Caring/personal service occupations.</li> <li>• Customer service occupations.</li> </ul>

Source: *Working Futures 2007-2017*

There is also evidence from the detailed sector studies which corroborates and supports much of the above. In particular, the cluster studies provide evidence of the following occupational jobs and skill needs:

- significant demand for technology professionals in the computing sector;
- skill gaps emerging amongst managers and professionals across a range of sectors, in relation to ICT, the digital economy and technological change more broadly;
- high levels of anticipated demand for corporate managers and health associate professionals in the health and social work sectors;
- a need for improved management skills across several sectors, often specific in character, related to the sector;

- a high demand for highly skilled, specific STEM related occupations;
- widespread demand for associate or 'para' professional and skilled technician roles, across a wide range of sectors;
- significant expansion of frontline personal service occupations, especially in the care sector.

## Priorities for action

The National Strategic Skills Audit seeks to provide greater insight and foresight into England's existing and future skills needs. We conclude by drawing together the analysis, summarising the occupations and sectors which present strategic skills needs, where short, medium or longer term action needs to be taken. We undertake an assessment of the importance of different skills needs, and allocate a 'traffic light' rating, based on four criteria:

- the degree of certainty or likelihood of the skill demand materialising and failing to be met, and the significance of any consequent skill deficit under different future scenarios;
- the magnitude in terms of the scale of action required, based on the numbers of jobs that will need filling and the level of demand or size of the skills need;
- the lead time required to rectify the deficit (e.g learning time required);
- the criticality based on the risk to economic development based on the sector and occupational analysis above.

Depending on how these criteria all combine, each occupation and skills need is then given a single colour rating, signifying the importance and priority for action. These go from red to pink, to amber with red indicating the greatest importance. The results can be summarised as follows:

### Red – high priority skills needs for immediate action

- **Corporate managers as a group, and a range of specific management skills** have been identified in a number of key sectors. The sectors are likely to include retail, business services/computing/digital media organisations, financial and professional services, health and social care, education, public administration and hospitality. Management and leadership covers a multitude of different core activities and behavioural competences, and includes leadership, change management, people management, financial management, risk management, negotiation and procurement skills requirements which must be delivered exceptionally well to fully respond to and exploit future challenges and ensure High Performance Working. This therefore explains the red rating.
- **Specific and significant management and professional skill shortages** have been identified in the computing and software sectors. These occupations receive the highest rating because of the direct and indirect significance of the digital economy and the importance of these occupations within those industries. More specifically this includes, management skills to harness the potential of the digital media industry through delivery of multi-platform content, the successful operation of networks within the sector, and the exploitation and commercialisation of broader ICTs in manufacturing and across the wider economy are similarly critical.
- **Health and social care professionals** are currently in short supply **in a number of medical specialisms such as particular medical practitioners** (i.e. audiological medicine, genitourinary medicine, haematology, paediatric surgery – for example see the MAC list) **pharmacy and qualified social workers**. Some of these roles may be sourced using immigration, and action is currently being taken to address skills shortages in some of these occupations. The sector is an important one in terms of volume of demand, therefore these skills needs receive a red rating.

- **Science and technology professionals in pharmaceutical and medical technology industries** and also in key parts of manufacturing (i.e. traditional and advanced areas) are both essential to the preservation of globally specialist sectors. A new multi-disciplinary knowledge base will be essential for the higher value added product market strategies that will be required to compete in these markets and to adapt to the pace of technological change. In the pharmaceutical and medical technology sectors, this will call for specialist, biological skills, chemistry, physics, mathematics and statistics. These skills therefore receive a red priority rating.
- **Teaching and research professionals across the education sector** will be essential to support the supply of new recruits to a number of priority sectors. As businesses develop their technology and production processes this will require close and on-going co-operation between education providers and employers to ensure that evolving curriculums effectively meet industry needs. This will be especially important in key areas such as STEM related subjects where there is a more general emerging skills need for multi-disciplinarity both within science, technical and business areas. Research within HE is critical too to providing the insights and innovations which can be commercialised through the relevant sectors. With an ageing teaching workforce, it is vital that the sector is attractive.
- **Health and social care associate professionals and technical roles** are currently in short supply in a number of medical specialisms such as distinct areas of nursing and amongst therapists. Indeed, these areas have significant current demand and are anticipated to exhibit significant growth, not least because replacement demand will be more substantial due to the age composition of the current workforce. They are already experiencing skills shortages. For instance, skills shortage vacancies reported amongst associate professional staff account for 30 per cent of vacancies in these sectors. Furthermore, some occupations exhibiting particularly strong skills deficits are listed on the MAC skills shortage list such as distinct areas of nursing in operating theatres and neonatal intensive care units. Migration therefore may also be obscuring the true nature and level of skills deficits amongst the domestic workforce.
- **Associate professional and technical roles will be required in a broad range of sectors, particularly manufacturing/process sectors, including oil, gas, electricity, chemicals, pharmaceuticals, automotive, engineering, broadcasting.** They are likely to be required in large numbers, will require breadth as well as depth of knowledge including generic product lifecycles and manufacturing techniques, and are essential to survival if competitive strategies associated with moving into higher value added markets are pursued.

In particular, there is a growing need for technicians especially in specialist STEM areas. Demand for technicians is rising across a range of sectors driven by increased technological complexity; the increasing attention being given to higher value added product market strategies and the changing skill mix in some professions. There is also increasing importance being attached to intermediate vocational skills and career pathways. In a number of skilled trades, the workforce is also ageing and yet in a number of emerging sectors, the demand for builders, electrical trades, plumbing, joinery, heating, ventilation and air conditioning is likely to grow. This combined with persistent skills shortages in some of these areas, evident already, explains the red rating.

- The ageing population will lead to increased demand for care services with particularly **significant volume of staff in care assistant roles**, who will need greater understanding of ICT to support care users with assisted living technologies. This skills need receives a red rating because the volume of demand predicted by *Working Futures* is very high. Also, demand for care is likely to increase substantially, and greater attention will be given to the quality of the care provided, related to the history of difficulties in recruiting to the sector, which may return following economic recovery. This is also traditionally a migration intensive sector/set of occupations.
- The volume of **customer service roles** is likely to expand and they are highly important to priority industries within the service sector **including retailing and after-service and maintenance roles** related to manufacturing and digital economy sectors. Although there is some uncertainty about the volume of increase due to the effects of recession, and evidence suggests few particular difficulties in filling these roles, the size of the sectors involved is significant. The quality of customer service skills required in particular for occupations in hospitality, tourism and leisure sectors handling overseas tourists visiting Britain receives a red high priority rating, as these skills may be critical to generating repeat business and therefore the economy. Employability skills in team working, communication, problem solving and essential literacy and numeracy are critical for frontline staff.

**Pink – high priority skills needs which are of importance rather than critical to the economy and/or distinct sectors but where deficits are smaller in scale and require a shorter lead time to rectify than for those rated red**

- **Procurement, commissioning and financial management skills** are identified in a range of private sector industries as well as within key parts of the public sector including central and local government. Whilst in the case of the latter, they may not generate economic growth, they still achieve significant importance, having potential to reduce public sector debt through securing better value for money and the more effective delivery of public services.
- **Management skills required to develop innovation processes to apply existing products for medical/healthcare** markets could be critical to prevent further job loss in parts of the manufacturing sector.
- Within the **financial services sector risk management, ethics and influencing** skills among senior managers are likely to be a necessary (although possibly insufficient) condition to avoid a further financial crisis. These therefore also receive a pink priority rating.
- Specific **management skills around data security management and exploitation of intellectual property** identified in the Audit also receive a pink rating, not due to imminent security risks, but rather because the ability to commercialise user-generated innovations and develop revenue streams may be a key source of profit generation within the digital economy and in key parts of advanced manufacturing.

The analysis also identifies a range of key skills in a number of professional roles:

- **Food technologists for the manufacturing and processing industries** and also parts of the biotechnology sector will be essential, albeit possibly in small numbers, to safeguard sufficient quantity and quality of food supplies and safety as the population expands.
- **Urban planners and actuaries** are in short supply for the professional and financial services sector. The volume of demand is relatively small but the training lead time for actuaries in particular is long, within a sector which is predicted to experience lower growth than others, therefore these occupations receive a pink rating.
- **Science and engineering professionals with additional specialist expertise in low carbon energy generation** will be needed for large scale projects in the engineering/construction sector and energy generation industries for the low carbon economy.

**Amber – medium priority skills needs of moderate scale and/or time frame for action where the degree of certainty of their impact may be less critical**

- **Engineers for large scale construction projects** in the engineering/construction sector are already recognised as skills shortage occupations in the MAC listings. The level of demand for these occupations is contingent upon public and private sector investment in major construction projects, which are currently negatively affected by economic downturn. Given the alternative sources of overseas labour and some doubt over level of demand, these skills needs receive an amber rating. However, it will be important to monitor both the levels of demand and supply, and in particular, to identify any bottlenecks in supply of experienced staff due to a shortage of new recruits to the industry.
- **Investment advisers in the financial services sector** will require a level 4 qualification and a sufficient supply is essential to strengthen processes in the sector and to improve service delivery in the industry.
- A number of associate professional or technical roles and some skilled trades receive an amber rating across a variety of sectors. These include **chefs, graphic designers, paraprofessional roles in the public sector** (e.g. PCSOs and advanced practitioners in healthcare), and investment advisers in financial services. Others include **advice workers, counsellors and community development workers for victims of crime/substance abuse**, which are important for national well-being. These roles are important ones within these sectors for which either alternative sources of recruits can currently be found (chefs through migration), or where other roles receive higher ratings of criticality.

Finally, the assessment has identified wider strategic skills needs which perhaps are less of a priority although nonetheless important in:

- **Change management with a particular emphasis on people management and staff engagement skills.** This is especially among managers in sectors affected by recession and/or public spending cuts may be important for organisational reputation and long-term staff retention, and helpful in supporting improved service delivery.
- **Sports coaches** are likely to rise due to increased interest in active leisure pursuits following the Olympics and a more active ageing population. They are important for optimising national health and well-being.

**In addition, there are occupations which will continue to provide significant employment but will remain essentially relatively low skilled. These include parts of the retail, hospitality and care sectors.** There are important jobs here which will be more carefully studied in the next National Strategic Skills Audit.

This assessment of priorities is necessarily preliminary and a result of professional judgement based on the vast amount of material assembled and analysed in this Audit. It does, however, provide a strong foundation on which to build further dialogue on the skill priorities for England that are required to meet our evolving labour market and economic requirements.

The very process of publishing the National Strategic Skills Audit and identifying the skills issues and priorities will, we hope and anticipate, encourage adaptation in the behaviour of the key agents for change – individuals, employers, providers, funders, government, public agencies – which will lead to, some or all of these issues being actively resolved. Over time, the possible outcomes and futures outlined in the Skills Audit will not necessarily of course come to pass.

## Key messages

Beyond these specific priorities there are a number of broader messages that emerge from the National Strategic Skills Audit. In general, the Audit identifies the fundamental importance of increasing skill levels to future economic growth over the longer term. In addition to this the 10 key messages from the Audit are as follows:

### We need intelligent markets that anticipate needs

The Audit adopts a systematic approach to maximise the use of available Labour Market Information (LMI) and to take an over-arching and long term perspective. It is not possible or desirable to plan precisely the 'numbers' of skills or jobs that we need now and in the future in particular localities, estimating demand, supply and mismatch and then structuring provision precisely to meet these needs. The labour market is too complex and dynamic and the means of adaptation of supply too slow. But we can use intelligence about the operation and structure of the economy and labour market, to inform the choices and decisions of all the relevant key players – individuals (and their advisors); employers; providers; intermediaries; funders; public agencies; and government. We are all more likely to make better informed decisions if we have access to the same high quality information and *'intelligence.'* Markets work best when information is rich, dense and available and when actors are able to respond to the 'signals' provided. This national information, when enhanced by more detailed local intelligence, may alone be enough to encourage actors to adapt their behaviour, to stimulate dialogue and to identify and anticipate priorities. It may be sufficient to change the behaviour of participants in ways that will address pressing skills priorities. But we can go further than this too. While we cannot plan provision or individual/ employer behaviour, we can encourage, stimulate and 'nudge' it, especially when intelligence is supplemented with other policy levers providing financial and/or behavioural incentives.

### Skills for jobs matter

The Audit identifies the fundamental importance of increasing skill levels in key sectors and jobs to economic recovery and future economic growth over the longer term. If we are to move towards high performing, high value added sectors, this requires higher level jobs, and in turn skills. To fully maximise economic performance, and to generate real opportunity for individuals and for business success,

*we need to ensure that we supply the skills which effectively meet the changing needs and requirements of the labour market.* It is vital that the skills acquired are responsive to labour market changes, and better align, match and balance, what is demanded both in volume and composition. This calls for a renewal of the commitment to '**economically valuable skills.**' Without this we risk: the existence of structural mismatches in the labour market; imbalances between what the skill system produces and what the economy requires; skill shortages, structural unemployment; skill gaps; underemployment; and a growing dependency on migrant workers to meet the needs of the labour market left unmet by the indigenous workforce. As a consequence, the full benefits of up skilling will not be fully realised to individuals, employers, communities or the country as a whole. Skills for jobs must be our mantra.

### **Demand matters as well as supply**

The Audit assesses the extent to which skills needs are being effectively met to identify the most pressing strategic skills priorities. Measures of **skills mismatch** highlight where there are imbalances between, on the one hand, the *supply* of skills and, on the other, what skills are *demanded* for specific jobs. The Audit draws attention to the variation in the nature and scale of different skills mismatches. These will require different attention and hence action – in short, responses are required both on the demand and supply side.

Indeed, **skill shortages** (which occur where employers face difficulties recruiting new workers due to a lack of available skills in the external labour market), clearly require action on the supply side to tackle unmet needs; as do **skill gaps** which indicate deficiencies in skills in the internal labour market. Further, if **unemployed** people are to be 'brought back in' to employment, in many cases they will need to be up skilled or re-skilled. But, in addition **underemployment** needs to be addressed. This requires a different response. When individuals are over-skilled for the jobs they do, this may reflect under-utilisation of skills, and hence employers not sufficiently making use of their employees' available skills within the workplace. But it may also suggest individuals are not pursuing the 'right' qualifications or training valued by employers (i.e. economically valuable skills). Underemployment can best be tackled by more companies moving up the value chain, into higher value added products and services; using a more knowledge-intensive work organisation and hence better means to effectively deploy their more highly skilled and qualified workers,' but it also requires individuals to pursue skills and qualifications that employers really do need. The solution to mismatches requires: steps to increase the number of higher skilled jobs; to continue to supply people to fill those jobs in the 'right skills areas' (influencing skill supply flows as appropriate to meet demand); and, then, more effective job-matching so that people's skills are deployed effectively.

### **The workplace matters**

With much of skills mismatch being internal to organisations (such as skill gaps, and underemployment), this places crucial importance on the workplace. The appropriate supply of skills, whilst essential, is not enough on its own. It is a necessary, but not sufficient, condition for success. What goes on in the office, factory or shop floor is as important as what goes on in school, college and university. This means that High Performance Working (HPW) practices which seek to improve the management of organisations, and their staff, are as much part of the solution to skills issues as skills provision and learner choice. This raises issues for policy makers about how to provide public services to businesses and support a greater take-up of HPW to: stimulate businesses to review their business strategies; move up the value chain (i.e. by delivering higher value goods and services) raise their demand for high skills; reorganise their work; and by so doing improve skills developments and utilisation in the workplace and also firm performance.

### **Migration matters**

Migration is clearly another important feature of the labour market. It can mask underlying skills mismatches between the skills demanded and those available in the domestic workforce. Migrant workers will help to overcome some skills shortages and will represent a preferred source of skills for some employers, possibly also affecting training activity. The migrant workforce is relatively highly concentrated in particular occupations, sectors and regions. However, much migration is 'low skilled' and may act as a deterrent to employers to 'raise their game' and move from 'low cost, low skilled' to more highly skilled operations. Indigenous workers would be in a better position to compete with other

EEA nationals, if they were encouraged to access these opportunities and acquire the skills that the relevant employers seek. 'Non EEA migrants' are now subject to the Points Based Migration System (with a strong focus on skilled workers). More skilled opportunities for indigenous workers could be made available by taking some occupations off the skill shortage list used in the Points Based System. This is only possible by skilling up more indigenous workers to be able to do the jobs on this list.

### Sectors and geography matter

Studies of the 'emerging sectors' identified in *New Industry, New Jobs* (BERR, 2009) commissioned as a part of the Audit together with the skills assessments produced by Sector Skills Councils (SSCs), show that sectoral differences in need, mismatch and skill issues are significant. Distinct sectors experience a specific combination of drivers of demand, with particular consequences for businesses, jobs, and in turn skills. Where there is a focus on particular sectors (nationally or regionally) in terms of strategy, policy or delivery, it is essential to take clear cognisance of the particularities of sectoral priorities. Nonetheless, our work shows too that there are many transversal/pan sector priorities, where issues are common across sectors. In addition, there are also considerable variations across the regions in the pattern of skills demand and nature of skills imbalances. Such regional distinctiveness also needs to be recognised in terms of shaping action.

### High level skills and jobs matter

The Audit highlights the increasing importance of higher skills and jobs to the economy. There is a significant demand for highly skilled workers in the labour market, with the largest number of people employed as managers, professionals, associate professionals and in technical roles, with associated requirements for higher level skills. Furthermore, the importance of these roles is anticipated to increase in future with the effects of drivers of change such as globalisation, on-going technological developments and continued growing sophistication in consumer demand.

Significant progress has been made in raising the qualifications levels of the workforce and **stimulating supply** over the last ten years, so that compared to other OECD nations our supply of highly skilled people is likely to place us 10th in the OECD by 2020. This progress needs to be sustained to retain our international position. A further challenge, however, is ensuring we supply the 'right,' economically valuable skills, which employers demand and which then can be to be effectively deployed in the workplace. Whilst overall returns to higher qualifications have held up (despite the recent growth in higher skills), there is substantial variation in experience by subject area. This raises questions about the provision currently supplied, and student choices. The ageing workforce, and associated decline in the number of 15 to 24 year olds also means that we will increasingly be dependent in the future on up skilling older workers already in the labour market to meet our higher skill goal, and this raises issues about modes of provision, as well as the nature of provision.

There are also **demand side** issues. Despite the recent growth in high skilled jobs, there are indications that the UK has recently experienced a relatively slow rate of high skilled job creation, and certainly one which is well below the overall growth of high skilled people. Skills shortages are higher in more highly skilled professional occupations, but there is increasing evidence of over-qualification and under employment in the workforce, which raises questions about the relevance of supply, and whether employers are fully optimising their employees' skills, as well as the adequacy of job matching in the labour market.

### Intermediate skills and jobs matter

There are pressing strategic skills issues at intermediate skills levels too. In recent times, there has been little change in the proportion of the workforce qualified at intermediate levels (level 3) and consequently, on current progress, we are not expected to meet the goals set for intermediate level in the Government's Skills Strategy. The Audit highlights the growing importance of technicians, driven by growing technological complexity, many within emerging sectors as well as existing sectors. This calls for vocational knowledge and workers with the ability to apply an in-depth understanding of a particular (often technical) field in a practical setting. This, in turn, places a growing emphasis on strengthening the intermediate vocational career pathways (from level 3) to ensure that the skill requirements for these jobs can be met and people can progress into these areas. Furthermore, whilst there are indications that in



some of the traditional sectors, intermediate jobs (in for example skilled trades) are forecast to decline, many of these areas comprise a largely ageing workforce, and when replacement demand is taken into account, combined with issues about the adequacy of supply, this highlights significant pressing skills supply needs. In addition, the highest densities of skills shortages occur in many of these areas, and have persisted for some time. Further, there will also be emerging opportunities amongst the 'emerging' sectors for skilled trades too which will need to be met.

### **Generic, employability and basic skills matter**

There is substantial evidence within the Audit pointing to the importance of generic skills – which are often pervasive across the economy. These include 'employability skills' such as customer handling, problem solving, team working, oral and written communication, but also extend to cover a basic platform of literacy and numeracy too. Indeed, evidence is increasingly emphasising the importance of 'T-shaped' skillsets where technical aspects to jobs, requiring detailed knowledge and skills, are supplemented with more generic skills, which enable individuals to work more effectively with their colleagues and/or customers and apply their technical expertise in practice, often in commercial settings. This is supported by recent survey findings (Shury *et al*, 2010) where employers often cite a range of technical and practical skills in combination with generic skills as being the skills lacking amongst workers. Another vital component of the generic skills issue concerns the importance of management. High quality management skills are crucial to achieving High Performance Working, and to ensuring that businesses are continually developed and organisations effectively managed to make full use of their staff to optimise business benefits.

### **Low skilled jobs are expected to persist**

Despite the continued growth of highly skilled work within the labour market, and a substantial overall decline in recent years in lower skilled jobs, in the future, it is expected that significant employment will remain in areas that have traditionally demanded low skills. Current forecasts suggest that this could be in the region of about a fifth of all jobs working in some substantially growing sectors such as retail and hospitality and care of the young and elderly. Many such jobs experience high labour turnover, requiring continuing skills replenishment. It is also the case that a lot of these jobs are in considerable need of up-skilling to improve customer service, product/service quality and deliver increasingly tailored services to individuals and families. Many such jobs, in addition, operate in specifically local labour markets, face limited international (or even often national) competition, but meet important local public and market needs. Improving the quality of such jobs and the goods/services provided is important. Whilst the actual scale of future demand volume may vary depending on broader structural developments within the labour market, changes in consumer demand, and the extent to which a significant number of businesses adjust their modes of working, break out of 'low skill equilibrium' and move into more higher value markets, it is still expected that this will be a key source of employment. Moreover, these jobs may also be important for those seeking to move out of unemployment and through the labour market, people supplementing incomes through part-time work (such as students and women returners); and as a key source of employment for migrant workers.

### **In order to further develop understanding in preparation for, and in, the 2011 National Strategic Skills Audit, the UK Commission will:**

- work with BIS to further develop the identification of key sectors that are both economically significant and exhibit skill deficiencies;
- work with HEFCE to identify areas of imbalance between skills demand and supply in higher level skills;
- work with the MAC to incorporate the results of their developed methodology for, and results from, their 2010 Review of the Shortage Occupation list;
- commission a set of projections for the period 2009-2015 which takes account of the impact of the recession and structural change on the labour market and skills.

## References

### **BERR (Department for Business, Enterprise and Regulatory Reform) (2009)**

*New Industry, New Jobs*. BERR, London. Available: <http://www.berr.gov.uk/files/file51023.pdf> (Accessed 16th February 2010).

**BIS (Department for Business, Innovation and Skills) (2009)** *Skills for Growth*. TSO, London.

**Cogent, Semta and Skills for Health (2009)** *Life Sciences and Pharmaceuticals: A Future Skills Review with Recommendations to Sustain Growth in Emerging Technologies*. Report produced for the National Strategic Skills Audit 2010.

**ConstructionSkills, Asset Skills, Cogent, Engineering Construction Industry Training Board, Energy and Utility Skills, GoSkills, Proskills, Semta and SummitSkills (2009)** *The Engineering Construction Industry: Strategic Skills Cluster Report*. Report produced for the National Strategic Skills Audit 2010.

**DTI (2002)** *Foresight Futures 2020: Revised Scenarios and Guidance*. DTI, September, London.

**e-skills UK, Skillset and Creative and Cultural Skills (2009)** *Strategic Skills Assessment for the Digital Economy*. Report Produced for the National Strategic Skills Audit 2010.

**Energy & Utility Skills, Asset Skills, Cogent, ConstructionSkills, Engineering Construction Industry Training Board, GoSkills, Lantra, Proskills, Semta, Skills for Logistics, SummitSkills and Skillfast-UK (2009)** *Low Carbon Cluster: Sector Skills Assessment Report*. Report produced for the National Strategic Skills Audit 2010.

**Expert Group on New Skills for New Jobs (2010)** *New Skills for New Jobs: Action Now*.

European Commission, Brussels. Available: <http://ec.europa.eu/social/main.jsp?catId=568&langId=en> (Accessed 16th February 2010).

**LSC (Learning and Skills Council) (2008)** *National Employers Skills Survey 2007: Main Report*. LSC, Coventry.

**MAC (Migration Advisory Committee) (2008)** *A Review of Labour Shortages, Skills Shortages and Skill Gaps*. MAC, Croydon. Available: [www.ukba.homeoffice.gov.uk/sitecontent/documents/aboutus/workingwithus/mac/239769/yorkreview.pdf](http://www.ukba.homeoffice.gov.uk/sitecontent/documents/aboutus/workingwithus/mac/239769/yorkreview.pdf) (Accessed 16th February 2010).

**SAMI (2010)** *Horizon Scanning and Scenario Building: Scenarios for Skills 2020*. UK Commission for Employment and Skills, Wath-upon-Deerne. <http://www.ukces.org.uk/server.php?show=nav.403>

**Semta, Skillfast-UK, Improve, Proskills and Cogent (2009)** *Skills and the Future and Advanced Manufacturing: A Summary Skills Assessment for the Advanced Manufacturing Cluster*. Report produced for the National Strategic Skills Audit 2010.

**Shury J., Winterbotham M., Davies B., Oldfield K. and Constable S. (2010)** *National Employer Skills Survey*. UK Commission for Employment and Skills, Wath-upon-Deerne.

**Skills for Justice, ConstructionSkills, Financial Services Skills Council, SummitSkills and Asset Skills (2009)** *Professional and Financial Services Cluster Report*. Report produced for the National Strategic Skills Audit 2010.

### **UKCES (UK Commission for Employment and Skills) (2009)**

*Ambition 2020: World Class Skills and Jobs for the UK*. UKCES, Wath-upon-Deerne.

Available: [http://www.ukces.org.uk/upload/pdf/UKCES\\_FullReport\\_USB\\_A2020.pdf](http://www.ukces.org.uk/upload/pdf/UKCES_FullReport_USB_A2020.pdf) (Accessed 16th February 2010).

**Wilson, R. Homenidou, R. and Gambin, L. (2008)** *Working Futures 2007-2017*.

UK Commission Evidence Report No. 2. UK Commission for Employment and Skills, Wath-upon-Deerne.

Available: <http://www.ukces.org.uk/upload/pdf/Working%20Futures%203%20FINAL%20090220.pdf> (Accessed 16th February 2010).





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