

## **UEERE9990Y Coordinate the design of micro-grid renewable energy systems**

### **Modification History**

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

### **Application**

This unit involves the skills and knowledge required to coordinate the design of micro-grid renewable energy systems.

It includes safe work practices, site inspection processes and procedures, service provider responsibilities, consulting with qualified people to assess of client energy demand requirements and assessing micro-grid equipment options to meet client requirements and site conditions. It also covers provision of advice to the client on energy storage standards, codes of practices, government/utilities incentive schemes, and information related to the design and installation of a micro-grid renewable energy generation system.

Licensing, legislative or certification requirements that apply to this unit may differ between jurisdictions and system types. They should be checked prior to commencing this unit.

### **Pre-requisite Unit**

UEERE0011Y Design grid-connected photovoltaic power supply systems

UEERE0031Y Design off-grid PV Systems

UEERE5001Y Design grid-connected energy storage systems

UEERE9991Y Conduct site survey for off-grid PV/genset systems

UEERE9999Y Conduct site survey for grid-connected renewable energy systems

and

UEEEL0039 - Design, install and verify compliance and functionality of general electrical installations

or

UEERE9993Y Apply electrical principles to renewable energy design

## Competency Field

Renewable Energy

## Unit Sector

Electrotechnology

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

#### **1 Prepare to coordinate design of micro-grid**

#### **2 Coordinate site survey for a micro-grid**

### PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures relevant to site assessment are obtained and applied
- 1.2** Scope and scale of proposed micro grid is determined from project brief
- 1.3** Stakeholders and required experts that need to be consulted and involved are identified and engaged
- 1.4** Site survey plan is developed in consultation with required personnel
- 1.5** Equipment and documentation needed for the site survey are obtained in accordance with workplace procedures
- 1.6** Requirements for site survey, contractual obligations, and roles/responsibilities of people involved are discussed with stakeholder/s
- 1.7** Requirements for production and approval of design are identified and documented
- 2.1** Details of project brief are verified, and any discrepancies recorded
- 2.2** Current stakeholder/s energy usage data is collected and expected future energy generation needs are discussed, and expectations are clarified

- 2.3** Energy resource data is collected
    - 2.4** Information about site access, building structures and layout, existing electrical infrastructure is gathered and documented
    - 2.5** Site hazards that may impact installation are identified and documented
    - 2.6** Reports and data from technical experts is obtained and added to site survey data
    - 2.7** Distribution/network requirements are determined where required
    - 2.8** Site survey data is analysed and report prepared
  - 3** **Coordinate the design of micro-grid**
    - 3.1** Any relevant industry standards, building/electrical regulations, codes and jurisdictional approval process are identified
    - 3.2** Qualified person/s are consulted and briefed as required on site conditions, and client requirements and expectations
    - 3.3** Options for Micro-grid energy generation equipment to meet site requirements and client expectations are identified and noted
    - 3.4** Different options for micro-grid energy storage equipment to meet site requirements and client expectations are identified and noted
    - 3.6** Placement of system components is considered, and any restrictions or issues of concern noted
    - 3.7** Micro-grid system performance standards and compliance methods are applied to the design development
    - 3.8** Safety, functional and budgetary considerations are incorporated in design
    - 3.9** Qualified person/s are consulted to ensure micro-grid system design draft complies with the design brief, industry standards and regulations, job requirements and workplace procedures

- 3.10** Micro-grid system design is documented in line with industry standards and regulations, job requirements and workplace procedures
- 3.11** Micro-grid system design is documented and submitted to relevant person/s for approval

## **Foundation Skills**

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## **Range of Conditions**

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

## **Unit Mapping Information**

This is a new unit.

## **Links**

UEE - Electrotechnology Training Package Companion Volume Implementation Guide at:  
[sector webpage link here]

## **Assessment Requirements for UEERE9990Y Coordinate the design of micro-grid renewable energy systems**

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### **Performance Evidence**

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS), and risk assessment and control procedures
- developing the site survey plan in consultation with the project manager, client, equipment manufacturers, installers and engineers
- identifying, engaging and coordinating technical expertise required for the site survey and design
- communicating effectively with stakeholders
- undertaking site inspection safely and documenting findings
- coordinating qualified person/s as required to:
  - assess client energy demand requirements
  - develop options for suitable generating systems
  - develop options for suitable storage systems
  - determine impact of site conditions on selection of best options
  - determine placement of system components, any restrictions or issues of concern
  - identify potential installation problem/s and recommend solutions
  - determine any required sign-off or approval for design and final installation
  - produce final site survey report
  - produce micro-grid design
- obtaining approval for final design
- completing relevant organisational documentation.

### **Knowledge Evidence**

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of the following. Additional advice and definitions for some items is provided in the UEE Training Package Companion Volume Implementation Guide (CVIG).

- relevant WHS/OHS requirements

- relevant manufacturer specifications
- relevant workplace documentation, policies and procedures
- relevant standards, building regulations and codes of practice
- methods to identify and comply with contractual obligations
- customer service responsibilities
- stakeholders involved in the design, installation and maintenance of energy systems and their roles
- methods to identify conditions to drive energy source
- environmental management plan development and implementation
- management of system maintenance processes
- site surveying
- energy assessment and monitoring
- micro-grid energy generating systems
- micro-grid energy storage systems
- basic energy principles
- methods for identifying and recording existing electrical and generation infrastructure
- electricity network requirements and restrictions
- government/utilities incentive schemes
- jurisdictional approvals required before installation
- roles and responsibilities of people involved in design and installation
- load control, demand management and tariffs.

## Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

## Links

UEE - Electrotechnology Training Package Companion Volume Implementation Guide at:  
[sector webpage link here]

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## CVIG Content

relevant WHS/OHS requirements may include:

- risk assessment and mitigation processes
- legislated requirements
- roof access and working at heights
- working in remote areas
- development and implementation of safety management plans.

relevant standards, building regulations and codes of practice may include:

- energy assessment and monitoring
- interoperability standards
- fire and safety
- storage and safety of fuel

stakeholders involved in the design, installation and maintenance of energy systems and their roles may include:

- distribution network providers
- users of the micro-grid
- entities (e.g. mine, council, consortium)
- power retailers
- land owners

site surveying may include:

- sunshine hours irradiation, latitude, azimuth and altitude angles, radiance, tilt angle
- energy efficiency initiatives relevant for domestic dwelling and commercial premises to reduce the electrical energy demand by the site owner
- electricity network requirements and restrictions
- government/utilities incentive schemes
- assessing WHS/OHS risks when working on a particular site
- solar access for the site
- solar resource for the site
- available area for the solar array
- roof is suitable for mounting options for the array
- shading and estimates of its effect on the system
- switchboard or distribution board is located for connecting the output of inverter
- array junction box (if required) and location of inverter
- cabling route and estimates of the lengths of the cable runs
- monitoring panels or screens and determining a suitable location with the site owner
- existing electrical system

energy assessment and monitoring may include:

- methods for discussing with clients
- methods for collecting energy usage and patterns
- energy efficiency
- data sources



- data logging
- meter analysis
- site plans, satellite images, distances between structures and infrastructure
- information to support development of fire safety plan

micro-grid energy generating systems may include:

- different equipment types and their componentry
- distribution configurations
- factors that impact equipment type selection
- design, installation, and maintenance requirements
- environmental considerations and required approvals
- considerations when multiple sources are used
- mix of renewable and other energy generating systems
- smart systems including monitoring and control
- generator controls
- running multiple systems
- smart PLC/SCADA smart processors
- data networking
- protection systems
- cable selection
- private metering
- fuel systems
- fire and safety
- bushfire resilience
- grid stability

micro-grid energy storage systems may include:

- different equipment types and their componentry
- factors that impact equipment type selection
- design, installation, and maintenance requirements

jurisdictional approvals required before installation may include:

- relevant regulation and responsibilities
- environmental
- heritage
- safety
- fire
- local guidelines