




UEE Renewable Energy

Project Update

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Project Purpose Statement

During transition to the 2012 Standards for Training Packages it was identified that renewable energy qualifications were not fit for purpose. The review will update these qualifications and related units to reflect current technologies, industry practices, regulations, and accreditation.

Renewable systems, technology and industry practices have evolved significantly since these qualifications were last reviewed. To address this, Training Package materials will be updated to enable the Electrotechnology workforce to develop the necessary skills for the installation and maintenance of renewable energy technologies used by domestic and commercial customers.

The project includes the review of 8 existing qualifications, 50 existing units, and the Skill Sets they appear in. If identified as appropriate by the Technical Advisory Committee (TAC), some existing units may be deleted and new units developed.

Outputs of the project will be published in Release 5.0 of the UEE Electrotechnology Training Package.

Deliverable summary after initial review

	In project scope	Not reviewing	Existing reviewed	New	Delete
Units	50	3	25	14	22 *
Qualifications	8	-	6 **	-	2

* 9 of the units that are proposed for deletion have had their content absorbed across other new and/or revised units.

** three Certificate IV qualifications will be merged into one, so only four qualifications will be submitted for endorsement.

Key discussion points during project

- Enrolments in material being reviewed are in some instances zero or very low over the last three years and therefore deletion of some content may be appropriate.
- There are three general 'sustainability awareness' units within the project scope which are used in the core of many UEE qualifications, and it was agreed the benefit of updating these units does not justify the impact that changes to them would have, i.e. require a major release and code change to the qualifications in which they appear (every qualification in the UEE Training Package)
- Material had not been properly reviewed for over a decade, and significant change was required to some content.
- Titles of many units did not reflect their content. For example, the units that had titles starting with "Solve problems in..." are largely theory units that have little to do with actual problem solving.

- The structure of content across many units was not ideal to support industry's skilling needs, nor the implementation of training and assessment.
- Regulation dictates what work can only be done by Licenced Electricians. However, there are some areas where people with sufficient underpinning knowledge (e.g. Electrical Engineers) could be better utilised in the sector, but current prerequisite requirements are a barrier to their participation. Discussions about 'Design' units involved lengthy debate about this division. It is clear however, that the sector needs to be able to draw from a broader pool than just Electricians for some functions if they are going to be able to meet demand now and into the future.
- Content could be grouped into three main areas and the complexity of working on systems increased through the following sequence (see matrix page 3):
 1. Grid-connected
 2. Off-grid
 3. Micro-grid
- Installation of the energy generating components for each of the three areas shown above was very similar, but the way the components are connected to PCEs/Inverters/loads, and the presence of other generating equipment, is the factor that separates them and influences complexity of working on them.
- There is value in structuring the installation units to cover what happens on either side of an inverter/PCE.
- Work on micro-grids is an evolving area and there is better definition required about what constitutes a micro-grid. The configuration and make-up of micro grids can take many different forms, and therefore, development of units to cover design and installation processes applicable across this breadth is difficult. This difficulty is compounded by the multidisciplinary teams involved in their design and installation. There is a heavy emphasis on the role of engineers in this area (both from a technical and regulatory perspective); and, installation and maintenance of the poles and wires that connect them are covered in a different Industry Training Package (UET).
- There is a necessary divide between work on renewable energy systems that generate to meet the energy needs of the owner, and those that generate energy for commercial distribution. More integration between training packages may be a useful consideration in future.
- Some of the current 'remote area supply' content is not being used and there is no indication that it will be in the foreseeable future. The first round of public consultation may elicit some yet unidentified interest in their retention.
- Some of the current energy efficiency assessment units duplicate content in other Industry Training Packages, and the accreditation linked to the units in other Training Packages may make them better options.

Matrix for main content

The TAC developed a matrix to guide development of content related to the design, installation, maintenance (including fault finding and repair) and inspection of grid-connected, off-grid and micro-grid renewable energy systems. The matrix does not cover all content involved in the review, and areas not covered are covered later in this update.

System type	Technology/ Type	Function						
		Site Survey	Design	Install source to PCE	Install PCE to load	Maintenance, fault finding & repair	Inspection	
Grid Connected	PV	UEERE9999Y Conduct site survey for grid-connected renewable energy systems	UEERE0011Y Design grid-connected photovoltaic power supply systems	UEERE0016Y Install PV systems to inverter/PCE	UEERE9989Y Install grid-connected systems (PCE to grid)	UEERE9995Y Fault find and repair grid-connected photovoltaic power supply systems	UEERE9987Y Maintain renewable energy (RE) apparatus	UEERE9998Y Inspect grid connected renewable energy systems
	Storage		UEERE5001Y Design grid-connected energy storage systems	UEERE9994X Install energy storage to inverter/PCE	UEERE4001Y Install PCE to grid and essential loads			
Off Grid	PV/Genset	UEERE9991Y Conduct site survey for off-grid PV/genset systems	UEERE0031Y Design off-grid PV Systems	<i>Covered by GC content above</i>	UEERE9992Y Install off-grid systems to electrical installation	UEERE9988Y Fault find and repair off-grid PV/genset systems to an electrical installation	UEERE0027Y Coordinate maintenance of renewable energy (RE) apparatus and systems	UEERE9997Y Inspect off-grid renewable energy systems
	Wind		UEERE0032X Design wind energy systems	UEERE0036Y Install and maintain wind energy systems				
	Micro-hydro		UEERE0029Y Design micro-hydro systems	UEERE0037Y Install and maintain micro hydro systems				
Micro Grid		UEERE9990Y Coordinate the design of micro-grid renewable energy systems	UEERE9986X Coordinate the installation, fault finding and repair of micro grid systems					Inspect Microgrid Systems

UEERE0020Y Promote sustainable energy practices will be used as a general introductory unit for new entrants (including sales personnel)

UEERE9993Y Apply electrical principles in Renewable energy design will be used as an alternate prerequisite path for non-electricians into design units

REVIEW STATUS OF MATERIAL

Following is an update on what has happened to, or is planned for, the 50 units of competency and 8 qualifications included in this project.

Not reviewing

The following units are used to cover general 'sustainability awareness' in the core of many UEE qualifications. It was agreed that the benefit of updating these units does not justify the impact that changes to them would have, i.e. require a major release and code change to the qualifications in which they appear.

- UEERE0001Y Apply environmentally and sustainable procedures in the energy sector
- UEERE0013Y Develop strategies to address environmental and sustainability issues in the energy sector
- UEERE0015Y Implement and monitor energy sector environmental and sustainable policies and procedures

Common units

The following units are general and span multiple system types.

New Unit Title	Current Unit Title	Notes
UEERE0020Y Promote sustainable energy practices	UEERE0020 Promote sustainable energy practices in the community	Entry level units mainly used in Certificate II Qualifications. Reviewed and updated.
UEERE0021Y Provide basic sustainable energy solutions for energy management in residential premises	UEERE0021 Provide basic sustainable energy solutions for energy reduction in residential premises	RE0021 also suitable for sales personnel to develop basic RE industry/equipment awareness.
UEERE9987Y Maintain renewable energy (RE) apparatus	New unit	Cover scheduled preventative maintenance across all system types One for doing maintenance; the other for coordinating it.
UEERE0027Y Coordinate maintenance of renewable energy (RE) apparatus and systems	UEERE0027 Coordinate maintenance of renewable energy (RE) apparatus and systems	
UEERE0044Y Plan renewable energy (RE) projects	UEERE0044 Plan renewable energy (RE) projects	Engineering level units for AQF 5 and 6 level qualifications.
UEERE0042Y Manage renewable energy (RE) projects	UEERE0042 Manage renewable energy (RE) projects	
UEERE0033Y Develop engineering solutions to renewable energy (RE) problems	UEERE0033 Develop engineering solutions to renewable energy (RE) problems	
UEERE9993Y Apply electrical principles to renewable energy design	New unit	Developed to ensure non-electricians have sufficient underpinning knowledge to undertake design

Grid Connected units

New Unit Title	Current Unit Title	Notes
UEERE9999Y Conduct site survey for grid-connected renewable energy systems	New unit	New unit that covers a lot of the previous content held in relevant 'solve problems...' unit
UEERE0011Y Design grid-connected photovoltaic power supply systems	UEERE0011 Design grid-connected photovoltaic power supply systems	Reviewed and updated. Have 'site survey' as prerequisite. Also have RE9993 Principles unit <u>or</u> UEEEL0012 as prerequisite.
UEERE5001Y Design grid-connected energy storage systems	UEERE5001 Design battery storage systems for grid-connected photovoltaic systems	
UEERE0016Y Install PV systems to inverter/PCE	UEERE0016 Install, configure and commission LV grid-connected photovoltaic power systems	Instal PV systems either side of PCE/inverter
UEERE9994Y Install energy storage to inverter/PCE	New unit	
UEERE9989Y Install grid-connected systems (PCE to grid)	New unit	Instal storage (battery) systems either side of PCE/inverter
UEERE4001Y Install PCE to grid and essential loads	UEERE4001 Install, maintain and fault find battery storage systems for grid-connected photovoltaic systems	
UEERE9995Y Fault find and repair grid-connected photovoltaic power supply systems	New unit	Covers trouble shooting and repair. Scheduled preventative maintenance covered in RE9987
UEERE9998Y Inspect grid connected renewable energy systems	New unit	Drafted in a general way to facilitate changes to Standards/Regulation over time.

Off Grid units

New Unit Title	Current Unit Title	Notes
UEERE9991Y Conduct site survey for off-grid PV/genset systems	New unit	New unit that covers a lot of the previous content held in relevant 'solve problems...' units
UEERE0031Y Design off-grid PV systems	UEERE0031 Design stand-alone renewable energy (RE) systems	Reviewed and updated.
UEERE0029Y Design micro-hydro systems	UEERE0029 Design micro-hydro systems rated to 6.4 kW	
UEERE0032Y Design wind energy systems	UEERE0032 Design wind energy conversion systems (WECS) rated to 10 kW	
UEERE0030Y Design renewable energy (RE) heating systems	UEERE0030 Design renewable energy (RE) heating systems	Reviewed and updated. Both old units mapped to new one. Maintenance embedded.
UEERE0036Y Install and maintain wind energy systems	UEERE0036 Install small wind energy conversion systems rated up to 10 kW for ELV standalone applications	
	UEERE0038 Install, configure and commission LV wind energy conversion systems rated up to 10 kW	

New Unit Title	Current Unit Title	Notes
UEERE0037Y Install and maintain micro-hydro systems	UEERE0037 Install, configure and commission LV micro-hydro systems rated up to 6.4 kW	Reviewed and updated. Both old units mapped to new one. Maintenance embedded.
	UEERE0039 Install, set up and maintain ELV micro-hydro systems rated up to 6.4 kW	
UEERE9992Y Install off-grid systems to electrical installation	New unit	Covers installation for just PV/genset PCE to loads. Installation of PV and batteries to PCE/inverter covered in grid connect units (RE0016 and RE0094)
UEERE9988Y Fault find and repair off-grid PV/genset systems to an electrical installation	New unit	Covers trouble shooting and repair. Scheduled preventative maintenance covered in RE9987
UEERE9997X Inspect off-grid renewable energy systems	New unit	Drafted in a general way to facilitate changes to Standards/Regulation over time.

Micro Grid units

New Unit Title	Current Unit Title	Notes
UEERE9990Y Coordinate the design of micro-grid renewable energy systems	New unit	Covers coordination of both site survey and design. Recognises the involvement of multiple technical experts and engineers in the process
UEERE9986X Coordinate the installation, fault finding and repair of micro grid systems	New unit	Covers coordination of both installation, and fault-finding/repair. Recognises the involvement of multiple trades, technical experts and engineers in the process.
UEERE9996X Inspect micro grid renewable energy systems	New unit	Drafted in a general way to facilitate changes to Standards/Regulation over time.

Energy Efficiency units

Important to note that the CPP Property Services Training Package has a full qualification for Energy Efficiency Assessors. That qualification, and units within it, are used for accrediting assessors.

New Unit Title	Current Unit Title	Notes
CPPHES4005 - Assess household energy use and efficiency improvements	UEERE0005 Assess energy loads and uses for energy efficiency in residential, office and retail premises	Replaced current unit with import. Duplicates CPP unit which is used to accredit energy efficiency assessors
UEERE0003Y Assess energy loads and uses for energy efficiency in commercial facilities	UEERE0003 Assess energy loads and uses for energy efficiency in commercial facilities	Reviewed both for consistency of approach with CPP household one and added evidence requirements. It was not thought that CPP units adequately covered commercial or industrial.
UEERE0004Y Assess energy loads and uses for energy efficiency in industrial properties and enterprises	UEERE0004 Assess energy loads and uses for energy efficiency in industrial properties and enterprises	
UEERE0014 Develop strategies to address sustainability issues for electrical installations	UEERE0014 Develop strategies to address sustainability issues for electrical installations	Reviewed and updated.

UEERE0010Y Design energy management controls for electrical installations in buildings	UEERE0010 Design energy management controls for electrical installations in buildings	Updated. UEEIC0013 added as prerequisite to improve base.
UEERE0012 Develop effective engineering strategies for energy reduction in buildings	UEERE0012 Develop effective engineering strategies for energy reduction in buildings	Basic updates completed. Mostly covers a building's thermal performance.
UEERE0034 Diagnose and rectify faults in renewable energy (RE) control systems	UEERE0034 Diagnose and rectify faults in renewable energy (RE) control systems	Basic updates completed.

Remote Area Supply units

Twelve (12) Remote area supply units are proposed for deletion. Those 12 units have had no enrolments last three years. There is no apparent industry interest in using them and no known RTOs ready to deliver. Consultation will identify if any interest in retention

Unit Title	Notes
UEERE0019Y Maintain safety and tidiness of remote area power supply systems	Basic review done. Are used in a number of qualifications - including NWP Water qual's
UEERE0023Y Work safely with remote area power supply systems	

Units to be deleted

Current Unit Title	Notes
UEERE0025 Carry out basic repairs to renewable energy (RE) apparatus	Content covered in other new units
UEERE0022 Solve basic problems in photovoltaic energy apparatus and systems	Content covered by RE9999, RE0011, RE9989 and RE9995
UEERE0045 Solve basic problems in micro-hydro systems	Content covered by RE9991, RE0037 and RE9992
UEERE0046 Solve problems in stand-alone renewable energy (RE) systems	Content covered by RE9991, RE0031 RE9992 and RE9988
UEERE0047 Solve problems in wind energy conversion systems (WECS) rated up to 10 kW	Content covered by RE9991, RE0036 and RE9992
UEERE0035 Install ELV stand-alone photovoltaic power systems	Content covered by RE0016 and 9989
UEERE0005 Assess energy loads and uses for energy efficiency in residential, office and retail premises	Replace with import. Duplicates CPP unit which is used to accredit energy efficiency assessors
UEERE0028 Design hybrid renewable power systems	Content covered by UEERE0031Y, UEERE0032Y and UEERE0029Y
UEERE0048 Verify compliance and functionality of an extra-low voltage renewable energy installation	Not required. Quals it appears in being deleted
UEERE0002 Assemble and connect remote area power supplies	No enrolments last three years. No known RTOs ready to deliver. No apparent industry interest in using. Consultation will identify if any interest in retention.
UEERE0006 Conduct periodic maintenance of remote area power supply battery banks	
UEERE0007 Conduct periodic maintenance of remote area power supply generator sets	

Current Unit Title	Notes
UEERE0008 Conduct periodic maintenance of remote area power supply photovoltaic arrays	
UEERE0009 Conduct periodic maintenance of remote area power supply wind generators	
UEERE0017 Maintain and repair facilities associated with remote area essential service operations	
UEERE0018 Maintain and repair remote area power generation facilities	
UEERE0024 Attend to breakdowns in remote area power supplies (RAPS)	
UEERE0026 Conduct checks in the demand side use of remote area power supplies (RAPS)	
UEERE0040 Maintain and monitor remote area essential service operations	
UEERE0041 Maintain operation of remote area power generation plant	
UEERE0043 Plan periodic maintenance schedules of remote area power supplies (RAPS)	

Qualifications reviewed

Code and Title	Pathway	Notes
UEE41920 Certificate IV in Electrical - Renewable Energy	Electrical	Merged into one Certificate IV.
UEE42020 Certificate IV in Electrical - Photovoltaic systems	Electrical	Replaced existing units with new ones.
UEE43120 Certificate IV in Energy Efficiency and Assessment	Electrical	Elective groups reorganised.
UEE50720 Diploma of Renewable Energy Engineering	Electrical	Replaced existing units with new ones. Elective groups reorganised.
UEE60920 Advanced Diploma of Renewable Energy Engineering	Electrical	
UEE62020 Advanced Diploma of Engineering Technology - Renewable Energy	Renewables	

Qualifications to be deleted

Code and Title	Pathway	Notes
UEE32020 Certificate III in Renewable Energy – ELV	Renewables	ELV content no longer required in a qualification.
UEE41620 Certificate IV in Renewable Energy	Renewables	

Note: two of the Certificate IV qualifications in the table above will also be removed.