

Contents

Introduction	3
The East Midlands	4
Developing Skills and Qualifications	5
The Role of Sector Skills Councils	6
Apprenticeships	8
Barriers to Apprenticeships	9
National Skills Academies	9
Apprenticeships and Low Carbon	11
East Midlands Colleges and Apprenticeships	12
Mapping the Skills Offer	27
Defining the Low Carbon Economic Sector and its Businesses	28
Business Groupings into Low Carbon Skills Sectors	29
Defining and Categorising Low Carbon Skills	30
Generic Skills Requirements	31
Skills Shortages	31
Identified Skills in the Low Carbon Sectors	31
College Provision Including Gap Analysis	35
Explaining and Interpreting the Gaps in Provision	38
Criteria for Determining if a Training/Skills Need Should be Met By Colleges	39
Demand Side Gaps	39
National, Private and Specialist Providers	40
Improving the Supply Side Provision in FE Colleges	40
FE Colleges' Skills Offer Mapping	41
FE Colleges and Short Knowledge Transfer Partnerships	43
Defining the Low Carbon Economy	43
Problems, Difficulties and Successes	45
Criteria for Successful KTPs	46
New Models of Supply Side Capacity Building and Knowledge Transfer	46
Conclusion	48
References	48

Pathways to a Low Carbon Economy

This guide is part of a wider set of activities delivered through the emda/AoC East Midlands FE Low Carbon Task Group. The group was set up with the aim of ensuring that the East Midlands' Further Education sector develops an exemplary, innovative and comprehensive approach to delivering skills in order to drive the transition to a low carbon economy.

The FE Task Group was asked to undertake three elements of research:

- to explore the potential for the development of a regional low carbon Apprenticeship scheme or the 'low carbonisation' of existing schemes
- to map the current FE college curriculum offer in low carbon skills against business skill needs and identify any gaps or deficiencies in skills supply
- to encourage colleges to become partners in a shortened version of KTP, known as sKTPs.

The research and activities were undertaken between October 2010 and early March 2011 and the resulting reports were published at the end of March. Beneficiaries of the research are East Midlands Colleges and stakeholders who will be able to undertake some form of low carbon training or Apprenticeship, or have low carbon included in existing programmes and frameworks.

The research contributes to the energy and resources strand of the Regional Economic Strategy, in particular it fits with the priority actions of reducing the demand for energy and resources, utilising renewable energy technologies, and exploiting low carbon technologies. It also contributes to the Employment, Learning and Skills strand by engaging colleges with businesses.

At the regional level, the Regional Skills Priorities Statements highlighted the importance of providing the right skills to support the low carbon and environmental sectors. The work of the FE Task Group is a fundamental part of taking this forward, with the research as key strands of the FE task group work plan.

At the national level, there remains a commitment to the low carbon agenda from the Coalition Government. The targets set out in the Low Carbon Transition Plan (published by the previous Government) remain valid, and the UK is therefore committed to meet the target of emission cuts of 18% on 2008 levels by 2020, and source 15% of energy from renewable sources by 2020. Meeting these targets requires not just investment and support for companies in the emerging low carbon marketplace, but support for wider action to ease the transition from a high to a low carbon economy. This action has to include activity to equip the workforce with the right skills for a low carbon economy. The Government is committed to expanding Apprenticeship schemes and making them more accessible to learners and employers.

Findings from the three research tasks have been included in this booklet to provide a 'guide' to qualifications and Apprenticeships in East Midlands' colleges, linked to the low carbon agenda.

A low carbon economy is defined as an economy “which has a minimal output of greenhouse gas emissions into the biosphere, but specifically refers to the greenhouse gas carbon dioxide”. The aim of a low carbon economy is to integrate a country’s production and markets (including manufacturing, agriculture, transportation and power-generation for example) with technologies that produce resources and materials with minimal greenhouse gas emission.

The UK is committed to legally binding targets to reduce greenhouse-gas emissions under the Kyoto Protocol and European Union Climate Change Programme. Specifically, the UK is committed to cutting 12.5% of greenhouse gas emissions (between the years 2008-2012) under the Kyoto Protocol; reducing CO₂ emissions by 26% (by 2020) under the Climate Change Act 2008; and reducing greenhouse-gas emissions by 80% (by 2050) under the Climate Change Act 2008. Target reductions are relative to the base year of 1990.

As the world’s population grows and fossil fuel reserves and natural resources diminish, there is a need to move to a low carbon economy on a global scale, to minimise environmental impact and foster sustainability. Organisations in the public and private sectors have a responsibility for change and must proactively seek improvement in economic, social and environmental performance in order to be sustainable, contribute to the low carbon economy and reduce costs. In the UK, successive governments, local authorities, businesses and the community are required to reduce waste through recycling and reuse; use low carbon energy methods and sources; improve energy efficiency; source local foods and materials; and comply with environmental initiatives.

The Energy Act 2008 updated legislation resulting from the Energy White Paper “Meeting the Energy Challenge” of 2007. The Energy Act indicates the availability of new technologies (for example Carbon Capture and Storage) and emerging renewable technologies; relates to the UK’s changing requirements for secure energy supply (such as offshore gas storage) and serves to protect the environment. The Act; together with the Planning Act 2008 and the Climate Change Act 2008, underpins long-term energy and climate change strategy. The Act covers offshore gas supply infrastructure; renewables; feed-in tariffs; decommissioning offshore renewables and oil and gas installations; improving offshore oil and gas licensing; nuclear waste and decommissioning costs; offshore transition; smart metering; Renewable Heat Incentive; and housekeeping.

The Energy Bill of 2010/11, which has reached the report stage in the House of Lords is designed to provide for change in the provision of energy efficiency for homes and businesses, and make improvements to secure, low carbon energy supplies and fair competition in energy markets. The Bill also relates to energy companies promoting low carbon emissions and reduced home-heating costs.

In 2009, the Government’s Chief Scientific Adviser, Sir John Beddington, asked the Committee on Climate Change to “review the adequacy of the UK’s research and innovation arrangements for delivering technologies required to meet the UK’s climate change objectives”. The Committee’s report, ‘Building a Low Carbon Economy – the UK’s Innovation Challenge,’ built on previous analysis of technologies required to meet the 2050 target to reduce emissions by 80% relative to 1990 levels. The Committee assessed current technology challenges and UK capabilities to support technology development, and recommended priorities for Government support. The report recommended that the Government should develop a long-term strategy for the UK economy in line with the 2050 emissions target in the Climate Change Act based on three key actions:

Develop and deploy offshore wind, marine, carbon capture and storage for power generation, aviation technologies, and electric vehicle technologies
Deploy nuclear power, advanced insulation materials, heat pumps and CCS for energy intensive industries
Research and develop hydrogen fuel cell vehicles, technologies in agriculture and industry, third generation solar PV technologies, energy storage and advanced biofuels technologies.

The East Midlands

The East Midlands is a diverse region. The third largest region in England, it is made up of six counties; Derbyshire, Leicestershire, Lincolnshire, Rutland, Nottinghamshire and Northamptonshire. It has a population of 4.28 million and is spread over an area of 15,008 kilometres.

East Midlands Development Agency research shows that, "Employment (in the region) in upper tier occupations is significantly lower than national average, whilst in lower tier occupations (limited skills levels) is higher than average". This may indicate the reason lower employer demand for skills in the East Midlands exists.

The Integrated Regional Strategy (East Midlands Regional Assembly) has four main themes around which it set objectives- sustainable development; environment; economic and spatial. The environment objectives determine the region's commitment to manage, enhance and conserve energy and the environment.

The National Employer Skills Survey for England 2009 (NESS09) published in August 2010 by the UK Commission for Employment and Skills (UKCES) provides details of the skills situation in England based on responses from over 79,000 employers. The data shows that the recruitment of young, new labour market entrants straight from education increases with the size of the organisation. Organisations with 100 or more staff were more likely to recruit graduates from HE than school or college leavers aged 16 to 18. Organisations with between 25 and 99 employees were equally likely to have recruited graduates from HE and 17 to 18 year-olds; whilst organisations with fewer than 25 employees were more likely to have recruited 17 or 18-year-olds than 16 year olds or recent graduates.

In the survey, employers were asked which skills they found difficult to obtain (where there were skill-shortage vacancies). Results show that three in five (62%) of all skill shortage vacancies were technical, practical and job-specific skills. The results of the survey also show that employers often use training as a means to compensate for vacancies which are hard to fill. 9% of organisations increased training for existing staff, 7% increased spending on trainee programmes. On questions relating to skills gaps, results show that there is a particular concentration in skilled trade occupations in the agricultural, mining and quarrying and construction sectors.

Employers in the agricultural and construction sectors had a concentration of skills gaps in elementary occupations. The research found that skills gaps vary in cause and type by occupation. The most common cause of skills gaps for all occupational groups is a lack of recent recruitment. For staff at managerial level, the second most common cause of skills gaps is the organisation's failure to ensure training. Other skills gaps were the result of inability to keep up with change and up-skill the workforce. Approximately half the employers surveyed felt there was a need to up-skill the workforce to keep pace with new legislative or regulatory requirements; the development of new products and services or the introduction of new technologies/ equipment, or new working practices. Around a third also felt that the need to up-skill was a result of competitive pressure. Legislation was the most commonly reported incentive for up-skilling by most employers, except in the very largest organisations with 500 or more staff, where the introduction of new working practices was mentioned more often.

Interestingly, employers in the primary, manufacturing, construction, retail and transport sectors were less likely to expect the need to up-skill staff during the 2009-10 period. In construction, electricity, gas and water supply, agriculture and manufacturing, employers thought skilled trades were second most likely (after managers) to need up-skilling.

The NESS09 discovered that employers in the East Midlands were least likely to have formal business planning and staff development and training in place. 35% did not have a business plan, training plan or budget. Nationally, 2.8 million employees had received training in the previous 12 months and 24% of all trainees had been trained towards a nationally recognised qualification. A third of all employers were training at least one member of staff towards a recognised qualification or had done so in the previous 12 months.

In the section on Apprenticeships, the research showed there was good awareness of government-funded Apprenticeships (over 90% of employers had heard of them) but awareness of the different levels/types of

Apprenticeship (Advanced, Higher and Adult) was much lower. An awareness of all types of Apprenticeship was strongly linked to the size of the organisation.

NESS09 results show that 8% of organisations offered Apprenticeships, but only 4% had staff undertaking an Apprenticeship at the time. Interestingly, larger employers were more likely to offer Apprenticeships, but Apprentices made up a higher proportion of the workforce of smaller companies. As a result, perhaps, of traditional views and practices, it seems Apprenticeships are more likely to be offered to those aged under 25 than those 25 or over, and to new recruits rather than existing staff. 30% of larger organisations (500+ staff), offered Apprenticeships and 22% employed at least one. In smaller organisations (fewer than 5 staff) 5% offered Apprenticeships and 2% employed them.

Employers in the construction, electricity, gas and water sectors were the most likely to have staff undertaking Apprenticeships. Of employers represented by Summitskills, 26% offered Apprenticeships and 18% had Apprentices; for IMI (automotive) the figures were 20% and 12% respectively; for SEMTA, 14% and 8% and for Constructionskills, 10% and 5% respectively. SSC sectors least likely to offer or have Apprentices were more likely to be in service professions. Apprentices were more concentrated in organisations in the Summitskills sector, with 52.5 Apprentices per 1,000 employees, followed by IMI (19.9 per 1,000), SEMTA (12.1) and Constructionskills (11.5). Interestingly, Summitskills and Constructionskills sector employers employed 10% (each) of all Apprentices in England; and Constructionskills employers employ 5% of the total workforce nationally.

Developing Skills and Qualifications

The Climate Change Act requires businesses and properties to reduce their carbon emissions over 3 yearly periods by 26-32% from 2009 to 2020; reducing energy use and costs. Decarbonising industry and services will require building on existing STEM-based skill sets (science, technology, engineering and maths) and, when new skills are needed, developing new qualifications. Schools, colleges, universities, businesses and sector bodies need to respond to demands speedily and flexibly. There will be an ever increasing demand for Apprentices with appropriate skills, particularly at skilled technician and intermediate professional level (3 and 4). The government plans to deliver an additional 35,000 advanced and higher Apprenticeships to young adults aged 19 to 30 (over two years) from September 2010; including co-funding the delivery of 1,000 Apprenticeships a year to support decommissioning and new-build in the nuclear energy sector, and 2,500 Apprenticeships in the wind energy sector. The National Apprenticeship Service (NAS) has identified the renewable energy sector as one of its priorities for Apprenticeship development.

The Confederation of British Industry 2009 Employer Survey identified a shortage of STEM graduates, a shortage of STEM skills at all levels within the workforce and a lack of STEM technicians and graduates in the energy sector. Similarly, the Department for Innovation, Universities and Skills (DIUS) 2009 mentions shortages of marine engineers, mechanical and electrical engineers in its STEM survey. The National Skills Academy Power, in the 2009 'Mapping Renewables Skills' report, concluded that an ageing workforce and deficiencies in STEM skills will affect the renewables/low carbon sector now and in the future; particularly as the sector grows and expands.

In some low carbon sectors, a lack of trainers with specialist skills or a lack of specialist equipment could potentially cause quality issues with the standard of training available. Many technicians are trained by the manufacturers of equipment, as the manufacturer has the most to gain from investing in the facilities to deliver the training. This very specific training is potentially limiting and non-transferable and does not encompass or grow the skills in system design; skills which are equally vital to a low carbon economy.

Broader and more generic training is generally the province of learning providers, but centres may be reluctant to invest in course materials, resources and facilities, as initial outlay may be costly and cohorts of learners small. The lack of equipment and trained teachers could potentially result in inferior quality training.

Dwindling resources have brought about the need for change, and to educate and train the workforce to adapt and comply is essential to the global economy. Learning providers are responsible for training the current and future workforce to design, install, maintain and work in a low carbon economy and training programmes and resources must be fit for purpose. When estimates indicate that solar photovoltaic

electricity will deliver environmentally friendly electricity to over one billion people and make environmental savings of 900 million tonnes of carbon dioxide by 2020; the need to train and equip the workforce is paramount.

However, there are skill shortages in many areas of the economy, not necessarily a result of lack of demand. As Alison Wolf describes in the Wolf Report; “English education is not generating enough people with quantitative skills at various levels.”

The report noted that in the past few years, “....there has been a 20% decline in the number of places (in construction) for young people in colleges, although student demand for places is increasing. In some parts of the country, there is an acute shortage of Apprenticeship places. British construction companies meanwhile employ large numbers of skilled immigrants who have trained under different systems.”

The Role of Sector Skills Councils

Sector Skills Councils develop National Occupational Standards that clearly set out the competences required by trades and professions. Sector Skills Councils work with Awarding Organisations, certification bodies and training providers to develop qualifications for existing workers and Apprentices and to develop short awareness courses for employers.

By actively engaging with employers, training providers and government to identify future training needs, Sector Skills Councils will play a key role in developing National Occupational Standards and qualifications which embrace the Low Carbon agenda; as they have a responsibility for ensuring the training infrastructure helps employers develop a workforce able to contend with sustainability and low carbon.

Summitskills, the Sector Skills Council for building services engineering, has identified the need for skilled personnel to respond to government incentives such as Feed-in Tariffs (2010) and the Renewable Heat Incentive (Spring 2011); and to changes in building regulations and zero carbon targets for new homes. As a Sector Skills Council, they have a wide-ranging remit for low carbon which includes the specification, design, installation, commissioning, repair and maintenance of environmental technology systems. These environmental technologies include bio-fuels; combined heat and power; heat pumps; mechanical heat recovery ventilation; micro hydro generation systems; micro wind energy; solar photovoltaics; solar water heating and water harvesting and recycling.

Summitskills recognises that most environmental technologies build on existing skills sets and jobs by up-skilling the workforce. Summitskills are aware that up-skilling the workforce to encompass environmental technologies will provide businesses with a significant advantage over competitors; and at present, there are insufficient businesses to meet demand. The lack of appropriate skills may result in the ‘buying-in’ of overseas expertise.

Constructionskills, the Sector Skills Council and Industry Training Board for the construction industry, has a major role in ensuring the sector is able to deliver a low carbon future; as 47% of the UK’s carbon emissions are created from the energy used in construction and the built environment. Current legislation dictates that all new homes are to be zero-carbon by 2016; all new buildings are to be zero-carbon by 2019; and 7 million homes will have retro-fit ‘makeovers’ by 2020.

The specialist and technical skills needed in the construction and built environment sector require training and qualification development to include low carbon for new builds and for refurbishment. Constructionskills are working with other Sector Skills Councils in the industry (the Built Environment Skills Alliance) to meet these requirements.

Energy and Utility Skills (EU Skills) the Sector Skills Council for gas, power, waste management and water industries, recognises that low carbon technologies are extensions to existing industries and activities, rather than new industries, and that the up-skilling of core skills will meet requirements. EU Skills has identified that up-skilling the current workforce and re-skilling (eg redundant workers) are critical to delivery. The expectation is that there will be a low number of direct ‘low carbon’ jobs in most sectors, but there is potential for significant growth in specific sectors such as offshore wind energy; marine (wave and tidal) energy and carbon capture and storage.

Asset Skills, the Sector Skills Council for facilities management, housing, property and planning, has developed low carbon skills training in commercial and domestic property, aimed at facilities managers, property and energy managers, energy assessors and suppliers. As building regulations are geared to improving the energy efficiency on new buildings, the sector's workforce needs to know and understand how to maintain and manage them to meet the low carbon agenda. Asset Skills is developing qualifications (up to level 4) and short CPD courses to train sector staff in energy advice and efficiency, carbon reduction and renewable technologies.

LANTRA, the Sector Skills Council for Environmental and Land-based Industries, has assessed skills needs to help achieve a low carbon economy and recognises that land-based industries can change skills and practices to manage resources, benefitting their businesses and climate change.

SEMTA, the Sector Skills Council for Science, Engineering and Manufacturing Technologies, works with employers to determine current and future skills needs and provide short and long term skills solutions. SEMTA identifies change needed in education and skills policy and practice to increase productivity. SEMTA represents aerospace; automotive; bioscience; electrical; electronics; maintenance; marine; mathematics; mechanical; metals and engineered metal products; and supports low carbon and composites skills.

In response to the consultation, "Meeting the Low Carbon Skills Challenge" (June 2010), SEMTA stressed the importance of making public funding available for re-skilling, including second qualifications at levels 3 and 4 in key low carbon technical areas; and expressed the hope that the Qualifications and Credit Framework would provide unit funding for qualifications and units related to generic low carbon skills; so individuals can top up their existing skills.

"The Low Carbon Cluster Sector Skills Assessment Report" was produced in 2009 in response to the government's low carbon agenda and commitments. The cluster comprises 11 Sector Skills Councils and 1 Industry Training Board: The report focuses on the following:

- Decarbonising the power industry
- Large-scale renewable power generation
- Development of new nuclear energy capacity
- Energy from waste
- Carbon capture and retrofitting carbon capture
- Decarbonising industry
- Improved energy efficiency
- Reduced emissions and wastage
- Alternative fuels (hydrogen, biofuels, etc)
- Low carbon processing
- Land management and the natural environment
- Decarbonising the transport sector
- Low carbon engines and vehicles
- Fuel efficiency
- Air traffic management
- Hybrid vehicles
- Modal shift
- Decarbonising buildings
- Retrofitting existing buildings (energy efficiency)
- Zero-carbon homes (new build)
- Retrofitting commercial buildings (energy efficiency)
- Micro-renewables.

The report made a number of valuable recommendations, which are far-reaching and beyond the scope of Sector Skills Councils and sector employers alone. Some of the recommendations suggest a sea-change in the perceptions of young people at a very early age and throughout school life; specifically, changing young people's perceptions of low carbon industries, addressing the lack of diversity in the current workforce, and increasing the number of women in the sector. The report suggests pre-school intervention is crucial to creating positive attitudes towards STEM subjects and that there is a collective responsibility for engendering enthusiasm from government, employers, institutions, policy-makers, funders and other stakeholders.

Apprenticeships

Apprenticeships are a structured programme consisting of an appropriate work-based qualification such as a National Vocational Qualification (NVQ) at Level 2, Level 3 or Level 4; a technical qualification relevant to the specific Apprenticeship; Key Skills or Functional Skills; and other qualifications or requirements relevant to the occupation and specified by the sector, such as Health & Safety or working practices. Apprentices are employed and training takes place in the workplace (“on-the-job”). Off-the-job training may be day release, or a number of days in a block at a local college or specialist training provider, or a site visit from a trainer in a dedicated training room. There are over 200 types of Apprenticeships across many sectors; currently 85,000 employers offer Apprenticeships. There are three levels of Apprenticeship for young people (over 16) and adults:

Intermediate Apprenticeships (level 2)

Advanced Apprenticeships (level 3)

Higher Apprenticeships (level 4).

The National Apprenticeship Service contributes to the cost of training for all Apprenticeships. The size of the contribution for training varies depending on the sector and age of the candidate. For 16-18 year olds, the contribution is 100% of training; for 19-24 year olds, it is up to 50%; and for those aged 25 plus, a contribution towards the cost of training is made depending on the sector. Many employers still perceive the cost as prohibitive and perceive lack of time and/or money as a barrier to training employees. During times of recession and economic uncertainty, training of any kind, including Apprenticeships, becomes a low priority. It is widely recognised that this is a short term view, as the stagnation of skills development is detrimental to an organisation’s competitiveness.

Statistical First Release Data from the Data Service (Department for Business, Innovation & Skills, 27 January 2011) provides information on Apprenticeship starts and achievement in the UK. The volume of Apprenticeship starts (UK) in 2009/10 was 279,700, an increase of 16.6% compared to 2008/9.

In 2009/10 there were:

190,500 level 2 Apprenticeship starts (20.2% increase on previous year)

87,700 level 3 Advanced Apprenticeship starts (7.9% increase on previous year)

1,500 Higher Level Apprenticeships (level 4+).

Learners under 19 years of age started 116,800 Apprenticeship frameworks (17.5% increase).

19-24 years started 113,800 Apprenticeship frameworks (34.3% increase).

25 + years started 49,100 Apprenticeship frameworks (12.1% fall).

The volume of Apprenticeship framework achievements in 2009/10 was 171,500, an increase of 19.6% on 2008/9.

In 2009/10 there were:

111,900 level 2 Apprenticeship framework achievements (14% increase on previous year)

59,400 Advanced Apprenticeship framework achievements (31.4% increase)

200 Higher Level Apprenticeship framework achievements.

Learners under 19 achieved 73,100 Apprenticeship frameworks (7.9% increase).

19-24 years achieved 64,200 Apprenticeship frameworks (10.9% increase).

25 + years achieved 34,300 Apprenticeship frameworks (almost double 2008/9).

An Intermediate Apprentice is likely to earn £65,000 more over a lifetime than someone taking the NVQ route; and an Advanced Apprentice is likely to earn £105,000 more over a lifetime than a level 3 NVQ trained person.

In the East Midlands, Apprenticeships (16-18, 19-24 and 25+) by Residency and Contractor are not growing at the national rate. In Nottingham City and Nottinghamshire, Apprenticeships have declined and numbers are lower than the rest of the East Midlands. This is particularly worrying as the region lags behind England

as a whole. Currently, there are 1000 Apprenticeship vacancies in the East Midlands. The government is committed to Apprenticeships for employed people, and Programme Led Apprenticeships are to be phased out. Interestingly, the East Midlands has the second highest level of Programme Led Apprenticeships.

The government of Scotland recently announced (February 2011) an investment of £1 million on 500 Apprenticeships in the country's low carbon and energy industries. However, there is still a long way to go to meet an earlier target of the creation of 25,000 modern Apprenticeships in the sector in 2011/12. Scotland's major power company, Scottish and Southern Energy, recruits around 100 Apprentices every year. In 2010, the UK's first Apprenticeship for wind turbine technicians was launched in Scotland, alongside the Low Carbon Skills Fund, designed to help up-skill the workforce in the sector.

At present, some technical certificates at level 2 and 3 have not been replaced on the QCF for non-employed learners, for example, plumbing and electro-technical; however replacements will exist for employed learners. As the qualifications have not been approved by the Sector Skills Council (Summitskills) they cannot be accredited by Ofqual; as Ofqual require QCF compliance/SSC approval. Many employers have taken on young people on completion of a full-time college course in the past, but a lack of programme-led Apprenticeships could potentially diminish the pool of skills.

An increase in adult Apprenticeships (employers using the Apprenticeship route for existing employees) has resulted in a decrease in the number of 16-18 year olds starting Apprenticeships. This problem may be further exacerbated by the raising of the participation age, as more young people enter the training market but do not have the skills or experience to secure employment.

Barriers to Apprenticeships

The adult employment rate in the East Midlands is 73.3%, higher than the national rate of 72%. Unemployment amongst those aged 16 or more is 7.3% in the East Midlands, 8% nationally. The East Midlands is a region made up of approximately 95% small to medium enterprises (SMEs) and 86% of SMEs in the East Midlands employ fewer than 10 people. SMEs tend to rely on 'just in time' training with a direct relevance to the business, prefer 'bite-sized chunks' rather than protracted programmes and prefer employees to stay on-site for training so less work time is lost. SME owner/managers tend to be time poor and focus on the operational concerns of the business rather than the training of staff members; and micro-businesses are less likely to identify training or succession planning as essential to the business.

Whilst it is easy to understand the reservations of small businesses, it does not explain the lower number of Apprenticeships in the East Midlands, when succession planning and injecting new skills into the workforce are essential to the continuous cycle of delivering services. Interestingly however, the National Apprenticeship Service has noted that most enquiries concerning Apprentices come from micro-businesses (10 people or less) and that there is more work to be done with larger organisations.

National Skills Academies

National Skills Academies deliver specialised skills training to employees and learners to help them respond to business needs. They are created, with employers from specific sectors, to improve competitiveness in key areas of the economy. National Skills Academies work with Sector Skills Councils and other industry representatives and bodies to effect change, achieve the priorities employers have identified, ensure training and qualifications are relevant to the industry sector, and quality assure training provision. National Academies also help to identify qualifications and skills needed in the future and seek to fill training gaps and skill shortages. National Academies in different sectors have different configurations, they could be permanent training centres in a fixed location; or operate from a college or training provider; or be based in a workplace training centre; or deliver training and services online. Programmes and training are suitable for existing employees and potential recruits.

There are currently 18 National Skills Academies, 16 of which are currently operating in the following sectors:

Manufacturing
Construction
Financial Services
Food and Drink Manufacturing
Nuclear
Process Industries
Hospitality
Creative and Cultural
Sports and Active Leisure
Retail
Enterprise
Social Care
Materials, Production and Supply
Information Technology
Power
Railway Engineering.

The National Skills Academy for Power promotes careers in the power industry; maintains a network of skills providers; provides training materials and resources for schools and colleges; is a vehicle for sharing best practice; and boosts education and training provision in the power sector. The Skills Academy has a national hub, which works with regional training providers; each regional training group includes power sector companies' internal training provision and private, further and higher education providers.

The National Skills Academy for Construction (led by ConstructionSkills) is a demand-led training model. The client and contractor determine the required skills and training is practical and takes place within a live project. The National Skills Academy for Logistics is in the planning stage. On 4 February 2011, the Skills Minister John Hayes announced a new National Skills Academy for Environmental Technologies.

The new National Skills Academy for Environmental Technologies will aim to deliver 2000 publicly-funded and over 200,000 privately funded training courses in the first 5 years. It will receive £2.5 million of funding over three years (matched by employers), working with employers and training providers to create a skilled workforce in low carbon and renewable energy. The Academy will be a network of 14 hubs across England, based in Further Education Colleges, along with over 80 accredited training providers.

The initial accredited Skills Academy hubs are:-

Bedford College (EofE)
Blackburn College (NW)
Bradford College (Y&H)
College of North West London (Lond)

Cornwall College (SW)
Dudley College (WM)
Hartlepool College (NE)
Leeds College of Building (Y&H)
Liverpool Community College (NW)
Stephenson College (EM)
Stourbridge College (WM)
Genesis Project (Somerset College, SW)
Trafford College (NW)
Weston College (SW).

The lead 'hub' in the East Midlands is Stephenson College and there are eight colleges in the region acting as 'spokes':

Chesterfield College
Lincoln College
Grantham College
Moulton College
South Leicestershire College
Leicester College
Derby College
Northampton College.

In the East Midlands, five core courses are planned for development; in Awareness, Solar, Photovoltaics, Heat Pumps and Water Harvesting.

Apprenticeships and Low Carbon

The network of providers (with a central administration and co-ordinating function based in Milton Keynes) will provide training in the design, installation and maintenance of technologies such as solar thermal, photovoltaics, heat pumps, water harvesting and recycling. Summitskills, the Sector Skills Council for building services engineering, will approve the accredited training to ensure the sector has the right skills to meet government carbon reduction targets and face the challenges of the low carbon economy.

In 2008, the Department for Environment, Food and Rural Affairs (Defra), working with the Department for Innovation, Universities and Skills (DIUS) and the Department for Business, Enterprise and Regulatory Reform (BERR), commissioned research to review the understanding and current skills requirements for a low carbon and resource efficient economy. The resulting 92 page document produced by ProEnviro, entitled 'Skills for a Low Carbon and Resource Efficient Economy', shows demand for qualified staff in low-carbon industries such as renewables, nuclear, green building and transport. The report suggests that the skills needed to achieve and maintain a successful low carbon and resource efficient economy are drawn

from a wide range of subject areas; categorised as:

Design
Waste
Energy
Water
Buildings
Transport
Materials
Financial
Management
Policy and Planning.

Some of the skills required to support a low carbon economy are new, some are more established; such as science, technology, engineering and mathematics skills (STEM); and others are generic and multi-sector skills. The report concluded that existing skills need to be increased, applied in new situations or adapted with further training. The report's research also found that employers do not articulate demand for low carbon and resource efficient economy skills, possibly because there is a lack of understanding of the skills required to implement change and the benefits of integrating low carbon/resource efficient skills into a business. Consequently, it is difficult for learning providers on the supply side of skills training to anticipate and prepare for future demand.

In some instances, organisations recognise the need for 'low carbonising' Apprenticeships and put forward arguments for the development of specific frameworks. The National Association of Professional Inspectors and Testers (NAPIT) is pressing for a bespoke Apprenticeship framework in micro-generation; but support from the various bodies involved is limited, citing the flexibility of existing frameworks to cover the skills required.

The skills delivery system in vocational subjects, and funding, tends to be more focused on lower level skills, when in fact, the new agenda requires more intermediate technical and professional skills (levels 3 to 5). As 70% of the workforce of 2020 is already in the workforce, the integration of skills for a low carbon economy should be threaded through internal and external company training schemes; and assimilated into QCF qualifications and National Occupational Standards. Sector Skills Councils are in a position to influence the low carbon agenda and raise awareness at employer level.

At present, some technical certificates at level 2 and 3 have not been replaced on the QCF for non-employed learners, for example, plumbing and electro-technical; however replacements exist for employed learners. Colleges in the process of recruiting for September 2011 are seeking clarification regarding provision to full-time learners to replace NQF programmes run by City & Guilds and EAL. The Association of Colleges is putting the case for a continuation of full-time qualifications' options (at levels 2 and 3) and has submitted a proposal to the SFA to address the issue.

East Midlands' Colleges and Apprenticeships

In 2009, the East Midlands NTI Construction Network was one of 5 successful bids for funding from the Department of Innovation Universities and Skills (DIUS) Further Education Specialisation and Innovation Pathfinder Fund, delivered via the LSC. The funding was used to provide a local source of specialist knowledge for businesses. Each project member employed a specialist advisor to research innovative components, raise awareness and offer advice to design and construction companies in order to improve energy efficiency and reduce carbon emissions.

Project members were:

Chesterfield College (water management, rainwater harvesting, greywater recycling, water saving appliances)
West Nottinghamshire College (renewables, electricity and energy, energy efficient building products)
Derby College (modern methods of construction, off-site manufacturing)
Lincoln College (thermal mass in buildings)
Leicester College (weather compensating controls, dual fuel systems)
Stephenson College (renewable energy, solar, biomass, mini/micro combined heat and power).

Despite the fact that many frameworks could be 'low carbonised', not all FE Colleges in the East Midlands have the equipment or staff expertise to deliver the technical input and employers may find it difficult to source a local provider. Many colleges do not have the financial resources to invest in technology or staffing to deliver the programmes, because the market is considered to be too small or too specialist. In instances where technology is too expensive, or there is a lack of critical mass in terms of attracting cohorts, investment in low carbon technologies is not a priority. Whilst colleges are willing to adapt existing programmes and offer specialised short training courses, the offer may be narrowed by a lack of regional demand, geographical limitations and cost. Highly specialised programmes may require specialised provision which colleges cannot offer.

Moulton College

Moulton College's plumbing Apprentices and Advanced Apprentices have access to and awareness training on rain/grey water harvesting, solar domestic (flat plate and tubular collectors) and newly installed heat pump training rigs. Bricklaying, carpentry and stonemasonry Apprentices also receive basic awareness tuition regarding these new technologies.

The Rainwater Harvesting and Solar Domestic training rigs and real installations were partly funded by emda in the 2008 investment scheme.

It appears that a lack of SME employer awareness/engagement in renewable technologies is proving problematic in promoting low carbon initiatives. However, it is obvious to staff at Moulton College that when students are exposed to new technologies and have hands on experience of working with the equipment, they are enthusiastically engaged and genuinely interested. The college hopes this passion for renewable technologies will be transferred to their colleagues in the workplace and the existing workforce to ignite an interest in awareness and training for the low carbon agenda.

Grantham College

Grantham College officially opened their Renewable Energy Centre earlier this year. The college has recognised the significance of developing training relevant to the low carbon sector. As such the Renewable Energy Centre will serve as a purpose built venue and training centre for taster courses, full-cost training, full-time courses and Apprenticeship programmes. The centre will be utilised for supporting the delivery of the new plumbing Apprenticeship frameworks and the renewable/low carbon elements.

In the Automotive Centre, a Hybrid car was purchased from Honda and has been used to deliver general knowledge about hybrid/low carbon technology to apprentices and young Apprentices.

Renewable Energy Centre Opens (cutting) 18/1/11

Guests included colleagues from East Midlands Colleges including Boston, Derby, Lincoln, Nottingham Trent and New College Nottingham as well as representatives from businesses that provided equipment for the centre including British Eco and ITHO and also a number of representatives from SKDC, Lincolnshire County Council and a number of local employers based in the area.



The centre was originally mews accommodation for students and has been worked on since 2009 after £15,000 of funding was secured from East Midlands Development Agency (emda).

In total £40,000 of funding has been successfully bid for, which has seen equipment including under floor heating, airsource and groundsource heating, photovoltaic, solar heating, heat recovery and rainwater harvesting systems purchased and installed in the centre.

The centre will be a fully functional Renewable Energy Centre which will provide employers,

College students and the community with hands-on experience of the new environmental technologies and access to short courses and training in these areas.

Steve Shepherd, Head of Construction, said "It was a very successful launch which was well attended by a good range of different organisations. Everyone gave positive feedback about the centre and I am very pleased with what we have achieved with the opening of the centre. We now have a valuable asset to deliver environmental technologies training to the people of Grantham and the surrounding area."

The Head of Engineering at Grantham College, added, "It might prove difficult to adapt Apprenticeships to include low carbon skills as the technology is not yet mass produced and is also still in the development stage. It could be several years before the technology defines itself."

New College Stamford

At New College Stamford, staff members are currently undertaking external CPD sessions so low carbon elements can be integrated into the learners' qualifications, as the new Electrical 2357 and Plumbing 6189 programmes have elements of low carbon technology within them. The college is currently investigating the possibility of running motor vehicle hybrid fuelled vehicles' programmes in 2012, but there are major costs involved.

The college has approached a number of major construction companies to explore the possibility of sponsorship, but it has become increasingly difficult to get them on board. A number of part-time courses, including installing photovoltaic/solar panels and carbon management, are currently advertised by the college, but local response is poor, possibly due to the current economic climate and/or changes in feed-in tariffs. In order to increase engagement with low carbon training, colleges need more access to grant funding.

Boston College

Boston has introduced minor aspects of low carbon identified within Apprenticeship frameworks. New frameworks are including units associated with low carbon, currently evident within the proposed electro-technical framework and the plumbing framework. The college has not been in receipt of emda funding relating to low carbon resources.

As many providers have found, frameworks are challenging to deliver. The focus is determined by the Awarding Body's requirements and the Awarding Body is guided by the relevant Sector Skills Council. Until very recently, there was little evidence of SSC engagement in low carbon across trade areas. However, the college is determined to engage with the changing focus in new frameworks which include low carbon.

Chesterfield College

Chesterfield College has not specifically introduced low carbon technology into Apprenticeship programmes; although they are heavily involved in water management via the NTI Pathfinder project. Staff members at the college think there may be difficulties in adapting Apprenticeships to include low carbon skills, as the time frame to complete specific units makes adding additional elements difficult. Colleges also need to ensure employer advisors have an up-to-date knowledge of low carbon units and elements to be able to advise employers of options and career paths.

Chesterfield College has made full use of the equipment purchased through the Pathfinder project. The college is now registered to deliver rainwater harvesting courses (BPEC) and is currently working with the

Eco Centre at Wirksworth to deliver rainwater courses at both venues. The equipment will also be used for a three-day 'green' festival (Peak Climate Change) at Cromford Mill in April/May 2011.

South Leicestershire College

South Leicestershire College have not yet begun to 'low carbonise' existing programmes, but plans are in place to use installed equipment from the emda scheme in September 2011. It has been difficult to adapt Apprenticeships to include low carbon skills as providers are waiting for Sector Skills Councils and Awarding Bodies to finalise the development of programmes based on National Occupational Standards. Despite the fact that more units are coming on stream through the QCF, it will take time for complete programmes to be fully developed.

The National Apprenticeship Service is considering the introduction of a hybrid Apprenticeship based on Low Carbon Energy technologies. There is a possibility that a lack of skills and knowledge gleaned from a specific Apprenticeship (for example plumbing or electrical installation) could expose the learner to danger. College staff hope there will be a requirement to have a wider knowledge pertaining to Water Byelaws etc; or Certification and Testing of Electrical Installations, to ensure the installations conform to requirements. If qualifications are too narrow, this may not happen.

Loughborough College

Loughborough College has recently invested in vehicles and technology to delivery hybrid vehicle training. This is not a feature of the current L2 provision but will be a feature of the L3 provision from 2011-12 onwards.

As many college providers have found, it is often difficult to include low carbon skills in Apprenticeship programmes as it is a question of cost and economy of scale. Examples of low carbon equipment are generally costly for providers to purchase and, as yet, low carbon represents only a small percentage of the curriculum.

Lincoln College

Lincoln College is a hub partner of the East Midlands National Skills Academy for Environmental Technologies. The college purchased solar panel, hydrogen fuel and wind turbine technology kits from emda funding; and has introduced hydrogen fuel cell vehicles, solar panel and wind turbine technology to all Apprenticeship programmes within Construction and Engineering. Solar thermal is now an integral part of the plumbing Apprenticeship programmes along with Environmental Technology awareness.

The college now has the capital equipment to both train and demonstrate new technologies in the sector; but at the moment there is little or no interest from employers. Only a minority of employers are taking up training in the low carbon economy, but this tends to be training for specific suppliers of equipment rather than Apprenticeships. The problem currently lies in a lack of suitable frameworks in the low carbon sector. New Building Services frameworks are being introduced later this year which will include pathways for Environmental Technologies. Hopefully this will increase the opportunity for Apprentices to train in these fields.

Member colleges working in the 'hub and spoke' model of the National Skills Academy will also stimulate demand for low carbon training among employers. The Academy will also improve integrated partnership working amongst providers in the East Midlands which in turn will increase the ability to deliver training and advice on new technologies.

Stephenson College

Low carbon technologies have not been applied to any Apprenticeship programme associated with building services; and despite publicity, QCF units are still to be finalised. Stephenson has all the current range of renewable energy equipment for the building services sector and it is used for the enrichment of all building services' learners in the college. The emda funded kit includes Commercial Solar Thermal, Woody Biomass and Combined Heat and Power equipment.

New College Nottingham

New College Nottingham is investing heavily in its facilities to enable the college to offer training programmes and include elements and equipment in Apprenticeship frameworks in 2011-12. The equipment/facilities include Air Source Heat Pumps and Biomass. The Biomass course is for wood fuelled biomass boilers and stove heating; and the content of the programme includes an introduction to woody biomass heating and its context within the renewable energy centre - system costs, funding and government policy - Fuel Characteristics, Supply etc. Other low carbon courses on offer include Heat Pumps (Ground and Air Source); Disinfection of Stored Water Systems; Photovoltaic Awareness; Rain and Grey Water Harvesting; Renewables Awareness; Solar-Domestic Hot Water; and Underfloor Heating Design.

Apprenticeship Frameworks at FE Colleges in the East Midlands

COLLEGE	APPRENTICESHIP	LEVEL 2	LEVEL 3	LEVEL 4
North Nottinghamshire College	Electro technical	✓	✓	✓
	Plumbing	✓	✓	
	Bricklaying	✓	✓	
	Carpentry	✓	✓	
	Engineering	✓	✓	
	ICT User	✓	✓	
	Vehicle Maintenance and Repair	✓	✓	✓
Northampton College	Electrotechnical	✓	✓	
	Mechanical Performing Engineering Operations	✓		
	Mechanical Tech Cert		✓	
	Motor Vehicle	✓	✓	
West Nottinghamshire College	Painting and decorating	✓	✓	✓
	Brickwork	✓	✓	✓
	Bench Joinery	✓	✓	✓

	Site Carpentry	LEVEL 2 ✓	LEVEL 3 ✓	LEVEL 4 ✓
	Electrical Installations	✓	✓	✓
	Electrotechnical Technology	✓	✓	
	Engineering	✓	✓	✓
	Engineering Technology	✓		
	Industrial Applications	✓		
	Motor Vehicle Maintenance (Light & Heavy Vehicle)	✓	✓	
	Basic Plumbing Skills	✓		
	Mechanical Engineering Studies Plumbing		✓	
	Traffic Officer	✓	✓	
	Warehousing	✓	✓	
	Driving Goods Vehicles	✓	✓	
	Carry & Deliver Goods	✓	✓	
Moulton College	Carpentry	✓	✓	
	Joinery	✓	✓	
	Brickwork	✓	✓	
	Wall & Floor Tiling	✓	✓	
	Stonemason	✓	✓	
Derby College	Construction	✓	✓	
	Electricity Industry	✓	✓	

		LEVEL 2	LEVEL 3	LEVEL 4
	Electro technical	✓	✓	
	Mechanical Engineering	✓	✓	
	Fabrication & Welding	✓	✓	
	Glass Industry Occupations	✓	✓	
	Motor Vehicle	✓	✓	
	Plumbing	✓	✓	
Chesterfield College	Trowel Occupations	✓	✓	
	Wood Occupations	✓	✓	
	Maintenance Operations	✓		
	Painting & Decorating	✓	✓	
	Electrical Installations	✓	✓	
	Electrical Engineering	✓	✓	
	Mechanical Engineering	✓	✓	
	Fabrication & Welding	✓	✓	
	ICT Professional	✓		
	Auto Vehicle Maintenance & Repair	✓	✓	
	Vehicle Body Spray & Paint	✓	✓	
	Mechanical Engineering Services Plumbing	✓	✓	
	Retail	✓		
	Warehouse & Storage	✓		

		LEVEL 2	LEVEL 3	LEVEL 4
	Logistics Operations		✓	
Boston College	Wood Occupations	✓	✓	
	Trowel Occupations	✓	✓	
	Building Maintenance Operations	✓	✓	
	Electro-technical		✓	
	Engineering	✓		
	ICT User	✓	✓	
	Light Vehicle Maintenance	✓	✓	
	Plumbing	✓	✓	
	Retail	✓	✓	
New College Stamford	Wood Occupations	✓	✓	
	Site Carpentry	✓	✓	
	Trowel Occupations	✓	✓	
	Bench Joinery	✓	✓	
	Vehicle Maintenance & Repair	✓	✓	
	Motor Cycle	✓	✓	
	Basic Plumbing Studies	✓		
	Mechanical Engineering Services Plumbing	✓		
Grantham College	Carpentry Site & Bench	✓	✓	
	Bricklaying	✓	✓	

		LEVEL 2	LEVEL 3	LEVEL 4
	Painting and Decorating	✓	✓	
	Plastering	✓	✓	
	Installing Electro-technical Systems & Equipment		✓	
	Operations & Maintenance Manufacturing	✓	✓	
	Electrical & Electronic Engineering	✓	✓	
	Light Vehicle Maintenance and Repair (including Motorcycle)	✓	✓	
	Maintenance Operations	✓		
	Plumbing	✓	✓	
South Leicestershire College	Electrical/Electronic Servicing	✓	✓	
	Engineering Maintenance	✓	✓	
	Fabrication and Welding	✓	✓	
	Mechanical Manufacturing Engineering	✓	✓	
	Installation and Commissioning	✓	✓	
	Technical Services	✓	✓	
	Industrial Applications	✓		
Loughborough College	Engineering	✓	✓	
	Vehicle Fitting (Retail Motor Industry)	✓	✓	
Lincoln College	Trowel Occupations (Bricklaying)	✓	✓	
	Trowel Occupations (Plastering)	✓	✓	
	Wood Occupations (Site)	✓	✓	

		LEVEL 2	LEVEL 3	LEVEL 4
	Wood Occupations (Bench)	✓	✓	
	Decorative Finishing and Industrial Painting	✓	✓	
	Electro-technical		✓	
	Engineering and Manufacturing Technologies	✓	✓	
	Mechanical Engineering Services (Plumbing)	✓	✓	
	Vehicle Body Paint	✓	✓	
	Vehicle Maintenance and Repair	✓	✓	
South Nottingham College	Mechanical Manufacturing Engineering	✓	✓	
	Engineering Maintenance and Installation	✓	✓	
	Fabrication and Welding Engineering	✓	✓	
	Marine Engineering	✓	✓	
	Aeronautical Engineering	✓	✓	
	Electrical and Electronics Engineering	✓	✓	
	ITQ	✓	✓	
	IT Practitioner	✓	✓	
	Customer Service	✓	✓	
	Retail Services	✓	✓	
	Security (CCTV, Retail Patrol Guard, Door Supervisor)	✓	✓	
	Light Vehicle Maintenance and Repair	✓	✓	
	Vehicle Paint and Body Repair	✓	✓	

		LEVEL 2	LEVEL 3	LEVEL 4
	Warehouse and Distribution	✓	✓	
	Environmental Services	✓	✓	
	Recycling	✓	✓	
Leicester College	Carpentry and Joinery (Site, bench and shopfitting)	✓	✓	
	Painting and Decorating	✓	✓	
	Plastering	✓		
	Brickwork	✓	✓	
	Building Services Engineering: Gas	✓		
	Electrical Installation		✓	
	Plumbing	✓	✓	
Brooksby Melton College	Business Improvement Techniques	✓		
	Motor Vehicle Maintenance and Repair	✓	✓	
New College Nottingham	Brickwork	✓	✓	
	Carpentry and Joinery	✓	✓	
	Construction	✓	✓	
	Maintenance Operations	✓	✓	
	Painting and Decorating	✓	✓	
	Plastering	✓	✓	
	Wall and Floor Tiling	✓	✓	
	Electrical	✓	✓	

		LEVEL 2	LEVEL 3	LEVEL 4
	Heating and Ventilation	✓	✓	
	Gas ACS Aligned	✓	✓	
	Plumbing	✓	✓	
Stephenson College	Constructing Contract Operations		✓	
	Trowel Occupations	✓	✓	
	Wood Occupations		✓	
	Decorative Occupations	✓		
	Fitted Interiors	✓		
	General Construction	✓		
	Maintenance Operations	✓		
	Electrotechnical		✓	
	Engineering Craft	✓	✓	
	Engineering Maintenance	✓	✓	
	Engineering Manufacture	✓	✓	
	Engineering Technical	✓	✓	
	Welding	✓		
	Plumbing	✓	✓	
	IT User	✓	✓	
	Motor Vehicle Maintenance and Repair	✓	✓	
	Motor Vehicle HGV	✓	✓	

	Motor Vehicle LGV	✓	✓	
	Motor Vehicle Parts	✓	✓	
	Warehousing and Storage	✓	✓	

Low Carbon Sector Apprenticeships in East Midlands FE Colleges

		FE College Offers																	
		BPO			BSE			Con			EI			ET			Eng		
College	Level	2	3	2	3	2	3	4	2	3	4	2	3	4	2	3	4		
Northampton																			
West Nottinghamshire																			
North Nottinghamshire																			
Moulton																			
Derby																			
Chesterfield																			
Boston																			
New College Stamford																			
Grantham																			
South Leicestershire																			
Loughborough																			
Lincoln																			
South Nottingham																			
Leicester																			
Brooksby Melton																			
Stephenson																			
New College Nottingham																			

KEY:

BPO: Building Products Occupations
 BSE: Building Services Engineering
 Con: Construction
 EI: Electricity Industry
 ET: Electro-technical
 Eng: Engineering
 EngT: Engineering Technology
 GIO: Glass Industry Occupations
 HVR: Heating, Venting & Refrigeration
 H: Housing
 IA: Industrial Applications

ICT: Information Communication Technology
 N: Nuclear Decommissioning
 PT: Passenger Transport
 P: Plumbing
 R: Retail
 SRM: Sustainable resource Management
 T & L: Transport & Logistics
 WM: Waste Management
 WI: Water Industry
 WTO: Wind Turbine Operations

		EngT		GIO		HVR		H		IA		ICT		MV		
College	Level	2	3	2	3	2	3	2	3	4	2	3	2	3	4	
Northampton																
West Nottinghamshire		EngT									IA					
North Nottinghamshire													ICT	ICT		
Moulton																
Derby				GIO	GIO											
Chesterfield													ICT			
Boston													ICT	ICT		
New College Stamford																
Grantham																
South Leicestershire											IA					
Loughborough																
Lincoln																
South Nottingham													ICT	ICT		
Leicester																
Brooksby Melton																
Stephenson													ICT	ICT		
New College Nottingham					HVR	HVR										

		PT		P		R		SRM		T&L		WM		W		WTO	
College	Level	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3
Northampton																	
West Nottinghamshire				P	P					T&L	T&L						
North Nottinghamshire				P	P												
Moulton																	
Derby				P	P												
Chesterfield				P	P	R				T&L	T&L						
Boston				P	P	R	R										
New College Stamford				P	P												
Grantham				P	P												
South Leicestershire																	
Loughborough																	
Lincoln				P	P												
South Nottingham						R	R			T&L	T&L	WM	WM				
Leicester				P	P												
Brooksby Melton																	
Stephenson				P	P					T&L	T&L						
New College Nottingham				P	P												

Apprenticeships Frameworks available for providers to deliver (February 2011)

The following apprenticeship framework sectors in craft, technical and supervisory qualifications are linked directly or indirectly to the low carbon and 'renewables' agenda. They are listed by the National Apprenticeship Service, but may not be available locally.

Framework	Level 2	Level 3	Level 4	Sector Skills Council
Building Products Occupations	✓	✓		Proskills
Building Services Engineering		✓		Summitskills
Construction	✓	✓		constructionskills
Electricity Industry	✓	✓		EU Skills
Electrotechnical		✓		Summitskills
Engineering	✓	✓		SEMTA
Engineering Construction	✓	✓		Engineering Construction
Engineering Technology			✓	SEMTA
Glass Industry Occupations	✓	✓		Proskills
Heating, Ventilating, Air Conditioning and Refrigeration		✓		Summitskills
Housing	✓	✓		Asset Skills
Industrial Applications	✓			SEMTA
Nuclear Decommissioning		✓		Cogent
Plumbing	✓	✓		Summitskills
Water Industry	✓	✓		EU Skills
Sustainable Resource Management	✓	✓		EU Skills
Wind Turbine Operations and Maintenance	✓	✓		EU Skills/Renewable UK
ICT	✓	✓		e-skills UK
Retail	✓	✓		Skillsmart
Motor Vehicle	✓	✓		IMI
Passenger Transport	✓	✓		Goskills
Transport and Logistics	✓	✓		Skills for Logistics

Framework Comparison to Last Year (England)

(by permission National Apprenticeship Service)

Framework	2009/10	2008/09	Difference	
Customer Service	29,400	22,100	7,300	33%
Business Administration	26,500	20,500	6,100	30%
Hospitality & Catering	20,900	16,100	4,900	30%
Children's Care Learning & Development	19,600	16,900	2,700	16%
Health & Social Care	17,400	12,000	5,400	45%
Retail	16,800	10,700	6,100	57%
Hairdressing	15,800	15,900	-100	-1%
Engineering	14,500	14,700	-200	-1%
Construction	13,400	15,700	-2,400	-15%
Active Leisure & Learning	10,800	7,800	3,000	39%

Mapping the Skills Offer Qualification Provision in East Midlands' Colleges

The low carbon skills offer in East Midlands Colleges was identified and measured against business needs. Gaps in provision were subsequently identified which could be filled by expanding and extending college provision. The exercise was undertaken in the context of:

- HM Government Policy statements on the low carbon industrial strategy designed to make a transition to a low carbon and resource efficient economy; this includes enabling employees and businesses to take advantage of the opportunities in the low carbon economy by providing the necessary skills across all sectors to accelerate the UK's progress in line with targets such as the Kyoto Agreement.
- emda's Regional Economic Strategy for Low Carbon environmental goods and services, which identifies the need to build these sectors in terms of capacity and capability by providing a supply of skilled and qualified employees able to support the anticipated growth of these sectors.
- emda funding for a Labour Market Intelligence (LMI) project to identify the pattern and disposition of low carbon businesses in the East Midlands and to identify the training needs of those businesses in order to inform the demand side of the project.
- a supply side analysis of the colleges' low carbon related curriculum offer completed in parallel and a gap analysis to inform future college curriculum developments.

The demand and supply analysis is based on the position in February 2011. During February, Government announced the approval and go-ahead for the National Skills Academy in Environmental Technologies. The East Midlands Hub for this is Stephenson College, Coalville, Leicestershire. The investment in this hub and spoke model will accelerate the growth of provision and increase the range of courses available, and the expertise of staff and the capacity of colleges to grow low carbon skills courses in the future.

The primary source of demand analysis is the emda funded 'Low Carbon Environmental Goods and Services Sector Skills Survey' of September 2010, commissioned from Ekosgen.

The following additional sources were used to produce the full demand analysis:

- Sector Skills Councils' LMI especially from SummitSkills
- Trade Associations (eg Rainwater Harvesting Association)
- Employers' Organisations
- Colleges' own LMI
- DBIS and DECC published data
- New Engineering Foundation
- Employer Feedback
- Empirical evidence from the FE Task Group and interviews with member colleges
- Energy Institute – Low Carbon Skills Reports
- National Strategic Skills Audit for England 2010 – Strategic Skills Needs in the Low Carbon Energy • Generation Sector
- HM Government "Meeting the Low Carbon Skills Challenge 2010".

Defining the Low Carbon Economic Sector and its Businesses

All studies of the Low Carbon sector have problems in defining the scale and scope of the sector. In the context of this study of skills needs, research drew on several analyses of the overall low carbon sector. The main sub-sectors, as described below, were adapted from the Eksngen report which is the most substantive and relevant to the mapping exercise.

The Eksongen study identified a total of 2087 businesses in the East Midlands with credentials to be included in the low carbon economic sector. An extract from the Eksongen report is included below, followed by a grouping of those businesses into categories which relate to the skills analysis. The second group of 216 organisations represents the follow-up survey sample which was used to research skills needs in particular. Table 1.1 below contains details of the survey sample.

Table 1.1: Survey sample by LCEGS sub-sector

Sub-Sector	Follow-up Survey Sample	LCEGS Database
Air Pollution	5	39
Environmental Consultancy	27	165
Environmental monitoring, Instrumentation & Analysis	7	60
Marine Pollution Control	0	1
Noise and Vibration Control	2	25
Contaminated Land Reclamation and Remediation	0	16
Waste Management	8	160
Water Supply and Waste Water Treatment	15	168
Recovery and Recycling	17	330
Hydro	2	3
Wave and Tidal	2	2
Biomass	2	17
Wind	2	13
Geothermal	0	11
Renewable Energy Consulting	5	16
Photovoltaic	6	37
Alternative Fuel Vehicle	1	10
Alternative Fuels	2	9
Additional Energy Sources	0	2
Carbon Capture & Storage	1	3
Carbon Finance	0	1
Energy Management	16	149
Building Technologies	23	203
Civil Nuclear	2	52
Conventional Power	2	40
Other	56	495
Total	216	2,087

Source: ekosgen 2010

Business Groupings into Low Carbon Skills Sectors

To facilitate an analysis of the demand for skills and the supply side study, it is necessary to categorise the wide range of businesses identified in the Ekosgen study into sectors. Ekosgen identified the following sector and sub-sector groupings in Table 1.2 below.

LCEGS Sector Skills Follow-Up Survey

Table 1.2: Sub-sectoral groupings

Sector/Group	Sub-Sectors	Survey sample
Pollution Control	Air Pollution Environmental Monitoring Instrumentation and Analysis Noise and Vibration Control	17
Environmental Consultancy	Environmental Consultancy	27
Waste Management	Waste Management Recovery and Recycling	25
Water Supply and Waste Water Treatment	Water Supply and Waste Water Treatment	15
Renewable Energy	Hydro Wave and Tidal Biomass Wind Geothermal Renewable Energy Consulting Photovoltaic/Solar	19
Alternative Fuels/Power Generation	Alternative Fuels Additional Energy Sources Carbon Capture and Storage Civil Nuclear Conventional Power Energy Management	8
Energy Management	Energy Management	16
Building Technologies	Building Technologies	23
Other	Other	56

Source: ekosgen 2010

It is important to note that other studies of low carbon economic activity include other areas of activity such as conventional fuel vehicles, transport and logistics. Other studies give more emphasis and analyse in more depth sectors which are grouped under one heading in the Ekosgen study. An example of this, which is important to Further Education, is Building Technologies which, if disaggregated into sub-sectors, is more valuable as a way of analysing skills demand. For example, Building Technology includes the large area of retrofitting existing building stock, insulation technology, building services installation and maintenance such as ventilation and space heating.

Another area where greater emphasis is needed is in Motor Vehicle Technology, where the Ekosgen Study identifies only alternative fuels' technology as a low carbon skills sub-sector, whereas skills in wider vehicle technology such as "blue motion", "ecoflex" and similar high fuel efficient technologies are just as important in meeting emissions targets and reducing the carbon foot print of vehicles. No other forms of transport are included in the Ekosgen Study.

Consequently additions have been made to the main Ekosgen Study to enhance the overall demand model, giving a wider perspective in the areas which are relevant to the provision of technician training at levels 1 to 4 and therefore of value to colleges in planning future provision.

Defining and Categorising Low Carbon Skills

Throughout much of the published research, one of the difficulties was defining skills accurately enough to be of benefit to the providers in growing the supply side.

The four main ways of describing and categorising skills demand are typically:

- 1 by the characteristics or nature of the product, service or technology which describes the business or sector eg microgeneration
- 2 by job title for example 'Wind Turbine Maintenance Engineer'
- 3 by qualification, for example, BSc in Applied Chemistry is often quoted for Waste Management
- 4 by specific skill set such as "ability to weld to ISO/BS standards".

In order to provide a more rounded assessment of demand, it is necessary to draw from evidence at all of the above four levels of evidence. There is also the need to interpret these sources into meaningful sectors which will help colleges to plan their provision.

The four categories above are often used interchangeably and qualifications are used as a proxy for a skill-set. Often there is an assured pre-requisite qualification required in a sector which is not mentioned when researching skills needs. These are often at the pre-employment level where Apprenticeship or full-time vocational courses are required by the employer. BTEC, City and Guilds and NVQs at Levels 2 to 4 are often cited as examples of this, which are overlooked in surveys but are nevertheless important contributions to business.

One example is vehicle maintenance, where a full Level 3 in Vehicle Maintenance would be a pre-requisite qualification for working on electric or hybrid power vehicles. An additional specific qualification in servicing and maintaining hybrid vehicles would be the 'top up' or endorsement to the main qualification. Therefore, both the main full Level 3 in Vehicle Maintenance and the specialist qualification in hybrid vehicles would be included in the mapping of courses available from FE colleges in order to satisfy the employer demand for training in appropriate skills. With this example in mind the supply side study includes all pre-requisite and preliminary qualifications relevant to the low carbon sector.

The demand side analysis recognises the need for underpinning or core technical qualifications as well as the specific low carbon specialist qualifications, which rely upon prior learning in order to be effective. Whilst the emphasis of the research may well be on the development and provision of courses clearly designed for the growing low carbon sector (eg installation and maintenance of PV systems) it must be

recognised that the core of competencies in the low carbon sector will often be derived from the mainstream technical qualifications such as the BTEC National Diploma in Engineering.

Generic Skills Requirements

Whilst the Ekosgen and other studies of the low carbon economy disaggregate activity into sectors and try to define it in discrete ways, the reality is that there is significant overlap in technologies. Consequently, there is considerable overlap in skills needs, qualifications and experience required in several sectors.

The sector based analysis of skills needs reflects this situation, with the mention of certain generic skills occurring frequently in the list of skills, training or qualifications cited by businesses in several different sectors.

Unsurprisingly these generic skills occur most frequently in areas such as:

Engineering – mechanical, electrical, construction, especially at degree level
Plumbing and electrical installation at technician level
Health & Safety, driving, mechanical fitting, reading drawings, all at the operator level.

Skills Shortages

It is also important to note that the mapping exercise focuses on skills needs and not skills shortages. Many reports into low carbon skills focus on shortages which, whilst important, may ignore the fact that there are key sector skills which are having demand satisfied and may therefore go ignored and unreported. Skills shortages may be of a temporary or transient nature and may reduce in times of recession, but nonetheless they are important indicators to help colleges with their planning.

As stated previously skills shortages may not necessarily indicate a gap in supply side provision by education and training providers. It may be caused by demand not being satisfied by individuals choosing that particular career path; poor pay and conditions in the firm/sector; it may be a geographical or localised problem or temporary in duration as the supply side responds with a time lag before skills supply can be expanded. Shortages may also reflect the preferences of the working population where STEM is not seen as an attractive occupational choice.

College provision is often developed in anticipation of demand which does not materialise when a course is offered; or it may be offered once or infrequently to satisfy low levels of demand. If a course is uneconomic in cost and popularity terms, it may be terminated leading to a perceived gap in provision for which the college can be exonerated. Therefore skills shortages may not necessarily indicate a gap in provision.

Identified Skills in the Low Carbon Sectors

Based primarily upon the Ekosgen Study the mapping of skills demand has been structured on the following sectors:

- 1 Pollution Control and Environmental Services
- 2 Waste Management
- 3 Water Supply and Waste Water Treatment
- 4 Renewable Energy (including Microgeneration)
- 5 Power Generation and Alternative Fuels
- 6 Energy Management
- 7 Building Technologies
- 8 Vehicles and Transportation.

1 Pollution Control and Environmental Services

Skills Identified

- Relevant degrees in chemistry, geology, geophysical engineering, environmental science including post graduate degrees in specialist subjects
- Technical Ability
- Health and Safety
- Building Construction Surveying
- CAD
- Condition Monitoring, including Installation Laboratory and Analytical Services
- Installation commissioning and maintenance of pollution and environmental services systems including mechanical and electrical fitting, site installation skills such as welding and structural assembly
- Surveying conducting field tests and surveys including collecting samples using a variety of manual and automatic collection methods. Ground/Air condition monitoring.

2 Waste Management

Skills Identified

- Degrees in Chemistry and Applied Sciences and Environmental Management, Engineering (Mechanical/Electrical)
- Chartered Institute of Waste Management
- NVQs in Recycling and Recycling Technology
- Transport, Logistics and Vehicle Maintenance
- Health and Safety
- Materials Handling including conveyor and FLT operations
- Mechanical and Electrical Maintenance of Machinery including separation technology, compaction and mobile plant and machinery
- Hazardous waste handling including Hazardous Area Control, Pollution Control, specialist hazchem regulations, asbestos regulations
- Incinerator and waste to energy systems engineer, technical and operational
- Licensing regulations relating to collection disposal and storage of waste especially contracted waste
- Waste to Energy systems design, installation and maintenance

3 Water Supply and Waste Water Treatment

Skills Identified

- Engineering (mechanical and electrical) qualifications
- Construction and Building Services Qualifications
- Chemistry Degree and Laboratory Technology
- Filtration and Treatment Technology
- Civil Engineering – drilling and storage systems
- Driving and Transport Licences
- Operating Drilling Rigs
- Health and Safety
- Water Treatment including disinfection
- Water Regulations and Byelaws
- Plumbing qualifications
- Rainwater Harvesting Technology
- Organic recycling technology
- Water extraction licensing and utilisation regulations, systems and installation
- Water sampling, analysis and treatment including chemical technology and treatment technology

4 Renewable Energy including Microgeneration

Skills Identified

- Mechanical, Electrical and Construction Engineering Degrees
- Geological and Ground Condition monitoring qualifications, degree and post graduate level
- Wind Turbine design, manufacture installation and maintenance
- Design, manufacture installation and maintenance of PV solar, Ground Source heat pumps, air source heat pump
- Microgeneration Certification Scheme
- Technician installation, maintenance testing and repair qualifications
- Biomass systems design manufacturing and installation
- Plumbing, electrical installation and building services technician qualifications C&G/BTEC
- Health and Safety
- Fork Lift Truck/driving/machinery operating and general equipment skills
- Reading drawings, product knowledge
- Bench/Engineering skills

5 Power Generation and Alternative Fuels

Skills Identified

- Electrical, Mechanical and Environment Engineering at degree level
- Power generation qualifications
- Fuel and energy technology qualifications such as degrees in Applied Chemistry and Physics
- Analytical design and systems engineering qualifications
- Building and Construction Engineering
- Computer and IT skills linked to the management of the distribution network
- Fuel finding skills
- Specific product knowledge
- Carbon capture and storage including mining regulations.

NB: All nuclear power related qualifications and competences are excluded from this list and are, of course, covered by the requirements of the civil nuclear authorities including the National Skills Academy for Nuclear and the Nuclear Industries Association (see gap analysis for further details on nuclear skills).

6 Energy Management

Skills Identified

- Engineering, Electrical, Building and Construction degree level qualifications
- Technical qualifications at Levels 2, 3 and 4 in Plumbing, Heating and Ventilation; Electrical Installation; Installation Maintenance and Repair of PV solar microgeneration and hybrids of these
- System product knowledge (proprietary)
- Building Services and Maintenance
- BPEC/Gassafe/ACS certification for Gas Systems
- Inspection and Testing Electrical, Plumbing
- Heating and Microgeneration in commercial and domestic premises including HETAS certification
- Hot water systems maintenance and testing
- Insulation installation and retrofitting
- Statutory qualifications such as Part L and Part P Electrical Competency qualifications
- Instrumentation installation and testing
- System design and specification especially CHP

NB: There is no mention of Smart metering (feed in tariff) or retrofit in the Ekosgen Study but other research suggests there are requirements which will be in high demand within two to five years.

7 Building Technologies

Skills Identified

- Architecture, architectural technologists
- Building services design, structure and civil engineering
- Mechanical, electrical and building/construction engineering – degree and post graduate level
- Thermal and energy technology especially
- Heat pumps, energy recovery and inclusion of CHP, microgeneration and associated technologies
- Craft level skills for operators at Level 2 in building materials, wood occupations, plumbing and electrical installation and maintenance
- Technician level qualifications at Level 3/4 in plumbing, heating, gas, electrical and microgeneration technology
- Retrofitting technology especially in thermal/insulation, microgeneration and energy consumption including Smart metering, “Feed In” technology and related design, installation and maintenance
- Glazing technology including retrofit
- Rain water harvesting
- Estimating and quality surveying
- Construction Safety Passport Scheme

8 Vehicles and Transportation

(NB: This sector is not specifically categorised in the Ekosgen Study/Report)

Skills Identified

- Alternative Fuel Technology – degree, post graduate qualifications in design manufacture and introduction of Alternative Fuel vehicles
- Design installation and commissioning of fuel services including electric charging points
- Maintenance and Servicing of AF vehicles including hybrid and electric systems
- Maintenance and Servicing of high efficiency conventional fuel vehicles such as KERS (Kinetic Energy Recovery Systems) and other regenerative technologies which are being introduced to road vehicles
- Technician qualifications in maintaining complex fuel efficiency systems on road vehicles including emission control devices and Euro V compliant standards
- Driving Training
- CPC for operators and drivers

College Provision in Low Carbon Skills including Gap Analysis

A series of surveys was undertaken directly with colleges to identify the range of provision applicable to the low carbon sector. Whilst the emphasis was collecting data on the whole of the relevant provision, the colleges' responses often concentrated on the main generic and precursor qualifications. Also, the supply side listings often did not refer to Apprenticeships linked to specific technical qualifications. Coverage of the entire range of relevant provision offered by colleges proved problematic because respondents were often unfamiliar with their own college's full range of provision. The exercise highlighted major weaknesses in colleges' ability to collate, present and promote their own products for this new market, because interpreting demand is difficult when it involves so many new and emerging needs. Consequently a considerable amount of interpretation of supply has been undertaken to produce the following analysis based around the Ekosgen sector based report structures.

Pollution Control and Environmental Services

Generic and Precursor Provision

- GCSE, A level and BTEC programmes at levels 2, 3 4 in Science, Applied Science and Environment
- Health and Safety Training including contractors' passport
- Mechanical, Electrical and Construction Engineering at Levels 2, 3 4 including Apprenticeship
- Computer Aided Design, IT systems and related software training

Specialist Provision

Colleges tend not to offer specialist programmes with training run "in-house" for pollution and environmental services. Private providers, utility companies and proprietary service providers are the major skills providers.

Gap Analysis

It is unlikely that FE Colleges can provide anything wider or specific to serve this market which is niche, low volume and served by specialist national providers.

Waste Management

Generic and Precursor Provision

- Mechanical and Electrical Engineering including plant operations at Levels 2, 3, 4 including Apprenticeships
- GCSE, A level and BTEC qualifications in Applied Sciences
- Health and Safety including operatives safety schemes.

Specialist Qualifications

- East Midlands Colleges are not listed as running the Chartered Institute of Waste Management qualifications nor their NVQ in Recycling
- Specialist mobile plant and compaction technology such as hydraulics engineering is offered by North Nottinghamshire College
- No other specialist provision for this sector is listed.

Gap Analysis

There is a need to review how colleges can offer Waste Programmes. There is interest from the prison service in offender training in recycling and such NVQs would be suitable for Adult "Return to Work" programmes at Levels 1, 2 and 3.

Water Supply and Waste Water Treatment

Generic and Precursor Provision

- Mechanical, Electrical and Construction Engineering at Levels 2, 3, 4 including apprenticeships
- Pure and Applied Science subjects on GCSE, A level and BTEC programmes
- Plumbing and Building Services programmes at Levels 2, 3, 4
- Health and Safety including contractors' passport scheme.

Specialist Provision

- Domestic and commercial water systems programmes including: stored water inspection, maintenance testing and risk assessment; water hygiene; water bylaws
- Rainwater harvesting.

Gap Analysis

- Colleges are able to offer a growing range of water technology programmes especially in rainwater harvesting
- Utility companies provide "in-house" specialist courses for contractors and their own staff
- There is no evidence of a gap in FE college provision leading to unsatisfied demand
- There is growing interest in "environmentally friendly" waste water treatment training which no college is currently offering.

Renewable Energy including Microgeneration

Generic and Precursor Provision

- Mechanical, Electrical and Building/Construction Engineering at Levels 2, 3, 4 including Apprenticeships
- Plumbing, electrical installation and related building services programmes from BTEC, C&G including NVQs
- Health and Safety including contractors' passport scheme.

Specialist Provision

- Renewable energy systems design, installation, commissioning and maintenance – for solar, PV, heat recovery, air/ground/water source heating, biomass and hybrid systems
- National Skills Academy for Environmental Technologies developing new provision and capacity following ministerial approval in February 2011.

Gap Analysis

- No provision for wind, turbine technology, geological and ground condition technology including drilling and surveying currently on offer
- Growth in domestic and commercial microgeneration is leading to increased demand for retraining and upskilling of plumbing, electrical and building contractors
- Microgeneration Certification Scheme for contractors increasing demand for competency based training.

Power Generation and Alternative Fuels

Generic and Precursor Provision

- Mechanical, Electrical and Construction Engineering Foundation Degrees
- HNC/HND in Engineering
- Level 2, 3 and apprenticeships in engineering (electrical)
- Health and Safety including contractors' passport scheme
- CAD, IT and MIS computerised training packages.

Specialist Provision

- Power engineering Foundation degrees, HNC/HND and Level 4/5 options and endorsements
- City and Guilds Electricity Supply, Power Generation and Distribution.

Gap Analysis

- No nuclear provision
- No carbon capture and storage provision.

Many aspects of this industry are large scale specialist areas such as nuclear or carbon capture and storage which preclude college involvement. The National Skills Academy for Power has no provision approved to run in East Midlands FE Colleges.

Energy Management

Generic and Precursor Provision

- Mechanical, Electrical and Building/Construction Engineering at Levels 2, 3, 4 and Foundation degrees
- Plumbing, heating and ventilating qualifications at Levels 2, 3 4
- Building services systems installation maintenance, testing and repair
- Health and Safety including contractors' passport scheme.

Specialist Provision

- BPEC, Gas-safe, ACS certification for gas, hot water and energy systems
- Electrical competency qualifications – Part P
- Energy conservation including insulation and retrofitting technology
- Microgeneration systems maintenance, repair and testing including energy efficiency
- Systems design, updating and maintenance including instrumentation
- Energy Assessors and Display Certificate.

Gap Analysis

Colleges are rapidly expanding provision in this technology with a clear commitment to retrofitting and improving the energy performance of existing buildings (see next section on Building Technology).

Building Technologies

Generic and Precursor Provision

- Building and Construction craft, technician programmes at Levels 1, 2, 3, 4 including apprenticeships
- Plumbing, electrical installation programmes
- Building Environment (BTEC)
- Building Services Engineering (Mechanical and Electrical) up to Level 5
- Heat and Ventilation Operatives
- Foundation Degree in Building Services Engineering.

Specialist Provision

- Electrotechnical services and technology
- Building design for under floor heating systems design installation and commissioning
- Thermal insulations including retrofitting
- Design, installation testing and inspection of electrical systems
- BPEC programmes in renewable energy installations.

Gap Analysis

The provision is growing alongside the demand for improvements in building performance. There are gaps in provision in technology such as Structural Insulation Products and similar insulation technology. Likewise, other building systems technology with a low carbon impact, such as “factory” offsite construction technology, is not in the provision offered. Glazing technology, including retrofitting is not mentioned in the college’s offer. Retrofitting as a specific skill-set should be given more emphasis as the UK’s lowering stock requires investment in insulation and energy systems.

Vehicles and Transportation

(NB This sector was not identified or covered by the Ekosgen Report)

Generic and Precursor Provision

- Motor Vehicle craft, technician and advanced technician qualifications in the inspection, maintenance and repair of motor vehicles at levels 1, 2, 3, 4
- Health and Safety and legislative provision such as CPC for operators and drivers.

Specialist Provision

Hybrid fuel vehicles – maintenance and repair

Electric and alternative fuelled vehicle repair, maintenance and operation.

Gap Analysis

College provision is adapting rather than introducing new programmes to ensure competencies in new vehicle technology are provided for such as fuel efficiency in conventional vehicles. Alternative fuel vehicles are still a rarity but are increasing and provision is being changed to enable the introduction of this technology.

Explaining and Interpreting the Gaps in Provision

The demand side research was primarily conducted using generic and often proxy indicators of demand and consequently the gap analysis reflects this frequent lack of specificity. The supply side, by contrast, uses the course title or qualification aim as the main descriptor.

As a result, there is a need for interpretation of both sides in order to identify, describe and quantify gaps in a way which would be meaningful and assist in targeting the growth of provision to sectors where there is a confirmed gap capable of being filled by FE Colleges.

Identifying the gaps attributable to a perceived supply side problem with FE Colleges (ie a skills area where it would be reasonable to expect FE to become a provider) is another difficult aspect of the gap analysis. Any blurring of the edges between what is and what is not an FE programme is a consequence and feature of what is an emerging and imperfect market.

The demand side analysis contains a wide variety of needs but some are outside the remit of FE Colleges. However, they were included in the Ekosgen survey and their inclusion is helpful in providing a full picture. As there is a blurring of the boundaries of what constitutes FE curriculum, especially with the growth of HE in FE institutions, it is helpful to include all expressed and articulated demand so that FE Colleges can see where they may expand their offer. However, it is necessary to define provision which is the legitimate province of FE and where there might be a reasonable obligation and expectation that FE Colleges should supply the courses in question. Likewise there is demand which clearly sits outside the remit of FE (such as nuclear) where the market is too complex, too costly to enter and too specialist.

The gap analysis has been interpreted from the supply and demand analysis using a set of criteria to identify which skills delivery is a legitimate responsibility of FE and which might be reasonably expected to fall outside the scope of FE.

Criteria for determining if a Training/Skills Need should be met by FE Colleges

The following criteria have been used to identify provision which could reasonably be expected to be delivered by a FE College.

The qualification or training is:

- at levels 1 to 4/5
- on the QCF database (i.e. approval for funding)
- offered by numerous other FE Colleges – not necessarily in the region
- linked to an Apprenticeship in a “mainstream” technology
- accredited by one of the major awarding bodies common in FE.

By contrast other skills and qualifications will, by their content, level or complexity exclude themselves from FE. These would include qualifications and training which:

- Is at levels 6 – 9
- Linked to a manufacturer or supplier’s proprietary equipment, service or technology.

Other reasons for gaps in provision by FE Colleges:

- Businesses may experience other types of gaps in supply which need to be mentioned
- Geographical Gap – not all colleges across the region deliver all the range of programmes demanded, therefore employers may have to travel to obtain the course they need
- Timing Gap – often courses are run at certain times of the year which is not always convenient for business, but is determined by other factors such as the timing of mainstream college programmes
- Some colleges do not or cannot afford to invest in the technology or staffing to deliver the programme because the market is considered to be too small, too specialist or difficult to compete in
- External funding regulations may inhibit the running of certain courses and there may be a reluctance to pay full cost for certain programmes
- Colleges may be excluded from accessing the proprietary technology needed to provide the training
- Where the technology is so advanced, expensive or niche that it would preclude FE involvement because the costs of entry, the size of the market or investment in staffing or other facilities would be uneconomic for the College
- Where the supply chain and production process of the end product is such that it precludes third party training and so it is best left to those involved in the whole organisation whose unique position generates positive benefits and quality for all concerned eg Nuclear and Carbon Capture and Clean Coal.

The gap analysis is based upon an assessment of demand and supply taking account of the market factors which might exclude a FE college from participating in the provision of a particular programme of skills.

Demand Side Gaps

Many colleges experience a demand side gap based upon a shortage of learners choosing to take up available places on courses in STEM subjects, which are major feeder courses to low carbon skills programmes. Vacancies on engineering, construction and associated courses in colleges are in evidence and the shortage of Apprenticeship places in employment is a further factor in producing a gap.

There is substantial evidence that FE colleges have responded, and continue to respond, to the needs of the low carbon sector by providing an increasing range of courses directed specifically at the growing needs of businesses.

However, primary evidence of why this response may be held back or restricted reveals that colleges believe there are a number of factors which are inhibiting expansion, identified as:

- Technology is outside the scope, expertise and competence of the college, its staff and facilities
- The market is too small, especially at local or sub regional level to justify and sustain investment in facilities and staffing and there is no long term reliable demand forecast
- The cost of entry to the market is too high including marketing costs and expertise
- The college mission does not include operating at the level/in this market
- Some training is best left to private sector specialists
- The financial returns do not justify the investment
- Colleges are too focused on achieving quality standards and performance levels associated with main stream provision
- No targets are set for, or emphasis given to, developing provision by Boards, Ofsted or other stakeholders
- There are no internal incentives for staff to develop the new programmes
- There are limited (or no) CPD opportunities and low carbon developments do not feature in college CPD programmes
- There is a difficulty in recruiting qualified and experienced staff and pay rewards fall behind business
- Private sector training providers are lower cost and able to operate in niche markets nationally
- Manufacturers prefer to use their own staff to deliver training
- Colleges lack an R & D culture and work loads preclude it
- There is a lack of investment in low carbon technology in colleges
- Awarding bodies and SSCs are slow to respond to low carbon technology
- Funding bodies do not recognise the additional costs of entering new markets or running high cost STEM programmes such as low carbon.

National, Private and Specialist Providers

There are a considerable number of national, private and specialist providers in the low carbon skills supply sector, often related to the provision of proprietary equipment and/or services, such as a unique technology where the manufacturer provides training and skills alongside the equipment as part of a “turn key” or packaged contract for the customer. In cases such as the nuclear industry, there are also security, safety and natural interest factors which limit the opportunity to provide skills training eg in the East Midlands only one organisation (Construction Learning World in Nottingham) is listed as a member of the National Skills Academy for Nuclear. The rate of technical innovation, copyright and commercial interest often put specific skills training firmly in the hands of specialist providers to the exclusion of FE colleges.

Improving the Supply Side Provision of Low Carbon Skills in FE Colleges

Feedback from colleges and other stakeholders identified suggestions for improving the supply side provision of low carbon related training. These include:

- Identifying, investing in and establishing national, regional or sub regional centres for specific types of low carbon provision which would enable investment to be fully utilised, achieve economies of scale, grow expertise faster and link more directly with employers. The National Skills Academy programme’s Environmental Technologies Academy is already having a major beneficial impact on provision.
- Closer collaboration with employers, business and trade associations, including agreement to deliver training on behalf of equipment and systems’ manufacturers.
- Earmarked investment from central government, regeneration agencies and college funding bodies could be targeted at low carbon teaching facilities in colleges.

- In the East Midlands the emda and NTI funded projects provided the most significant investment in facilities in the region – far outweighing the colleges’ own internal investing funding, which in many cases has been minimal.
- The SFA/Funding Agency could consider changes to the funding methodology to encourage the growth of low carbon provision.
- Colleges should prioritise CPD, R & D and investment in facilities to this sector, as low carbon is the fastest changing area of the curriculum.
- Staff development, secondments, shadowing and technical and professional updating of staff in low carbon should be a priority.
- R & D in colleges should be more recognised, formalised and funded – linking with HEIs/universities and research bodies such as TSB through the KTP and similar programmes.
- Governing Bodies should take a closer interest in low carbon, setting targets for innovation and responsiveness in the colleges’ curriculum.

Conclusion

Further Education Colleges in the East Midlands provide a wide range of courses relevant to the emerging low carbon economy. The majority of these are generic and precursor in nature with an emphasis on building, construction, engineering and related technologies. There is a growing range of more specialist provision specifically aimed at low carbon technologies, such as those under the aegis of the new National Skills Academy for Environmental Technologies. More investment in the promotion and marketing of the current range of programmes would be beneficial to colleges.

Many of the demand side needs are in small, often immature, niche areas where there are significant barriers to entry by FE colleges and it is unlikely in the short term that these will be met by the publicly funded part of FE. Colleges need to invest further in growing their Low Carbon Skills programmes as demand will increase and markets start to mature and expand to meet the needs of the low carbon goods and services economy.

ABC Qualifications Engineering

College offering Qualification

	CH	WN	LI	LE	DC	ST	GR	SNC	BOS	CAS	SLC	LOU	NNC
Level 1 Award in Building Services Engineering (QCF)													
Level 2 Award in Building Services Engineering (QCF)													
Level 2 Award in Performing Heating & Ventilation Operations													
Level 2 Award in Performing Plumbing Operations													
Level 2 Award in Performing Electrical Installation Operations													
Level 3 Certificate in Building Services Engineering (Electrical) (QCF)													
Level 3 Certificate in Building Services Engineering (Mechanical) (QCF)													
Level 2 Unit 02 Award in Sustainability and the Renewable Industry									X				
Level 2 Unit 08 Converting Wind into Energy									X				
Level 2 Certificate in Sustainable Energy								X					

EDEXCEL / Btec Qualifications

	CH	WN	LI	LE	DC	ST	GR	SNC	BOS	CAS	SLC	LOU	NNC
Level 2 BTEC Firsts Construction / plus C&G Firsts	X		X										
Level 3 BTEC Nationals from 2010 Construction and Built Environment	X	X	X	X	X	X							
Level 3 BTEC Nationals from 2010 Building Services					X	X							
Level 3 BTEC Nationals from 2010 Civil Engineering	X		X		X	X							
Level 4 BTEC Higher Nationals Building Services Engineering				X									
Level 4 BTEC Higher Nationals Civil Engineering	X		X		X								
Level 4 BTEC Higher Nationals Construction	X		X	X	X								
Level 2 BTEC Firsts Engineering (Electrical)	X		X								X		
Level 3 BTEC Nationals Electrical / Electronic Engineering	X	X	X	X	X	X	X			X	X		
Level 4 BTEC Higher Nationals Electrical/Electronic Engineering	X	X	X	X	X	X	X			X			
Level 2 BTEC Firsts Engineering (Mechanical)	X						X			X	X	X	X
Level 3 BTEC Nationals Manufacturing Engineering	X			X			X			X	X	X	X
Level 3 BTEC Nationals Mechanical Engineering	X	X		X		X							
Level 3 BTEC Nationals Operations and Maintenance Engineering							X					X	
Level 4 BTEC Higher Nationals Manufacturing Engineering				X	X	X	X			X			
Level 4 BTEC Higher Nationals Mechanical Engineering		X		X			X						
Level 4 BTEC Higher Nationals Operations Engineering					X	X							

BPEC Certification

	CH	WN	LI	LE	DC	ST	GR	SNC	BOS	CAS	SLC	LOU	NNC
Nat Accredited Certification Scheme for Gas Fitting Operatives (ACS)				X									
The Oil Fired Technicians Association (OFTEC)													
Water Regulations (England and Wales)				X	X	X					X		X
Water Byelaws (Scotland)						X							
Unvented Hot Water Storage Systems			X	X	X	X					X		X
Solar Domestic Hot Water Heating		X	X	X		X	X				X		
Part L Energy Efficiency		X	X	X	X	X					X		
Part P Electrical Competence Scheme (ECS)				X							X		X
Disinfection of Water Systems													
Energy Awareness				X		X							
Rainwater Harvesting				X		X					X		
Woody Biomass						X							
Underfloor Heating						X	X						
Groundsource Heat Pumps / Air source				X		X	X				X		
BPEC Gas Foundation				X									X

City and Guilds Qualifications

	CH	WN	LI	LE	DC	ST	GR	SNC	BOS	CAS	SLC	LOU	NNC
Level 3 Advanced Professional Certificate in Construction													
Level 4 Higher Professional Diploma in Construction													
Level 3/4 Diplomas for Non-Domestic Energy Assessors and Display Energy Cert													
Level 3/4 Diplomas for Domestic Energy Assessors and Home Inspectors		X											
Level 2/3 Electrotechnical Services													
Level 2/3 Electrical and Electronic Servicing													
Level 3 Certificate in Electrical Technology Engineering	X												X
Level 2/3 Certificate in Electrotechnical Technology 2330	X		X	X	X	X						X	X
Level 2/3 Electricity Supply, Power Generation and Distribution													
Level 2/3 Certificate in Installing and Testing Domestic Photovoltaic Systems													
Level 1 Performing Manufacturing Operations	X					X	X						X
Level 2 Performing Engineering Operations	X				X	X	X				X	X	X
Level 2 Performing Manufacturing Operations	X										X		
Level 3 Mechanical Engineering C&G 2800	X		X			X							X
Level 3/4 Diplomas for Domestic Energy Assessors and Home Inspectors													
Level 3/4 Diplomas for Non-Domestic Energy Assessors and in Display Energy Cert													
Level 3 Energy Efficiency for Domestic Heating													X
Level 1 Thermal Insulation													
Level 2 Thermal Insulation													
Level 2 Energy Awareness													
Level 2 Certificate in Plumbing	X	X		X	X	X				X			X
Level 3 Certificate in Plumbing	X	X		X	X	X							X
Level 2 Certificate in Fundamental Inspection, Testing and Initial Verification					X								
Level 2/3 Electrical and Electronic Servicing													
Level 2/3 Certificate in Electrotechnical Technology	X	X		X	X								
Level 2/3 Electrotechnical Services					X								
Level 2/3 Electrical Installation	X	X		X			X			X	X		X
Level 3 Certificate in Installing and Testing Domestic Photovoltaic Systems								X					
Level 3 Code of Practice for In-service Inspection and Testing of Electrical Equip	X												
Level 3 Inspection, Testing, Design and Certification of Electrical Installations	X			X						X			
Level 3 Cert in the Building Regulations for Electrical Installations in Dwellings				X									
Level 4 Higher Professional Diploma in Building Services Engineering													
	CH	WN	LI	LE	DC	ST	GR	SNC	BOS	CAS	SLC	LOU	NNC
Solar Hot Water/ Heat Pumps/ P.V./ Micro Regeneration Cert Scheme									X				
Hybrid Cars							X						
Level 1 P.V., Wind, Biomass, Hydrogen Cell								X					
Fluid Hydraulics													X
Foundation Degree Power Engineering												X	
Foundation Degree Power Systems Mangement												X	
Bridging course/ Degree Power Engineering P/T												X	
Level 2 P.V., Wind, Biomass, Hydrogen Cell								X					
Level 3 International Non Accredited AEMT modules (Hazardous Area Controls)												X	
Foundation Degree- Engineering Mechanical/ Electrical	X										X		
Foundation Degree - Sustainable Construction											X		
Foundation Degree- Engineering Mechanical/ Manufacturing										X			
Foundation Degree- Engineering Mechanical Production										X			
Product Design & Manufacture										X			

CH Chesterfield College
WN West Notts College
LI Lincoln College
LE Leicester College
DC Derby College
ST Stephenson College
GR Grantham

SNC South Notts College
BOS Boston
CAS Castle College
SLC South Leicester College
LOU Loughborough
NNC North Notts College

FE Colleges and Short Knowledge Transfer Partnerships

The East Midland Regional Development Agency (emda) worked with Further Education Colleges in the East Midlands for over three years on a number of projects designed to expand FE's provision of low carbon skills. These include the Skills4Energy project, a capital investment programme for colleges to acquire low carbon technology and funding for a number of projects to encourage expansion in low carbon expertise and technology capacity. As part of this set of initiatives a proposal was made to introduce Knowledge Transfer Partnerships (KTP) to the FE sector specifically targeted at low carbon sector projects.

Colleges were encouraged to become partners in a shortened version of KTP, known as sKTPs. The intention was to encourage colleges to work with business partners on projects designed to stimulate technology transfer between them.

The objectives of the emda funded programme were as follows:

- 1 to facilitate employer engagement between businesses in the low carbon sector and FE colleges developing their low carbon expertise and curriculum
- 2 to offer CPD opportunities for employees of organisations and the "associate" to grow the quantum of low carbon technology expertise in the sector
- 3 to encourage the applied research and development programmes for curriculum development in colleges by stimulating new and innovative approaches to skills development and delivery.

Overall sKTPs were encouraged as an ideal vehicle for stimulating the FE sector's engagement in low carbon technology transfer and thereby contributing to the regional low carbon strategy.

Defining the Low Carbon Economy

For the purposes of the sKTP programme, the low carbon sectors eligible for support were prescribed by the partners, with advice from emda, as follows:

Knowledge and Technology Transfer Areas: Scopes of Activity

Manufacturing

- EMS/QMS
- Resource efficiency – clean/lean manufacturing
- Process innovation
- Design
- Innovation and markets/diversification
- R&D

Vehicles

- Maintenance and servicing
- Low carbon fuels
- Energy storage ie fuel cells and batteries
- Transmission/drive trains
- Fuelling infrastructure

Renewable Energy

- Wind turbines and system
- Solar (heat and PV) panels
- Ground/air/water source heat pumps
- Biomass boilers
- Waste to energy boilers
- Domestic and commercial/industrial

Building Services

Space and water heating
Power and lighting
Mechanical systems ie conveyors/machinery/lifts
Design and innovation
Maintenance
CHP

Energy Networks

Conventional electricity distribution and transmission sectors and supply chain
Private wire systems
District heating
Decentralised systems

Management and Innovation

Change management
Access to markets/marketing
Growth
Opportunity identification
Skills/technology/markets analysis
People development

The sectors listed differ from those defined in the parallel project on mapping low carbon skills, commissioned by emda and informed by a research report produced by Ekosgen. For example, inclusions in the sKTP sector include manufacturing, management and innovation, which are not covered by the Ekosgen report (which includes pollution and water technology, but exclude vehicles).

The sKTP activity entailed:

- a KTP Finder Service seeking prospective business partners
- promoting sKTP to colleges and employer groups
- following up enquiries and expressions of interest.

In December 2010, there were fundamental changes made to the criteria for supporting KTP programmes, including sKTPs, as a result of public expenditure cuts. As a consequence the Training Strategy Board introduced changes including; a moratorium on KTP applications generally including the non-availability of the portal for applications; the withdrawal of sKTPs and the introduction of a minimum qualifying project period of six months and substantially higher financial contributions from partners. The effect of this announcement was to impact significantly on the remainder of the exercise. As a consequence, this effectively “raised the bar” for FE Colleges to a point where they would have much greater difficulty in commencing and fulfilling their obligations under the scheme. Other parts of the public sector were experiencing the same financial pressures and this meant the extra funding requirements for “classic” KTPs put them out of reach of most colleges suffering funding cuts.

The tightening of the criteria for application also affected the FE initiative because the TSB signalled that only projects with “life changing” potential would be considered against a much more rigorous set of criteria. As a consequence, research activity changed as follows:

- The finder service continued to identify further opportunities which could be developed into KTPs (under the new criteria) or as employer engagement projects for colleges. This was, and still is, important as colleges need to grow their low carbon sector specialism and expertise.
- Evidence was gathered to identify how knowledge transfer could and should operate in the low carbon sector, to assist FE to grow its capacity.
- Issues and barriers to progressing projects were recorded.

- The components of a successful KTP were identified.
- Expressions of Interest were recorded.
- Recommendations on how KTPs could be adapted to be attractive to FE were made, identifying the benefits of using KTPs to facilitate and encourage the growth of low carbon skills capacity in colleges.

Problems, Difficulties and Successes in Operating Low Carbon sKTPs in FE Colleges

In addition to the impact of the TSB changes, three categories of problems were identified:

- The suitability of the sKTP programme as a mechanism/process for developing low carbon skills capacity and employer engagement in FE Colleges.
- The capacity and expertise of the colleges in KTPs in low carbon technology.
- The suitability and relevance of the enquiries and outline proposals generated by the finder service and others.

The potential benefits of using KTPs to develop low carbon provision in colleges are:

- The scheme enables colleges to engage with businesses in the sector and up-skill staff in the latest technology.
- It enables staff to share their expertise and so benefit the business.

However, in the case of low carbon technology, it has to be recognised that colleges are, in many cases, only at the starting point of developing their expertise and do not have staff who are sufficiently qualified and experienced to add value to a project. Therefore the KTP becomes a “one way street” of exchange from the firm to the college.

Whilst KTPs have been in existence for more than 30 years, they have not been taken up by FE generally, let alone in a new technology such as low carbon, because of some inherent difficulties, whether real or perceived, which include:

- The KTP application process is perceived as convoluted, bureaucratic and intrusive. For example, the business’ financial health has to be verified and evaluated before receiving public funding.
- The vocabulary is complex and the pathways to gaining approval are not clear.
- To qualify colleges need to have Level 4 (or above) provision, which is often not the case.
- The criteria for making a successful bid are ambiguous and often do not correspond with the objectives of the partnership for the FE partner (ie to gain knowledge and expertise relevant to curriculum development and raising student achievement levels).
- Universities have RAE and other R&D targets, but this is not the case in FE, where colleges’ missions, strategies and targets are generally imposed or, at least, heavily influenced by external agencies such as Government or Ofsted. There is no pressure or target imposed on colleges to deliver KTP or the applied research associated with them and there is no ready supply of, or support for, post graduates to act as associates. Consequently many of the facilitation and support arrangements needed for successful KTPs are missing from a typical mainstream FE College and there appears to be no incentive on the part of colleges to grow them.

For low carbon technology these problems are magnified by the infancy and newness of much of the technology with which the staff are suppose to engage. Developing low carbon technical expertise is costly and despite recent capital investment from emda many colleges are deficient in resources. KTPs do not invest in capital and the “return on investment” in a KTP is seen by colleges as being very low.

Colleges view KTPs as being too specialist, narrow and disconnected from the FE curriculum to offer appropriate development opportunities for staff, or to bring in suitable curriculum material or technology relevant to the needs of learners at levels 1-3. Colleges believe there are more effective ways of achieving the objective of growing capacity in low carbon skills.

Criteria for Successful KTPs

There are lessons which colleges can learn from university based KTPs in order to improve the probability of success.

- Selecting the right associate and ensuring that the business partner is clear about the level of support needed. Most associates are operating at postgraduate or doctorate level and have R&D skills as well as level 5+ qualifications in the relevant areas.
- The business partner must be able to support the associate and ensure that the project aligns itself with the business need. Mentorship from both institutions needs to be effective and well co-ordinated.
- The associate needs to have their experiences co-ordinated using a detailed development plan with clear milestones and targets agreed by all partners.
- The associate needs to have good access to staffing and resources in the academic institution and support in the work place needs to be readily available and at an appropriate level.

There is a need for a clear commitment from the associate for the duration of the project and the need for the academic institution to provide support outside the typical academic year/vacation calendar.

For these reasons it is essential that if FE is to participate in KTPs then a thorough preliminary process of establishing the management arrangements for the project need to be put in place prior to commencement.

New Models of Supply Side Capacity Building and Knowledge Transfer

When developing its low carbon technology provision the dilemma for colleges is:

- (a) should it grow its provision and then seek employer engagement from a position of being able to offer high quality, response provision or
- (b) engage with employers to assist in guiding and defining the growth in capacity to ensure that it is what employers want and the engagement process helps staff to raise their eyes to what is happening in business and improve their own competencies?

Most colleges have taken a pragmatic view of investing in new facilities by developing capacity through a “reverse engineering” model which takes its lead from business and uses its leadership to define the direction of capital investment and curriculum development. This process has, in many ways, been usurped by Sector Skills Councils, Awarding Bodies and others who have been given powers to intervene in what is being delivered to students.

Against this backdrop, the challenge for colleges engaged in growing their low carbon technology and skills capacity is to (either independently or collectively), introduce new models of employer engagement and associated technology and skills transfer, which will together increase the supply side and their ability to satisfy the increasing demand for low carbon skills.

The research undertaken to identify how Knowledge Transfer in low carbon can be expanded and strengthened recognised that colleges committed to developing their provision in the low carbon sectors employ a wide variety of strategies and activities to accomplish this. It is important to identify these as alternatives to KTP and their contribution to expanding skills capacity and competency.

- Links with Trade Associations and Professional Bodies

Many colleges have strong links with trade associations and professional bodies such as the Rainwater Harvesting Association with Chesterfield College. Membership of the Trade Association's education and training committees is evident at North Nottinghamshire College's National Fluid Power Centre who link closely with the British Fluid Power Association.

- Role of Advisory Boards

Many colleges have advisory boards which provide strong links with employers and trade bodies. They provide opportunities for secondments of staff and are able to provide visits and technical forums for staff.

- Special Interest Groups

Colleges are often members of special interest groups such as the AoC/EMFEC East Midland Skills for a Low Carbon Economy FE Task Group. These groups offer ideal opportunities to share knowledge between institutions and the organisation of staff development opportunities.

- In-Company Training Programmes

Often colleges will be able to access the training programmes of equipment manufacturers especially if this is linked to the packages of equipment by the college.

- Role of National Skills Academy, Sector Skills Councils and Awarding Bodies

Cross sector institutions have a key role in providing Knowledge Transfer as part of the continuous programme of updating colleges on the national curriculum requirements for courses under their jurisdiction.

This aspect of Knowledge Transfer is common because it links directly to the course content and student's learning needs. It comes under the most frequent scrutiny and is most closely associated with the key tasks of staff.

- Co-ordinating Knowledge Transfer in the College and FE Sector

Low carbon technology is probably the single biggest innovation in the FE curriculum since the introduction of computers and information technology in the last century. For low carbon technology to succeed in colleges, the institution needs to take a co-ordinated approach to up-skilling those staff and functions on which it is impacting.

Knowledge Transfer delivered in a co-ordinated way can assist this process of change. To succeed, Knowledge Transfer activities need to be given more prominence in CPD programmes, strategic plans and curriculum development activities.

Staff members need to focus their CPD/appraisals and curriculum development activities using many of the approaches identified above, in ways which suit the needs of the individual, the institution and the particular characteristics of the low carbon sector of interest.

Given the wide range of technologies in the low carbon sector and the different rates and types of technological developments being experienced, it is not possible to rely upon one model or approach to Knowledge Transfer – each sector needs its own strategy linked undoubtedly to a combination of activities which work for those involved.

There is little evidence of low carbon Knowledge Transfer being systematically developed in colleges and there is an opportunity and need for this to be developed in the future.

Conclusion

The low skills sector in colleges needs to accelerate and grow its range of provision and mechanism to engage with employers, suppliers of equipment and the low carbon industry at large (however it is defined). At the moment there does not seem to be a co-ordinated strategy either nationally or in individual colleges to make this happen. This deficiency needs to be addressed and whilst naturally this may take time and government intervention and ambition, there is nothing stopping individual colleges from developing their own strategies and actions to address the skills needs of the low carbon sector.

References

The Energy Act 2008

Energy White Paper - Meeting the Energy Challenge

Building a Low-carbon Economy – the UK's Innovation Challenge - Committee on Climate Change

The Integrated Regional Strategy - East Midlands Regional Assembly

The National Employer Skills Survey for England 2009 (NESS09) 2010 - UK Commission for Employment and Skills (UKCES)

The Confederation of British Industry Employer Survey 2009

Department for Innovation, Universities and Skills (DIUS) Employer Survey 2009

Mapping Renewables Skills 2009 - National Skills Academy Power

Meeting the Low Carbon Skills Challenge (June 2010) - SEMTA

The Low Carbon Cluster Sector Skills Assessment Report - 11 Sector Skills Councils and 1 Industry Training Board

Statistical First Release Data from the Data Service - Department for Business, Innovation & Skills, January 2011

Skills for a Low Carbon and Resource Efficient Economy - ProEnviro

Low Carbon Environmental Goods and Services Sector Skills 2010 - Ekosgen

The Wolf Report 2011 - Professor Alison Wolf

LSC Round Table Discussion 2010

Summitskills Low Carbon booklets.

Produced by EMFEC

www.emfec.co.uk

Company Registration No. 2640936

Charity Commission No. 1004087

