

**TAC Meeting 23/11/2021 [Lawrence Coomber member]**

1 message

**Lawrence Coomber** <lawrencecoomber@gmail.com>  
To: Paul Humphreys <paul.humphreys@aistnds.org.au>  
Bcc: gabbycoomber <gabbycoomber@gmail.com>

Wed, Nov 24, 2021 at 8:39 AM

23/11/2021

Hello Paul, and thanks for a very informative first TAC meeting today.

1. I look forward to contributing over the next 6 months to the TAC outcomes.
2. I have long been a supporter and practitioner in Renewable Energy Technology education for young technicians; engineers; TAFE graduates [NMIT Melbourne] and also high school students both nationally and internationally with some success, so I am in the right company with the TAC.
3. In 1985 I founded and still head up a highly regarded Australian technology and manufacturing company [T/as Flowtech Water Meters / Aquila Power] after 20 years' service as an Electrician and Electrical Systems Engineer with the Royal Australian Navy. We are technology equipment and systems innovators and manufacturers, for both the Australian Water and Energy industries, and smart technology suppliers to most Australian Rural and Regional Councils, Public Utilities, and many Civil Contractors since 1985. Our company is considered as the Industry Standard in smart water metering and mains hydraulic diagnostics technology.
4. When you address the 'Division of Work' and which TAC members will work in groups going forward, please have a quick look at the attached pdf file which will give you a brief snapshot of my dealings [particularly in the Global Renewable Energy Industry] over the last 20 years, I am a globally focussed and future thinking active engineer.
5. The TAC has a unique opportunity to set a very high bar for Australian students, aimed at developing a culture of global innovative technology and manufacturing excellence, able to compete against the world's best and excel at every level in the rapidly unfolding new energy technologies era. It is an exciting time to be a young emerging Australian technocrat - but we must strive to develop young leaders and innovators and manufacturers of world's best practice systems and equipment, and not simply be content to be installers [by rote] of imported technologies from others who have mastered higher technical educational standards and enterprise better than ourselves..

Thanks Paul and I look forward to our next meeting.

Best regards Lawrence Coomber  
CEO Aquila Power

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# Head Engineer Technical Support Services



## Lawrence Coomber

Lawrence is a senior Renewable Energy Systems Designer and Installer and Clean Energy Council member and licensee, holding the full range of CEC technology endorsements including Wind, Solar PV, Micro-Hydro, Hybrid and Battery Storage, for both On Grid and Off Grid Systems Design and Installation of any scale.


An experienced professional electrical engineer, with over 30 years experience in the Renewable Energy sector in both Australia and overseas.

Lawrence brings a unique depth of experience and cutting edge hands-on practical expertise, to both Renewable Energy Solutions customers, and a broad network of associates throughout the global industry.

Clean Energy Council: - A8765474

Electrician | Electrical Contractor: -

Qld: 42390 | Qld: 67642 | NSW: 6457C | WA: EW203778


**Electrical Work Licence** 

**LAWRENCE JOHN COOMBER**

is licensed to perform the work of:

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**Electrical Contractor Licence** 

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**LAWRENCE JOHN COOMBER**

Licence No: EW203778      Expiry Date: 18/12/2021  
Issued by the Electrical Licensing Board Western Australia

**CONTRACTOR LICENCE**

ELECTRICAL  

**LAWRENCE JOHN COOMBER**

11 ANDREW AVE  
TUROSS HEAD NSW 2537

NUMBER  
6457C


EXPIRES  
01/11/2022

Q

 **CLEAN ENERGY COUNCIL  
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Lawrence Coomber 

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23/01/2021  
mHydro, Wind, H-Storage



Enquiries 13 23 91

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Level 2: AP93338

**Lawrence  
Coomber**



CLEAN ENERGY COUNCIL  
**ACCREDITED  
INSTALLER**

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**This is to certify that**

Lawrence Coomber

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**has fulfilled all requirements of the Clean Energy  
Council and is hereby awarded Accreditation for**

Grid-connect Design & Install, SPS PV Design  
& Install and Battery Design & Install  
of photovoltaic power systems

Micro - Hydro

Wind

Hybrid

Storage

---

**Accreditation Number**

A8765474

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**Date Accreditation Awarded**

20/05/2010

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**Date Accreditation Expires**

23/01/2022

CEC Accreditation Team



Lawrence Coomber with Chinese Corporate partners at the North Melbourne Institute of Technology - Graduation Awards Ceremony 2011

Lawrence Coomber [Renewable Energy Technologies of The Future] Lecture Series Introduced to China Schools 2013





Lawrence Coomber introduced an information and awareness program for both Guangdong Provincial and Local Governments, and selected Guangdong technology manufacturers, outlining the rapidly emerging high growth potential for joint venture project opportunities between key innovative Australian and Guangdong Province Renewable Energy Technology companies.



Lawrence Coomber, Qld Minister for Energy and Resources, Australian Ambassador, and Australian Trade Delegation, meeting with Guangdong Provincial Government leaders



Lawrence Coomber giving a presentation to Dongguan Municipal Government leaders on Australia/ Chinese joint sporting development initiatives.



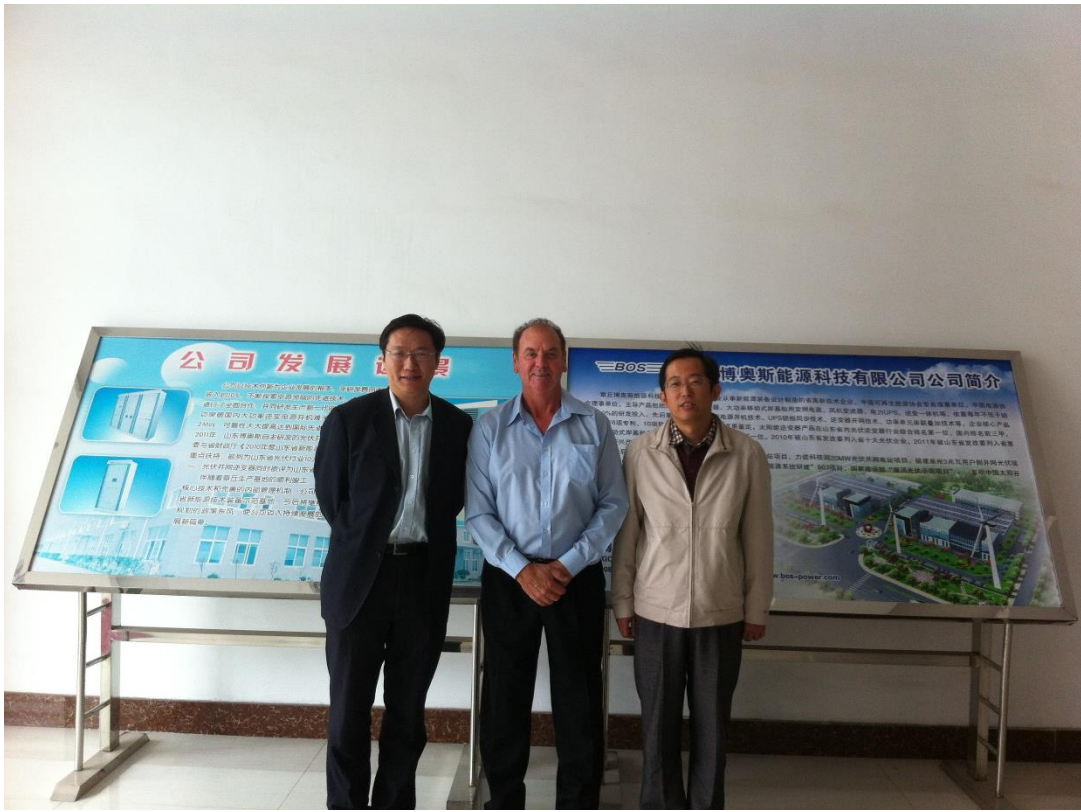
Lawrence Coomber introducing a group of Chinese Renewable Energy Company executives and Australian counterparts, to the Victorian Minister for Education & Training at Parliament House Melbourne.



Lawrence Coomber signing a joint Australia/Chinese energy technology venture agreement with Shenzhen manufacturer Growatt accompanied by eight visiting Australian Energy Industry Engineers.



Lawrence Coomber in the capacity as Chairman of the Australian Clean Energy Association Incorporated at Dongguan partner manufacturer CSG PVTech with inaugural NMIT Academic Awards Graduates.



Lawrence Coomber with senior executives of BOS Technology Corporation Jinan China





Eco-Asia  
Convention  
Hong Kong  
2008

Royal Australian Navy  
Ex Naval Engineers Reunion



Attending negotiations with Dubai  
Energy Government Ministry  
Guangzhou 2009

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# MINUTES: UEE RENEWABLES

## TAC Meeting 1

<b>Date:</b>	23 November 2021	<b>Time:</b>	1:00pm – 4:00pm
<b>Location:</b>	Online (Teams)		
<b>TAC Member</b>	<b>Organisation</b>		
<b>TAC Members:</b>			
Alex Newman	Jakes Jacobs		
Allen Burrows	Lawrence Coomber		
Anita Talberg	Martin Stephens		
Bobbi McKibbin	Michael Cullen		
Christian Silva	Michelle Taylor		
David Tolliday	Richard Kowalski		
Gary Lucas	Robbie Nichols		
Gavin Crabtree	Sandy Atkins		
Geoff Stapleton	Stuart Butterworth		
George Nestic	William Gammon		
Greg Power	Caz Saunders (proxy for Craig Redman)		
Howard Pullen			
<b>AIS:</b>			
Paul Humphreys (ISS)	Alexander Versace		
<b>Apologies:</b>			
Anne Nguyen	Elizabeth Rosenberg		
Craig Redman	Kennedy Mavunganidze		
Daniel Chadwick	Mark Burgess		
Daniel King	Yannick Zapf		
Darryl Bower			

# UEE Renewable Energy

Project Update

8 April 2022



Level 2 / 31 Market Street,  
South Melbourne VIC 3205  
(03) 9604 7200  
[www.australianindustrystandards.org.au](http://www.australianindustrystandards.org.au)

## 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
<b>CPPHES4005</b> - Assess household energy use and efficiency improvements	UEERE0005 Assess energy loads and uses for energy efficiency in residential, office and retail premises	<b>Replaced current unit with import.</b> 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. Elective groups reorganised.
UEE43120 Certificate IV in Energy Efficiency and Assessment	Electrical	
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.



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# UEE RENEWABLES

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**PROJECT  
COMMENCEMENT**

**TRAINING PACKAGE  
DEVELOPMENT AND  
CONSULTATION**

**VALIDATION**

**ENDORSEMENT**

# ENDORSEMENT

**2 DECEMBER 2022**

The UEE Electrotechnology Training Package (Release 5.0) has been endorsed by the Skills Ministers for implementation.

This project resulted in the development of 13 new Units of Competency and 19 new Skill Sets, and updates to four qualifications, 25 units and 10 Skill Sets. Two qualifications and 14 units have been deleted.

This work has significantly restructured and updated renewables training products so they reflect employers' contemporary skill and knowledge needs to design, install, maintain and inspect renewable energy systems. The revised content covers current renewable energy technologies/systems, regulatory compliance, and industry licencing/accreditation.

The revised and new material meets the needs of Licenced Electricians as well as Electrical Engineers; and the development of industry skills and knowledge for support roles such as sales personnel. The content provides the opportunity for improved collaboration and pathways across roles in the renewables field.

To support the delivery of the Training Package, a Companion Volume Implementation Guide (CVIG) has been developed to assist assessors, trainers, Registered Training Organisations (RTOs) and enterprises. The CVIG contains a comprehensive list of all products in the Training Package; mapping information which details the changes that have been made to the materials; regulation and licensing implications; and useful links to other information.

The endorsed UEE Electrotechnology Training Package Release 5.0 is now available on [training.gov.au](https://training.gov.au).

The following materials were approved:

## **Updated Qualifications:**

- UEE43322 Certificate IV in Electrical – Renewable Energy (replaces the following three qualifications: UEE41920, UEE42020 and UEE43120)
- UEE50722 Diploma of Renewable Energy Engineering
- UEE60922 Advanced Diploma of Renewable Energy Engineering
- UEE62022 Advanced Diploma of Engineering Technology – Renewable Energy

## **Deleted Qualifications:**



# PAUL HUMPHREYS

Industry Skills Specialist - Electrotechnology

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Phone: 0429 670 588

- UEERE0080 Install photovoltaic power conversion equipment to grid
- UEERE0082 Maintain renewable energy (RE) apparatus

## Updated Units of Competency: AUSTRALIAN INDUSTRY STANDARDS

Level 2, 31 Market Street, South Melbourne  
Phone: (03) 9604 7200

- UEERE0053 Assess energy loads and uses for energy efficiency in commercial facilities
- UEERE0056 Coordinate maintenance of renewable energy (RE) apparatus and systems
- UEERE0059 Design energy management electrical installation technologies
- UEERE0060 Design grid-connected battery storage systems
- UEERE0061 Design grid-connected photovoltaic power supply systems
- UEERE0063 Design micro-hydro systems
- UEERE0064 Design off-grid photovoltaic/generating set systems
- UEERE0065 Design renewable energy (RE) heating systems
- UEERE0066 Develop effective engineering strategies for energy reduction in buildings
- UEERE0067 Develop engineering solutions to renewable energy (RE) problems

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AUSTRALIAN  
INDUSTRY  
STANDARDS

- UEERE0067 Develop engineering solutions to renewable energy (RE) problems
- UEERE0068 Develop strategies to address sustainability issues for electrical installations
- UEERE0069 Diagnose and rectify faults in renewable energy (RE) control systems
- UEERE0075 Install and maintain micro hydro energy systems to power conversion equipment
- UEERE0076 Install and maintain wind energy systems to power conversion equipment
- UEERE0077 Install battery storage equipment power conversion equipment to grid
- UEERE0078 Install battery storage to power conversion equipment
- UEERE0081 Install photovoltaic systems to power conversion equipment
- UEERE0083 Maintain safety and tidiness of remote area power supply systems
- UEERE0084 Standardise renewable energy (RE) projects
- UEERE0085 Plan renewable energy (RE) projects
- UEERE0086 Promote sustainable energy practices
- UEERE0087 Provide basic sustainable energy solutions for energy management in residential premises
- UEERE0088 Work safely with remote area power supply systems

Transport and Logistics

Water

Supply Chains

Technical Advisory

Committees (TACs)

Training Packages

**Deleted Units of Competency:**

- UEERE0002 Assemble and connect remote area power supplies
- UEERE0005 Assess energy loads and uses for energy efficiency in residential, office and retail premises
- UEERE0017 Maintain and repair facilities associated with remote area essential service operations
- UEERE0022 Solve basic problems in photovoltaic energy apparatus and systems
- UEERE0024 Attend to breakdowns in remote area power supplies (RAPS)
- UEERE0025 Carry out basic repairs to renewable energy (RE) apparatus
- UEERE0026 Conduct checks in the demand side use of remote area power supplies (RAPS)
- UEERE0028 Design hybrid renewable power systems
- UEERE0035 Install ELV stand-alone photovoltaic power systems
- UEERE0040 Maintain and monitor remote area essential service operations
- UEERE0043 Plan periodic maintenance schedules of remote area power supplies (RAPS)
- UEERE0045 Solve basic problems in micro-hydro systems
- UEERE0046 Solve problems in stand-alone renewable energy (RE) systems
- UEERE0047 Solve problems in wind energy conversion systems (WECS) rated up to 10 kW
- UEERE0048 Verify compliance and functionality of an extra-low voltage renewable energy installation

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## New Skill Sets:

Identifying Skills needs

• UEESS00196 Grid-connected Battery Storage Systems Designer-Installer Skill Set

• UEESS00197 Grid-connected Battery Storage Systems Installer Skill Set

• UEESS00196 Grid-connected Renewable Energy System Site Surveyor Skill Set

• UEESS00197 Grid-connected Renewable Energy Systems Inspector Skill Set

• UEESS00198 Hybrid Photovoltaic, Wind and Battery Storage Systems Installer Skill Set

• UEESS00199 Micro-hydro Systems Designer Installer Skill Set

• UEESS00200 Micro-hydro Systems Designer Skill Set

• UEESS00201 Micro hydro systems Installer Skill Set

• UEESS00202 Micro-grid Renewable Energy Systems Inspector Skill Set

• UEESS00203 Micro-grid systems Design Coordinator Skill Set

• UEESS00204 Micro-grid Systems Installation and Maintenance Coordinator Skill Set

• UEESS00205 Off-grid Photovoltaic/Generating Set Systems Designer-Installer Skill Set

• UEESS00206 Off-grid Photovoltaic/Generating Set Systems Installer Skill Set

• UEESS00207 Off-grid Photovoltaic Generating Set Systems Designer Skill Set

• UEESS00208 Off-grid Renewable Energy System Site Surveyor Skill Set

• UEESS00209 Off-grid Renewable Energy Systems Inspector Skill Set

• UEESS00210 Wind Energy Systems Designer-Installer Skill Set

• UEESS00211 Wind Energy Systems Designer Skill Set

• UEESS00212 Wind Energy Systems Installer Skill Set

• UEESS00213 Wind Energy Systems Inspector Skill Set

• UEESS00214 Wind Energy Systems Design Coordinator Skill Set

## Updated Skill Sets:

• UEESS00193 Grid-connected Photovoltaic and Battery Storage Systems Designer Skill Set

• UEESS00194 Grid-connected Photovoltaic Systems Designer-Installer Skill Set

• UEESS00195 Grid-connected Photovoltaic Systems Installer Skill Set

• UEESS00210 Sustainable – Electrical Installations Sustainability Strategies Skill Set

• UEESS00211 Sustainable – Energy Assessment of Commercial Facilities Skill Set

• UEESS00212 Sustainable – Energy Assessment of Industrial Properties and Enterprises Skill Set

• UEESS00213 Sustainable – Energy Assessment of Residential, Office and Retail Premises Skill Set

• UEESS00214 Sustainable – Energy Efficiency Systems Designer Skill Set

• UEESS00215 Sustainable – Energy Efficiency Systems Developer Skill Set

• UEESS00216 Sustainable – Identify Energy Efficiency Strategies Skill Set



[Public Safety IRC](#)

[Public Safety IRC Industry Outlook](#)

[Public Safety Projects](#)

[Rail](#) **31 OCTOBER 2022**

[Rail IRC](#)

[Rail IRC Industry Outlook](#)

[Rail Projects](#)  
At its meeting on 12 October 2022 the AISC approved the UEE Electrotechnology Training Package (Release 5.0) for referral to Skills Ministers for endorsement.

[Transport and Logistics](#)

[Transport and Logistics IRC](#)

[Transport and Logistics IRC Industry Outlook](#)  
The Renewables project has updated four existing qualifications, updated 25 existing units of competency (UoC), developed 13 new UoC, updated 10 existing Skill Sets, and developed 19 new Skill Sets. 14 UoC and two qualifications are proposed for deletion.

[Transport and Logistics Projects](#)

[Water](#)  
For more information on this project, please contact the Industry Skills Specialist.

[Water IRC](#)

[Water IRC Industry Outlook](#)

[Water Projects](#)

[Supply Chains](#)

[Supply Chains Projects](#)

[National Training System](#) **12 SEPTEMBER 2022**

**CASE FOR ENDORSEMENT SUBMITTED TO AISC**

[Industry Reference Committees \(IRCs\)](#)

[Registered Training Organisations \(RTOs\)](#)

[State Training Authorities \(STAs\)](#)  
The Electrotechnology Industry Reference Committee has submitted the Case for Endorsement and draft Training Package materials to the Australian Industry and Skills Committee (AISC) for consideration at its meeting on 12 October 2022.

[Technical Advisory Committees \(TACs\)](#)

[Projects](#)

[Aviation](#) **[View Case for Endorsement](#)**

[Correctional Services](#)

[Electrotechnology](#)  
If approved, this Case for Endorsement will result in:

[ESI Generation](#)

**Updated Qualifications:**  
[ESI Transmission, Distribution and Rail](#)

[Gas](#) • UEE43322 Certificate IV in Electrical – Renewable Energy

[Maritime](#) • UEE50722 Diploma of Renewable Energy Engineering

[Public Safety](#) • UEE60922 Advanced Diploma of Renewable Energy Engineering

[Rail](#) • UEE62022 Advanced Diploma of Engineering Technology – Renewable Energy

[Transport and Logistics](#)

**Deleted Qualifications:**

- UEE32020 Certificate III in Renewable Energy – ELV
- UEE41620 Certificate IV in Renewable Energy

**New Units of Competency:**

- UEERE0051 Apply electrical principles to renewable energy design
- UEERE0054 Conduct site survey for grid connected photovoltaic and battery storage systems
- UEERE0055 Conduct site survey for off-grid photovoltaic/generating set systems
- UEERE0057 Coordinate the design of micro-grid renewable energy systems
- UEERE0058 Coordinate the installation, fault finding and repair of micro grid systems
- UEERE0070 Fault find and repair grid-connected photovoltaic power supply systems
- UEERE0071 Fault find and repair off-grid PV/genset systems to an electrical installation
- UEERE0072 Inspect grid connected renewable energy systems
- UEERE0073 Inspect micro grid renewable energy systems
- UEERE0074 Inspect off-grid renewable energy systems
- UEERE0079 Install off-grid power conversion equipment to electrical installation
- UEERE0080 Install photovoltaic power conversion equipment to grid
- UEERE0082 Maintain renewable energy (RE) apparatus

**Updated Units of Competency:**

- UEERE0052 Assess energy loads and uses for energy efficiency in commercial facilities
- UEERE0053 Assess energy loads and uses for energy efficiency in industrial properties and enterprises
- UEERE0056 Coordinate maintenance of renewable energy (RE) apparatus and systems
- UEERE0059 Design energy management controls for electrical installations in buildings
- UEERE0060 Design grid-connected battery storage systems
- UEERE0061 Design grid-connected photovoltaic power supply systems
- UEERE0062 Design micro-hydro systems
- UEERE0063 Design off-grid photovoltaic/generating set systems
- UEERE0064 Design renewable energy (RE) heating systems
- UEERE0065 Design wind energy systems
- UEERE0066 Develop effective engineering strategies for energy reduction in buildings

- UEERE0067 Develop engineering solutions for renewable energy (RE) problems
- UEERE0068 Develop strategies to address sustainability issues for electrical installations
- UEERE0069 Diagnose and rectify faults in renewable energy (RE) control systems
- UEERE0075 Install and maintain micro hydro energy systems to power conversion equipment
- UEERE0076 Install and maintain wind energy systems to power conversion equipment
- UEERE0077 Install battery storage equipment power conversion equipment to grid
- UEERE0078 Install battery storage to power conversion equipment
- UEERE0081 Install photovoltaic systems to power conversion equipment
- UEERE0083 Maintain safety and tidiness of remote area power supply systems
- UEERE0084 Manage renewable energy (RE) projects
- UEERE0085 Plan renewable energy (RE) projects
- UEERE0086 Promote sustainable energy practices
- UEERE0087 Provide basic sustainable energy solutions for energy management in residential premises
- UEERE0088 Work safely with remote area power supply systems

#### **Deleted Units of Competency:**

- UEERE0002 Assemble and connect remote area power supplies
- UEERE0005 Assess energy loads and uses for energy efficiency in residential, office and retail premises
- UEERE0017 Maintain and repair facilities associated with remote area essential service operations
- UEERE0022 Solve basic problems in photovoltaic energy apparatus and systems
- UEERE0024 Attend to breakdowns in remote area power supplies (RAPS)
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- UEERE0046 Solve problems in stand-alone renewable energy (RE) systems
- UEERE0047 Solve problems in wind energy conversion systems (WECS) rated up to 10 kW
- UEERE0048 Verify compliance and functionality of an extra-low voltage renewable energy installation

## **New Skill Sets:**

- UEES00191 Grid-connected Battery Storage Systems Designer-Installer Skill Set
- UEES00192 Grid-connected Battery Storage Systems Installer Skill Set
- UEES00196 Grid-connected Renewable Energy System Site Surveyor Skill Set
- UEES00197 Grid-connected Renewable Energy Systems Inspector Skill Set
- UEES00198 Hybrid Photovoltaic, Wind and Battery Storage Systems Installer Skill Set
- UEES00199 Micro-hydro Systems Designer Installer Skill Set
- UEES00200 Micro-hydro Systems Designer Skill Set
- UEES00201 Micro hydro systems Installer Skill Set
- UEES00202 Micro-grid Renewable Energy Systems Inspector Skill Set
- UEES00203 Micro-grid Systems Design Coordinator Skill Set
- UEES00204 Micro-grid Systems Installation and Maintenance Coordinator Skill Set
- UEES00205 Off-grid Photovoltaic/Generating Set Systems Designer-Installer Skill Set
- UEES00206 Off-grid Photovoltaic/Generating Set Systems Installer Skill Set
- UEES00207 Off-grid Photovoltaic Generating Set Systems Designer Skill Set
- UEES00208 Off-grid Renewable Energy System Site Surveyor Skill Set
- UEES00209 Off-grid Renewable Energy Systems Inspector Skill Set
- UEES00217 Wind Energy Systems Designer-Installer Skill Set
- UEES00218 Wind Energy Systems Designer Skill Set
- UEES00219 Wind Energy Systems Installer Skill Set

## **Updated Skill Sets:**

- UEES00193 Grid-connected Photovoltaic and Battery Storage Systems Designer Skill Set
- UEES00194 Grid-connected Photovoltaic Systems Designer-Installer Skill Set
- UEES00195 Grid-connected Photovoltaic Systems Installer Skill Set
- UEES00210 Sustainable – Electrical Installations Sustainability Strategies Skill Set
- UEES00211 Sustainable – Energy Assessment of Commercial Facilities Skill Set
- UEES00212 Sustainable – Energy Assessment of Industrial Properties and Enterprises Skill Set
- UEES00213 Sustainable – Energy Assessment of Residential, Office and Retail Premises Skill Set
- UEES00214 Sustainable – Energy Efficiency Systems Designer Skill Set
- UEES00215 Sustainable – Energy Efficiency Systems Developer Skill Set
- UEES00216 Sustainable – Identify Energy Efficiency Strategies Skill Set

# Site Visit Unit for Off Grid ▶ Inbox



**Geoff Stapleton** <geoff@gses.com.au>

Feb 27, 2022, 12:35 PM



to Paul, Gary, David, aburrows@cleanenergycouncil.org.au, christian.silva@nmtafe.wa.edu.au, Kennedy.Mavunganidze@tafesa.edu.au, gcrabtree@cleanenergycouncil.org.au, lawrence@ac

Hi Paul and Everyone

At the last off-grid meeting I promised to work on the knowledge requirements for the site for off grid systems units. I did that, but I thought to fast track the process I would have 2 others, David Tolliday and Michelle Taylor look at it before I sent it back to Paul and yourselves.

That led to e-mails back and forth about the actual structure of the grid matrix for site visits and design units. To be fair part of this was resulting from the point raised a lot of times already—systems are not being designed correctly. Site visit for grid connect by a non-designer is OK but off grid systems it is more critical. The system must be designed to meet the client's requirement both in power/energy but also possibly operational (e.g no generator except in periods of sustained bad weather or when higher usage eg visitors/parties etc).

We also looked at the fact that in the matrix the site visit fed into all three system design units, that is PV/Generating Set (shortened to genset for future reference), Wind and hydro. It was suggested that site visit should actually be undertaken by a designer, and that there is no site visit unit, but the material is covered individually in the three design units. However, Michelle raised the issue that they do train individuals to undertake the site visit who then work with their designers when they return. The cost of sending a higher paid designer out to remote systems is too high, but to fair as a DNSP they have a lot of customer supply reliability regulatory requirement then a commercial sale would have.

The outcome was whether to have a site visit unit for PV/Genset that would meet the needs of DNSP's and possibly others in future. This unit would briefly introduce micro hydro and wind, so the person doing the site visit was aware that there were possibly other solutions beside PV and genset. The key outcomes of the unit is, determining any specific customer requirements, undertaking load assessments/analysis, determining solar access and shading, identifying where equipment might be located. This site visit unit was then a prerequisite for the design unit, ensuring that the designer actually did both units even if the company they work did not send them out to undertake the site visit.

The discussion around the poor designs in the industry included ,what should be the prerequisites for the PV/Genset design unit? Currently a number of RTO's have the pathway of people doing GC and then GCwBatteries and then SAPS. There is some commonality with GC and GCwB when it comes to products being used with the different systems and therefore is partly repeated in the SAPS course. However, the mindset for designing an off-grid system is completely different to designing a PV array for a grid connect system or selecting an inverter/battery system in GCwB. I personally feel some of the issues with design of off grid systems at the moment is the designers following a grid connect mindset. As been said by many people—the off grid system is the customers power supply. If PV/inverter/batteries do not meet their requirements they either have a black-out or have to run the genset, which many people do not want to do too often.

So, the discussion was around do we have GC and GCwB design as prerequisites for off grid PV/genset or is the off-grid PV/genset unit a complete stand alone unit. When people are learning solar resources and other common information (e.g. battery technologies) the RTO could choose to RPL people who have undertaken the GC and GCwB units, however my belief is that there is no harm in repeating it. It is important that the design unit does focus on the fact that the system equipment has to be sized to meet the customers' requirements, emphasising that it is generally a different mindset to GC courses where the grid is available as back up.

So the consensus so far is.....,

1. An Off-GRID Site Survey UoC is required for PV/GENSET which will include an awareness of micro-hydro & wind resource requirements. (This has been highlighted as required by industry)

2. The Off-grid site survey is a pre-req for Off-grid design

3. For micro-hydro & Wind, the design UoC will include detailed requirements of the applicable site survey for the technology

As a member of the off-grid TAC, do you agree with the above

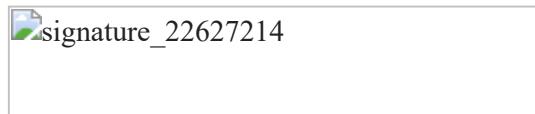
The answer to this question is important in finalising the design unit.

Attached is the site visit unit that Michelle, David and myself have worked on. It is based on it just being site visit for PV/Genset. It is shown in tracked changes with numerous comments on the side. It would be good, for sake of time, if people could review this before the next meeting in just over a week.

Regards

Geoff

## Managing Director

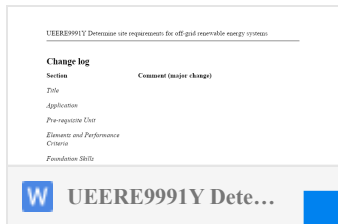
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**Lawrence Coomber** <lawrencecoomber@gmail.com>

Feb 27, 2022, 3:58 PM



to Geoff, Paul, Gary, David, aburrows@cleanenergycouncil.org.au, christian.silva@nmtafe.wa.edu.au, Kennedy.Mavunganidze@tafesa.edu.au, gcrabtree@cleanenergycouncil.org.au, lawrence@

27/02/2022

Thanks Geoff, Michelle and David; excellent work and a solid platform for next week.

I have made a side note in the attached file about some key points that we have probably overlooked up to now, but nevertheless these points can't be dismissed without consideration, or our young practitioners/designers/installers coming through will end up incapable of intuitively, confidently and quickly "scaling up" their system design imperatives to those expected of worlds best practice: **Fully Functional Smart Off Grid System Solutions** that both manage themselves [without user intervention - as does the Grid supply network] and seamlessly service complex and variable load scenarios 24/7.

Regards Lawrence Coomber  
Aquila Power



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