SCOTTISH QUALIFICATIONS AUTHORITY

Skills for Work Course — Energy (Intermediate 2)

Structure of the Course

This Course is at Intermediate 2 level and consists of four mandatory Units and a choice of one from three optional units.

The mandatory Units are:

- Energy: An Introduction — 1 Unit credit
- Energy: Domestic Wind Turbine Systems — 1 Unit credit
- Energy: Domestic Solar Hot Water Systems — 1 Unit credit
- Energy: Employability and Careers — ½ Unit credit

The optional units are:

- Energy and the Individual — ½ Unit credit
- Energy: Oil/Gas Extraction — ½ Unit credit
- Energy: Conventional Production Technologies and the Grid — ½ Unit credit

Summary of Course content

The *Intermediate 2 Energy Skills* Course has been designed to provide a basis for progression into further education or for moving directly into training or employment within the Energy sector.

Candidates will explore a variety and range of industries and career opportunities which exist within the energy sector. They will also become familiar with key words and terms used in the sector, and will develop an awareness of the impact of the energy sector on the environment. Personal development of employability skills will be the main focus across the Course with each Unit aiming to enhance such skills. The development of teamwork and practical skills and carrying out test procedures are also given a high profile.

The mandatory Units in this Course introduce the various energy industries based in the UK and develop practical skills by building a small scale solar hot water system and wind turbine. Candidates will also review their employability skills and strengths and weaknesses which will be used to help select the most appropriate career for them within the energy sector.

There is an opportunity to specialise in one subject area by selecting one of the three optional Units, i.e. analysis of their own carbon footprint, OR develop a

deeper knowledge of Oil and Gas production in the North Sea, OR develop further knowledge on the conventional energy generation systems used in the UK.

Summary of content of each Unit:

Energy: An Introduction

The aim of this Unit is to provide candidates with an overview of where we get our energy from, the engineering systems that convert it into a more convenient form and the energy conversion processes that take place from fuel being input to energy being generated. The Unit gives a broad overview of traditional and renewable energy systems, energy conservation and includes an evaluation of an industrial or domestic energy generation facility.

Energy: Domestic Solar Hot Water Systems

This Unit introduces a micro generation system which generates heat from solar energy and transfers this heat energy to a heat exchanger and on to other appliances e.g. hot water tank or under-floor heating system suitable for use in a domestic or small scale industrial building. This is a practical skills based Unit which gives candidates the practical skills to manufacture some of the parts and assemble a small solar hot water panel. Working as part of a team is seen as an essential element of this Unit

Energy: Domestic Wind Turbines Systems

This Unit introduces residential or micro generation wind turbine systems which generate electrical energy. This is a practical skills based Unit which will give candidates the ability to wire up an electrical circuit, manufacture parts, assemble and test a small scale wind turbine. The candidates will use prepared components to complete the design and build. Working as part of a team is seen as an essential element of this Unit.

Energy: Employability and Careers

Candidates will review their performance in the employability skills undertaken in the two practical based Units; *Energy: Domestic Solar Hot Water Systems and Energy: Domestic Wind Turbines Systems* and evaluate their own strengths and weaknesses. This Unit will also involve students investigating careers within the energy sector, reflecting on their previously identified strengths and weaknesses and finally selecting which career in the energy sector is most suitable for them.

Energy and the Individual

Candidates will investigate the energy they use over an average year, this will include producing their own Carbon Footprint. In this Unit candidates will use web based Energy and CO_2 calculators or will use spreadsheet or paper based calculations to work out their own Carbon Footprint. From the data gained they will review and evaluate their lifestyles to try and reduce the energy they consume and thereby reduce the size of their carbon emissions/footprint.

Energy: Oil/Gas Extraction

Candidates will be introduced to the formation of oil and gas fields, the sustainability of these fields and the type of platform construction used on off-shore installations. The methods used to extract oil and gas including, drilling, mud and fluid control will also be investigated.

Energy: Conventional Production Technologies and the Grid

Candidates will investigate how conventional energy generation plants support the UK's total energy needs and review the effect each of them has on the environment. They will investigate systems used to generate electricity using coal, oil, gas, hydro and nuclear energy as a power source. The nation grid and the distribution of energy/power will also be investigated.

Assessment Approaches

Assessment in this Course will be based on both performance evidence, through candidates performing a range of practical activities supported by assessor observation checklists and written and/or oral evidence, through candidate folio, case study scenarios or question and answer. Candidates will also carry out self-review and evaluation of their progress in employability skills. Where possible, assessment should reflect current workplace practice, whether demonstrated through work placement, or simulated environments.

The Units for this Course have been designed so that evidence relating to the employability skills may be used across more than one unit.

Each Unit will be supported by a National Assessment Bank (NAB) item which will provide an assessment package and will exemplify the national standard.

Experience of the workplace

Through their experiences of the various practical skills and self reflection in the Course, candidates should become aware of steps to employment or further training and this will help them to make valid personal choices regarding careers and further study.

It is recommended that centres work in partnership with other organisations to assist in offering a realistic working environment. This may be schools working with colleges, employers or training providers to ensure that candidates have opportunities which allow them to develop desirable employability skills. This could also include site visits, guest speakers from the industry and simulated exercises.

Resource Requirements

Centres will require workshop facilities for each of the practical Units in the Course. The course requires candidates to build a small scale domestic wind turbine and solar panel. The individual units specify the component parts required, Centres should ensure they are appropriately resourced to do this The delivering centre should also ensure that candidates have IT access including online facilities for research purposes. It is anticipated that this Course may be delivered through partnerships between schools and a colleges/private trainers/employers in order to provide the necessary expertise and access to a variety of appropriate learning environments.

Progression

This Course or its Units may provide candidates with opportunities to progress to:

- a National Progression Award
- a National Certificate programme in Further Education
- employment with training in the Energy sector

Publication of Course and Unit Specifications

Course and Unit Specifications will be published on SQA's website by April 2008. www.sqa.org.uk/skillsforwork

Launch event

The launch event for the Energy Intermediate 2 Course will be held on the 29th April 2008.

Publication of NABs

A NAB for each Course Unit will be made available during or before June 2008.

Publication of Learning and Teaching Support Packs

Learning and teaching support packs are being produced by the Scottish Further Education Unit to support this Course. These are planned for publication on the SFEU website by August 2008. *www.sfeu.ac.uk*