



Australian Government

**UEERE4010 Plan the installation of
bidirectional electric vehicle systems in a
low voltage environment**

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Modification History

Release	Comments
1	This unit of competency was first released in UEE Electrotechnology Training Package Release 11.0.

Application

This unit describes the skills and knowledge required to plan the installation of bidirectional electric vehicle (EV) equipment in a low voltage (LV) environment. Bidirectional charging refers to EV charging equipment capable of both importing energy to charge an EV and exporting energy from the EV to a site installation and/or the distribution network.

The work involves planning and preparing sites for bidirectional EV equipment to ensure safe integration with electrical infrastructure, electric vehicles and the electricity grid, including preparing accurate site assessments, schematic diagrams, site plans, system specifications, and approval documentation that meet client requirements, industry standards, and regulatory obligations.

This unit applies to individuals who are competent in the core skills of an electrician and are undertaking further development in specialist renewable energy, storage, or advanced system design contexts, and who take responsibility for interpreting technical and regulatory information and preparing planning documentation in line with established industry standards and procedures.

Licensing/Regulatory Information

This unit applies to licensed electricians or individuals that have been deemed competent in their final licensing assessment (capstone) or an equivalent pathway recognised by the relevant state or territory regulatory authority.

Work associated with this unit is subject to electrical licensing requirements and grid connection approvals governed by jurisdictional regulators and electricity distributors. All tasks must be carried out under applicable workplace and regulatory arrangements.

Licensing, legislative, and regulatory requirements can vary between states and territories; relevant jurisdictional information must be sourced prior to commencing the unit.

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

Renewable Energy

Unit sector(s)

Electrotechnology

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare for the site survey	1.1 Identify work health and safety (WHS) requirements relevant to the site survey
	1.2 Notify relevant parties required to undertake the site survey
	1.3 Review current client energy usage data and identify future changes
	1.4 Provide relevant parties with information on standards, regulations, codes, and risk control measures for bidirectional EV equipment
2. Conduct the site survey	2.1 Conduct a pre-work briefing with each organisational stakeholder prior to the site survey, covering site access, conditions, hazards, installation issues, and client requirements
	2.2 Apply and monitor WHS procedures to ensure safe work outcomes and continuous improvement
	2.3 Undertake the site survey for the proposed design and installation
	2.4 Discuss and document current and projected client energy generation needs and clarify expectations with client
	2.5 Document site hazards that may impact installation
	2.6 Gather and record information on site access, building structures, existing electrical and renewable energy infrastructure
	2.7 Analyse existing installation capacity to determine suitability for bidirectional energy export

	2.8 Discuss equipment to meet site requirements and expectations with the client
	2.9 Consider the placement of system components and note any restrictions or issues of concern
3. Prepare a site plan and report	3.1 Interpret site survey data to determine system options
	3.2 Confirm the roles and responsibilities of all parties involved in the design and installation and clarify their roles
	3.3 Identify and apply industry regulations, legal obligations, and job requirements
	3.4 Liaise with Distribution Network Service Provider (DNSP) to determine export limits, metering requirements, and approval conditions
	3.5 Prepare the site survey report
4. Develop a design	4.1 Incorporate safety, functional, and budgetary considerations into the design
	4.2 Verify and submit to relevant parties the design for compliance with the design brief, industry standards, regulations, job requirements, and workplace procedures
	4.3 Consider feedback and incorporate any required changes to the design within industry standards, regulations, job requirements

Range of conditions

N/A

Assessment Requirements for UEERE4010 Plan the installation of bidirectional electric vehicle systems in a low voltage environment

Performance Evidence

To demonstrate competent application of the skills and knowledge in this unit, evidence must show that the individual can:

- conduct site surveys, for:
 - one design that incorporates a bidirectional EV system, and
 - one design that incorporates a bidirectional EV system together with a renewable energy resource

Each must include the following:

- confirm WHS requirements and site access arrangements
- identify all parties involved and the required plant, tools/test equipment, and Personal Protective Equipment (PPE)
- obtain client objectives and constraints
- record and interpret the client's energy profile
- identify hazards and record risk control measures
- record measurements, site access, cable routes, equipment locations, and capture photos
- record details of existing electrical and communications infrastructure
- perform demand/capacity checks and confirm design against standards, legislation, and regulations
- apply measurements, site access, cable routes, equipment locations, and capture photos if required
- recommend a solution with rationale against site conditions, client needs, and compliance requirements, including export control
- prepare a single-line diagram (SLD) and site layout/plan showing major components
- prepare a list of materials and equipment requirements
- develop a commissioning and testing plan including:
 - charge and discharge testing
 - control checks
 - requirements of standards, regulations, and legislation
 - DNSP requirements and limitations
 - approvals/notifications and compile application information
- present the proposal to client, record feedback, and update documents.

Knowledge Evidence

To demonstrate competent application of the skills and knowledge in this unit, evidence must show that the individual has knowledge of:

- hazards during site surveys and appropriate risk controls
- principles of WHS for planning and documentation
- types of PPE, test and measurement equipment used for survey tasks
- alternating current (a.c.) and direct current (d.c.) bidirectional EV equipment architectures and operating modes
- charger and vehicle compatibility, including connector types and communication protocols
- operational scenarios and constraints of bidirectional EV equipment
- industry standards and DNSP or grid-connection requirements at planning stage
- approval and notification requirements, metering arrangements, and export limits
- demand, diversity and service capacity
- protection and isolation requirements, including residual current device (RCD) types, residual direct current detection devices (RDC-DD), earthing, grid interaction, phase balance, and phase rotation
- power quality, including voltage drop, voltage rise and fault levels
- energy management systems, current transformer (CT) placement, and export-limiting methods
- communication requirements and reliability considerations
- cyber security considerations and firmware management
- site survey records, single-line diagrams, site plans, safe work method statements, commissioning and test plans and approval documentation
- equipment placement constraints, including clearances, ventilation, ingress protection (IP) ratings, structural considerations, corrosion, and weather exposure
- access, egress, traffic, and construction-phase constraints
- client requirements and communication of technical options to non-technical stakeholders.

Assessment Conditions

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

Assessment must be conducted in a real or simulated work environment that reflects actual design conditions for bidirectional EV equipment. Assessment activities must require the candidate to demonstrate compliance with current electrical safety legislation, applicable

service and installation rules, and relevant network standards in the state or territory of assessment.

Learners must be licensed electricians, or have been deemed competent in their final licensing assessment (capstone) or equivalent pathway, as recognised by the relevant regulatory authority. Assessment must demonstrate compliance with current electrical safety legislation, applicable service rules, and electricity network standards.

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

Unit Mapping Information

Previous Code and Title	Equivalence	Comments
	Newly created	This unit has been created to address a skill or task required by industry that is not covered by an existing unit of competency

Links

Companion volumes, including implementation guides, are found on the national training register - <https://training.gov.au/training/details/UEE>.