

# **Business Skills Training on Income Opportunities from Increased Electricity Supply at Vava'u Outer Islands**

**Joint PCREEE – CBS Training**

***27 – 28 January 2025***

# Presentation Outline

1. PCREEE – roles and experiences
2. Baseline Business info at the islands.
3. TREP and it's mini-grids systems /components.
4. Potential income generation opportunities.
5. Starting a Businesses.
6. Access funding – startup a business.
7. Basics Financial Management.
8. Electricity Cost and Savings.
9. Energy Efficiency – Minimum Energy Performance Standards & Labelling (MEPSL).

# What is PCREEE? – Pacific Centre for Renewable Energy and Energy Efficiency

- Established in 2017  
(office based in Tonga)
- Going years 9 years now
- UNIDO, Austria, Norway & NZ funding support



# BUSINESS PLAN 2020-2030

Pacific Centre for Renewable  
Energy and Energy Efficiency



## Four (4) Strategic Areas

- **Programme 1. RE&EE Business Start-Up and Entrepreneurship Support**
- **Programme 2. RE&EE for Sustainable Mobility**
- **Programme 3. RE Mini-grids**
- **Programme 4. Energy Efficiency Investment**



### Support to PICs

1. Capacity Buildings Program
2. Energy Policy Development – (incl. guidelines /standards)
3. Small subsidy – starting a new businesses related to energy
4. Energy Forum, Awareness
5. Development/review of Concept Note and Project Proposal.



# Highlight of Experiences

## Programme 1. RE&EE Business Start-Up and Entrepreneurship Support

### *a) Supported the Development AND Delivery of National Qualifications in Sustainable Energy*



- NSCE Level 1 & 2 successfully started on the 12 September 2022 with 20 students (71% female, 29% male) registered under Level 1 and 30 students for Level 2 (21% female, 79% male).

- Certificate Level 3 successfully registered in Tonga 2023.
- Next step is for TIST to seek accreditation from TNQAP to deliver these registered Level 3 courses
- Development of SE National Certificates Level 4 is underway.
- Hopes to extend the qualifications to Diploma level in the future.



*b. Support the Productive Use of Energy [20 – 30%]*



**At the Solomon Islands:**

- One rural community reached out to PCREEE for funding assistance to purchase solar freezer systems that could be used to store their catches /fish for sale at the markets in Honiara.
- PCREEE provided subsidy ~ 30% of the total cost.





### c. Internship Opportunities



#### **Tiueti Sisilia Fangupo**

Ms. Tiueti Fangupo completed her 6 weeks Summer Internship with the PCREEE in February 2019. She was a Structural Engineering student from the University of Technology, Auckland, NZ. Tiueti started her Summer Internship in December 2018 and her internship included working with the Tonga Department of Energy exposing her to some of the small scale and community-based Renewable Energy projects that the department is working on.

Intern



#### **Sione Folau**

Mr. Sione Folau was a Master of Science in Climate Change student from the Pacific Centre for Environment and Sustainable Development (PaCE-SD) of the University of the South Pacific. Sione completed 3 weeks with PCREEE in March 2018, doing research for his thesis on the topic – Carbon Footprint Mitigation Strategies for the Kingdom of Tonga. The research is based on Tonga's Energy Sector. Sione worked closely with the PCREEE team together with the Tonga Department of Energy and was grateful for their inputs to his research.

Intern



#### **Annie Marie Malolo**

The PCREEE is pleased to welcome Ms Annie Marie Malolo who is on a 6 months internship with the PCREEE that started on 14th November 2024. Ms Malolo is a Graduate of the University of the South Pacific, majoring on Information Systems and Geography. She is a keen Taekwondo enthusiast and loves to do further studies on climate change.



# Highlight of Experiences

## Programme 2. RE & EE for Sustainable Mobility

- Supported the development of Regional E-mobility Policy – started rolling out in 2021.
- Supported the development of EV standards and guidelines in [ADB-funded project and managed by PRIF)
- Supported the demonstration of EV technologies and business services.
- Hosted national/regional workshop to share experiences on EVs





# Highlight of Experiences (continue)

## Programme 3. RE Mini-Grids

- Supported with capacity programs and trainings on mini-grids maintenance and operation.
- Supported the development of standards and guideline for Minigrids
- Conducted Feasibility Study and National Mini-Grid awareness, information and promotion campaign.





# Highlight of Experiences

## Programme 4. Energy Efficiency Investment

- Supported the Pacific Island Countries with operationalizing the Energy Efficiency Legislations – such as the Minimum Energy Performance Standards and Labelling regulation.
- Supported the national energy forum /events







## 2. Business baseline info – ng. pisinisi kei fakahoko 'I motu

Islands	Population		Total
	Female	Male	
Ofu	61	72	133
'Otea	116	100	216
Falevai	100	130	230
Hunga	82	88	170





# 3. Tonga Renewable Energy Project (TREP)

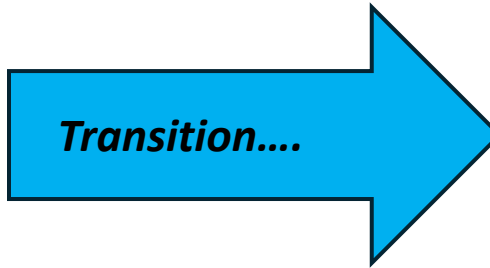
The following subprojects are being implemented under TREP:

1. TREP 01 – Grid Stability BESS at Popua Power Station, Tongatapu (7.2MW /3.8MWh)
2. TREP 02 – Load Shifting BESS at the Villa, Tongatapu (6MW /20.88MWh)
3. TREP 03 – Lot 1
  - 350kW solar PV facility and 464kW/ 1,856 KWh BESS at ‘Eua
  - 300kW solar PV facility and 1003 kW/ 2,007 KWh BESS at Vava’u
4. TREP 03 – Lot 2
  - Solar PV/ BESS microgrid including low voltage distribution system, for the following islands in the Ha’apai group: ‘O’ua, Tungua, Kotu and Mo’ua
  - Solar PV – BESS microgrid, medium /low voltage distribution system for Niuafu’ou.
5. TREP 12 – Solar PV – BESS micro-grid, including low voltage distribution system, for the following islands in the Vava’u Group: Hunga, Ofu, Falevai (note this subproject was added during the TREP implementation phase).



Con't.....

## Solar Home Systems



## Solar Minigrids Systems

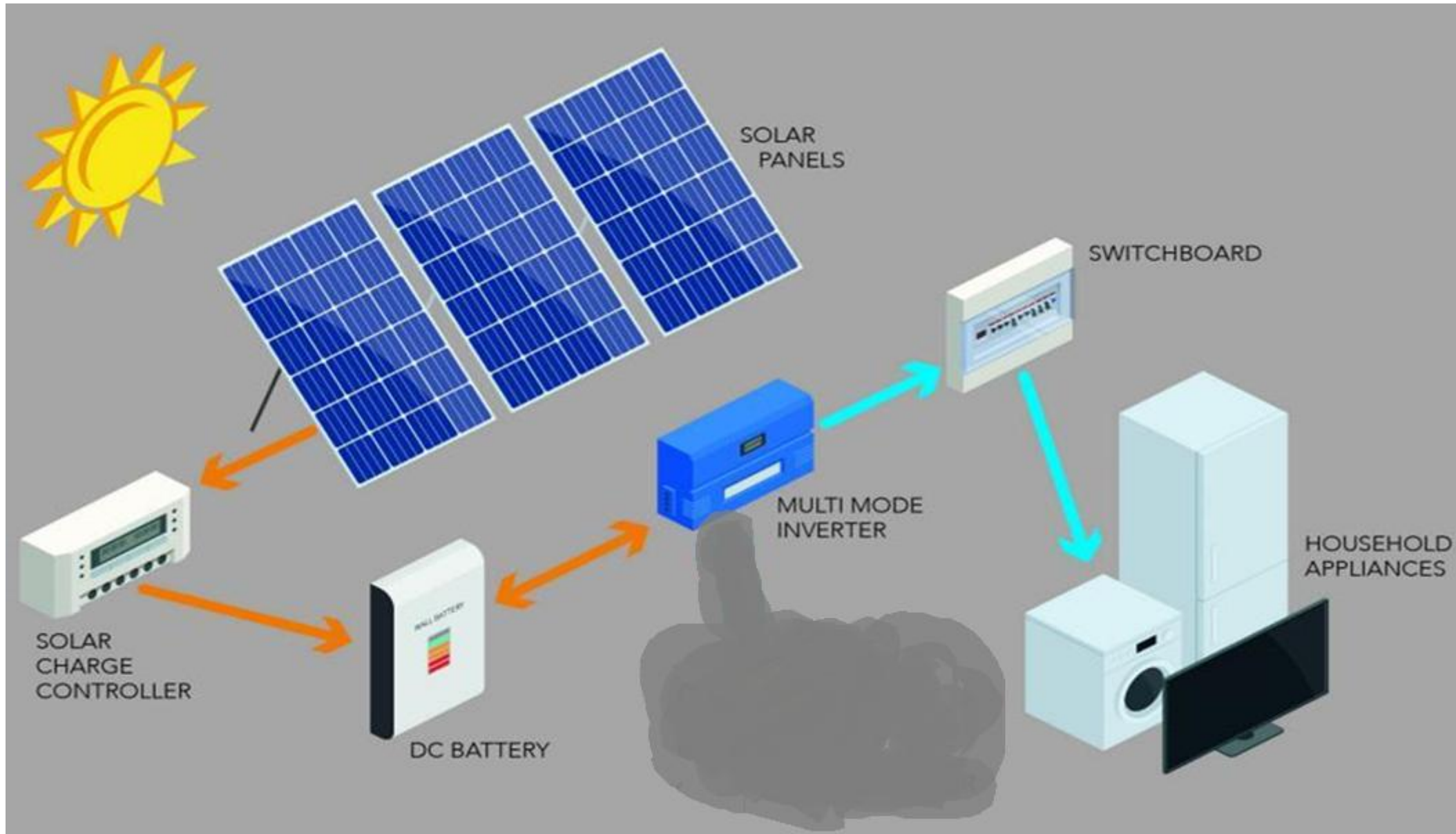


- Small-scale, standalone systems designed to power individual households.
- Typically range from 20 – 500Watts of capacity.
- Designed for basic energy needs, such as lighting, phone charging and low-power appliances

- Medium-large scale systems designed to supply electricity or even small islands/communities.
- Capacity range from a few kW to 100+ kW
- Can support higher energy demands – washing machine, refrigerators, freezers and heating appliances etc.



# Simple schematic of a solar mini-grids system





# 4. Potential Income Opportunities



Barber shot – kosi'ulu totongi



Retail shop - falekoloa



DJ -hire



Misini fakapa-tutu



Misini tuki kava



Restaurant - falekai



Tailoring – tuitui totongi



Laundry – foo totongi

## Productive Use of Energy

refers to the use of energy—typically electricity—to support income-generating activities and improve productivity in various sectors, such as agriculture, small-scale industry, and services

The **ultimate goal** is to enhance economic development, improve livelihoods, and reduce poverty by leveraging energy access.



# 5. Starting a Business



## 1. Develop a Business Idea

- Identify what you want to sell or the services you want to provide.
- Research the market to ensure there is demand for your product/service.
- Consider how electricity (e.g. AC power from minigrids) can help your business



## 2. Create Simple Business Plan

- Describe your business – what will you do or sell
- Identify your target customers
- Estimate Cost and Revenue – what will it cost to run a business, and how much money will you make
- Set Goals – what you want to achieve (short /long term)



## 3. Register your Business

- Describe your business – what will you do or sell
- Identify your target customers
- Estimate Cost and Revenue – what will it cost to run a business, and how much money will you make
- Set Goals – what you want to achieve (short /long term)



## 4. Open your Bank Account

- Open a Business Bank Account to keep your personal and business money separately.
- This will help you manage your cash flow and building credibility.

# 6. Access Funding – to start-up a business

## 1. Personal Saving



## 2. Bank Loan



e.g. BSP, ANZ, MBF or  
TDB

## 3. Micro-finance Loan



e.g. SPPD

## 4. Gov Grants/Subsidy Program



e.g. PCREEE 20-30%  
subsidy



# 7. Basics Financial Management

## 1. Cash Flow – movement of money in and out of business



### Why Cash Flow is important:

1. Pay expenses on time
2. Avoid running out of money
3. Save for emergencies /growth.

# 7. cont.....

## 2. Budgeting– Planning how much money you expect to earn(income) and how much you will spend (expenses)

Category	Estimated Monthly Amount
<b>Income</b>	
Barber services (haircuts,shaves etc)	4,320
<b>Total Income</b>	<b>+4,320</b>
<b>Fixed Expenses</b>	
Wages for employees	1,000
Loan	600
<b>Total Fixed Expenses</b>	<b>-1,600</b>
<b>Variable Expenses</b>	
Barber tools & equipment (razors, clippers etc)	500
Utilities (electricity & water)	200
Supplies (shampoo, hair gels etc.)	220
<b>Total Variable Expenses</b>	<b>-920</b>
Savings – Emergency	<b>-500</b>
<b>Remaining Profit</b>	<b>\$ 1,300</b>

For example: Running a barber shop [fale kosi ‘ulu)

**Assumption:**

- Operating Monday – Sat every week or 6 days/week, 24 days per month
- \$15 /customer hair cut
- Avg of 2 customers/day

**What is Fix expenses/cost:** are costs that remain constant or predictable over time. These expenses are not affected by the number of Customers or sales in the business.

Examples: rent, loan payments, salaries/wages etc.

**What is Variable expenses/cost:** are expenses that change in direct proportion to the level of business activity or production. These costs fluctuate depending on factors such as # of customers, sales volumes or production output.

Examples: utilities (electricity and water), maintenance and repairs, supplies and materials etc.



## 7. cont.....

**3. Record Keeping**– involves collecting, organizing, storing and maintaining information related to a business’s financial and operational activities

### *Key elements of Record-keeping*

- i. **Income records:** documentation of money earned through sales, services, or other sources.
- ii. **Expense records:** record of money spent on business operations, including receipts and invoices.
- iii. **Inventory records:** logs of stock levels, purchases, and usage of goods or materials
- iv. **Employee records:** detail of wages, hours worked, payroll information
- v. **Tax records:** documentation needed for filing taxes, such as income statement and deductible expenses.

### **Example: Record-keeping of Fish Market**

Date	Fish Type	Quantity Sold (kg)	Price per kg (TOP)	Income (TOP)	Expense Item	Expense (TOP)	Remaining Stock (kg)	Notes
Tuesday, 21 January 2025	Ngatala	10	15	150	Ice Purchase	10	50 kg	Fresh stock received today.
Tuesday, 21 January 2025	Snapper	5	12	60	Fuel for Boat	20	20 kg	Sold to regular customer.
Tuesday, 21 January 2025	ponetuhi	8	10	80	Packaging Materials	5	12 kg	Used 16 plastic bags.
Tuesday, 21 January 2025	Valu	6	18	108	Market Stall Rent	15	14 kg	Paid stall rent for the day.
<b>Totals</b>	<b>4 Types</b>	<b>29 kg</b>	<b>-</b>	<b>398</b>	<b>4 Expenses</b>	<b>50</b>	<b>Remaining Stock: 96 kg</b>	<b>Net Income: 348 TOP</b>

# 8. Electricity Cost and Savings

## Fakafehoanaki 'a e ngaahi mo'ua 'uhila

Ko ha tepile fo'ou 'oku ne fakafehoanaki 'a e mo'ua 'uhila lolotonga moe ngaahi mo'ua ki mu'a:

- 'Avalisi e ma'olunga moe ma'ulalo e mafana 'o e 'ea- Fakamatala 'ea fakatatau ki he feitu'u 'oku ke 'iai.
- Ngaahi 'aho tohi mo'ua- Koe lahi e ngaahi 'aho 'oku lau ai ho'o mo'ua 'uhila.
- 'Avalisi e ngaue'aki faka 'aho (kWh) - Ko e 'avalisi ho'o ngaue'aki faka'aho ho'o 'uhila 'i he kilowatt-houa.
- kWh fakakatoa 'oku ngaue'aki - Fakakatoa 'o e 'uhila 'oku ke ngaue'aki 'i he kilowatt-houa.
- Iuniti totongi 'uhila & Tokoni 'a e Pule'anga -Koe totongi 'uhila 'i he kilowatt fakatatau ki he totongi kuo faka'ata meihe Komisoni 'Uhiila. 'Oku 'asi foki heni moe tokoni 'a e Pule'anga

## Ngaahi founga totongi & ngaahi founga fetu'utaki

- Ngaahi founga totongi ke fili mei ai- 'Oku fakafaingofua'i hono totongi ho'o 'uhila 'aki hono 'oatu ha ngaahi founga totongi 'uhila keke fili mei ai hange koe totongi ngaue'aki 'a e initaneti, ngaue'aki 'a e Pangike fakafou 'i he initaneti pe koe ngaahi feitu'u ke totongi 'i he kanita. (Totongi 'i he initaneti 'oku ngaue'aki pe ki he kau kasitoma 'a Tongatapu te'eki a'u ki motu.)
- Founga Fetu'utaki - Fetu'utaki mo kimautilu fakafou he'emau uepisaiti, telefoni pe imeili. Fetu'utaki ki he'emau fika ki he fiema'u fakavavevave, 'aia ku ta'e totongi, pea 'oku faka'ilonga'i makehe atu.

**YOUR ELECTRICITY BILL**

Customer No: 123456  
 Account No: 654321

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**INVOICE TO:**  
Tonga Power Limited

**PAYMENT AND ADJUSTMENT**  
 26/08/24 Opening Balance: \$173.83  
 Past Due Power Charges: \$173.83

**ACCOUNT SUMMARY**

Invoice No: 8158302  
 Electricity Supplied from: 04/06/2024 to 26/08/2024  
 Past Due Power Charges: \$173.83  
 Power charges (please see below for details): \$15.36  
 Lifeline Tariff Discount Scheme: -\$1.79

**Total Amount Due by 09 September 2024: \$187.40**

(If any part of the Past Due Power Charges amount remains unpaid after 2 Sep 2024 your electricity supply will be disconnected without further notice)  
 The current Power Bill Amount is due for payment within 30 days of bill date  
 Government Lifeline Tariff Discount Scheme provides a 17.91 senti per kWh rebate for all power customers who use 150 kWh or less per month

**CURRENT CHARGES: \$15.36**  
(Please see Current Month power charges table below for more detail)

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**PAYMENT OPTIONS**

**Online Payment (Credit \ Debit Cards):**  
 Send an email to [oss@tongapower.to](mailto:oss@tongapower.to) to register and manage your bill account online  
 Link: <https://www.oss.tongapower.to>

**Internet Banking:**  
 BSP account number: 2000624664  
 ANZ account number: 1681919  
 TDB account number: 153116 S1

**Over the Counter:**  
 Any Tonga Power Limited Office  
 Any Western Union Office  
 Any Tonga Gas Office  
 Tonga Development Bank

**Monthly Billing and Charges**

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**CONTACT INFORMATION**  
(Also available on our website: [www.tongapower.to](http://www.tongapower.to))

- Billing enquiries: 21400, 28311
- Re-connections: 7720141 / 7720019
- Meter enquiries: 27744
- Fault: +676944 / 28344
- Email: [powerbillstbu@tongapower.to](mailto:powerbillstbu@tongapower.to)

**Emergency (free): 944**

**Billing Period Comparison**

	August 2023	June 2024	July 2024
<b>Billing Days</b>	30	32	31
<b>Avg Daily Usage (kWh)</b>	0.17	0.16	0.52
<b>Total Usage (kWh)</b>	5	5	16
<b>Avg High Temp</b>	23°	24°	23°
<b>Avg Low Temp</b>	17°	19°	17°
<b>Tariff Unit Cost</b>	\$0.8120	\$0.8120	\$0.9603
<b>GPO Rate</b>	\$0.1791	\$0.1791	\$0.1120

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**CURRENT MONTH POWER CHARGES USAGE DETAILS**

Item / Fakakiiki	Meter	Invoice Period / Taimi 'Inivisi	Previous Bill Read / Lau Mo'ua ki Mu'a	Current Bill Read / Lau Mo'ua ko eni	Units Used / Uniti na'e ngaue'aki	\$ Rate / Totongi	\$ Total / Fakakatoa
Energy Usage / 'Uhila na'e ngaue'aki	10112938	05/06/24 - 05/07/24	3901 kWh	3917 kWh	16 kWh	\$0.9603	\$15.36
<b>Total for site this month:</b>							<b>\$15.36</b>

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**Fuel component:** \$7.84 (16 units x \$0.4903). **Non-fuel component:** \$7.52 (16 units x \$0.4700) / Totongi 'uhila 'oku 'ave ke totongi 'aki 'o e tofo \$7.84 ('uniti' o 16 x \$0.4903), fakalele 'aki 'a e Pisisia koe \$7.52 ('uniti' o 16 x \$0.4700).

**The Electricity Commission Administration Fee** of \$0.18 (16 units @ \$0.0112) / Totongi 'uhila Komisoni 'Uhiila (Electricity Commission) \$0.18 ('uniti' o 16 @ \$0.0112).

Tonga Power Ltd welcomes any **feedback/complaint**. If you have an issue please contact us at: [feedback@tongapower.to](mailto:feedback@tongapower.to). If you wish to take a complaint/feedback further then you can contact the Electricity Commission, P.O. Box 47, Nuku'alofa or [email to chairman\\_regulator@gmail.com](mailto:email_to_chairman_regulator@gmail.com) / Oku mau tili lele ho'o moa tanaki'anga 'aku fa'ia ma: Fetu'utaki mai kibe 21400 pe email mai kibe [feedback@tongapower.to](mailto:feedback@tongapower.to). 'E toe malava pe ke toe fakanofo ho'o laungatanaki kibe Komisoni 'Uhiila 1 he P.O. Box 47, Nuku'alofa pe email kibe [chairman\\_regulator@gmail.com](mailto:chairman_regulator@gmail.com).

## Fakamatala 'o e 'Akauni

'Oku 'i heni kotoa 'a e fakakiiki ki he ngaahi fakamatala mahu'inga fekau'aki mo ho'o mo'ua 'uhila.

## Mo'ua fakakatoa ke totongi

'Oku tohi lanu hinehina ho'o mo'ua fakakatoa ke totongi 'i he pa lanu kulokula, ke ha makehe mo 'ilonga lelei ange. 'I lalo ai, 'oku ha ai 'a e 'aho faka'osi ke totongi ho'o toenga mo'ua 'uhila, ki mu'a pea tu'usi atu.

## Kalafi- Hisitolia

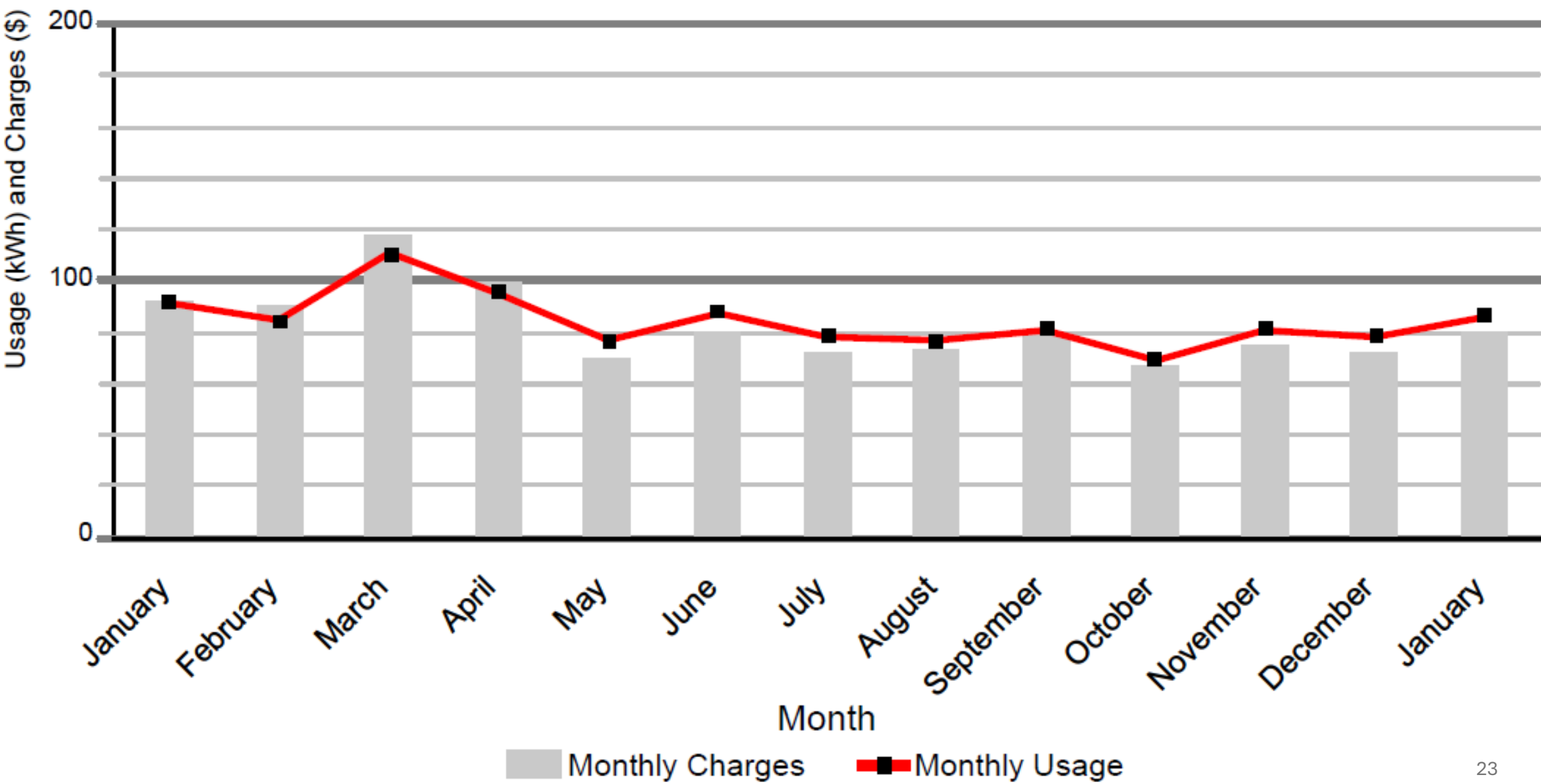
'Oku faka'asi 'i he kalafi 'o a'u ki he mahina 'e 12 'a e hisitolia ho'o ngaue'aki fakamahina ho'o 'uhila fakataha mo hono ngaahi totongi.

## Ko ho'o mo'ua 'uhila lolotonga/Fakakiiki ho'o ngaue'aki

'Oku fakakiiki heni 'a e mita ho'o 'uhila, vaha'a taimi 'oku totongi, mo'ua ki mu'a, mo'ua lolotonga, 'iuniti ngaue'aki, totongi ki he 'iuniti 'o e 'uhila 'oku ke ngaue'aki, pea mo ho'o mo'ua fakakatoa ki he mahina.



# Monthly Billing and Charges



# CURRENT MONTH POWER CHARGES USAGE DETAILS

Route: 1310/42

Item / Fakaikiiki	Meter	Invoice Period / Taimi 'Inivoisi	Previous Bill Read / Lau Mo'ua ki Mu'a	Current Bill Read / Lau Mo'ua ko eni	Units Used / Uniti na'e ngaue 'aki	\$ Rate / Totongi	\$ Total / Fakakatoa
Energy Usage / 'Uhila na'e ngaue'aki	316187743	05/12/24 - 31/12/24	12329 kWh	12408 kWh	79.14 kWh	\$0.9169	\$72.56
Energy Usage / 'Uhila na'e ngaue'aki	316187743	01/01/25 - 02/01/25	12408 kWh	12414 kWh	5.86 kWh	\$0.8947	\$5.24

Total for site this month: **\$77.80**

Difference:  $79.41\text{kWh} \times \$0.9169 = \$72.56$

\*\*image of smart meter to be put here.



## 1. Cooling Appliances

- Refrigerator -200 Watt



- Freezer 400 W



- AC unit 1kW (1000W)



## 2. Heating Appliances



Microwave 800W



Kettle 1,500W



Toaster 1000W



iron 1000W

Washing Machine 450W



Sewing Machine 80W



Laptop-Computer 60W



Phone Charger 7W



Hair Clippers-100W

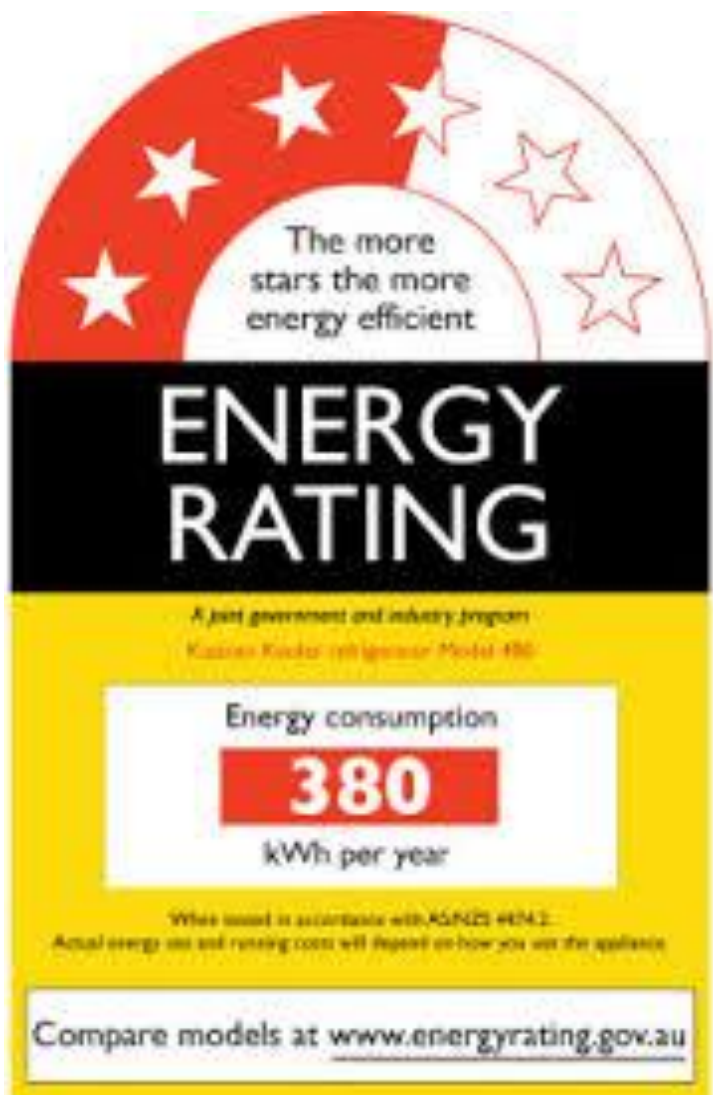


Floodlights-100W





# Minimum Energy Performance Standards & Labelling [MEPSL] program



The more stars the more energy efficient

## ENERGY RATING

A joint government and industry program  
Kaitiaki Takekiriwhiriwhiri Mōhiohio

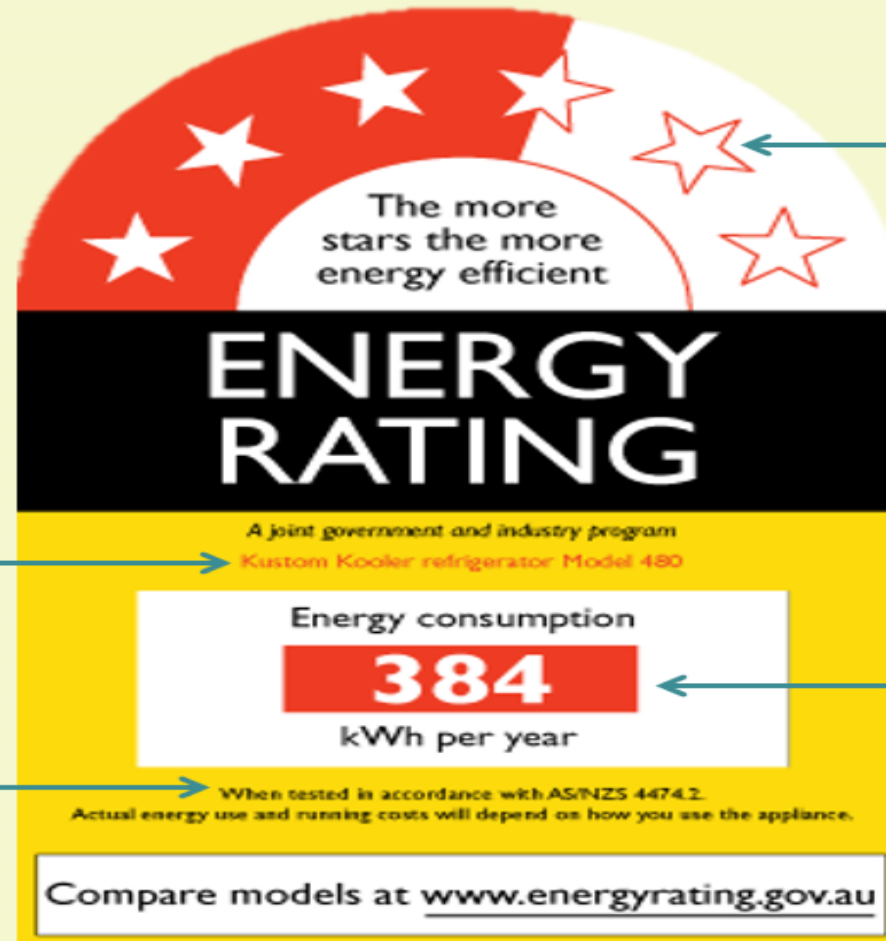
Energy consumption  
**380**  
kWh per year

When used in accordance with AS/NZS 6142.  
Actual energy use and running costs will depend on how you use the appliance.

Compare models at [www.energyrating.gov.au](http://www.energyrating.gov.au)



# Identifying Energy Rating Labels



Stars shows the efficiency of the appliance

Brand and the specific Model Number

Must state the AS/NZS 4474.2 Test Standards

States the energy consumption rate in kWh per year



# THE ENERGY RATING LABEL

Calculating Cost to Run [Compare the labels on two similar sized fridges]:

- Annual Cost to Run = Energy Consumption (kWh) x Electricity Tariff (TOP/kWh)
- **Example** – Kapau fie fakatau ha’o ‘aisi fo’ou ‘I Tonga, pea ko e totongi ‘o e ‘uhila ki he ‘iuniti (kWh) ko e TOP\$1.10

	'Aisi 1	'Aisi 2
Lahi e fetu'u he Leipolo	Fetu'u e 3 	Fetu'u e 6 
Lahi 'o e fakamole ki he 'aisi takitaha	542 kWh x \$1.10 = <b>\$596 .20 ki he ta'u</b>	318 kWh X \$1.10 = <b>\$349. 80 ki he ta'u</b>

Malo 'aupito.....