



REGISTERED NATIONAL QUALIFICATION

Title:	National Certificate in Sustainable Energy (Solar) Level 4¹				
Version:	1	Qualification type:	National qualification	TQF level:	4
Credits:	88	TQF Registration code:	QR-04-NQ-018-07-0504-26-01		
Approval date:	10 th June 2026	Next review:	10 th June 2031		
Qualification developer:	<ol style="list-style-type: none"> 1. Department of Energy, Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC), Nuku'alofa, Tonga. 2. Tonga Australia Support Platform (TASP), Department of Foreign Affairs and Trade (DFAT), Tonga – as Consultant Nuku'alofa, Tonga 				
Purpose:	<p>The <i>National Certificate in Sustainable Energy (Solar) Level 4 (NCSEL4(S))</i> is aimed at those:</p> <ul style="list-style-type: none"> • who already been working in a field related to Energy/ Sustainable energy/electrical industry or • with relevant work experience who wish to pursue a career in Sustainable energy. <p>The learner will demonstrate knowledge, skills, techniques and experiences in understanding system components, verifying the</p>				

¹ This Tonga national qualification, *National Certificate in Sustainable Energy (Solar) Level 4*, has been adapted from the Pacific regional micro qualifications (micro credentials) which has been accredited by the Pacific Community's Educational Quality and Assessment Programme (EQAP) and registered on the Pacific Register of Qualifications and Standards (PQRS) therefore, considered equivalent to the Regional registered micro qualifications (micro credentials).

This qualification adaptation is the outcome of a close collaboration between the Tonga National Qualifications and Accreditation Board (TNQAB) and the qualification developers (which is Tonga Department of Energy, MEIDECC, and the Tonga Australia Support Platform (TASP), and made possible through financial support from TASP, Department of Foreign Affairs and Trade (DFAT), Tonga.

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	<p>sizing of equipment; install and commission solar PV systems; diagnose and carry out fault analysis of solar system; and compile reports and documentation. They will gain employment as Solar PV technicians, technical officers, site officers, project officers, maintenance technicians etc. at local and international sustainable energy companies, government department, electrical utility and development partners.</p> <p>This qualification not only supports the organisation outcomes of the Tonga Strategic Development Framework 2035 (TSDF 2035) but also assists the implementation of <i>Tonga Energy Road Map 2021-2035 (TERMPLUS)</i> and <i>Tonga's Low Emission Development Strategy (LEDS) 2021-2050</i> by building a skilled local workforce capable of safely expanding renewable electricity generation. This is consistent with MEIDECC's corporate plan priorities for climate resilience, low-emission development and energy security. It addresses industry-validated skills gaps in installation quality, system reliability and occupational safety across Tongatapu and the outer islands of Tonga.</p>
<p>Rationale</p>	<p>Tonga and other Pacific Island countries are susceptible to the negative consequences of climate change. They are at the forefront of the transition from fossil fuels to renewable energy sources for the production of power.</p> <p>The <i>National Certificate in Sustainable energy (Solar) Level 4</i> programme offers a convincing rationale rooted in environmental protection, economic benefits, and social equity. It promotes a transition away from fossil fuels, reduces greenhouse gas emissions, and enhances energy security by diversifying energy sources, such as:</p> <ul style="list-style-type: none"> • Transitioning to renewable energy sources like solar, wind, hydro and biomass energy sources significantly reduce greenhouse gas emissions, which is the primary driver of climate change. • Diversifying energy sources and reducing reliance on imported fossil fuels enhances energy security and reduces vulnerability to price fluctuations and geopolitical instability. • Sustainable energy solutions, particularly off-grid renewable energy systems, can provide access to electricity for communities in remote or underserved areas,

	<p>improving quality of life and fostering economic development.</p> <p>The transition to sustainable energy to reduce greenhouse gas emissions, vulnerability to oil price fluctuations and deploying renewable energy(mini-grids) to remote areas requires developing relevant competency skills and knowledge to serve the needs of local people and the national energy sector.</p> <p>This qualification targets individuals who are in the electrical/solar profession willing to acquire specialised skillsets on solar installation and operation and maintenance in both grid connect PV system and off-grid PV system. It will also be a pathway to those who have completed national Sustainable Energy (level 3)/Certificate in Electrical (level 3) to upgrade and acquire specialised qualification on solar energy. The interested people must meet the entry requirement of the programme.</p>																				
<p>Outcomes Statement</p>	<p>Graduates of <i>the National Certificate in Sustainable Energy (Solar) Level 4</i> will be able to:</p> <ol style="list-style-type: none"> i. work independently as a solar technician for on-grid and off-grid solar PV systems across Tonga. ii. confirm size (design) iii. install iv. test and commission v. operate and maintain solar PV systems in line with recognized IEC/AS/NZ standards and the Energy Act. vi. provide safety and compliance checks, conduct maintenance and repair services for solar PV systems in Tonga. 																				
<p>Qualification Components</p>	<p>This qualification consists of the following units of competency:</p> <table border="1" data-bbox="467 1491 1410 2002"> <thead> <tr> <th></th> <th><i>Unit Code</i></th> <th><i>Unit Title</i></th> <th><i>Credit value</i></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>NS117-04</td> <td>Develop knowledge on Electrical Principles</td> <td>10</td> </tr> <tr> <td>2</td> <td>NS118-04</td> <td>Demonstrate electrical installation technology</td> <td>10</td> </tr> <tr> <td>3</td> <td>NS119-04</td> <td>Understand electronics fundamentals</td> <td>6</td> </tr> <tr> <td>4</td> <td>NS120-04</td> <td>Determine sizing and installation of off-grid PV systems (SHS and stand-alone PV systems)</td> <td>12</td> </tr> </tbody> </table>		<i>Unit Code</i>	<i>Unit Title</i>	<i>Credit value</i>	1	NS117-04	Develop knowledge on Electrical Principles	10	2	NS118-04	Demonstrate electrical installation technology	10	3	NS119-04	Understand electronics fundamentals	6	4	NS120-04	Determine sizing and installation of off-grid PV systems (SHS and stand-alone PV systems)	12
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	5	NS121-04	Operate and maintain off-grid PV systems (SHS and stand-alone systems)	8	
	6	NS122-04	Determine sizing and installation of grid connected PV systems	10	
	7	NS123-04	Operate and maintain grid connected PV systems	8	
	8	NS124-04	Determine sizing and installation of off-grid PV systems (Hybrid systems)	10	
	9	NS125-04	Operate and maintain off-grid PV systems (Hybrid systems)	6	
	10	NS126-04	Determine sizing and installation of grid connected PV system with battery storage	8	
				Total Credits	88
	Note:				
	<ol style="list-style-type: none"> 1. The above units of competency can be delivered as short courses consisting of one or more units depending on the training needs of an interested training provider. 2. Approval for short course delivery be sought from TNQAB prior to delivery. 3. Competency gained through short courses delivered in the past five years, can be considered for cross credit. 				
	[Refer to section below on cross-credits]				
Entry Requirements	Learners for this qualification must have: <ul style="list-style-type: none"> • Successful completion of minimum Certificate level 3 Electrical/Electrotechnology/Sustainable Energy Or <ul style="list-style-type: none"> • Minimum of Pass in Form 7 Mathematics and Physics with either 3 years solar PV experiences OR completion of the solar micro-credentials. 				

Learning Assumed to be in Place	Trainees are expected to: <ul style="list-style-type: none"> • have basic computer literacy – MS office and email etc. • speak in English and Tongan • know fundamentals of electrical safety and electrical principles 								
International Comparability	<p>This Tonga national certificate in sustainable energy (Solar) Level 4 is aligned to:</p> <ol style="list-style-type: none"> 1. Relevant competency standards/micro-qualifications/solar accreditation delivered and recognised by Solar Accreditation Australia (SAA) (as in the table below): <table border="1" data-bbox="467 689 1394 1986"> <thead> <tr> <th data-bbox="467 689 938 824"> Tonga National Certificate in Sustainable Energy (Solar) Level 4 </th> <th data-bbox="946 689 1394 824"> Solar Accreditation Australia (SAA) </th> </tr> </thead> <tbody> <tr> <td data-bbox="467 831 938 1361"> 1. NS120-04 Determine sizing and installation of off-grid PV systems (SHS and stand-alone PV systems) </td> <td data-bbox="946 831 1394 1361"> UEERE0063 Design off-grid photovoltaic/generating set systems UEERE0081 Install photovoltaic systems to power conversion equipment UEERE0078 Install battery storage to power conversion equipment UEERE0079 Install off-grid power conversion equipment to electrical installation </td> </tr> <tr> <td data-bbox="467 1368 938 1765"> 2. NS122-04 Determine sizing and installation of grid connected PV systems </td> <td data-bbox="946 1368 1394 1765"> UEERE0061 Design grid-connected photovoltaic power supply systems UEERE0081 Install photovoltaic systems to power conversion equipment UEERE0080 Install photovoltaic power conversion equipment to grid </td> </tr> <tr> <td data-bbox="467 1771 938 1986"> 3. NS123-04 Operate and maintain grid connected PV systems </td> <td data-bbox="946 1771 1394 1986"> UEERE0056 Coordinate maintenance of renewable energy (RE) apparatus and systems UEERE0082 Maintain renewable energy (RE) apparatus </td> </tr> </tbody> </table>	Tonga National Certificate in Sustainable Energy (Solar) Level 4	Solar Accreditation Australia (SAA)	1. NS120-04 Determine sizing and installation of off-grid PV systems (SHS and stand-alone PV systems)	UEERE0063 Design off-grid photovoltaic/generating set systems UEERE0081 Install photovoltaic systems to power conversion equipment UEERE0078 Install battery storage to power conversion equipment UEERE0079 Install off-grid power conversion equipment to electrical installation	2. NS122-04 Determine sizing and installation of grid connected PV systems	UEERE0061 Design grid-connected photovoltaic power supply systems UEERE0081 Install photovoltaic systems to power conversion equipment UEERE0080 Install photovoltaic power conversion equipment to grid	3. NS123-04 Operate and maintain grid connected PV systems	UEERE0056 Coordinate maintenance of renewable energy (RE) apparatus and systems UEERE0082 Maintain renewable energy (RE) apparatus
Tonga National Certificate in Sustainable Energy (Solar) Level 4	Solar Accreditation Australia (SAA)								
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		UEERE0070 Fault find and repair grid-connected photovoltaic power supply
4. NS124-04 Determine sizing and installation of off-grid PV systems (Hybrid systems)		UEERE0063 Design off-grid photovoltaic/generating set systems UEERE0079 Install off-grid power conversion equipment to electrical installation
5. NS125-04 Operate and maintain off-grid PV systems (Hybrid systems)		UEERE0082 Maintain renewable energy (RE) apparatus UEERE0071 Fault find and repair off-grid photovoltaic/generating set systems to an electrical installation
6. NS126-04 Determine sizing and installation of grid connected PV system with battery storage		UEERE0054 Conduct site survey for grid-connected photovoltaic and battery storage systems UEERE0060 Design grid-connected battery storage Systems UEERE0078 Install battery storage to power conversion equipment UEERE0077 Install battery storage equipment power conversion equipment to grid
<p>2. Relevant renewable energy micro-qualifications registered on Pacific Register of Qualifications and Standards (PRQS) by the Pacific Community (SPC)'s Educational Quality and Assessment Programme (EQAP) (as in the table below):</p>		
Tonga National Certificate in Sustainable Energy (Solar) Level 4		Educational Quality and Assessment Programme (EQAP) MQ
1. NS120-04 Determine sizing and installation of off-grid PV systems (SHS and stand-alone PV systems)		PPAOG101 Designer of off-grid PV power systems (DC Load SHS)

		<p>PPAOG102 Designer of off-grid PV power systems (Stand-alone Solar systems)</p> <p>PPAOG201 Installer of off-grid PV Power systems (DC Load SHS)</p> <p>PPAOG202 Installer of off-grid PV Power systems (Stand-alone Solar Systems)</p>
2.	NS121-04 Operate and maintain off-grid PV systems (SHS and stand-alone PV systems)	<p>PPAOG301 Maintainer of off-grid PV Power systems (DC Load SHS)</p> <p>PPAOG302 Maintainer of off-grid PV Power systems (Stand-alone Solar Systems)</p>
3.	NS122-04 Determine sizing and installation of grid connected PV systems	<p>PPAGC100 Designer of grid connected PV systems</p> <p>PPAGC200 Installer of grid connected PV systems</p>
4.	NS123-04 Operate and maintain grid connected PV systems	PPAGC301 Operator and maintainer of PV systems (Grid connected)
5.	NS124-04 Determine sizing and installation of off-grid PV systems (Hybrid systems)	<p>PPAOG103 Designer of off-grid PV Power Systems (Hybrid Power Systems)</p> <p>PPAOG203 Installer of Off-grid PV Power systems (Hybrid Power Systems)</p>
6.	NS125-04 Operate and maintain off-grid PV systems (Hybrid systems)	PPAOG303 Maintainer of off-grid PV Power systems (Hybrid Power Systems)
7.	NS126-04 Determine sizing and installation of grid connected PV system with battery storage	<p>PPAGB501 Designer of Grid Connected PV system with batteries</p> <p>PPAGB402 Installer of Grid connected PV system with batteries</p>
<p>3. <i>Regional Certificate IV in Sustainable Energy</i> registered by the Pacific Community (SPC)'s Educational Quality and</p>		

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	<p>Assessment Programme (EQAP) (<i>upon request to EQAP for reference</i>)</p> <p>4. Any other Pacific Island qualification in SE that has been formally recognised as equivalent to the regional qualification mentioned in (3) above</p>
Recognition of Prior Learning	<p>Any individual without prior formal qualification but has prior technical experience (5 years+) on electrical work including solar PV may request RPL for this level of training program. The learner wishing to request RPL needs to apply in writing to the training providers.</p>
Credit Transfer	<p>The Tonga Qualifications Framework (TQF) as well as most other Frameworks allow for credit recognition and transfer from other regional or national qualifications through a process of mutual recognition.</p> <p>Credit transfer is a process whereby credits already achieved for one qualification are recognised towards a new qualification. Thus, if a learner has obtained the relevant competency (within the past five years) in:</p> <ol style="list-style-type: none"> 1. A qualification which has been identified as equivalent to NCSE(S)L4, he or she will receive credit for unit standards which have been successfully completed. Evidence of achievement will be required by relevant authorities before credit transfer is approved; 2. A TNQAB approved qualification that contains any of the component units of this national qualification; 3. A TNQAB approved short course that is made up of any of the component units of this national qualification, he or she will cross credit recognition. Evidence of achievement will be required by relevant authorities before credit transfer is approved. 4. A regional approved Micro-qualification (MQ) or approved short course that is made up of any of the component units of this national qualification, he or she will cross credit recognition. Evidence of achievement will be required by relevant authorities before credit transfer is approved.
Learning Pathways	<p><u>Pathways in:</u></p>

	<ol style="list-style-type: none"> 1. Successful graduates of the Certificates (Level 3) in Electrical Engineering or higher 2. Successful graduates of the Tonga National Certificate in Sustainable Energy Level 3 or equivalent; 3. Current employees without formal qualifications but with a pass in Form 7 Mathematics and Physics and 3 years+ solar experiences willing to acquire formal qualifications. 4. Interested learners OR current employees who meet the entry requirements 5. Completion of relevant short courses <p><u>Pathways out:</u></p> <ol style="list-style-type: none"> 1. Other higher-level qualifications in Sustainable energy such as Diploma in Renewable Energy (Solar) at USP Pacific TAFE or SPC's Regional Diploma in Sustainable Energy (level 6) 2. Employment in government institutions, power utilities, solar companies, etc.
Support for Qualification	<p>This national qualification has gained the support of the following organizations:</p> <ol style="list-style-type: none"> 1. Department of Energy within the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC), Tonga. 2. The Pacific Community's Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE). 3. Ministry of Education and Training, Tonga. 4. School of Science and Technology (SST), Tonga National University. 5. Pacific Community's Educational Quality and Assessment Programme (EQAP), Fiji. 6. Sustainable Energy Industry Association of the Pacific Islands (SEIAPI). 7. Tonga Australia Support Platform (TASP)/Department of Foreign Affairs and Trade (DFAT), Tonga.
Accreditation Requirements	<p>Important accreditation requirements include:</p> <ol style="list-style-type: none"> 1. Teaching staff must have:

- a) At least a level 5 qualification in Electrical Engineering or related field plus 3 years relevant industry experience;
 - b) A relevant qualification as a trainer or assessor in TVET;
 - c) A valid first aid certificate.
2. Physical resources (computers and internet access, and class room resources such as projectors/LED screen);
 3. Specialised solar training equipment for each unit of competency;
 4. Unit descriptors ready for distribution to students with details of:
 - a) Learning outcomes, qualification components, credit values, entry requirements, required training resources etc.
 - b) Assessment details including assessment tasks and due dates, marking guidelines, moderation information, and other requirements about the completion of each unit
 - c) Recommended textbooks/readings for students, and
 - d) Names and contact details of teaching staff