

# Scottish Qualification Authority

## Workplace Assessed Unit Specification

### General information

**UNIT NUMBER:** F8XJ 04

**UNIT TITLE:** Working Principles, Installation Options and Regulatory Requirements for Micro-Renewable Technologies, Water Harvesting and Recycling Technologies

**Publication date:** June 2010

**Version:** 02 (May 2012)

#### **GENERAL COMPETENCE FOR UNIT:**

The aim of this Unit is to allow candidates to develop the knowledge and understanding required to be able to communicate with others in relation to the fundamental working principles, potential to install and regulatory requirements for micro-renewable and water harvesting and water recycling technologies. To prepare candidates to progress to the specialist Units for the installation, commissioning, handover, inspection, service and maintenance of micro-renewable and water recycling technologies.

#### **OUTCOMES**

- 1 Identify the fundamental working principles of micro-renewable and water harvesting and recycling technologies
- 2 Identify the typical advantages and disadvantages of micro-renewable and water harvesting and recycling technologies
- 3 Identify the fundamental requirement of building location/building features for potential to install micro-renewable and water recycling systems to exist.
- 4 Identify the fundamental regulatory requirements relating to micro-renewable and water harvesting and water recycling technologies

#### **ACCESS STATEMENT:**

Access to this Unit is subject to the following pre-requisite:

Entry to this Unit is at the discretion of the centre. Candidates doing this Unit do not need any prior knowledge or experience.

# Workplace Assessed Unit Specification

## Statement of standards

**UNIT NUMBER:** F8XJ 04

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

### OUTCOME 1

Identify the fundamental working principles of micro-renewable and water harvesting and recycling technologies

### PERFORMANCE CRITERIA

- (a) Identify the fundamental working principles for each of the following heat producing micro-renewable energy technologies solar thermal (hot water), ground source heat pump, air source heat pump and biomass
- (b) Identify the fundamental working principles for each of the following electricity producing micro-renewable energy technologies solar photovoltaic, micro-wind, micro-hydro
- (c) Identify the fundamental working principles for each of the following water harvesting and recycling technologies rainwater harvesting and greywater recycling
- (d) Identify the fundamental working principles of the following co-generation technologies micro-combined heat and power

### EVIDENCE REQUIREMENTS

Written and/or oral evidence is required to demonstrate knowledge defined in the PCs and must be produced in controlled supervised, open-book conditions. This may be done by a balance of multiple choice, short answer, restricted response and structured questions.

# Workplace Assessed Unit Specification

## Statement of standards (cont)

**UNIT NUMBER:** F8XJ 04

**UNIT TITLE:** Working Principles, Installation Options and Regulatory Requirements for Micro-Renewable Technologies, Water Harvesting and Recycling Technologies

### OUTCOME 2

Identify the typical advantages and disadvantages of micro-renewable and water harvesting and recycling technologies

### PERFORMANCE CRITERIA

- (a) Identify typical advantages associated with each of the following technologies listed in the range statement
- (b) Identify typical disadvantages associated with each of the following technologies listed in the range statement

### RANGE STATEMENT

- ◆ solar thermal (hot water)
- ◆ solar photovoltaic
- ◆ ground source heat pump
- ◆ air source heat pump
- ◆ micro-wind
- ◆ biomass
- ◆ rainwater harvesting
- ◆ grey water recycling
- ◆ micro-hydro
- ◆ micro-combined heat and power (heat-led)

### EVIDENCE REQUIREMENTS

Written and/or oral evidence is required to demonstrate knowledge defined in the PCs and must be produced in controlled supervised, open-book conditions. This may be done by a balance of multiple choice, short answer, restricted response and structured questions.

# Workplace Assessed Unit Specification

## Statement of standards (cont)

**UNIT NUMBER:** F8XJ 04

**UNIT TITLE:** Working Principles, Installation Options and Regulatory Requirements for Micro-Renewable Technologies, Water Harvesting and Recycling Technologies

### OUTCOME 3

Identify to the fundamental requirement of building location/building features for potential to install micro-renewable and water recycling systems to exist

### PERFORMANCE CRITERIA

- (a) Identify the fundamental requirements for potential to install a solar water heating system to exist
- (b) Identify the fundamental requirements for potential to install a solar photovoltaic system to exist
- (c) Identify the fundamental requirements for potential to install ground source heat pumps system to exist
- (d) Identify the fundamental requirements for potential to install an air source heat pump system to exist
- (e) Identify the fundamental requirements for potential to install a biomass system
- (f) Identify the fundamental requirements for potential to install a micro wind system
- (g) Identify the fundamental requirements for potential to install a micro hydro system
- (h) Identify the fundamental requirements for potential to install a water harvesting or recycling system
- (i) Identify the fundamental requirements for potential to install a microcombined heat and power (heat led) system

### EVIDENCE REQUIREMENTS

Written and/or oral evidence is required to demonstrate knowledge defined in the PCs and must be produced in controlled supervised, open-book conditions. This may be done by a balance of multiple choice, short answer, restricted response and structured questions.

# Workplace Assessed Unit Specification

## Statement of standards (cont)

**UNIT NUMBER:** F8XJ 04

**UNIT TITLE:** Working Principles, Installation Options and Regulatory Requirements for Micro-Renewable Technologies, Water Harvesting and Recycling Technologies

### OUTCOME 4

Identify the fundamental regulatory requirements relating to micro-renewable and water harvesting and water recycling technologies

### PERFORMANCE CRITERIA

- (a) Identify what would be typically classified as 'permitted development' under town and country planning regulations in relation to the deployment of the following technologies listed in the range statement
- (b) Identify which sections of the current building regulations/building standards apply in relation to the deployment of the following technologies listed in the range statement

### RANGE STATEMENT

- ◆ solar thermal (hot water)
- ◆ solar photovoltaic
- ◆ ground source heat pump
- ◆ air source heat pump
- ◆ micro-wind
- ◆ biomass
- ◆ rainwater harvesting
- ◆ grey water recycling
- ◆ micro-hydro
- ◆ micro-combined heat and power (heat-led)

### EVIDENCE REQUIREMENTS

Written and/or oral evidence is required to demonstrate knowledge defined in the PCs and must be produced in controlled supervised, open book conditions. This may be done by a balance of multiple choice, short answer, restricted response and structured questions.

# Workplace Assessed Unit Specification

## Statement of standards (cont)

**UNIT NUMBER:** F8XJ 04

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### ASSESSMENT

In order to achieve this Unit, candidates are required to present sufficient evidence that they have met all the Performance Criteria for each Outcome within the range specified. Details of these requirements are given for each Outcome. The assessment instruments used should follow the general guidance offered by the SQA assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of the assessment instruments used showing how evidence is generated for each Outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

# Workplace Assessed Unit Specification

## Support notes

**UNIT NUMBER:** F8XJ 04

**UNIT TITLE:** Working Principles, Installation Options and Regulatory Requirements for Micro-Renewable Technologies, Water Harvesting and Recycling Technologies

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 20 hours.

### APPROACHES TO GENERATING EVIDENCE

Written and/or oral evidence is required to demonstrate knowledge defined in the PCs and must be produced in controlled supervised, open-book conditions.

The Unit is designed to allow candidates to develop the knowledge and understanding required to be able to communicate with others in relation to the fundamental working principles, potential to install and regulatory requirements for micro-renewable and water harvesting and water recycling technologies. Tutors should make use of a range of delivery methods and support materials to allow the candidate to relate the knowledge to practical experience. This Unit has been developed to reflect some of the knowledge requirements in the following SummitSkills national occupational standards:

Determine Legislative and Working Practice Requirements for Environmental Technology Systems EVTS 9

Outcome 1 relates to the fundamental working principles of micro-renewable and water harvesting and recycling technologies

Outcome 2 relates to the typical advantages and disadvantages of micro-renewable and water harvesting and recycling technologies

Outcome 3 relates to the fundamental requirement of building location/building features for potential to install micro-renewable and water recycling systems to exist.

Outcome 4 relates to the fundamental regulatory requirements relating to micro-renewable and water harvesting and water recycling technologies

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## Support notes (cont)

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### APPROACHES TO ASSESSMENT

An integrated approach to gathering evidence and assessment should be encouraged. For example if structured appropriately it may be possible to develop an assessment which covers all 4 Outcomes. In this Unit an appropriate instrument of assessment could be a question paper consisting of a balance of multiple choice, short answer, restricted response and structured questions. A single assessment covering all Outcomes should not exceed 2 hours in duration.

### DISABLED CANDIDATES AND/OR THOSE WITH ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website [www.sqa.org.uk/assessmentarrangements](http://www.sqa.org.uk/assessmentarrangements)

### REFERENCES

1. For a fuller discussion on assessment issues, please refer to SQA's Guides to Assessment and Quality Assurance.
2. Procedures for special needs statements are set out in SQA's guide 'Guidance on Special Assessment Arrangements' (AA0645/3).
3. For details of other SQA publications, please consult SQA's publications list. (FD037).



## History of changes to Unit

Version	Description of change	Date
02	Access Statement requirements amended.	29/05/12

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