Low Carbon Energy Skills

Chesterfield College

Introduction

This project aims to raise the awareness of the low carbon energy skills agenda in the Region, assess current skills levels, competence and confidence of staff, in order to evaluate how the agenda can most effectively be taken forward. This report will identify and recommend CPD approaches to support the development of a low carbon apprenticeship programme.

Project synopsis

The UK Low Carbon Transition Plan sets out the Government's ambitions to cut emissions from homes by 29% on 2008 levels by 2020, and from workplaces by 13%. By the year 2050 emissions from homes need to be almost zero to meet targets.

The UK Commission for Employment and Skills (UKCES) commissioned PricewaterhouseCoopers LLP to produce a report in March 2010 (Evidence Report 16) for the National Strategic Skills Audit for England 2010. The report predicts a relatively large number of jobs creation in the construction and installation industries, particularly up to 2020 but recognises the need for priority sector assessments of skill needs and horizon scanning, exploring important issues in the assessment of developments for immediate and emerging priority skills needs.

The 'Meeting the Low Carbon Skills Challenge' Consultation (March 2010) identifies that:

- The traditional lack of investment in skills in the construction industry is exacerbated by its fragmented nature and reliance on subcontractors.
- There needs to be more investment in formal research, development and demonstration, particularly in house-building.
- Mechanisms for sharing good practice and lessons learned could be improved.

Recent climate change legislation and more stringent building regulations are beginning to drive change among some specialist and larger companies (Feed-In Tariffs and the Renewable Heat Incentive) to incorporate renewable micro-generation, and will create demand for new and adapted skills.

The house building industry is particularly sensitive to fluctuations in the economy. As a result, the industry keeps its labour force as flexible as possible with a heavy reliance on subcontractors. This flexibility contributes to skills shortages in periods of growth, and the need for speedy ways to up-skill a transitory workforce as well as efficient and effective re-skilling in response to innovation and change. Micro businesses and SME's will aim to up-skill and re-skill their workforce to optimise their opportunities in respect of The Green Deal UK initiative available from late 2012 and achieve the Green Deal Quality Mark. The longer term benefits of skills upgrading will enable business to take advantage of longer term business growth and the 4th Carbon budget running from 2023 to 2027 to enable the UK to meet its legally binding obligations to cut emissions by 80%. The supply side of education and training sector has a

responsibility to be ready and able to engage industry, employers and staff in order that they can fully meet their commitments. Through this project and other work carried out within the region that responsibility will be met for the East Midlands Region, and beyond.

Project aims

This Project is aimed at developing a virtual CPD centre through which skills and knowledge deficits will be met, with a clear focus on the Construction Sector, with some associations to the Engineering Sector. It will assist in identifying need, supporting and delivering skills training to practitioners involved in the sustainability agenda. A skills audit tool will be created to initially assess knowledge, skill and understanding with development being supplemented through support resources such as case studies related to skills growth, employer engagement scenarios and an evaluation of the development of unitised and apprenticeship provision.

The project is innovative in its approach to forming a strategic alliance network through which good practice and case study materials can be exchanged, and through which staff development opportunities can be co-ordinated across education and training providers, bringing value-added to the relationships and coherence to the growth in understanding and sharing of good practice. This will enhance self regulation and sustainability within the institutions involved and taking part.

Project delivery

The Management Group first met to identify the project requirements, approach and areas of interest to pursue. A Project Co-ordinator was appointed to ensure that the direction and rate of progress was maintained. The Project Manager researched a variety of skills audit tools that could be used, finding none specific to the requirements of the project. An online audit tool was developed (Appendix 1) with 40 questions relating to the respondents confidence and behaviour in regard to aspects relating to the sustainability agenda.

A literature review was undertaken to identify current practice within FE colleges and the expertise within the East Midlands was identified. In identifying where the expertise and interest lay contact was made with a number of organisations to discuss opportunities to form strategic partnerships and collaborative working alliances. Among the variety of organisations were FE Colleges (e.g. Lincoln College, North Lindsey College), Private Training Providers (e.g. Groundwork) and Advisory/representative organisations (e.g. iNet managed through the University of Northampton).

Facilities and resources required to train and develop people within the interest areas were purchased, and included:

- Rainwater Harvesting equipment and greywater.
- Solar PV panels
- Groundsource heat pump

Staff CPD was then addressed in order to train-the-trainers (Appendix 2)

Rainwater Harvesting

One developmental area that the project chose as a direction was Rainwater Harvesting. This involves capturing non-potable rainwater (non- drinking standard) at the point of fall, then substituting it for mains water for specific applications. The Code for Sustainable Homes, and commercial equivalents such as BRE Environmental Assessment Methods assessments, already require that all new buildings are designed t o reduce the demand on mains water supplies. The UK Rainwater Harvesting Association has produced an Introductory Guide to Rainwater Harvesting. Rainwater Harvesting Systems can be simple, or large systems with above or underground tanks, filters and pumps that will can be fed into all the non-potable uses

inside buildings such as toilets, washing machines, showers and baths. Greywater is household waste water that has not come into contact with toilet waste. It comes from the bath, shower, bathroom wash basins, and washing machines. Typically, domestic reuse systems collect greywater and store it before reusing it to flush the toilet. More advanced systems treat greywater to a standard that, it is claimed, can be used in washing machines and the garden. If applied appropriately to gardens, greywater re-use presents minimal health and environmental pollution risks. Using saved water for irrigation means green spaces will provide to provide evaporative cooling when most needed. BS 8515 has been published to protect the public and to make sure that reliable systems are designed, installed and maintained. The British Standard gives guidance on the design, installation, testing and maintenance of rainwater harvesting systems supplying non-potable water in the UK.

Project outcomes

The project has realised a number of outcomes. In terms of curriculum development:

- 'Groundwork' is a progression partner with Chesterfield College, offering the ASCENTIS (formerly OCNW) Environmental Sustainability qualification to pre and post 16 learners who will develop a basic understanding of sustainability before locating within one of the trade areas at the college to develop the theme within their chosen trade. Further benefits arise from the collaborative partnership arrangements as Groundwork learners and staff will visit the college the engage in further sustainability projects and joint venture activities beyond the trade being delivered by staff and studied by individual learners, enabling a broader understanding and development of low carbon skills, together with sharing of good practice and CPD into the heritage skills.
- Chesterfield College courses in Construction and the Built Environment include units relating to sustainability.
- Four (4) members of staff attended the renewable energy awareness course at our hub partner organisation, Stephenson's College, in February 2012 to enable them to deliver this course. This was also a prerequisite to the same members of staff attending the Solar Thermal Course at Stephenson's during the February half term.
- Building alterations are planned to be able to offer BPEC Solar Thermal Courses in September 2012.
- A training needs analysis was undertaken by the Directorate of Construction and the Built Environment for the National Trust at Hardwick Hall and identified the staffing skills deficits. A training plan was put together to fulfil the outcomes for a sustainable design of an educational building on a site of special scientific interest. The project was successful with the plans being authorised by Natural England and the college will be involved directly in the sustainable build.

Sharing of project findings

The project findings are shared through communication with partners and disseminated through each organisation at course team meetings, intra-organisational CPD events and inter-organisational knowledge exchange forums.

A Regional Sustainability Conference is planned for the Summer of 2012 bringing together expertise from across the Region and employers delegates will attend to hear case study examples and skills development initiatives linked to improving their response to profitability and.

Appendix 1:
Online Skills Mapping and Audit Tool

Do you know what low carbon skills are?

Tick the following that you regularly use or have in the home

Release of Green House Gases into the atmosphere directly effect the earth's temperature

If we save energy we can reduce the amount of Carbon released to the atmosphere

Fifty Eight (58%) of all car journeys in Britain are less than 5 miles.

An estimated 152 million Tonnes of Carbon Dioxide are released by transport each year in Britain

Energy which is classed as renewable can reduce the amount of Carbon released into the atmosphere

Heat from the ground can be converted to heat homes and business

Each litre of petrol burnt produces 2.4kg of carbon dioxide

Carbon capture and Storage is an option to control and store carbon from fossil fuel power stations

Tick all the sources of power that you think are renewable

One (1) recycled glass bottle would save enough energy to power a computer for 25 minutes

Solar Photovoltaic systems generate power from sunlight

Rain water harvesting is not normally associated with low carbon technology

Around only 19% of house hold waste is recycled or composted

Tick the three power sources which are classed as 100% renewable

The code for sustainable homes sets out to reduce carbon emissions at the point of design

G is the most efficient rating on the energy performance certificate

All the electricity providers are legally bound to reduce the electricity emissions in 2020 by 30-40%

Approximately 60-70% of household carbon dioxide comes from producing heat & hot water

One (1) recycled tin can would save enough energy to power a television for 3 hours

Seventy percent (70%) less energy is required to recycle paper compared with making it from raw materials

Only 15% of the 65 million printer cartridges that are sold in the UK are recycled

The construction industry uses around 60% of all timber in the UK

Forest Stewardship Council (FSC) exists to ensure that forests are responsibly & ethically managed

Volatile organic compounds, VOC's are carbon based chemical compounds found in most paints, these VOC's are harmful to health, the environment and contribute to global warming

Leaving TV's, Stereo's, radio or games systems on standby can still use between 75% and 90% that these systems use when its fully used

Which best describes your role with the College at present

Are you aware of the colleges Enviornmental policy for reducing its Carbon footprint

What type of CPD event would you like to see take place on Low Carbon Agenda

Do you feel that there is enough information available to you to help the staff reduce the colleges Carbon footprint?

What is your current yearly carbon footprint

What is the average world carbon footprint

How much water does it take to produce 1 cup of coffee?

Are you aware of the governments green deal scheme?

Do you know what R H I stands for

What is your approximate water usage per day?

Which are of CBE do you currently work in?

On a scale of one to ten. One being the best compliment. How would you rate this survey?

Appendix 2:
Examples – CPD and Partnerships sharing best practice summary

Event	Topic	Date	Activity
Earth Build UK	Low Carbon options for Sustainable design AGM	January 2012	Resulted in a European work experience opportunity for several students fully funded for up to 10 days.
Avon Croft Building with Lime	Low Carbon options for Sustainable design	December 2011	• Good collaborative arrangements agreed

			• External speaker (author of several brickwork books) demonstrating skills in the use of lime and its properties for historic construction
Peak Hydro Forum	Renewable Low Carbon Energy for Hydro	December 2011	Work experience opportunities at Buxton on a community project
British Research Establishment	Low Carbon options for Sustainable design in main stream construction	November 2011	Tour of innovation park at BRE and presentation on new methods of construction e.g. Hempcrete, solid wall thermal mass
East Midland Innovation	Low Carbon options for Sustainable design and effects on construction design methods	February 2012	Green roofing event in preparation for display and demonstration at Chesterfield College
Philosophy of Conservation & lowering of Carbon emissions in practice	The rationale for Low carbon in construction, sustainable design & heritage conservation projects	March 2012	Knowledge and specialist skills development (stonemasonry) in order to develop links with Heritage bodies to expand facilities and resources (e.g. external speakers)
Eco Centre Exchange	Delivery of Low Carbon agenda project to Derbyshire CC ECO HUB	October 2011	Links made with community for work experience outcome through the straw bale project at Riber. Curriculum links for pre-16
Use of lime in heritage construction	Low Carbon options for Sustainable design in and effects on heritage construction methods	September 2011	Preparation for full cost course offer and links to the organisation, East Midlands Construction and the Built Environment (EMCBE)
Introduction to Environmental Technology Systems	NSA Environmental Tech Level 3	January 2012	Level 3 course training event to enable tutors to deliver and assess courses at full cost as

			prelude to renewable courses (e.g. rainwater harvesting,)
Introduction to Environmental Technology Systems	NSA Environmental Tech Level 3 Installation of Solar Thermal	January 2012	Level 3 course training event to enable tutors to deliver and assess courses at full cost as prelude to renewable courses (e.g. solar pv and thermal)
Introduction to Environmental Technology Systems	NSA Environmental Tech Level 3 Installation of Ground Source installation	June 2012	Level 3 course training event to enable tutors to deliver and assess courses at full cost as prelude to renewable courses (e.g. Ground Source Heat Pumps)
Eco Centre Spring Fair	Sustainable insulation & effects on Carbon Emissions	April 2012	Promote the area and progressive thinking of college and full cost courses
Cromford Mill Fair	Sustainable Buildings& Raising Awareness of Climate Change	April 2012	Promote the area and progressive thinking of college and full cost courses
Student Work Experience	Garden farm design & Build of sustainable thermal mass straw bale construction	November – January 2011	Expand student awareness and different living styles
Student Work Experience	Use of lime pointing on historic buildings	November – January 2011	Practical knowledge skills development to raise awareness of different living styles and use of lime
Student Work Experience	Design of a Sustainable thermal mass, low carbon traditional structure for Natural England & National Trust on a SSSI site	December – January 2011	Practical knowledge skills development to raise awareness of different living styles and use of lime Expand student awareness and different living styles and work with the National Trust
Xtra Therm	Development of insulation materials and installation of materials towards the Levels 4,5 & 6 code for sustainable homes	September – March 2011	Developing industry links and developing new products raising student awareness

East Midland Innovation	Code for sustainable homes Level 6 house sustainable	June 26	Looking at level 6 house in Derby with innovative heat storage and recovery system