

# Alliance response to the consultation 'Meeting the Low Carbon Skills Challenge'

A consultation on equipping people with the skills to take advantage  
of opportunities in the low carbon and resource efficient economy

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## Executive Summary

The Alliance of Sector Skills Councils welcomes this opportunity to respond to the Government's consultation '*Meeting the Low Carbon Challenge*'. We are pleased to see that the consultation has been significantly informed by the Sector Skills Councils *Low Carbon Cluster Sector Skills Assessment* report (December 2009).

The Alliance has the capability and potential to work effectively across sectors in a 'major cross sector effort', such as the low carbon agenda requires. Raising skills in priority cross sector areas is one of the five strategic objectives in our 2010-11 Business Plan and we have numerous mechanisms to deliver this aim. The Alliance has recently convened a new CEO level 'Cross Sector Strategic Group' to oversee, guide and manage priority cross sector work across SSCs. We also have a strategic Low Carbon Forum and Green Skills Strategy as mechanisms to take this agenda forward. Many of the other cross sector clusters also have a low carbon focus this year – in particular, the Management & Leadership Forum and the Manufacturing Skills Alliance.

This response has been achieved through input from SSCs led by the Alliance Low Carbon Forum. The Alliance agrees with the five key challenges for employers, the skills system and Government. The key points and recommendations put forward by the Alliance on the low carbon consultation are as follows:

- A clear strategy and direction from Government is urgently required in order to stimulate both demand from employers and innovation in skills development and delivery.
- A sector-led approach is the best means to engage employers on low carbon issues and sell and promote solutions. SSCs, working collaboratively, have the employer engagement mechanisms to show how principles applied in one sector can be utilised across others, and have the capability to promote, test, and feedback on good practice.
- SSCs should have the lead in forecasting skills needs in the low carbon context through their LMI to ensure a match between supply and demand. The Alliance is ideally positioned to continue working with government and industry to help ensure a match between supply and demand of skills related to the low carbon agenda in the future.
- Skills should be focussed on business need articulated by employers rather than the demands of emerging policy. Skilled management and leadership is key to effective skills utilisation and deployment.
- Funding solutions need to be rapid response and flexible, focussing on the upskilling of the existing workforce, rather than on new entrants. Funding flexibility for 'top-up' units of learning is vital.

The detailed response expands on these points and responds to individual questions included in the consultation. We also include a specific section on Nuclear within the 'Decarbonising the Power Industry section' to accurately reflect the situation in that sector. This response is a UK wide response and includes an annex from Scotland on specific comments on low carbon in that country.

## Introduction

The Alliance of Sector Skills Councils (The Alliance) welcomes this consultation on meeting the low carbon skills challenge. Employers, partners in the skills system and Government face significant challenges to ensure the UK's workforce has the right skills so businesses fully realise the opportunities from the global move to a low carbon economy. We are pleased to see that the work of Sector Skills Councils (SSCs) is referenced throughout this document, and we hope that the network can continue to work with the government and industry to help ensure a match between supply and demand of skills related to the low carbon agenda in the future.

Firstly, it is important for this consultation to recognise that although some aspects of low carbon adoption will create new opportunities, low carbon is not a sector in its own right, but an issue or theme that crosses all sectors.

Secondly, it is not a new industry but an extension to existing industries and activities across the country. As such many of the skills required to meet the low carbon challenge are not in brand new roles and will not necessarily be linked to new jobs or new industries, but will be achieved through upskilling the existing workforce. Government should therefore be advised not to work on the assumption that it is possible to just train the currently unskilled and unemployed to successfully fill the jobs that this challenge will provide, but that it will require a broader coordinated approach across that covers all aspects of the economy. This is supported by the UKCES National Strategic Skills Audit (March 2010), which emphasises that low carbon is one of the areas that will regenerate the economy, but will not be a provider of a large number of jobs in England.

Overall, this is a major management and leadership challenge. How to choose the most effective combination of upskilling the current workforce while training and hiring-in new workers in a rapidly changing, complex environment is no small problem. The Alliance has developed a well-tested set of management and leadership tools and processes over the last 5 years that are particularly appropriate for such issues.

However, there are parts of the UK, Scotland in particular that have identified the expansion of offshore wind farms, and development of other industries in supporting the low carbon agenda, as creating an increase in job opportunities. This usefully demonstrates the distinction between the move to a low carbon economy supported by all sectors, and then the specific developments that will need to be made in some to develop fundamentally new approach. Further discussion of the Scottish issues is described in Annex 1.

SSCs have a key role to play in forecasting skills needs through their Labour Market Intelligence, which is backed by employers, and it is recommended that SSCs should actively lead in this area. SSCs are also in an ideal position to set low carbon skills needs in the wider sectoral context. For example there is currently a shortage in engineering skills in general and therefore skills required for low carbon should be considered as part of this wider situation.

Policy makers should note that it is important to use a tailored approach when engaging with employers on the low carbon agenda in order to ensure significant 'buy-in'. In particular, small to medium enterprises (SME's) will respond far better to an argument based around 'business opportunity', rather than pitching to them about the 'low carbon' agenda. It is not necessarily that SME's don't associate with the terminology, but rather that they don't see low carbon as an imperative for their business. SSCs, through their direct employer communication on a sector specific basis, offer employers opportunities to engage with this agenda in terms of their own business needs and priorities.

## Skills across the Economy and for key Sectors

### 1. What more can employers, schools and Government do to promote the take up of STEM subjects by young people, and encourage them to consider careers in low carbon sectors?

#### Employers

- 1.1 The Alliance suggests that there is a need to communicate the low carbon agenda (including how its targets are formulated and when they will impact upon business) to employers, in order to enable them to articulate the future demand for skills. In any economic circumstances, and particularly the present, the “market” for skills needs to be articulated as an integral part of policy implementation.
- 1.2 Greater engagement and collaboration is needed between employers and schools to ensure that pupils are exposed to activities which are genuinely relevant to both their studies and to industries relevant to the low carbon agenda. Employers providing practical help and support in delivering activities aligned to the curriculum will assist greatly in making education relevant to the real world.

However, it should be taken into consideration that it can be difficult for schools and employers to engage due to issues around health and safety fears which can make visits almost impossible (in some areas). It is widely acknowledged that these sorts of visits actually drive enthusiasm for both employers and children. Proskills, as the lead SSC for Health and Safety have offered to work in collaboration with the Health & Safety Executive (HSE), employers and schools to drive best practice activity in this area.

- 1.3 The Alliance suggests that there is a need for employers to offer increased access to, and promotion of, bursary and employer sponsorship schemes, which will encourage young people to enter STEM studies. This will help to create closer relationships between young people and employers – increasing the likelihood that (i) the young person will go on to pursue a career in a STEM area and (ii) increasing the likelihood that the young person will actually want to work for the employer supporting them (a win-win situation for both the young person and the employer). It is widely recognised that fostering these kinds of relationships between a student and those that are able to offer appropriate (in this case industry-specific) mentoring and other forms of pastoral support are key to delivering successful outcomes to young people.
- 1.4 Employers, in collaboration with their SSC, need to provide clear, concise and accessible information on the career pathways and opportunities open to young people in their industries both now and in the future (e.g. job profiles, case studies, etc.). Proskills currently runs the innovative [PrintIT!](#) scheme with more than 1,000 schools in England and Scotland, which raises awareness of careers, technologies and techniques in the Printing industry amongst year 9/10 schoolchildren. The main focus is a design competition run in conjunction with employers and Fairtrade, and awareness of the environmental impact of the industry is raised through direct employer/school partnerships and visits. PrintIT! has been hugely successful with employers and schools, reaching more than 100,000 students so far, and will be rolled out to other manufacturing industries this year. Other innovative methods of getting this information to young people also need greater investigation, including the internet, social networking sites, sporting/entertainment events, etc.

#### Schools

- 1.5 Teachers are an obvious way of motivating young people to learn and to take a strong interest in a particular subject or career path. Therefore, continuing to invest in quality teaching staff and in attracting young scientists into the teaching profession will offer high quality role models to young people – role models that they can relate to and who are able to ignite young peoples’ enthusiasm for STEM learning and careers.
- 1.6 It is advised that the current generation of young people are very environmentally aware. As such, quality information, advice and guidance (IAG) on industries relating to the low carbon agenda will resonate with

their thinking, and provide a qualification and career routeway through which they can achieve their environmental ambitions. A number of sectors (including Summit Skills and STEMNET) run Ambassadors schemes – introducing experienced engineers into schools to explain the opportunities. It is suggested that this type of work could be expanded at a very low cost and could be extremely impactful.

- 1.7 Positive, high quality careers advice delivered to young people, parents and teachers which is based on accurate and appropriate information and delivered in an impartial manner is absolutely crucial to encouraging more people in STEM-related careers. The importance of overcoming misconceptions that STEM-related occupations and industries are dirty (engineering), out-moded and declining career option or that IT is a career purely for 'computer geeks' cannot be over-estimated. SSC's should work together to deliver a consistent message to schools and co-ordinate representation at school events, in order to reduce the disruption to the school curriculum.
- 1.8 Schools should do more to encourage representation from STEM-related industries on the Board of Governors. STEM and/or low carbon committees of school governing bodies would also be able to offer advice on appropriate learning activities and promote links with industry.
- 1.9 Provision of resource materials (e.g. Energy Foresight) which assist teaching and provide industry exposure.
- 1.10 The recent '*Science: So What?*' campaign highlighted an important message for young people, and encouraged them to see the influence of science in everyday life. This message could be refined and expanded to show the impact of STEM across a whole range of industries, and used to emphasise how STEM study opens doors, whereas non-STEM study is often restrictive on future choices. Young people often believe they are 'keeping their options open' by focusing on non-STEM subjects, because they do not understand how STEM is valued in most sectors and occupations. It is imperative that the career opportunities from STEM subjects (as explained for science by the *Futuremorph* website) are promoted to and understood by young people and their parents.
- 1.11 For young people to have a true sense of the importance of low carbon developments, and to feel enthusiastic about careers, low carbon needs to be embedded in school practice and activities. All educational/skills programmes should have 'green skills' and an understanding of environmental impact embedded within them, so that eventually this becomes second nature. Encouraging schools to involve students in low carbon developments in their buildings and processes will result in student familiarity with the principles of low carbon, and an understanding of the value of it in a whole range of practical contexts.
- 1.12 The new Diplomas and Extended projects provide an excellent opportunity to raise the profile of STEM subjects, and low carbon knowledge, in 14-19 education. Through access to the 'STEM' Diplomas (Engineering, Manufacturing and Product Design, Environmental and Land-Based and IT), young people will have the opportunity to investigate both the theory and practice of STEM principles. Diplomas also enable schools and colleges to embed additional aspects of applied STEM teaching into the curriculum, through the consortia model of delivery. By enabling institutions to form consortia, all members benefit from access to a much wider range of teaching skills and facilities. Working together on the Diploma provides a vehicle for bringing schools and employers together in innovative partnerships.
- 1.13 The Extended Project is another area where STEM subjects, and low carbon initiatives may benefit. While those studying STEM subjects are likely to choose STEM-related projects, it is to be hoped that other students will be drawn to STEM or low carbon projects through encouragement of their school and teaching staff.
- 1.14 Inevitably, teachers across the curriculum will need to improve their understanding of STEM careers, and of the low carbon agenda. This can be communicated by an enthusiasm for the role of STEM in their

subject (whatever that might be) and an appreciation for the need for low carbon considerations in its application.

### **Government**

- 1.15 The Alliance suggests that one of the main reasons for limited employer collaboration with schools and engagement with young people is that, in the short-term, there is very little advantage to the employer. Additionally, in a time of economic downturn, employers are heavily engaged in immediate survival issues and cost savings and have less time and resource available. Offering incentives, such as tax breaks, to those employers that do engage and support school learning activities should help to increase the number of employer that get involved.
- 1.16 Offering incentives to schools to recruit teachers with a STEM background would do much to raise the profile of STEM-related subjects in schools. This could also work to promote STEM degree courses in teacher training colleges. Incentives/ support could also be offered to schools to encourage them to set up STEM/ low carbon clubs. Incentives for individuals to study STEM subjects post-GCSE onwards would also be likely to increase participation.
- 1.17 The increasing tendency to combine GCSE science courses is problematic for employers. A greater in-depth knowledge of any science subject is important to match the requirements of employers and to allow continued study at higher levels.
- 1.18 Although, in general, degree student numbers are increasing across most aspects of engineering, the picture is less encouraging in the disciplines of electronic and electrical engineering and production and manufacturing engineering.
- 1.19 Applicant numbers to IT related degree courses have almost halved since 2001. These subjects are critical to the development and deployment of low carbon technologies. More work needs to be done to encourage greater numbers of young people from the UK to study all STEM-related subjects at HE level.
- 1.20 The development and integration of Foundation Degrees and vocationally based subject courses is an important element to increasing access to STEM-related career opportunities for all those with the desire to succeed in the future, whatever their preferred learning route. On this subject, the merit of vocationally-based courses should not be under-sold by any educational institution – be it a school, sixth form, college or university.

## **2. What more can universities, working with businesses, do to help stimulate demand for the high level STEM skills required in the low carbon economy?**

- 2.1 The Alliance recommends that employers in general need to made aware of the benefits of engaging and collaborating with universities in terms of meeting current and future skills demands; and obviously the mechanisms for this to happen need to be in place and accessible to employers. Incentives and other encouragements may need to be considered to facilitate this. Case studies and other promotion activities should be developed showcasing best practice and the benefits to employers of collaborating with universities. SSCs should be key partners in this work.

### **Case Study:**

e-skills UK's Information Technology Management for Business (ITMB) Honours degree was introduced to reflect the changing nature of IT work in the UK. Specific issues the programme set out to address included the following:

- Employment in the IT industry in the UK was growing at 5 times the all-sector average, yet acceptances onto Computing degrees had consistently declined since 2001.
- The employment growth would predominantly be in high value roles which demanded sophisticated skills in business, client relationship and project management alongside deep technical competencies. That type of cross-disciplinary integration was not wide spread in Higher Education in the UK.
- The gender imbalance in the IT workforce was mirrored by that of IT- related degree courses.

e-skills UK established a collaboration of employers and universities which agreed to work together to develop a fundamentally different type of degree course which would prepare graduates for success in multi-disciplinary IT professional careers.

The ITMB degree specification was designed in partnership with employers including BA, BT, CA, Ford, Fujitsu, HP, IBM, Morgan Stanley, Norwich Union and Unilever.

ITMB is proving the value of a demand-led approach:

- 13 universities are offering a new, employer-led curriculum.
- There is accelerating employer support for the programme - 56 employers are now providing an unprecedented level of involvement in design and delivery and contributing over £0.5 million of in kind support a year.
- There is accelerating student numbers - there are now over 700 students on the programme.
- Some universities are reporting significant increases in application rates compared to standard computing courses.
- ITMB universities also report an increase in the quality of ITMB applicants, and are increasing their entry requirements accordingly.
- 32% of ITMB students are female, more than double the average for Computing degrees (15%).

The unique breakthrough of the ITMB programme is to have achieved a multi-employer and multi-HEI consortium working together in development and delivery:

- Collaboration across the ITMB universities (and internally across departments) is coupled with the exceptional depth and breadth of employer engagement that underpins the programme.
- Companies from across the IT industry, and employers of IT professionals in other industries, have been brought together. They make the programme genuinely relevant to, and actively supported by industry.
- Innovative and collaborative delivery between HEI and industry is evident across the thirteen universities.

The programme forms a key plank in e-skills UK's strategy to deepen engagement between employers and HEIs. It is contributing to a range of other initiatives, from the development of the 14-19 Diploma in IT through to work to help HEIs engage more in the upskilling of the existing workforce.

*"e-skills UK has broken new ground managing such successful collaboration between employers, universities and the Government."*

- Jenny Taylor, Foundation Manager – IBM UK

An Industry-HE forum could be set up to include SSCs, funding bodies (including Research councils and HEFCE/W), Professional and trade bodies, industry and HE, to discuss the priority areas of action.

Collaboration between employers and institutions needs to take place to ensure that the development and delivery of Foundation Degrees and vocational work-based learning pathways is relevant to the current and future employer related to low carbon.

- 2.2 Working Higher is one example of Foundation Degree provision attempting to enhance collaboration.
- 2.3 EU Skills is developing a Higher Level Skills Strategy which aims to build and sustain collaborative network models for greater employer engagement with HEIs. These networks will enable HEIs and employers in the renewable energy sector to identify learning routes which meet their requirements for a range of higher skills. The strategy is built on the principles of:
  - HE programmes utilising work-based delivery processes
  - Flexible, credit-based, modular delivery mechanisms
  - The accreditation of in-company higher skills programmes
  - Development frameworks that support career pathways and progression
  - Effective entry routes for mature learners into higher education learning
  - Undergraduate programmes that prepare graduates for the world of work
  - Skills for innovation being integral to higher level learning programmes
- 2.4 Collaboration between employers and institutions needs to take place to ensure that the development and delivery of Foundation Degrees and vocational work-based learning pathways is relevant to the current and future skills needs and opportunities that will result from the adoption of the low carbon agenda.
- 2.5 Access to accurate information regarding training provision and courses needs to be made easier for employers, so that appropriate provision can be easily identified wherever it is in the UK. SSCs and National Skills Academies (NSAs) will be vital to compiling this information. For example, the Skills Academy for IT will provide IT professionals with access to industry-valued courses and qualifications that cover technical, business and interpersonal skills. It will make it easy for employers and individuals to find what they are looking for and for IT professionals to gain recognition for their skills. Everyone with an interest in building a superior IT workforce has something to gain from the National Skills Academy for IT:
  - **Employers** will be able to more easily and cost effectively help their IT professionals develop to their full potential
  - **IT professionals** can boost their skills and demonstrate their expertise, and so accelerate their careers and earning potential
  - **Education and training providers** can prove their relevance to employers and help shape the education and training for IT professionals.

Foundation Degree framework specifications would give all providers the advantages of:

- Sector-wide recognition that will reassure employers that the Foundation Degree has been benchmarked against recognised industry standards
- Reassuring confidence that their Foundation Degree programme development will be in line with employer's needs
- Templates of documentation that will help accelerate and shape Foundation Degree development stages.

Employers want innovative curriculum delivery, flexibility and immediate benefits to their business. A consortium approach is recommended where possible to reflect the high priority given to customized learning. Regional delivery through FE seems to be key to identifying routes to market and raising demand.

- 2.6 The academic year is often not convenient for employers – degrees take three years with contact time of only two-three days for seven months of the year. Where standards can be guaranteed, the availability of two-year part-time full degrees would be welcomed by many employers as more practical and appropriate.
- 2.7 Where the need for new provision is identified, the cost and time associated with its development is a limiting factor (i.e. it takes too long, is too bureaucratic, etc.). The streamlining of provision development would help greatly in terms of closing gaps in provision which exacerbate current skills deficiencies.
- 2.8 There needs to be rigorous quality assurance of provision. Innovative and best practice provision should be identified and promoted by employers, institutions, Sector Skills Councils, trade unions/associations, etc. The availability of provision across the whole of the UK is a key factor – region-specific policy can be constraining, especially for large employers that work across nations and regions.

Cogent has started this practice through Working Higher, and is now working with Engineering Council and universities to arrange flexible CPD provision to meet industry needs.

- 2.9 The Alliance believes that there is significant scope for universities to work with business in the future to promote low carbon careers and skills. A key component of this work will be quality sandwich placements and work experience for undergraduates. The positive influence of a well-run placement on those in Higher Education cannot be overstated. We hope to see significantly more placements related to the low carbon agenda, and also more placement students working on low carbon projects across all sectors.

As an example, the e-skills internship is an industry-backed student placement programme designed to boost the employability of graduates:

- Students participate in a period of employment within an organisation – usually for a year – during which they develop a set of skills and capabilities that are widely valued by employers across the IT sector, and which will help them perform better in their university studies,
- Employers are able to offer high quality placements more easily whilst benefiting from a cost-effective boost to resources and
- Universities can incorporate or build on their existing placement programmes, attracting more students as a result of the sector-wide support of employers to this scheme.

We hope to see significantly more placements in low carbon industries, and also more placement students working on low carbon projects across all sectors.

- 2.10 For those students who do not undertake a placement, it would be worthwhile considering an incentive for universities to stimulate dissertations and projects in low carbon areas. There may be scope for

employers who are unable to offer full placements to co-operate with HE to provide ideas, projects and support in low carbon subjects, where the HEI does not have specific expertise.

- 2.11 In terms of course design HEIs can work with industry to incorporate low carbon considerations into the base modules of STEM and other vocational degrees, both as discrete units and also embedded into wider areas. For every principle of STEM learning, there should be an assessment of the impact on pollution production, low carbon processes, and efficient use of resources.
- 2.12 As in schools, supporting teaching staff to increase their understanding of the opportunities and demands related to the adoption of the low carbon agenda through better engagement with industry – improve their understanding and you will boost student interest in and demand for skills relevant to a low carbon economy.

### **3. How can more colleges and universities be encouraged to respond to the need for specialist skills in emerging low carbon sectors?**

- 3.1 Put at its simplest government needs to articulate policy clearly. This in turn will enable SSCs to work with their employers to identify the job roles and specific skill area required to implement policy

Employers in turn will then be able to clearly identify and articulate their specialist skills needs related to low carbon adoption. This will require employers to have confidence in the direction and scale of future demand; this, in turn, requires effective strategic leadership and direction from government, as well as collaboration from companies throughout supply chains, trade associations and SSCs. An appropriate forum would allow open discussion and task groups to take forward strategic priority areas.

- 3.2 Although increasingly institutions are recognising the potential of the market for skills related to low carbon developments, they need to ensure that they focus on the needs of the industry rather than trying to second guess the market. This will help institutions:
- understand why UK PLC would need such a response
  - prove, upfront, its commercial viability to industry (funding)
  - help them compete for funding
  - demonstrate the link to the new political world (ministerial policy)
  - align it to their own strategic objectives
  - create links between industry and their institution
  - improve the relationship between vocational qualifications and academia

Ensuring these developments take place will require regular engagement with both employers and SSCs. However, it would be preferable to have a small number of co-ordinated centres of excellence in provision, rather than a mass of universities and colleges offering reformatted, existing programmes. Universities should also capitalise on the Knowledge Transfer Networks for support and industry engagement.

- 3.3 When asking educational institutions to prepare for emerging skill requirements, the issues for FE and HE are well known. Skilled staff need to be developed and recruited, while capital equipment is often a key expense, which rapidly depreciates in modern technology-based sectors. One solution is always close links with employers who have access to such skills and technologies, and who can give an insight into

how the new skills requirements are developing. Knowledge Transfer activities in this area should be supported.

- 3.4 In addition to the development of vocational qualifications and accreditation routes, the IMI are currently developing routes and CPD products to also up-skill teachers, trainers and assessors responsible for delivering the teaching, learning and assessment of the new electric vehicle qualifications, as well as for other new qualifications for alternative drives (e.g. Hybrid vehicles).

A strategy to support the wider dissemination of training and qualifications is also under development to ensure promotion and up-take of new products and training provision in low-carbon technologies.

#### **4. Is our overall analysis of the skills challenges, as outlined in this document, correct?**

- 4.1 The Alliance broadly agrees with the overall analysis of the skills challenges which are set out in the consultation document and were informed by the SSCs *Low Carbon Cluster Sector Skills Assessment* report (December 2009). However, it should be taken into consideration that skills will often have to be geared to the demands of emerging policy. For example if , as seems likely, CERT obligations on Energy Suppliers are made more rigorous a large increase in the demand for Home Energy Advisers at level 3 or even 4 ( they are currently level 2 ) will be generated. This is where tracking policy in detail (as the Alliance Household Energy Management cross sector group is doing) is essential.

- 4.2 It should be noted that up-skilling rather than re-skilling will be key in the low carbon field, as individuals take on new and expanded roles. The extent to which new jobs will be created is debatable as many of these “new” jobs will simply replace existing roles, as they develop to cover new technologies.

It should also be noted that employment in linked occupational areas will also expand due to changing consumer patterns and policy influences. The passenger transport sector anticipates that there will be a shift from the private car to low carbon public transport solutions. Changes in consumer patterns can be influenced by a range of issues such as policies (e.g. congestion charging), individual awareness of carbon footprint and work by local travel planners to promote the benefits of integrated transport. This will lead to increases in jobs in the passenger transport sector as planning, service delivery and transport maintenance roles will expand accordingly. It is therefore important to evaluate any impact on employment elsewhere in the economy.

A possible exception to the above statement lies in the area of Energy Advice where the emerging “Green Deal “ policies of the new Coalition Government are placing great emphasis on reducing carbon emissions from existing homes by a combination of retrofitting and behavioural changes.

- 4.3 As aforementioned in this consultation response, it is also a point of debate as to whether a low carbon sector or industry actually exists in its own right – but rather that it is an issue or theme that crosses all sectors. However, ‘Green’ jobs do exist, and will increasingly, exist in all sectors of the economy.

Environmental considerations are now at the core of many customer, brand and operations decisions and although IT & Telecoms is part of an environmental problem, it underpins environmental solutions. Addressing environmental concerns in a commercially sustainable way is demanding new skills, from technical design of power management through to the development of new services to assess

environmental metrics. Employers (and in particular SME's) will not train in skills that customers are not asking for. Therefore, in order to stimulate the demand side (employers), skills need to be geared towards business need. Government must stimulate the market demand for the technologies, leading to employers then wanting personnel with the appropriate skills. Environmental concerns and green IT are becoming an integral part of business and technology decisions. New business and IT skills will be required to support company environmental goals and activities:

- IT professionals will need to expand their considerations for operational and technical requirements to include accounting for power requirements as well as developing *skills to measure the environmental impact of business operations*
- Business managers face the inclusion of environmental performance into market perceptions of their brand, products and services. Managers need to gain experience in understanding how to use information and different service channels to reduce their company's operational carbon footprint
- IT users in general and business leaders in particular will determine the impact of environmentalism through their definition of "eco-friendly" requirements (power, thermal, recycling, disposal) in purchasing hardware and communications gear as well as requirements for selecting external service providers
- Government and its agencies will be among the first to require environmental considerations in technology and technology related service tenders. These agencies will need new skills and awareness to *craft tenders that support development of environmental capabilities* in the UK and the EU.
- Higher Education has new opportunities for research and development in the areas of power efficient solutions and power management and the application of technology on environmental policy issues as well as *managing enterprise environmental impact*. In the next five years, environmental concerns and green IT are expected to be an integral part of business and technology decisions. New business and IT skills will be required to support company environmental goals and activities.

#### 4.4 Additionally:

- There is no clear evidence that technical jobs linked to low carbon operations will change significantly over the next decade – it is more likely that up-skilling of core skills will be required;
- The profile of the low carbon energy workforce does not appear to differ much from the wider energy sector workforce in terms of age and gender, which will exacerbate existing skills gaps and shortages in the energy sector;
- There are shortages in most engineering disciplines, both for highly qualified engineers and experienced technicians;
- Project managers with qualifications in engineering are needed across a number of technologies and sections of the supply chain;
- It is imperative that there is a 'healthy' energy sector with the resource capability (both level of skill and numbers) to quickly respond to the requirements for the deployment of renewable energy technologies as they are developed.

- 4.5 The proposal to support 2,500 Apprenticeships in the emerging wind sector for 19-30 year-olds over a two-year period from September 2010 is ambitious. Employers are keen to develop a competent workforce but this will not be solely through the recruitment of Apprentices. There is a need to up-skill the existing workforce across the energy industry and funding for both apprenticeships and 'top-up' modules of training to up-skills staff is needed. It would be helpful if the Wind Turbine Operations and Maintenance NVQ could be funded as a standalone qualification and not requiring a full apprenticeship programme.

- 4.6 The skills challenges of any new or emerging area for the economy need to be constantly reviewed to ensure attention is paid to all aspects. Examples of the aspects involved in creating skills for a low carbon economy include:
- Training individuals – not just training in specific skills which specific industries such as renewable energy will require, but also broadening the understanding across the workforce of the importance of a low carbon approach.
  - Training businesses – giving businesses as complete units the skills to plan for low carbon solutions and understand the drivers for the expansion of low carbon activities.
  - Changing processes – a skill such as Business-Improvement Techniques enables the wholesale reworking of key processes to reduce waste and environmental impact.
- 4.7 The Low Carbon agenda will have a great impact across the manufacturing industries, and the changes in design, technology and manufacturing technologies will demand higher level skills. Priorities will include:
- a. High level skills and knowledge at levels 4 & 5 are now critically important if the UK economy is to compete and acquire share in New Technology Low Carbon markets. These skills will require a range of programmes including higher level apprenticeships, Foundation degrees, degrees, relevant MSc modules, PhDs and support for Continued Professional Development (CPD).
  - b. Leadership & Management – remains a priority across all management levels in all sizes of manufacturing companies.
  - c. World Class Provision – education and training must be fit for purpose to ensure ‘through life’ Skills development is available to employers through the National Skills Academies related to the sector
  - d. Productivity – supply chain, lean techniques, New Product Process Design and Implementation (NPPDI) will prove vital in raising productivity through Low Carbon adoption.

**5. What are the best ways to replicate the examples of good practice provided throughout this document quickly and effectively?**

- 5.1 The Alliance suggests that the drive must come from employers and employer groups/ trade associations, in collaboration with SSCs. Ambassadors for each area of best practice should be identified to promote and support the delivery of solutions.
- 5.2 Rapid response and flexible funding solutions are important; for example the recognition and funding of in-house training in addition to “formal” training routes. We need to ensure that any ‘internal’ courses are suitably mapped against the National Occupational Standards. This is the only way we can accredit internal courses in order for them to have impact on employees should they go to another company in the same industry sector.
- Also, support is needed for short courses (e.g. two days) for adult learners. Funding is too often focused on new entrants, but the industries relevant to the low carbon agenda are more concerned about up-skilling the existing workforce (e.g. micro-generation installers).
- 5.3 SSCs are already collaborating through the Alliance Low Carbon Steering Group and the work of this group should be used to highlight and promote best practice interventions to the industry.
- 5.4 The Alliance believes that the sector-led approach, with SSCs working together, is the best way to ‘sell’ low carbon skills. While employers may vaguely recognise the benefits of a low carbon focus, SSC expertise and credibility in applying low carbon principles to their particular discipline will give employers

the confidence to take action. SSCs can also link together to show how principles applied in one specialism can be scaled and evolve for others. Finally, we are able to communicate directly with employers through our marketing and employer engagement activities, to promote, test, and feedback on good practice.

## 6. Is stimulating innovation in skills development and delivery the best way forward?

- 6.1 The Alliance agrees that stimulating innovation in skills development and delivery is the best way forward, but, as previously mentioned, skills will often depend on the demands of emerging policy rather than the demands of business. The intentions of the new Government in this area needs to be totally clear, and accepted by employers, before development and delivery is started.
- 6.2 As previously articulated, there is a need to raise demand from employers through better understanding of the drivers on their business, and how low carbon will be a key influence in the future, whatever their sector. Where employers understand the link between future prosperity and immediate action, they are significantly more likely to engage. For example, Semta has had considerable success in improving training engagement and impact through its employer engagement activity, which is based on a structured analysis of the drivers on the business. Once this is established and agreed with a company, informed decisions regarding training (which in turn changes company behaviour) can be made, and are far more successful in helping the company prepare for its future. Since low carbon will be a key driver on all business in the future, more of this kind of activity will enable employers to engage with low carbon processes.
- 6.3 There is a need for a campaign to convince employers to work with trade unions and involve their employees directly in the changes and adaptations that will result from the adoption of the Low Carbon agenda. Many company-wide initiatives fail due to lack of buy-in from technical and craft staff (they are the ones who make new processes work on daily basis).
- 6.4 Training solutions are often modelled around inflexible funding mechanisms, which can limit innovation of delivery. There will be a need to support skills development interventions at all levels and not just full qualifications; modular/unit-based provision will be in high demand by employers. Realigning the skills and funding systems to accurately reflect employer needs will help to fix this. SSCs will need to be key partners in this work.
- 6.5 Innovation in skills development and delivery will be difficult while demand is low and uncertain; such innovation will follow once demand increases, as long as the qualifications frameworks and public support are flexible enough to allow it.

In order to bring co-ordination, coherence and consistency to effecting necessary skills changes, SSCs have a fundamental responsibility to maintain National Occupational Standards (NOS) (they and their forerunners have done this over the last 20 years). The Standards are developed in conjunction with sector employment interests and define the range of occupational functions carried out across the sector in terms of competence in the workplace and required underpinning knowledge.

The NOS provide a powerful tool for the sectors with many applications that can range from sector skills strategy, through organisational skills needs, to individual skills needs. They also, importantly, help drive and inform the development of sector education, training and qualifications.

Within the Built Environment this also means that NOS provide a mechanism for inter-relating academic, vocational and professional qualifications (including CPD), and progression between them.

The NOS are developed and structured through the process of Functional Mapping. Each SSC has a functional map(s) and NOS which flow from them.

- 6.6 The Built Environment Future Skills Group (BEFSG) is taking oversight of the updating of Built Environment Consolidated Functional Map. First produced in 2008, this brings together functional mapping and National Occupational Standards suites across BESA members. This update will

incorporate changes to encompass issues such as the low carbon agenda, sustainability, sustainable communities, modern methods of construction etc. This updated Map will provide a fundamental platform in relation to future requirements which would help co-ordinate the SSCs NOS work and also identify gaps in each individual area, which would then inform the qualification framework and whether new qualifications would be required or whether existing ones required updating. This is as much applicable to informing education curricula and provision, as it is to the development of vocational qualifications, since the National Occupational Standards derived from the Functional Map, provide the highest common denominator of industry needs in terms of competence and knowledge needs.

## **A) Decarbonising the Power Industry**

### **7. How should employers and Government plan for the future re-deployment of skilled workers from high carbon industries to low carbon industries, and ensure a just transition?**

- 7.1 The Alliance suggests that the first step is to ensure that the skills needs of the power industry are properly identified and articulated to stakeholders. SSCs are already working on a skills strategy for the renewable energy industry.
- 7.2 Additionally, the future demand for skills from the high carbon industries should not be forgotten; these are certain to play a significant role in meeting the UK's energy needs for some time to come. These industries will, in any event, be required to pursue carbon reduction strategies (technological, process and business), with a concomitant skills demand. The establishment of generic sustainability National Occupational Standards as being developed by Cogent will be important to codify the requirements.
- 7.3 There will be a need to support both high carbon employers and employees in developing the skills required by the power industry. This will often take the form of short up-skilling programmes. Therefore, the development of, and funding support for, flexible modular qualifications is crucial. The work of the National Skills Academies will be very influential in this area.
- 7.4 The Alliance strongly believes that there is a critical role for qualifications and subjects such as Business-Improvement Techniques, which prepare individuals by changing their mindset about their whole way of working. This mindset which is applicable in all companies, and creates a focus on minimising waste, maximising resources, etc. SSCs are already clustering to share standards and qualification criteria, which will help individuals move between sectors and transfer their skills to new technologies.
- 7.5 It is imperative that public funding is available for reskilling – including second qualifications at levels 3 and 4 in key low carbon technical areas. Where training and qualifications have been identified by the SSC and government as key to economic growth and business productivity (as low carbon-related skills surely are), these should be funded to the highest levels for all capable of completion, regardless of prior attainment.
- 7.6 The Alliance hopes that the Qualifications and Credit Framework in England will provide and incentivise unit funding for those qualifications and units related to generic low carbon skills (including sustainable procurement; carbon accounting; performance reporting; environmental management systems; risk management; whole life costing; cost benefit analysis and commercialisation skills). It will be imperative that individuals can top up their existing skills in these areas with the low carbon application.

**8. For the power sector skills we have identified, what is the best way to accelerate skills development beyond what is planned?**

- 8.1 The Alliance recommends that the easiest way to do this is by aiding the delivery of the National Skills Academy for Power (NSAP) priorities. In addition, governments around the UK need to provide clarity on energy policy, support longer regulatory timeframes facilitating longer-term workforce planning) and assist with sector attraction.
- 8.2 It will also be important to be able to respond to any large-scale inward investment opportunities and a rapid response initiative would help to support economic development agencies in providing a supporting case for inward investing companies.
- 8.3 The planning process, whether through the Infrastructure Planning Commission or a different mechanism, must be transparent, efficient and timely to maintain the confidence of employers and allow effective skills planning. Significant delays threaten energy security and growth of the UK skills base.
- 8.4 From the wind industry in particular there is a need to recruit and train a whole new workforce on the operation and maintenance of plant as well as bringing existing employees' skills up-to-date. Similarly, to support manufacturing investment in this area, the potential for a rapid rise in the demand for composite design and manufacturing skills, needs to be recognised. New cross sector working, including the National Skills Academy for the Process Industries under its extended composites remit, the National Composites Network, National Composites Centre, Cogent and Semta will bring coherence to a diverse field. Flexible funding that is truly demand-led would help employers invest in the skills they need earlier than is currently possible, thus securing the benefits to be gained for the UK economy from both the onshore and offshore wind industries.

**9. What more can be done, both within the power industry, and through Government energy policy, to promote energy-related careers to young people?**

- 9.1 Governments around the UK need to agree energy policy, thus providing industry and the suppliers of skills with a clearer view of the timeline for skills development. They also need to promote the "wonders of a low carbon world" (e.g. Prof. Brian Cox) – exploiting the current interest in science programs to promote the low carbon industry as a career option. The provision of energy-related training incentives (e.g. no tuition fees, significant grants, etc.) for those employers that attract younger recruits would also be worthwhile. Government support of resources, such as Energy Foresight, which aid teachers in placing curriculum material in an exciting industry relevant context, is an important component in promoting energy related careers.
- 9.2 The power sector has already identified this as an issue and has set this as a priority for the NSAP. It will be important to ensure that NSAP works with the renewable industry bodies to ensure their needs are met.

**10. How can we stimulate the demand for the skills required to meet the Carbon Capture and Storage (CCS) market opportunity, including a range of skills; from advanced R&D skills, to crafts and technical skills?**

- 10.1 CCS is still in the early stages of development with a priority at the moment for higher level engineering and scientific skills. It will be important to work with, and support, the CCS industry to ensure we

capitalize on the benefits to be gained for the UK. As mentioned earlier in this response, we would still rely heavily on the existing skills of those employees/ers from the high carbon industry and there is still a need for the level 3 'craft' disciplines to build these new infrastructures. Nevertheless many of the core skills are recognised to already exist, albeit applied in mature industries. For example, the expertise of the oil and gas industry in handling very large fluid volumes in geological deposits should be recognised. What is lacking is the integration of disciplines within CCS operations.

- 10.1 Closer links need to be established between the industry and university R&D programmes; with the development of longer-term knowledge transfer activities (e.g. Higher Skills Consortiums between universities and employers). Demonstrator projects could be initiated to explore both technological challenges and the skills required to address them.
- 10.2 It will be necessary to raise awareness of the potential for this industry and communicate this to the prospective workforce (including young people) as part of the sector recruitment and attractiveness activities currently taking place via the Power Sector Skills Strategy Group and the NSAP. This would help to increase participation in STEM subjects in schools, as well as FE and HE, as is the case with wave and tidal technologies.
- 10.3 Government support to aid the development of a Sector Value Proposition for the industry, including CCS, would help the Power Sector Skills Strategy Group and the NSAP in their work to promote the sector, and the challenges that it faces.

## **B) Decarbonising the Power Industry – Nuclear power**

The development of skills for nuclear power is distinguished from those in the rest of the industry because of the unique safety regulatory framework which applies. Recent, substantive, nuclear initiatives from government (for regulation) and private utility companies (for investment), make this issue particularly germane. The Alliance has therefore included this nuclear specific response to the consultation.

### **Prologue**

Nuclear power has over recent years been regarded by government as a key pillar of the UK's energy portfolio. **Civil nuclear electricity generation currently supplies around 70% of the UK's low carbon electricity** from a fleet of reactors that are due to be removed from service over the next 13 years. Without a programme of replacement, Sizewell B will be the only remaining nuclear reactor by 2023, adding a substantial extra demand to grow renewable energy supplies. The view of nuclear as a stable low carbon baseload supply prompted the previous government to regard it as part of a 'trinity' of secure energy provision, alongside Clean Coal (with carbon capture and storage) and Renewables. In turn, the new government has indicated that it will:

*'[...] bring forward the National Planning [sic] Statement for ratification by Parliament so that new nuclear construction becomes possible.'*<sup>1</sup>

Government action has been matched by public positions from three nuclear consortia proposing 16 GWe of new build. This commitment from the private sector, underpinned by the regulatory safeguards from government, drives the ambition for a nuclear renaissance.

### **Skills for the Civil Nuclear Sector**

The consultation document "*Meeting the Low Carbon Challenge*" already cites and summarises many of the key points identified in two Cogent *Renaissance* reports **Power People** (September 2009)<sup>1</sup> and **Next Generation** (March 2010).<sup>1</sup>

The *Next Generation* report includes a series of recommendations to ensure a secure supply of skills for the nuclear sector. The skills scenarios were facilitated through the formation of a '**Nuclear Energy Skills Alliance**' of government and skills bodies representing manufacture, construction and nuclear operations. The analyses and the recommendations have been derived following extensive consultation with employers through an expert panel and under peer review of the final published version.

The aforementioned skills reports will be the bedrock of a **separate and detailed response to this skills consultation from Cogent, the Sector Skills Council for the Nuclear Industry.**

#### **Proposal**

**The findings of *Next Generation* are current for Nuclear Power, and we maintain that they should form the basis of a specific nuclear strand of a skills strategy to decarbonise the power industry.**

#### **Qualification Statement to Paragraph 44**

We would draw attention to need for clarity in defining the constitution of the UK power industry within the consultation paper. Reference to the 'Power industry' in paragraph 44 includes the identified need for 28,000 new skilled employees. It is important to be clear that this figure relates only to non-nuclear generation. Required support for existing nuclear power generation, fuel processing and decommissioning is additional to this figure, at a level of around 14,000 by 2025. Nuclear new build will involve up to 30,000 further jobs in construction and subsequent operation. Full analysis will be reported through the separate and detailed response to this skills consultation from Cogent, the Sector Skills Council for the Nuclear Industry.

#### **Specific Questions from the consultation document:**

#### **7. How should employers and Government plan for the future re-deployment of skilled workers from high carbon industries to low carbon industries, and ensure a just transition?**

In its peer-reviewed report of March 2010 – *Next Generation* - Cogent SSC has identified "Transition Planning" as a key area for cross-sector collaboration. In a specific recommendation on this matter the report calls for – and has set in train structures to facilitate – such re-deployment:

*"The sector skills bodies with employers to review transition planning, especially where compatibility and transferability of skills is available from other industries that may have excess capacity. Where high risk shortage categories are identified, the Nuclear Energy Skills Alliance to develop solutions, including working with the Migratory Advisory Committee, the UKBA and other Government agencies to identify solutions."*

This report is now widely referenced by Government, employers and other stakeholders (e.g. the Adam Smith Institute's 'Nuclear Industry Forum', June 2010) and a Nuclear Energy Skills Alliance group has been convened to see this through with the Utility companies and their supply chain. Further details will be given in the separate response by Cogent on behalf of the Nuclear sector.

#### **8. For the power sector skills we have identified, what is the best way to accelerate skills development beyond what is planned?**

Maximising the rate of nuclear skills development should be achieved by ensuring the implementation of the recommendations of the Nuclear Energy Skills Alliance, as detailed in the *Next Generation* report. As above, further comment will be made in the separate response by Cogent on behalf of the Nuclear sector.

**9. What more can be done, both within the power industry, and through Government energy policy, to promote energy-related careers to young people?**

The *Energy Foresight* programme has now reached the end of its funding programme and no additional funding has been sourced to continue delivery. This programme has been very successful with all learning materials developed and training delivered to over 2000 teachers across the UK. *Teachers from Industry* is a new programme that has now been piloted by the Skills Academy to deliver innovative learning in primary schools to raise interest in the STEM agenda including an understanding of the Nuclear Industry. *Science and Engineering Ambassadors (SEA) for Nuclear*. The Skills Academy continues to support the SEA programme and now has circa 60 SEAs in place.

<sup>1</sup>The Coalition: our programme for government - [http://www.cabinetoffice.gov.uk/media/409088/pfg\\_coalition.pdf](http://www.cabinetoffice.gov.uk/media/409088/pfg_coalition.pdf)

<sup>2</sup> *Power People: The Civil Nuclear Workforce 2009 – 2025, Cogent 2009* - <http://www.cogent-ssc.com/research/Publications/NuclearReportPowerPeople.pdf>

<sup>3</sup> *Next Generation: Skills for New Build Nuclear, Cogent 2010* - <http://www.cogent-ssc.com/research/Publications/Renaissance2.pdf>

## Decarbonising Buildings and Construction

**11. Can the Zero Carbon Hub approach be used as a model for identifying skills needs, and stimulating demand for those skills, across the construction sector?**

11.1 The Alliance agrees that the Zero Carbon Hub approach could be used as a model for identifying skills needs and stimulating demand across the different industry sectors. The partnership approach used within the Skills and Training Workstream which brings together the Zero Carbon Hub, NHBC, HBF and ConstructionSkills for new build homes has had the added value of bringing together expertise from the housing, skills and training sectors and involvement from all of the partners. The approach has added significant weight and influence to the project and ensured a greater commitment to, and integration of, skills issues around new home building.

In order for the Zero Carbon Hub approach to achieve maximum impact there is a need to recognise that skills to produce zero carbon in the broader construction sector require the engagement of the built environment supply chain and this involves a number of sectors including, for example, building services engineering. The involvement of the wider group of SSCs who represent these sectors, such as the BESA group which includes Asset Skills, ConstructionSkills EU Skills, Proskills and SummitSkills is essential.

11.2 The intended house building skills portal [www.homebuilding-skills.com](http://www.homebuilding-skills.com) will link future skills needs and skills supply and can provide a model that could be replicated for the wider industry. This opportunity to work together has also enhanced the relationship between all the organisations and has laid the foundations for working together in the future. This model could easily be adapted to include the work of the other SSC's but would probably require other committed partners to link in.

## **12. What more could it do to deliver low carbon and resource efficient skills in all parts of the construction industry?**

- 12.1 The Alliance suggests that to deliver low carbon and resource efficient skills in all parts of the construction industry the remit of the Zero Carbon Hub would need to broaden. Currently it focuses on the new building housing sector and as stated above this approach has worked well. If the key players from other sectors such as the repair and maintenance sector, non domestic buildings and infrastructure and the supply chain were involved the influence of the Zero Carbon Hub could extend across other sectors of the industry. To do this it would need to develop the same level of industry involvement as the home building model but would need to broaden into renewable technologies, products and services as there are clear overlaps.
- 12.2 To ensure the low carbon and resource efficient skills were delivered across the industry there should be continuous development of the workforce which includes managers, supervisors and trades people, as opposed to the current approach of purely continued professional development. It would also require some form of measurement and assessment of the skills and knowledge of the workforce, for example a skills card that not only measures competence but also carbon knowledge as well. This may not necessarily be a role for the Zero Carbon Hub but rather something the broader industry has to consider to support 'continued craft development'.
- 12.3 It is suggested that the skills which are identified as needing development should be mapped to the relevant SSC in the wider built environment. Each SSC can then contribute the specific technical skills development for their sector as well as working collaboratively on the more general management, supervisory and customer service skills which will cut across all sectors. This will also help to provide greater clarity of any new skill areas which might bridge traditional SSC areas in the zero carbon world.
- 12.4 Employers will need to be incentivised and encouraged to take forward the business growth opportunities of a new low carbon market, and will need a delivery infrastructure to incentivise this take-up. To break free of the circular argument in which each party is waiting for the other to act, there is a clear need to kick-start this process by setting in place a system that allows employers, providers and sector bodies to collaborate, create and communicate a system for skills planning and delivery.

Without a concerted effort to develop such a skills infrastructure, the sector, and subsequently the economy, will simply be unprepared for the forthcoming boom in renewable energy design and installation and Government will struggle to meet its plans for the low carbon transition.

## **13. What more should Government and industry do to ensure that those retrofitting existing buildings have the necessary skills?**

- 13.1 The Household Energy Management Strategy places the energy suppliers at the heart of this agenda through the Carbon Obligation. Strong links with the energy suppliers will be key to delivering a strategic approach to skills issues which support their delivery of carbon reductions.
- 13.2 Adoption of the public/private ZCH model, aligned with appropriate SSCs, would contribute greatly to this process. There are already a number of measures which will help to develop the skills within the retrofit market for example EEPH are working with a group of four SSCs (Asset Skills, Construction Skills, Energy and Utility Skills and Summit Skills) to develop an implementation plan for the erstwhile HEM

strategy which is now being re-aligned within an emerging “Green Deal” policy we need more definitive information on this RF. As an example, a centre in Stoke on Trent is being developed as a centre of excellence for refurbishment training.

- 13.3 SMEs make up a large part of the retrofit market, and are a key target of the ‘cut the carbon’ campaign’ (see question 14). It is essential to work with SMEs and their federations to ensure their members have the necessary skills not only to respond to demand but also to have the skills to give authoritative advice to house holders to help develop the retrofit market.
- 13.4 To ensure that those retrofitting existing buildings do have the necessary skills and that house holders have confidence in those skills there may well be a need to develop an accreditation/certification scheme. Any scheme developed needs to take account of those schemes which are already in existence and to ensure that it is branded so that it is easily recognised. Provision for these skills would benefit from engagement with the manufacturers of the new products and technologies.
- 13.5 It is the building services engineering (BSE) sector that will deliver the skills needed to fulfil the carbon reduction targets relating to local power generation and micro generation. This covers all the ‘green’ installations for homeowners, small community projects and many commercial properties. Therefore, a strategy for micro generation skills development must be in place to deliver the national carbon reduction targets. Through existing research and occupational mapping, it has been established that the skills for environmental technology systems are an extension of existing occupations, rather than new occupations in isolation.
- 13.6 Vital additional skills are needed for this sector to understand these new technologies and how they need to be designed, installed, maintained and integrated with existing systems in order to deliver maximum efficiency and carbon savings. The move to environmental technologies brings a need for more multi-skilling and multi-disciplinary work practices and greater integration of installation and design skills. Employers across the sector have determined that the minimum level of base competence to be able to up-skill in these technologies is at NVQ/SVQ Level 3. However further development taking level 3 learning through level 4 and beyond is required in order to satisfy progression and address fully the needs of employers.
- 13.7 Employers in the sector have been slow to top up the skills of their existing workers, not allowing them to work on the environmental technologies. Research has shown that small and micro businesses tend not to be natural entrepreneurs. They are very cautious about spending money to upskill their existing workforce without a clear need to do so. As a consequence they are waiting for client demand or legislation to drive their business into the environmental technologies market.

The key driver for any business is customer demand. The client’s decision to select a particular system, appliance or technology is often heavily influenced by the chosen installation business. Secondary drivers include legislation and incentives. If however, demand is stimulated before businesses have extended their workforce skills, clients will look to other countries where businesses already have these skills.

- 13.8 The current lack of confidence and the impact of the downturn have played a major part in employers not taking on these new environmental technologies in great numbers. Introduction of FITS and the RHI in 2011 will help stimulate demand if they make a significant contribution towards the cost of the installation,

reduction in payback time and reduction in energy usage cost, and therefore enable businesses with the right skills to compete more readily.

- 13.9 The installation of environmental technology systems in sufficient volume to make a significant contribution to the 2020 and 2050 targets, is unlikely without the engagement and support of UK building services engineering sector businesses. Once engaged, installation businesses have huge potential to stimulate the market and create customer demand.
- 13.10 Drivers linked to encouraging sector installation businesses to engage with environmental technologies and to stimulate the market, are essential. For example funded training for upskilling, particularly in the current economic climate, is likely to be an effective driver as well as evidence of ongoing work for the business once its employees are qualified.
- 13.11 The National Skills Academy for Environmental Technologies will help to ensure the UK has a skilled, competent workforce to install new and renewable technologies. It is essential that there should be strong links with DECC and the SSC during the RHI development period to ensure that any criteria for installer accreditation are mapped into the National Occupational Standards for environmental technologies. The Skills Academy will be the key route for training and upskilling installers to enable them to competently install renewable heat technologies.
- 13.12 The Alliance suggests that DECC should work with relevant stakeholders to agree what would constitute an approved/qualified person in relation to the installation, maintenance and repair of smaller technology systems. The National Skills Academy for Environmental Technologies will ensure that training provision is available for the installation and maintenance of renewable heat technologies; the Alliance recommends that any RHI funding is linked to training that is based upon relevant national occupational standards.

#### **14. What more could be done to improve awareness of low and zero carbon regulations along construction industry supply chains to enable them to take advantage of new low carbon markets?**

- 14.1 The Alliance suggests that improved awareness could be achieved through close working with energy suppliers to link in with their communication strategies. Greater support for skills development for the manufacturing and extraction companies in the supply chain would also be beneficial to ensure that the necessary skills are available to meet the end-user requirements. The work of the Built Environment Skills Alliance (BESA) of SSCs should be used here to accurately map out the ways in which low carbon will affect these activities.
- 14.2 Consideration needs to be extended to the wider built environment, and not just limit itself to the construction sector. There are industry supply chains in the wider built environment skill areas which need to have increased awareness of low and zero carbon regulations to maximise their opportunities in new low carbon markets.
- 14.3 Enhanced innovation, entrepreneurship and business development skills will allow employers to gain confidence in their ability to work with new technologies. This is likely to stimulate further business development as companies communicate their expertise to existing and potential clients. With increased skills and knowledge, the building services engineering sector can become more active in promoting the low carbon agenda to consumers, acting as a trailblazer for environmental skills.

14.4 All sections of the supply chain need to be alerted to the mixture of “carrot and stick “ being applied by government .The area of Energy Advice has been referred to above – and we need to await news of the emerging “Green Deal “ proposals from DECC and CLG. Large companies now have an explicit Carbon Reduction Commitment of which they are well aware. Such statutory measures will drive not only the organisations involved but also their suppliers down a reduced carbon road. Support services (e.g. Facilities Management and the supply chain) have a large role to play.

14.5 The previous administration`s policies on energy advice appear largely being adopted/adapted by the new Coalition Government under the “Green Deal” Brand. A group of four SSCs are working with DECC and CLG to address the skills needs of Home Energy Advisers – an area where real new jobs may be envisaged.

Green Deal will be a market driven approach – with loans of around £6500 for home owners to support advice, retrofitting and behavioural changes which will be “attached “ to the property and passed on to new owners. Interest, added to energy bills, will be less than the savings generated as a result of Green Deal.

Home Energy Advisers will have to be qualified and accredited to enable them to practice.

Commercial Energy Advice is almost certain to follow.

14.6 The ‘Low Carbon Campaign’ that ConstructionSkills is due to launch in the Autumn is designed to raise awareness of low and zero carbon, including regulations and legislation. In parallel to the campaign training and development solutions that maximise capability to thrive in this new market are being researched, developed and implemented. The publicity campaign will in the main be focused at SMEs and retrofit companies urging them to invest in future skills. The plan was welcomed by Paul Morrell, the Chief Construction Officer and already a number of federations have pledged their support for the campaign.

14.7 As mentioned in the answer to questions 13 linking federations into this approach of developing the skills, knowledge and capabilities of their members to help develop the market by being able to advise householders on solutions for their home, is essential.

#### **15. How should we capture and respond to the key skills demand and supply issues in the eco-towns projects and share lessons learnt more widely?**

15.1 The Bicester Eco-Town project will provide a good opportunity for wider dissemination of the issues associated around skills demand and supply. ConstructionSkills are developing a number learning projects which will look at the skills issues relating to changing products and processes within the low and zero carbon agendas. The aim is for these learning projects to become case studies which can be disseminated to the wider industry. The Bicester Ecotown and the associated construction skills training programme will provide an ideal opportunity for a learning project and case study development.

## Decarbonising the Transport Sector

### 16. What are the key technical disciplines involved in the transition to ultra-low carbon vehicles? How can we ensure the new skills required are met?

- 16.1 There will be significant demand for skills in establishing the electricity infrastructure which will support low carbon vehicles. This will exacerbate the skills deficiencies facing the traditional power and the large-scale renewable sectors.
- 16.2 Sema's work with companies at the cutting edge of vehicle production and design suggests that the initial significant skills demand will be in design, and implementation of design skills in ultra-low carbon technologies. This means that high level manufacturing skills will be required, specifically including electric management, electric battery skill, electrical safety and containment, composite technology and a wider need for advanced manufacturing skills. This is a relatively new area of manufacture and therefore the skills landscape is still being developed and identified. However, the challenges facing this sector and discipline can be witnessed in other areas, where composites and advanced manufacturing are emerging as key skills.
- 16.3 IMI are currently working with the Society of Motor Manufacturers and Traders (SMMT) and leading on the development of products which support the Low Carbon agenda through development of VQs and Accreditation routes for the safe repair and maintenance of Electric Vehicles

The Institute of the Motor Industry is working with the SMMT and Traders to provide training programmes in the safe repair and maintenance of electric vehicles. This work includes the development of national occupational standards (identifying specific knowledge and skills requirements), vocational qualification and accreditation routes. These will establish consistent technical competency levels, focusing on maintenance and repair. Sema is also involved in this work from a vehicle production and design perspective.

Sectors Skills Councils, working together with trade bodies and professional institutions, can provide the necessary expertise and dissemination structures to ensure standards in new automotive skills are relevant, workable, and rigorous. This will safeguard the future of new industries by providing a flexible set of standards, which will evolve with the new technologies, but provide consistency to enable individuals to develop their skills from a solid base.

### 17. What more do we need to do to ensure that UK companies have the skills they need to capitalise on the transition to lower carbon aviation?

- 17.1 As highlighted in the SSC Cluster report, *Skills and the Future of Advanced Manufacturing* (December 2009), there are a number of key pressures on skills for advanced manufacturing in the aviation sector, which will include low carbon 'drivers, such as:
- Social: public awareness of environmental impact is increasing, and pressure is on manufacturers to reduce this in both the manufacturing process, and in the operation of aircraft.
  - Technological: critical technologies related to low carbon in aerospace are the development of lightweight composite materials and structure configuration to optimise vehicle performance; the

technologies associated with the systems issues of life-cycle-cost, operation, and maintenance, control of pollution and reduction of noise.

- Legal and environmental: both in the UK and EU, pressure is on the aerospace industry to reduce emissions and impact on the environment at every stage.

17.2 The SSC Cluster report, *Skills and the Future of Advanced Manufacturing* (December 2009) also identifies the following technologies related to low carbon as requiring skills in the UK Aerospace sector: aerodynamics and propulsion systems, advanced materials such as composites and advanced electric drives; fluid dynamics modelling and applications, new materials, propulsion, systems engineering and autonomous operation; new aircraft design such as the Blended Wing Body. As a result, there will be increased demand for skills in all occupations, particularly highly skilled managers, professionals and technicians to address innovation and emerging technologies. For low carbon, and aviation as a whole, this means:

- Management - to operate successfully in complex global aerospace markets, a range of leadership and management skills at global standards will be required including: change management, business modelling, risk management, supply chain management, value chain management, knowledge management and strategic workforce development.
- Professionals - will need a mix of technical and business skills to meet future requirements for developing and designing commercially viable technology and products while communicating and managing projects effectively across supply chains.

17.3 The SSC Cluster report, *Skills and the Future of Advanced Manufacturing* (December 2009) also identifies a number of technical skills - demand for high level general engineering skills, mechanical, electrical, electronics and specific aerospace skills due to new product development that cuts across different engineering disciplines. Systems skills (design, modelling and integration) for high integrity systems, software (systems, modelling and simulation), mathematics, advanced materials engineering (lightweight, smart, electric and magnetic), diagnostic and prognostic skills, skills to support emerging technologies, exploitation of new product development, process excellence, research skills.

- Technicians – will require a range of technical and management/business skills as they interface between design and production, optimising processes.
- Technical skills - lean manufacturing, process excellence, whole product life cycle, design skills, composites, MRO licensed engineers (Part 66, Category B and above).
- Business skills – costing, project management, team working, problem solving and communication skills to facilitate Integrated Product Teams, marketing.

The Alliance suggests that all these should be considerations when public funding decisions are being made. SSCs will continue to highlight qualifications and standards which provide good value for money, and funding should follow these recommendations.

As the consultation notes, many of these skills could be brought across from other sectors, but this means some retraining and 'additionality' of qualifications at higher levels. Second qualifications to support these skills should be included in funding considerations, as well as appropriate levels of funding for comprehensive programmes such as apprenticeships and high level technical NVQs.

## **18. Are the skills priorities identified for the freight and logistics sector correct? What more do we need to do to ensure employers in the freight sector have the skills they require?**

18.1 Transport accounts for 21% of the UK's domestic greenhouse gases with freight transport alone (not incorporating warehousing et al.) responsible for 31% of those emissions. Research from Skills for

Logistics shows that 8% of the UK workforce is employed in logistics occupations. The sector itself has long been working on reducing emission levels and significant progress has been made. New and alternative modes of transport and storage continue to be investigated and piloted. Employers across the sector recognise that the right skills need to be in place to make these shifts in behaviour and practices possible (our recent Green Skills report makes this point). Often when people consider the freight and logistics sector they think only of lower skilled occupations. It is worth stressing, economic forecasting suggests that in the Logistics Sector to 2017 there will be greater demand for managers (169,200) than for machine operatives (107,600). Only 53% of our managers currently hold a Level 3 qualification. Improving management skills is an obvious way by which to both improve the productivity of the sector and reduce its environmental impact.

- 18.2 The Alliance agrees that the consultation is right to highlight the need for both operative and management level skills within the Logistics Sector. The Skills for Logistics *Sector Skills Assessment* details in full the current and future skills needs for the sector across the UK, we are confident that it provides in-depth answers to most logistics related skills questions. Full nation reports and briefing documents are available at [www.skillsforlogistics.org](http://www.skillsforlogistics.org).

**19. What more should Government and employers do to ensure UK companies have the skills they need to capitalise on the electrification of rail and future rail projects?**

- 19.1 Ensuring that training providers have up to date skills and knowledge is vital. It is some time since the last electrification work was carried out so those delivering training will need to refresh their own knowledge and skills. The new National Skills Academy for Rail Engineering (NSARE), working with GoSkills, will have a key role in developing provider skills and ensuring that fit for purpose training is available.
- 19.2 National Occupational Standards, qualifications and apprenticeships will need to be kept under constant review so that they can be updated quickly to reflect the emerging needs of the workforce. National qualifications, with transferable skills, will be important as skilled employees will need to move between development projects.
- 19.3 As noted in the consultation document, planning for skills is needed and the requirements for the workforce need to be considered from the inception of any project. A number of key projects being undertaken to improve the rail infrastructure are likely to require a new approach and project planning techniques. New and improved railway lines and light rail infrastructures are likely to lead to an increased demand for the fabrication and erection of steel structures for catenary, bridges, stations, stops and related permanent way structures, as well as for the manufacture of rail vehicles, rails and associated mechanical, electrical and electronic engineering infrastructure.
- 19.4 In order to improve the supply of these engineers and technicians, more needs to be done to encourage engineering graduates to seek a career in engineering. Two fifths of UK domiciled engineering and technology graduates do not enter full-time employment after graduation and although half of these go on to further study, there is a significant untapped pool of potential employees whose skills can be developed through major rail infrastructure projects. Although the vast majority of engineering graduates entering full-time employment join an employer connected with engineering (74%), there is a significant proportion of female graduates taking on positions in companies whose main economic activity is retailing (20%).
- 19.5 Improved, clearly understood career progression opportunities, combined with a concerted attempt to improve the image and reputation of engineering occupations (as a place to work), is needed to raise the proportion of engineering graduates going on to work in positions vital to improving the UK's rail infrastructure.

## Decarbonising Supply Chains across the entire Economy

### 20. What more should Government and employers do to up-skill existing, and future, workers in the forestry and farming industries, in particular to support the emerging bio-energy, biomass processing and renewable heat sectors?

- 20.1 Industry's skills needs relevant to the energy from waste and anaerobic/ aerobic digestion technologies need to be investigated and a clear idea of potential demand identified; appropriate levels of training provision can therefore be planned.
- 20.2 Generally speaking, more needs to be done by Government and SSCs to support the needs of specialist areas of both the waste management and water industries; both of which play an important part in the low carbon agenda.
- 20.3 Decision-making processes across agencies need improving in order to eradicate confusion. For example, Defra has brought about a situation where training providers and awarding organisations are developing unaccredited training provision, in response to their Anaerobic Digestion Strategy, rather than reviewing what exists and asking employers what is missing. BIS/SSC input and support could have avoided this. EU Skills is currently working to bring together the different stakeholders with a view to identifying employer needs and having standardised provision.
- 20.4 Whitehall Departments and devolved administrations have all set targets for reducing carbon emissions. It is accepted that meeting low carbon challenges should be tackled across all sectors, all regions, all categories of farmers, growers, forestry and land managers as well as government and regulators.
- 20.5 Reducing carbon emissions will have to be achieved through efficiencies across the supply chain (growing, harvest, storage, processing, transport, retail and home consumption) and not through decreased food production. Reductions will need to be achieved within the context of food security and growing population while also not compromising on environmental goals, food safety and animal welfare.
- 20.6 The Land-based sector must continue to appreciate why low carbon technology needs to be adopted and governments should build upon existing regional technology transfer models to support the industry to acquire these new skills for existing and new entrants to the sector. This will involve supporting existing work undertaken by levy boards, unions, trade associations, suppliers and distributors. Where possible research should work alongside knowledge transfer programmes funded from Rural Development Plans and other government departments.
- 20.7 The range of individual low carbon technology topics that cross the sector is too great to list but key areas include:
  - Carbon sequestration related to peat, trees, urban planting, etc
  - Minimal cultivation
  - Precision farming around water, fertiliser, pesticides etc
  - Ruminant diets and how high sugar grasses etc can affect the amount of methane produced
  - Grass and forage utilisation
  - Manure and slurry storage
  - Plant breeding programmes and genetics
  - Utilisation by growers of new science and technology
  - Role of methane and Nitrous oxide as far more potent greenhouse gases than carbon dioxide
  - Anaerobic digestion

- Energy utilisation within farming and forestry businesses
- Agronomy around bio-fuels
- Heat pumps and renewable energy applications
- Business skills to address new markets
- Growing and harvesting biomass
- Forestry and Woodland management skills

It is important to recognise that these skills are relevant to the existing workforce as well as new entrants.

20.8 Drivers for change will continue to be:

- CAP reform linked to Good Agricultural and Environmental Condition (GAEC)
  - Moves towards carbon footprint measurements on food and how supermarkets take this forward alongside food miles and local sourcing policies. There is a need to have meaningful data in this area so that improvements can be quantified. Improved skills in the measurement and auditing of carbon footprint will be required across the supply chain. Government can support in these areas of measurement.
  - Assurance schemes may also play an important part in influencing change.
- Consumer demands around environment and low carbon may follow similar paths to fair-trade.

20.9 The natural environment can continue to play a part in a low carbon system through the capture of carbon through natural, sustainable processes.

20.10 The development of an Agri-Skills Strategy in England by industry, Lantra and government will provide an overarching approach to skills development in agriculture and horticulture. Key aims of the strategy are to increase the professionalism of farmers and support more sustainable approaches. Devolved Administrations should be encouraged to support similar industry initiatives to raise awareness of skills and professionalism within the sector, in some cases they have supported low carbon activity within national work plans delivered by SSCs. Similar skills and CPD recognition issues need to be addressed for the forestry sector.

20.11 The Alliance will continue to support future development of NOS to reflect the needs of moving to a low carbon but increasing technology supported sector. SSCs will continue to ensure that qualifications reflect the needs of employers within the sector including apprenticeships. Collaboration across SSCs to ensure learning reflects the needs of employers must continue. Collaboration and dialogue with Awarding Bodies must continue to ensure flexible delivery systems are developed to benefit learners.

20.12 The ability of HE modules around low carbon to be accessed as “bite-sized” chunks of learning by managers and decision makers appears attractive to forward thinking businesses.

20.13 Given the age profile of the agriculture and horticulture sectors and that the majority are small micro-industries; the primary access point for advice is through attendance at knowledge transfer events. It is vital that these events continue to give a “seeing is believing” experience in short, focussed informal learning environments that farmers are able to attend around their daily business activities and are able to share with their farming peers.

20.14 Even though there are excellent examples of technology transfer systems across all Nations around production based activity, greater focus needs to be placed upon low carbon issues and Renewables. Even with established Rural Development Plan funded technology transfer programmes like Farming

Connect in Wales which has been running since 2001 there remains a majority of the sector not engaged. Further work need to be done as to how key low carbon messages can be disseminated to these hard to reach businesses.

20.15 As a general rule, where possible government should support and influence in the areas of activity listed above. Governments need to ensure that employers understand the financial benefits that can come from low carbon technology and climate change mitigation rather than just the targets that have been set by the Westminster and the devolved Governments. This can be done through knowledge transfer and best practice utilising leading land managers.

**21. What actions should be taken to ensure that individuals working in carbon intensive industries have the skills to make the transition to a low carbon, resource efficient economy?**

21.1 See the response to question 7.

21.2 There is a need to support all sectors in the transition to a low carbon economy. This will require developing awareness of the requirements of the low carbon transition, supporting the development of existing staff and the re-skilling of those entering industries relevant to the low carbon agenda from other sectors.

Manufacturing companies are often amongst the highest energy users, particularly in industries such as paper, ceramics, or brick making. There are a number of companies in these industries that have already made great strides in reducing Carbon output and improving energy efficiency, and wherever possible case studies should be developed and publicised to provide examples of best practice.

21.3 Specific and targeted support will be required by the water and waste water industry and who are one of the higher users of energy. This industry will need significant support from within the low carbon transition system to enable it to reduce its carbon footprint. It cannot do it within its current boundaries of operations.

21.4 Additionally, EU Skills has had significant success in the past with welfare-to-work programmes which have delivered the long-term unemployed into sustainable and attractive careers within the domestic gas installers market (called Ambition: Energy).

21.5 There is often a lack of joined up thinking from government which can confuse employers. For example, BIS/DECC consulting on Skills for low carbon at the same time as DEFRA approve a scheme to demonstrate technical competence for Environmental Permitting. This scheme does not take into account any of the existing provision or qualifications that employees may have but requires employers to pay for their employees to undertake an unaccredited test (following unaccredited training) which has been developed in isolation without consulting employers and not in direct response to employer demand. This affects a number of industries relevant to the low carbon agenda, including waste management, water, construction and agriculture.

**22. Is our understanding of the skills needs in advanced manufacturing correct? How can these needs best be met in the short, medium and longer terms?**

22.1 The Alliance agrees that the skills listed in the consultation are undoubtedly central to advanced manufacturing. It is also worth highlighting the list of skills mentioned under Question 17, as Aerospace forms a key element of advanced manufacturing.

22.2 The SSC cluster report *Skills and the Future of Advanced Manufacturing* (December 2009) came to seven conclusions in its analysis of the skills requirements of Aerospace, Plastic Electronics, Silicon Electronics, Industrial Biotechnology, Composites, and Nanotechnology as a whole. The conclusions, with their application to low carbon, are listed below:

Key common conclusions from the seven summary analyses:

1. High-level technical skills represent the most important element of specific skills demand in relation to Advanced Manufacturing. In low carbon, this includes product design, materials, systems and process design, waste management, etc.
2. Inter-disciplinary expertise is needed, in particular in smaller companies and teams, where the cost of bringing together a representative from all the relevant disciplines might be prohibitive. Low carbon considerations spread across disciplines, and mean that in the long term, all STEM disciplines will need to collaborate around this.
3. An accelerated supply of capable and competent technical support staff is required. For low carbon, this means:
  - a) promotion to raise the image of technical support work in low carbon areas,
  - b) public funding for initial formation frameworks, in particular apprenticeships, probably at both advanced (NVQ Level 3) and higher (NVQ/QCF L4) levels, and
  - c) a new attitude among employers (not just large employers) to the investment for the future involved in mentoring young people, both in relation to work placement for undergraduate students and formal apprenticeship programmes for the technicians. Low carbon must form a cornerstone of this experience for young people, showing them how it is intrinsic to the processes of a wide range of industries.
4. Effective and fast commercialisation of applications of new technologies requires expertise beyond an adequate supply of technical skills. For low carbon, key areas include, New Product and Process Development and Implementation (NPPDI), and Production and Manufacturing Engineering.
5. Skills in understanding and managing risk - the deployment of new technologies (an inevitable component low carbon developments) brings with it a number of risks.
6. Adoption and exploitation of new technologies will always be more of a challenge for smaller established companies than for larger ones. Competitive pressures inevitably mean that small companies have little spare time or capacity for absorbing or adopting new approaches, and even where they do, many struggle to procure the finance to cover additional investment for the longer term. Thus a key element of skills policy needs to find ways to overcome barriers to innovation within SMEs.
7. Probably the greatest specific implication for public learning provision in this area relates to the Knowledge Transfer (KT) process from HEIs to enterprises. SMEs in particular, could benefit particularly strongly from the provision by HEIs of short-courses, focused on specific technical areas such as low carbon, and timed for company convenience. While many university staff would like to increase the amount of such provision, the funding realities of universities do not always make this easy, and improved mechanisms and funding arrangements for this would be welcomed by industry.
8. Where the adoption of new technologies by existing sectors is concerned (e.g. aerospace, electronics) the supply of R&D skills needs to be augmented with knowledge and understanding of how things work in existing industries. Thus graduate and postgraduate flows in the enabling technologies need to be supplemented by graduates with more general engineering knowledge.
9. Because the areas in advanced manufacturing have generally not yet matured into their own sector, there is little corresponding established sectoral institutional activity (trade associations, etc.) to provide information on the exciting careers currently available and in prospect. In this situation, it is

presumably appropriate for public policy to coordinate promotional activity for these strategically important areas (as identified in Question 1).

**23. What are the key skills challenges in the service and support sectors to deliver improved resource efficiency and low carbon?**

23.1 The Alliance suggests the following are the key skills challenges in the service and support sectors to deliver improved resource efficiency and low carbon:

- Influencing and communication with client/customers – covered in the suggested programme as change management
- Regulatory and compliance issues – Carbon Reduction reporting etc
- Awareness and technical skills to manage new technology
- Change management
- Process modernization management/control
- Project management and sustainability related skills for new technology
- Selling the business case to employers for delivery is extremely important
- Provision of Energy Advice by Facilities Management companies to their clients
- Accurate data collection for Display Energy certificates where required on public buildings
- Provision of Energy Performance Certificates (EPCs) for clients

23.2 Implementation of food manufacturing excellence and sustainability is key to moving forward in both food manufacture and the supply chain. This will help build the critical skills and competence capacity across the workforce to deliver improved resource efficiency and low carbon. The driver for this is business productivity and success which is a particularly strong and rational approach to delivery. Developing the necessary learning and skills provision with the right leading edge capability and supporting implementation case study/success records is key.

23.3 Whilst retail does not require specific low carbon skills in its workforce, it relies heavily on its suppliers for ensuring it meets its obligations around low carbon and wants to know that they have the requisite skills to support them – retail is a significant purchaser in the UK.

## **Skills for Adapting to Climate Change**

**24. What will the key skills needed be, to build adaptive capacity for climate change, enabling organisations to minimise risks, and capitalise on the opportunities that climate change will bring?**

24.1 A distinct change in emphasis is required from that of food supply chains to the realisation and use of a food supply network approach, made up of integrated chains which alter with global change/business and consumer needs.

24.2 Skills will be needed to operate in more flexible and less hard-wired arrangements within a network including strategic level skills to plan change, set new vision for operations and manage risks, management skills to research new markets and sources, plan/implement/evaluate change, procedure implementation and development. Financial knowledge for asset managers and engineers will be important to maximise the return of investment decisions and tax relief incentives.

## Annex A: Scotland

In parallel with the current consultation, the Scottish Government is consulting on its own discussion paper entitled “Towards a low carbon economy for Scotland”, to which the Alliance of Sector Skills Councils in Scotland will be contributing.

In a Scottish context, the transition to a low carbon economy is considered to represent a significant economic opportunity with *“Scotland’s enviable natural resources, research expertise, and industrial base provide firm foundations to capitalise on the growth of renewable energy, carbon capture and storage, and improvement in energy efficiency”*. The latest set of Sector Skills Assessments for Scotland already predicts strong jobs growth over the coming years in the related fields of construction and waste management and within the Asset Skills footprint.

The Scottish Government has itself predicted that 60,000 new Scottish jobs could be created in low carbon industries by 2020, including 26,000 new jobs in the renewable energy sector, and that low carbon goods and services will be worth an estimated £12 billion by 2015.

The ASSC in Scotland has identified a number of specific challenges and opportunities associated with making the transition to a low carbon economy in Scotland, namely:

- There are already emerging skills gaps and shortages in the on-shore and off-shore wind energy and marine wave and tidal power generation industries;
- A transfer of the significant pre-existing skills base from Scotland’s North Sea oil and gas industry into the development of marine-harvested algal biofuels could merit further exploration and support, with the direct involvement of the Scottish North Sea oil and gas industry;
- Scotland’s unrivalled natural environment puts it in a position to contribute a great deal to the low carbon agenda by taking a lead in sustainable land management. In many cases, knowledge in areas such as soil science, organic chemistry, genetics and efficient resource management will become increasingly important but are currently missing from the skill set of managers in the agricultural and horticultural sector;
- As elsewhere in the UK, many of the individual industries contributing to the transition to a low carbon economy appear to be suffering from an ageing workforce, with the issue being particularly concerning in areas such as power generation which is forecasting large percentages of its workforce retiring over the course of the next 10-15 years;
- As elsewhere in the UK, although the supply of STEM graduates and postgraduates has increased in recent years, with demand for specific skills in the low carbon industries expected to increase greatly over the next decade or so, the supply of STEM skills is not predicted to increase at the same rate, which will have implications for the future workforce;
- Although a well-proven renewable energy and waste management technology, anaerobic digestion remains under deployed within Scotland’s waste and farming sectors;
- The Scottish Government envisages that carbon capture and storage (CCS) will play a crucial role in decarbonising energy generation in Scotland by 2030, with low carbon coal technologies representing a major market for business, potentially supporting 30,000-60,000 jobs UK-wide, 10,000 of which it believes Scotland should aim to capture. For current and future skills requirements in this area to be met, government needs to provide clear and consistent information concerning the strategic commitment to the overall future energy mix, the extent to which different fuel types will play a part and, consequently, precisely what role CCS technology will be required to play.

## Annex B: The Alliance of Sector Skills Councils

The Alliance was established in April 2008 as the collective voice of the 25 SSCs, the employer-led organisations on skills for sectors across the UK economy. Its strategic priorities and objectives for 2009-12 are as follows.

- To position SSCs collectively for optimum impact and act as a catalyst for change within the skills and employment system.
- To enable SSCs collectively to deliver their unique role in ensuring that standards and qualifications meet employers' needs.
- To position SSCs collectively as the authoritative voice on sectoral Labour Market Intelligence.
- To be a catalyst, leader and co-ordinator for raising skills in priority cross-sector areas and for linking with sectors not covered by SSCs.
- To provide first class services for Alliance members and to enable them to raise their capacity, capability and performance.

By working together as a strong Alliance, SSCs have positioned themselves for increased impact which is more than the sum of the parts. Through this joint working the SSCs will be recognised for their key role in achieving a world-class workforce in the UK and being a leader in skills development that meets the needs of employers of all kinds across public, private and independent sectors.

The Alliance is largely funded by the subscriptions of its members. It is a company limited by guarantee and a Scottish charity with offices in London, Cardiff, Edinburgh and Belfast.

### Sector Skills Councils

SSCs are independent, employer-led and UK-wide organisations that are advocates for their industries and identify and tackle sector-critical skills needs. There are currently 25 SSCs covering approximately 90% of the economy. SSCs are the most recently quality assured bodies in the skills system and the only organisations actually licensed to represent their sectors' employers on skills issues. SSCs provide a unique channel to reach employers who will only engage with those who understand their specific needs and circumstances. SSCs all work towards the following four key goals:

- reduced skills gaps and shortages
- improved productivity, business and public service performance
- increased opportunities to boost the skills and productivity of everyone in the sector's workforce
- improved learning supply through National Occupational Standards, apprenticeships, and further and higher education.

SSCs have been established and developed during the last five years and in that time they have built strong working relationships with the UK Government and the devolved administrations, and important skills stakeholders such as the UKCES, Confederation of 19 Alliance of Sector Skills Councils, British Industry, the Institute of Directors, Federation of Small Businesses, trade union bodies, funders, providers and awarding bodies. They have played a leading role on a range of skills issues, including:

- working with employers to identify future skills needs

- developing skills and training solutions
- developing and maintaining National Occupational Standards
- influencing and shaping the future development of qualifications
- designing Apprenticeship/Modern Apprenticeship frameworks
- encouraging greater investment in training
- providing labour market information that assists in long-term business planning.

The unique selling points of the Alliance of SSCs in a complex landscape are as follows:

- SSC footprints include 1,707,885 enterprises and cover approximately 90% of the workforce across the UK, which gives us strength in breadth
- Alliance members have in total 350 very senior employers from every sector of the UK economy on their individual SSC boards, and this gives us powerful leverage
- SSCs have a robust and distinctive evidence base for skills development in their sectoral Labour Market Intelligence (LMI)
- by working together as an Alliance we can map skills across the economy - and thereby facilitate mobility and redeployment between sectors
- employers naturally cluster and work collaboratively on a sector basis. This is evidenced through a wide range of successful sector-base initiatives – ranging from 14-19 Diplomas to Apprenticeships.

## **Annex C: SSC Contribution**

14 SSCs contributed to this consultation response, plus the Engineering Construction Industry Training Board (ECITB).