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Regional Certificate 2 in Sustainable Energy (SE)

The Certificate 2 in Sustainable Energy is a generic qualification aimed at those who are working or seek entry to work in the Energy/Sustainable Energy sector working with Renewable Energy (RE) sources and Renewable Energy Technologies (RETs).

<table>
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<td>Level 1 credits</td>
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Credit Value:

One credit is equivalent to ten notional learning hours. Notional learning hours include: direct contact time with teachers and trainers (directed learning), time spent in studying, doing assignments, and undertaking practical tasks (self-directed/work related), time spent in assessment.

Sustainable Energy

The Pacific Island states are particularly vulnerable to the adverse effects of climate change. They are also countries that are leading the world in reducing their fossil fuel consumption and shifting to renewable energy sources of electricity generation. The increasing demand, usage and costs associated with fossil fuels to power the transportation and energy sectors of Pacific Island nations has led to an energy transformation in the region. Investment in clean and affordable energy, with a focus on renewable energy, energy efficiency and conservation is leading diversity in technologies, sources of energy and mitigating the environmental effect of using fossil fuels.

Around the Pacific Island region, the price of fuel and electricity tariffs rank amongst the highest in the world and there are significant inefficiencies in electricity generation and fuel consumption in the transport sector. While there are promising renewable energy opportunities, about 7 million people out of the region’s 10 million still do not have access to electricity. Against this backdrop, Pacific Island countries are prioritising a shift to renewable electricity sources and increased access for all communities. In some cases, whole atolls are now 100 percent renewable, many more people have access to clean and reliable power, the amount of diesel imported for electricity generation has been reduced and some Pacific countries can now better manage the impacts of climate change. As a result of the shift and ongoing changes there is a need for training in a wide range of skills associated with sustainable energy.

The purpose of the certificate level qualifications in Sustainable Energy is to use the formal technical vocational education and training (TVET) sector to facilitate building national and regional capacity to:

- raise the level of awareness and knowledge on alternative renewable energy sources and renewable energy technologies (RETs),
- develop technical skills and knowledge to support processes for installation, operation and maintenance of RETs, and undertake planning, development, monitoring and assessment and management of sustainable energy projects to promote energy efficiency which will mitigate loss and damages from the effects of climate change. These qualifications contribute to developing a Pacific Community whose people are educated and healthy and manage their energy resources in a sustainable way.

Certificates 1 and 2 in Sustainable Energy are generic qualifications which include general learning on on-grid and off-grid power systems, renewable and non-renewable energy sources, energy efficiency

All outcomes for this Certificate 2 are compulsory covering the following key job roles:

- **Using tools, equipment and materials**: applied safely in the workplace and relating to generic tools and equipment used for on-grid and off-grid renewable energy sources (wind, micro-hydro, solar, biomass) renewable energy technology and energy efficiency such as fuel generators, battery charge controllers, hand and power tools, PV Solar panels, wind turbines.

- **Identifying appropriate renewable energy sources and renewable energy technologies, measuring energy efficiency and participating in the implementation of sustainable energy projects**: determine standalone and hybrid power systems suitable for local communities, government imperatives/INDCs and development partner objectives; report on suitable alternative energy sources/technologies and identify risk and vulnerability factors, conduct and monitor tasks to implement SE projects.

- **Communicating with stakeholders**: to identify problems, use appropriate technology to convey information effectively, use appropriate cultural protocols for Pacific Island contexts, to facilitate discussion and resolve conflicts if needed.

**Flexibility and Recognition of Prior Learning:**
This qualification can be achieved in different settings including the community, workplace and education institutions. Learners can achieve competence in ways most suited to their educational, work or cultural needs and aspirations.

Recognition of prior learning (RPL) acknowledges the skills and knowledge gained from workplace, community experiences or informal training which includes courses or study previously undertaken. Assessment for RPL must be undertaken by a qualified assessor.

**Entry level/pre-requisites**
Entry to the Certificate 2 level qualification requires either completion of the Certificate 1 in Sustainable Energy or equivalent work/volunteer experience. The equivalent experience requires evidence of relevant activities undertaken in work and/or community environments within the past 12 months.

**Credit Transfer Arrangements**
The Pacific Qualification Framework allows for credit recognition and transfer from other regional or national qualifications through a process of mutual recognition. Credit transfer is a process whereby credits already achieved for one qualification are recognized towards a new qualification. If a learner has obtained competency in the Certificate 1 in Sustainable Energy (within the past 3 years) they will receive a credit for unit standards which have been successfully completed.

**Pathways**
On completion of the Certificate 2 in Sustainable Energy graduates can progress to further learning in Sustainable Energy (Certificates 3 and 4) or other industry areas which provide the opportunity to gain higher level technical skills and knowledge and contribute to the workforce.

**Graduate Profile**
A graduate of a level 2 certificate is able to: demonstrate basic factual and/or operational knowledge of a field of work or study related to energy/sustainable energy, apply known solutions to familiar problems,
apply standard processes relevant to the field of work or study, apply literacy and numeracy skills relevant to the role in the field of work or study, work under general supervision, demonstrate some responsibility for own learning and performance, collaborate with others.

On completion of a Certificate 2 in Sustainable Energy graduates will have broad basic knowledge and skills to engage as competent community members and employees. A graduate would be competent to undertake roles such as; gathering relevant information and data for monitoring and reporting of projects, providing general information, communications and services to communities, government and development partners, and developing community awareness on matters related to renewable and non-renewable energy sources, renewable energy technologies, energy efficiency and energy management.

• Create community awareness on matters of sustainable energy.
• Assist energy officers and community members to collect field data on energy matters.
• Assist the community in determining appropriate energy sources and technologies
• Assist the conduct of energy efficiency assessments using a combination of quantitative and qualitative research tools and technologies.
• Communicate effectively with community stakeholders using appropriate protocols
• Apply and promote Traditional Knowledge in Sustainable Energy interventions

Requirements: A Certificate 2 in Sustainable Energy comprises 7 compulsory Unit Standards

Unit codes. First digit represents certificate level; second digit represents strand with Generic units as zero (0), Energy Management (1); Energy Efficiency (2). RE specialisations (3) - Solar; Hybrid Wind Systems; Biomass; Micro Hydro. Third and fourth digits is the simple numbering of units.

3 Generic Skills Units: The learning and assessment activities in these unit standards will be applied in relation to Renewable Energy and Renewable Energy Technology.

<table>
<thead>
<tr>
<th>ID</th>
<th>Unit Title</th>
<th>PQF Level</th>
<th>PQF Credit</th>
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<td>CG2001</td>
<td>Participate in a work team towards an objective</td>
<td>2</td>
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<tr>
<td>CG2002</td>
<td>Collect, present and apply workplace information</td>
<td>2</td>
<td>4</td>
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<tr>
<td>CG2003</td>
<td>Identify and use appropriate Cultural Protocols for communities for Pacific Island Countries</td>
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PLUS

4 Core Skills Units

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<td>2</td>
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<td>SE2003</td>
<td>Provide basic sustainable energy solutions for energy reduction in residential, commercial and industrial premises</td>
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<td>SE2001</td>
<td>Apply tools, equipment, materials relevant to tasks in RETs and Energy Efficiency Practices</td>
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<tr>
<td>SE3203</td>
<td>Promote and contribute to energy efficiency</td>
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Regional Registration Information

Provider Arrangements
Accredited providers/assessors need to apply to the regional accrediting agency (EQAP) to deliver this qualification. In addition, if the Pacific country hosting delivery has national quality and/or registration requirements the provider must comply with the national application processes.

Version
This is the first version of the Certificate 2 in Sustainable Energy. This qualification and the unit standards were provisionally endorsed on 19 May 2016 by the Pacific Regional Sustainable Energy Industry Standards Advisory Committee (ISAC) in Nadi, Fiji. Final endorsement was obtained in September 2016 through the web-based communication 'Basecamp'.

Certification & Quality Assurance
This qualification will be awarded by the regional accrediting agency on behalf of the Pacific Regional Industry Sector Advisory Committee (Sustainable Energy Industry Association of the Pacific Islands/SEIAPI). It may also be awarded by a Pacific Island national accrediting agency and/or an accredited training organisation. Workplace assessors assessing against regional unit standards must comply with the Pacific regional (PQAF) and relevant national quality assurance standards.

Review
Regional qualifications exist to meet the needs of learners and the broader Pacific community and economy. All qualifications need to be reviewed periodically to ensure they remain useful, relevant and fit for purpose.

An initial round of review for the certificate levels 1 to 4 regional qualifications in Sustainable Energy will focus on ensuring relevance and appropriateness in a regional and national context. The initial review will be undertaken within two years of granting of regional accreditation. Regional qualifications in Sustainable Energy will thereafter be reviewed every three years to ensure they remain aligned with changing Pacific regional and national priorities. Any person or organization may contribute to the review of this qualification by sending feedback to the Pacific regional quality assurance agency EQAP, or a national education quality agency.

This table indicates the date of accreditation to be noted in the review process.

<table>
<thead>
<tr>
<th>Accrediting Agency</th>
<th>Version</th>
<th>Review Date</th>
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<tr>
<td>Education Quality Assessment Programme (The Pacific Community)</td>
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<td>September 2018</td>
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Qualification Developer
This qualification was developed by the Pacific Regional Sustainable Energy Industry Standards Advisory Committee (ISAC) for the Sustainable Energy Industry Association of the Pacific Islands (SEIAPI) to EQAP.

Pacific Regional Qualifications Unit
Educational Quality and Assessment Programme (EQAP)
Address: Level 5, Vanua House, Victoria Parade, Suva.
P.O Box 2083 Government Buildings, Suva, Fiji
Phone: (+679) 337 8517
Email: EQAP@spc.int
UNIT STANDARDS
<table>
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<tr>
<th>Title</th>
<th>Collect, present and apply workplace information</th>
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<tr>
<td>Level</td>
<td>2</td>
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<td>Credits</td>
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**Purpose**

This unit describes the skills and knowledge required to collect, present and apply information from a range of sources in a workplace. It applies to individuals working under direct supervision who are developing basic skills and knowledge of workplace information and communication systems which are applicable to working in a broad range of settings relevant to working in the energy sector.

**Classification**

Participation and Governance

**Critical health and safety prerequisites**

All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island country.

**Recommended skills and knowledge**

- technical literacy and communication skills sufficient to interpret and apply common industry terminology (energy sector), and interpret work procedures and processes
- questioning and active listening skills, for example when obtaining information on technical working practices
- interpersonal skills to enable effective communication in meetings
- skills in preparing information accurately to be shared
- access workplace information relating to work responsibilities
- presentation skills to enable communication of information appropriate to audience and purpose
- participation in group discussions and processes
- recording of workplace information in required format/s
Explanatory notes

- Everyday workplace language must be used. This may include commonly used technical and industry terms.

- Information may be conveyed in verbal, written and screen-based forms appropriate to the audience and the purpose of the information.

- Typical workplace information includes work instructions, check sheets, tally sheets, labels and codes; material safety data sheets standard forms, web-based information, and telephone and email messages.

Legislation

All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments.

Outcomes and evidence requirements

Outcome 1

Gather and interpret workplace information

Evidence Requirements

1.1 Access, interpret and apply workplace documentation and ensure the work activity is compliant

1.2 Access information and data from a variety of information sources and communication systems

1.3 Seek additional necessary information

1.4 Interpret and apply correct information

Outcome 2

Communicate information

Evidence Requirements

2.1 Analyse and confirm the purpose of the communication with others

2.2 Participate in meetings and other information sharing events
2.3 Organise communication logically so it is structured and balanced according to the purpose, audience and context
2.4 Present information that is clear, succinct and unambiguous, ensuring the language and method is applicable to the communication purpose and audience

Outcome 3
Select and present verbal information

Evidence requirements
3.1 Workplace information requirements are identified according to responsibilities outlined in the job specifications.
3.2 Information is collected, assessed and structured to convey meaning to others.
3.3 Communication is interactive, clear, accurate and sensitive to the audience to which it is addressed.
3.4 Technical and non-technical language is identified and used in accordance with the requirements of the situation.

Outcome 4
Demonstrate knowledge of methods and processes for collection, presentation and application of workplace information.

Evidence requirements
4.1 Methods of accessing, recording and storing workplace information are identified in terms of print and computer based systems.
4.2 Workplace information is collected, evaluated, formatted and stored to meet organisational requirements.

Outcome 5
Use and record workplace information

Evidence requirements
5.1 Routine workplace practices are used to obtain information required to operate in the workplace
5.2 Information is recorded in standard formats according to workplace recording requirements

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<th>Process</th>
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<th>Last Date for Assessment</th>
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Planned Review Date: September 2018

Status information and last date for assessment for superseded versions
Title
Identify and apply knowledge of appropriate cultural protocols for Pacific Island Countries

Code
CG2003  Level  2  Credits  6

Purpose
This unit of competency describes the skills and knowledge required to develop awareness of, and apply the protocols of culture in the Pacific Island region, including the need to identify the appropriate persons when approaching a community and communicate according to protocols.

This unit standard is for persons who work, or intend to work, in the Energy/Sustainable Energy sector.

Persons credited with this unit standard are able to:
• identify and describe cultural protocols for a specific Pacific Island countries and communities
• explain appropriate protocols for a specified Pacific Island and/or community to be used when engaging with the community
• use appropriate personal and social protocols of a Pacific Island country or community to promote successful consultations

Classification
Participation and Governance

Critical health and safety prerequisites
All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island country.

Recommended skills and knowledge
• Consultation skills to be applied with appropriate cultural authorities for a community
• Knowledge of cultural information, material and cultural expression that is appropriate to be shared
• Skills to identify groups to be consulted in relation to owners or custodians of cultural and community knowledge
• Knowledge of cultural protocols for consultation, research and recording information on sustainable energy for particular Pacific Island communities
Knowledge of respect and cultural sensitivity towards people, their beliefs, customs, values, lore/law, ceremonies and history

Knowledge of cultural diversity within Pacific Island countries, communities and island groups

Knowledge of customs and protocols of the Pacific Island community with which they are working

Quality assurance requirements

This unit standard may only be assessed and recommended for award by qualified Workplace Assessors. Assessors must comply with the regional and national assessment and moderation requirements of quality frameworks. Details of specific registration and accreditation requirements and the national assessment arrangements are available from EQAP on EQAP@spc.int.

Explanatory notes

Protocols will be relevant to a specific Pacific Island country and/or community. The Pacific Island protocols will depend on the relationships of those involved in the communication and must be used in accordance with culturally appropriate practices for the specified Pacific Island.

1. Definitions
   
   **Culture** is the characteristics and knowledge of a particular group of people, defined by everything from language, religion, food, social structure, music, dance and arts.

2. Legislation
   
   All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments.

Outcomes and Evidence Requirements

**Outcome 1**

*Identify beliefs and associated cultural protocols for specific Pacific Island countries and communities*

**Evidence Requirement**

1.1 Identify the importance of Pacific island beliefs and the relationship of these beliefs with cultural landscapes

1.2 Identify, describe and respect cultural gender roles

1.3 Identify, describe and respect language within specific Pacific Island countries that inform the basis of social relationships and community roles

1.4 Identify, describe and respect cultural groups and avoidance relationships

1.5 Describe the rights of individuals within communities to hold specific knowledge and ceremony

1.6 Describe the rights of individuals within communities and responsibilities associated with sharing that knowledge
1.7 Describe the inherent diversity that exists within the Pacific region, countries, communities and outer islands

**Outcome 2**  
*Identify Pacific Island Country cultural authorities*

**Evidence Requirements**
2.1 Apply various approaches and resources to identify cultural authorities for a specific Pacific Island Country  
2.2 Identify and communicate with appropriate cultural authorities  
2.3 Respect and implement the advice by cultural authorities  
2.4 Respect and implement rights and responsibilities associated with cultural knowledge, story, song, land and ceremony  
2.5 Acknowledge and respect traditional knowledge and practices

**Outcome 3**  
*Use cultural protocols in community consultations*

**Evidence Requirements**
3.1 Identify and record key protocols required for specific Pacific island country community consultation  
3.2 Select participants for and methods of consultation in accordance with decisions made by community cultural authorities  
3.4 Use communication approaches that place cultural protocols and values as a principal concern  
3.5 Participate in community consultation following appropriate cultural protocols for a specific Pacific Island Country and community

**Outcome 4**  
*Use appropriate personal and social protocols*

**Evidence Requirements**
4.1 Observe appropriate use of personal protocols for addressing and greeting persons, personal contact, and gestures  
4.2 Allow respect for local and community traditions and social structures to guide personal presentation and conduct  
4.3 Use personal communication styles such as language, non-verbal communication, discussion, meaning, questioning, eye contact and silence that reflect the customs and idioms of the Pacific Island Country and local community

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Planned Review Date: September 2018

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**Purpose**

This unit covers competency in working with others and making a positive contribution to the effectiveness and efficiency of a team in a community and/or work environment when predominantly under direct supervision. Limited responsibility towards others is required. This unit standard is appropriate for people who are currently in the workforce or intend to engage in employment.

Persons credited with this standard are able to:

- Participate and work in teams to achieve objectives
- Contribute to team functions and operations
- Acknowledge team roles and support team members in achieving their role
- Contribute to team planning and opportunities to improve the efficiency of the work of the organisation/community

**Classification**

Participation and Governance

**Critical health and safety prerequisites**

All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island country.

**Recommended skills and knowledge**

- Teamwork skills applied to a range of situations
- Skills in encouraging others/team members
- Written and verbal communication skills
- Interpersonal skills
- Knowledge on fundamentals of team structures and dynamics
- Knowledge on causes of conflict and dysfunctional work groups
- Knowledge on basic conflict resolution
- Participation and expression of views in a group environment
- Willingness to share information in a team environment
Explanatory notes

1 Definitions
- **Function** refers to the activities of the group/team, how it operates
- **Team** means two or more people working together towards a common purpose
- **Contribute to workplace goals** includes completion of tasks, development of new skills, personal development, attainment of new knowledge
- **Appropriate feedback** on performance includes acknowledging initiatives, ideas assistance and performance
- **Participate** means take part in, be part of a group/team working towards achievement of objective(s), under direction and supervision.
- **Organisations’ policy and procedures** vary between sectors and organisations and include strategic plans, operational procedures and standards, and relevant legislation.

2 Legislation
All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments.

Outcomes and evidence requirements

Outcome 1
*Use communication and interpersonal skills appropriate for effective team work towards achievement of objectives*

Evidence requirements
- 1.1 Use interpersonal skills appropriate to the work context to support effective teamwork
- 1.2 Use questions to clarify and obtain information from other team members
- 1.3 Participate in group discussions
- 1.4 Convey information in a logical, clear and concise manner

Outcome 2
*Contribute to team activities*

Evidence requirements
- 2.1 Roles and responsibilities of team members are recognised.
- 2.2 Contribution is made to identifying team goals and objectives.
2.3 **Activities** are completed to required standard within timeframe and in accordance with organisation's policies and procedures.

2.4 **Assistance** in the completion of tasks is requested from other team members where appropriate.

2.5 Participation of team members is encouraged and acknowledged.

2.6 Changes in allocated roles and responsibilities are implemented.

2.7 Team meetings are attended regularly and punctually

**Outcome 3**
*Share knowledge and information*

**Evidence Requirements**

3.1 Information relevant to work is communicated effectively with team members to enable efficient completion of tasks

3.2 Knowledge and skills are shared between team members.

**Outcome 4**
*Give and receive support to/from team members*

**Evidence Requirements**

4.1 **Feedback**/assistance is given to other team members in an appropriate manner.

4.2 Team members are supported in achieving workplace goals.

4.3 Feedback from other team members is acted upon appropriately.

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**Purpose**

This unit standard is for people who work, or intend to work in the Energy sector.

Persons credited with this unit standard are able to:

- Identify Renewable and Non-Renewable Energy Resources harnessed in a global, regional (Pacific-wide) and local (communities) context,
- Identify and describe different types of Renewable Energy Technologies used globally and those that are used in various Pacific Island communities.
- Explain and distinguish energy efficiency and energy conservation
- Identify energy ratings on different electrical appliances used in households, offices and commercial buildings
- Identify the units of “power”, “voltage”, “electrical current” and “electrical energy” in accordance to the System of International Units (SI Units)

**Classification**

Core Skills

**Critical health and safety prerequisites**

All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island Country

**Recommended skills and knowledge**

The following skills and knowledge in the area of Renewable Energy and Energy Efficiency are required:

- Knowledge of renewable energy sources and renewable energy technologies
- Knowledge on principles of energy efficiency
- Knowledge on the principles of energy conservation
  - Skills in communication (verbally and non-verbally) with groups and individuals
  - Basic skills in understanding/relating the use of a piece of technology that would be used as a training tool.
Explanatory notes

1 Definitions

- **Renewable Energy Resources** refers to resources that are available naturally and can be replenished by nature. Examples are sunlight, wind, rain (water), tides, waves, plants and geothermal heat.

- **Renewable Energy Technology (RET)** refers to a technology that uses naturally available energy resources to produce energy for human consumption to meet its needs. Such energy produced is deemed to be ‘clean energy’ because there is no emission of greenhouse gases into the atmosphere.

- **Energy Rating** refers to the consumption of electrical energy by an electrical appliance.

- **Power rating** refers to the amount of power in watts (W) that can flow through a system safely

- **Energy Efficiency** refers to the utilisation minimal energy to be able to ‘do work’.

- **Energy Conservation** refers to minimizing energy usage by using less energy (input energy) such as electrical energy or liquid fuel (unleaded petrol or diesel). It can be distinguished from energy efficiency.

- **Specifications** refer manufacturer’s specifications on operation, processes, maintenance repairs for tools equipment, resources

2 Legislation

All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments.

Outcomes and evidence requirements

**Outcome 1**
Identify Renewable and non-Renewable Energy resources available in global, regional, national and local contexts

**Evidence requirements**

1.1 Identify and describe renewable and non-renewable energy resources that available globally

1.2 Identify and describe renewable and non-renewable energy resources that are available in the Pacific region
1.3. List and explain the advantages and disadvantages of using non-renewable energy resources globally and in the Pacific region

Outcome 2
Identify different types of Renewable Energy Technologies used globally and in the Pacific region

Evidence requirements
2.1 Explain the term “Renewable Energy Technology” and distinguish from “Renewable Energy Resources”.
2.2 State reasons for the use of the different Renewable Energy Technologies in different geographical locations and terrains globally and in the Pacific region.
2.3 Explain why some renewable energy technologies are difficult to employ in the Pacific region compared to other areas of the world.

Outcome 3
Describe and explain the benefits of energy efficiency and energy conservation

Evidence requirements
3.1 Explain the difference(s) between the terms ‘energy efficiency’ and ‘energy conservation’.
3.2 List and explain benefits of practising energy conservations globally, regionally and locally.
3.3 List benefits of implementing energy efficiency measures in residential, commercial, and industrial premises.
3.4 Identify financial and economic benefits of utilising RET and other energy saving practices in residential, commercial, and industrial premises.

Outcome 4
Identify and explain energy ratings of different electrical appliances power tools used in residential, commercial and industrial buildings.

Evidence requirements
4.1 Define the term ‘energy rating’ with regard to electrical appliances and power tools used in residential, commercial, and industrial contexts.
4.2 Identify and explain the ‘power rating’ and the ‘amperage’ of household, office appliances and power tools.
4.3 Explain how to determine energy consumed, in watthour (Wh) by an electrical appliance given the length of time used, power rating and/or the appliances amperage, the local grid household voltage.

Outcome 5
Define the terms, “power”; “voltage”; “electrical current” and “electrical energy” in accordance to the System of International Units (SI Units)

Evidence Requirements
5.1 Define, power, voltage, electrical current and electrical energy.
5.2 Identify SI units of power, electrical current, electrical energy and voltage and their respective multiple units.
5.3 Explain the relationship between power, electrical current, voltage, electrical resistance, and time (duration of appliance use)

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<tr>
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Planned review date | September 2018

Status information and last date for assessment for superseded versions
<table>
<thead>
<tr>
<th>Title</th>
<th>Apply tools, equipment, materials relevant to tasks in RET and Energy Efficiency practices</th>
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</thead>
<tbody>
<tr>
<td>Code</td>
<td>SE2001</td>
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</table>

**Purpose**

This unit standard is for a person who work, or may intend to work in the energy sector or energy related sectors.

Persons credited with this unit standard are able to:
- Select and use tools and equipment relevant to each of the different RET and EE practices and measures;
- Identify and use relevant materials relevant for each of the different in RETs and EE practices and measures;
- Identify basic faults in RETs and other power tools and perform repairs using correct too and procedures;
- Demonstrate ability to write basic reports in regards to tool handling and storage, including wear and tears;
- Demonstrate ability to work independently under limited supervision with RET.

**Classification**

| Resources |

**Critical health and safety prerequisites**

All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island country.

**Recommended skills and knowledge**

The following skills and knowledge in the area of Renewable Energy and Energy Efficiency are required:
- Identify and describe the appropriate uses of common tools, equipment and materials used with the renewable energy sources of solar, wind, micro-hydro and biomass;
- Select and use appropriate tools, equipment and material specific to each of the following RET: solar photovoltaics; biomass; micro-hydropower and wind-power;
- Use energy efficiency practices with tools, equipment and resources for renewable energy technologies;
- Use energy conservation practices with tools, equipment and resources for renewable energy technologies;
Quality assurance requirements

This unit standard may only be assessed and recommended for award by qualified Workplace Assessors.

Assessors must comply with the regional and national assessment and moderation requirements of quality frameworks. Details of specific registration and accreditation requirements and the national assessment arrangements are available from EQAP on EQAP@spc.int.

Explanatory notes

1  Definitions

- **Renewable Energy Resources** refers to resources that are available naturally and can be replenished by nature. Examples are sunlight, wind, rain (water), tides, waves, plants and geothermal heat.
- **Renewable Energy Technology (RET)** refers to a technology that uses naturally available energy resources to produce energy for human consumption to meet its needs. Such energy produced is deemed to be ‘clean energy’ because there is no emission of greenhouse gases into the atmosphere.
- **Energy Efficiency** refers to the utilisation minimal energy to be able to ‘do work’.
- **Energy Conservation** refers to minimizing energy usage by using less energy (input energy) such as electrical energy or liquid fuel (unleaded petrol or diesel). It can be distinguished from energy efficiency.
- **Specifications** refer manufacturer’s specifications on operation, processes, maintenance repairs for tools equipment, resources
- **Maintenance activities** refer scheduled maintenance and servicing and restoration of low voltage electrical components, motors, appliances and fittings and maintenance and servicing of tools and equipment used by electrical fitter mechanics, in particular power analysers, cathode ray oscilloscope (CROs), secondary injector set, relay tester, phase sequence testers.
- **Scheduled maintenance and servicing** refers replacement of consumables; minor adjustments; replacement of faulty components; operational changeovers.

2  Legislation

All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments.

Outcomes and evidence requirements

Outcome 1

*Select and use tools, equipment and materials relevant to different RET and EE practices*

Evidence requirements

1.1. Identify and use tools, equipment and materials used in different RET and EE practices

1.2. Identify relevant RET testing techniques involved with monitoring activities over different time periods
1.3. Use safe and appropriate practices for handling and storing tools, equipment and materials used in RET in accordance with specifications and organisational policies and procedures

1.4. Prepare and update appropriate servicing and maintenance records for tools, equipment and materials used in different RET and EE practices in accordance with specifications and organisational policies and procedures

**Outcome 2**

*Identify basic faults in RETs and other power tools and equipment, and perform basic repairs*

**Evidence requirements**

2.1. Identify and describe the basic faults in sustainable energy systems, RETs and associated tools and equipment.

2.2. Identify relevant tools required to repair or rectify basic faults in energy systems and associated power tools and equipment

2.3. Apply correct procedures in fault-finding and basic repairs of power tools and sustainable energy systems

**Outcome 3**

*Conduct work activities independently under limited supervision*

**Evidence requirements**

3.1. Use appropriate workplace verbal and non-verbal communication skills to maintain workflow and workplace relationships so that tools, equipment and materials are applied appropriately in work activities

3.2. Plan and manage work task, including access and use of tools and equipment sheds/storage, movements in accordance to organisational policies and procedures

3.3. Prepare records and write basic reports on the condition and status of tools, equipment and materials used in RET and energy efficiency practices

| Planned review date | September 2018 |

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<tr>
<td>Title</td>
<td>Provide basic sustainable energy solutions for energy reduction in residential, commercial and industrial premises</td>
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<tr>
<td>Code</td>
<td>SE2003</td>
<td>Level</td>
<td>2</td>
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</tbody>
</table>
| Purpose | Persons credited with this unit standard are able to  
- Prepare to monitor energy usage to help in energy reduction in residential, commercial and industrial premises  
- Identify basic sustainable energy options using renewable energy sources and renewable energy technologies to reduce energy consumptions in residential, commercial and industrial premises.  
- Identify basic sustainable energy options using non-renewable energy sources to conserve and reduce energy consumptions for residential, commercial and industrial premises.  
- Complete monitoring activities and provide reports on alternative sustainable energy options for residential, commercial and industrial premises |
| Classification | Core Skill |
| Critical health and safety prerequisites | All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island country. |
| Recommended skills and knowledge | The following skills and knowledge in the area of Renewable Energy and Energy Efficiency are required  
- Current economic, social, environmental and political issues impacting on utilising renewable energy technology  
- Energy services/demand encompassing: terminology; energy, power, temperature, symbols, units energy conversion and efficiency domestic dwelling: energy services and energy demand of individual appliance, energy efficient appliances; primary energy and end use energy and embodied energy instruments  
- Energy ratings, energy labels, manufacturer’s specifications |
| Quality assurance requirements | This unit standard may only be assessed and recommended for award by qualified Workplace Assessors. |
Explanatory notes

1 Definitions

- **Renewable Energy Resources** refers to resources that are available naturally and can be replenished by nature. Examples are sunlight, wind, rain (water), tides, waves, plants and geothermal heat.

- **Renewable Energy Technology (RET)** refers to a technology that uses naturally available energy resources to produce energy for human consumption to meet its needs. Such energy produced is deemed to be ‘clean energy’ because there is no emission of greenhouse gases into the atmosphere.

- **Energy Rating** refers to the consumption of electrical energy by an electrical appliance.

- **Power rating** refers to the amount of power in watts (W) that can flow through a system safely

- **Energy Efficiency** refers to the utilisation minimal energy to be able to ‘do work’.

- **Energy Conservation** refers to minimizing energy usage by using less energy (input energy) such as electrical energy or liquid fuel (unleaded petrol or diesel). It can be distinguished from energy efficiency.

- **Energy usage** the same as energy consumption refers to the amount of energy use in a particular system or in a household.

- **Energy reduction** refers to the measure taken to reduce the amount of energy usage in a system or a household

2 Legislation

All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments

3 Range

This unit must be demonstrated in relation to providing basic sustainable energy solutions for energy reduction in residential, commercial and industrial premises in any of the following: Appliances, Business equipment, Computers, Data Communications, Electrical, Electrical Machines, Electronics, Fire protection, Instrumentation, Refrigeration and Air Conditioning

Outcomes and evidence requirements

**Outcome 1**

Plan and prepare to monitor energy usage for energy reduction

**Evidence requirements**

1.1 Contribute to planning and preparing for monitoring of energy usage to ensure WHS/OHS policies and procedures are followed

1.2 Identify appropriate safe locations/worksites in which monitoring of energy usage is to be undertaken usage

1.3 Identify and obtain materials and resources necessary to undertake the monitoring of energy in accordance with established procedures

**Outcome 2**

Identify and describe basic solutions for energy reduction in residential, commercial and industrial premises
Evidence requirements

2.1 Explain the needs for employing solutions for energy reductions in residential, commercial and industrial premises, in the context of greenhouse gas emission reduction and economic growth

2.2 Describe how RET are sustainable solution to reducing energy consumption

2.3 Perform basic residential, commercial and industrial premises electrical appliances/equipment inventory, with regards to power rating, amperage, voltage requirement

2.4 Read and explain household/residential electrical metering

2.5 Identify the types of labelling on common electrical appliances in the local context/community

2.6 Explain what the energy star labelling means in terms of energy efficiency for common electrical appliances in the local context/community

2.7 Explain benefits of household appliance labelling and standards

2.8 Identify factors contributing to energy wastage in households, commercial and industrial buildings in a regional and local context

Outcome 3
Conduct measures to assist energy reduction in residential, commercial and industrial premises

Evidence requirements

3.1 Collect past electricity costs (bills) from residential, commercial and industrial premises

3.2 Calculate power rating of an electrical appliance, given the amperage and the voltage specification

3.3 Calculate energy consumption of an electrical appliance given its power rating and time of use, showing unit of measurement throughout the calculation.

3.4 Calculate the total electrical power used by a household over various time periods (e.g.; hour, day, week, month)

3.5 Identify and describe measure to reduce energy consumption in residential premises

3.6 Explain how building designs and orientation can contribute to reducing energy consumption

Outcome 4
Report on energy consumption/monitoring activities to meet stakeholder needs

Evidence requirements

4.1 Prepare a written report on energy usage for residential, commercial and industrial premises in accordance with regulations and stakeholder requirements (community, development partners, and government utility agencies).

4.2 Prepare records and reports on inventories and energy consumption for residential, commercial and industrial premises

4.3 Prepare notes/reports on energy reduction interventions or measures for residential commercial and industrial premises to meet regulatory requirements and stakeholder needs.

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<tr>
<td>Title</td>
<td>Promote and contribute to energy efficiency</td>
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<tr>
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**Purpose**

This unit standard is for persons who work, or intend to work, in the energy/sustainable energy sector. It describes the outcomes required to maintain energy efficient work practices and contribute to systems improvement with regard to energy efficiency.

Persons credited with this unit standard are able to demonstrate skills and knowledge required to support the organisation's workplace health and safety (WHS) principles and practice.

Persons credited with this unit standard are able to:
- Identify and describe the requirements to maintain energy efficiency
- Explain the benefits relating to energy efficiency using different sources of renewable energy
- Promote and apply energy efficient work practices
- Identify opportunities for efficiencies in energy consumption or use of raw materials
- Identify opportunities for innovation in energy efficiency

**Classification**

Core

**Critical health and safety prerequisites**

All training and assessment activities must be in accordance with health and safety legislation and related regulations of the relevant Pacific Island country.

**Recommended skills and knowledge**

- Knowledge on organizational and community standards relevant to maintaining and contributing to energy efficiency
- Knowledge of environmental protection and conservation requirements including safe disposal of waste material and recycling
- Workplace communication skills, protocols and procedures
- Skills in safe use of equipment and tools to complete work tasks whilst optimizing energy efficiency
Quality assurance requirements

This unit standard may only be assessed and recommended for award by qualified Workplace Assessors.

Assessors must comply with the regional and national assessment and moderation requirements of quality frameworks. Details of specific registration and accreditation requirements and the national assessment arrangements are available from EQAP on EQAP@spc.int.

Explanatory notes

1 Definitions

Work area includes any place where work activities are conducted inside or outside a physical building. This includes a location in a rural or remote areas, villages, communities, houses, water-based location above or below the water surface, caves, and travel to reach a work site.

Energy efficient practices refers to reducing adverse environmental impact from the use of energy e.g.: adjusting thermostats and changing timing of energy intensive activities, install energy efficient fixtures, purchase of renewable energy sources.

Renewable energy sources include: solar, wind, hydro, biomass, biogas, biofuel.

Safety is the condition of being protected from or unlikely to cause danger, risk, or injury.

2 Legislation

All activities associated with this unit standard must comply with the requirements of national codes of practice, regulations and legislation for workplace health, safety, and environmental protection and any subsequent amendments.

Outcomes and Evidence Requirements

Outcome 1
Identify requirements to maintain and contribute to energy efficiency on work sites

Evidence Requirements

1.1 Identify and review requirements to maintain energy efficiency
1.2 Identify and describe benefits relating to energy efficiency and renewable energy sources
1.3 Compare the benefits of using alternative sources of energy and raw materials

Outcome 2
Follow and promote energy efficient work practices

Evidence requirements

2.1 Adhere to worksite/community energy efficiency standards/policy/procedures, including those related to recycling and waste management
2.2 Operate equipment to ensure maximum energy efficiency
2.3 Use power tools to ensure maximum energy efficiency
2.4 Monitor own work practices to maintain energy efficiency
2.5 Promote positive aspects of using renewable energy sources and technologies to alternative energy sources
**Outcome 3**

*Contribute to systems improvement with regard to energy efficiency*

**Evidence requirements**

3.1 Contribute to and support reviews and operations for improvements in energy efficiency

3.2 Identify opportunities for efficiencies in consumption for raw materials and progress through appropriate personnel/community members

3.3 Identify opportunities for innovation in energy efficiency and progress through established channels.

| Planned Review Date | September 2018 |

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</table>
ASSESSOR GUIDES
## Job 2.1 Apply safe work practices

### Unit Standards

There is no specific unit standard for this job role but it is underpinned in all unit standards at certificate level 2.

### Job Description

Under direct supervision, you will need to demonstrate skills and knowledge to apply safe working practices at all times.

All activities shall be conducted in accordance with workplace procedures and community protocols in the Pacific local country of work.

### KNOWLEDGE

<table>
<thead>
<tr>
<th>To show that you have the required competence you will need to demonstrate knowledge in the workplace on:</th>
</tr>
</thead>
</table>
| • Procedures, principles, acts, rules and codes of Pacific Islands Governments and regional agencies relating to:  
  - safety (examples tools and equipment, personal gear, ergonomics, fire and emergency);  
  - health (example health and wellness, hygiene) environment (e.g. waste disposal, sanitation);  
  - welfare (e.g. work life balance); in the workplace when applying in your local context  
  - How to identify workplace hazards and hazards to personal safety, and how to avoid them  
  - What to do at work when detecting an accident, fire or emergency including but not limited to:  
    — physical injury  
    — fire  
    — cyclone  
    — earthquake  
    — flooding  
    — tsunami  
    — lightning and thunder storms  
    — hazardous substance accident  
    — electric shock  
  - The importance of safety audits  
  - Safety procedures for isolating machinery and equipment  
  - Shutdown procedures for machinery and equipment |

### DEMONSTRATION

<table>
<thead>
<tr>
<th>To show that you can apply your knowledge in the workplace you will need to:</th>
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</table>
| • Work safely at all times  
  - Follow workplace rules and instructions from colleague, tradesperson/instructor/supervisor/community authorities  
  - Wear correct personal protective clothing and equipment at all times PPE (hand gloves, safety boots, safety helmets, safety glasses, ear masks, dust mask)  
  - Safely store, carry and dispose hazardous materials in accordance with standard specifications stipulated for physical, biological, electrical and chemical substances. This may include but not limited to:- batteries, e-waste (electronic and IT products), industrial waste (biological and chemical waste), carbon emission and reduction of toxic materials and substances  
  - Safely operate equipment and tools in accordance with standard specifications and operating procedures.  
  - Keep work areas clean and free of debris  
  - Safely handle, use, clean and store a range of tools, equipment and resources  
  - Use electrical safeguards with power tools and equipment  
  - Assist work personnel in reporting any workplace risk  
  - Safely use equipment such as ladders and scaffolding, and safety harness where required  
  - Attend safety awareness meetings  
  - Before starting work identify and report workplace hazards which may related to:  
    — equipment  
    — machinery  
    — electrical  
    — chemical  
    — fire  
    — gas  
    — fumes  
    — confined spaces  
    — compressed air  
    — noise  
    — slippery surfaces  
    — product handling  
    — other environmental hazards |
## Job 2.2 Apply and use tools, equipment and materials for SE

<table>
<thead>
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<th>Unit Standards</th>
<th>Job Description</th>
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<tbody>
<tr>
<td><strong>SE2001: Apply tools, equipment and materials relevant to tasks in RET and energy efficient practices</strong></td>
<td>You will need to demonstrate and apply the knowledge required to identify and use basic tools, equipment and materials used in Renewable Energy Technology (RET) and Energy Efficiency (EE)</td>
</tr>
<tr>
<td><strong>All activities shall be conducted in accordance with workplace procedures</strong></td>
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</table>

### KNOWLEDGE

**To show that you have the required competence you will need to demonstrate knowledge in the workplace on:**

- Generic tools, equipment/materials used for components or power systems for: wind, solar, biomass, micro-hydro,
- Definition of Renewable Energy
- Difference between RE from non-RE with examples
- Types of RET in local and the regional contexts: Solar, Wind, Biomass, Biogas, Wave etc
- Types of technologies per RET type: Type of Solar PV, Type of Battery, Type of Charge Controller, Type of Wind Turbine, etc
- Main components of a Solar PV Home system: Solar PV, Battery, Charge Controller etc
- Definition of Energy Efficiency
- Definition of Energy Conservation with example
- Define Energy Efficiency.

### DEMONSTRATION

**To show that you can apply your knowledge you will need to:**

- Demonstrate skills in use and storage of a range of:
  - hand, power tools and equipment correctly that may include: angle grinder (hand and portable), test equipment, gauges, test lamps, multi-meter, electrical test instruments
  - winding equipment such as: bearing puller, growler tester, coil winding machine, earth loop impedance tester
  - cable termination equipment that may include: crimping tool, air blower, heat gun, soldering iron
- Keep accurate records for personal and workplace tool storage systems
- Conduct tool checks as required by workplace procedures
- Report identified faults to supervisor in accordance with workplace procedures
- Basic connections and set up of wind turbine, micro-hydro, solar or biogas plant
- Testing of installed set ups and generations of test equipment
- Identify and use appropriate tools and equipment for the different type of technologies per RET type: Type of Solar PV, Type of Battery, Type of Charge Controller, Type of Wind Turbine, etc
- Conduct simple calculation of the energy efficiency of simple electric circuit for electrical appliances
**Job 2.3 Demonstrated knowledge and application of Renewable Energy Technologies, energy conservation and energy efficiency (including own work practices)**

<table>
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<th>Unit Standards</th>
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<tbody>
<tr>
<td><strong>SE2002</strong>: Describe and Explain Basic Renewable Energy Technologies (RET) and Energy Saving Practices</td>
<td>You will need to demonstrate the knowledge and skills required to work with RET, measure energy efficiency and apply energy efficient practices in your own work activities.</td>
</tr>
<tr>
<td><strong>SE2003</strong>: Provide basic sustainable energy solutions for energy reduction in residential, commercial and industrial premises</td>
<td>All activities shall be conducted in accordance with workplace procedures.</td>
</tr>
<tr>
<td><strong>SE3203</strong>: Promote and contribute to energy efficiency</td>
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**KNOWLEDGE DEMONSTRATION**

**To show that you have the required competence you will need to demonstrate knowledge in the workplace on:**

- Renewable Energy Technologies
  - Definition of Renewable Energy
  - Difference between RE from non-RE
  - Differentiate Renewable Energy Resources from Renewable Energy Technology
  - Type of Renewable Energy Resources in your country and the Pacific Region: Solar, Wind power, Biomass/ Biogas, hydropower
  - Type of technologies per Renewable Energy Resource: Solar- Solar PV system, Solar Water Heating system, Wind power – Wind turbine; Biomass – Digester, Gasifiers, steam turbine, biofuel (liquid) processing plants; Flowing River water – Hydropower system
  - Main components of: a Basic Solar PV system; Hydropower systems; wind power systems and various Biomass systems
- Non-renewable energy Resources
  - Advantages and disadvantages of RE and non-RE resources
  - Uses on fossil fuel in Pacific Island countries
- Energy Efficiency and Conservation
  - Definition of Energy Efficiency
  - Definition of Energy Conservation Define Energy Output and Energy Input with regards to electrical appliances
  - Energy saving measures and practices in household, commercial and industrial building
  - Energy saving work practices using tools, equipment and resources working with RET

**To show that you can apply your knowledge in Basic Renewable Energy Technologies (RET) and Energy Saving Practices in the workplace you will need to:**

- Demonstrate skills in selecting appropriate RET for a given situation to conserve and generate energy efficiency
- Assist skilled personnel with skills applied to different types of technologies per Renewable Energy Resource: Solar- Solar PV system, Solar Water Heating system, Wind power – Wind turbine; Biomass – Digester, Gasifiers, steam turbine, biofuel (liquid) processing plants; Flowing River water – Hydropower system
- Assist skilled personnel in determining solutions for energy reduction (conservation and/or efficiency) for residential, commercial and industrial premises.
- Advocate and promote energy conservation through materials and practices (energy sources) to reduce energy consumption in Building, Appliances, Vehicles and Power utilities for residential, industrial and commercial premises.
- Advocate and promote energy efficiency through materials and practices (energy sources) to reduce energy consumption in buildings, appliances, vehicles and power
- Utilities for residential, industrial and commercial premises.
- Demonstrate skills in undertaking calculations to determine energy efficiency
- Engage in own work practices which promote energy conservation and energy efficiency.
## Job 2.4 Engage and communicate effectively in a range of workplace situations

<table>
<thead>
<tr>
<th>Unit Standards</th>
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<tbody>
<tr>
<td>CG2002: Collect, present and apply workplace information</td>
<td>You will need to demonstrate workplace skills and knowledge to communicate effectively in a range of situations with work teams and stakeholders in work locations.</td>
</tr>
<tr>
<td>CG2001: Participate in a work team towards an objective</td>
<td><em>All activities shall be conducted in accordance with workplace procedures.</em></td>
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<tr>
<td>CG2003: Identify and apply appropriate cultural protocols for Pacific Island countries and communities</td>
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<table>
<thead>
<tr>
<th>KNOWLEDGE</th>
<th>DEMONSTRATION</th>
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<tbody>
<tr>
<td>To show that you have the required competence you will need to demonstrate knowledge in the workplace on:</td>
<td>To show that you can apply your knowledge in the workplace you will need to:</td>
</tr>
</tbody>
</table>
| • Principles of communication and stakeholder engagement  
  ✓ Formulate and convey messages  
  ✓ Structure for written communications  
  ✓ Appropriate methods of communicating  
  ✓ Appropriate language, terminology, protocols  
  • Understanding of fundamentals of team structures and dynamics  
  • Communication and planning in a team environment  
  ✓ Identify the key points to communicate  
  ✓ Identify the most appropriate terminology to use  
  ✓ Identify the most appropriate language to use  
  • Various applications of technologies such as email, social media to convey messages and respond | • Identify similarities and differences between different methods of communication  
 • Select the right means to deliver the message to the chosen target audience(s).  
 • Identify similarities and differences between different methods of communication to work effectively in a team.  
 • Work in a team to identify problem at stake and the expected solution or outcome of the process.  
 • Practice different approaches that help convey the messages in a team situation.  
 • Skills in using technologies like emails, social media, smart phones, to communicate with stakeholders and work effectively in a team  
 • Demonstrate knowledge of methods and processes for collection, presentation and application of workplace information  
 • Apply appropriate community protocols and respect for Pacific culture when communicating and working with communities and local stakeholders.  
 • Define community protocol in terms of local Pacific island countries  
 • Community protocols and cultures within local communities.  
 • Pacific Island Cultural influences such as family, religion, land, people, legends & myths, taboos and totems |