

Biomass Feasibility Study: Additional Scope

March 2011

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Executive Summary

Conclusion

There is a good opportunity for the development of a high profile training capability concerning renewable energy to be located in East Renfrewshire and delivered by Reid Kerr College through a new East Renfrewshire College and the existing WRTC facility at Rouken Glen.

Recommendation

The study recommends the concept of an innovative **Sustainable Energy Institute** which will aim to become a unique European if not International Centre of Excellence in the provision of **Sustainable Energy Planning**. The Institute's **Planning Centre** will deliver courses for the Public Sector throughout **Scotland, the UK and Europe**, to introduce them to the concept of Sustainable Energy Planning (SEP), and explain how this should be done. It will show how to integrate SEP with all Public Sector functions carried out by Planners, Environment Protection Agencies, Regulation and Policy Specialists, Economic Development departments, and Health & Safety regulators. At the same time, the Institute's **Skills Centre** will provide a set of courses for the local labour market in renewable energy training for electricians, plumbers, joiners, lawyers, etc. These will be comparable with other renewable energy skills courses available around Scotland.

Summary

As an extension to the existing Biomass Feasibility Study, IRRI has conducted a desktop study to assess the potential for renewable energy training and skills development in East Renfrewshire. IRRI has been asked to look at the requirement for trained personnel to work in the developing renewable energy sector in East Renfrewshire, and consider how the training provision within East Renfrewshire can be upgraded to meet this demand via the existing WRTC and the planned East Renfrewshire College. In particular, IRRI has been asked whether the provision of training could be an opportunity to establish East Renfrewshire as a leading centre of excellence in the renewable energy sector, and therefore be a demonstration of its pre-eminence in renewables. This report summarises findings of the Biomass Feasibility Study conducted by IRRI.

Wind energy is the main renewable energy technology in East Renfrewshire, with Whitelee, Europe's largest onshore wind farm, situated on Eaglesham Moor. East Renfrewshire is also host to numerous smaller wind farms, including the National Wind Turbine Testing Site, and many more are in various stages of planning. A landfill gas control compound is in operation between East Ayrshire and East

Renfrewshire and an application has recently been submitted for Europe's largest Energy from Waste plant to be built in Newton Mearns. If the application is accepted, East Renfrewshire will host two European scale renewable energy developments. Despite these wind and energy from waste developments there are large gaps available for the development of alternative renewable energy technologies in the East Renfrewshire's renewable energy market.

There are no certified renewable energy installers for based within East Renfrewshire. All trade is currently passed to certified installers out with East Renfrewshire who provide installation services within the region. There is also a notable lack of certified biomass installers within the greater Glasgow region.

Advice on renewable energy technologies is provided locally by ERCET, Go Greener and the managing Local Action Groups (LAGs) of LEADER. National services such as the Energy Saving Scotland advice centre, Community Energy Scotland and the Carbon Trust also offer general advice on renewable energy. There is a lack of advisory services for specific renewable technologies in the East Renfrewshire area.

Unemployment rates in Barrhead are significantly higher than those of East Renfrewshire, Scotland and the UK. Additionally, the average member of the Barrhead working age group population has fewer qualifications than in the rest of East Renfrewshire, Scotland and the UK. On average, the East Renfrewshire working age group population is more qualified and suffers less unemployment in comparison to that of Scotland and the UK. However, when considering the Barrhead labour market it is apparent that statistics for East Renfrewshire poorly represent Barrhead.

Although East Renfrewshire is well served by renewable energy courses across the Scottish central belt, there are no courses within the local area. This situation presents a gap in the market for a college to cater to the needs of East Renfrewshire. Given that East Renfrewshire is host to numerous renewable energy projects operating on both a national and European scale, it is an opportunistic location to develop the college as a specialist centre for renewable energy technology.

As hosts of Europe's largest onshore wind farm, East Renfrewshire is taking important steps to meet Scotland's renewable energy targets. Scotland is ambitious in its renewable energy targets set out in The [Climate Change \(Scotland\) Act 2009](#). To achieve these targets, Scotland is actively developing renewable energy through a variety of large-scale projects. Within Scotland, there is currently 4405.13MW of installed renewable energy capacity and a further 1440.933MW under construction. Wind Energy accounted for the majority of renewable energy generation with 2561.91MW and there is a further 1069.94MW under construction.

Based on current developments in the UK and concerns over a skills crisis in renewable energy, there is great potential for a Renewable Energy Centre of Excellence to be developed in East Renfrewshire.

Biomass Feasibility Study: Additional Scope

Final Report

1. Background

As an extension to the existing Biomass Feasibility Study, IRRI has been asked to look at the requirement for trained personnel to work in the developing renewable energy sector in East Renfrewshire, and consider how the training provision within East Renfrewshire can be upgraded to meet this demand via the existing WRTC and the planned East Renfrewshire College. In particular, IRRI has been asked whether the provision of training could be an opportunity to establish East Renfrewshire as a leading centre of excellence in the renewable energy sector, and therefore be a demonstration of its pre-eminence in renewables. It is notable that there are a number of high profile activities relating to renewable energy already taking place in the area, which include plans for dramatic developments in both wind energy and also in biomass. This has given rise to observation that insufficient training provision currently exists in the region and the thought that renewable energy offers the grounds for exciting initiatives in training and skills development, and these could be pioneered through an existing training facility (WRTC) and a proposed new College (East Renfrewshire College).

2. Objectives

The Objectives of the study were stated as follows:

This study will explore the options available for renewable energy development within a new East Renfrewshire College, linked with WRTC, in considering:

- a) how the College project could tap into new renewable developments and develop as a knowledge base/centre of excellence in training for renewable energies
- b) how the WRTC could be developed to contribute to renewables training activity in East Renfrewshire and/or support training developments.

The study will consider the framework of Learning, Employability and Enterprise in the region, and explore the gaps in relation to the existing training provision within the region and the anticipated labour market requirements. Desk research was used to gather the majority of information required, using all the information available from the Council and ERCET, as well as published data.

A further thought was added to the scope. There is an opportunity to meet a further objective not stated within the original brief. The seeds of a Centre of Excellence, a demonstration site or sites that place East Renfrewshire in a leading role within Scotland and further across Europe.

Market Development

How developed is the renewables sector in the region, by different renewable sources?

The penetration of renewable energy in East Renfrewshire is weighted on select renewable technologies. The area's main focus is wind power, with Europe's largest onshore wind farm situated on Eaglesham Moor, a developing extension in East Kingswell, and numerous smaller developments in plans in the area.

Wind Power

Whitelee Wind Farm: Situated on Eaglesham Moor, East Renfrewshire, Whitelee Wind Farm is Europe's largest onshore wind farm. The wind farm consists of 149 turbines, producing 322MW of electricity, enough to power 180,000 homes per year. Alongside renewable energy generation, Whitelee wind farm brings additional social benefit through its popular visitor centre and outdoor pursuits.

Whitelee Wind Farm is owned by Scottish Power Renewables, part of Iberdrola Renovables, the largest global renewable energy company. Iberdrola Renovables operate in over 20 countries, generating in excess of 10,000 MW of electricity per year and powering over 5 million houses. The planning and design of Whitelee takes a holistic approach, working with the natural environment and creating a space to engage the public in nature and the future of renewable energy. A major focus of the Whitelee Wind Farm Development was the £2 million visitor and learning centre which offers an insight into the developing industry, managed by the Glasgow Science Centre. This has proved to be a huge success, with over 120,000 people visiting in the past 12 months.

National Wind Turbine Test Site: Innovative engineering developers, TUV NEL, own the National Wind Turbine Test Site which is located on Myres Hill, Eaglesham, East Renfrewshire.

Ardoch and Over Enoch Wind Farm: Ardoch and Over Enoch wind farm, was consented in March 2004, consisting of 5 wind turbines with a 6.5MW capacity, enough electricity to power the equivalent of 3634 homes over the course of a year¹. The wind farm was developed by RWE Npower Renewables.

Landfill Gas

Craignaught Landfill Gas Control and Utilisation Compound: Craignaught landfill site is located in the post-operational Craignaught Quarry which lies between Dunlop, East Ayrshire, and Neilston, East Renfrewshire. The site uses energy to waste practices by capturing the methane and carbon dioxide produced by biodegrading landfill, and using it as an energy resource. This has two main benefits: reducing greenhouse gas emissions, and preventing offsite gas migration to nearby buildings. The landfill site is capable of generating 2.41MW.

¹ This calculation is based on a capacity factor of 30% and an average household consumption of 4,700 kWh/year (RenewableUK, 2010).

Air Source Heat Pump

The Waste Recycling Technology Centre is situated in Rouken Glen Park, East Renfrewshire. The centre uses an air source heat pump to generate heat for the building.

Solar Hot Water

The Waste Recycling Technology Centre, situated in Rouken Glen Park, uses solar hot water technology to generate hot water for use within the building.

Biodiesel

The Waste Recycling Technology Centre, situated in Rouken Glen Park, utilises waste vegetable oil from local schools to run a biodiesel project which fuels a fleet of vehicles used by the centre.

What are the anticipated developments to the renewable energy sector in the coming years?

Wind Power

Whitelee Wind Farm and East Kingswell extension: Whitelee Wind Farm is currently undergoing expansion, with plans underway for an additional 75 turbines in East Kingswell, Ayrshire. This will produce an extra 217MW of electricity per year, powering a further 124,000 homes.

Harelaw Renewable Energy Park: Plans are underway for Harelaw Renewable Energy Park which will be situated on the border between East Renfrewshire and East Ayrshire. The Park will comprise of 59 wind turbines with a maximum capacity of 2MW, up to 0.5 acres of photovoltaic cell coverage with a maximum capacity of 150 watts, and a small scale hydro-electric power station capable of generating up to 1 MW.
Middleton Wind Farm: In June 2009, East Renfrewshire Council approved a planning application for a wind farm near Newton Mearns submitted by RWE npower renewables. The wind farm will comprise 6 wind turbines and have 15MW capacity.

Moorhouse Wind Farm: A planning application was submitted to East Renfrewshire in April 2010 to build a 19 turbine wind farm next to the Whitelee wind farm site in East Renfrewshire. The wind farm would have a 40MW capacity.

Neilston Community Wind Farm: Neilston Community Wind Farm is unique joint venture between Carbon Free Developments Ltd and the Neilston Development Trust, approved in early 2011 by East Renfrewshire Council. The project is the first of its type in Scotland, utilising the skills of both a private developer and an established community group. The joint nature of the project involves Carbon Free Developments Ltd providing the capital for the project development process, whilst Neilston Development Trust seeks the communities support and covers a portion of the project costs. The wind farm is planned to have 4 turbines and aims to be operational by late 2012.

Energy from Waste

Newton Mearns Recycling Village: Lifetime Recycling Village, an organisation committed to building a sustainable zero waste future for Scotland, is currently in the early stages of planning a zero carbon recycling village in Newton Mearns, East Renfrewshire. The plans involve a £640 million waste plant; the biggest recycling and energy-from-waste facility in Europe. If successful, the plant would be fully operating by 2014 generating in excess of 100 MW of electricity, enough energy to power over 100,000 homes and would also create over 700 job openings in East Renfrewshire.

The plans are based on an existing energy park built by Green Energy Parks, which opened in Peterborough in 2009. The plant would utilise optical sorting technology and plasma gasification and vitrification. Optical sorting technology would be used to separate and remove any waste which can be re-used or recycled. Any remaining waste would be subjected to plasma gasification and vitrification. This process retrieves any energy stored in organic biomass, releasing it as biogas which can then be fed back to the main combustion unit and used as fuel. Any inorganic waste is vitrified, significantly reducing the volume of the ash, immobilizing any toxins or pollutants and neutralising acids. The vitrified waste is then suitable to be used as a construction material. Combined with the biogas, latent heat extracted from the hot ash is sufficient to fuel the plasma gasification and vitrification process, resulting in a closed loop zero carbon system.

The current status of this project is pending as Lifetime Recycling Village have recently launched a pre-application community consultation. Once completed, this will be followed by a planning application to the East Renfrewshire Council in spring 2011.

Sustainable Developments

Dams to Darnley Country Park: East Renfrewshire County Council and Glasgow City Council are currently working together to develop Scotland's newest country park. Dams to Darnley Country Park, situated between Barrhead, Darnley and Newton Mearns, covers 1350 acres of land. The park hosts a variety of wildlife due to its diverse landscape comprising of open water, wetland and burn, woodland, grassland and scrub. Given this natural diversity, Dams to Darnley has potential to be a rich recreational, environmental and educational resource.

Although still in early stages of development, there has been great progress in the development of the park to date. Improvements and repairs have been made to the existing infrastructure, such as stone walls, signs, benches, paths and entrance repairs. A park ranger service runs a regular programme of walks, events and activities to engage the local community with the park, and an environmental education programme has also been established. The most recent development is the link forged between the Country Park and the East Renfrewshire Waste Recycling Technology Centre which offers Rural Skills training however there are not any existing plans to incorporate renewable energy training into the park developments.

The current infrastructure of the park is under constant development and improvement however future plans involve developing links between paths and residential areas, and creating purpose built car parks to improve the park's accessibility.

Urban Sports Village: The Urban Sports Village is part of the East Renfrewshire Council Local Tourism Strategy and Action Plan. The development is planned for Pollok Ryat, East Renfrewshire and aims to be a unique facility offering water sports and outdoor pursuits, paralleling the outdoor activity status of Fort William. In the 'Local Tourism Strategy and Action Plan 2008-2012'², Visit Scotland and East Renfrewshire Council aims to boost East Renfrewshire's tourism by focusing on eco and green tourism. Although the Urban Sports Village is not yet in development, installation of renewable energy technologies could be suggested in the future.

In summary, the current and pending renewable energy developments in East Renfrewshire offer numerous job openings in the near future. It is important to note however, that required skills will vary depending on the scale of the project. Large developments such as Whitelee Wind Farm are classified as 'heavy industry' and will require engineering and construction skills whereas smaller developments such as community wind farms and solar PV installations will require skills that are specifically focused on microgeneration. In addition to renewable energy developments, Dams to Darnley Country Park and Urban Sports Village are both developments which have the potential to involve renewable energy in the future in alignment with their sustainable aims and beliefs.

3. Available Resource

How readily available within the region are qualified renewable energy engineers and installers, and for what renewable energy source?

To qualify for UK government renewable energy schemes, such as Feed-in-Tariffs and the Renewable Heat Incentive, it is necessary that renewable energy installations are installed by a certified installer.

Few qualified renewable energy installers are based in the greater Glasgow area and none within East Renfrewshire itself. As shown in the table below, 10.6 % of solar thermal, 8.3% of solar photovoltaic, 23.5% wind and 22.2% of heat-pump MCS certified installers in Scotland are currently located in the greater Glasgow region.

It is notable that no biomass MCS certified installers are based in the greater Glasgow area; the closest MCS certified biomass installer is located in West Lothian. The demand for qualified renewable energy installers within the region is therefore being met by installers who have been trained outside the region and are based outside the region.

Table showing MCS certified installers based in the greater Glasgow area³

² East Renfrewshire Council 'Local Tourism Strategy and Action Plan 2008-2012' [online] Available at <<http://www.eastrenfrewshire.gov.uk/tourismstrategy.pdf>> [Accessed on 8 March 2011]

³ Adapted from Community Energy Scotland's 'Scottish Installer List as at 02-06-10' [online] <<http://www.communityenergyscotland.org.uk/userfiles/file/Accredited%20Installers/Scottish%20Installer%20List%20as%20at%2002-06-10.pdf>> [Accessed 24 March 2010] Appendix I

RE Technology	Company	Region
Solar Thermal Installers		
	Absolute Solar & Wind Ltd	Glasgow
	Alexander J Cunningham Ltd/a William Skinner & Son	Ayrshire
	Ecoliving Ltd	Lanarkshire
	Novadyne	Inverclyde
	Ventus Green Energy Ltd	East Ayrshire
Solar PV Installers		
	Absolute Solar & Wind Ltd	Glasgow
	Solar & Wind Applications Ltd	Ayrshire
Wind Installers		
	Gaia-Wind Ltd	Glasgow
	Proven Energy Ltd	East Ayrshire
	Solar & Wind Applications Ltd	Ayrshire
	Ventus Green Energy Ltd	East Ayrshire
Heat Pump Installers		
	Anderson Floorwarming Ltd	Lanarkshire
	Curtis Heating & Energy Solutions Ltd	Lanarkshire
	Ecoliving Ltd	Lanarkshire
	Fusion Mechanical Services Ltd	Lanarkshire
	MMAXX Underfloor Heating Ltd	Glasgow
	Renewable Resources Ltd	Lanarkshire
	Solar & Wind Applications Ltd	Ayrshire
	Sustainable Earth Ltd	South Lanarkshire

How readily available within the region are advisory services, and for what renewable energy source?

Renewable Energy advisory services are available in East Renfrewshire, however it is not clear to what extent these are used. ERCET currently runs a CCF funded Powerdown project and Community Energy Scotland work in the region, although there are not many projects.

Local Advisory Services

East Renfrewshire Community Enterprise Trust (ERCET) is a Community Interest Company (CIC) that aims to advance economic development across East Renfrewshire. **PowerDown**, a project funded by the Climate Challenge Fund, has a network of community energy advisors that advises both households and businesses on energy efficiency, carbon emission reductions, and can offer information about renewable energy resources. The PowerDown project is being delivered by ERCET in East Renfrewshire and aims to reduce carbon emissions and improve energy efficiency in the areas of Barrhead, Eaglesham and Waterfoot.

The Lighthouse of C.R.Mackintosh, in Glasgow, is a branch of the Renewable Energy Strategies and Technology Applications for Regenerating Towns (RESTART) project which works for innovative energy-environmental integration at city scale. The Lighthouse offers a renewable energy advice centre for the promotion of renewable energies however it is unclear to what extent this facility is used by residents in East Renfrewshire.

Go Greener is a non profit voluntary organisation based in East Renfrewshire which promotes sustainable living and aims to raise awareness of the impacts of climate change. There are many working groups that focus on different areas within the organisation, including eco-schools, energy, transport, food, waste and community engagement.

LEADER funding supports community development projects in rural areas. In East Renfrewshire, the LEADER programme is managed by a **Local Action Group** (LAG). The LAG consists of individuals, businesses, private sector, public sector, voluntary sector and community sector. Projects eligible for East Renfrewshire funding must be located in Eaglesham, Waterfoot, Neilston or Uplawmoor.

National Advisory Services

The Energy Saving Scotland advice centre (ESSac) is funded by the Scottish Government and managed by the Energy Savings Trust. The ESSac offers advice to householders, communities and small businesses throughout West Central Scotland, helping them save money and reduce both their energy usage and environmental impact. The ESSac offers a wide range of advice and information covering energy efficiency, small scale renewables and transport.

Community Energy Scotland is Scotland's only national body operating to help communities benefit from renewable energy. It helps community groups deliver projects through a network of Development Officers throughout Scotland. Since May 2009, Community Energy Scotland has delivered the Scottish Governments Communities and Renewable Energy Scheme (CARES). Iona McDonald is the Development Officer for the Greater Glasgow and Lanarkshire area which includes East Renfrewshire.

The Carbon Trust is a not-for-profit company which provides support to help business and the public sector boost business returns by cutting carbon emissions, saving energy and commercialising low carbon technologies.

4. Labour Market

Population and Economic Activity

All figures taken from NOMIS official labour market statistics: 'Labour Market Profile for East Renfrewshire' 07.02.2011 and 21.03.2011⁴ (see Appendix II).

⁴ NOMIS Official Labour Market Statistics: East Renfrewshire [online] Available at <<https://www.nomisweb.co.uk/reports/lmp/la/2038432132/report.aspx?town=east%20renfrewshire>> [Accessed on 7 February 2011 and 21 March 2011]

The working age group (16-64 years) in East Renfrewshire is slightly lower than the national average. In 2009, the Scottish population totalled 5,194,000 out of which 3,412,458 (65.7%) were in the 16-64 working age group. The total population of East Renfrewshire was 89,000, out of which 55,600 (62.3%) were in the working age group. This compares to a total population of 60,003,100 throughout Great Britain, of which 65% were in the working age group in 2001.

Between July 2009- June 2010, unemployment rates⁵ were slightly lower than the Scottish average in East Renfrewshire at 6.2%. Between July 2009- June 2010, 44,000 (78.1%) of the 55,600 East Renfrewshire working age group population were economically active. This compares to 76.9% of the total Scottish working age group population. Of those who were economically active, 41,200 (72.4%) were employed and 2,700 (6.2%) were unemployed, comparative to 71.0% and 7.5% of the Scottish average.

The increase in unemployment in East Renfrewshire was significantly higher than the Scottish average between June 2008- June 2010. Between June 2008- June 2010, unemployment rose dramatically from 1,500 to 2,700 (3.4% to 6.2%) in East Renfrewshire; a relative increase of 82.35%. This compares to rising figures of 4.5% to 7.5% over Scotland; a relative increase of 66.67%, and 5.2% to 7.7% over Great Britain; a relative increase of 48.08%.

The percentage of the East Renfrewshire working age group population claiming Job Seekers Allowance in February 2011 was below the Scottish average. In February 2011, 1,451 (2.6%) of the East Renfrewshire working age group population were claiming Job Seekers Allowance (JSA) comparative to the Scottish average of 4.3%. Of those claiming JSA, 28.8% were aged 18-24, 53.4% were aged 25- 49 and 17.4% were above age 50. This compares to the Scottish averages of 28.4%, 55.5% and 15.1%. In the same time period, there were 94 Job Centre Plus vacancies and 15.4 JSA claimants per vacancy in East Renfrewshire. The percentage of the working age group population claiming JSA in the all Barrhead wards was above the East Renfrewshire average in February 2011. With the exception of Barrhead North and Liboside, the percentage of the working age group population in the Barrhead wards claiming JSA was also above the average calculated for both Scotland and Great Britain.

In 2008, there were 22,000 jobs in East Renfrewshire. The job density, the ratio of filled jobs in the area divided by the number of people in the working age group population, was 0.39. This is comparative to an average job density of 0.80 in Scotland and 0.79 in Great Britain.

Residents of East Renfrewshire have above average qualifications in comparison to Scotland and Great Britain. 47,500 (85.7%) of the East Renfrewshire working age group population have at least an NVQ, and 25,900 (46.8%) have an NVQ4 and above, whereas 79.1% of the Scottish working age group population have at least an NVQ, and 33.9% have an NVQ4 and above. 5,700 (10.3%) of East Renfrewshire's working age group population have no qualifications, which is below the Scottish average of (13.3%). Recent statistics are not available for the Barrhead wards (Auchenback, Barrhead Central, Barrhead East, Barrhead North, Liboside, North Neilston and West Arthurlie) however data obtained in 2001

⁵ Statistics are model-based using JSA claimant numbers obtained from local authorities.

demonstrates that the Barrhead working age group population is less qualified than the general East Renfrewshire working age group population. The percentage of the Barrhead working age group population with higher level qualifications is lower than the average of the East Renfrewshire working age group population. With the exception of Barrhead North, the percentage of the Barrhead population without any qualifications is higher than the East Renfrewshire average.

Employee jobs by Occupation

The East Renfrewshire workforce is highly skewed towards managerial roles, which suggests there is capacity for managerial training. Between July 2009- June 2010, 23,800 (57.9%) of the East Renfrewshire working age group population were employed in managerial and senior official occupations, professional occupations, and associate professional and technical occupations; comparatively, this is above the Scottish average of 40.9% and the British average of 44.4%.

7,300 (17.7%) were employed in administrative and secretarial occupations and skilled trades occupations; comparatively, this is below the Scottish average of 22.6% and the British average of 21.6%. 5,700 (13.9%) were employed in personal service occupations and sales and customer service occupations; comparatively, this is below the Scottish average of 17.8% and the British average of 16.3%. 4,300 (10.5%) were employed in process plant and machine operative occupations, and elementary occupations; comparatively, this is below the Scottish average of 18.8% and the British average of 17.8%.

Employee jobs by Industry

In 2008, 800 (4.7%) of the East Renfrewshire working age group population were employed in manufacturing, 1,600 (8.7%) were employed in construction, and 15,700 (86.3%) were employed in services (distribution, hotels and restaurants; transport and communications; finance, IT and business; public admin, education and health). In comparison to the Scottish working age group population average, 8.7% were employed in manufacturing, 5.9% were employed in construction and 81.9% were employed in services. Of the British working age group population, 10.2% were employed in manufacturing, 4.8% were employed in construction and 83.5% were employed in services.

How would anticipated developments in the renewable sector change the East Renfrewshire labour market?

The anticipated developments in the renewable sector would bring positive change to the East Renfrewshire labour market. In 2010, 2,700 members of the economically active East Renfrewshire population were unemployed and in February 2011, 1,451 were claiming job seekers allowance. There are many developments either underway or pending in the East Renfrewshire area which would create job openings either with a renewable energy focus or with a sustainable, environmental outlook. Examples of such developments include the Whitelee Wind Farm which is currently undergoing expansion in the East Kingswell area and the Newton Mearns Recycling Village which promises to create over 700 job openings if plans are accepted. Alongside renewable energy specialist training, employment will also be created in unrelated occupations, such as managerial and administrative roles, through these

developments in the renewable sector. All these need training, which is either not currently available within the region, or not available at all. The existing training provision for this sector is still very new, as it has only recently been developed.

5. Training Provision

What renewable energy teaching and training resource is available within the region and what courses are available by renewable energy source?

Provision for East Renfrewshire (Barrhead):

East Renfrewshire is well served through courses across the central belt outside the region itself. Effective transport links make these courses accessible. There are not, however, any developed options within the East Renfrewshire area so travel would be necessary. If there is to be large scale renewable technology developments within the region, there may be opportunities to explore new renewable technology training provision. Current renewable energy teaching and training resources in East Renfrewshire are listed below.

East Renfrewshire Waste Recycling Technology Centre (WRTC) situated in Rouken Glen, is a social development project which offers trainee placements in Environmental Conservation (SVQ2). Future projects include renewable energy technologies such as wind turbines and bio-diesel production.

The centre offers training opportunities to community members, with a focus on tackling the issues of social exclusion and unemployment. Short courses in construction, engineering and rural skills are offered; this is highly applicable given the current renewable energy developments in the East Renfrewshire area. The centre also works closely with local businesses, developing bespoke training opportunities which pay the trainees a minimum wage and equip them with key skills directly applicable to the jobs offered by the businesses involved.

In addition to running social development projects, the centre also works in conjunction with the East Renfrewshire council's education department, delivering community projects for school children and students. The main programmes are the Hanging Basket programme, working with school children and staff to plant hanging baskets to decorate the local area, and the Grow Cook 'n' Eat programme which works with Reid Kerr College as part of a hospitality qualification.

The centre hosts a range of projects to encourage reuse best practice, such as composting, recycling, sustainable construction and maintenance.

Whitelee Wind Farm, the largest wind farm in Europe, is situated in the East Renfrewshire area. Whitelee has developed a schools education pack which takes students on a site trip to see the wind turbines, allows them to work with hands on interactive exhibits and take part in a workshop which is tailored to the capabilities of the student's age group. Whitelee have also developed online teaching resources which include lesson plans, practical exercises and interactive games. A complimentary Whitelee wind farm learning pack is offered by Glasgow Science Centre. Although Whitelee currently doesn't provide training opportunities, there is scope for it to do so in the future.

6. Renewable energy training provision in Scotland

Renewable Energy Training Provision Review

For the purpose of assessing availability of renewable technology training within Scotland, a review has been conducted using the Careers Scotland on-line database and further desk research (see Appendix III and IV). The training identified is at the further education and professional training level and does not include higher education e.g. degree level courses.

Overview:

Appendix III shows that there are numerous options for renewable technology training available in Scotland. However, as identified within the media⁶, issues have arisen due to a concentration of courses focused at the technician level, leaving gaps within areas such as health and safety and financial management. Demand for renewable energy workers is expected to rapidly increase in 2013/2014 as many pending projects move into development and operational phase. It should be noted that renewables training is a relatively new sector and there are several plans for expansion as detailed below in future options.

In a telephone interview, Dr Peter Dennis from the Sustainable Energy And Micro-renewables (SEAM) Centre, at Inverness College UHI confirmed that renewable energy training in Scotland has suffered from stretched infrastructure and a lack of facilities to effectively host training. In terms of the private sector, Dr Dennis added that the renewables market is very difficult to predict however there is a general shift towards training provision for apprentices who need to be equipped with the necessary knowledge and skills. Dr Dennis also noted a plateau forming in certain training courses such as solar thermal where the majority of those requiring training had already received it. Furthermore, Dr Dennis noted the difficulty in building a domestic market due to the geographical spread of Scotland's population but that there is potential within it.

Skill level: From the list of courses, there seems to be an equal spread across courses for professionals, school leavers and beginners. There are also several MCS certification bodies who offer further training for professionals across various renewable technologies in order to become a certified supplier/installer.

Geographic spread: Courses tend to be clustered around highly populated central belt areas, notably Glasgow and Edinburgh Courses are also available from Inverness College and Highlands & Islands University albeit with a reduced range of options. Several institutions provide flexible/distance learning options and, with further investigation, this may prove to be more widely available.

⁶Thomas. N, *Renewables sector 'faces major skills crisis'*, [online] Available at: <www.scotlandonsunday.scotsman.com/business/Renewables-sector-39faces-major-skills.6716913.jp> [Accessed 24 March 2010]

Future options in Scotland

There are numerous courses in development which concentrate on renewable technology training, a few of which are listed below.

Green Academies: The Scottish Government has recently announced the launch of ‘Green Academies’ in Scotland, which are to be setup over the next year. The Academies will be run by Scottish Gas and will support 447 green energy jobs including 77 new jobs and apprenticeships. Links will be forged between the Academies and skills hubs at local colleges to aid recruitment of local apprentices. The skills hubs will focus on the installation of green technologies that qualify for the Scottish Government heating initiative which offers heating help to reduce fuel poverty issues in low income families. Trainee engineers will be trained on the installation of insulation, air source heat pumps, super efficient boilers, solar panels and other micro-generation technologies.⁷

Scotland’s Electrical Trade Association (SELECT): Currently developing training courses in Photovoltaic technology, air source heat pumps and ground source heat pumps.

Scottish and Northern Ireland Plumbing Employers Federation (SNIPEF): Currently developing a training course in solar hot water technology.

Sustainable Energy and Micro-renewables (SEAM) Centre: Currently developing courses in biomass technology, under floor heating, wind turbine technology and rainwater harvesting. SEAM is also interested in providing training in emerging technologies such as fuel cells.

Whitlock Energy Collaboration Centre (Part of Carnegie College): recently opened a centre dedicated to skills development and knowledge sharing in support of the growing renewable energy sector.

British Gas: Currently exploring the potential for renewable energy technology training, possibly in the Dumfries area. After speaking with a British Gas consultant, it was confirmed they are looking into this although it is at a very early stage of development.

National Skills Academies: The UK has recently launched a National Skills Academy for environmental technologies. National Skills Academies already exist in a number of sectors and are designed to guarantee that training and qualifications are relevant to the related industry sector. They support a range of training from purpose built training centres to online courses, and provide a streamlined approach to training staff to ensure they are equipped with the skills and qualifications needed in the future. The environmental technologies National Skills Academy will receive £2.5m funding over 3 years, which will be matched by employers, and will work with industry and training providers to ensure that employers in renewable energy industries can access a skilled workforce. This initiative aims to allow the

⁷ ‘Green Academies to be established’ [online] Available at <<http://www.scotland.gov.uk/News/Releases/2011/03/07085119>> [Accessed on 28 March 2011]

industry to grow and support the Governments ambitious targets for renewable energy and low carbon growth.

In the first 5 years, the National Skills Academy aims to provide 2000 publicly funded and 200,000 privately funded training courses. It also aims to build a network of 14 specialist training provider ‘hubs’ located in Further Education Colleges, with over 80 accredited training providers across England to offer environmental qualifications.

8. Demand for renewable energy training in Scotland

Obtaining data relating to the demand for renewable training across Scotland has been a difficult process with institutions providing incomplete or inconclusive data and often hesitant to release their figures. However, it must be noted that this is an emerging sector and as such there may be minimal data available.

A general consensus from consultations with admissions departments within institutions and training facilities suggests there is a steady growing demand for renewable energy training. This view is backed up by the Scottish Government’s report ‘Towards a Low Carbon Economy for Scotland’⁸ which, in March 2010, projected a further 26,000 jobs in renewable energy by 2020 and a further 26,000 jobs in emerging low carbon technologies, also by 2020.

Furthermore, the Scottish Government report⁹ ‘Skills for Scotland: Accelerating the Recovery and Increasing Sustainable Economic Growth’ confirms that it is likely there will be significant growth in the renewables sector and a resulting demand for skilled employees. The report also states that a Renewable Action Plan Skills Framework will work with partners to ‘better understand future skills requirements, improve recruitment and sector attractiveness, ensure adequate training provision to meet sector needs, and develop suitable qualifications for use in schools, universities, colleges and workplaces.’

During the research, conversations were held with Colleges Scotland. Although they couldn’t provide any data on training demand in Scotland, they confirmed that they are currently carrying out their own research, trying to gauge the demand for training within the sustainability sector. This suggests that there is little data available.

The raw data which was collected from institutions and government databases is below:

Scottish Funding Council (Infact database)¹⁰

Analysis of Further Education Awards for year range 1998-99 to 2009-10:

⁸ Scottish Government. Towards a Low Carbon Economy for Scotland: Discussion paper. March 2010.

⁹ Scottish Government. Skills for Scotland: Accelerating the Recovery and Increasing Sustainable Economic Growth. October 2010.

¹⁰ ‘Analysis of Further Education Awards’ Infact Database [online] Available at <<https://stats.sfc.ac.uk/infact/>> [Accessed on 9 March 2011]

Year	Candidates for Environmental-protection/energy/cleansing/security	Candidates for Power/Energy Engineering
98-99	1869	67
99-00	1224	786
00-01	1583	575
01-02	3298	588
02-03	2571	401
03-04	2791	416
04-05	3534	480
05-06	3174	252
06-07	5073	901
07-08	7199	916
08-09	5272	640
09-10	3437	781

Dundee College

Course Title	Number of Applicants (to present day)	Total intake (to present day)
Pre-Apprenticeship Renewable Energy	28	14
NQ Engineering with Renewable Energy Technologies	50	August 2011 Start
Access to engineering, Fabrication and Welding with Renewable Energy Technology	36	August 2011 Start
HNC Engineering Systems with Renewable Energy Technologies	64	August 2011 Start
HND Engineering Systems with Renewable Energy Technologies	18	August 2011 Start
Renewable Energy Awareness Course	8	8
Renewable Energy Awareness (Commercial)	0	0
Rain & Grey Water Harvesting (Commercial)	0	0
Domestic Heat Pumps (Commercial)	6	6
Domestic Heat Pumps	7	7

SEAM Centre

Course Title	Number of Applicants (to present day)	Total intake (to present day)
Solar Hot Water	22	22 (since 2009)
Solar PV	7	7
Heat Pumps	8	8 (April 2011)

Conversations with the SEAM Centre manager identified that courses on offer had had no advertising or marketing but they are about to launch a marketing campaign in conjunction with a fuller schedule. Even without the marketing, he confirmed that there was definitely a demand there and they are expecting an increased demand with the new Renewable Heat Incentive.

Ayr College

Course Title	Number of Applicants (to present day)	Total intake (to present day)
Domestic Hot Water	unable to obtain data	40-50

Cardonald College

Course Title	Numbers 2009-10	Numbers 2010-2011	Numbers 2011-2012 (estimate)
Skills for Work Energy	14	14	14
Solar Installation for Plumbing & Heating Engineers	15	24	35-40
Renewable Energy Awareness	0	4	12
Heat Pumps	0	4	12
SVQ Electro Technical Services 1 st year	Unable to obtain data	Unable to obtain data	28
SVQ Electro Technical Services 2 nd year	Unable to obtain data	Unable to obtain data	36
SVQ Electro Technical Services 3 rd year	Unable to obtain data	Unable to obtain data	30
SVQ Plumbing 1 st year	Unable to obtain data	Unable to obtain data	42
SVQ Plumbing 2 nd year	Unable to obtain data	Unable to obtain data	36
SVQ Plumbing 3 rd year	Unable to obtain data	Unable to obtain data	20
Electronics	Unable to obtain data	Unable to obtain data	20

Perth College

Course Title	First 8 week period	Second 8 week period
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	(Jan – Mar 2011)	(April – June 2011)
Renewable Energy Awareness	9	13

Clydebank College

Course Title	1 st 2 day course	2 nd 2 day course
Renewable Awareness	10	10

Adam Smith College

Course Title	Number of Applicants 2011/ 2012
Renewable Energy Systems HNC	14
Renewable Energy Systems NC	8
Renewable Energy Systems PDA	0

Short Course Titles	Start Date	End Date	Number of Applicants
Carbon Footprinting	06/04/2011	07/04/2011	3
Carbon Footprinting	05/05/2011	06/05/2011	1
Carbon Footprinting	09/06/2011	10/06/2011	0
Carbon Footprinting	07/07/2011	08/07/2011	0
Introduction to Renewables	11/03/2011	11/03/2011	7
Introduction to Renewables	01/04/2011	01/04/2011	5
Introduction to Renewables	13/05/2011	13/05/2011	1
Introduction to Renewables	27/05/2011	27/05/2011	0
Introduction to Renewables	17/06/2011	17/06/2011	1
Introduction to Renewables	24/06/2011	24/06/2011	0
Solar Power	13/04/2011	13/04/2011	2
Solar Power	03/05/2011	03/05/2011	0
Solar Power	07/06/2011	07/06/2011	0

Lews Castle College

Course Title	Dates	Applicants
Renewables PDA	Unable to obtain data	41

9. Changes in renewable energy training provisions: How are skills and accreditation being standardised across Scotland and the UK? Are they divided by renewable energy source?

While there a variety of accreditation bodies for different renewable technologies, effort is being made to standardise these. The information below details some of the accreditation bodies currently operating in Scotland and across the UK; however this is not an exhaustive list. Through active government support, the Microgeneration Certification Scheme has become the most widely adopted scheme.

The Microgeneration Certification Scheme (MCS)¹¹ certifies microgeneration technologies used to produce electricity and heat from renewable sources. It is an internationally recognised quality assurance scheme, which approved both products and installers through satisfying rigorous tested standards. The MCS scheme covers: Wind Energy, Small Scale Hydro, Solar Thermal Hot Water, Ground Source Heat Pumps, Air Source Heat Pumps, Biomass, Solar Photovoltaic technologies. MCS is being encouraged by the government through financial incentives under the Clean Energy cash back scheme. Clean Energy Cash-back takes two forms, Feed-in Tariffs, and the Renewable Heat Incentive.

CEN Solar Keymark Scheme¹² is an equivalent scheme to the MCS for Solar Thermal products. The Solar Keymark was developed by the European Solar Thermal Industry Federation (ESTIF) and CEN (European Committee for Standardisation). It is the main quality label for solar thermal products and is widely spread across the European market and beyond.

BPEC¹³ is a provider of training and certification for the Building Services Engineering sector. They offer plumbing and heating engineers a range of renewable energy courses, including Solar Thermal Hot Water, Heat Pumps, Solar Photovoltaic, Renewable Energy Awareness and Warm Water Under floor Heating.

NICEIC¹⁴ is a UK electrical contracting voluntary body, who offer certification services within the construction industry. NICEIC offer renewable energy installation courses in Solar Photovoltaic (Solar PV) installation, solar domestic hot water, ground source & air source heat pump installation and installing under floor heating.

Logic Certification¹⁵ is a UK Building Services Industries certification body. Logic Certification main focus is in oil and gas accreditation services; however Logic Certification has also developed training assessment packages for the renewables industry including Solar Thermal Hot Water, Ground and Air Source Heat Pumps and Solar Photovoltaic. **Accreditation Standardisation across Europe**

At present, there is a lack of understanding in levels of accreditation necessary for renewable energy planning, installation and maintenance, and how these are changing on a European scale. The SMALLEST project¹⁶ has recently commissioned a study which will collate training approaches, standards,

¹¹ For further information, see: www.microgenerationcertification.org

¹² For further information, see: www.estif.org/solarkeymark

¹³ For further information, see: www.bpec.org.uk

¹⁴ For further information, see: www.niceic.com

¹⁵ For further information, see: www.logiccertification.com

¹⁶ For further information, see: <http://www.smallestnpp.eu>

accreditation pathways across the Northern Periphery Programme region. Dundee College have been employed to conduct the study, which will investigate potential for training standardisation for energy installers and professional advisors.

10. Scotland's role: How does Scotland compare and connect with activities in the UK and Europe, including European projects in renewable energy?

Scotland is ambitious in its renewable energy targets set out in The Climate Change (Scotland) Act 2009¹⁷. One target is to generate 80 per cent of Scotland's electricity from renewable sources by 2020 (~8 GW) with an interim target of 31 per cent by 2011 (~5 GW), and 20 per cent of Scotland's total energy use to come from renewables by 2020. To achieve these targets, Scotland is actively developing renewable energy through a variety of large-scale projects. Examples of projects are listed below.

Viking Energy is a joint venture between the Shetland community and Scottish and Southern Energy. The project proposes to build one of the world's most productive onshore wind farms by installing 127 turbines with a total generating capacity of 457.2 MW. An application was submitted on 29th September 2010 and construction is planned to commence in 2012.¹⁸

The European Marine Energy Centre (EMEC), Orkney, is a globally pioneering marine energy facility. EMEC is at the forefront of marine-based renewable energy developments and offers facilities to test full scale grid connected prototype devices in optimal wave and tidal conditions. In addition to currently testing numerous innovative designs, the centre is also involved in research and development projects and offers advice to other testing centres.¹⁹

The Scottish Energy Laboratory (SEL), launched earlier in 2011, aims to strengthen Scotland's international renewable energy outreach. The European Marine Energy Centre in Orkney, the Hydrogen Office in Fife and the European Offshore Wind Development Centre are all included in the SEL.²⁰

The European Offshore Wind Deployment Centre has recently been granted 40 million euros from the EU to be developed offshore in Aberdeen Bay. The Centre will allow offshore wind farm developers to test new designs, promises to deliver electricity to the national grid and will enable large scale dispersion

¹⁷ 'Climate Change (Scotland) Act 2009' [online] Available at <<http://www.legislation.gov.uk/asp/2009/12/contents>> [Accessed 24 March 2011]

¹⁸ 'Viking Energy' [online] Available at <<http://www.vikingenergy.co.uk/default.asp>> [Accessed 24 March 2011]

¹⁹ 'The European Marine Energy Centre' [online] Available at <<http://www.emec.org.uk/>> [Accessed on 24 March 2011]

²⁰ Scottish Enterprise: 'Scottish Energy Laboratory' [online] Available at <<http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/scottish-energy-laboratory.aspx>> [Accessed 24 March 2011]

of lessons learned to the EU industry. A full application to planning permission to construct the wind farm will be submitted to Marine Scotland in Spring 2011.²¹

According to Scottish Renewables²², there is currently 4405.13MW of installed renewable energy capacity and a further 1440.933MW under construction within Scotland. Wind energy installations account for the most installed capacity, with 2561.91MW and there is a further 1069.94MW under construction. Hydropower (excluding pumped storage) has the second largest installed capacity, with 1395.06, however little is under construction and there are not any plans for significant further installations. Biomass accounts for <500MW of current renewable energy capacity, both installed and under construction, however a further 915.32MW is in planning. Energy from waste accounts for 131.66MW of currently installed capacity, 2.50MW is under construction, and 34.1MW is resolution to consent.

Despite the proposed developments, both wave and tidal power currently only account for <3MW of installed renewable energy capacity and there are no sites under construction, however there is scope for 600MW of wave energy capacity and 1032.70MW of tidal energy capacity.

According to the latest European Union Energy Figures²³, the UK was the 11th largest renewable energy generator in 2007. In the same year, the UK was also competitively ranked as the 3rd largest wind power generator in Europe, the 4th largest biomass generator and the 4th largest hydropower with pumping storage generator. The UK was not competitively ranked in hydropower (without pumping technology) or solar power. Germany and Spain were the only two countries that produced a significant amount of energy from solar PV and even these amounts were small relative to energy produced from alternative renewable technologies.

In 'Wind in Power, 2010 European Statistics'²⁴, European Wind Energy Association (EWEA) reported that the UK was the 4th largest European wind energy installer in 2010 and had the 5th largest total wind energy capacity installed at the end of 2010.

According to DECC Regional Renewable Statistics for the UK in 2009²⁵, Scotland hosted 170 wind energy sites, had 48% of wind power capacity and 49% of wind power generation. In comparison, England

²¹ Aberdeen Renewables: 'European Offshore Wind Deployment Centre' [online] Available at <http://www.aberdeenrenewables.com/wp-content/uploads/AREG_wind%20brochure.pdf> [Accessed on 24 March 2011]

²² 'Summary of Renewable Energy Projects in Scotland - 23 February 2011', Scottish Renewables [online] Available at <http://www.scottishrenewables.com/static/uploads/energy_database/110223_energydatabase_summary.pdf> [Accessed 8 March 2011]

²³ 'EU ENERGY IN FIGURES 2010: Electricity Generation from Renewables Extended time series' [online] Available at http://ec.europa.eu/energy/publications/doc/statistics/ext_renewables_gross_electricity_generation.pdf [Accessed 8 March 2011]

²⁴ 'Wind in Power: 2010 European Statistics' [online] Available at <http://www.ewea.org/fileadmin/ewea_documents/documents/statistics/EWEA_Annual_Statistics_2010.pdf> [Accessed 9 March 2011]

²⁵ 'Regional Renewable Statistics' [online] Available at <<https://restats.decc.gov.uk/cms/regional-renewable-statistics>> [Accessed 10 March 2011]

hosted 250 wind energy sites and had 33% of both wind power capacity and generation. Northern Ireland and Wales both hosted fewer wind energy sites and generated significantly less wind power.

In comparison to England, Wales and Northern Ireland in 2009, Scotland had the second largest total number of renewable energy generation sites, the largest number of hydropower sites and the second largest number of wind power sites within the UK. Scotland was also the second largest total renewable energy generator, but the largest hydropower and wind energy generator.

11. East Renfrewshire within Scotland: How does East Renfrewshire compare with Scotland?

Relating the generating capacity of the main existing or planned developments in East Renfrewshire to Scotland (see section 3), East Renfrewshire has a significant role in Scottish renewable energy generation, with a focus on wind power. Whitelee Wind Farm, Europe's largest onshore wind farm, has 322MW of the 2561.91MW installed wind power capacity in Scotland. The extension of Whitelee Wind Farm in East Kingswell is planned to have a further 217MW generating capacity. This totals the Whitelee generating capacity to 539MW; 9.23% of wind energy generating capacity of installed and sites currently under construction combined. If the plans for the Newton Mearns Lifetime Recycling Village are accepted, East Renfrewshire will host two of the largest renewable energy developments in Scotland.

12. The options for development within the College and WRTC

There is a real opportunity for the development of training surrounding the field of renewable energy. A Flagship product could be created to take leadership of the sector for purposes of Economic Development and also for innovation. The options available include:

- a) Standard Training pack condensing existing renewable energy training courses and making them available through one centre.
- b) Community-based training courses to introduce formal training to the process of developing renewable energy for communities.
- c) Training for external experts to work with communities developing renewable energy for them.
- d) Business and management training for commercial and entrepreneurial engagement with renewable energy opportunities.
- e) Sustainable energy planning training specialists in how to apply their skills to energy planning for renewable energy.

In considering the options, it is necessary to realise that the long-term trend will be for the trades and professions to absorb renewable energy training into their routine qualification processes. Those wishing to become a plumber or electrician will learn the rudiments of renewable energy just as they learn the rudiments of conventional energy now. Heating engineers will learn about renewable heat in the same way as they learn about traditional heat. However, energy is a sector in itself and the opportunity for a new training centre of excellence can take advantage of this.

13. Potential for Centre of Excellence

Based on current UK developments and skills crisis concerns, there is great potential for a Renewable Energy Centre of Excellence to be developed in East Renfrewshire. The environmental technologies National Skills Academy plans to ensure that renewable energy industries have a sufficient supply of skilled workers to meet the demands created by a growing renewable energy industry, yet there are no plans for a base in Scotland. Given that East Renfrewshire currently hosts Europe's largest onshore wind farm and is potentially going to host Europe's largest Energy to Waste facility, it would be appropriate for a specialist college to be developed in the area. The existing and pending European-scale renewable energy developments in the East Renfrewshire area, combined with the innovative training provisions in Reid Kerr college place the Barrhead College in an appropriate position to become a renewable energy training centre of excellence.

6. Long-term Vision

The study recommends the concept of an innovative **Sustainable Energy Institute** which will aim to become a unique European if not International Centre of Excellence in the provision of **Sustainable Energy Planning**. The Institute's **Planning Centre** will deliver courses for the Public Sector throughout **Scotland, the UK and Europe**, to introduce them to the concept of Sustainable Energy Planning (SEP), and explain how this should be done. It will show how to integrate SEP with all Public Sector functions carried out by Planners, Environment Protection Agencies, Regulation and Policy Specialists, Economic Development departments, and Health & Safety regulators. At the same time, the Institute's **Skills Centre** will provide a set of courses for the local labour market in renewable energy training for electricians, plumbers, joiners, lawyers, etc. These will be comparable with other renewable energy skills courses available around Scotland.