

UEERE9999Y Conduct site survey for grid-connected photovoltaic and battery storage 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 complete site surveys for grid-connected photovoltaic and battery storage 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 grid-connected equipment options to meet client requirements and site conditions. It also covers provision of advice to the client on battery storage standards, codes of practices, government/utilities incentive schemes, and information related to the installation of a grid-connected photovoltaic and battery storage systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable

Competency Field

Renewable Energy

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

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

- 1 Prepare to conduct site survey**
 - 1.1** Stakeholders are identified and client requirements and expectations for grid-connected system obtained
 - 1.2** Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures relevant to site survey are obtained and applied
 - 1.3** Equipment and documentation needed for the site inspection are obtained in accordance with workplace procedures
 - 1.4** Requirements for site survey and roles/responsibilities of people involved in site survey, design and installation are discussed with client
 - 1.5** General information about industry standards, building/electrical regulations and codes, and risk minimisation is provided to client
 - 1.6** Advice on the benefits of photovoltaic and battery storage systems and energy management is provided to client
 - 1.7** Current client energy usage data is collected, and future changes identified
 - 1.8** Resources, information sources and other people that will support gathering required site survey information are identified
- 2 Undertake and document site survey**
 - 2.1** Site survey for the proposed installation is safely undertaken
 - 2.2** Current and expected future client energy generation needs are discussed, and expectations are clarified
 - 2.3** Site hazards that may impact installation are identified and documented
 - 2.4** Information about site access, building structures, existing electrical infrastructure, available RE resources is gathered and included in report
 - 2.5** Site survey report is prepared and provided to designer in accordance with workplace procedures

- 2.6** Designer, and other qualified person/s if required, are consulted and briefed on client expectations and requirements
- 2.7** Designer, and other qualified person/s if required, are consulted and briefed on site access, conditions, risks and potential installation issues
- 2.8** Options for grid-connected photovoltaic and battery storage equipment to meet site requirements and client expectations are discussed with designer, and other qualified person/s if required
- 2.9** Placement of system components is considered, and any restrictions or issues of concern noted
- 2.10** Final site survey report is prepared after consultation with designer

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 UEERE0022Y Conduct site survey for grid connected photovoltaic and battery storage systems

Modification History

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

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
- identifying all relevant stakeholders and qualified personnel required to complete site survey
- communicating effectively with clients to discuss:
 - requirements for site assessment and information to be collected
 - roles/responsibilities of people involved in design, installation and maintenance
 - industry standards, building/electrical regulations and codes, and risk minimisation relevant to the installation
 - benefits and options of photovoltaic and battery storage systems and energy management
- undertaking site survey safely and documenting findings including:
 - potential site hazards that may impact installation
 - site access, layout, distances and building structures
 - solar access and shading
 - gathering information about existing electrical installation and any existing energy generation elements
 - current energy usage including maximum power and energy demand
 - current and expected future energy generation needs including maximum power demand
 - working with qualified personnel as required to complete site survey
 - options for suitable photovoltaic generating systems
 - options for suitable battery storage systems
 - options for placement of system components, any restrictions or issues of concern
 - potential installation problem/s and recommend solutions
- producing final site survey report.

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 including:
 - risk assessment and mitigation processes
 - safe work method statements (SWMS)/job safety assessments or risk mitigation processes prior to site visit
 - legislated requirements
 - roof access and working at heights
 - electrical safety
- basic energy principles
- relevant manufacturer specifications
- relevant standards, building regulations and codes of practice
- stakeholders, required personnel and roles and responsibilities of people involved in design, installation and maintenance
- methods for identifying and recording existing electrical infrastructure
- relevant local, state and commonwealth requirements
- site survey process and information to be gathered, recorded and analysed
- energy assessment and review including:
 - methods for discussing with client energy use patterns and future plans in energy use
 - methods for collecting energy usage and patterns
 - consideration of appropriate energy efficient appliances and technologies
 - data sources
- energy services required by the electrical installation grid-connected photovoltaic systems including:
 - different equipment types their componentry and configuration
 - factors that impact equipment type selection related to site and usage characteristics
 - basic design, installation, and maintenance requirements
 - connection limitations, requirements
 - basic configuration of a PV array
 - environmental considerations and required approvals
- grid-connected battery storage systems including:
 - methods of battery storage
 - fundamentals of battery storage
 - different energy storage technologies, associated componentry and system configuration
 - factors that impact equipment type selection related to site and usage characteristics
 - life expectancy

- Basic design, installation and maintenance requirements
- basic operation of battery storage systems and integrated systems
- installation considerations and requirements for grid-connected photovoltaic and battery storage systems
- electrical diagrams for a RE system including:
 - functional block diagrams for typical grid-connected RE system configurations
 - architectural and site diagrams to show the locations of equipment, fittings and cabling.

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
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- 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]

CVIG content

Site survey 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 power conversion equipment
- array junction box (if required) and location of power conversion equipment
- 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
- cultural heritage or environmental considerations
- noise considerations
- access for customer
- access for installation and maintenance personnel

Local, state and commonwealth requirements may include:

- codes
- consumer protections (eg NETCC), ACCC
- safety and technical elements

Information about existing electrical installation may include:

- existing RE installation elements
- electrical safety elements
- switchboards and electrical layouts - need to know c/b sizes, what connects to what (when there are sub boards and the like), overhead and underground wiring and other services
- existing grid connection considerations
- safety, protection, reticulation

Energy usage data may include:

- understanding of not only maximum loading but also diversity of site electrical operations - eg seasonal loads like shearing, significant events

Basic energy principles may include:

- definition of the terms: energy, power, energy efficiency, end-use energy, primary energy and embodied energy
- system autonomy
- calculation relating to energy, power and time
- units and symbols for energy, power, time and temperature
- conversion of energy and power quantities from one unit to another

DRAFT