



Modiul 7 - Lenas Wakabuk

Sola insaed lo Komiuniti

PIJIN LANGUAGE – SOLOMON ISLANDS

Slen fo fanding hem kam from:

KOICA
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An patna wetem:



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“Sola insaet Komiuniti” training modiol hem introdaksin long olketa waka blong sola paoa (fotovoltik) sistem.

Taem lenas komplitem kos yia, olketa lena bae save long olketa ya:

- Diskraebem sola Eneji
- Ekspleinem nao olketa paramita blong elektrikal (V, I, P an E, AC an DC)
- Luksave long olketa difren pat bae yiusim insaet long Sola Paoa Sistem

- Ekspleinem olketa waka blong olketa difren pat insaet long Sola Paoa Sistem.
- Diskraebem olketa difren taep long sola paoa sistem
- Diskasem olketa ki fakta fo save long hem taem baem eni sola paoa sistem an/o olketa difren pat long hem
- Diskraebem nao impotens long mentenens blong Sola Paoa Sistem

Diswan yu save jius fo duim o noma (opsonol)

- Luksave long olketa beisik tes ikuipmen an soum hao fo duim stret long seif wei tu.

LESON PLAN

TEBOL 2: Leson Plan

Olketa sapta insaed lo wakabuk ia	Olketa leson insaed wakabuk ia
1. Aes break - introdaksin	Leson Topik an Aktiviti 1
2. Wanem nao sola eneji	Leson Topik
	Aktiviti 2
	Aktiviti 3
3. Beisik blong elektrisiti	Leson Topik
	Aktiviti 4
4. Pats blong elektrisiti	Leson Topik
	Aktiviti 5
5. Sola PV sistems taep	Leson Topik
	Aktiviti 6
6. Seifti wetem Sola PV sistems	Leson Topik
	Aktiviti 7
	Aktiviti 8 –opsonol : yu jius fo duim o nomoa
7. Taem yu baem Sola paoa sistems	Leson Topik
	Aktiviti 9
8. Fiksim sola hom sistems	Leson Topik
	Aktiviti 10
	Aktiviti 11
	Aktiviti 12

Disfala Lenas Waka buk (LW) hemi teken aot from Treinas Gaed (TG) wea kam wetem. Olketa infomesin insaet long disfala LW olketa bin mekem isi an sot. Olketa raetim daon noma olketa mein aedias noma an wea olketa fokas na long olketa piksas, daegrams an olketa aktivitis blong hem wea alaom na lenas fo engeij wetem olketa trenas taem blong

treining. If yu laekem eni adisinol infomeisin long eni seksin insaed, yu save luk go nao long Trenas Gaed (TG) blong Lenas Wakabuk (LW) ia.

Kava foto: Komiuniti Sola PV training lo Rukua vilej. Sos : Mohammed Tazil, GGGI , Fiji

Stetment fo diklearem no eni risponsibiliti: Global Green Growth Institute hem no promesem, long toktok o mining, o hem no garem eni ligol laeabiliti o risponsibiliti long hao stret, kompli o hao eni nara mek tri pati hem iusim, o risalt blong olketa iusim, eni infomeison, tul, prodakt, o proses wea hemi stap insaed long infomison long disfala dokument o hem representim dat eni yus bae hem no brekem lo blong olketa praevet ona raet.

MINING BLONG OLKETA WODS YIA (GLOSARI)

AC karent: Oltenaiting karent hemi wanfala taep blo elektrisiti wea save sens or hem olweis sens. Disfala taep karent ia invetas, jenereitas an bikifala paoa sistims na prodiusim.

Kemikol eneji: eneji wea stap tugeda insaed lo kemikol kompaon osem atoms an molekiuls. Disfala taep eneji yia save aot kam (rilis) taem oketa kemikol riakt.

Karent (A): Elektrik karent hemiwan flou blo elektrik saj insaed lo seket o waea.

DC current: Daerekt karent hem wanfala taep blo eneji wea hem stap semsem an sola panols na save wakem.

Eneji: Hemi paoa wea hemi teken from making yus lo fisikol o kemikol risosis, espeseli fo provaedim na laet an hit (hot) o fo mekem masins waka

Hanes osem PPE: Hemi fom blo pesonol protektiv ekwipmen (PPE) wea oketa wakem kam (disaenim) fo kajim na man inkeis em foldaon from hae ples taem hem waka

Hit Eneji: Hit eneji yumi save kolem temol eneji tu, hemi eneji wea wanfala objek garew bikos lo muvment blo molekuls blo hem.

Haedrolojik saekol: hem wata taem hem kontiniu noma fo sekuleit insaed and araon noma lo haedrosfia blo et an sola radiesin nao hem draevem.

Mekanikol Eneji: hemi everi eneji wea wanfala objkt garew biko lo muvment blo hem an ples hem stap (posisin).

Nem Plet: hemi saen o stika wea hem pas go na lo aplaens o ikwipmen wea hem talem na nem, hu na mekem an oketa nara ditels osem.

Radiasin: Eneji wea travol bae weivs o patikols, in patikula na elektromagnetik radiasin osem hit o x-reis elektromagnetik wevs wea daerektli transpotim na eneji lo spes. Sunlaet hemi wanfa fom blo radiasin.

Sola Eneji: eneji from sun wea hemi konveted go lo temol o elektrikol eneji.

Temol Eneji: hemi eneji objek garew biko lo muvmen blo molikuls blo hem.

Volteij: hemi laekli difrens bitwin tufala points lo seket an hem nao wanem hemi kosim karent fo flow insaed lo seket wea hemi klos.



1

Aes Breka-
Introdaksin

AKTIVITI 1

Introdusim yuseleva long olketa narawan long grup.
Tokabaotem wanem nao yu laek fo tekem from disfala
treining an wanem nao eksperiens yu garem finis wetem
sola insaet komiuniti blong yu

A large, white, stylized number '2' is positioned on the left side of the page. The background is a gradient of teal and blue, with a vertical line separating the lighter blue area on the left from the darker teal area on the right. The number '2' is white and stands out against the blue background.

**Wanem nao
Sola Eneji?** _____

2.1 Wanem nao Eneji?

Olketa Kastom stori talem olowe dat san hem paoaful olowe. San givim eneji long plant, wea pipol an olketa animol save kaikam. Long evri kalsa san hem spesol samting.

Save diskraebem eneji olsem samting wea garem staka fom an save senis fom fo givim yumi samting yiusful.

- **Hit eneji** - Trae tingim baek taem yu startem faea fo boelem wata. Taem yu kam kolsap long faea yu save filim nao hot diswan hem bikos long eneji.

FIGA 1: Wan hem som na Hit (hot) eneji an wata wea hemi boel¹



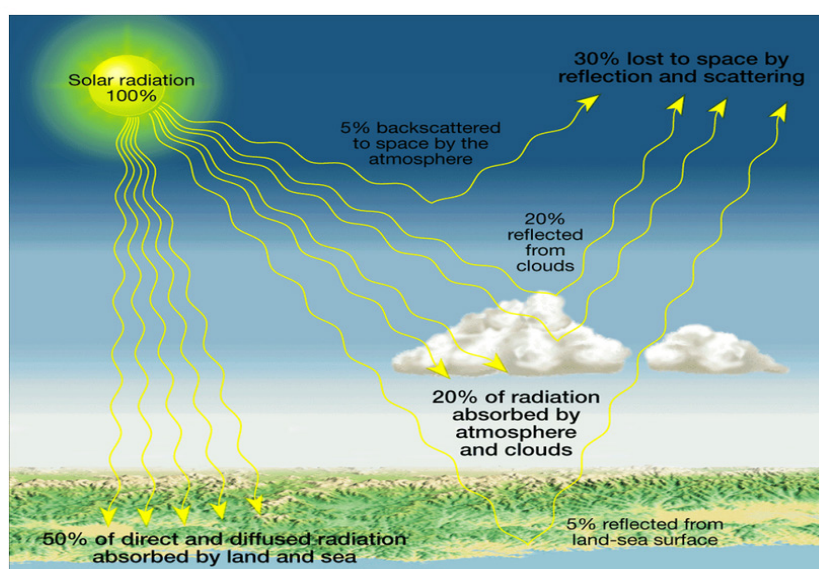
The burning wood gives out heat energy and heats the pot. This heat helps to boil the water. The heat energy gets transfered to water. We all know how hot boiled water is.

- **Mekanikol eneji** - diswan hem eneji wea enjin long bout hem givim fo roteitem nao propela fo muvum bout.
- **Kemikol eneji** - insaet long olketa batri, save yiusim olketa kemikol fo stoarem eneji mekem yu save onim nao radio, sajem fon o olketa laet long naet
- **Elektrikol Eneji** - diswan hem eneji wea flou tru olketa waea fo givim paoa long olketa aplaens.

Sola eneji hem elektromagnetik redieisin weak am from san. Yu save tekem an tanem go nao long olketa yiusful fom blong eneji olsem hit an elektrisiti (paoa) yiusim nao olketa difren teknologi olsem panol (PV) an temol kolekta.

Staka eneji from san hem lus bifo hem kasem Et olsem long Figa 2.

FIGA 2: Hem som na ful infomeisin blo totol sola redieison²



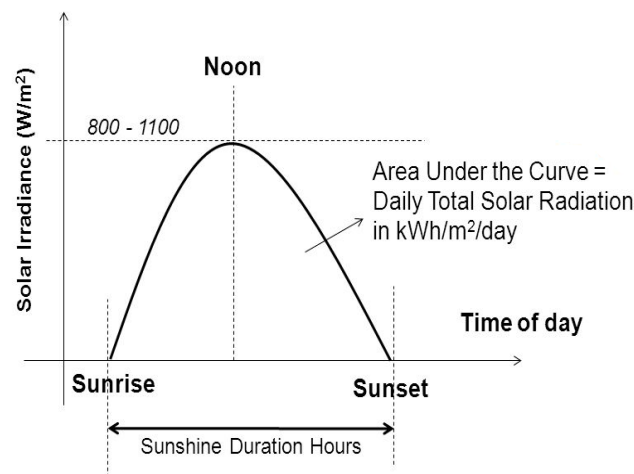
¹ Source: Pikrepo, <https://p0.pikrepo.com/preview/673/890/black-cooking-pot-on-fire.jpg>, accessed on 16 June 2021.

² Source: SlidePlayer, "Slide 42 of Weather and Climate", https://player.slideplayer.com/72/12257222/slides/slide_42.jpg, accessed 25 June 2021.

Diuring long olketa difren taem long de, redieisin wea kam from san hem difren lelebet an enei wea kam from olketa yius blong difren divaes wea yiusim disfala redieisin fo konvetem go long yiusful enei hem difren tu.

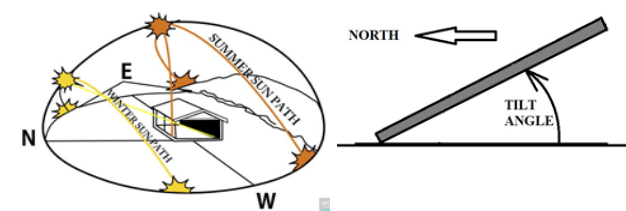
Taem san hem raes long moning, iradiens (W/m^2) hem zero wea hem minim dat paoa wea kam from sola PV sistem hem ziro. Taem san kaka map moa, staka enei moa hem kam go kasem aftanun taem hem kasem nao maksimam den nomoa iradiens ya bae hem stat fo ridius an dikris long paoa tu gogo hem ziro moa long ivining.

FIGA 3: Hem som na Sola Iradians Graf³



In oda fo yu meksua dat yumi tekem maksimam amaont long paoa from olketa sola panol, sola panol ya mas feisim san fultaem. Taem yu kipim sola panol ya flat long ruf o no feisim san bae hem mekem fo yu lusim staka sola enei an diswan save kosim enei soteij an sola sistem save satdaon long hem.

FIGA 4: Hem som na pat (rod) blo san wea san folom insaed lo wan yia⁴ an tilt blo sola panol⁵

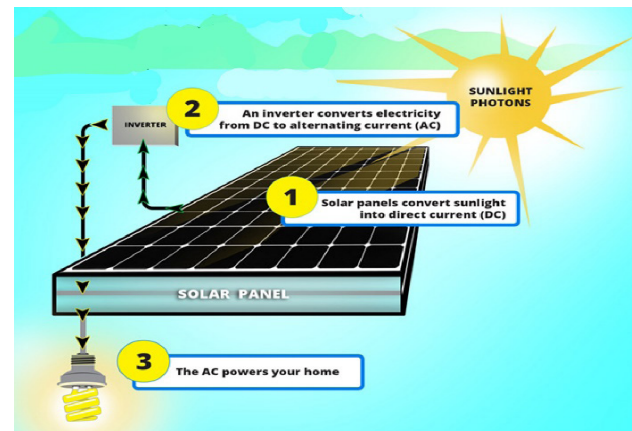


(Not: tekem not dat tilt angol hemi 10 digris not)

Fo tekem maksimam sola enei long Solomon Aelan, evri PV modiol mas stan bituin 10 digri an feis go long Not daareksin diswan hem fo tekem maksimam sola paoa from olketa modiol ya insaet long yia.

Sapos yu garem sola panol waswe yu poentem long agol an daareksin wea hem shud long hem? Sapos nomoa yu maet lusim sola paoa evride ya

FIGA 5: Som na Sola Paoa sistim (AC)⁶



Enei from san hem konvet go nao long paoa (Daarekt karent (DC)) taem yiusim nao sola PV sistem (panol). DC Karent hem konvet go nao long altaneiting karent (AC) taem yiusim nao inveta. Inveta nao provaedem AC karent (240V) go long laet balb.

Figa 6 hem soum sola kolekta wea yiusim nao enei blong san fo hotim wata (no prodiusim nao elektrisiti). Figa 7 hem soum nao woman wea instolem sola PV (panol) fo mekem nao paoa (yiusim sanlaet fo prodiusim nao paoa)

3 Research Gate, Journal of Energy Conversion and Manag.

4 Source: www.wolfarchitects.com.au, May 2021.

5 Mohammed Tazil, GGGI.

6 Source: 93energy.com, "How Solar works", <https://www.93energy.com/hubfs/Screen+Shot+2019-05-13+at+4.12.05+PM.png>, accessed 25 June 2021.

A close-up photograph of a worker wearing a white hard hat with a logo, an orange safety vest over a tan shirt, and patterned work gloves. The worker is focused on securing a large, rectangular solar panel onto a metal mounting structure. The background shows a construction site with various materials, a small white building, and a red shipping container under a clear sky.

A photograph showing several rows of seedling trays filled with soil and small plants, likely in a nursery or greenhouse setting. The trays are arranged in a grid pattern, and the plants are small and green, indicating they are in the early stages of growth. The background shows more trays and some foliage, suggesting a large-scale cultivation operation.

Raetem daon nots blo yiu lo hia

[illegible]

10 Adapted from the Fiji Sun, "Kava Demand Creates Trade Opportunity Between Fiji, Madang, August 2018, <https://fijisun.com.fj/wp-content/uploads/2015/11/Kava-1-750x403.jpg>

AKTIVITI 2

1. Soum nao sos blong eneji long evri piksa ya (Figa 1 go kasem 9) an raetem nao leta “s” long hem.

2. Luk long figa 1 go kasem 9 an soum wanem nao konvetem sola eneji go long paoa an yu makem diswan yiusim nao leta “E”.

3. Luksave long olketa difren fom blong olketa eneji wea hem prodius an makem wetem leta “P”

4. Waswe, sola hem fri?

5. Waswe, sola eneji hem klin tu?

6. Waswe, olketa klaod ridiusim sola eneji tu?

7. Waswe, taem yu tanem agol blong panol an daereksin bae afektem konvesin blong sola eneji?

8. Waswe nao sola eneji hem impoten long yumi?

9. Diskasem long klas hao nao man an woman long eria blong yu yiusim sola eneji?

AKTIVITI 3

1. Wat taem long de nao bae yu save tekem gud amaont blong sola paoa an wae?

3

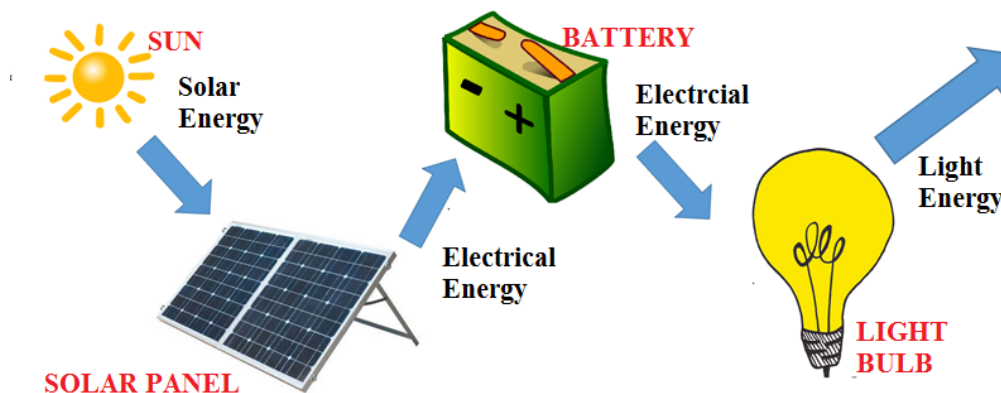
Beisik long
elektrisiti

3.1 Elektrikol Eneji

Elektrikol eneji hem narafala fom blong eneji. Yunit fo mesarem eneji hem Joules. Hem save kam from haedro, win,

sola o hit eneji tu. Yumi laek fo sensim eneji from san go long elektrikol eneji go long paoa laet an olketa narafala aplaens. Piksa long daon bae soum yu hao diswan hem hapen.

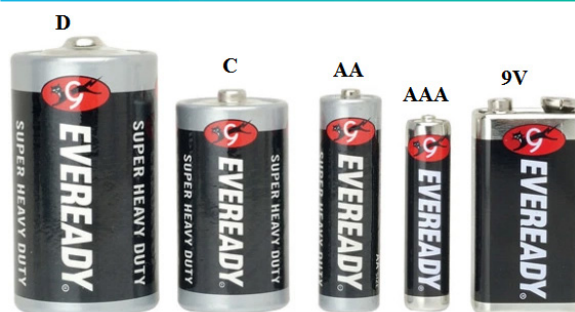
FIGA 10: Hem som na hao sola eneji sensim na fom blo hem fo givim na laet lo yumi¹¹



Long Figa 10 yumi lukim sola eneji from san hem sens go long elektrikol eneji wea kam from sola eneji. Bat san save kam nomoa long de an yumi nidim eneji long naet, yumi storem nao disfala kemikol eneji long batri fo yusim behaen. Yumi save lukim dat batri ya hem storem nao elektrikol eneji yusim nao kemikol.

Seifti Tip: Eneji blong eni fom no mata hem elektrikol eneji from panol o from batri hem denjaes an save kosem ham sapos yumi no keaful. Mas folom olowe nao rul blong seifti taem waka wetem eneji.

FIGA 12: Som na difren taep blong olketa smol batri¹³



3.2 Eneji insaet batri

Eneji insaet long batri hem stap yusim nao olketa kemikol. Samfala batri bae no save sajem olsem nao olketa smol AA saes bat olketa nara bik wan ya yumi save yusim nao wetem sola panol save saj yusim elektrikol eneji.

FIGA 11: Hem som na wanfala Led asid risajabol batri¹²



3.3 Lane abaotim nao Paoa

Hao nao bae yumi save hao mas eneji nao yumi yusim from batri? Long simpol tem yumi divaedem eneji yumi yusim long taem yumi yusim.

Long simpol tem yumi defaenem paoa olsem eneji yumi yusim long taem olketa givim. Yunit blong paoa hem Watts (W). Yumi bae konsen moa long paoa den eneji taem yumi tokabaot sola PV sistem. Yumi save hao mas nao eneji wea bae yumi yusim from batri sapos yumi save paoa nao olketa aplaens nao nidim. Paoa hem save minim tu elektrikol eneji wea hem kam from olketa panol tu.

¹¹ Adapted from the Electricity Basics, Arizona State University (VOCTEC), <http://vottec.asu.edu>

¹² Source: JICA.

¹³ Source: Lazada, "Eveready battery", https://ph-live-01.slatic.net/p/6abf377c3bd40ff76088f4764c8624cb.jpg_2200x2200q80.jpg_.webp, accessed 25 June 2021.

FIGA 13: Som na wanfala 4W laet Balb¹⁴



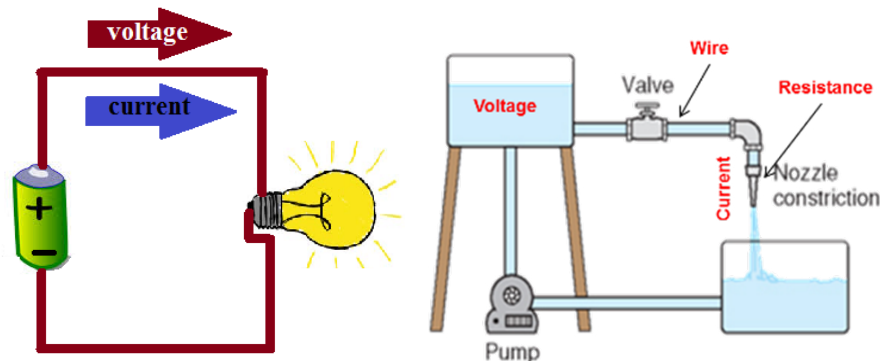
FIGA 14: Som na hao mas paoa na disfala sola panol ia save prodiusim¹⁵



3.4 Lane abaotim Volteij an Karent

Volteij hem elektrikol potensol o presa wea muvum electron tru long waea (kondakta) an save kompearem presa insaet long wata paep. Hao nao paoa hem transfa from sola panol go long batri o long laet balb o inveta o eni narafala aplaens? Yumi yiusim olketa kopa waea. Insaet long olketa copa waea hem transfa insaet tufala komponen o pat. Paoa hem muv tru long olketa waea olsem volteij an karent.

FIGA 15: Hem som na volteij an karent oketa mekem ap na paoa – Volteij hem osem presa insaet lo wata tank)¹⁶



Volteij hem mesam long yunit volt an karent save mesam lonf Amperes o Amps. Yumi laek fo save olowe hao mas karent an volteij nao long olketa waea.

Seifti Tip Hae karent an volteij save kosim bik karakil an save dae tu sapos tufala pasem bodi blong yu. Mas avoidem olketa bea waea an mas no waka long olketa laev skeet. Mas praktesim seifti olowe o tekem ril elektrisian.

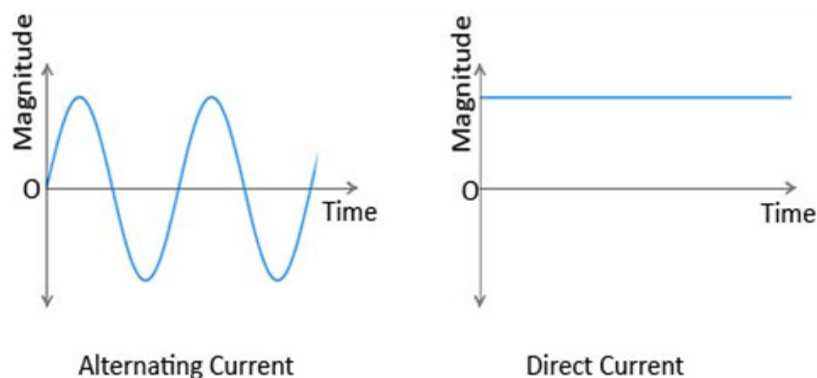
3.5 Lane abaotim AC an DC sistem

Paoa from batri flou blong hem save stedi. Karent wea yumi tekem from batri nem blong hem darekt karent o DC bikos hem no sens. Long DC or darekt karent, karent hem flou daerekt from positive go long negative teminol garem nomoa wan valiu. Long olketa bik divaes, yumi garem AC karent o olketa narafala karent wea karent ya hem garem fom wea hem olsem wev.

¹⁴ Source: Shopee.com, Philips Led Lights 4 Watt Yellow and White Color, <https://shopee.com.my/PHILIPS-4-WATT-LED-LIGHT-yellow-and-white-i.267756065.3536838685>

¹⁵ Source: Ebay, "Solar Panel Kit", <https://www.ebay.com.au/itm/40W-12V-Solar-Panel-Kit-Mono-RV-Camping-Power-Portable-Battery-Charger-Outdoor-/313164338615>, accessed 25 June 2021.

¹⁶ Adapted from the Electricity Basics, Arizona State University (VOCTEC), <http://votcec.asu.edu>

FIGA 16: Hem som na AC an DC garem difren volteij an karent magnitud taem taem gogo)¹⁷

AC volteij hem save hae ya an staka long olketa grid sistem ya yiusim AC nao fo transfa paoa go long olketa haos. Paoa wea hem kam from olketa paoa laen ya go long olketa haus hem flou wetem AC ya. Staka long olketa aplaens olsem TV's, redio an samfala moa olketa wakem fo waka wetem 220 go long 240-volt AC. Diswan hem minim bae olketa no waka nao long 12 volt DC sistem. Since sola hem givim aot DC 12 go kasem 24 volt, yumi yiusim nao divaes wea nem blong inveta fo inkrisim nao volteij go long 240 volt an sensim nao Daerekt Karent (DC) flou go long Alteneiting Karent (AC) flou.

Luk long baek blong aplaens bae yu lukim hem ran long 240V den hem AC naya. Frikuenzi wea hem 50-60 Hz talem dat long divaes hem minim hem AC aplaens naya. Yu mas meksua yu ridim nae baek blong aplaens fo save sapos hem AC or DC. Leibol long baek o nem plet blong aplaens garem tu infomeisin long volteij an karent wea hem nidim fo aplaens ya.

Long hia hem sampol blong nem plet blong AC paoa frisa.

FIGA 17: Hem som na sampol blo Nem plet laibol blo wanfala sest frisa¹⁸

Haier			
Deep Freezer			
Model:	DW-25L92	Refrigerant:	R600a: 52g
Inner Temperature:	-10°C - -25°C	Anti-shock Safety Classification:	I
Effective Volume:	92L	Power Connection Type:	Y
Rate Voltage:	220-240V~	Foaming Cabinet:	CP/IP
Rate Frequency:	50Hz	Manufacture Date and No.:	in the Barcode
Power Input	77W		
Rate Current:	0.35A		
Climate Class:	4		
Weight:	46kg		
Haier Medical and Laboratory Products Co., Ltd.			
Haier Industrial Park, Economic Technology Development Zone, Qingdao 266510, P.R. China			

AC Voltage

Power Usage

Current Usage

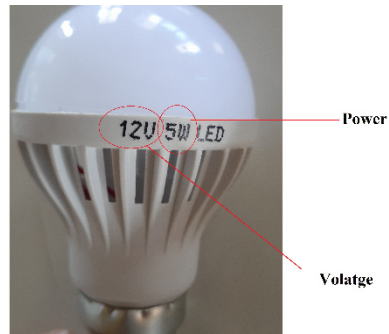
Paoa yu tekem taem yu multiplaem nao volteij an karent tugged. Long Figa 17, yumi lukim 220V multiplaem wetem 0.25. Karent reiting hem givim yumi paoa wea hem 77W wea hem stap nao Paoa input laibol. Diswan hem yiusful sapos

paoa ya hem no go daerekt, yumi save yiusim nao volteij an karent fo kalkiuleitem. Diswan hem sampol blong DC laet nem pleit o laibol.

¹⁷ Adapted from System Components: Charge Controllers & Inverters, Arizona State University (VOCTEC), <http://vottec.asu.edu>

¹⁸ Source: DocPlayer, "Deep Freezer-upright: HMRSM Haier Medical & Laboratory Products Co., Ltd.

FIGA 18: Som na diteils blo DC balb leibol¹⁹



Raetem daon oketa nots blong yiu long hia:

AKTIVITI 4

Treina bae provaedem fo olketa lena wetem tufala AC aplaens nem plet olsem AC laetbalb an AC fan. Treina bae provaedem tu tufala DC aplaens nemplet olse DC balb an DC frij (sapos hem naf). Yu mas keaful no fo separetem olketa divaes. Long olketa tim, olketa lena mas duim diswan:

- Luksave watkaen divaes nao hem AC an watkaen wan nao hem DC.
- Olketa mas save hao fo ridim voltej an karent bae nidim fo ranem nao olketa divaes ya.
- Olketa mas save talem hao mas paoa nao wanwan long olketa divaes ya save yiusim.

FIGA 19: Hem som na AC Balb 220-240V, 3W, 0.01A²⁰



¹⁹ Source: Amazon.com, "Led bulbs", https://m.media-amazon.com/images/I/31kJoFKty+L._AC_SY100_.jpg, accessed 21 June, 2021.

²⁰ Amazon.com, "Led bulbs", https://m.media-amazon.com/images/I/31kJoFKty+L._AC_SY100_.jpg, accessed June, 2021

FIGA 20: Som na AC fan 220V, 55W, 0.25A²¹FIGA 22: Som na DC frisa 12V/24V, 55W, 4.58 A/2.29A²³FIGA 21: Som na DC laet 12V, 6W, 0.5A²²

21 Source: Khind.com, <https://www.khind.com.my/index.php?route=product/search&search=AC%20Fan%2C%20220V%2C%2055W%2C%200.25A%20>, accessed 25 June 2021.

22 Source: AliExpress.com, <https://www.aliexpress.com/item/1316122622.html>, accessed 25 June 2021.

23 Source: Made in China.com, "Solar Freezer", <https://m.made-in-china.com/company-commercial-energy/>, accessed 25 June 2021.

4

Olketa pat blong
Sola Paoa Sistem

Olketa mein pat blong sola paoa sistem an olketa waka blong hem bae yu lukim long teibol.

AKTIVITI 5

FIGA 23: Som na panol (PV modiul)²⁴



- Sola Fotovolteik (PV) modiul yusim sola enoji fo wakem nao paoa tru long ifekt long fotovolteik. Hem yusim sanlaet olsem sos blong enoji an mekem darekt karent (DC). Olketa sola panol konekt go long saj kontrola fo sajem batri.)

FIGA 24: Som na batri²⁵



- Batri hem divaes wea hem save storea nao elektrikol enoji long fom blong kemikol enoji an save konektem enoji ya go long paoa. Wanfala led asid batri save produsim nao 12V DC. Batri hem konekt nao long saj kontrola.

FIGA 25: Som na saj kontrola²⁶



- Saj kontrola hem waka blong hem fo kontrolem an regiuleitem nao sajing blong batri from sola panel. Hem stopem ova-sajing an ova disajing an save proteketem tu from ovavolteij o ada volteij blong batri. Sapos nomoa olketa waka ya hao batri waka an laefspan blong hem save go daon an diswan ya risk tuya. So saj kontrola hem barava impoten fo meksua batri laef long taem.

FIGA 26: Som na inveta²⁷



- Inveta hem elektronik divaes or seketri wea sensim daerekt karent (DC) go long alterneiting karent (AC).
- Inveta hem elektronik divaes o seket wea nidim nao DC paoa sos wea hem stedi.
- AC aotput volteij blong paoa inveta hem waka fo semsem olsem nao grid/paoa laen volteij wea hem save 240VAC.

²⁴ Source: Audio Digital, <http://www.audio-digital.com/tag-produk/sound/>

²⁵ Source: JICA.

²⁶ Adapted from System Components: Charge Controllers & Inverters, Arizona State University (VOCTEC), <http://voctec.asu.edu>

²⁷ MorningStar, May 2021, <https://www.morningstarcorp.com/products/suresine/>

FIGA 27: Som na keibols²⁸



- Olketa elektrikol kebol save yusim nao fo konektem tufala o staka divaes fo wakem nao transfa blong elektrikol signal o paoa from wanfala divaes go long narawan. Insaet long sola paoa sistem, olketa kebol konekt from sola PV modiul go long olketa saj kontrola, from olketa saj kontrola go long olketa batri an olketa DC aplaens.

FIGA 28: Som na break or Aesoleita (Isoleita)²⁹



- Seket breka hem otomatik elektrikol seket wea hem fo protektem elektrikol seket fo hem no nogud taem karent hem strong an staka tumas from ovalod or sot seket.)
- Aesoleit hem divaes save yusim fo aesoleitem nao seket o ikuipmen from paoa sos.

FIGA 29: Som na elektrikol swij³⁰



- Suis hem elektrikol pat wea save yusim fo kontrolem paoa saplae go long elektrikol aplaens, olsem suis fo laet.

FIGA 30: Som na elektrikol aotlet³¹



- Paoa aotlet (Paoapoen) hem fo save konektem nao elektrik ikuipmen go log altaneiting karent (AC) paoa saplae.

28 Source: Global Market, http://newimg.globalmarket.com/PicLib/group0/5e/73/c477defc613ecc9a0e47b82452f4_l.jpg

29 Source: Wave inverter.co, <https://waveinverter.co.nz/shop/solar/solar-connectors/pv-dc-isolator-switch-mc4/> and POSO.com, <http://poso.com.vn/wp-content/uploads/2020/04/1-2.png>

30 Source: Trade Zone, <https://www.tradezone.com.au/product/hpm-40-amp-1-gang-excel-vertical-internal-isolation-rocker-switch-gloss-white-16567.html>, accessed 25 June 2021.

31 Source: EuroTech NZ, "PDL 600 Series Power Points", <https://www.kiwisparks.co.nz/collections/pdl-600-series-power-points/products/pdl-691>, accessed 25 June 2021.

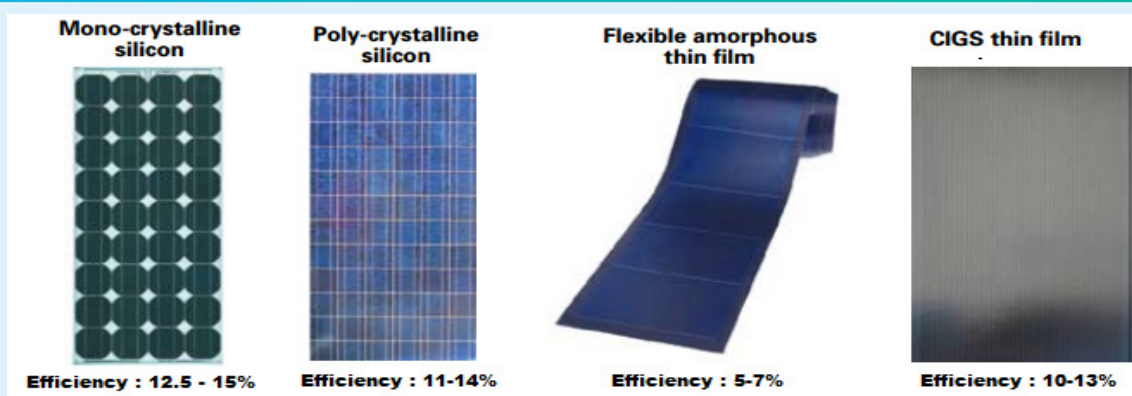
1. Wanem nao waka blong olketa inveta?

2. Wae nao yumi nidim olketa batri?

Fo diskas go moa: Olketa taep blong Sola Panol

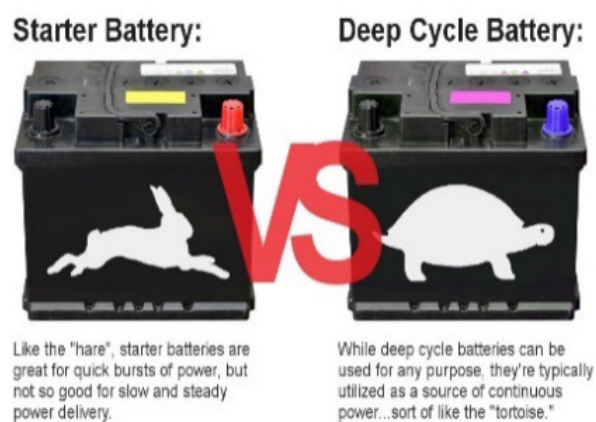
No mata hem garem olketa difren taep long sola panol, tufala nao hem komon an nem blong tufala ya nao mono-crystalline

an poly-crystalline olsem long piksa lo daon ya. Wanwan taep hem garem nao difren ifensi fo konvetem sola eneji go long elektrisiti (paoa)

FIGA 31: Difren Taeps blo PV modiuls³²

4.1 Olketa difren taep batri

Hem garem staka difren taep long batri save yusim long sola paoa sistem, mein wan nao led asid taep. Difrens bituin stata an olketa dip saekol batri hem eksplein long Figa 32 long daon.

FIGA 32: Stata andip saekol batri³³

³² Source: Hapres, J Sustain Res. "Building Integrated Photovoltaic for Architectural Facades in Singapore", 2020, https://sustainability.hapres.com/images/JSR_1263_Fig5.jpg

³³ Source: Off Road Aussie.com, "Deep-Cycle vs Starter Batteries", <https://offroadaussie.com/wp-content/uploads/2015/07/deep-cycle-vs-starter-battery.jpg>, accessed 25 June 2021.

5

Olketa difren taep
blong Sola PV sistem —

Afta luktru nao long olketa difren pat wea hem yius long sola paoa sistem long olketa sapta wea hem go finis, disfala sapta bae diskasem olketa difren taep blong sola PV sistem.

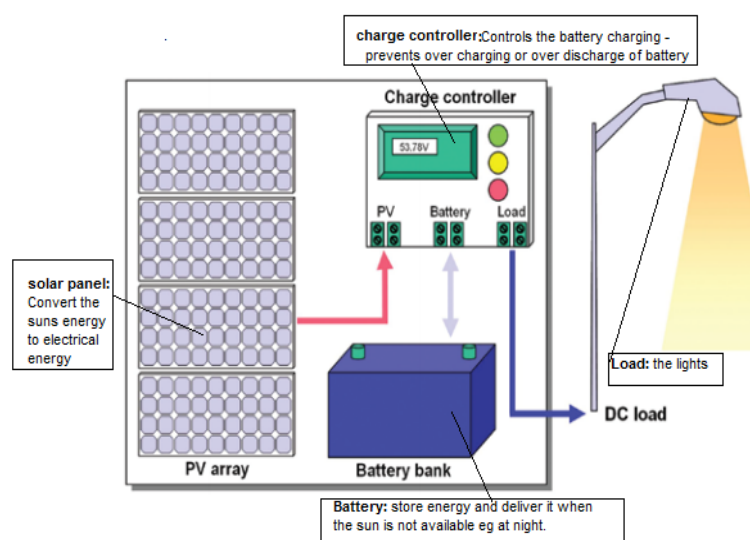
Hem garem trifala taep sola paoa sistem. Olketa ya nao:

- Stanalon (of-grid) sola paoa sistem.
- Ola paoa sistem wea hem stap long grid.
- Haebrid sola paoa sistem.

5.1 Stanalon (of-grid) sola paoa sistem

Olketa stanalon sistem no konekt go nao long elektrisiti grid an bae yu save lukim diswan long olketa rimout eria wea hem koneksin go long grid hem garem limit, o long olketa eria wea dimand blong eletrisiti hem lou.

FIGA 33: Stanalon paoa system³⁴



Wanfala stanalon DC system (save kolem long sola hom sistem) hem disaen fo olketa paoa DC aplaens insaet long haos, staka taem hem olketa DC laet, fon hem saj o hem maet DC fan o redio an samfala samting moa. Bikos inveta hem no stap, disfala sistem ya bae no save givim paoa nao long bik AC aplaenses.³⁴

5.1.1 Stanalon sola DC paoa sistem

Stanalon DC sistem bae hem garem nao olketa difren pat olsem:

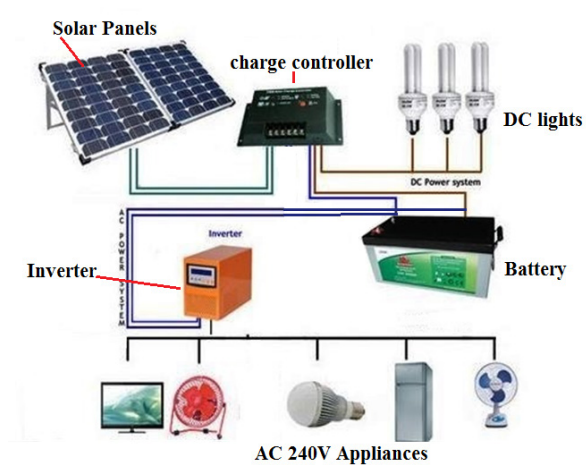
- Sola PV Panol.
- Saj kontrola.
- Batri.
- DC lod (laet balb, redio an samfala moa).

5.1.2 Stanalon sola (AC +DC) paoa system

Stanalon AC+DC paoa sistem hem kolsap semsem wetem DC paoa sistem bat hem garem nao inveta wea hem help nao fo paoarem olketa AC aplaens tu olsem yu lukim long Figa 34.

³⁴ Source: From Sun to Power.com, "Off-grid solar photovoltaic systems", <https://fromsuntopower.files.wordpress.com/2012/07/pv21.jpg>, accessed 25 June 2021.

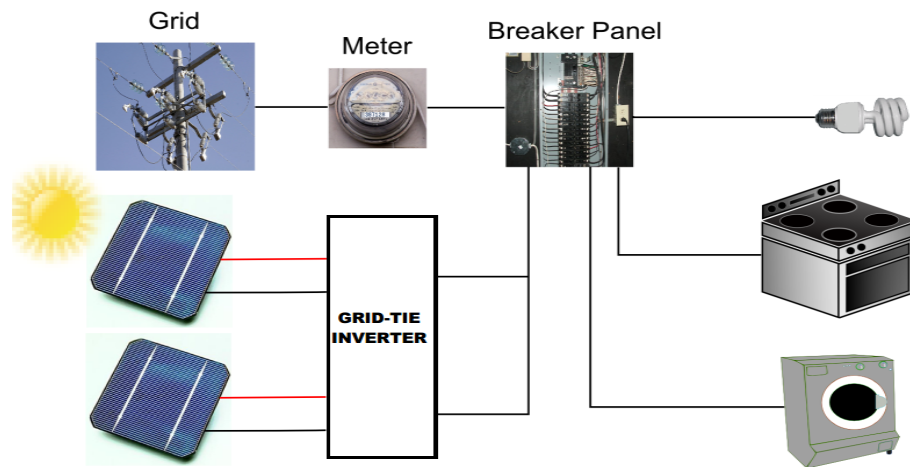
FIGA 34: AC/DC paoa sistim wea hem stanap seleva³⁵



5.2 Sola paoa wea hem stap long grid

Olketa taep sistim ya hem komon nao long olketa eria wea grid infrastraksa hem fit fo stap long hem. Inveta hem konvetem nao paoa wea hem kam from sola sistem-hem nao daerekt karent (DC) go long AC elektrisiti mekem paoa wea hem kam ya hem waka gud nao wetem grid. Olketa sistim no save krietem nao grid blong olketa seleva bikos olketa save konekt go nao long grid wea hem stap finis fo saplaem paoa go long grid.

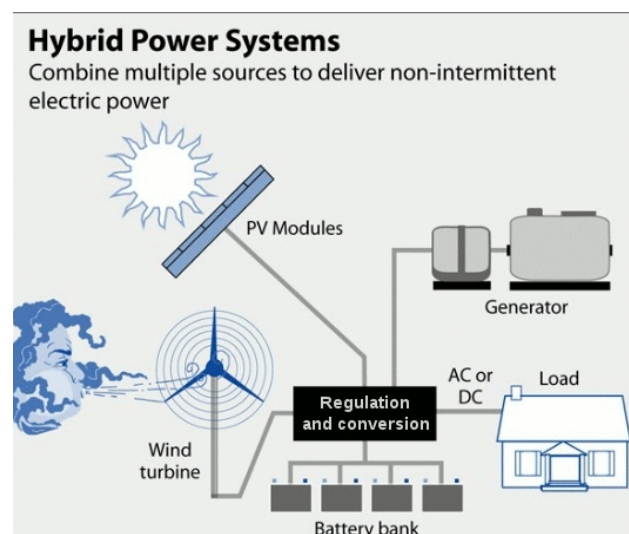
FIGA 35: Piksa ia som na Grid konekted Sola PV sistim³⁶



5.3 Haebrid sola paoa sistim

Haebrid sola PV sistim hem stat fo popiula nao. Disfala kaen taep sistim ya hem fitim nao fo wea fid long tariff hem provaed go nao long grid wea hem konekt go nao long olketa konsuma from olketa Yiutiliti kampani. Batri baek ap sistim hem narafala wei wea bae save waka tu bikos olketa konsuma yusim nao elektrisiti wea hem stoad long de taem fo ran long haos blog olketa long naet.

FIGA 36: Piksa ia som na win sola haebrid sistim³⁷



³⁵ Source: India mart.com, Solar Grid Tie Energy Storage System, <https://5.imimg.com/data5/VV/TV/MY-11206303/solar-energy-storage-system-500x500.jpg>, accessed 25 June 2021.

³⁶ Source: Hindawi, "Journal of Renewable Energy", June 2021, <https://www.hindawi.com/journals/jre/2013/785636/fig1/>

³⁷ Source: www.energy.gov, adapted from, "What is Solar-Wind Hybrid Power Plant? Solar Mango, <http://www.solarmango.com/ask/2015/10/23/what-is-a-solar-wind-hybrid-power-plant/>

Raetem nots blo yu lo hia

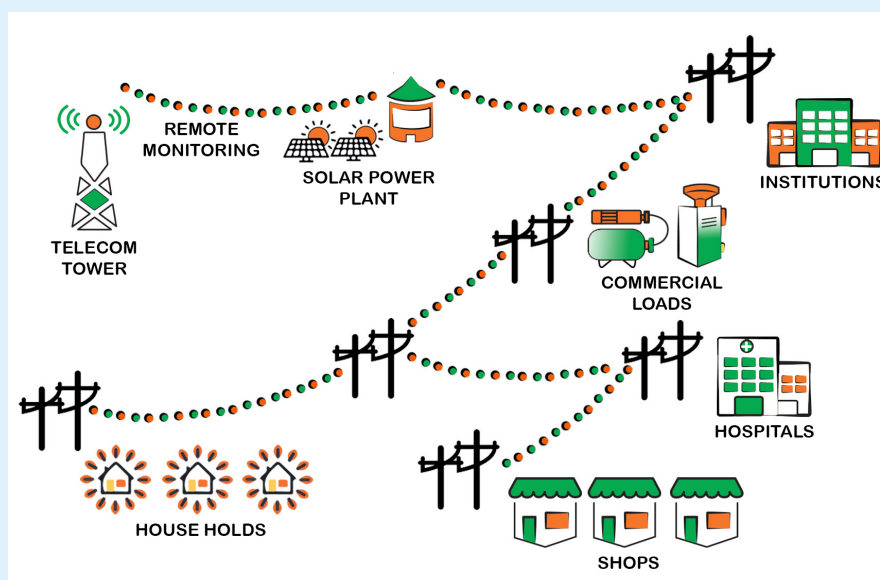
AKTIVITI 6

Keis stadi blong sola mini grid sistem long Solomon Aelan.

Sola mini grid sistem hem wanfala bik AC taep sistem wea save instolem fo givim paoa long ful komiuniti an ino wanfala haos nomoa. Hem save inkludem samfala fom blong tarif sistem

wea hem yusim nao mita fo kaontem nao amaont blong eneji wea wan haos hem yusim an save mekem wanwan haos fo peim nao fo eneji wea olketa yusim.

FIGA 37: Sola Mini-Grid sistims³⁸



Kualiti blong paoa sistem hem sem nomoa olsem olketa from grid/paoalaen long olketa taon an bik taon, yu save paoarem evri taep AC aplaens long diswan, hem maet garem ristriksin fo stopem pipol fo trae paoarem nao olketa bik ikuipmen wea bae save ovalodem nao paoa sistem. Seleni wea tekem from

olketa mita sistem save go baek nao long olketa atoriti wea putum nao mini grid sistem, diswan hem fo mentenens blong sistem, ripleisim olketa pat o pei fo olketa narafala ekspens wea hem kam wetem ranem paoa sistem.

38 Source: <https://www.taraurja.com/mini-grid-model/>, accessed on 4/11/2020.

Keis Stadi 1: Sola Mini-Grid Sistim lo Taro lo Soisol Provins

FIGA 38: Sola Mini grid sistim lo Taro³⁹



Long Ogost 2017, wanfala sola mini grid sistem olketa instolem long Taro long Soesol Provins hem fo provaedem nao klin sola enoji fo 174 kastoma long aelan. Sistem ya hem Solomon Paoa nao go instolem an hem kostem kolsap \$17 million SBD wea seleni ya kam from World Bank an Asian Development Bank.

Projekt ya go inlaen nao wetem strategi blong Solomon Aelan Gavmanf blong rurol elektrifikeisin an fo daonem grinhaos gas, hem fo sapotem tu strategi fo inkrisim nao footprint blong paoa long kantri.

Disfala sistem long Figa 38 ya hem yiusim nao teknologi ikuipmen blong distaem.

- 225kW graon maonted Sola PV panol (neks long eapot)
- Staka batri inveta (yialo kala long wol)
- Bikfala 1.2 MWh (mega-wataoa) sil mentenens fri lid asid batri
- Proteksin, transmison an ikuipmen fo distribuisin
- 150kW bekap disol genereita fo givim paoa long sistem taem garem staka klaod long de. Long avrej disol genereita hem save on nomoa fo 2aoa long wan de.
- Kas paoa pei fest mitaring sistem hem wea olketa hao resajem paoa mita fo mek yius long elektrisiti.

39 Mohammad Tazil.

Keis 2: Sola Mini_Grid Sistim lo Seghe, Westen Provins

FIGA 39: Som na Sola Mini grid sistim lo Seghe⁴⁰

Long Ogos 2017, wanfala sola-mini grid hem olketa instolem long Seghe long Westen Provins, diswan hem fo provaedem klin sola eneji go long 80 kastoma long aelan. Solomon Paoa nao instolem diswan an hem kostem kolsap\$14 million SBD wetem seleni an sapot from World Bank an Asian Development Bank.

Projekt ya go inlaen nao wetem stategi blong Solomon Aelan Gavmanf blong rurol elektrifikeisin an fo daonem grinhaos gas, hem fo sapotem tu stategi fo inkrisim nao footprint blong paoa long kantri.⁴¹

Disfala sistem ya (Figa 39) yiusim nao teknologi ikiupmen blong distaem olsem:

- 150kW graon maont sola PV panol (neks long eapot).
- Samfala batri inveta (yialo kala long wol).
- Bik 0.9MWh (mega-wataoa) sil mentenens fri led asid batri (grei kala long metol rak).
- Proteksin, transmison an distribiisin ikuipmen.
- Wanfala 150kW bekap disol jenereita fo paoarem nao sistem long taem garek staka klaod long de. Long averej, disol jenereita hem save ran nomoa fo 2 aoa long de.
- Kas-paoa pripeid mitaring sistem, hem wea olketa haos risajem nao paoa mita fo mek yius nao longelektrisiti/paoa.

40 Source: <http://solomonpower.com.sb/highlights-of-2017>, accessed on 13/07/2021.

41 Source: <http://solomonpower.com.sb/highlights-of-2017>, accessed on 13/07/2021.

6

Seifti long Sola
PV sistem

Long hia samfala impoten seifti tip fo folom fo stap seif an kipim olketa narafala sef taem dil wetem sola PV sistem.

1. Mas ofum paoa olowe bifo mekem koneksin, ajasmen o bifo yu sekem eniting. No waka long skeet taem hem stil aktiv long paoa yiet.

FIGA 40: Woning Saens⁴²



2. Sapos yu no man save abaotem paoa an nid fo duim eni paoa sistem o waearem haos wea yu no save, yu mas tekem nao wanfala elektrisian wea hem trein fo duim diswan fo yu. Yu no duim waearing seleva bikos bae yu no save duim gud, hem no save kosim faea seleva bat bae yu save sok, karakil an dae tu.

FIGA 41: Mas rimemba fo garek elektrisian wea hem trein fo duim waering⁴³



3. Mas praktisim seifti olowe an kipim olketa pikinini awei from olketa elektrikal hazard. Sapos yu o eniwan hem waka long hae volteij trae fo werem PPE (pesonel protektiv ikuipmen) olsem insuleitid glav, ae glas an seifti futwea tu sapos stap.
4. No trae fo ripaerem nogud batri yuseleva. Olketa batri save garek denjares kemikol wea save kosem sirias ham if hem dis-asebol o brej. Olketa batri save storem tu bik amaont wea save kosem sirias karakil o dae sapos teminol hem sot skeet.

FIGA 42: Som na Asid woning⁴⁴



5. No storem olketa batri kolsap long faea o insaet living rum-samfala batri save givim aot nao flemabol o toksok gas no mata yumi no lukim.

FIGA 43: Som na woning blo fums⁴⁵



6. No stoarem olketa batri long speis wea hem smol o kolsap ful bikos olketa save kosem faea. Putum olketa batri ya long rum wea hem bik an ea hem flou gud.

FIGA 44: Som na batri woning⁴⁶



7. Sapos garek, werem hanes wea hem konekt go long straksa wea hem strong taem instolem nao sola PV panol long olketa ruf o long ples hem hae. Sapos yu no save gud long hao fo duim diswan, hem gud sapos yu tekem help from wanfala teknisian fo duim diswan fo yu.

⁴² Source: AviationPros, <https://www.aviationpros.com/tools-equipment/safety-equipment/article/11148860/ground-handling-safety-signs>

⁴³ Source: Safety workblog.com, <https://safetyworkblog.com/assets/understanding-the-2015-edition-of-nfpa-70e-the-arc-flash-hazard.jpg>

⁴⁴ MSDS online, <https://www.msdsnline.com/2014/07/22/sulfuric-acid-safety-tips-sulfuric-acid-msds-information/>

⁴⁵ Source: National Safety Signs, <https://nationalsafetysigns.com.au/wp-content/uploads/2020/02/D10332-Toxic-Fumes-sign.png>

⁴⁶ We Need Signs.com, "Ansi Battery Charging Safety Signs", <http://www.weneedsigns.com/home.php?cat=403>

FIGA 45: Wearem na hanes wea konkt go lo strakja wea hemi strong an seif⁴⁷



8. Yu mas save dat sola panol hem mekem nao paoa from eni amaont long sanlaet. Yu mas no tasim nao olketa waea long taem ya, no mata taem yu klinap o duim mentenens.

FIGA 46: Piksa ia som woman waka wetem sola panols⁴⁸



9. Olketa sola panol an maoting blong hem n ruf tu save hot tumas long san fo tek kea fo werem olketa glav an olketa narafala PPE.

FIGA 47: Mas wearem na Glavs an PPE⁴⁹



10. Mas olowe meksua dat yu praktis lada seifti rul taem yiusim lada fo kasem nao ruf fo dil wetem sola PV sistem. Yu mas meksua dat lada ya hem at lis hem long 75 digri egol wetem graon. Meksua lada ya hem steibol long flat graon. Meksua tu samwan hem holem nao lada ya long bottom fo stopem from hem foldaon.

FIGA 48: Praktisim na seifti rul blo olketa lada⁵⁰



47 For Construction Pros. Com, "The Sustainable Solar Roof Installer" <https://www.forconstructionpros.com/business/article/10878093/the-sustainable-solar-roof-installer-best-practices-make-perfect>

48 Flip the switch, <https://www.imdb.com/title/tt9124366/>

49 Dreamstime.com, <https://www.dreamstime.com/stock-illustration-d-engineer-installing-photovoltaic-panels-conversion-solar-energy-to-electricity-rendered-cartoon-illustration-white-image84190049>

50 Ladders Level, <https://laddersnivoo.weebly.com/>

AKTIVITI 7: HAO NA FO SETEM AP WANFALA DC SOLA SISTEM

Fo disfala aktiviti, olketa ikuipmen ya nao bae yu nidim from VOTEC Kit.

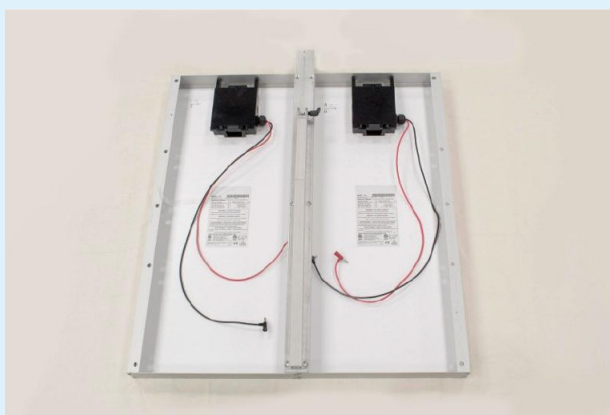
1. Sola panol an maonting rak wetem olketa skru
2. MTT waearing bod
3. Olketa seifti glav an aeglas/sanglas
4. Batri an Saj kontrola

5. Olketa Seket Breka

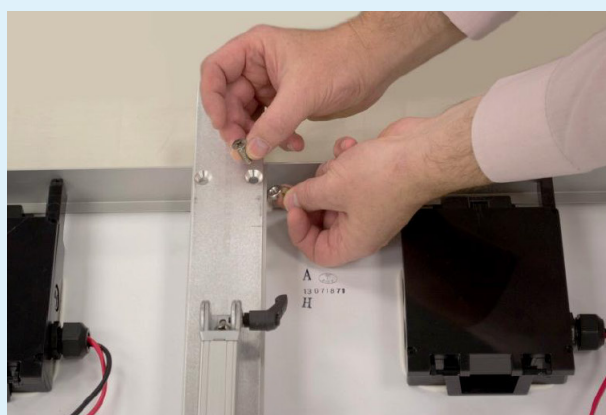
6. Sola Mes (fo sheding)

Stat fo putum sola PV Arei yiusim tufala panol. Folom instraksin wea hem stap long piksa long daon ya. Yu alaom nomoa olketa lena fo duim maena taetening.

STEP 1.



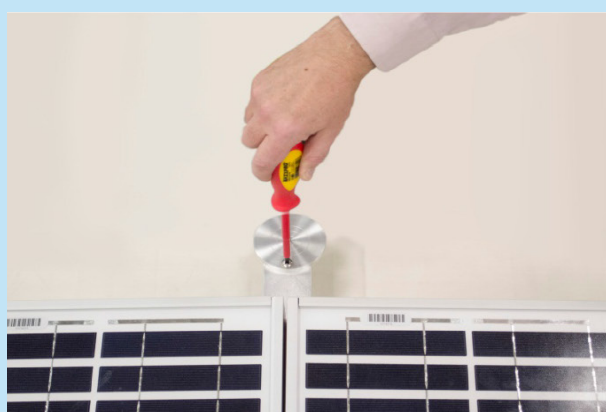
STEP 2.



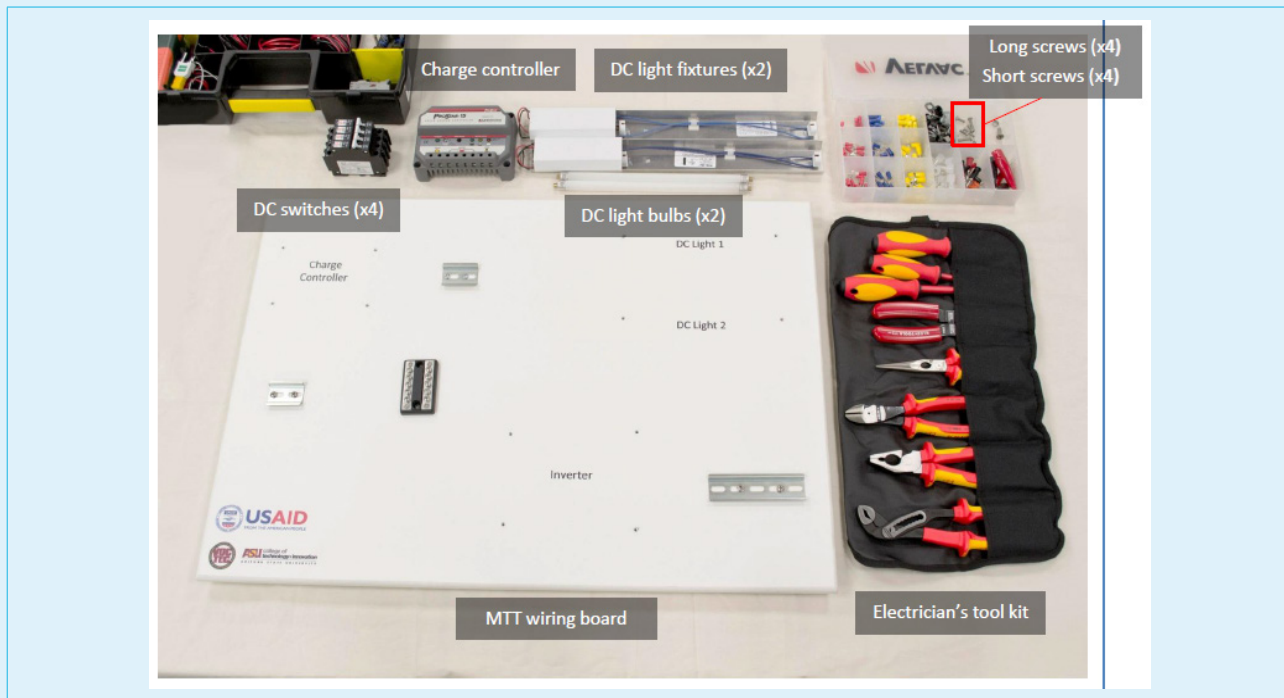
STEP 3.



STEP 4.

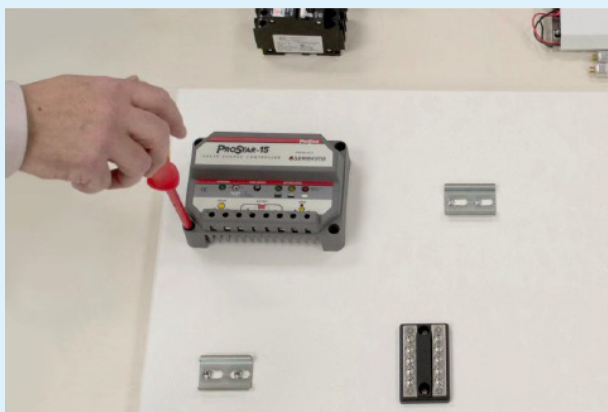


Piksa ia som na VOTEC kit/Sola Trening kit



Olketa step wea yu mas folom fo konektem olketa pat ya nao hem long daon. Olketa mas lena mas herem instraksin from olketa treina.

STEP 1.



STEP 2.



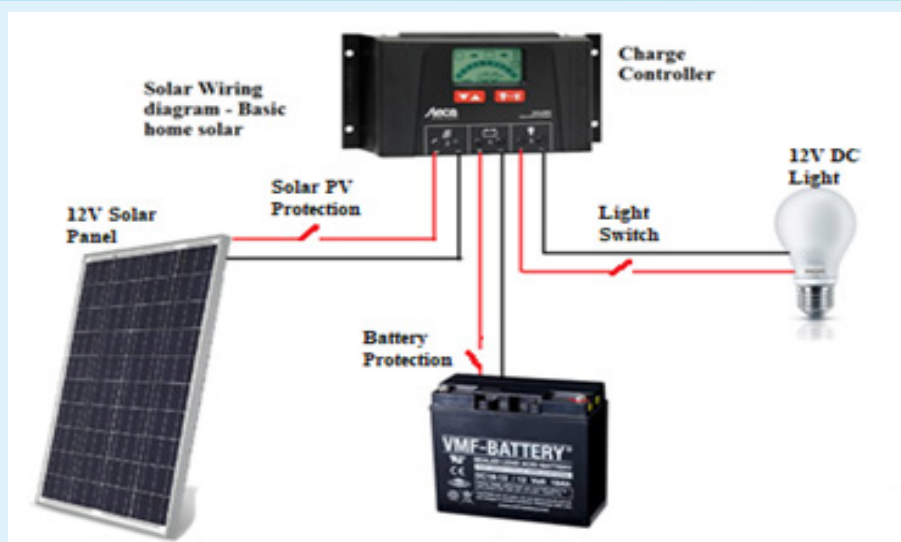
STEP 3.



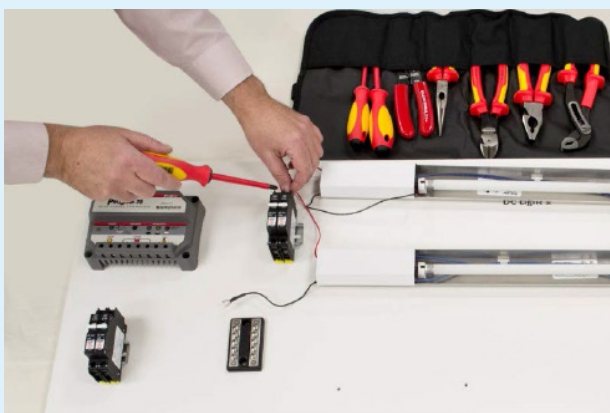
STEP 4.



Waring Steps

FIGA 49: Hao for konectim na sola piksa⁵¹

STEP 1.



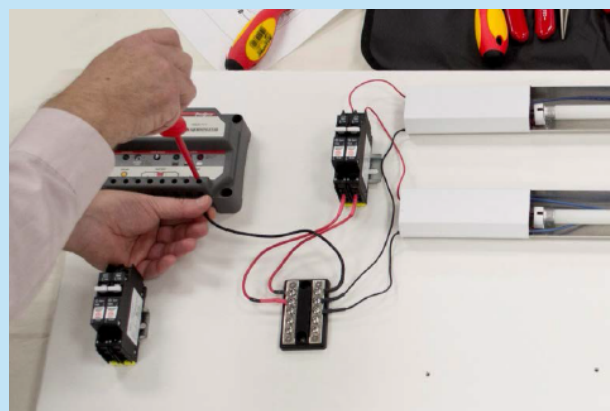
STEP 2.



STEP 3.

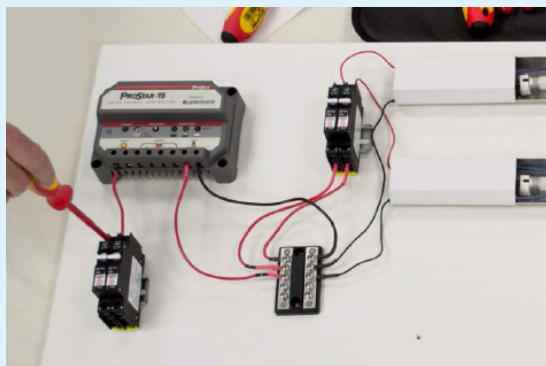


STEP 4.

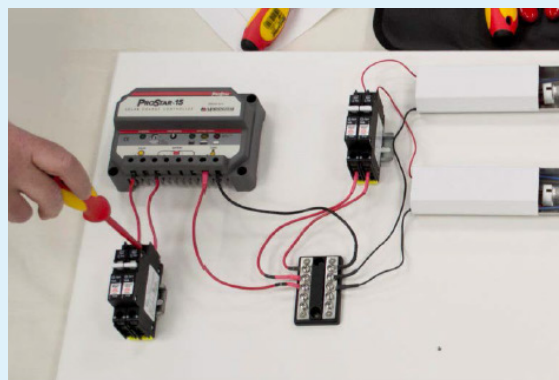


51 Adapted from the Electricity Basics, Arizona State University (VOCTEC), <http://votcec.asu.edu>

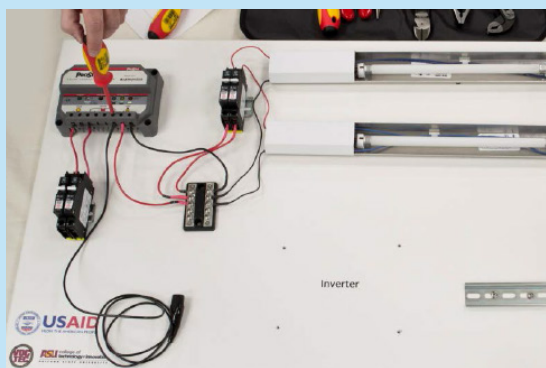
STEP 5



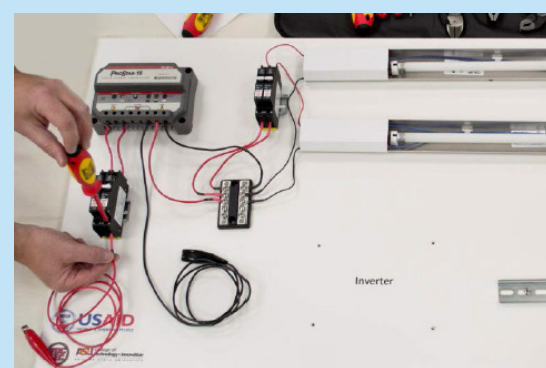
STEP 6.



STEP 7.

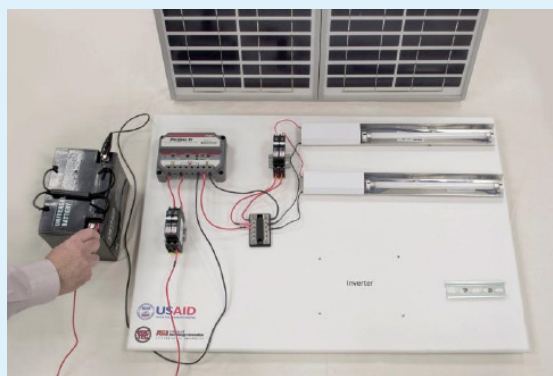


STEP 8.

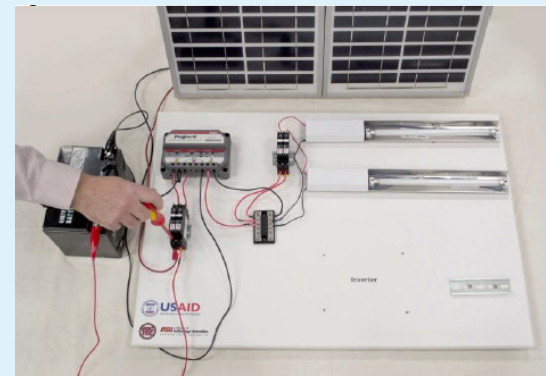


Lasfala steij fo putim tugeda na sistim

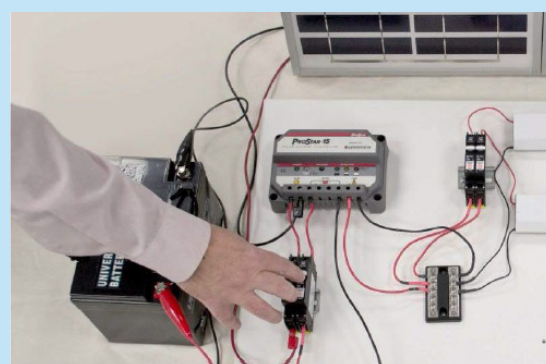
STEP 1.



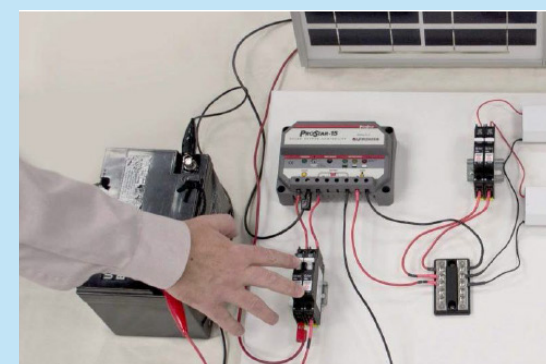
STEP 2.



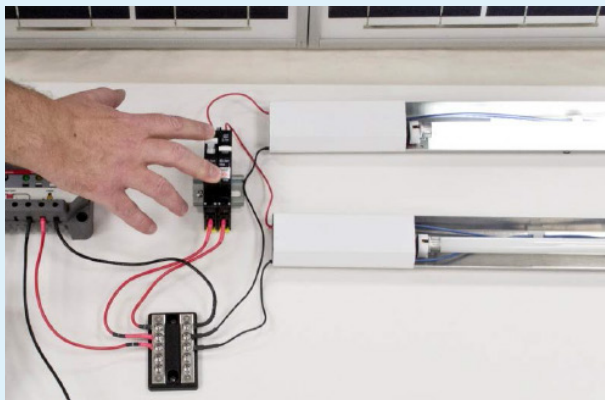
STEP 3.



STEP 4.



STEP 5.



STEP 6.



Wans yu suisim on setup, saj kontrola bae sajem nao batri an olketa DC laet bae hem kam on. Olketa lena save lukim nao sistem an askem eni kuestin olketa garem.

AKTIVITI 8: OLKETA IFEKT BLONG SEIDING LONG OLKETA SOLA PANOL

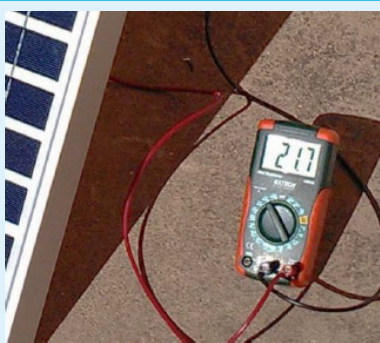
Disfala aktiviti hem soum olketa lena hao nao seiding hem afektem an ridisium paoa aotput from olketa sola panol.

Disfala aktiviti hem soum hao nao fo yiusim olketa mita o klamp mita. Olketa step fo disfala aktiviti hem nao yu lukim long olketa piksa long daon an instraksin bae treina hem givim.

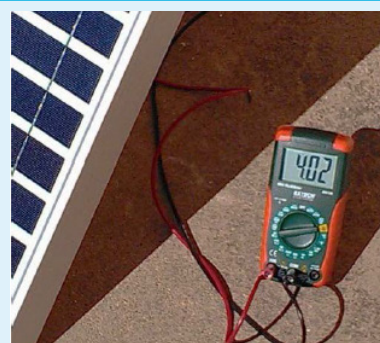
1.



2.



3.



Not long olketa mesamen blong voltej

- Voltej mesamen save duim nao long parallel fo mesarem open skeet voltej blong panol.
- Test mita ya hem shud set go long “**DC Voltej**” mesamen mod.
- (Konekt olketa tes mita **red prob** go long positive waea blong sola panol).
- Konekt olketa tes mita **blak prob** go long negative waea blong sola panol.
- (Tes mita mas soum nao voltej blong olketa sola panol).

Nout long olketa mesamen blong karent

- Karent mesamen save dium long sirias fo mesarem nao sot skeet karent blong panol.

- Tes mita hem shud set go long “**DC Karent**” mesamen mod.
- Konektem olketa tes mita **red prob** go long positive waea blong sola panol.
- Konektem olketa tes mita **blak prob** go long negative waea blong sola panol.
- Tes hem shud soum karent long olketa panol

Seifti Tip: NO DUIM KARENT MESAMEN LONG BATRI.
Diswan bae sotem nao batri an kosem nao ikuipmen fo nogu an save kosem sirias karakil. Karent mesamen save duim nomoa long olketa sigol sola panol o nomol seket wetem lod.

Ripitim olketa step long antap fo mesarem olketa voltej an olketa karent fo tu moa seided kondisins olsem olketa piksa long daon.

1	2	3
Shade PV array with solar shade #1 (transmittance of 65%)	Measure voltage of PV array (V_{OC2})	Measure current of PV array (I_{SC2})
4	5	6
Shade PV array with solar shade #1 (transmittance of 30%)	Measure voltage of PV array (V_{OC2})	Measure current of PV array (I_{SC2})

7

Hao Fo baem sola
paoa sistem

7.1 Taem Baem olketa sola laeting kit

Bae yu garem wanfala panol, wanfala sola paoa boks an samfala laet. Sola paoa bok o sola jenereita boks garem batri, saj kontrola an koneksin pot fo olketa laet an long samfala keis, USB pot fo sajem olketa mobael fon.

FIGA 50: oketa sola laeting kit wea oketa bildim redi stap finis⁵²



Taem baem laeting kit wea hem redi wan finis, gud kualiti produkt save kam wetem 2 yia waranti, loua kualiti save garem fu mans waranti nomoa.

Save askem sela, sapos olketa save duim ripea an kipim ripleismen pat long stok kolsap o long stoa.

7.2 Taem yu baem wanfala sola hom sistem (SHS) tek not lo oketa samting ya:

No olsem olketa potabol laeting kit, wanfala sola hom sistem hem bik an save provaedem moa paoa an save inkludem olketa laet, fan, frij, inveta, batri, saj kontrola an olketa an olketa narafala aetem).

Tek nout dat had fo go nomoa an baem SHS fo ranem nao olketa aplaens blong yu. Wanfala SHS hem nid fo yu mas saesem, disaenem an sola paoa an wanfala sola paoa sistem ekspet nao mas putum tugeda folom nao paoa spesifik aplaens nomoa.

Samfala kuestin fo askem na man salem sola yia

1. Waswe prodakt ya garem eni waranti tu?

Waranti wea hem fo long taem hem bae gud tumas. Eksampol nao, taem baem sola panol wetem 10 yia waranti hem gus nao ovam sola panol wea hem garem nomoa 2 yia waranti ya. No mata watkaen sola pat nao yu tekem, askem sapos olketa givim waranti. Hem gud fo spendem lelebet seleni moa an tekem nao wanfala gud kualiti prodakt wetem waranti wea bae hem stap long taem).

FIGA 51: Lebol blo waranti na lukosem⁵³



2. Waswe sola panol kam wetem maonting fiksa?

Olketa SHS sistem wetem staka bik sola panol bae nid fo putum nao long ruftop o olketa pol. Yu shud askem sapos olketa kam wetem maonting braket. Sapos nomoa bae hem had fo maontem gud ya sapos braket ya no stap.)

FIGA 52: Maonting fikjas⁵⁴

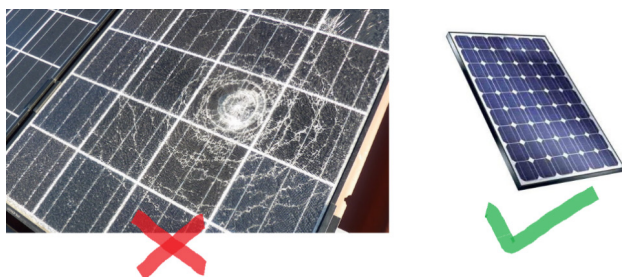


3. Sekem olketa saen wea hem soum nogud. No baem prodakt wea hem nogud. Mas askem sela olowe fo soum yu olketa prodakt an soun to hao fo hem waka e.g laet o batri. Sapos panol hem krak, deti o nogud no baem. Sapos olketa batri hem lik o hem blot-no baem.

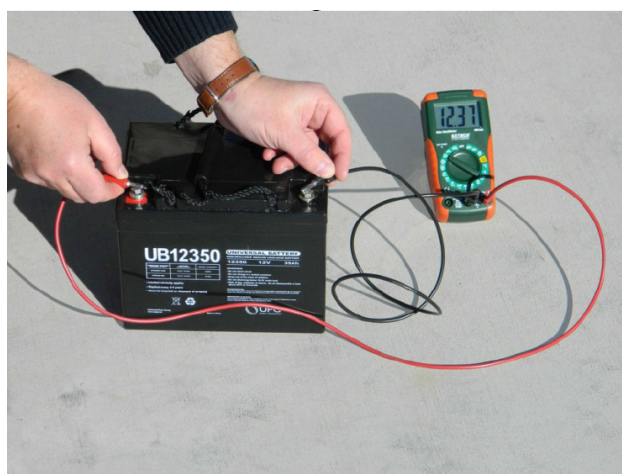
⁵² Source: Amazon, "Complete Solar Lighting Kit", <https://www.amazon.co.uk/Off-Grid-Lighting-System-Lights-Battery-White/dp/B00HOEGHSY>, accessed 25 June 2021.

⁵³ Source: PNGWING, <https://www.pngwing.com/en/free-png-kfvt>

⁵⁴ Renewables Now, "Global solar BOS market to fall to USD 25bn by 2020", <https://renewablesnow.com/news/global-solar-bos-market-to-fall-to-usd-25bn-by-2020-461526/>

FIGA 53: Oketa panols wea nogud⁵⁵

4. Fo olketa batri yu save askem na man salem fo mesam an soum yu na batri voltej

FIGA 54: Askem man salem ia fo help⁵⁶

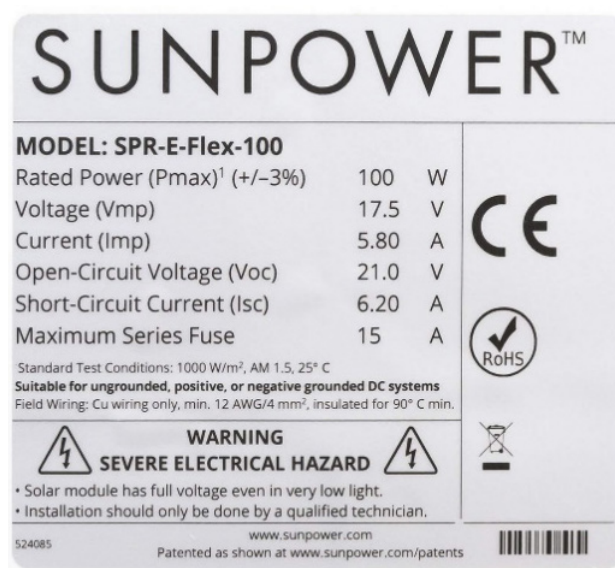
5. Luk fo produkt wea hem bran wan an hem kualiti wan tu
Luk fo olketa produkt wea hem garem bran, logo an instraksin manuel. No baem olketa produkt wea hem no bran, no eni infomeisin o misim instraksin manuel. Askem olketa famili an olketa frends blong yu abaotem eksperiens blong olketa wetem eni bran fo trae faendaot watkaen bran nao hem gud mekem yu save go fo hem tu.

FIGA 55: Oketa prodaks ia oketa kwualiti bran ia⁵⁷

6. Taem selektem inveta, askem sela sapos aotput blong inveta hem wanfala piua saen wev, bikos olketa produsim kiln kualiti paoa aotput.

FIGA 56: Inveta⁵⁸

7. Lukluk gud long olketa nem plet blong evri pat. Olketa produkt ya samtaem save putum rong olketa rong boks

FIGA 57: Nemplets⁵⁹

8. Meksua evri produkt ya hem seif fo yusim. No baem olketa produkt wea hem luk nogud o yu lukim nao olketa waea wea hem souaot o olketa produkt wea hem no disaen gud an save kosem sirias karakil.

55 Twitter.com, Solar Energy World, <https://twitter.com/solareworld/status/1186417038610386945>

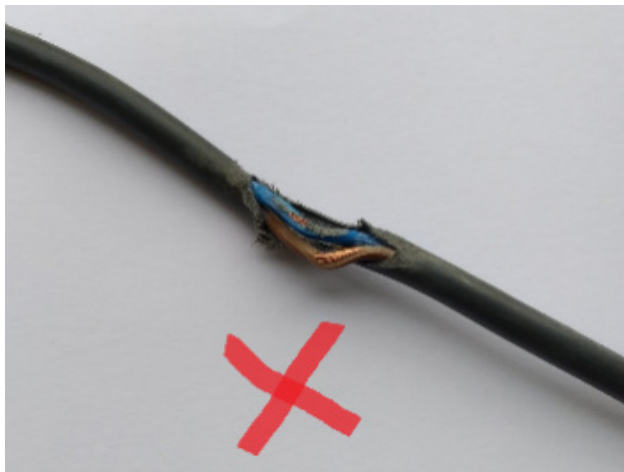
56 Amazon.com, "Electric Measuring instrument", <https://www.amazon.com/Electric-Measuring-Instrument/s?k=Electric+Measuring+Instrument>, accessed 25 June 2021.

57 Coulee Energy, "How to choose a right panel solar", <https://couleenergy.com/how-to-choose-a-right-solar-panel/>

58 Goughlui.com, "The Power Inverter", <https://goughlui.com/2014/07/30/review-teardown-hip-300-300w-pure-sine-wave-power-inverter/>

59 Source: Pinterest, "SunPower Marine Flexible Solar Panels", <https://www.pinterest.com/pin/714735403339440675/>

FIGA 58: Noke baem na nogud prodaks⁶⁰



9. Mas lukluk gud long olketa stoa fo luk long olketa praes, waranti, olketa saes, bran, seifti an samfala samting long prodakt taem yu laek baem.

AKTIVITI 9: TAEM BAEM SOLA SISTEM

Taem yu laek baem sola sistem

Wanem nao samfala impoten kuestin yu nid fo askem?

⁶⁰ Source: IOL, "How to fix frayed cables", <https://www.iol.co.za/technology/how-to-fix-frayed-cables-49412981>

8

Mentenens blong
sola hom system

Evri sola paoa sistem hem rikuarem fo regiula mentenens fo meksua seif an propa opereisin an fo hem stap long taem tu. Sapos no sekem olowe, sistem ya bae no waka gud kasem hao nao hem shud waka, an diswan save lid go nao fo hem nogud hariap o samfala pat nogud kuiktaem wea hem save ekspensiv fo ripearem o ripleisim.

8.1 Wae nao samfala sola paoa sistem feil?

Hem garem staka rison wae nao sola paoa sistem bae save garem problem. Yumi save notisim wanfala sistem wea hem feil festaem long samtaem an long olketa narataem, wanfala sistem witaot eni notis nomoa. Adastanem hao sola paoa blong yu hem waka an duim regiula mentenens hem wanfala gud wei fo avoedem nao sistem feilia. Wanfala simpol mentenens seklis hem barava wanfala gud wei fo duim.

8.2 Mentenens blong olketa pat blo Sola sistim

Yumi luk long hao nao yumi karem aot regiula mentenens long olketa difren pat blong sola PV sistem.

8.2.1 Olketa sola panol

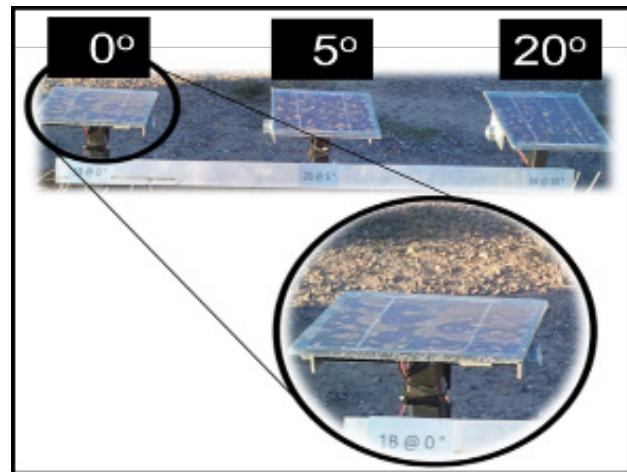
- Inspektem sola PV panol fo eni saen long dameij olsem impact o fraksa.
- Antap long panel hem mas kiln an klia long eni deti an rabis.

FIGA 59: Panol wea oketa nogud⁶¹



Sapos graon hem long olketa sola panol hem save dikrisim nao aotput ovataem.

FIGA 60: Hao nao tilt angol hemi afektim na lus blo soiling⁶²



8.2.2 Mentenens blong batri

Batri mentenens hem inkludem nao olketa waka wea hem dipen nao long taep long batri an rikuamen blong kampani wea wakem.

- Inspektem an klinim batri rak, keis trei an temineisin.
- Mesarem batri volteij sapos yu garem malti mita o yu save ridim nomoa volteij ya from saj kontrola.
- Samfala saj kontrola displei skrin bat olketa simpol wan save soum nomoa saj level blong batri wetem led laet.

⁶¹ Jim Dunlop Solar.

⁶² Source: ASU PV/ Reliability Laboratory.

FIGA 61: LED laets hemi som na saj level blo batri ia⁶³

- Samfala saj kontrola soum nao batri volteij an olketa narafala mesamen stret long displei skrin. Bae yu nid fo konsaltem nao manuel blong olketa kontrolas ya fo soum nao hao na olketa difren mesamen save soaot.

FIGA 62: Saj kontrola wetem batri volteij displei⁶⁴

- Piriodic batri mentenens hem shud inkludem sekem olketa teminol fo rast an taetem gud long teminol. Sapos batri hem tuweit taep, den sekem batri wata an sensim wetem distil wata sapos level hem go lou. Trae fo duim diswan evri 2-4 wik.
- Yiusim stil brash fo klinim enu oxideisin bildap long olketa koneksin, mas meksua yu no minim fo sotem nao teminol.
- Sek fo olketa lus waea an koneksin an olketa waea wea nogud. Tekem help semtaem fo ripearem eni waea wea hem nogud.

FIGA 63: Taem klinim teminol koroson⁶⁵

Seifeti Tip: Hem gud fo yu yiusim olketa seift aeglas an olketa raba glav taem yu sevem olketa batri. Sapos yu waka wetem olketa tuwei taep batri hem gud fo yu werem olketa ol kaleko nogud asid poa lo yu. Kipim wanfala open boks long beiking soda an plastik kap long wata, inkeis blong spil, yu save poarem beiking soda long wata, miksim an yiusim datwan fo kuiktaem niutrolisem eni asid wea poa.

No dropem eni long olketa tul blong yu long batri bikos hem save sotem nao teminol an kosem sirias karakil an spoelem ikuipmen tu.



Sampol seklis blong mentenens blong sistem hem nao long daon.

63 Source: Sundaya Apple, "Sundaya Apple Regulator, Quick Start Manual", https://assets.website-files.com/5a2fb65f5701c800018e826f/603e4f42254a71b39b6e33a9_Sundaya%20apple%20-%20English.pdf

64 Source: Amazon, "iSunergy MPPT Solar Charge Controller", <https://www.amazon.com/iSunergy-Controller-Intelligent-Regulator-Batteries/dp/B081GSFDKC>, accessed 25 June 2021.

65 Source: Jim Dunlop Solar.

8.3 Beisik mentenens seklis

TEBOL 3: Beisik Hom Sola meintanans Wikli Seklis

Aetem	Samting fo duim everi wik	Duim finis (tikim)
1	Sekem panol fo eni dameij	
2	Sekem olketa waea fo dameij o lus koneksin	
3	Klin sola panol orienteisin an tilt)	
4	Sekem fo lukim panol hem no seid o deti	
5	Sekem panol maoting hem strong	
6	Sekem panol volteij an karent insaet saj kontrola displei-sapos hem posibol. Meksua sistem hem sajem batri long deitaem an hem ful saj taem hem 4pm long gud weda.	
7	Sekem batri volteij insaet saj kontrola-sapos hem posibol. Batri volteij hem shud bituin 12V (taem lou long saj) go 14V(taem hem ful saj)	
8	Sekem an klinim batri teminol fo eni rast.	
9	Sekem an taetem eni lus teminol	
10	Sapos batri hem tuweit, sekem wata levol blong batri an rifilim wetem distil wata sapos hem lou.	
11	Sekem ples fo putum batri hem kol an ea flou gud	
12	Sekem olketa laet an aplaens blong sistem hem waka	
13	Sekem an kipim evri narafala aplaens hem kiln an fri from deti an dast. Klinim olketa hol blong ventileisin wetem drae kaleko nomoa.	
14	Mek sua evri smol insekt no save go insaet long ikuipmen wea hem sensitiv	

Raetem nots blong yu lo hia

AKTIVITI 10: SEKLIS FO DUIM MEINTANANS

Krietem wanfala mentenens sekapis blong olketa waka wea bae yu save duim fo ekstendem nao laef blong sola paoa sistem blong yu.

AKTIVITI 11: ROL PLEI: SENSIM GO LONG SOLA

Waka blong eksasaes ya hem fo tekem evriwan long komiuniti fo luksave nao long ki rol blong olketa woman pleim long disisin meiking, long manejmen an yiusim sola teknologi. Ridim keis stadi an helpem olketa ansarem nao olketa kuestin. Siusim tufala pipol fo aktem naos tori ya.

Hao olketa woman tekem kam sens

Salo an hasban blong hem Mario stap na long Barana vilij wetem trifala pikinini blong tufala. Olketa no garem eni paoa long vilij. Mario hem fisaman an mas go aot long si bifo a san hem raes fo tekem olketa gud fis an dilivarem long fising steisin wea garem nao onli wanfala aes rum long aelan. Samtaem Mario save tekem kam olketa smol fis fo kukim lo haus. Tufala garem trifala pikinini, Lili hem 9, Timoci hem 10 an Salote hem 13 yias old an olketa go long skul wea hem 4 km from haos blong olketa. From haos blong Sala go kasem long skul hem tekem wan aoa fo wakabaot. Olketa garem tu bik gaden long hom. Olketa garem staka poteito, yam, kabis an olketa tomato fo deili nid blong olketa. Olketa parens blong Mario wea oketa olo finis stap wetem olketa tu. Mario waka had an staka taem hem garem staka narasamting fo duim olsem ripaerem bout, tekem aes, an tekem olketa pasenja go long nara aelan insaet bout blong hem long olketa ivining. Sala hem save bisi tu lukaftarem parens blong Mario, lukaftam haos, lukaftam oketa pikinini an duim olketa waka blong komiuniti wea nid fo duim.)

Wanfala ivining, 13 yia ol dota blong tufala Salote hem stadi yiusim kerosin laet. Smel blong kerosin ful insaet haos taem olketa laetem trifala laet. Mario no kam baek yiet from neiba blong olketa wea hem go fo dring kava lelebet. 9 yia ol Lili hem komplein dat smel blong kerosin hem mekem hem sik. Tufala pikinini ya raoa tufala evriwan laek yiusim laet. Lili no min fo tekem nao laet an ranran wetem an laek plei wetem. Taem tufala ranran insaet haos, den nomoa laet ya foldaon from han blong hem, lan long map an faea stat nao. Salote saot fo help an olketa neiba ran kam fo aotem faea bat staka buk blong salote hem bone na. Lili hem fraet tumas fo yiusim nao kerosin laet. Long naet Sala talem Mario abaotem wanem hem hapen

Mario: Rilaks no eniwan hem bone, Bae mi tekem olketa niu buk long en long wik. Wae nao yu wari tumas?

Sala: I ting hem taem yumi stop fo yiusim olketa kerosin laet insaet haos blong yumi.

Mario: Wanem? Yu karange ya-wanem nao bae yumi yiusim

Sala: Mi notisim dat neiba blong yumi Lusi an famili blong hem baem wanfala sola sistem an distaem olketa yiusim laet long naet olsem olketa hotel. Olketa garem frij tu fo kipim fis an kaikai blong olketa fo stap long taem. Bik gele Tima hem

stat fo duim gud tu long skul waka blong hem bikos hem stadi yiusim nao laet.

Mario: Wow, yu ya peim staka atensin tumas long Lusi. Yufala olketa woman olowe

Sala: Wanem nao yu minim “yufala olketa woman”

Mario: Umm.

Sala: Mifala olketa woman mas draevem nao kerosin bikos mifala fil olsem laef hem laek taem no eni paoa. Mi hav to wekap eli taem hem dak yiet an laetem nao smel kerosin laet den kukim kaikai. Mi have to duim ekstra fo stoarem nao kaikai an fis mekem hem nogud an yumi sik long hem. Mi meksua tu dat olketa pikikini duim homwok taem long lelebet laet. Mi mas sevim slen fo no spen tumas long kerosin.

Mario: Mi laekem wanfala frisa tu fo kipim fis. Bat Jone talem mi dat sola sistem hem baem hem stop waka insaet wan wik nomoa. Hao sapos hem nogud or hem no waka? Nara samting tu bae sola sistem ya bae kostem yumi seleni naya.

Sala: Oh my God, yumi at lis traem nomoa. Yumi sevim nao seleni yu mekem from fis taem yu selem evri wik ya an yumi

sevim gogo Krismas bae yumi garem nao fo inaf fo wanfala sistem. No wari abaotem mentenens. Mi herem wanfala woman from wanfala long olketa vilij long narasaed long aelan olketa trein nao fo menteinem nao sistem. Wanfala long olketa go nao long India fo go trein. Mi herem tu olketa garem training fo sola sapos eniwan laek. Bae mi go an atendem wanfala long olketa sesin so mi save lane tu. Den bae mi save help fo fiksime olketa narafala sistem insaet long vilij an save mekem ekstra seleni.

Mario: Diswan hem barava gud aedia Sala. Mi hapi yumi tufala agri long diswan an mi hapi fo kipim tu olketa pikinini an parens blong mi taem yu go training long sola sistem ya.

En long plei

- Afta stori ya hem en, mekem olketa lena go long grup an helpem olketa tingabaotem evriting olketa lanem an askem olketa fo helpem Sala an Mario ansarem tufala kuestin ya.
- Wanem kaen samting nao Sala an Mario mas luk fo taem baem nao wanfala sola PV sistem?
- Hao bae Sala an olketa woman bae save lukafterem sola PV sistem, mekem hem save stap long?

AKTIVITI 12-ROL PLEI

Disfala rol plei hem abaotem wanfala grup blong yang pipol wea sidaon adanit wanfala tri long vilij stori stori. Nomineitem trifala karekta fo pefomem nao disfala rol plei, Amelia, Santos an Daniel.

Amelia: Hei Santos, mi herem granma blong mi hem storim nao abaotem sola training hem atendem.

Santos: Yu tru? Mi ting hem nao grandma blong mi atendem tu ya. Hem naes ya, dat olketa stil lane yiet.

Amelia: Ya, granma blong bara gud tu ya- hem storim mi nao samfala samting abaotem wanem hem lanem wea hem samfala samting mifala lanem long skul tu ya.

Santos: Ok so wat nao hem talem yu?

Amelia: Yu save dat long difren taem long de, eneji from san hem difren an samfala eneji moa hem prodius nao long de taem san barava hot fo gud.

Santos: Ya, yumi evriwan save datwan ya?

Amelia: Ya yumi save bat hem naes nao fo herem granma blong mi tokabaotem an trae fo tisim mi.

Santos: Yumi lanem tu dat bikos yumi stap long saoten hemispia, so sola panol yumi yiusim mas feisim not an ben lelebet long agol fo tekem maksimam sola eneji.

Amelia: Ya, mi no ting abaotem datwan-taem mi lukim olketa instolem sola panol- mi ting nomoa dat as long as hem long ruf-hem shud produsem eneji- bat hem dipen long kantri yumi stap long hem, yumi mas tingabaotem nao fo instolem long raet wei o bae yumi lusim staka eneji insaet long yia.

Daniel: Ya, hem samting yumi save bat hem gud fo lukim olketa granma blong yumi duim diswan an help fo tekem kam laet long vilij. Hem mekem ril difrens fo lukim olketa haos laet long naet.

Amelia: Ya, mi fil seif taem wakabaot long vilij long naet bikos long laet.

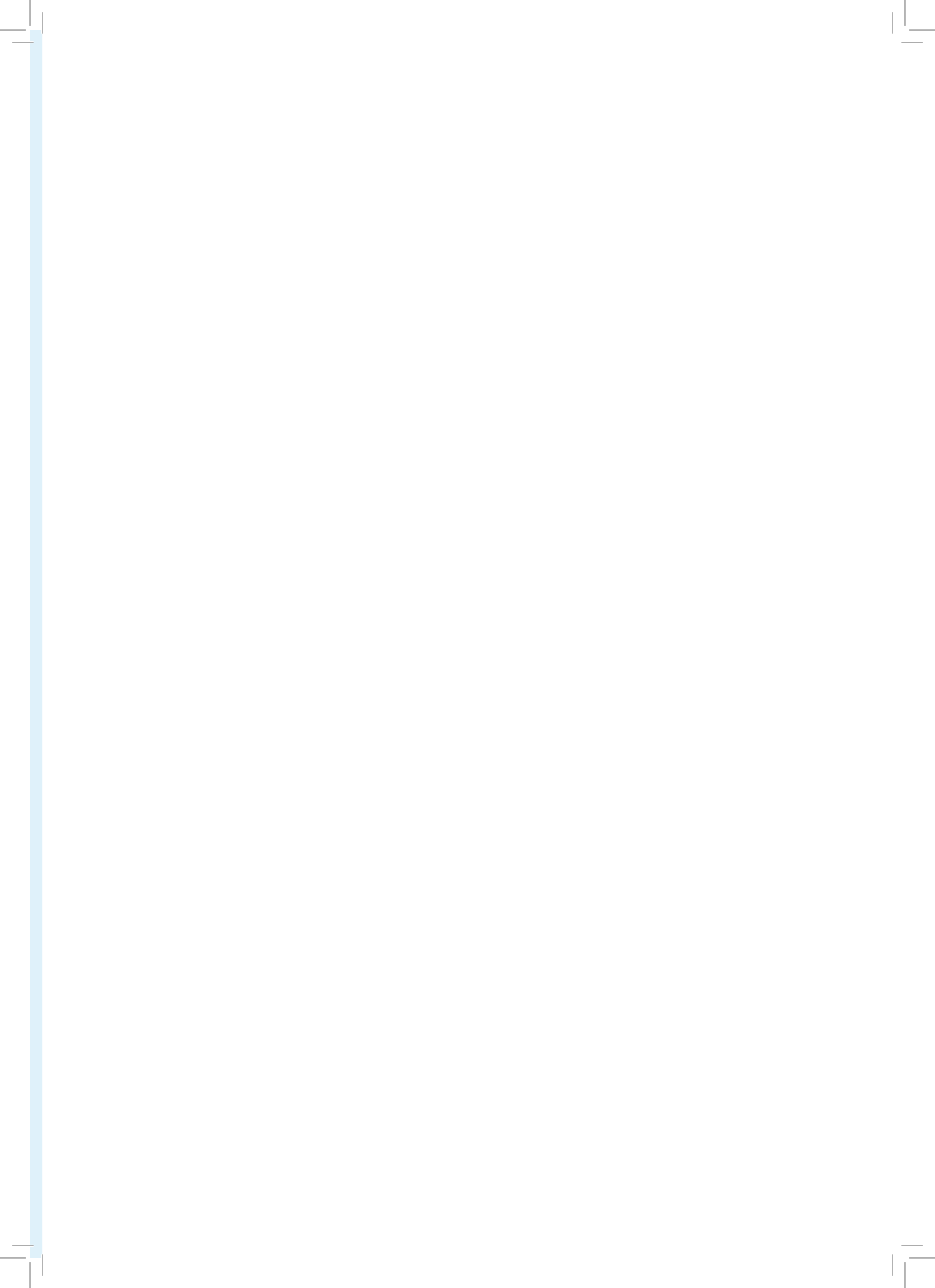
Santos: Lastaem, yumi lukim nomoa olketa man duim olketa teknikal samting olsem, so hem naes sens fo lukim olketa granma olketa sola teknisian.

Daniel: Ya, hem givim staka respekt long olketa, so garem staka gud samting abaotem.- yumi nid fo askem olketa fo pasim nao samfala long olketa nolej long diswan long yumi so yumi save sapotem olketa wetem mentenens.

Amelia: Ya. mi ting hem nao wanem granma blong mi hem stat fo duim wetem mi. Mi barava laek lanem staka samting moa abaotem. Fo adastandem hao nao sola hom sistem hem waka an hao nao fo menteinem hem simpol nomoa. Yumi evriwan mas wiling fo duim diswan an searem nolej ya wetem olketa narawan. Hem garem staka rong infomeisin wea hem spred an onli wei fo mek sua olketa sola sistem save stap long taem sapos yu lanem hao fo duim stret an enkarejem olketa bik pipol long haos, espesili Olketa woman.

En long plei

- Wanem nao evriwan long yufala lanem from disfala modiul wea yu no save abaotem bifo?
- Waswe, yu ting dat yu long gud posisin fo baem, opereitem an duim beisik mentenens blong sola hom sistem?
- Hu nao yu tingim hem shud lidim nao fo opereitem an duim beisik mentenens blong sola hom sistem blong yu?





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