

# Identification of Renewable Energy Training Provision, Qualification Accreditation

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## List of Abbreviations

ACRIB	Air Conditioning and Refrigeration Industry Board
APHC	Association of Plumbing and Heating Contractors
BACH	British Association of Construction Heads
BDA	British Drilling Association
BEAMA	British Electrotechnical and Allied Manufacturers Associations
BPEC	British Plumbing Employers Council
BRE	Building Research Establishment
BSI	British Standards Institution
BSRIA	Building Services Research and Information Association
BWEA	British Wind Energy Association
C4SH	Code for Sustainable Homes
C&G	City & Guilds
CAT	Centre for Alternative Technology
CHP	Combined Heat and Power
CHPA	Combined Heat and Power Association
CIBSE	Chartered Institution of Building Services Engineers
CITB	Construction Industry Training Board
CIWEM	Chartered Institute of Water and Environmental Management
CLG	Department of Communities and Local Government
CORGI	Council of Registered Gas Installers
CPD	Continuing Professional Development
CPS	Competent Persons Scheme
CSCS	Construction Skills Certification Scheme
DETI	Department of Enterprise, Trade and Investment (Northern Ireland)
DTI	Department of Trade and Industry
DSHW	Domestic Solar Hot Water
ECA	Electrical Contractors' Association
EEC	Energy Efficiency Commitment
EI	Energy Institute
EN	Euronorm
EPC	Energy Performance Certificate
EREF	Environment and Renewable Energy Fund
EST	Energy Saving Trust
EU	European Union
FETA	Federation of Environmental Trade Associations
FETAC	Further Education and Training Awards Council
GSHP	Ground Source Heat Pump
H&S	Health and Safety
HETAS	Heating Equipment Testing and Approval Scheme

HHIC	Heating and Hot Water Industry Council
HIE	Highlands and Islands Enterprise
HIP	Home Information Pack
HVCA	Heating and Ventilating Contractors' Association
ICE	Institution of Civil Engineers
IDHEE	Institute of Domestic Heating and Environmental Engineers
IET	Institution of Engineering and Technology
IME	Institute of Mining Engineers
IPHE	Institute of Plumbing and Heating Engineering
ISO	International Organization for Standardization
JIB	Joint Industry Board
LCBP	Low Carbon Buildings Programme
LMI	Labour Market Information
MDP	Major Demonstration Programme
MGAS	Microgeneration Accreditation Scheme
NAPT	National Association of Plumbing Teachers
NEF	National Energy Foundation
NFRC	National Federation of Roofing Contractors
NICEIC	National Inspection Council for Electrical Installation Contracting
NVQ	National Vocational Qualification
OFTEC	Oil Firing Technical Association
PMES	Plumbing Mechanical Engineering Services
PPS22	Planning Policy Statement 22
PV	Photovoltaic
QCA	Qualifications and Curriculum Authority
RE	Renewable Energy
REA	Renewable Energy Association
REIA	Renewable Engineer Installer Academy
RIBA	Royal Institute of British Architects
SAP	Standard Assessment Procedure
SBEM	Simplified Building Energy Model
SBSA	Scottish Building Standards Agency
SCHRI	Scottish Community and Householder Renewables Initiative
SELECT	Electrical Contractors' Association of Scotland
SNIJIB	Scottish and Northern Ireland Joint Industry Board
SNIPEF	Scottish and Northern Ireland Plumbing Employers' Federation
SQA	Scottish Qualifications Authority
SSC	Sector Skills Council
STA	Solar Trade Association
SWH	Solar Water Heating
UKAS	United Kingdom Accreditation Service
UKRHA	United Kingdom Rainwater Harvesting Association

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## Executive Summary

NEF was commissioned by SummitSkills to identify the training currently available in the UK on microgeneration technologies. A wide variety of organisations were contacted in order to identify their current and planned training. Details of the content of each course, any certification scheme and the target audience were noted.

The research process was concluded in February 2007 and it is recognised that a number of initiatives associated with the Microgeneration were unable to be included in this report. It is for that reason that the recommendations include requirements that further phases should take these into account.

This research identified that training provision has improved substantially in the last few years but much further work is needed. The solar thermal sector has led the way with the development of Logic and BPEC accredited courses. In addition, company specific and general interest courses have been established.

There are very few microgeneration courses in combined heat and power and hydro (one and two courses respectively). Only a few courses lead to a recognised qualification, particularly in wind and solar-PV. Two distinct approaches to accredited training were identified. In the first, the course is developed by a training body which is then run at a number of training centres. An example of this is the BPEC solar thermal course which is delivered by Bedford College and CAT, among other providers. In the second approach, a course is developed by a company to train installers of their products and is then certified by a relevant body.

We found few benchmarks for the best practice installation of renewable energy systems. This has hindered the development of training courses and there is no agreed process for installer training. There is a small pool of trainers able to teach tutors of renewable energy courses and this has created a bottleneck. Limited funding for the establishment of training is restricting the facilities available. However, several training courses are currently available to 'up skill' heating engineers and electricians. Some of these courses are linked to the Clear Skies list, the Government's existing list of accredited installers.

The authors would strongly recommend industry stakeholders to work actively with SummitSkills as the champion of renewable energy training on a national, regional and local level in the delivery of a quality skilled workforce. This is not to take anything away from the current good knowledge base; it is to encourage full participation in the continuous improvement process for the highest quality implementation of a complete microgeneration and renewable energy strategy which includes a competent workforce.

## 1. Introduction

Microgeneration is part of the Government's strategy for alleviating climate change and is currently being promoted through the Low Carbon Buildings Programme (LCBP). This process is in transition and it is expected that it will be replaced by the Energy Efficiency Commitment, phase 3 (EEC3).

If this sector is to expand substantially, it will demand many more skilled installers and system designers. In parallel, the Government intends to raise the standards for installers through Competent Persons Schemes (CPS). An important outcome is the need to train installers of these technologies so that they have additional skills and can work to the required standard. In order to make this happen quickly, it is expected that many of these technicians will already possess some of the skills (for example, plumbers or electricians).

The focus of this report, which was commissioned by SummitSkills, is to identify the extent of UK-based training on Microgeneration technologies for installers and system designers. Section 2 outlines the approach taken and section 3 summarises the results. The key points are discussed in section 4, which is followed by our conclusions and recommendations. A full list of the courses identified is given in appendix A.

### 1.1. Brief

The brief for this work is as follows:

1. Identify the availability and location of current training courses and qualifications.
2. Establish what accreditation schemes are currently in place.
3. Investigate requirements for training across the micro-renewables sector and also include air source heat pumps, micro-CHP, rain water collection and grey water recycling.
4. Identify key players in the current development of skills and their roles.

### 1.2. Contacts

The main contact at SummitSkills is Bob Blake.

The main contact at NEF is David Matthews.

## 2. Methodology

Following a kick-off meeting with SummitSkills on the 17th November 2006, the scope of work was agreed:

1. Review existing information and studies on training for renewables, air source heat pumps, micro-CHP, rainwater collection and grey water recycling.
2. Produce a list of relevant skills, trades and associated institutions and professional bodies.

3. Review of current and future relevant certification and accreditation schemes pertinent to training needs. Also, state how this relates to regulations and standards being applied to this sector.
4. Development of a short survey form to assist with the gathering of relevant information from training providers.
5. Contacting training providers to produce a list of current and proposed training and associated qualifications.

## 2.1. Survey information requested

Table 1 summarises the questions asked of training providers and gives an example response. The full results are detailed in Appendix A.

<i>Organisation responsible for establishing the course</i>		Elecsa & WM Training
<i>Technology</i>	<i>e.g. Solar, PV etc.</i>	Micro-wind
<i>Course Title</i>		Installation of Domestic Wind Turbine
<i>Cost</i>		£995
<i>How developed are the course materials?</i>	<i>Proposed / under development / signed-off?</i>	Signed off
<i>Date and frequency of course?</i>		Approximately monthly
<i>Content</i>	<i>e.g. what is covered, to what depth and how (practical vs. theoretical)</i>	Applicable Building Regulations Electrical Safety legislation, regulations standards and terminology Pre work survey / inspection Safe isolation procedures Identification of unsafe electrical situations Cable and component selection Installing and/ or rerouting cables Installation of electrical components Checking the correct and safe operation of installed electrical components Earthing and bonding requirements Electrical test procedures Recording of electrical test results and completion of certification.
<i>Design Issues</i>	<i>Survey and siting</i>	
	<i>System sizing</i>	
	<i>System planning</i>	
	<i>Building Regs - SAP &amp; SBEM</i>	Y
	<i>Structural design</i>	
	<i>Electrical design</i>	
	<i>Control system design</i>	
	<i>Monitoring systems</i>	
	<i>Thermal system (heating or cooling)</i>	
	<i>Integration with other RE systems</i>	

<i>Installation Issues</i>	<i>Site survey and selection</i>	
	<i>Complete system installation or partial / component installation</i>	
	<i>Installation: company specific or generic?</i>	
	<i>Health &amp; Safety</i>	Y
	<i>Grid connection</i>	Y
	<i>Integration with other systems</i>	
	<i>Mounting on buildings</i>	
	<i>Controls</i>	
	<i>Commissioning</i>	Y
	<i>Fault-finding and repair</i>	
	<i>Maintenance</i>	
<i>Who is the course aimed at?</i>		Installers of wind turbines. Beginners course for non-electrical personnel.
<i>Length of course</i>		5 days
<i>Author(s)</i>	<i>if known</i>	Elecsa and WM Training
<i>Approved by</i>	<i>Trade body, Govt etc</i>	Elecsa
<i>How approved</i>		
<i>Delivered by (include full contact details)</i>	<i>be specific e.g. Bedford College, Inverness college</i>	WM Training, Peveril House, 1 Markham Lane, Duckmanton, Chesterfield. S44 5HS
	<i>Tel</i>	0870 3502202
	<i>Website</i>	<a href="http://www.elecsa.org.uk">www.elecsa.org.uk</a> ; <a href="http://www.wmtraining.co.uk">www.wmtraining.co.uk</a>
	<i>Colleges</i>	
	<i>Specialist training centres</i>	Chesterfield
	<i>Manufacturers</i>	
	<i>Other</i>	
<i>Pre qualification</i>	<i>e.g. NVQ, MSc etc.</i>	None
<i>Output - Certificate, Qualification</i>		EL4001- Electrical installation of domestic wind powered small-scale embedded generators.
<i>Restriction on products/applications</i>	<i>e.g. only for a certain manufacturer or only for indirect solar and not for direct solar</i>	
<i>Awarding body</i>	<i>e.g. BPEC</i>	
<i>Relevance to LCBP, Microgen Acc, Building Regs.</i>	<i>e.g. used as a condition of registration on the scheme</i>	Satisfies the requirements for Part P self-certification and IEE Wiring Regs.
<i>Manufacturers selling products</i>	<i>e.g. Manufacturers who have an interest in the qualification if known - this question not so important.</i>	

**Table 1. Enquiry Form used with Training Providers and an Example Response.**

### 3. Results

#### 3.1. Existing Studies

Existing studies include:

- *Occupational and Functional Map of the UK Renewable Energy Sector*, December 2005, Energy & Utility Skills.
- Yellan D: *Feasibility Study for the Establishment of a Centre of Excellence for Installers*, Quantum Strategy and Technology, available at: <http://www.skills4business.org.uk/public/cms/File/Files/feasibility%20Study%20NW.pdf> [January 2007].

Existing sources of information on training:

- Energy Efficiency Partnership for Homes, available at <http://www.eeph.org.uk/skillsandtraining/> [January 2007]

A Labour Market Information (LMI) project is underway in Northern Ireland. Its intention is to gather information on training needs of businesses in Northern Ireland relating to renewable energy systems in order to provide more effective training. It will review the progress to date and help inform future development of a tiered qualification system.

#### 3.2. Relevant skills and trades

The relevant skills and trades pertinent to the technologies being covered are shown in table 2 below. This list is not definitive: for example many organisations cover installation and / or design.

Occupations, Trades, Skills	Relevant Professional and Trade Bodies	Scope	Industry/Technology														
			Solar Thermal	PV	GSHP	Air source heat pumps	Wood heating	Energy from waste	Micro wind	Small wind	Micro hydro	Micro CHP (stirling)	Micro CHP (wood)	MicroCHP (fuel cells)	Grey water recycling	Rainwater harvesting	
<b>Plumbers and Heating Engineers</b>	IPHE, CORGI, APHC, SNIPEF, IDHEE, CIBSE, HVCA	Installation, Design	***		***	***	***	***	**				***	***	***	**	***
<b>Electricians</b>	IET, ECA, NICEIC, Select	Installation		***						***	***	**					
<b>Electrical Engineers</b>	IET, CIBSE	Installation, Design		***						***	***	***	***	***	***		
<b>Civil Engineers</b>	ICE	Installation, Design			*					**	**						
<b>Design &amp; Planning Engineers</b>	IET, IMechE, ICE, CIBSE, IPHE, EI	Installation, Design, Planning	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
<b>Roofers</b>	NFRC	Installation	***	***						***							*
<b>Drillers</b>	BDA	Installation			***												
<b>AC &amp; Refrigeration Engineers</b>	ACRIB, FETA, HVCA	Installation, Design			***	***											
<b>Solar engineer</b>	STA, IDHEE	Design Installation	***														
<b>PV Engineer</b>	REA	Design Installation		***													
<b>Wind Engineer</b>	BWEA	Design Installation								***	***						
<b>Biomass Engineer</b>	REA	Design Installation					***	***					***				

**Table 2. Skills and Trades associated with Microgeneration and water recycling.**

### 3.3. Regulations, Accreditation, Certification and The Stern Report

Fossil fuels have arguably been massively subsidised for the last 200 years since they have been charged at extraction cost only. The Stern Report discussed the cost of carbon which needs to be added to the extraction cost. However, there are many opinions to the true cost of carbon.

If a subsidy is applied to fossil fuels, then this skews the market and only third party intervention will rebalance it. In this case, Government policy is required to redress the balance. A full policy covers three main initiatives with a series of flanking measures. The three main policies are:

- a financial incentive scheme to support the retrofit market.
- a regulation scheme to support the new build market.
- a quality scheme to maintain product, installation and marketing standards.

The LCBP is a Government grant scheme in England and Wales which covers renewable microgeneration. It is the successor to the Clear Skies and MDP grant funding schemes.

At the time of writing, all three elements of the new Government framework for supporting small scale renewable energy were under consultation. The authors recommend that the reader uses a good internet search engine to find out the latest situation on the EEC3 (retrofit support scheme), the C4SH (new build support scheme) and BRE, DTI and CLG websites to explore the current position on quality accreditation support schemes. The information included below is correct at the publication date of this report. DTI and CLG are discussing the rationalisation of the CPS and the new BRE Certification scheme. Northern Ireland already has in place separate arrangements that employers have identified as “Best Practice” for the sector.

The new UKMCS Installer certification scheme is in development – until its launch the scheme manager, BRE, is continuing to utilise the original Clear Skies criteria to assess the suitability of installers to join the scheme. Table 3 lists the certification schemes identified.

The BPEC Certification for solar domestic hot water heating is recognised under the Clear Skies installer registration scheme as providing acceptable training to installers. They have several assessment centres in the UK which ensure that all examinations are conducted fairly throughout the country. Three of these centres are based within companies; the remainder at colleges or specialist training centres. The solar thermal course is aimed at experienced heating engineers and plumbers. UKAS accredits BPEC Certification and BPEC Certification self-certifies its renewables training courses. The BPEC Certificate in Solar Domestic Hot Water Heating can be used to support an operative’s application to join a CPS.

Owner of Certification Scheme	Technologies	Current Status
BPEC Certification	Solar thermal	Operating
BPEC Certification	GSHP	Under development
City & Guilds	Solar-PV	Operating
City & Guilds	Wind	Under development
City & Guilds	Plumbing	Operating
CIWEM	Rainwater and grey water harvesting	Operating
HETAS	Solid fuel	Operating
Logic Certification	Solar thermal	Operating
Logic Certification	GSHP	Under development

**Table 3. Certification Schemes for Microgeneration Technologies**

City & Guilds (C&G) awards over one million vocational qualifications each year. Through its partnership with the organisations within the Built Environment it awards over 90% of all S/NVQs in the Built Environment. C&G works through over 8500 centres worldwide. It provides the syllabus and checks the standard of the facilities at the centre. It supplies an external verifier to moderate the examinations. All craft plumbers in the UK have a qualification awarded either by the partnership of C&G and the Joint Industry Board or the Scottish Qualifications Authority (SQA). C&G qualifications are recognised by the Qualifications and Curriculum Authority (QCA) and the SQA.

The JIB Plumbing, Mechanical Engineering Services (PMES) scheme recognises skills, knowledge, competency and health and safety (H&S) awareness for the UK plumbing industry. JIB certification is graded into four categories - Trained, Advanced, Technical and Mechanical Plumber – and awarded depending on qualifications and experience. Applicants must normally be working in England or Wales. Scheme members must hold a C&G or equivalent qualification and an H&S qualification and will be granted a membership card. This is colour-coded depending on the occupation and the qualification held. The Plumbing Registration Card Scheme card scheme is affiliated to the Construction Skills Certification Scheme (CSCS), which began in 1995. The scheme is administered by the plumbing JIB, which represents the industrial partnership between the trades union, Amicus, and the plumbing employers associations.

In Scotland and Northern Ireland, a similar card scheme operates through the Scottish and Northern Ireland Joint Industry Board (SNIJIB). Technicians must submit details of their technical and H&S qualifications and in return receive a membership card. In order to join the trade association, SNIPEF, they must be a member of SNIJIB and must then agree to have some of their installations inspected. In return, they can become a licensed member (SNIPEF is the Scottish and Northern Ireland Plumbing Employers' Federation).

The Chartered Institute of Water and Environmental Management (CIWEM) recognises one course in rain water harvesting and grants a CPD certificate for successful completion.

The Heating Equipment Testing and Approval Scheme (HETAS) is the official body recognised by Government to approve solid fuel domestic heating appliances, fuels and services. In association with the Solid Fuel Association (SFA), HETAS operates a registration scheme for heating engineers with special skills in the installation and maintenance of solid fuel heating systems. This ensures that customers can be sure that the installation is carried out by a suitably trained and insured person. HETAS has worked with the Government to convert its registration scheme for solid fuel installers into a Self-Certification Scheme providing compliance under Part J (but not Parts P or L) of the Building Regulations (see below for definitions of the Building Regulations).

Logic Certification is able to offer certification services under the Accredited Certification Scheme for gas and the Oil Firing Technical Association (OFTEC) Oil Scheme through a network of approved assessment centres around the mainland UK. It offers a course in Solar Thermal Domestic Hot Water that is not UKAS accredited and is developing one on Ground Source Heat Pumps. Logic Certification's solar thermal course is recognised by the Clear Skies Installer registration scheme and can be used to support application to a CPS. It covers the H&S aspects of roof mounting collectors, rather than the practical aspects of collector mounting. The GSHP course is being developed with the intention that it will meet the requirements of the LCBP. Logic is currently following a QA process and expect that they will eventually gain third party accreditation ie. UKAS or equivalent, for their courses. At present UKAS accredits Logic Certification who, in turn, self-certifies its renewables training courses.

Both CITB and NICEIC Certification have expressed an interest in developing training schemes in the micro-renewables sector.

It is anticipated that microgeneration courses such as those offered by BPEC and Logic will be recognised by the CLG's Competent Persons Schemes and BRE's microgeneration certification scheme.

### **Regulations**

The following statutory regulations are relevant to the Renewable Energy Installation Industry:

- H&S Regulations
- Construction Design & Management Regulations
- BS 7671: IEE Wiring Regulations
- Compliance with Clean Air Act
- Compliance under Parts A (structure), F (ventilation), G (hygiene), H (drainage and waste disposal), J (combustion appliances and fuel storage), L (conservation

of fuel and power) and P (electrical safety) of the Building Regulations (England and Wales) certified either by a Local Authority Building Control Officer or Self-Certified under a recognised Competent Persons Scheme

- The Building Regulations (Northern Ireland) 2000
- The Building (Scotland) Act 2003 and the Building (Scotland) Regulations 2004
- UK Water Regulations (Water Fittings) 1999 for England & Wales
- Water Byelaws 2000 for Scotland
- Water Regulations (NI) for Northern Ireland.

### **Competent Persons Schemes (CPS)**

CPSs were introduced by the Government as a way of enabling installers in England and Wales to certify that their work complies with the Building Regulations without having to involve the local authority Building Control Department. The situation in Northern Ireland and Scotland is described below. It is hoped that self-certification will significantly enhance compliance with the requirements of the Building Regulations, reduce costs for firms joining recognised schemes, and promote training and competence within the industry. They should also help tackle the problem of 'cowboy' installers and assist local authorities with enforcement of the Building Regulations.

The Building Act 1984 requires a person carrying out certain types of building work to give notice or deposit full plans to Building Control. A CPS scheme provides benefits to operatives within the building services engineering sector making more effective and efficient use of resources by reducing the need to refer to Building Control. The powers used to set up schemes are in the Building Act 1984.

The current schemes were set up under the Building Regulations 2000, 2001 and 2002.

Membership of these schemes is not compulsory, apart from the CORGI scheme. Businesses carrying out work covered by the Building Regulations may choose to join the schemes if they think this will be of benefit. Alternatively they may choose to continue to use local authority Building Control or to employ a private sector approved inspector.

If a company or individual chooses to join a CPS, they are first vetted to ensure that they meet the conditions of membership. If they meet these conditions they are classified as a 'competent person'. The work of organisations or individuals accepted as members of a scheme is not subject to Building Control inspection. Instead, the competent person self-certifies that the work is in compliance with the Building Regulations and issues a certificate to the consumer to this effect. In some schemes they then report the work to the scheme organisers who in turn inform the local authority about the work.

Table 4 lists established CPSs that are relevant to the building services engineering sector.

For example, an OFTEC technician wanting to join this scheme must hold a current certificate of assessed competence issued by a UKAS Accredited Certification Body. After successful completion, the technician may apply for OFTEC Registration. This is split into two parts: Individual and Business. Every individual must also apply for business registration. The company only needs to be registered once but each technician also has to be registered. A self-employed worker must also apply for business registration. Registration lasts for five years, after which a re-assessment is mandatory. Another example is the CPS operated by Elecsa, covering electrical installations to Part P of the Building Regulations. This covers anyone who successfully completes the Elecsa / WM Training course on domestic wind turbine systems.

Organisation	Scope
The Association of Plumbing and Heating Contractors (APHC)	Oil and solid fuel appliances, energy efficiency, electrical, plumbing, waste water and the Water Regulations.
The Building Engineering Services Competence Accreditation Ltd (BESCA)	In dwellings: plumbing, heating and energy efficiency; in commercial premises: ventilation and energy efficiency.
Council of Registered Gas Installers (CORGI)	(1) plumbing and ventilation (2) electrical and heating work.
Heating Equipment Testing and Approval Scheme (HETAS)	Solid fuels, solid fuel appliances and associated equipment and services.
National Association of Professional Inspectors and Testers (NAPIT)	Electrical, ventilation, plumbing and heating work.
National Inspection Council for Electrical Installation Contracting (NICEIC)	Ventilation, plumbing, combustion, appliances, fuel storage and energy efficiency.
The Oil Firing Technical Association (OFTEC)	Oil fired appliances and associated storage facilities, pipe-work and flues.

Source: PHAM News, January 2007.

#### **Table 4. Competent Persons Schemes Applicable to the Building Services Engineering Sector**

In Scotland, the Certification of Construction Scheme, managed by the Scottish Building Standards Agency, currently only operates one scheme. This covers electrical installation to BS7671.

#### **Home Information Packs**

From 1 June 2007, all home owners in England and Wales will need to prepare a Home Information Pack (HIP) before putting their property on the market. The Government proposes that the first document in this pack will be an Energy Performance Certificate (EPC), which will grade the energy efficiency of the house and suggest practical steps to reduce carbon emissions and save on energy bills. For an initial transitional period, vendors will be able to market their homes as soon as an EPC and key legal documents are provided.

### **Renewables Installer Accreditation Schemes**

The Clear Skies and MDP accreditation lists continue in operation until the end of March 2008. BRE will no longer accept applications from microgeneration installers who wish to be accredited onto the existing Clear Skies list. (Currently PV installers register with EST not BRE.) They cannot guarantee that installers will be transferred to the new Microgeneration Certification Scheme (UKMCS) that will be launched in April 2007 by BRE Certification as installers will need to meet the new requirements of the scheme. BRE, DTI and the new scheme steering group are working out how installers may transfer to the new scheme.

In April 2007, BRE is setting up a new scheme sponsored by DTI which will take over responsibility for certification of installers. This will build on the existing accreditation scheme.

A technician wanting to become an accredited PV installer, previously an EST scheme now part of the UKMCS, has to provide evidence of relevant experience in renewable energy installation or to have completed a recognised PV training programme. He or she must satisfy certain quality criteria and demonstrate that they are financially secure and trustworthy. Grant funding may be allocated for (up to) five projects where the provisionally accredited organisation is the named installer. Full accreditation will normally be granted following the satisfactory inspection of the first two installations. This removes the restriction on the number of grant-funded systems that can be installed but monitoring inspections are periodically carried out.

Completing the C&G PV training course provides a route into the accreditation process. Someone with relevant installation experience may submit a case study of work, which will be assessed by an EST technical panel.

### **Northern Ireland and Scotland**

The situation is different in Scotland and Northern Ireland. In Scotland, homeowners can qualify for grants worth up to 30 per cent of the cost of installing a renewable technology system, up to a maximum of £4,000 under The Scottish Community and Householder Renewables Initiative (SCHRI). SCHRI uses the same accreditation process as the Clear Skies List in England, Wales and Northern Ireland. It lists all qualifying businesses that operate in Scotland.

SCHRI is a single point of contact for grants, advice and project support to assist the development of new community and household renewable schemes in Scotland. It is funded by the Scottish Executive and managed jointly by EST and Highlands and Islands Enterprise (HIE). The objectives of SCHRI are:

- To support the development of community scale renewable projects.
- To support the installation of household renewables.
- To raise awareness of renewable technologies and their benefits in Scotland.

In Northern Ireland, the Department of Enterprise, Trade and Investment (DETI) operates an £8 million programme called *Reconnect*, which has enabled over 1500 households to benefit from grants for renewable energy. The initiative, which is managed by Action Renewables, offers grants of up to 50% to private homeowners wishing to install renewable energy systems. Action Renewables promotes and develops renewable energy in Northern Ireland. Its portfolio of programmes includes: general awareness raising, road shows, seminars, performance monitoring of technologies, research and evaluation, policy and lobbying.

*Reconnect*, which was known as the Household Programme prior to January 2007, is part of the Government's £59.2 million Environment and Renewable Energy Fund (EREF). Action Renewables and Sustainable Energy Ireland in Eire have jointly set up the Renewable Energy Installer Academy to provide training for installers of renewable energy systems. This is described in box 1 below.

#### **The Renewable Energy Installer Academy (REIA)**

The REIA is a joint venture between Action Renewables in Northern Ireland and Sustainable Energy Ireland in Eire. The REIA was established in recognition of the lack of trained installers and specifiers of microgeneration systems and that this is impeding market growth.

The REIA has contracted support from European advisors, including Arsenal Research, the Austrian Bio Energy Centre and the Danish Energy Authority. The REIA delivers training through existing colleges as follows:

- Dundalk IT – solar water heating, heat pumps, biomass
- North West – solar water heating, PV and hydro
- Lisburn - heat pumps
- East Down Institute - biomass
- Omagh - wind

The REIA seeks to set up accredited training courses for the above technologies, a code of practice, a registration process and a quality inspection process for installers. The REIA has established a central co-coordinating unit in Belfast for the region and it currently employs two staff, a project manager and an administrator.

The key activities of the REIA are to develop and deliver accredited training courses for designers and installers of each technology. Training laboratories have been established within the Institutes. Verification of the quality is achieved through inspecting installations, a registration process for installers and a database of installations. A website has been developed as a one-stop shop for installers and designers of renewable technologies.

The project has funding for three years, with 75% of the money coming from an EU INTERREG IIIA Grant. The target is to train 450 designers and installers by December 2007. Training laboratories have been completed in Northern Ireland as follows:

- North West Institute – solar water
- Lisburn Institute – heat pumps
- East Down – biomass
- Dundalk IT – solar, heat pumps and biomass

By March 2007, 479 installers had been trained on 37 courses. The solar, heat pump and biomass courses are accredited in Northern Ireland by BPEC and in the Republic of Ireland they will be accredited by the Further Education and Training Awards Council (FETAC). Following completion of the training, installers will present their first installation for inspection and sign up to a code of practice for the industry. Upon satisfactory quality inspection they will be issued with a card confirming that they are a registered installer and the registration number will be used on the application to access grants within *Reconnect*.

Source: REIA

### **Box 1: The Renewable Energy Installer Academy**

#### **Code for Sustainable Homes (C4SH)**

This code was published in December 2006 and aims to drive forward sustainable construction by specifying nine categories of standards, including: energy / CO<sub>2</sub>, water, waste and pollution. It is currently voluntary but the Government is considering making assessment under the quoted standards mandatory. A sustainability rating system is used, from one to six stars, indicating how much the building exceeds Building Regulations. Minimum standards for energy and water efficiency are specified at every level of the code recognising their importance in sustainability. Apart from this, the developer is free to select from a variety of options, which will each provide a number of points, contributing to the score which must be attained for that level.

#### **Energy Efficiency Commitment (EEC)**

EEC imposes a statutory obligation on electricity and gas suppliers to meet a target for the promotion of improvements in energy efficiency among household consumers in Great Britain through the promotion of measures such as cavity wall and loft insulation, energy efficient light bulbs, boilers and appliances. The next phase of EEC, termed EEC3, is scheduled to operate from 2008-2011. The Government will hold a formal consultation on its format during spring 2007. EEC3 will probably support all or most of the microgeneration technologies.

### **3.4. Training providers and qualifications**

See Appendix A for detailed results.

#### **Technology summaries**

##### **3.4.1. Biomass**

Only one generic, non manufacturer specific, course was identified that would train potential biomass installers. This course includes some system design but is

predominantly a practical course for installers. It was run for the first time in autumn 2006 and is close to completion in terms of accreditation as a BPEC qualification. The REIA which operates cross-border Northern Ireland and Eire is also offering a BPEC certified biomass installer training course.

#### **3.4.2. Solar Thermal**

Currently four solar thermal courses are recognised by the Clear-Skies Registration process:

- BPEC generic training course: this is delivered at several training centres and colleges and the REIA
- Logic generic training course
- Logic Manufacturers' courses
- BPEC Manufacturers' courses.

In addition there are several manufacturers and suppliers who offer other product specific installation training – these, usually one day seminars provide product specific training.

#### **3.4.3. Solar-PV**

There is one solar-PV course that provides a recognised qualification and is currently running. This is the C&G 2372 (Photovoltaic Installation) course which is on offer at three colleges now and will be available at six others later in 2007. A second certificated course is being developed in Northern Ireland and Eire by the REIA. Two other short courses covering aspects of system design and installation are on offer and are aimed at interested individuals, not installers.

#### **3.4.4. Wind**

There are no wind courses leading to a recognised qualification. Of the courses identified, ten are currently available and three are under development. Three of those available now aim to train installers of one specific make of turbine only. Four courses aim to stimulate further interest from individuals and farmers. Four generic wind installation courses were found. Two courses will run for the first time during the first half of 2007. C&G 2373 (micro-wind turbine installation) is in preparation but is not yet available.

#### **3.4.5. Hydro**

No hydro courses lead to a recognised qualification. Two courses, currently running were identified: these focus mainly on the design and planning aspects of hydro schemes. One further course is planned in Northern Ireland and one company indicated a possible interest in providing training if there was suitable demand.

#### **3.4.6. Ground Source Heat Pumps**

Information was obtained on four courses that are currently running; a further five are under development or a response was outstanding at the time of writing. Two of the

courses available now cover generic system installation. Generally design issues are not covered and the health and safety aspects of installation were not explicitly mentioned in the course material obtained.

#### **3.4.7. Micro-Combined Heat and Power**

Only one training course identified. It is a short course, at an introductory level for engineers and is recognised by CIBSE, RIBA and IET.

#### **3.4.8. Rainwater Harvesting**

Four general courses on water management were identified, each with rainwater harvesting included as a topic. Courses range from a CIWEM-accredited five-day CPD course to a half-day introductory course currently being piloted as a CPD session for the construction industry. No courses focus solely on the design and installation of rainwater harvesting systems.

#### **3.4.9. Grey Water Recycling**

Grey water recycling features only as a topic in the same four general water management courses mentioned in rainwater harvesting above. No courses focussing solely on the design and installation of grey water recycling systems were identified. No courses lead to a recognised qualification.

#### **3.4.10 Additional Related Training**

In addition to these specific recognised courses & assessments some other industry related assessments are:

Energy Efficiency	City & Guilds 6084, 6176
Electrical Work	City & Guilds 2391, 2381
Heating Engineering	NVQ 6012
Plumbing Work	NVQs
HETAS	Solid Fuel Combustion Appliances.

Belfast Institute of Further Education are currently in the process of developing a foundation degree in renewable technologies.

## **4. Discussion**

### **4.1 Biomass**

Currently the training of installers of biomass heating systems consists of existing heating engineers / installers being trained directly by manufacturers of biomass appliances. These have, until now, taken place at the manufacturers' headquarters in Europe. We are beginning to see some UK suppliers developing a UK based training centre, utilising tutors from Europe. This has already happened with two companies. The manufacturers' training courses generally take the form of one day focussing on the technical characteristics of the product, then ongoing installer support and sometimes on-site mentoring.

#### 4.2 Solar Thermal

Historically, the task of training a workforce of installers for the solar thermal industry has fallen to the individual manufacturers. This has led to a wide variety in the standard of training and expertise gained by UK installers. However, training availability in this industry has expanded dramatically over the last 18 months with the BPEC certification of the SWH for installer's course which was developed into its present syllabus from the earlier Shine 21 training with support from a European funded project led by IT Power. This training is now available at several colleges and training centres and over the last 12 months over 150 new installers have gained this qualification. Recently, another solar thermal course has been developed by Logic Certification and is now available at a number of training centres. Both these courses are currently recognised by the Clear Skies Installer registration process.

In addition to these generic training courses many manufacturers also provide product specific training seminars which vary widely in their scope and content.

#### 4.3 Solar-PV

Surprisingly few courses are currently available on solar-PV. This need has been met by product specific training from individual PV suppliers for their own installers. This also reflects the small number of installations completed each year. Only the C&G 2372 Photovoltaic Installation course leads to a recognised qualification. It covers most of the main issues related to installation (though not design) and is generic to all manufacturers. Other courses currently give a general introduction to the design or installation issues but are not intended as installer courses.

The provision of certificated training in solar-PV is expected to increase substantially during 2007 as the number of centres offering the C&G training increases from three to nine and the REIA course becomes available for the first time.

#### 4.4 Wind

A number of manufacturers provide product specific training for their installers but the extent of this is not clear. The only certified training currently available is offered by WM Training at their centre in Chesterfield, with certification provided by Elecsa. This appears to cover the electrical aspects well but does not mention roof mounting or integration with other systems.

#### 4.5 Hydro

Very few micro-hydro courses were identified. CAT runs a short course for potential installers, which is not specific to any manufacturer and is scheduled to be run once during 2007. The course gives a brief overview of system design and installation. An even briefer guide is given in the one-day course from Navitron, which is aimed at interested individuals. The only immediate prospect of a certificated course is the one under development by the REIA in Northern Ireland and Eire. They hope this will be recognised by C&G but state that installer specific training will be needed in addition.

#### 4.6 Ground Source Heat Pumps

Of the five courses currently available, two are generic across all manufacturers and three are manufacturer specific. The generic training has been developed by BSRIA and BPEC and is based on EU courses. Both are five days long and focus on installation, while also covering aspects of system design. The BPEC certified training is available at the REIA in Northern Ireland and Eire. This course will be replaced by mid 2007 by a new BPEC certified course which is modular (four modules, one day / module) and is more closely geared to the needs of UK organisations. Less time will be spent on the design standards for appliances, for example. This course is expected to enable self-certification under the relevant CPS.

Three further generic courses are under development, of which one (Logic Certification) will provide a recognised certificate. Additional courses (typically one or two days) are being developed by manufacturers specific to their products.

#### 4.7 Micro-Combined Heat and Power

The one short course identified is aimed at giving engineers an introduction to CHP technology and includes some knowledge about system design and the regulatory issues affecting installation. The course appears to be an information-giving day rather than a hands-on training opportunity. It does not give participants any recognised qualification or skill them to any level of competency in CHP installation.

The Combined Heat and Power Association was unable to name any courses and acknowledged a gap in training provision. Developers of micro-CHP indicated that the technology is still at a testing stage and that systems were not yet commercially available. It seems that there is currently little demand for training as no installation is taking place.

There is, however, some confidence in the industry that CHP-specific training may not be required. One manufacturer's website states that, when systems become available, 'CORGI registered installers working in full compliance with Part P of the building regulations have all the basic technical skills necessary to install a micro-CHP appliance' [Microgen - <http://www.microgen.com/> - January 2007].

On the other hand, the technical department at CORGI indicated that there is a need for a more co-ordinated approach to training provision and that there is a general lack of knowledge about renewables within the industry. It specifically pointed out that NVQs do not have any CHP content and that there is not even a standard for installation and maintenance of CHP. CORGI suggested that CHP installers are currently only likely to receive the manufacturers' training on their specific system. It also indicated that course providers may be unsure how their courses can comply with Building Regulations.

Training for the installation of micro-CHP is, therefore, almost non-existent and this fledgling industry seems to be at an early stage of determining the best way forward.

The Combined Heat and Power Association could become a key body in establishing minimum standards for the industry and joining with training institutions to develop high quality, accredited training opportunities.

#### **4.8 Rainwater Harvesting**

Rainwater harvesting features only as a subject in general courses on water management. Only one of the courses identified offers a qualification – a CPD certificate accredited by CIWEM. One course is currently being piloted as a CPD session for the construction industry. The other two courses identified seem to be aimed at ‘non-professionals’ with an interest in water conservation and are more of the information-giving type rather than the skills training type of course. There is a lack of dedicated rainwater harvesting courses.

The UK Rainwater Harvesting Association (UKRHA) was unable to provide details of any installation courses, even after a mail-out to its members. The UKRHA does have some criteria for membership, including that members ‘Provide rainwater harvesting related equipment and/or perform associated works and/or provide rainwater harvesting services to meet applicable UK or international standards, such as BS, EN, BSEN and ISO’ [<http://www.ukrha.org> – January 2007]. A request for information from individual installers resulted in only two responses - one stating that ‘installing systems isn’t rocket science’, and another offering to arrange a bespoke training session if requested.

Installation training is only delivered to employees of the installation companies on a product-specific basis. Without observing the training given or checking the work completed, it is difficult to comment on the quality of the training and whether trained installers can be deemed ‘competent’. Given that both electrical (in fitting pumps) and plumbing work is required in the installation of a rainwater harvesting system, installers should meet minimum trade standards for these tasks. If more regulation and standardisation of this industry is to be expected, the UK Rainwater Harvesting Association could become a key player in setting competency criteria for installers and in co-ordinating the development of training courses.

#### **4.9 Grey water Recycling**

As with rainwater harvesting, grey water recycling features only as a topic on general courses on water management. No courses are designed to provide competency in grey water system installation leaving a gap in this area.

Information about systems is available via company websites, but there is little reference to training on installation or comment on the skill level required of installers, other than that they should be ‘qualified plumbers’. Installation of a system with a pump would also require the services of a qualified electrician.

Grey water needs to be stored and re-used with caution as it can be harmful to humans and the environment. It is an industry sector that should ensure compliance

to minimum standards of competency of installers and provide training for the system users.

## 5 Conclusions

Progress has been made in training installers of microgeneration systems but further work is required. Several accredited courses are now available and there is a limited range of publications to guide installers.

- Sector Skills Councils (SSCs), such as SummitSkills are actively engaging with employers, training providers and government to determine future training needs. This forms the basis for Sector Skills Agreements which commits all parties to the agreed training.
- SummitSkills, along with its partners, is continuing dialogue and consultation to address the differing approaches across the UK. This will take account of the impact on the application of the technology particularly within Northern Ireland, Scotland and Wales.
- **Bottleneck in training the trainers**  
In the case of the Solar Thermal industry, the rapid growth in interest in this technology has led less to a lack of potential installers who would like to be trained but rather in a lack of people to train them. For example, under the BPEC and Logic schemes there are currently only a limited number of trainers who are able or available to train the trainers to deliver the course in the UK. As there are only a handful of experts in the field, these few trainers are also very busy with other commitments in the technology. This could potentially mean there are quality issues with the standard of training available and that it could take much longer than anticipated to increase the volume of competent installers. There are likely to be similar problems with the other technologies.
- **There are a limited number of enforceable standards or Codes of Practice for the installation of renewable energy systems**  
There is no mention of renewables installations in Building Regulations other than in a second tier document (non-enforceable guidelines). The guide for professionals on solar thermal systems (CE131) covers fully-filled and drain-back systems only. With no consensus on a benchmark for installation practice it has been a challenge for comprehensive training courses to be developed. This issue could be resolved with robust, comprehensive standards to which the industry could refer. At present the BSI Technical committee are in the process of updating a withdrawn standard (BS5918) for Solar Thermal Installers. In time, this may form the basis for an installation standard to be included in Building Regulations under Part L. BRE, in its installation inspections and installer registration scheme, currently has its own checklist against which to judge domestic installations but this is not legally binding and is open to interpretation. CIBSE is producing a technical manual on solar thermal and solar-PV, which is

due to be published in March 2007. It is also drafting a new manual on solar thermal, which is due for publication later in 2007. CORGI publishes the Domestic Heating Design Guide, which covers low pressure hot water heating systems using gas or oil boilers up to 60kW. The new BRE certification scheme should significantly improve issues.

- Training in renewable energy systems is needed for architects, designers, planners and building control officers as very limited provision was identified. Training is needed to cover large scales systems. Increased public awareness training in renewables would also be beneficial.
  - Significant progress has been made in developing training that provides certified qualifications (such as the C&G, BPEC and Logic courses). There is a need for a modular training scheme covering all renewable technologies. SummitSkills needs to determine the best way forward for this.
  - Individuals wanting to become installers of renewable energy renewable energy systems need to obtain heating or plumbing qualifications first and then add a qualification in renewable energy installation.
- **There is currently no specific system design course for RE systems.**  
Until now there has been no differentiation of training for system design from installation. With the recent and future predicted growth in this industry there is a strong case for a separate, additional training scheme for engineers to qualify for the design and specification of solar thermal and other microgeneration systems as opposed to the practical issues of fitting and commissioning a pre-selected set of solar components. For example, system design is currently included in the BPEC and Logic courses to a limited extent but these courses focus strongly on domestic installations. For all microgeneration systems destined for non-domestic buildings there is currently no certificated training scheme for design engineers. These courses would be better suited to expand on both Buildings Regulations and Planning issues.
  - **Limited funding for establishing training schemes**  
With a low initial volume of students, training centres may be reluctant to invest adequately in course materials and facilities straight away. Suitable roof rigs, for example, can be a costly outlay which a college may be hard-pushed to invest in if they have no legal obligation or dedicated funding. It could be tempting for training centres to take short-cuts to save money with no guaranteed income from large numbers of students. This will impinge on the quality of the training received by course participants.

Historically, the burden of training most installers has fallen to the manufacturers, and indeed it is they who stand to gain the most from investing in the facilities to

deliver this training. It may be possible to utilise this interest to expand the installation workforce. There would need to be a close tie in to whatever installation standards or codes of practice are developed.

- **Building Regulations**

These now require all heating and electrical systems installed (this issue affects all Microgeneration installations) to show compliance under Parts J, P and L of the Building Regulations. This requires approval from a Local Authority Building Control Officer for every installation or modification, at the cost of the customer, unless a suitable competency scheme can be developed, possibly along the lines of CORGI registration. There are several potential hosts for such a scheme, for example CORGI, trade associations or BRE.

In the case of BRE the new Installer Accreditation scheme is expected to gain third party accreditation ie. UKAS or equivalent. If this is the case it may be possible for it to be comprehensive enough to include a self-certification scheme for Buildings Regulation compliance. This would be a major benefit to the industry both in terms of raising the quality of installations and removing one of the main legislative barriers to growth.

## 6 Recommendations

### Consultation within RE Industry

- Consultation should be sought from representatives of the RE industry for further recommendations towards the provision of a comprehensive training process for the growth of a competent workforce. The awarding and accreditation bodies should be consulted.

The following trade bodies could be approached:

Action Renewables  
 APH Contractors  
 BACH  
 BEAMA  
 British Hydropower Association  
 British Wind Energy Association  
 Centre for Alternative Technology  
 Chair of Heating Strategy Group  
 Chair of HHIC/ MIME Group  
 Chair of Microgeneration Steering Group  
 CIBSE  
 Combined Heat & Power Association  
 CORGI (representing existing businesses)  
 Electrical Contractors' Association  
 Envirolink Northwest  
 EST Partnership Members

FETA  
 Ground Source Heat Pump Association  
 HETAS  
 HHIC Training Group  
 HVCA  
 ICOM Energy Association  
 IDHEE  
 IPHE  
 Main Certification bodies  
 Microgeneration Steering Group members  
 Micropower Council  
 NAPT  
 NICEIC  
 Renewable Energy Association (now incorporating British Photovoltaic Association and British Pellet Club)  
 Renewable Energy Installer Academy  
 Scottish Renewables  
 SELECT (Electrical Contractors' Association of Scotland)  
 SNIPEF  
 Solar Trade Association  
 UK Rainwater Harvesting Association

### **SummitSkills Tasks**

- The information identified in this report should be put on a database and updated regularly, in order to raise awareness of existing RE training and to build increased capacity.
- SummitSkills to engage directly with relevant central and devolved administrations/Government on the findings and future application of the recommendations.
- SummitSkills should take the lead in developing national standards for vocational qualifications. By its very nature (of being employer led), it has the right focus to determine the appropriate standards.
- We suggest that SummitSkills develops a closer relationship with the certification bodies and provides quality approval of new courses. This will be especially valuable as more course modules become available.
- SummitSkills should take the lead in promoting the development of training to fill identified skills gaps and this training should be offered in modules to fit individual needs.
- SummitSkills to explore the training that is needed for architects, designers and planners, on large scale systems and for building control officers.

- Training is required for medium size applications.
- During the project many employers expressed the view that the developments in Northern Ireland were driving forward the skills agenda for renewable technology and should be viewed as “best practice” Therefore SummitSkills should explore partnership options with Action Renewables and the REIA and other similar UK wide organisations to ensure on going employer consultation and sharing of the learning across the sector.

### **‘Upskilling’ the Installer Base**

- In the fast-changing world of the future, there will be an increasing need for re-training as new technologies require new skills, such as solar space heating.
- We recommend regular reviews with employers of training needs, being used to drive changes to training plans. The focus should be on accredited training that is ‘portable’ across employers, so as to maintain flexibility in the labour market. SummitSkills should especially support low-skilled employees to reach at least a minimum qualification level.
- Training should be modular in order to be of most benefit to heating engineers, plumbers and electricians etc
- Training is required for medium size applications and the need exists for SummitSkills to link all skills needs for the building services engineering sector.

Organisation	Installer Courses – Generic			Installer Courses – Manufacturer Specific			General Interest Courses		
	BPEC	BPEC	CAT	Hetas	Baxi	Organic Energy Co	Low Impact Living Initiative	Rural Energy	CAT
Technology eg. Solar, pv, etc	Biomass	Biomass	Biomass	Solid Fuel Appliance Installation Registration	Biomass	Biomass	Heating with wood	Biomass	Biomass
Course Title	Wood Heating for Installers	Wood Heating for Installers	Heating with wood fuels		Baxi Boiler Installation	Okofen Pellet Boiler Installation	Heating with wood	Biomass & Wood Fuel Heating	Heating with Wood
Cost	currently free	£800	£800	Hetas Registration		tbc	£120-£180	£42.50	£175-£320
How developed are the materials – proposed/under development/signed off?	Completed - but due to be <b>superseded</b> - this syllabus was adapted from an existing European course but is due to be replaced with the new course being developed at CAT.	near completion	Signed-off	Completed	Completed	Completed	Completed	Completed	Signed off
Date/frequency of course	tbc	annual	June 2007	Approx 10 x per year	Currently annual trip to Denmark – UK site in devt will run 3-4 x per year	3 x per year approx	Twice a year	Approx 3 x per year	February 2007
Content eg. what is covered, to what depth and how (practical v theoretical)			Different types of wood fuels and systems currently available. Full system design. Legal requirements for installation. Site visits to biomass energy systems.	Solid fuel appliance installation (not specific to wood/biomass heating)	Practical installation of Baxi Pellet & Log Boiler systems	Okofen Pellet Boiler Installation – basic info re pellets & combustion boiler technology & combustion, pellet storage & conveyor systems, hydraulics, boiler function & practice. Also subsequent on site mentoring and installer support	How to obtain firewood, methods of cutting, basic dos and don'ts of chainsaws, processing and drying, moisture content, how wood burns, stove design and home made stoves, flue reqs and design, hot water and central heating general design	Boiler Technology, Fuel Production, economics & grants	An introduction to using wood to heat homes and small businesses, with logs, pellets, chips or briquettes. Hands-on demos. Calculating moisture content. Log preparation and stacking. How best to buy wood for heating and how to burn it cleanly.
Design issues									
Survey and siting		y		Y	N	Y	Y	N	
System sizing		y	y	Y	N	Y	Y	N	
System planning			y	Y	N	N		N	
Building regs – SAP & SBEM		yes: part J, P & L	y	Part J only	Y	N		N	
Structural design				N	N	N		N	
Electrical design				N	N	N		N	
Control system design		y		N	N	N		N	
Monitoring systems				N	N	N		N	
Thermal system (heating or cooling)		y			N	N		N	
Integration with other RE systems		y		N	Y	Y		N	
Installation issues									
Site survey and selection		Y		Y	Y	Y	Y	Y	
Complete system installation or partial/component installation		complete	Complete	Partial	Complete	Complete	Partial	N	
Installation – company specific or generic		Generic		Generic	Baxi	Okofen	Generic	Generic	
Integration with other systems		Y		N	Y	Y		N	
Controls		Y		N	Y	Y		N	
Commissioning		Y		Y	Y	Y		N	
Fault-finding and repair		Y		Y	Y	Y		N	
Maintenance		Y		Y	Y	Y		N	
Who is the course aimed at?		Heating engineers	Installers of heating systems, architects and designers	Heating engineers	Heating engineers	Heating engineers	Householders, potential installers	Farmers, landowners	General Interest
Length of course		4 days residential	6 days	2 or 3 day	3 days plus ongoing support	1 day plus ongoing mentoring	Weekend residential	1 day	3 days
Author(s) if known		Chris Laughton CAT		Hetas	Baxi	Okofen	LILI	Rural Energy Ltd	
Approved by eg. Trade body/govt		BPEC		Hetas					
How approved									
Delivered by (include full contact details) & be specific (eg Bedford College)	Renewable Energy Installer Academy, Ireland	CAT	Centre for Alternative Technology	Various sites	Baxi Denmark, Foundation Firewood, Royston, Herts	The Organic Energy Company	LILI	Rural Training Centre	Centre for Alternative Technology
Tel			01654 705981		01763 849468	0845 458 4076		01664 454507	01654 705981
Website			<a href="http://www.cat.org">www.cat.org</a>			<a href="mailto:info@organicenergy.co.uk">info@organicenergy.co.uk</a>	LILI	<a href="http://www.trainingcentre.co.uk">www.trainingcentre.co.uk</a>	<a href="http://www.cat.org.uk">www.cat.org.uk</a>
Colleges									
Specialist training centres						Y			
Manufacturers									
Other									
Pre qualification eg. NVQ					Oftec, CORGI or Hetas reg				
Output – certificate/ qualification	BPEC Certificate	BPEC Certificate		Hetas Reg					
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar				With regards Pellet appliance installation Hetas will recognise relevant certificates gained from manufacturer specific training					
Awarding body eg. BPEC									
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme				Hetas registration with recognised biomass manufacturer training enables LCBP registration					
Manufacturers selling products						Okofen			

	Installer Courses – Generic			Installer Courses – Manufacturer Specific		General Interest Courses		
Organisation	BPEC	Logic	CITB	Solartwin Ltd	Powertech Solar	Navitron Ltd	Low Impact Living Initiative	CAT
Technology eg. Solar, pv, etc	Solar Thermal	Solar Thermal	Solar Thermal	Solar Thermal	Solar Thermal	Solar Thermal	Solar Thermal	Health & Safety
Course Title	Solar Water Heating Systems for installers	Solar Thermal full scope		Solartwin installation seminar	Solar Training Course	Solar Training Course	Solar Water Heating DIY	
Cost	£400-800	£375				£175	£150 or £1695 including a solar thermal system	
How developed are the materials – proposed/under development/signed off?	Complete	Complete	Possible future installers course	Complete	Developed	Developed	Complete	In concept
Date/frequency of course	Approx 3 x per year at several training centres	Various at 19 Centres		Regular, frequent seminars	Several times a year	Several times a year	Twice a year	
Content eg. what is covered, to what depth and how (practical v theoretical)					1 day training on Apricus system & components	1 day introduction to solar – classroom based	Theory session explaining how solar hot water works. Build and pressure test your own pump & control set, expansion vessel kit and air separator. Installation and maintenance	Health & safety regulations and practice relevant to Solar Thermal, Solar PV and Small Scale Wind installations
Design issues				N	N			
Survey and siting	y	Y		N	N	N	N	
System sizing	Y	Y		N	N	N	N	
System planning	y	Y		N	N	N	N	
Building regs – SAP & SBEM	y	Y		N	N	N	N	
Structural design	N	N		N	N	N	N	
Electrical design	N	N		N	N	N	N	
Control system design	N	N		N	N	N	N	
Monitoring systems	N	N		N	N	N	N	
Thermal system (heating or cooling)	Y	Y		N	N	N	N	
Integration with other RE systems	Y	N		N	N	N	N	
Installation issues								
Site survey and selection	Y	Y		y	Y	Y	Y	
Complete system installation or partial/component installation	complete	Partial(does not include roof mounting)		Partial	Component	Component	Complete	
Installation – company specific or generic	generic	Generic (Logic also operate 2 manufacturer specific courses)		Solartwin	Apricus	Specific		
Integration with other systems	Y	Y		n	N	N	Y	
Controls	Y	Y		Y	y	Y	Y	
Commissioning	Y	Y		y	Y	Y	Y	
Fault-finding and repair	Y	Y		n	N	N	Y	
Maintenance	Y	Y		n	N	N	Y	
Who is the course aimed at?	Heating engineers/ plumbers	Heating installers/ plumbers		Householders – potential installers	Prospective installers	Prospective installers	Technically competent householders/ plumbers	
Length of course	3 days	2 days		1 day	1 day	1 day	2 days	
Author(s) if known	BPEC/IT Power	Logic		Solartwin	Powertech solar	Navitron Ltd	LILI/Norfolk solar	
Approved by eg. Trade body/govt	BPEC	Logic						
How approved								
Delivered by (include full contact details) & be specific (eg Bedford College)	Bedford College, Inverness College, CAT, North West Inst of Further & Higher Education Londonderry, Flixborough Training Centre Flixborough Scunthorpe, PPL Plumbing Trainign Ltd York, SW Assessment & Training Centre Liskeard Cornwall, Renewable energy Installer Academy NI	19 independent training centres		Solartwin Ltd, 2 <sup>nd</sup> Floor, 50 Watergate St, Chester, CH1 2LA	Powertech Solar Ltd, 21 Haviland Road, Ferndown Industrial Est, Wimborne, BH21 7RZ	Epogee Ltd, The Drey, Old Dixton Rd, Monmouth, Np25 3SQ	LILI, Redfield Community, Winslow, Bucks, MK18 3LZ	Centre for Alternative Technology, Machynlleth, Powys, SY20 9AZ, <a href="mailto:courses@cat.org.uk">courses@cat.org.uk</a>
Tel	0845 644 6558	020 8839 2439		01244 403407	01202 890234	0870 740 1330	01296 714184	01654 705981
Website	<a href="http://www.bpec.org.uk">www.bpec.org.uk</a>	<a href="http://www.logiccertificati on.co.uk">www.logiccertificati on.co.uk</a>		<a href="http://www.solartwin.com">www.solartwin.com</a>	<a href="http://www.powertech-solar.com">www.powertech-solar.com</a>	<a href="http://www.navitron.org.uk">www.navitron.org.uk</a>	<a href="http://www.lowimpact.org">www.lowimpact.org</a>	<a href="http://www.cat.org.uk">www.cat.org.uk</a>
Colleges								
Specialist training centres								
Manufacturers								
Other								
Pre qualification eg. NVQ		G3 Certification, NVQ Level 2 Plumbing or other ODPM recognised fuel competence certificate						
Output – certificate/ qualification	BPEC certificate	Logic Certificate						
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	Course as delivered at CAT goes beyond BPEC syllabus	Enables LCBP registration					Participants take home components of system for home installation	
Awarding body eg. BPEC	BPEC	Logic certification						
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme	Enables LCBP registration	Does not include any roof work						
Manufacturers selling products	Both Vaillant and Schucoco run derivative courses which are product specific	Both Worcester Bosch and other manufacturers run derivative courses which are not 'Full Scope' but product specific						

	Installer Courses – Generic			Installer Courses – Manufacturer Specific	General Interest Courses	
Organisation	City & Guilds	Elecsa	Renewable Energy Installer Academy	Schuco	Navitron	CAT
Technology eg. Solar, pv, etc	Solar PV	Solar-PV	Sola-PV	Solar-PV	Solar-PV	Solar-PV
Course Title	Install and Test Domestic Photovoltaic Systems	Photo-Voltaic Systems			Solar PV	Solar Electric Systems
Cost	£800 (CAT), £795 (Empower)	£650	Initially free due to subsidy from the EU INTEREG IIIA grant. Professional registration: £70		£175	£175-£320
How developed are the materials – proposed/under development/signed off?	Signed off	Signed off	Under development		Signed off	Signed off
Date/frequency of course	CAT 25-30 March 2007, 1-6 July 2007, 9-14 Sept 2007, Empower 22-26 Jan, 30 April – 4 May, 11-15 June, 13-17 August, 24-28 Sept	2-4 April, 2-4 May, 28-30 May, 18-20 June, 16-18 July, 20-22 August	Expected to be available from Feb/Mar 2007		Spring 2007	4-6 May 2007, 5-7 Oct 2007
Content eg. what is covered, to what depth and how (practical v theoretical)	Introduction to Photovoltaic systems identifying typical PV installations Standards, Regulations, Guidelines and Codes of Practice PV Safety: preventing electric shock, suitable access equipment Types and characteristics of PV cells, international standards, factors affecting the installation of a PV array, roofing, DC system, Inverter and electrical protection, Earthing and Lightning protection, AC system and metering Performance monitoring Approvals Planning and approval requirements for local authorities Approvals for grid connection and complying with Building regs Installation tools and equipment Commissioning Customer care Install and commission a basic grid connected PV	The Solar resources System configurations Solar system design Solar modules Solar module mounting structure & arrays Electrical wiring of the solar system and associated components Solar modules Grid-connected solar systems Charge controllers Batteries Practical sessions Sizing solar systems System testing & commissioning	Installation of solar-pv systems: practical course for technicians		Background Potential for Solar PV production in the UK, Europe and the rest of the world Availability of PV and why PV is so expensive Types of PV available and Efficiencies Calculating yields – seasonal variation, angle etc Seasonal variation Solar Concentrators Effect of Temperature on Efficiency Mounting techniques Trackers Uses of pv Battery based systems Grid tie systems Installing and selling PV as a business Grants available Future PV and PV alternative technology	Introduction to electrical science – optional foundation class covering energy & power calculations, ohms law, basic AC theory The Solar resource: radiation; climatic; diurnal & annual effects; shading; PV components overview – characteristics, types PV system designed and components: stand alone systems; sizing batteries, inverters, cables & controls PV system design and components; grid connected systems; technical; financial issues and planning issues Guided tour of CAT's grid-connected PV systems including integrated and non-integrated roofing systems Installation and safety Each group will look at wiring of systems grid connection – computer modelling, tour of Eco Cabins and standalone PV systems
Design issues						
Survey and siting		Y				Y
System sizing					Y	Y
System planning					Y	
Building regs – SAP & SBEM	Y					
Structural design						
Electrical design		Y			Y	
Control system design						
Monitoring systems	Y					
Thermal system (heating or cooling)						
Integration with other RE systems						
Installation issues						
Site survey and selection	Y					Y
Complete system installation or partial/component installation	Y					Y
Installation – company specific or generic	Y					y
Health & Safety	Y					
Grid connection		Y				
Integration with other systems	Y					
Controls	Y					
Commissioning	Y	Y				
Fault-finding and repair	Y					
Maintenance						
Who is the course aimed at?	Qualified electricians	Qualified electricians	Qualified electricians		Landowners and DIY individuals	People with an interest in solar pv. Not for installers
Length of course	5 days	3 days			1 day	2 days
Author(s) if known	Developed with CREST (Loughborough) and IT Power		Renewable Energy Installer Academy			CAT staff
Approved by eg. Trade body/govt						
How approved						
Delivered by (include full contact details) & be specific (eg Bedford College)	Centre for Alternative Technology, Machynlleth, Powys. SY20 9AZ, <a href="mailto:courses@cat.org.uk">courses@cat.org.uk</a>		North West Inst, Strand Road, Londonderry, BT48 7AL	Whitehall Avenue, Kingston, Milton Keynes, MK10 0AL	Epogee Ltd The Drey Old Dixon Road Monmouth, NP25 3SQ	Centre for alternative technology, Machynlleth, Powys, SY20 9AZ <a href="mailto:courses@cat.org.uk">courses@cat.org.uk</a>
Tel	01654 705981	0870 3502202	028 7127 6000	01908 282111	07866 852492	01654 705981
Website	<a href="http://www.cat.org.uk">www.cat.org.uk</a>	<a href="http://www.wmtraining.co.uk/photo_voltaic_systems.htm">www.wmtraining.co.uk/photo_voltaic_systems.htm</a>	<a href="http://www.reinstalleracademy.org/coursecontent.htm">www.reinstalleracademy.org/coursecontent.htm</a>	<a href="http://www.schuco.co.uk">www.schuco.co.uk</a>	<a href="http://www.epogee.co.uk/solarpv.htm">www.epogee.co.uk/solarpv.htm</a>	<a href="http://www.cat.org">www.cat.org</a>
Colleges	Bedford College, Blackburn College, Redcar & Cleveland College, The College of North West London and Guildford College of Further and Higher Education					
Specialist training centres	Empower Training Services Ltd, Ratcliffe Energy Centre, Ratcliffe on Soar, Nottingham, NG11 0EG Technique Training Ltd, Derbyshire S43 4XA					
Manufacturers	0115 983 2900					
Other	<a href="http://www.empower-training.com">www.empower-training.com</a>					
Pre qualification eg. NVQ	Qualified electrician	Electrical experience equivalent to EAL domestic installer	Qualified electrician			
Output – certificate/ qualification	C&G 2372				Certificate of attendance	
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar						
Awarding body eg. BPEC	C&G	ELECSA	C&G likely		n/a	None
Manufacturers selling products	Not specific to any manufacturer	Not specific to any manufacturer	Not restricted to particular product but would expect course participants to get manufacturer specific training		Not specific to any manufacturer	Not specific to any manufacturer
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme	Y		Relevant to Environment and Renewable Energy Fund (EREF, Households Programme (initiative in Northern Ireland)		Would not qualify an insurer under LCBP	

Organisation	Installer Courses – Generic				General Interest Courses			
	City & Guilds	Elecsa WM Training	Elecsa & WM Training	Renewable Energy Installer Academy	The Mark Group	Iskrawind	SSE	Proven Energy Ltd
Technology eg. Solar, pv, etc	Microwind	Microwind	Microwind	Microwind	Microwind	Microwind	Microwind	Microwind
Course Title	C & G Micro-wind Turbine Installation	Installation of Domestic Wind Turbine	Installation of Domestic Wind Turbine					
Cost	POA	£995	£500	Currently free due to subsidy from the EU INTERREG IIIA grant				£250
How developed are the materials – proposed/under development/signed off?	Under development	Signed off	Signed off	Under development	Signed off	Signed off	Signed off	Signed off
Date/frequency of course	Available from c. May 2007	Approximately monthly	Approximately monthly	Available from Feb/Mar 2007	Not known	Not known		Not known
Content eg. what is covered, to what depth and how (practical v theoretical)	Micro-turbines available, safety, wind analysis, site selection, wind turbine installation, grid connection and wiring, mounting.	Applicable Building Regulations Electrical Safety legislation, regulations standards and terminology Pre work survey / inspection Safe isolation procedures Identification of unsafe electrical situations Cable and component selection Installing and/ or rerouting cables Installation of electrical components Checking the correct and safe operation of installed electrical components Earthing and bonding requirements Electrical test procedures Recording of electrical test results and completion of certification	Applicable Building Regulations Electrical Safety legislation, regulations standards and terminology Pre work survey / inspection Safe isolation procedures Identification of unsafe electrical situations Cable and component selection Installing and or rerouting cables Installation of electrical components Checking the correct and safe operation of installed electrical components Earthing and bonding requirements Electrical test procedures Recording of electrical test results and completion of certification.	Installation of small wind turbines - up to 20kW. Practical content for technicians.	Installation and commissioning of Windsave turbines.	Installation and commissioning of Iskrawind turbines and only for their dealers	Installation and commissioning of Swift Turbines only	Wind energy fundamentals, tour of workshop, full installation procedures (mechanical and electrical aspects) maintenance and troubleshooting
Design issues								Installer training course: Course gives in-depth knowledge of Proven wind turbine configurations, trains in installation techniques and troubleshooting and repair.
Survey and siting	Y							
System sizing	Y							
System planning								
Building regs – SAP & SBEM		Y	Y					
Structural design								
Electrical design	Y							
Control system design								
Monitoring systems								
Thermal system (heating or cooling)								
Integration with other RE systems								
Installation issues								
Site survey and selection	Y							
Complete system installation or partial/component installation								
Installation – company specific or generic	Generic							Proven wind turbines only
Health & Safety	Y	Y	Y					
Grid connection	Y	Y	Y					
Integration with other systems								
Mounting on buildings	Y							
Controls								
Commissioning	Y	Y	Y					
Fault-finding and repair	Y							
Maintenance								Y
Who is the course aimed at?	Qualified electricians	Installers of wind turbines. Beginners course for non-electrical personnel	Installers of wind turbines. Intermediate – for those with electrical experience					
Length of course	5 days	5 days	2 days					2 days
Author(s) if known	Ian Morrison, Empower Training with support from Electrotech Technology	Elecsa and WM Training	Elecsa and WM Training	Renewable Energy Installer Academy				Proven Energy Ltd
Approved by eg. Trade body/govt		Elecsa	Elecsa		Not known			
How approved								
Delivered by (include full contact details) & be specific (eg Bedford College)	Empower Training Services Ltd, Ratcliffe Energy Centre, Ratcliffe-on-Soar, Nottingham, NG11 0EG	WM Training, Peveril House, 1 Markham Lane, Duckmanton, Chesterfield. S44 5HS	WM Training, Peveril House, 1 Markham Lane, Duckmanton, Chesterfield, S44 5HS	Omagh College of Further Education, 2 Mountjoy Road, Omagh, Co. Tyrone, BT79 7AH	The Mark Group, 70 Boston Road, Beaumont Leys, Leicester, LE4 1AW	Iskrawind, Loughborough Innovation Centre, Epinal Way, Loughborough, LE11 3EH	Scottish and Southern Energy, Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ	Proven Energy Ltd Wardhead Park, Stewarton, Ayrshire, KA3 5LH
Tel	0115 983 2900	0870 3502202	0870 3502202		0800 616302	0845 8380588	01738 456253	01560 485570
Website	<a href="http://www.empower-training.com">www.empower-training.com</a>	<a href="http://www.elecsa.org.uk">www.elecsa.org.uk</a> <a href="http://www.wmtraining.co.uk">www.wmtraining.co.uk</a>	<a href="http://www.elecsa.org.uk">www.elecsa.org.uk</a> <a href="http://www.wmtraining.co.uk">www.wmtraining.co.uk</a>		<a href="http://www.markgroup.co.uk">www.markgroup.co.uk</a>	<a href="http://www.iskrawind.com">www.iskrawind.com</a>	<a href="http://www.scottish-southern.co.uk">www.scottish-southern.co.uk</a>	<a href="http://www.provenenergy.co.uk/content-38.html">www.provenenergy.co.uk/content-38.html</a>
Colleges								
Specialist training centres		Chesterfield	Chesterfield					
Manufacturers								
Other								
Pre qualification eg. NVQ	Qualified electrician	None	Electrical experience equivalent to EAL domestic installer or above.	Qualified electrician				
Output – certificate/ qualification	C&G expected	EL4001 – Electrical installation of domestic wind powered small-scale embedded generators	EL4001 – Electrical installation of domestic wind powered small-scale embedded generators					
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	Generic training for equipment from all manufacturers			Not restricted to particular product but would expect course participants to get manufacturer specific training				Training specific to Proven turbines
Awarding body eg. BPEC	C&G 2573			C&G likely				
Manufacturers selling products				Relevant to the Environment and Renewable Energy Fund (EREF), Households Programme (initiative in Northern Ireland)				
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme	In discussion with BRE about adding as a pre-requisite for LCBP	Satisfies the requirements for Part P self certification and IEE Wiring Regs.	Satisfies the requirements for Part P self certification and IEE Wiring Regs.	No funding from manufacturers	The Mark Group are the exclusive installers of Windsave turbines. They train their own staff but no details were given.	Iskrawind only train their dealers and the training is specific to this product	SSE are the exclusive installers of Swift turbines	

General Interest Courses						
Organisation	Eclectic Energy Ltd	Low Impact Living Initiative	CAT	CAT	Scoraig Wind	Navitron
Technology eg. Solar, pv, etc	Micro-wind	Wind and solar-PV	Micro-wind	Micro-wind	Micro-wind	Micro-wind
Course Title	N/A	Wind and Solar Electricity	Wind Power	Domestic Wind Power Systems	Build your own wind turbine	Wind Turbine Course
Cost	N/A	£120 - £180	£275-£595 depending on wage	£175-£320 depending on wage	£480 + VAT at Womersleys Ltd; £350-£650 depending on wage at CAT.	
How developed are the materials – proposed/under development/signed off?	No course offered yet but Eclectic Energy mentor the installers.	Signed off	Signed off	Signed off	Signed off	Under development
Date/frequency of course		13 - 15 April 2007, 19 - 21 October 2007	19 - 23 March 2007	9-11 November 2007	18 - 24 February 2007 at Womersleys Ltd; 30 September - 5 October, 2007 at CAT.	Not available until early 2007.
Content eg. what is covered, to what depth and how (practical v theoretical)		Environmental benefits of wind generators and photovoltaic panels practical and economic applications and usage – how much can I expect to generate? planning permission health and safety issues sizing systems circuit design including cable sizes, connections, fuses and batteries inverters – converting to 240V AC practical sessions: erecting a wind generator; installing a photo-voltaic panel; making safe connections maintenance issues	Part 1 covers the basic requirements for choosing and installing a wind energy system. There will be a visit to a local wind farm. Part 2 consists of detailed workshops on the design of wind machines.	Introductory course. Sessions will cover wind energy, stand alone systems, siting of machines and grid-linked systems. Calculation of the power in the wind, stand alone wind systems, system siting and grid connection.	Participants will be led through the design and build stages, which will cover all the information needed to construct a small aerogenerator. Welding, metalwork, manufacture of blades from wood, electrical machine assembly, erection of towers, turbine testing.	Wind power potential, turbine types and their characteristics, overspeed protection, importance of site, turbine installation, battery based systems, heater based systems, grid connection.
Design issues						
Survey and siting			Y			
System sizing			Y		Practical, with briefing sessions	
System planning		Y				
Building regs – SAP & SBEM						
Structural design						
Electrical design		Y				Y
Control system design						
Monitoring systems						
Thermal system (heating or cooling)						
Integration with other RE systems						
Installation issues						
Site survey and selection						Y
Complete system installation or partial/component installation						Concrete foundations, raising the lower, balancing blades
Installation – company specific or generic						
Health & Safety		Y				
Grid connection					Y	Y
Integration with other systems						
Mounting on buildings					Y	
Controls						
Commissioning					Y	
Fault-finding and repair						
Maintenance		Y				
Who is the course aimed at?		General public	People thinking of buying or building their own system; those with a general interest in wind power.	For those interested in buying and installing an aerogenerator as well as for those with a general interest in the subject.	People who would like to build their own wind turbine.	
Length of course		2.5 days	4.5 days	2.5 days	5.5 days	
Author(s) if known	Pete Anderson, Eclectic Energy	LILI	Rob Gwillim (NEF), Katie Brown (CAT), Hugh Piggott (Scoraig Wind)	Not stated	Hugh Piggott, Scoraig Wind	Not known
Approved by eg. Trade body/govt		None	None	None	None	
How approved		N/A	N/A	N/A	N/A	
Delivered by (include full contact details) & be specific (eg Bedford College)	Eclectic Energy Ltd, Edwinstowe House, High Street, Edwinstowe, Nottinghamshire. NG21 9PR	LILI, Redfield Community, Winslow, Bucks. MK18 3LZ	Centre for Alternative Technology, Machynlleth, Powys. SY20 9AZ , courses@cat.org.uk,	Centre for Alternative Technology, Machynlleth, Powys. SY20 9AZ , courses@cat.org.uk,	Centre for Alternative Technology, Machynlleth, Powys. SY20 9AZ , courses@cat.org.uk,	Epogee Ltd, The Drey, Old Dixton Rd, Monmouth, NP25 3SQ
Tel	01623-821535	01296 714184	01654 705981	01654 705981	01654 705981	07866-852492
Website	<a href="http://www.eclectic-energy.co.uk">www.eclectic-energy.co.uk</a>	<a href="http://www.lowimpact.org">www.lowimpact.org</a>	<a href="http://www.cat.org.uk/courses">www.cat.org.uk/courses</a>	<a href="http://www.cat.org.uk/courses">www.cat.org.uk/courses</a>	<a href="http://www.cat.org.uk/courses">www.cat.org.uk/courses</a>	<a href="http://www.epogee.co.uk/">www.epogee.co.uk/</a>
Colleges					Womersleys Ltd, Walkley Lane, Heckmondwike, West Yorkshire. WF16 0PG	
Specialist training centres					01924-400651	
Manufacturers					<a href="http://www.womersleys.co.uk/acatalog/Building_Products_training_courses_7.html">www.womersleys.co.uk/acatalog/Building_Products_training_courses_7.html</a>	
Other						
Pre qualification eg. NVQ		No previous electrical knowledge required	Knowledge of electrical systems	Knowledge of electrical systems		
Output – certificate/ qualification			None	None	None	
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	D400 Stealth Gen wind turbine only					
Awarding body eg. BPEC		None	n/a	n/a	n/a	
Manufacturers selling products						
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme						

Organisation	Renewable Energy Installer Academy	Centre for Alternative Technology	Navitron	Dulas
Technology eg. Solar, pv, etc	Hydro	Hydro	Hydro	Hydro
Course Title		Hydro-electric Power Systems	Hydro Turbine Course	
Cost	Initially free due to subsidy from the EU INTERREG IIIA grant. Professional registration: ~£70.	£175 - £320	£175	
How developed are the materials – proposed/under development/signed off?	Under development: proposed for phase 2 of programme. Demand for course being assessed.	Signed off	Signed off	
Date/frequency of course	Not yet available. The course is still being developed.	26-28 October 2007	January & December 2007	No course yet
Content eg. what is covered, to what depth and how (practical v theoretical)	Installation of hydro systems: practical content.	Tour of CAT's hydro system. Governors and electrical equipment. Water supply and pipes Calculation of pipe losses; choice of pipe sizes and type; pipe fittings; leats; leaf traps; settling tanks; the hydram. Water Power The size of the resource; fluctuations in power; selecting a site; measurement of flow; estimates from maps and river authority data; calculations of power available; legalities; problems of autonomous electrical systems; costs; flooding; flow exceedance curves. Small water turbines Pelton, Turgo, Banki, propeller types; how they work and characteristics; matching the turbine to the site. Practical session. Measuring head and flow, calculating efficiency. Water wheels. Where they are useful; types of construction; design calculations; efficiency.	Hydro Facts Introduction to Water Power Uses for Hydro Types of Turbine and relative efficiencies / usage Terminology Difference between Reaction and Impulse Turbines How a draft tube works Assessing site suitability for hydro power Methods for measuring head Methods for measuring Flow Calculation of power available Choosing a suitable turbine Calculating pipeline losses Choosing the right pipeline Calculating electrical wire losses Installation Techniques Dam/Water Diversion Pipeline Water turbine/Generator Electrical Works Battery-based Systems Dedicated mains systems Combining Heating Systems Grid-connection Systems Potential Problems - Runaway, Flooding Planning and Permissions Grants	No course but training could be provided if there was sufficient demand.
Design issues				
Survey and siting		Y	Y	
System sizing		Y	Y	
System planning				
Building regs – SAP & SBEM				
Structural design		Y	Types of Turbine and relative efficiencies/usage, draft tubes	
Electrical design		Y	Y	
Control system design		Y		
Monitoring systems				
Thermal system (heating or cooling)				
Integration with other RE systems				
Installation issues				
Site survey and selection		Y		
Complete system installation or partial/component installation				
Installation – company specific or generic				
Health & Safety				
Grid connection				
Integration with other systems				
Mounting on buildings				
Controls				
Commissioning				
Fault-finding and repair				
Maintenance				
Who is the course aimed at?	Technicians	Potential installers	Landowners and DIY enthusiasts	
Length of course		2.5 days	1 day	
Author(s) if known	Renewable Energy Installer Academy			
Approved by eg. Trade body/govt		None	None	
How approved		n/a	n/a	
Delivered by (include full contact details) & be specific (eg Bedford College)	North West Institute, Strand Road, Londonderry. BT48 7AL	Centre for Alternative Technology, Machynlleth, Powys. SY20 9AZ , courses@cat.org.uk,	Epogee Ltd, The Drey, Old Dixon Rd, Monmouth, NP25 3SQ	Dulas Ltd, Unit 1, Dyfi Eco Park, Machynlleth, Powys. SY20 8AX
Tel	028-7127 6000	01654 705981	07866-852492	01654 705000
Website	<a href="http://www.reinstalleracademy.org">www.reinstalleracademy.org</a>	<a href="http://www.cat.org.uk">www.cat.org.uk</a>	<a href="http://www.epogee.co.uk">www.epogee.co.uk</a>	<a href="http://www.renewable-resources.com">www.renewable-resources.com</a>
Colleges				
Specialist training centres				
Manufacturers				
Other				
Pre qualification eg. NVQ		None		
Output – certificate/ qualification				
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	Not restricted to particular product but would expect course participants to get manufacturer specific training.	None	Not specific to any manufacturer.	
Awarding body eg. BPEC	C&G likely.	N/A	N/A	
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme	Relevant to Environment and Renewable Energy Fund (EREF), Households Programme (initiative in Northern Ireland).		Would not qualify an installer under LCBP.	
Manufacturers selling products	No funding from manufacturers.			

Organisation	Installer Courses – Generic				Installer Courses – Manufacturer Specific			General Interest Courses		
	BSRIA	WM Training	BPEC	Logic Certification	Worcester Bosch	Ice Energy	Geothermal International Ltd	EarthEnergy Ltd	Navitron	CAT
Technology eg. Solar, pv, etc	Heat Pumps	GSHP	Heat pumps	GSHP	GSHP		GSHP	GSHP	Heat pumps	Heat pumps
Course Title	EU Heat Pump Installer		Heat Pumps	Ground source heat pumps				Ground source heat pumps	Heat Pumps	Heat Pumps
Cost	£450 + VAT		Currently free due to subsidy from the EU INTERREG IIIA grant. Professional registration: £70						tba	£175- £320
How developed are the materials – proposed/under development/signed off?	Signed off	Under development	Signed off	Under development	Signed off	Signed off	Under development	Signed off	Under development	
Date/frequency of course	tba	Late March 2007	3 to 4 times / year.		Approximately monthly.		March 07, as required	Once a quarter	Not available until early 2007.	12 - 14 October 2007
Content eg. what is covered, to what depth and how (practical v theoretical)	Marketing Costs of the system Environmental relevance of heat pumps Geology and climate Energy efficient buildings Operating principle The heat pump cycle Heat distribution and hydraulic system Heat sources Operation mode and control Site assessments Heat pump installation Basic electrical engineering System checks Customer education and warranty Maintenance		System design, generic installation of heat pumps and health and safety. Based on the EU Certificate.	Response awaited.	COP Dimensioning Components in the Heat Pump Hydraulics for collector systems (off-site) Installing, air testing and pressurising Collector System (off-site) Hydraulics for heating systems Control unit functions Practical exercise Alarm functions of the heat pump Trouble shooting exercise	Response awaited.	Two or three courses are being developed: 1. Basic installer training, for experienced plumbers, lasting 2-3 days 2. Commissioning and trouble-shooting, lasting 2-3 days 3. Ground loop design - some way off being available.	System design: building heat loss/ distribution system + heat pump selection + ground loop sizing. running cost issues COPs/SPFs Carbon issues heat pump basics closed loop ground source heat pumps typical types of installation typical (suitable) ground source heat pumps typical configurations for heating and hot water the operation of secondary heat sources the need for additional kW (for bi-valent heating) vs the need for additional temperature (for some DHW systems) unsuitable applications UK limitations – eg single phase issues, DHW legislation, underfloor zoning issues and buffer tank requirements Slinky installation – but not borehole installation Partner requirements and method of operation between ourselves	Heatpumps and Renewable Energy Ground Source / Air Source Heat pumps Advantages of Heatpumps as a heat source Disadvantages Tying-in Heatpumps with other Renewable Energy Installation Ground Source pipe Well-water Stream/River/Sea Installing the heatpump Delivering the heated water Commissioning the system: Priming the water Circuits Controller settings Performance/Efficiency Contribution of heat pumps	Response awaited.
Design issues										
Survey and siting			Y					N		
System sizing			Y					N		
System planning			Y					N		
Building regs – SAP & SBEM			Y					N		
Structural design								N		
Electrical design			Y					N		
Control system design			Y					N		
Monitoring systems			Y					N		
Thermal system (heating or cooling)			Y					N	Y	
Integration with other RE systems			Y					N	Y	
Installation issues										
Site survey and selection			Y					Y		
Complete system installation or partial/component			Y						General details on installation	
Installation – company specific or generic	Generic	Generic to all manufacturers	Generic			Specific to Ice Energy Products		Generic installation	Generic	
Health and Safety			Y							
Grid connection			Y							
Integration with other systems			Y							
Controls	Y		Y		Y				Y	
Commissioning	Y		Y		Y				Y	
Fault-finding and repair	Y		Y		Y					
Maintenance	Y		Y							
Who is the course aimed at?	Potential installers of heat pumps	Plumbers or electricians	Plumbers and other installers		Plumbers or electricians	Electricians and plumbers who want to add GSHP installation	Electricians and plumbers who want to add GSHP installation		Interested individuals	
Length of course	5 days	4 days	5 days		2 days	1 day	2-3 days	2 days	1 day	3 days
Author(s) if known	Reg Brown (BSRIA) with input from 8 European countries.	Dimplex / WM Training			Worcester Bosch	Ice Energy	Geothermal International Ltd			
Approved by eg. Trade body/govt	BSRIA		BPEC						Not approved	
How approved										
Delivered by (include full contact details) & be specific (eg Bedford College)	The Grimsby Institute of Further & Higher Education, Nuns Corner, Grimsby, Lincs. DN34 5BQ	Glen Dimplex UK Ltd, Millbrook House, Grange Drive, Hedge End, Southampton. SO30 2DF	Diane Dillon diane.dillon@actionrenewables.co.uk	Logic Certification Ltd, Unit 2, 1 Rowdell Road, Northolt, Middlesex. UB5 5QR	BBT Thermotechnology, Cotswold Way, Warndon, Worcester. WR4 9SW	Ice Energy Heat Pumps Ltd, Eynsham, Oxfordshire. OX29 4TH	Geothermal International Ltd, Spencer Court, 141-143 Albany Road, Coventry. CV5 6ND	EarthEnergy Ltd, Falmouth Business Park, Falmouth, Cornwall. TR11 4SZ	Epogee Ltd, The Drey, Old Dixton Rd, Monmouth, NP25 3SQ	Centre for Alternative Technology, Machynlleth, Powys. SY20 9AZ courses@cat.org.uk
Tel	01472-311222	0845 6005111	028 9068 5069	020 8839 2439	01905-752526	01865 882202	024-7667 3131	01326-310650	07866-852492	01654 705981
Website	<a href="http://www.grimsby.ac.uk">www.grimsby.ac.uk</a>	<a href="http://www.dimplex.co.uk">www.dimplex.co.uk</a>	<a href="http://www.reinstalleracademy.org/coursecontent.htm">www.reinstalleracademy.org/coursecontent.htm</a>	<a href="http://www.logiccertification.com">www.logiccertification.com</a>	<a href="http://www.worcester-bosch.co.uk/">www.worcester-bosch.co.uk/</a>	<a href="http://www.iceenergy.co.uk">www.iceenergy.co.uk</a>	<a href="http://www.geoheat.co.uk">www.geoheat.co.uk</a>	<a href="http://www.geoscience.co.uk">www.geoscience.co.uk</a>	<a href="http://www.epogee.co.uk/heatpump.htm">www.epogee.co.uk/heatpump.htm</a>	<a href="http://www.cat.org.uk/courses">www.cat.org.uk/courses</a>
Colleges			Dundaik Institute of Technology, Dublin Road, Dundaik, Co. Louth							
Specialist training centres	Plan to roll out to CITB training centres		00 353 42 937 0200							
Manufacturers			Lisburn Inst, 39 Castle Street Lisburn BT27 4SU							
Other										
Pre qualification eg. NVQ	NVQ level 2 in HVAC or electrical subjects				At least 12 months' experience in the construction or plumbing industry	Qualified plumbers	Experienced plumber	Experienced heating contractors		
Output – certificate/ qualification	Plan to award CITB certificate. Subsequently input to NVQ system	Expect certification from Elecsa. Possibly also from Logic.			Certificate of attendance only	Certificate of attendance only	To be decided	None	Certificate of attendance	
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	All products	All manufacturers	Not specific to any manufacturer		Covers Worcester Bosch heat pumps only.		Specific to Geothermal products		Not specific to any manufacturer	
Awarding body eg. BPEC	tba		BPEC		n/a	n/a	To be decided	n/a	n/a	
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme			Satisfies the regs of Action Renewables. Will tie in with Competent Persons Regulations		Would not satisfy requirements to be an approved installer under LCBP		Will seek approval under LCBP, when route has been clarified	Hopefully will be LBCP approved.	Would not qualify an installer under LCBP	
Manufacturers selling products								Calorex, Viessmann and Dimplex		

Organisation	Mid Career College
Technology eg. Solar, pv, etc	CHP
Course Title	An introduction to Combined Heat & Power
Cost	£282
How developed are the materials – proposed/under development/signed off?	Signed off
Date/frequency of course	01.02.2007
Content eg. what is covered, to what depth and how (practical v theoretical)	Introduction. The importance of energy distribution and supply. Reducing the environmental impact. What is CHP? The various types of equipment including spark ignition. Stirling Engines, turbines – conventional and micro. Residential, commercial and industrial systems discussed. Energy Supply Strategy. Conventional supply versus CHP. The effects of Climate Change Levy. The benefits of CHP. CHP Design Parameters. Selection process and options. Basis of design including design philosophy, market conditions and demand profiles. Installation parameters such as utility connections and G59, NETA and other regulatory issues. Investment Appraisal. The costs of CHP both capital and operational. Benefit analysis including environmental.
Design issues	
Survey and siting	Y – intro
System sizing	Y – intro
System planning	Y – intro
Building regs – SAP & SBEM	N
Structural design	N
Electrical design	Y
Control system design	Y
Monitoring systems	Y
Thermal system (heating or cooling)	Y
Integration with other RE systems	N
Installation issues	
Site survey and selection	
Complete system installation or partial/component installation	N
Installation – company specific or generic	N
Health & Safety	
Grid connection	Y
Integration with other systems	
Controls	
Commissioning	
Fault-finding and repair	
Maintenance	
Who is the course aimed at?	Engineers who wish to gain an insight into CHP
Length of course	1 day
Author(s) if known	Mid Career College
Approved by eg. Trade body/govt	Mid Career College – a leading provider of Continuing Professional Development Education & Training, concentrating on the Building Services Industry, Facilities Management and Construction
How approved	
Delivered by (include full contact details) & be specific (eg Bedford College)	Michael Jones, presenter: Dr Alan Sherratt, Course Programme Director Mid Career College, PO Box 20, Cambridge, CB1 5DG, UK email: <a href="mailto:courses@mid-career-college.ac.uk">courses@mid-career-college.ac.uk</a>
Tel	01223 880016
Website	<a href="http://www.mid-career.college.ac.uk">www.mid-career.college.ac.uk</a>
Colleges	
Specialist training centres	
Manufacturers	
Other	
Pre qualification eg. NVQ	
Output – certificate/ qualification	Certificate of attendance
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	
Awarding body eg. BPEC	
Manufacturers selling products	
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme	

	Installer Courses – Generic	CPD Course	General Interest Courses	
Organisation	Cranfield University	South Yorkshire Energy Centre	Centre for Alternative Energy	Low Impact Living Initiative
Technology eg. Solar, pv, etc	Rainwater harvesting	Rainwater harvesting	Rainwater harvesting	Rainwater harvesting
Course Title	Conservation and Reuse	Water use and conservation in domestic buildings	Water treatment, conservation and recycling	Sustainable water and sewage
Cost	£1295 – standard/ £1195 professional/trade association discount/ £1145 – multiple bookings		£320/230/175	£180/150/120
How developed are the materials – proposed/under development/signed off?	Signed off	Being piloted	Signed off	Signed off
Date/frequency of course	Cancelled in 2007 but hope to run in the future		March 23-25 2007	May 11-13 2007
Content eg. what is covered, to what depth and how (practical v theoretical)	Conceptual models of sustainable resource management, water recycling and <b>rainwater harvesting</b> , water and energy efficiency analysis, solids recovery and disposal, water demand forecasting, water demand management mechanisms, leakage management, environmental impact assessment	Availability and use of water efficient and water conservation appliances in refurbishment and new build, including sanitary goods, taps and showers, <b>rainwater harvesting</b> , grey water systems, compost toilets, improving existing appliances	Water efficiency, finding water, cleaning water, moving and storing water, <b>rainwater</b> and grey water – why and how? Private supply case studies	Sewage treatment, septic tanks, water efficiency, <b>rainwater harvesting</b> and grey water recycling
Design issues				
Survey and siting	N			
System sizing	Y			
System planning	Y			
Building regs – SAP & SBEM	N			
Structural design	N			
Electrical design	N			
Control system design	N			
Monitoring systems	N			
Thermal system (heating or cooling)	N			
Integration with other RE systems	N			
Installation issues				
Site survey and selection	N			
Complete system installation or partial/component installation	N			
Installation – company specific or generic	N			
Health & Safety	N			
Grid connection	N			
Integration with other systems	N			
Controls	N			
Commissioning	N			
Fault-finding and repair	N			
Maintenance	N			
Who is the course aimed at?		Being piloted as CPD session for construction industry	People interested in installing their own private water supplies, either to supplement an existing mains water supply or to meet entire needs	The course is about the collection, conservation and recycling of water, as well as sustainable ways of dealing with sewage.
Length of course	5 days	Half day	Weekend	Weekend
Author(s) if known	Cranfield University	Nick Parsons, South Yorkshire Energy Centre		Nick Grant, of Elemental Solutions
Approved by eg. Trade body/govt	Accredited for CIWEM CPD	In discussion re accreditation		
How approved				
Delivered by (include full contact details) & be specific (eg Bedford College)	Cranfield University, School of Applied Sciences, Cranfield Campus, Cranfield, Beds, MK43 0AL email: <a href="mailto:shortcourse@cranfield.ac.uk">shortcourse@cranfield.ac.uk</a>	Nick Parsons, South Yorkshire Energy Centre, c/o Heeley City Farm, Richards Road, Sheffield, S2 3DT email: <a href="mailto:infor@syect.co.uk">infor@syect.co.uk</a>	Centre for Alternative Technology, Machynlleth, Powys, SY20 9AZ email: <a href="mailto:courses@cat.org.uk">courses@cat.org.uk</a>	Low Impact Living Initiative, Redfield Community Winslow, Bucks, MK18 3LZ email: <a href="mailto:lili@lowimpact.org">lili@lowimpact.org</a>
Tel	01234 754176	0114 2584574	01654 705981	01296 714184
Website	<a href="http://www.cranfield.ac.uk/sas/water/cdp/reuse.htm">www.cranfield.ac.uk/sas/water/cdp/reuse.htm</a>	<a href="http://www.syect.co.uk">www.syect.co.uk</a>	<a href="http://www.cat.org.uk">www.cat.org.uk</a>	<a href="http://www.lowimpact.org">www.lowimpact.org</a>
Colleges				
Specialist training centres				
Manufacturers				
Other				
Pre qualification eg. NVQ	None			
Output – certificate/ qualification	CPD certificate?	Being piloted as a CPD session for construction industry		
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	None			
Awarding body eg. BPEC	Chartered Institution of Water and Environmental Management	In discussion re accreditation		
Manufacturers selling products				
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme				

	Installer Courses – Generic	CPD Course	General Interest Courses	
Organisation	Cranfield University	South Yorkshire Energy Centre	Centre for Alternative Energy	Low Impact Living Initiative
Technology eg. Solar, pv, etc	Grey water recycling	Rainwater harvesting	Rainwater harvesting	Rainwater harvesting
Course Title	Conservation and Reuse	Water use and conservation in domestic buildings	Water treatment, conservation and recycling	Sustainable water and sewage
Cost	£1295 – standard/ £1195 professional/trade association discount/ £1145 – multiple bookings		£320/230/175	£180/150/120
How developed are the materials – proposed/under development/signed off?	Signed off	Being piloted	Signed off	Signed off
Date/frequency of course	Cancelled in 2007 but hope to run in the future		March 23-25 2007	May 11-13 2007
Content eg. what is covered, to what depth and how (practical v theoretical)	Conceptual models of sustainable resource management, <b>water recycling</b> and rainwater harvesting, water and energy efficiency analysis, solids recovery and disposal, water demand forecasting, water demand management mechanisms, leakage management, environmental impact assessment	Availability and use of water efficient and water conservation appliances in refurbishment and new build, including sanitary goods, taps and showers, rainwater harvesting, <b>grey water systems</b> , compost toilets, improving existing appliances	Water efficiency, finding water, cleaning water, moving and storing water, rainwater and <b>grey water</b> – why and how? Private supply case studies	Sewage treatment, septic tanks, water efficiency, rainwater harvesting and <b>grey water recycling</b>
Design issues				
Survey and siting	N			
System sizing	Y			
System planning	Y			
Building regs – SAP & SBEM	N			
Structural design	N			
Electrical design	N			
Control system design	N			
Monitoring systems	N			
Thermal system (heating or cooling)	N			
Integration with other RE systems	N			
Installation issues				
Site survey and selection	N			
Complete system installation or partial/component installation	N			
Installation – company specific or generic	N			
Health & Safety	N			
Grid connection	N			
Integration with other systems	N			
Controls	N			
Commissioning	N			
Fault-finding and repair	N			
Maintenance	N			
Who is the course aimed at?		Being piloted as CPD session for construction industry	People interested in installing their own private water supplies, either to supplement an existing mains water supply or to meet entire needs	The course is about the collection, conservation and recycling of water, as well as sustainable ways of dealing with sewage.
Length of course	5 days	Half day	Weekend	Weekend
Author(s) if known	Cranfield University	Nick Parsons, South Yorkshire Energy Centre		Nick Grant, of Elemental Solutions
Approved by eg. Trade body/govt	Accredited for CIWEM CPD	In discussion re accreditation		
How approved				
Delivered by (include full contact details) & be specific (eg Bedford College)	Cranfield University, School of Applied Sciences, Cranfield Campus, Cranfield, Beds, MK43 0AL email: <a href="mailto:shortcourse@cranfield.ac.uk">shortcourse@cranfield.ac.uk</a>	Nick Parsons, South Yorkshire Energy Centre, c/o Heeley City Farm, Richards Road, Sheffield, S2 3DT email: <a href="mailto:infor@syect.co.uk">infor@syect.co.uk</a>	Centre for Alternative Technology, Machynlleth, Powys, SY20 9AZ email: <a href="mailto:courses@cat.org.uk">courses@cat.org.uk</a>	Low Impact Living Initiative, Redfield Community Winslow, Bucks, MK18 3LZ email: <a href="mailto:lili@lowimpact.org">lili@lowimpact.org</a>
Tel	01234 754176	0114 2584574	01654 705981	01296 714184
Website	<a href="http://www.cranfield.ac.uk/sas/water/cdp/reuse.htm">www.cranfield.ac.uk/sas/water/cdp/reuse.htm</a>	<a href="http://www.syect.co.uk">www.syect.co.uk</a>	<a href="http://www.cat.org.uk">www.cat.org.uk</a>	<a href="http://www.lowimpact.org">www.lowimpact.org</a>
Colleges				
Specialist training centres				
Manufacturers				
Other				
Pre qualification eg. NVQ	None			
Output – certificate/ qualification	CPD certificate?	Being piloted as a CPD session for construction industry		
Restriction on products/ applications eg. only for a certain manufacturer or only for indirect solar and not for direct solar	None			
Awarding body eg. BPEC	Chartered Institution of Water and Environmental Management	In discussion re accreditation		
Manufacturers selling products				
Relevance to LCBP, Microgen Acc, Building Regs eg. used as a condition of registration on the scheme				