



Modul 7 – Lena Wokbuk

Sola long Komuniti

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Kampani we i givim mane from:

KOICA
Korea International
Cooperation Agency

Long patnasip wetem:







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“Sola long Komuniti” trening modul hemi wan introdaksen long ol fundamentol blong sola (photovoltaic) paoa sistem.

Taem kos ya i komplit, ol lina bambae oli ajivim ol lening aotkam we i stap daon:

1. Diskraebem Sola Eneji
2. Eksplenem besik elektrikol paramita (V, I, P mo E, AC, DC)
3. Aedentifaem ol difren komponen we oli yusum long wan Sola Paoa Sistem
4. Eksplenem wok blong wanwan komponen blong wan sola sistem.
5. Diskraebem ol difren taeb blong Sola Sistem.

6. Aedentifaem besik test ikwipmen mo demonstretem raet mo sev yus blong hem.

7. Diskasem ol ki fakta blong konsidarem taem yu pem sola paoa sistem mo/o ol komponen blong hem.

8. Diskraebem impotens blong mentenens blong Sola Paoa Sistem

Opsonol:

9. Aedentifae besik test ikwipmen mo demonstretem raet mo sev yus blong hem.

TEBOL 1: Lesen Plan

Japta	Lesen Taeb
1. Aes Breka – Introdaksen	Teori mo aktiviti 1
2. Wanem hemi Sola Eneji	Teori
	Aktiviti 2
	Aktiviti 3
3. Ol Besik blong elektrik	Teori
	Aktiviti 4
4. Ol komponent blong Sola Paoa sistem	Teori
	Aktiviti 5
5. Ol Taeb blong Sola PV Sistem	Teori
	Aktiviti 6
6. Sefti long Sola PV Sistem	Teori
	Aktiviti 7
	Aktiviti 8 (Opsonal)
7. Pem Sola Paoa Sistem	Teori
	Aktiviti 9
8. Mentenens blong Sola Hom Sistem	Teori
	Aktiviti 10
	Aktiviti 11
	Aktiviti 12

Lena wokbuk ya (LW) i kamaot long koresponding Trena Gaed (TG). Ol Kontent long LW ya oli mekem i kam isi mo samaraesem, wetem fokus long ol daekram, pija mo ol koresponding aktiviti we i save alaoem man we i lanem blong stap enkej wetem trena long taem blong trening. Sipos yu

wantem kasem moa infomesen long eni seksen, plis lukluk i go long koresponding TG.

Kava pija: Komuniti Sola PV trening long Rukua Vilej. Sos: Mohammed Tazil, GGGI, Fiji.

Disklema: Global Green Growth Institute i no save mekem eni jenis/waranti, we maet long ekpres o implae, o asum long eni likol laeabiliti o responsibiliti blong akuresi, komplit, o eni namba 3 pati we i yusum, o risal blong eni kaen yus, blong infomesen, aparatus, prodak, o proses disklos long ol infomesen we i kontenem long plesia o ripresentem se yus blong hem bambae hemi no go ova long praevet raet blong hem wa.

GLOSERI

AC karent - Olteneting karent hemi taeb blong elektrik se hemi "oltenet" oli stap jenis oltaem, ol inveta oli produsum, jenereta, wan bigfala paoa sistem.

Kemikel enoji - Eneji we i sto long stored link blong kemikel kompaond, olsem ol atom mo molecules. Eneji hemi rilis taem kemikel riaksen i tekem ples.

Karent (A) - Wan elektrik karent hemi wan flo blong elektrik jaj long seket waea.

DC karent - Daerekt karent hemi wan taeb blong elektrik we hemi konstant mo ol sola panel mo batri nao oli produsum.

Eneji - Paoa we i kamaot long utilaesesen blong fisikol o kemikel risos, espeseli blong provaedem laet mo hit o long ol masin we oli wok.

Konektem (Harness) (olsem PPE) - hemi wan fom blong pesonal protektiv ikwipmen (PPE) we i disaen blong kajem wan man long kes blong foldaon taem hemi stap wok long ples we i hae tumas

Hit enoji - Hit enoji, we oli kolem tu temol enoji, hemi wan enoji we wan objek i gat from muvmen blong ol molecules

Haedrolojic Saekol - saekol blong wota insaed long haedrosfia blong wol mo sola rediasen nao i draevem.

Mekanikol Eneji - Hemi evri enoji we wan objek i gat from ol mosen mo ol posisen blong hem.

Plet Nem - Aedentifikesen stika o saen we i ataj long aplaens we i indiketem nem blong hem, manifakja, mo ol narafala ditel.

Radiesen - Eneji we i travel long ol wev o patikol, moa nao elektromaknetik rediesen olsem hit o x-rei elektromaknetik wev we i transpotem enoji tru spes. Sanlaet hemi fom blong rediesen

Sola Eneji - Eneji long san i konvet i go long temol o elektrik enoji.

Temal Eneji - hemi enoji we wan objek i gat from muvmen blong ol molecules.

Voltej - hemi potensol difrens bitwin tufala poen long wan seket mo hemi wanem we i kosem karent blong flo long klos seket.

TEBOL BLONG KONEKSEN

1000 Watt (W)	1 Kilowatt (kW)
60 sekon	1 minit
60 minit	1 Aoa
1 Wh (Wattaoa)	1Watt x 1Aoa



1

Aes Breka
Introdaksen

AKTIVITI 1

Introdusum yu wan long brif blong evriwan taem trena i aksem. Bambae oli askem yu blong askem trena. Brif blong

askem eni man taem trena i askem. Trena bambae i askem yu blong indiketem save long topik ya.



2

Wanem hemi
Sola Eneji

2.1 Wanem hemi Eneji

Yumi save diskraebem olsem wan samting we i gat plante fom mo i gohed blong jenisim fom blong givim wan samting we i gat yus blong hem. Sam long ol fom blong eneji hemi:

1. Hit eneji – Tingbaot taem yu statem wan faea blong boelem sam wota. Taem yu kam klosap long faea yu filim hot from hit blong eneji ya.

FIKA 1: Yu save tingbaot olsem wanem wota i hit ap?¹



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.

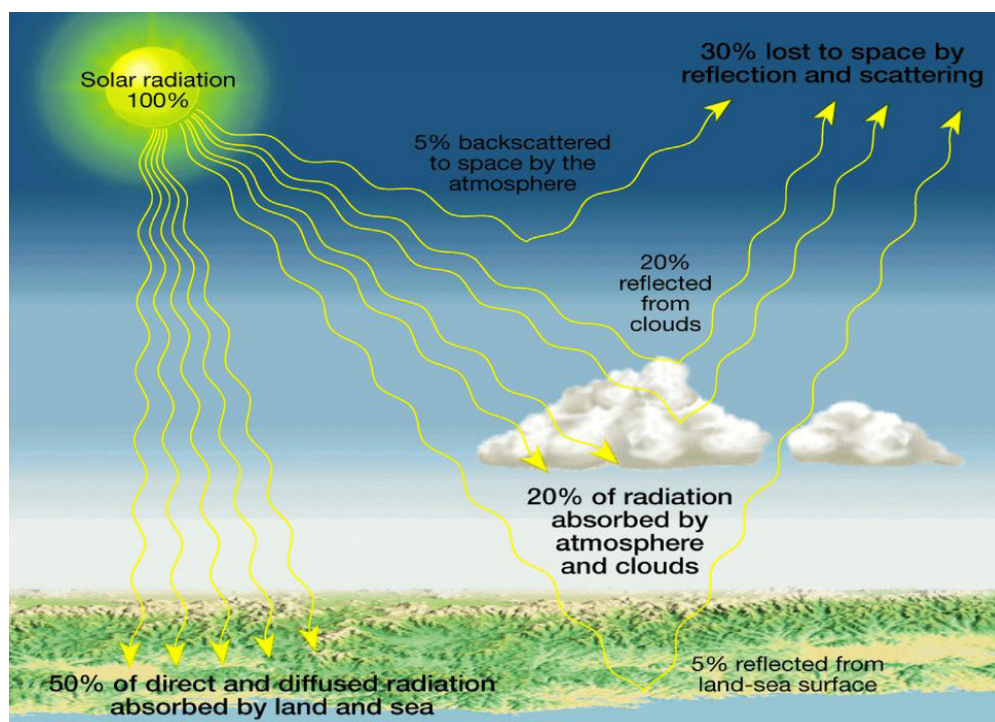
2. Mekanikol eneji – hemia hemi eneji we enjin blong bot blong yu i givim blong rotetem propela blong muvum bot. Semak, eneji blong wan enjin i givimaot blong traem blong muvum car.
3. Kemikel eneji – Insaed long ol batri, ol kemikel oli yusum blong storem eneji so bambae yu yusum blong tanem redio i on, jajem fon blong yu o laet long naet.
4. Elektrikol Eneji – hemia hemi eneji we i flo tru long ol waea blong givim paoa long ol aplaens blong yu.

Sola Eneji hemi elektromaknetik rediesen we san i givimaot. Hemi save kapjarem mo tanem i go long ol yusful fom blong eneji, olsem hit mo elektrik, yusum ol difdifren teknoloji olsem panel (PV) mo temol kolekta.

Sanlaet we i kasem wol i save hitimap land, osen, mo atmosfera.

Moa long sanlaet i kasem wol mo i absobem mo womem planet. Eneji long san hemi draeving fos biae weta mo klaemet, mo laef long wol.

FIKA 2: Ol Ditel blong total sola rediesen²



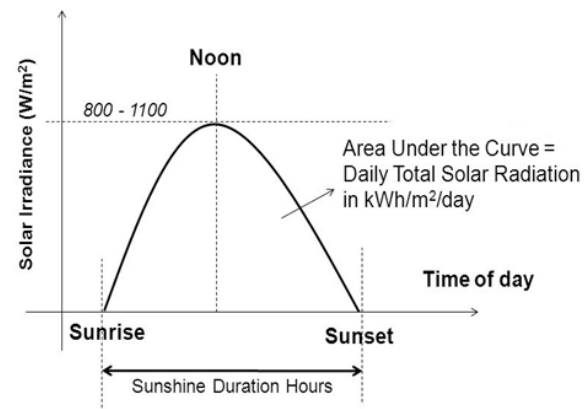
¹ GGGI Vanuatu

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

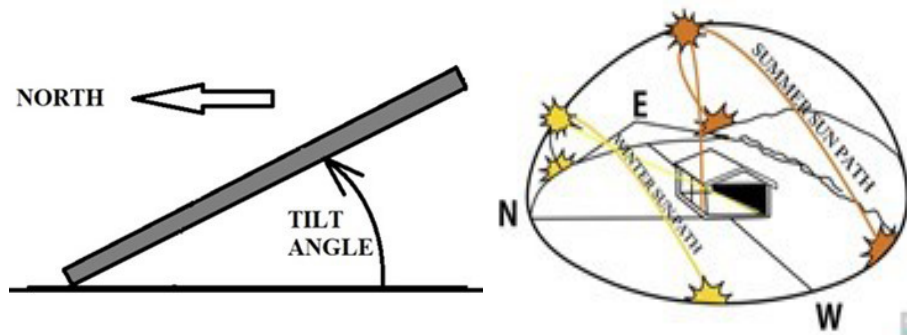
Long ol difren taem long dei, rediesen i kamaot long san i difren mo long semak fasin enoji we i produsum i yusum ol difdifren devaes we i yusum rediesen ya blong konvetem igo long yusful enoji i difdifren tu.

Kipim sola panel i flat long ruf o fes i go long difren ples aot long san i save kosem plante los long sola enoji mo hemia i save kosem smol enoji nomo mo sola sistem i save sat daon long longfala taem. Laki, i gat wan isi wei blong fiksing blong tiltim mo poentem sola panel we i mekemsua se yu karem maksimam amaon blong sola enoji long sola panel blong yu oltaem. Nambawan tilt ankol mo daareksen blong sola panel i dipen long kantri we yu liv long hem.

FIKA 3: Sola Irediens graf³



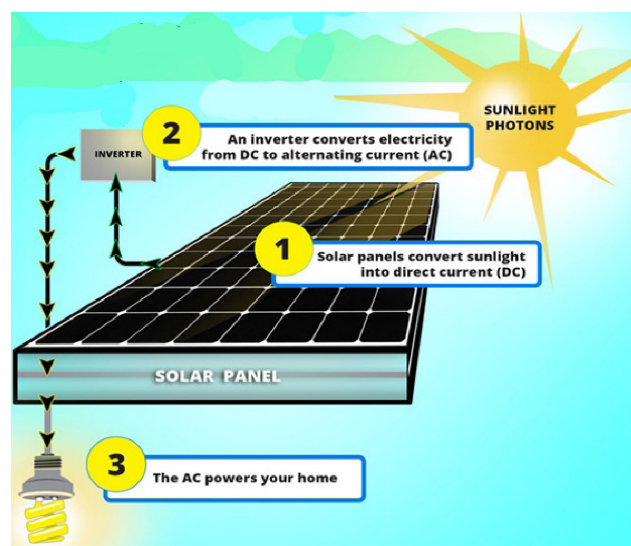
FIKA 4: Tod blong San long wan yia⁴ mo sola panel tilt⁵



Olsem yu save luk long Fika 4, san hemi hae antap long skae long taem blong sama (summer) (Disemba) mo go daon long skae i go long Not long taem blong kolkol (Jun) blong Vanuatu. Be, blong karem maksimam sola enoji long Vanuatu, evri PV modul i mas tiltim gud bitwin 15-20 digri mo fes i go long Not daareksen, blong mekemsua maksimam sola paoa jeneresen long ol modul truaot long yia.

Sola enoji i save konvet long tufala bigfala pat olsem elektrik mo hit. Fika 5 i soem olsem wanem sola enoji hemi konvet long elektik (AC karent) blong laetem wan balb.

Fika 5: Sola Paoa Sistem (AC)⁶



3 Research Gate, Journal of Energy Conversion and Management, https://www.researchgate.net/figure/Hourly-irradiation-curve-versus-peak-sun-hour-rectangle_fig1_264040352

4 Source: Wolf Architects, "Good orientation for energy efficiency" www.wolfarchitects.com.

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.

Fika 6 ko kasem Fika 9 i soem olsem wanem eneji i yus long ol difren fom.

FIKA 6: Sola temol kolekta⁷



FIKA 7: Woman i instolem Sola PV⁸



FIKA 8: Rurol sola system⁹



FIKA 9: San drae¹⁰



7 Source: Ozzie Solar Clean, "Residential hot water cleaning", <https://www.ozziesolarclean.com.au/images/grid/residential-solar-hot-water-cleaning.jpg>, accessed 25 June 2021

8 The CSR Journal, "Renewable Energy: A Potent Tool for Woman Empowerment in Rural India", <https://thecsrjournal.in/renewable-energy-potent-tool-women-rural-india/>

9 Source: Economist, "Double powered solar panel", <https://economist.com/wp-content/uploads/2020/01/twopanelpicture.jpg>, accessed 25 June 2021.

AKTIVITI 2

1. Aedentifaem sos blong eneji long evri pija mo makem wetem leta “S”

2. Aedentifae wanem i konvetem sola eneji i go long elektrik mo makem wetem leta “E”

3. Aedentifaem ol difrent fom blong eneji we i produsum mo makem wetem leta “P”

4. Sola eneji hemi fri?

5. Sola eneji hemi klin?

6. Ol klaod oli katemdaon sola eneji?

7. Ankel tilt blong panel mo daareksen i afektem sola enoji konvesen?

8. From wanem sola enoji hemi impoten long yumi?

9. Diskasem long klas olsem wanem ol Man mo Woman oli yusum sola enoji long eria blong yu?

AKTIVITI 3

1. Wanem taem blong dei bambae yu karem moa paoa mo from wanem?

OI Not:

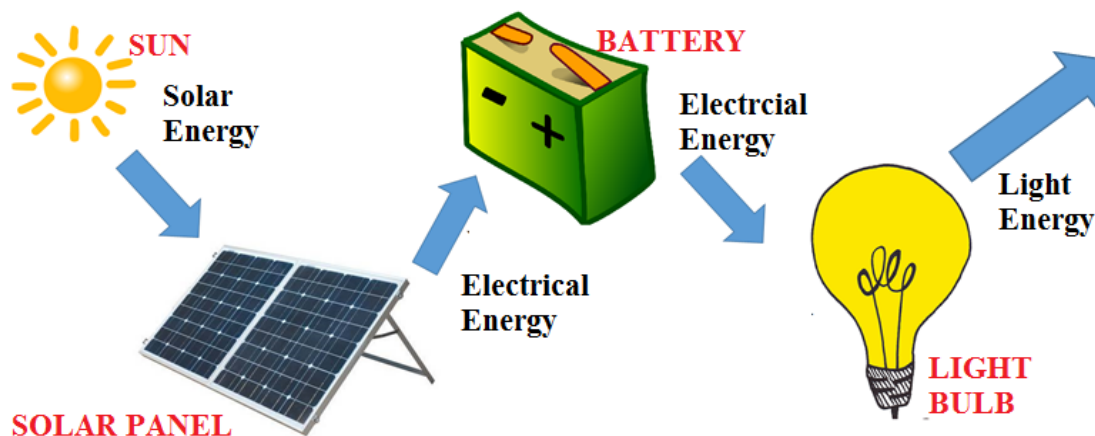
3

Ol Besik
blong Elektrik

3.1 Elektrikol Eneji

Elektrikol eneji hemi wan narafala fom blong eneji. Unit blong mesarem eneji hemi Joules. i save kam long haedro o wind o sola o hit eneji.

FIKA 10: Olsem wanem sola eneji i jenisim fom blong givim laet long yumi¹⁰



Long Fika 10 yumi lukim se sola eneji blong san hemi jenis long elektrikol eneji tru long sola panel.

Sefti Tip: Eneji blong eni fom maet hemi elektrikol eneji long wan panel o long batri hemi denja tumas mo i save kosem ham sipos yumi no tekem plante kea. Oltaem folem ol sefti rul taem yumi wok wetem eneji.

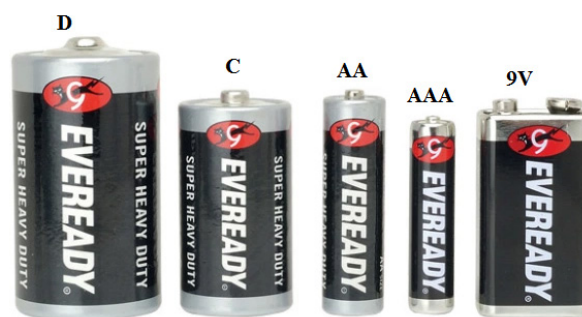
3.2 Eneji long wan batri

Eneji long wan batri oli yusum ol kemikel blong storem. Fika daon hemi soem wan rijajabol batri.

FIKA 11: Wan Lead Asid rijajabol batri¹¹



FIKA 12: Ol difren taeb blong smol batri¹²



3.3 Paoa

Long simpol tem yumi difaenem paoa olsem eneji we i yus long wan period otaem. Unit blong paoa hemi Watts (W). Yumi save hamas eneji bambae i yus long batri sipos yumi save hamas paoa wanwan aplaens i nidim. Paoa hemi rife tu long elektrikol eneji we i jeneret tru long panel.

¹⁰ Adapted from the Electricity Basics, Arizona State University (VOCTEC), <http://votcec.asu.edu>

¹¹ Source: JICA

¹² Source: Lazada, "Eveready battery", https://ph-live-01.slatic.net/p/6abf377c3bd40ff76088f4764c8624cb.jpg_2200x2200q80.jpg_.webp, accessed 25 June 2021.

FIKA 13: Wan 4W Laet Balb¹³



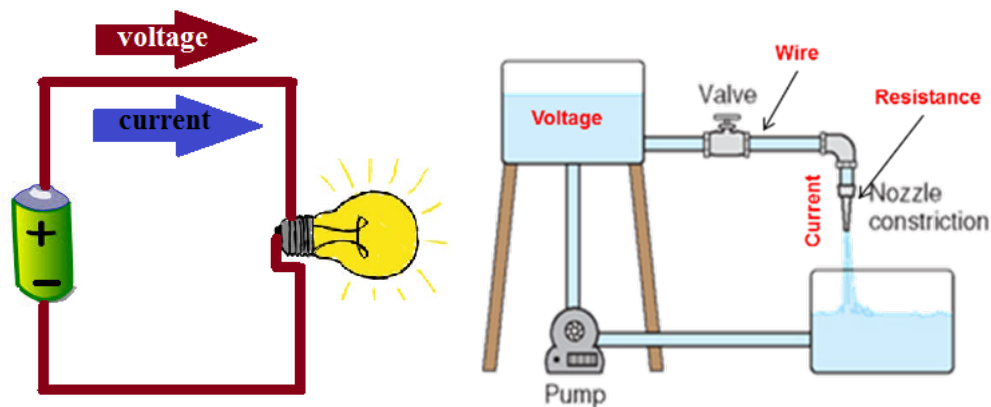
FIKA 14: Yu save ridim long fika antap se hamas paoa smol sola panel i save produsum?¹⁴



3.4 Voltej mo Karent

Voltej hemi elektrikol potensol, o presa we i muvum ol elektron tru long waea kondakta (conductors) mo i save kompea long presa insaed long paep blong wota.

FIKA 15: Tugeta voltej mo karent i mekemap paoa – voltej hemi olsem presa long wota¹⁵



Voltej oli mesarem long ol unit Volt mo karent oli mesarem long Amperes o Amps. Oltaem yumi wantem save hamas karent, mo voltej oli stap long waea blong yu.

Sefti Tip: Hae Karent mo Voltej i save kosem sirias injuri mo iven ded sipos i pas tru long bodi blong yu. Mas lukaot oltaem long ol neked waea mo neva wok long ol laef seket. Oltaem praktisim sefti o karem wan elektrisian we i kolifae.

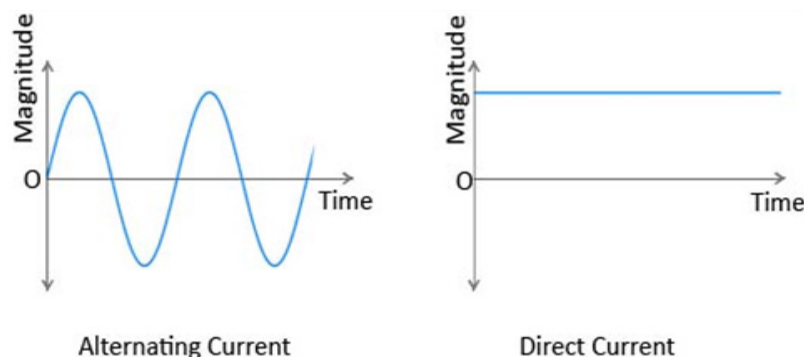
3.5 AC and DC sistem

Long DC o daerek karent, karent i flo darek long positiv i go long neketiv teminol long wan konstant wei. Long ol bigfala devaes, olsem jenereta o inveta, yumi gat AC karent o olteneting karent we karent i gat wan fom we i go antap mo godaon.

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

14 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.

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

FIKA 16: AC mo DC i gat ol difren voltej mo karent magnitud ova taem¹⁶

Hemia wan sampol blong nem plet blong wan AC paoa jest frisa:

FIKA 17: Sampol Nem plet lebol blong wan jest friza¹⁷

Haier			
Deep Freezer			
Model:	DW-25L92	Refrigerant:	R600a: 52g
Inner Temperature:	-10℃ - -25℃	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			

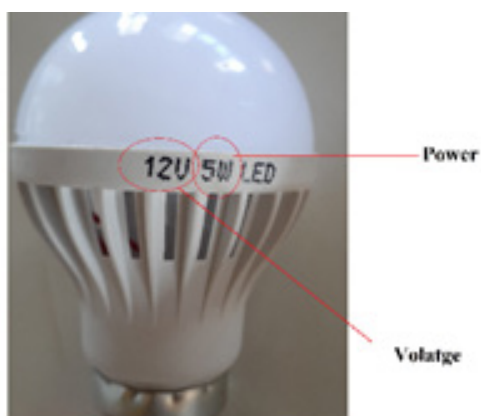
AC Voltage

Power Usage

Current Usage

Paoa oli faenem taem yu multiplae voltej mo karent tugeta. Long kes blong Fika 17, yumi lukim 220V multiplae wetem 0.35A karent ret bambae i givim yumi wan a paoa blong 77W we oli raetem long Paoa input lebol. Hemia i yusul sipos oli no givim paoa daerek, yumi save yusum voltej mo karent blong kalkuletem. Hemia wan sampol blong wan DC laet nem plet o labol.

OI Not:

FIKA 18: DC balb labol ditel¹⁸

¹⁶ Adapted from System Components: Charge Controllers & Inverters, Arizona State University (VOCTEC), <http://vottec.asu.edu>

¹⁷ Source: DocPlayer, "Deep Freezer-upright: HMRSM Haier Medical & Laboratory Products Co., Ltd.

¹⁸ Source: Amazon.com, "Led bulbs", https://m.media-amazon.com/images/I/31kJoFKty+L_AC_SY100.jpg, accessed 21 June, 2021.

AKTIVITI 4

Provaedem long ol lena wetem klosap 2 AC aplaens nemplet olsem AC laet balb mo AC fan. Mo tu provaedem olgeta wetem 2 DC aplaens nemplet olsem wan DC balb mo wan DC frij. Yu mas keaful blong no seperetem ol devaes blong olgeta. Long ol tim blong olgeta oli mas mekem ol samting we i stap daon:

1. Aidentifae wanem devaes hemi AC mo wiswan hemi DC.

2. Oli mas save ridim voltej mo karent we i nidim blong ranem ol devaes ya.
3. Oli mas save talem hamas paa wanwan devaes bambae i yusum.

(Lukaot oli no givim karent ret – yu save kalkuletem aot long paa mo voltej long ol fika we oli givim daon).



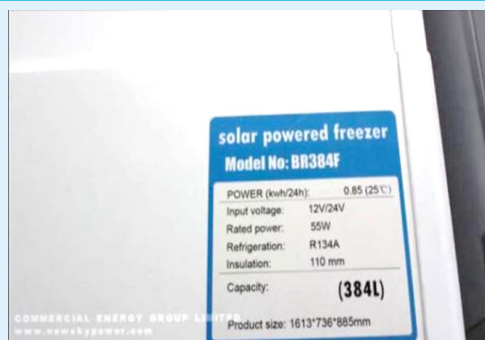
AC Balb 220-240V,3W,0.01A¹⁹



AC Fan, 220V, 55W, 0.25A²⁰



DC Laet 12V,6W,0.5A²¹



DC Frisa, 12V/24V, 55W, 4.58 A/ 2.29A²²

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

²⁰ 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.

²¹ Source: AliExpress.com, <https://www.aliexpress.com/item/1316122622.html>, accessed 25 June 2021

²² Source: Made in China.com, "Solar Freezer", <https://m.made-in-china.com/company-commercial-energy/>, accessed 25 June 2021

4

Ol Komponent blong
Sola Paoa Sistem —————

Ol men komponents blong sola paoa sistem mool wok blong hem oli soem long tebol daon.

AKTIVITI 5



Sola Panel (PV Modul)²³

Photovoltaic modul i yusum sanlaet enei (photons) blong produsum elektrik tru long photovoltaik ifek. Hemi yusum sanlaet olsem wan sos blong enei mo jeneretem daerek karent elektrik. Sola panel i konek long jaja kontrola.



Batri²⁴

Wan batri hemi wan devaes we hemi save storem elektrikol enei long fom blong kemikel enei, mo konvetem enei i go long enei elektrik. Komon batri i produsum 12V. Batri i konek i go long jaja kontrola.



Jaj Kontrola²⁵

Wan jaj kontrola menli kontrolem mo rekuletem jaj blong batri long sola panel. Hemi save limitim ret long wanem elektrik karent i adem o karemaot long batri. I priventem ovajaj mo i save protektem agens long ovavoltej o andavoltej, we i save katemdaon pefomens blong batri o laefspan mo i save putum long posisen long risk.



Inveta²⁶

Wan inveta, hemi wan elektrik devaes o seketri (circuitry) we i jenisim daerek karent(DC) i go long olteneting karent (AC).

Wan taeb blong paoa inveta devaes o seket i rikwae wan stebol DC paoa sos (12V, 24V) kebabol blong saplae inaf karent blong paoa we sistem i dimandem.

AC aotput voltej blong wan paoa inveta oltaem hemi rekulet blong semak olsem grid laen voltej, taep 240 VAC , 50 Hz.



O kebol²⁷

Elektrikol kebol oli yusum blong konektem 2 o moa devaes, i mekem transfe blong elektrik siknol o paoa long wan devaes i go long narafala. Long sola sistem, ol kebol oli konekt long PV modul i go long to batri, batri i go long inveta, inveta i go long paoa aotlet, PV modul i go long jaj kontrola, jaj kontrola i go long Batri mo dc paoa lod.

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

24 Source: JICA

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

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

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

Breka/Aesoleta²⁸

Wan seket breka hemi wan swij we oli disaenem blong hemi operet blong protektem wan elektrikol seket blong eni damej we eksek karent long wan ovalod o sot seket i kosem. Besik wok blong hem i blong stopem flo afta we oli faenemaot wan folt (fault).

Wan aesoleta hemi wan devaes we i yusum blong aesoletem wan seket o ikwipmen long wan sos blong paoa. Wan aesoleta hemi wan mekanikol swij devaes so long open posisen, i alaoem aesolesen blong input mo aotput blong wan devaes.

Elektrikol Swij²⁹

Swij hemi wan elektrikol komponen we i save diskonekt o konektem rod long wan elektrik seket, intaraptem elektrikol karent o daevetem long wan kondakta i go long narafala.

Elektrikol Paoa aotlet³⁰

Paoa aotlet i konektem elektrik ikwipmen long konektem elektik ikwipmen long olteneting karent (AC) paoa saplae long ol bilding.

1. Wanem hemi wok blong inveta?

2. From wanem yumi nidim ol batri?

28 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>

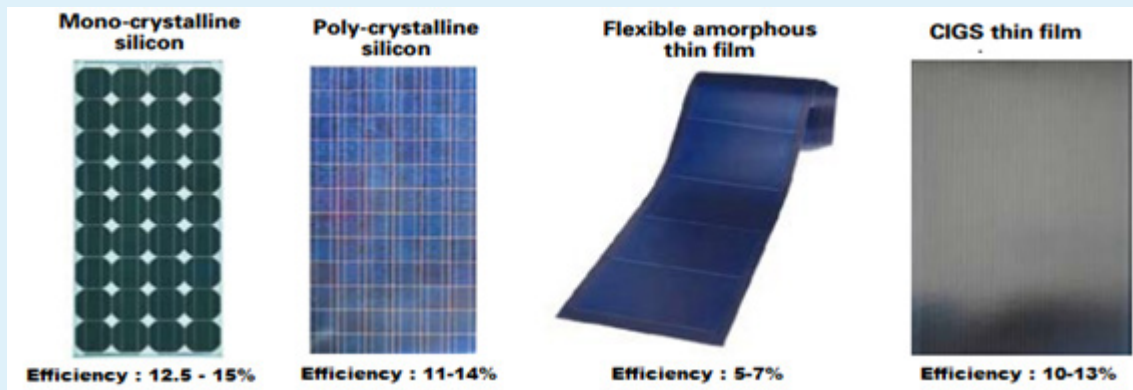
29 Source: Trade Zone, <https://www.tradezone.com.au/product/hpm-40-amp-1-gang-excel-vertical-internal-isolation-rocker-switch-gloss-white-16567.html>, accessed 25 June 2021.

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

OI Not:

OI Taep blong sola Panel

FIKA 19: Difren taeb blong PV modul³¹

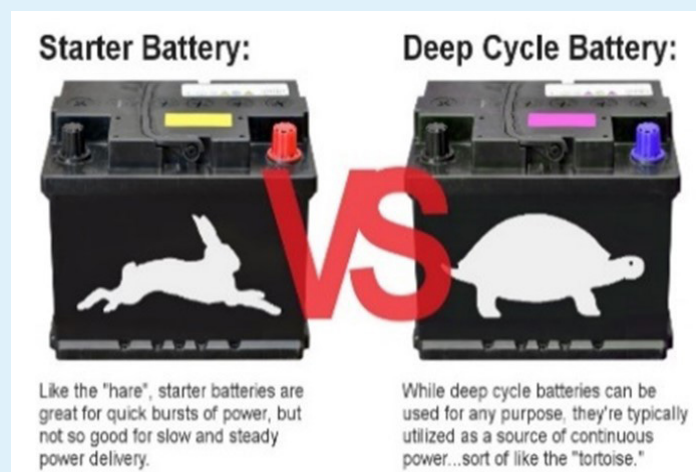


OI Taeb blong batri

Samfala oli komon mo jip bitim ol narafala:

OI difren samting bitwin stata mo dip saekol batri oli tokbaot long fika daon.

FIKA 20: OI Batri³²



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

32 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

Ol taeb blong
Sola PV Sistem

I gat trifala difren taeb blong sola paoa sistem. Olgeta ya:

1. Standalon (off-grid) paoa sistem
2. On-grid sola paoa sistem
3. Haebrid paoa sistem

I gat ol samfala taeb blong sola sistem setap, bambae yumi fokas long DC standalon sistem long modul ya blong kipim ol samting i isi long ol lena.

5.1 Standalon (off-grid) sola paoa sistem

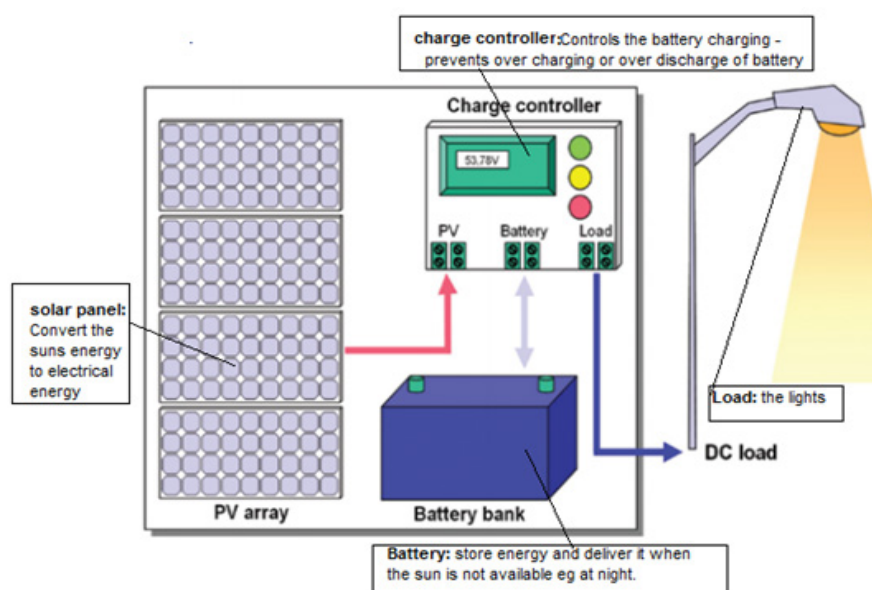
Stand-alon sistem oli no konekt long elektrik grid mo oli instol long ol rimot eria we i nokat koneksen long grid, o eria we nokat tumas nid blong elektrik.

5.1.1 Standalon DC Sistem

Standalon DC sistem bambae i gat ol komponen we i soem daon.

1. Sola (PV) Panel
2. Jaj Kontrola
3. Batri
4. DC Lod (Laet Balb; Redio etc.)

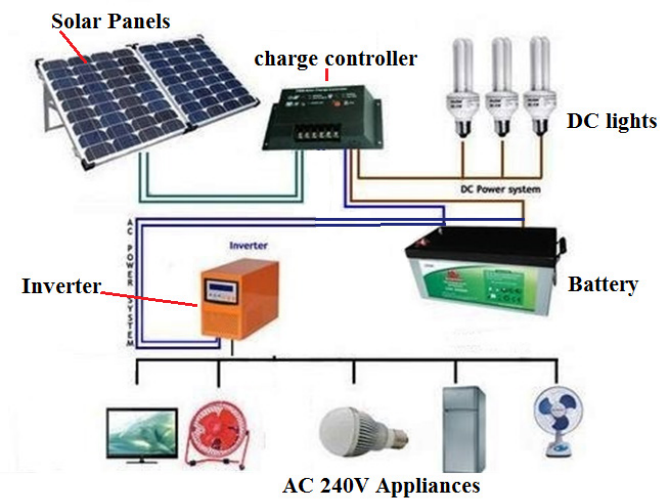
FIKA 21: Standalon DC Paoa Sistem³³



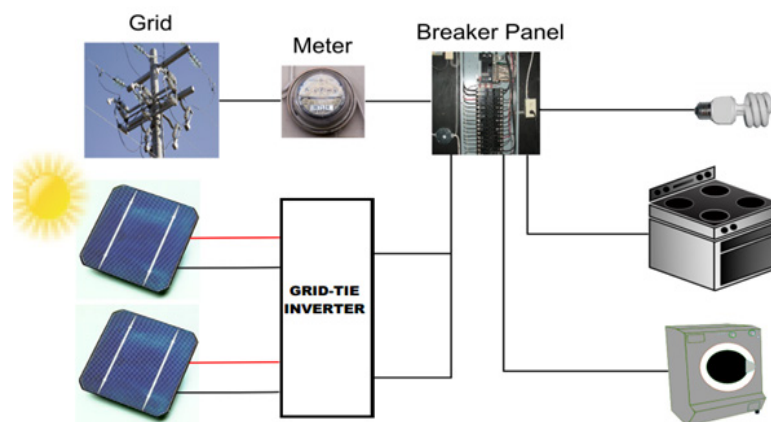
5.1.2 Standalon sola (AC+DC) paoa sistem

Standalon AC+DC paoa sistem hemi semak long wan DC paoa sistem, be i kam wetem wan inveta, we i givhan long hem blong givim paoa long ol AC aplaens, olsem we i stap long Fika 22.

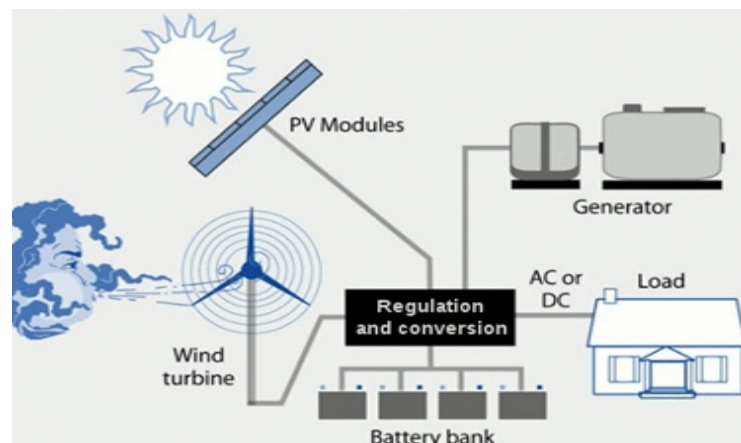
³³ Source: From Sun to Power.com, "Off-grid solar photovoltaic systems", <https://fromsuntopower.files.wordpress.com/2012/07/pv21.jpg>, accessed 25 June 2021.

FIKA 22: Standalon AC/DC Paoa Sistem³⁴

5.2 On-grid sola paoa sistem

FIKA 23: Grid Konekt Sola PV Sistem³⁵

5.3 Haebrid sola paoa system

FIKA 24: Win Sola Haebrid sistem³⁶

³⁴ 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.

³⁵ Source: Hindawi, "Journal of Renewable Energy", June 2021, <https://www.hindawi.com/journals/jre/2013/785636/fig1/>

³⁶ 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/>

AKTIVITI 6

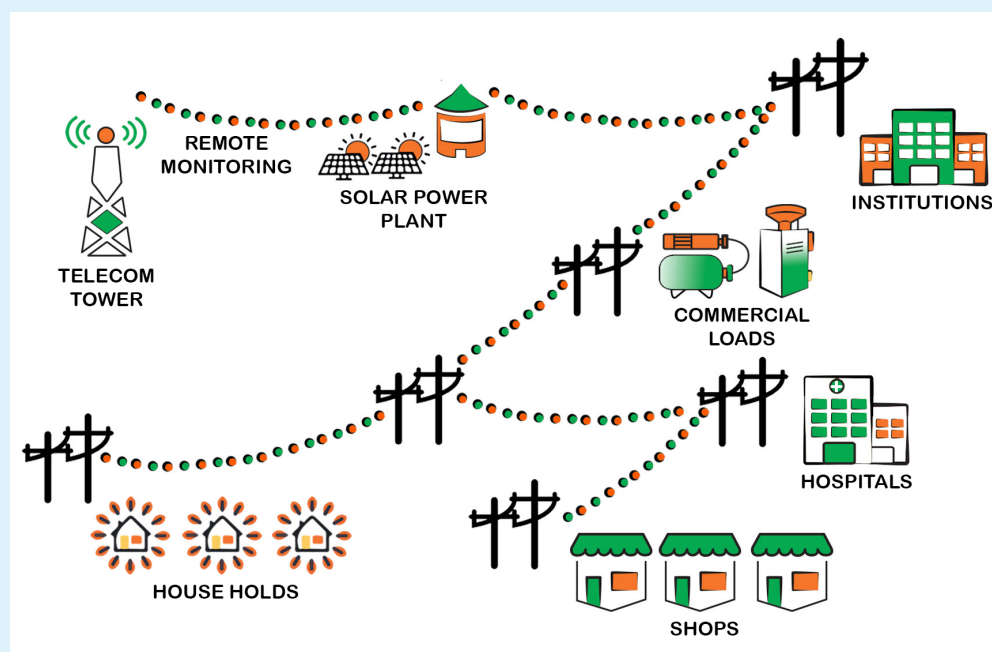
Kes Stadi blong Sola Mini-Grid sistem long Vanuatu

Hemi oltaem ekspensiv o ino posibol blong ekstendem grid paoa laen long urban eria i go long rimot rurol o aelan lokesen. So, olsem wanem nao yumi save provaedem klin paoa long bigfala skel long rimot lokesen? Ansa hemi blong yusum mini-grid sistem. Bambae yumi diskasem sam bigfala sola/haebrid

mini grid sistem we oli bin instolem long samfala rimot rurol komuniti long Vanuatu.

Sola mini-grid sistem hemi wan bigfala AC taep sistem we oli instolem blong saplae paoa long wan ful komuniti, be ino wan haos nomo. I save inkludum samfala fom blong tariff mita sistem we i kaontem amaon blong eneji wanwan haoshol i yusum, mo wanwan haoshol i rikwae blong pem eneji we oli yusum.

FIKA 25: Sola Mini-grid system³⁷



Kwaliti blong paoa sistem i semak long olgeta we oli provaed long grid/paoa laen long urban taon mo siti, yu save mekem paoa long ol taeb blong AC aplaens long hemia, stil bae i gat ol restriksen i stap blong priventem ol man blong traem mekem paoa i go long ol bigfala ikwipmen we i save ovalodem

paoa sistem. Mane we oli karem long mita sistem i go bak long ol otoriti we oli instolem mini-grid sistem, we yu save yusum blong mekem sistem mentenens, jenisim ol pat, o pem ol narafala ekspens we i asosiet wetem ranem paoa sistem.

³⁷ Source: <https://www.taraurja.com/mini-grid-model/>, Accessed on 4/11/2020

Kes Stadi 1: Wintua/Lorlow Sola Mini-Grid Sistem long Saotwest Bay, Malekula

FIKA 26: Wintua/Lorlow Sola mini-grid system³⁸

Sola mini-grid sistem we oli instolem long Wintua mo Lorlow, Saotwest Bay, Malekula, i provaedem klin sola enoji long ova 158 bilding. Gavman blong Austria nao i givim mane from, olsem pat blong Vanuatu NAMA program, we UNDP i manejem. Paoa mo Communications Solutions (PCS) nao oli mekem instolesen wok.

Sistem hemi yusum niufala teknoloji ikwipmen, olsem:

1. Ruf mo graon maont Sola PV panel,
2. Ol Batri (oli stap gud long waet bokis) mo Sola inveta (blu kala long wol),

3. Bigfala, fri lid asid batri we oli silim gud (grey kala long flo),
4. Proteksen mo distribusen ikwipmen (grey bokis long wol)
5. Bakap diesel jenereta (no stap long pija) blong givim paoa long sistem taem i gat longfala taem blong klaod, mo.
6. Moa impoten, wan smat mita sistem we i alaoem rimot monitaring tru long internet.

OI Not:

³⁸ Source: Nama Project, DoE

6

Sefti long Sola
PV sistem

Long plesia i gat sam impoten sefti tip blong folem blong stap sef mo kipim ol narafala i sef taem yu dil wetem sola PV sistem.

1. Oltaem tanem of paoa bifo mekem eni adisonal koneksen o adjasmen. No traem blong wok long seket we i stil aktiv wetem paoa.

FIKA 27: Woning Saen³⁹



2. Oltaem tekem wan man we i tren long saed blong elektrik blong mekem waearing long haos. No traem blong mekem wok ya yu wan.

FIKA 28: Werem ol Insulet Glov⁴⁰



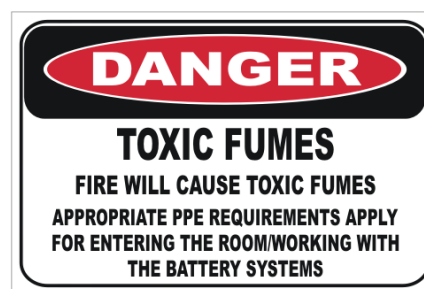
3. Oltaem werem PPE (personnel protective equipment) olsem insult glov, ae goggle mo seti sus.
4. No traem blong mekemgud ol batri we oli nogud yu wan. Ol batri oli kontenem oli kemikel we oli denja tumas we i save kosem bigfala ham/denja.

FIKA 29: Asid Woning⁴¹



5. Neva storem ol batri klosap long faea o insaed long living rum – samfala batri oli givimaot toxic gas nating we yumi no save luk.

FIKA 30: Fume Woning⁴²



6. Neva storem ol batri long ol smol spes o klosap long ol fuel from oli save kosem faea long ol spak. Oltaem plesem batri long gudfala ventilet eria.

FIKA 31: Batri Woning⁴³



7. Oltaem werem wan tae/rob we i konekt long ruf blong haos blong yu taem yu wok blong instolem sola PV panel long ruf.

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

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

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

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

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

FIKA 32: Konektem tae (harness) i go long ruf oltaem⁴⁴



8. Notem se sola panel i stat blong produsum elektrik long eni amao blong sanlaet. Mekesua blong no tajem waea long enitaem Sipos yu karem panel – yu save kavrremap long wan kaliko blong karem i go long ruf mo karemaot kaliko taem yu finis

FIKA 33: Yu lukaot taem yu karem sola panel long taem blong hot⁴⁵



9. Ol Sola panel mo ol maont mo iven ruf bae oli hot tumas long san so tekem plante kea blong werem ol glov mo ol narafala PPE taem yu handolem hot sefes.

FIKA 34: Werem PPE mo konektem hanes long ol ruf⁴⁶



10. Oltaem mekemsua yu praktisim ol lada sefti rul taem yu yusum lada blong kasem ruf blong dil wetem sola PV sistem. Mekemsua lada i gat wan 75-digri ankol wetem graon. Mekemsua se lada hemi stebol long flat graon. Mekemsua wan man i holem lada mo priventem blong klis.

FIKA 35: Lada blong mekem 75- digri ankol wetem graon⁴⁷



44 Source: Solar Power World, <https://www.solarpowerworldonline.com/2016/01/how-to-stay-safe-on-top-of-metal-roofs-when-installing-solar/>

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

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

47 Ladders Level, <https://laddersnivo.weebly.com/>

OI Not:

AKTIVITI 7: SETEMAP WAN DC SOLA SISTEM

Blong aktiviti ya jusum sam aktiv lena we oli save wok sef blong setemap wan isi DC hom sola sistem. OI ikwipmen we bambae yu nidim long VOTEC Kit:

1. Sola Panel mo Maonting Rack wetem ol skru
2. MTT waearing bod
3. OI Sefti Glov mo goggle

4. Batri mo Jaja kontrola

5. DC Seket breka

6. Sola Mesh (blong kavremap)

Statem blong asemblem sola PV Array yusum 2 panels. Folem ol instraksen we oli givim long pija daon. Alaoem ol lena blong taetem smol nomo.

Step 1:



Step 2:



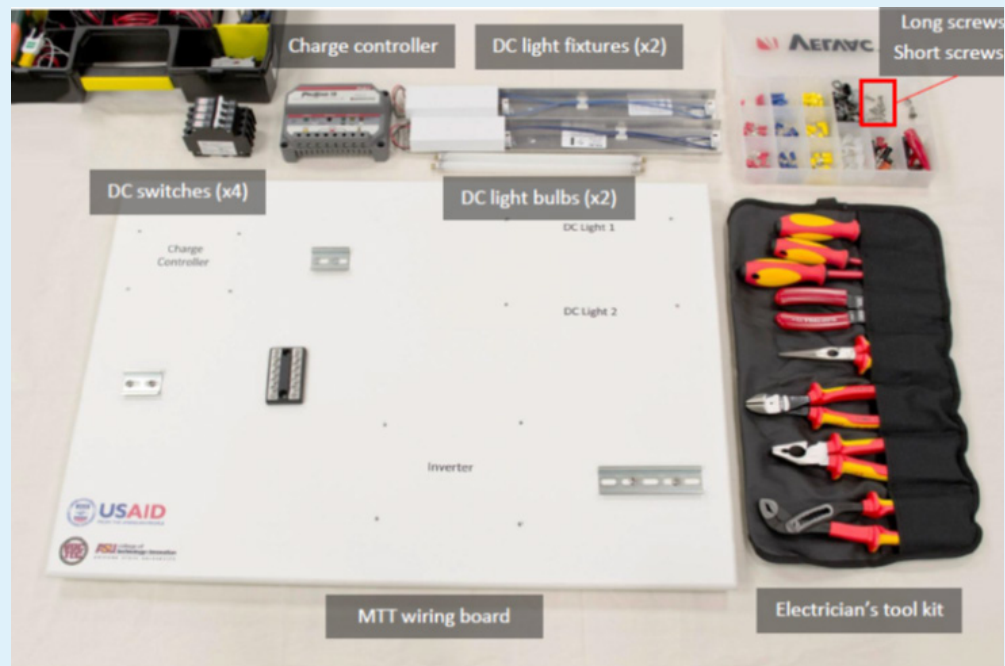
Step 3:



Step 4:

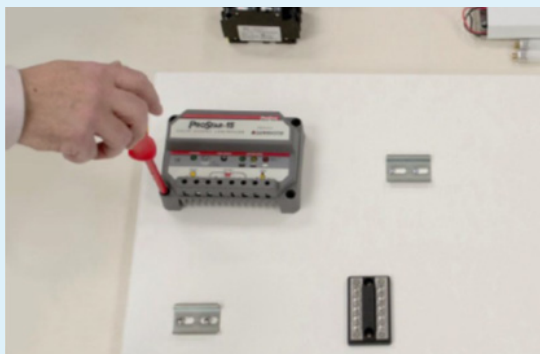


Fika doan i soem long yu wanem bambae yu nidim long VOTEC Kit.

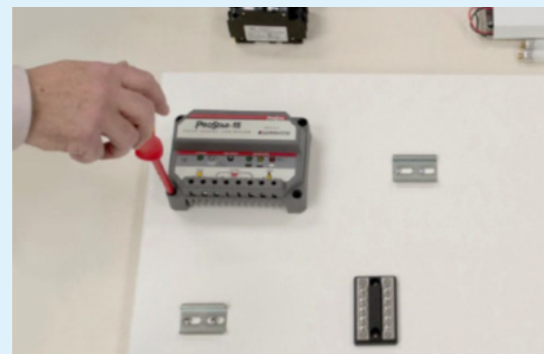


Ol step we oli rikomendem blong konektem komponen oli givim long nekis pej. Ol lena oli rikwae blong harem instraksen long ol trena.

Step 1:



Step 2:

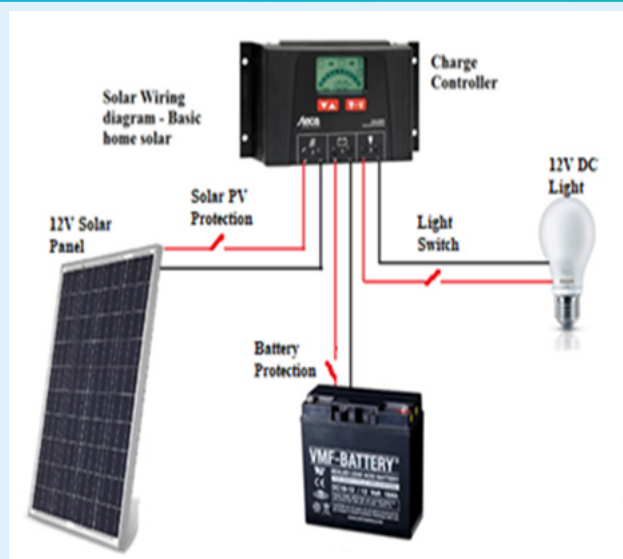


Step 3:



Step 4:



FIKA 36: Koneksen Daekram⁴⁸

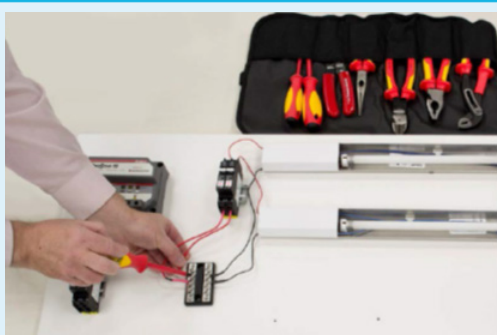
Step 1:



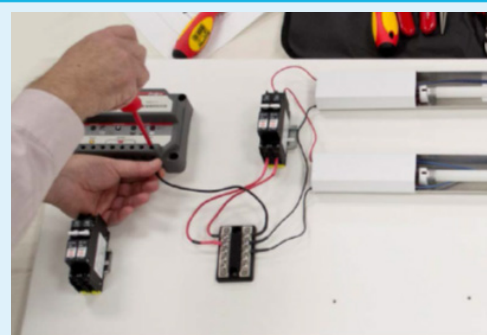
Step 2:



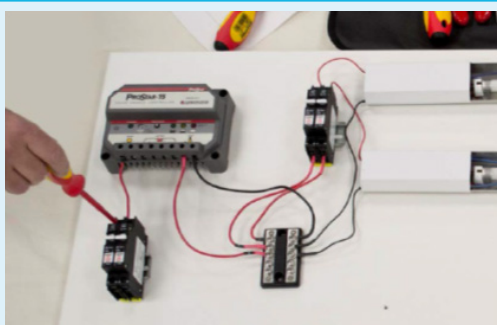
Step 3:



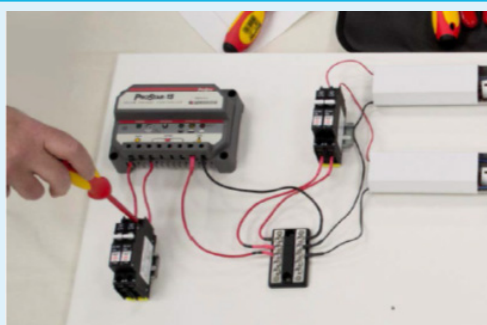
Step 4:



Step 5:

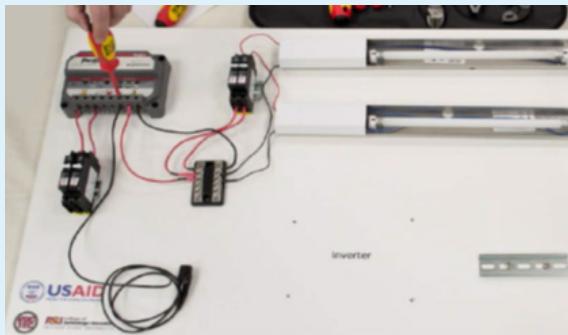


Step 6:

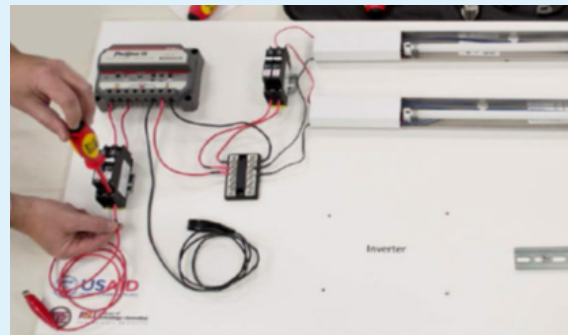


48 Adapted from the Electricity Basics, Arizona State University (VOCTEC), <http://votcec.asu.edu>

Step 7:



Step 8:



Faenol Assembly blong Sistem

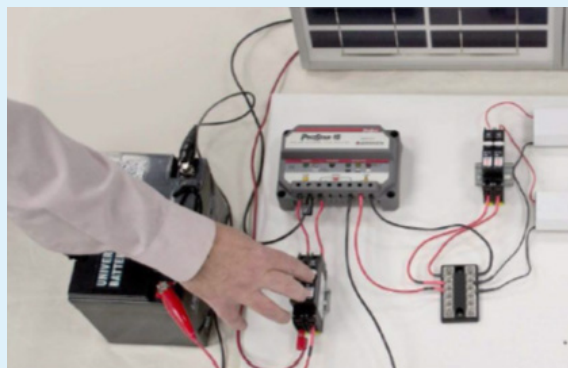
Step 1:



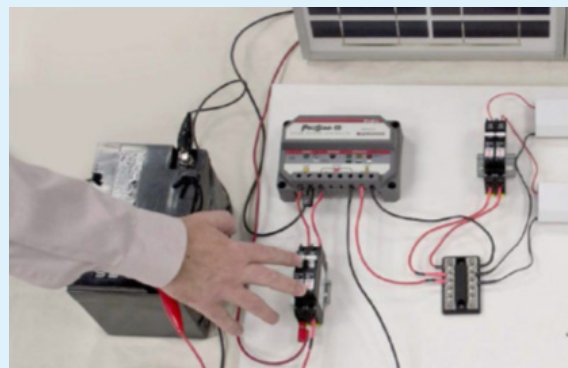
Step 2:



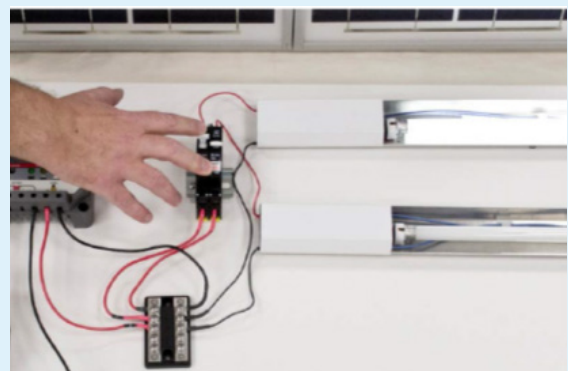
Step 3:



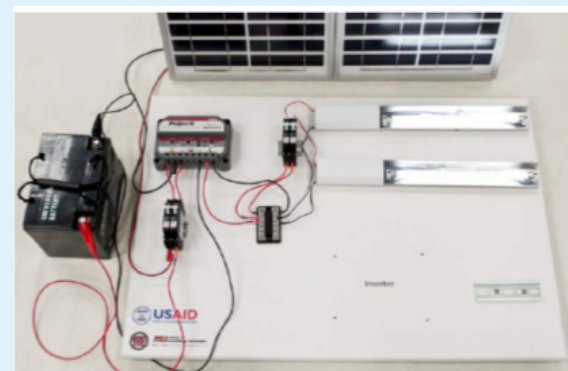
Step 4:



Step 5:



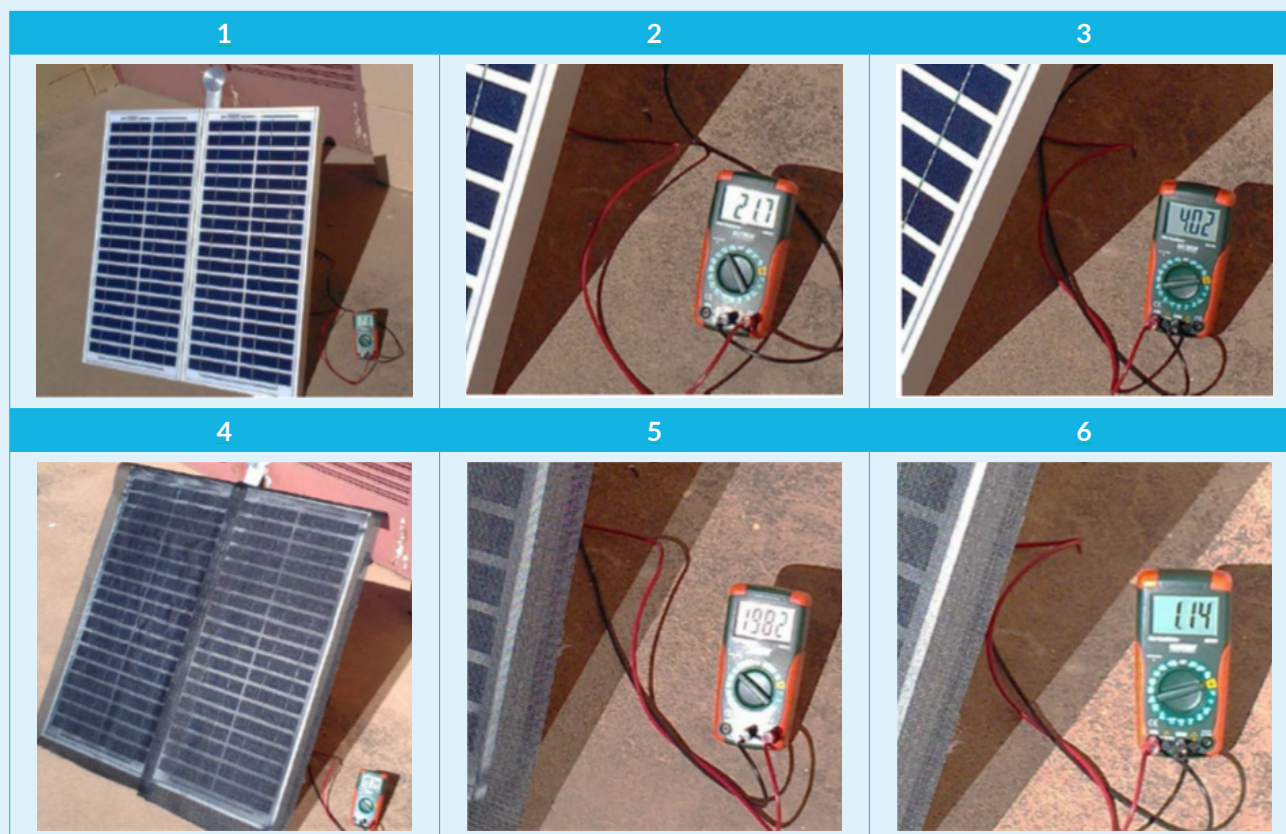
Step 6:



Taem yu swijim on setap, jaja kontrola i sud jajem batri mo ol DC laet bambae i swij on. Ol lena oli save obsevem sistem mo askem eni kwesten we oli gat.

AKTIVITI 8: OL IFEK BLONG SED LONG OL SOLA PANEL

I gat ol step oli givim daon:



7

Pem Sola
Paoa Sistem

7.1 Pem ol sola laeting kit

Hemia i isi blong pem from oli salem sistem tugeta. Oltaem i gat wan panel, wan sola paoa bokis mo ol laet.

FIKA 37: Sola Redi Built Laetning Kit⁴⁹



7.2 Pem wan hom sola sistem

Notem se yu no save go nomo blong pem wan SHS blong ranem aplaens blong yu. Wan SHS i nidim spesifik saes, desaen, mo fabriket tru long wan sola paoa sistem ekspet blong paoarem ol spesifik aplaens nomo.

7.3 Samfala kwesten blong askem man we i salem

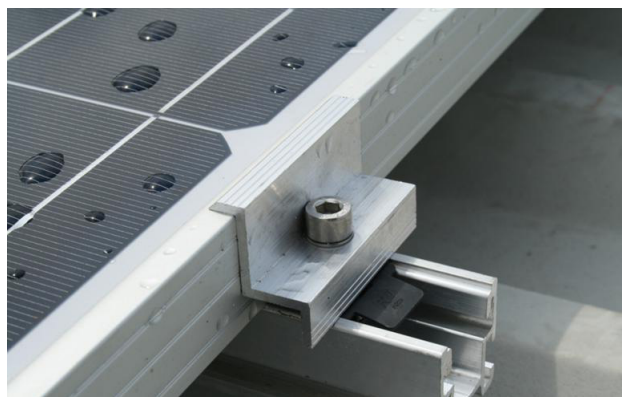
1. Prodak i gat eni waranti? –Wan waranti i mekem yu sua se sipos i gat eni damej blong wan seten taem bambae man we i salem bambae i tekem kea long hem. Longfala waranti hemi nambawan oltaem.

FIKA 38: Waranti Labol⁵⁰



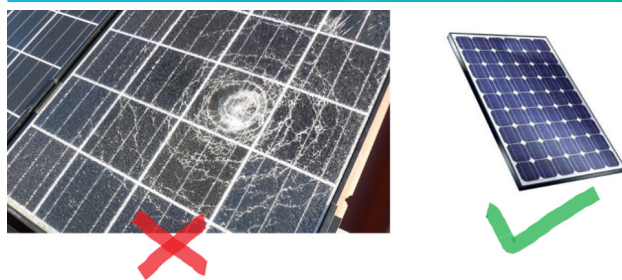
2. Panel i kam wetem wan maonting aean blong fitim (fixture)? – I nidim blong maontem ol Sola panel long top blong ruf. Yu mas askem sipos oli kam wetem wan maonting braket.

FIKA 39 : Maonting Fikja (Fixture)⁵¹



3. Jekem blong ol saen blong damej – Yu no pem ol prodak we oli damej.

FIKA 40: Ol Panel we oli Damej⁵²



4. Blong ol batri yu save askem man we i salem blong soem long yu batri voltej tru long mesamen. Blong wan 12V lead asid batri – voltej ino mas drop ananit long 12V.

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

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

51 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/>

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

FIKA 41: Askem man we i salem blong Asistim yu⁵³



5. Lukaotem ol branded prodak – Lukaotem prodak wetem gudfala brand mo logo mo intraksen manual. Yu no pem prodak we ino gat brand, raeting i lus o nogat instraksen manuel.

FIKA 42: Ol Kwaliti brand prodak⁵⁴



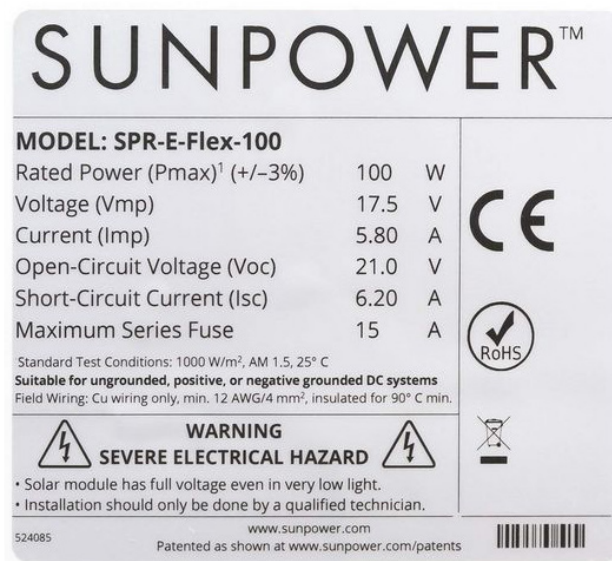
6. Taem yu selektem ol inveta, askem man blong sto sipos aotput blong inveta hemi wan pure sine wave, from hemia i produsum klin kwaliti aotput paoa.

FIKA 43: Inveta⁵⁵



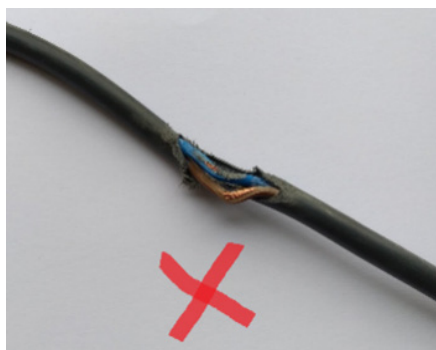
7. Inspektem nem plet blong evri komponen long ditel.

FIKA 44: Nemplet⁵⁶



8. Mekemsua prodak hemi sef blong yusum. Yu no pem sipos yu flim se i gat ekspos waea, o disaen blong prodak i luk pua mo i save kosem aksiden o injury.

FIKA 45: Yu no pem prodak we i damej⁵⁷



9. Oltaem yu lukluk raon long o stoa mo komeperem ol praes, kwaliti, waranti, ol saes, ol brand, sefti etc blong ol prodak we yu wantem blong pem.

⁵³ Amazon.com, "Electric Measuring instrument", <https://www.amazon.com/Electric-Measuring-Instrument/s?k=Electric+Measuring+Instrument>, accessed 25 June 2021.

⁵⁴ Coulee Energy, "How to choose a right panel solar", <https://couleenergy.com/how-to-choose-a-right-solar-panel/>

⁵⁵ Goughlui.com, "The Power Inverter", <https://goughlui.com/2014/07/30/review-teardown-hip-300-300w-pure-sine-wave-power-inverter/>

⁵⁶ Source: Pinterest, "SunPower Marine Flexible Solar Panels", <https://www.pinterest.com/pin/714735403339440675/>

⁵⁷ Source: IOL, "How to fix frayed cables", <https://www.iol.co.za/technology/how-to-fix-frayed-cables-49412981>

OI Not:

AKTIVITI 9 PEM SOLA SISTEM

Trena blong yu bambae i givim wan kit (VOTEC Kit) we i gat moa long ol sola paoa sistem komponen. Imajin se trena blong yu hemi man blong salem sola prodak, long tim blong yu diskasem fastaem mo askem kwesten long trena olsem yu wantem pem mo putum tugeta hom sola sistem blong yu. Hemia i blong trenem yu blong mekem ol raet jus taem yu pem ol sola komponent o sistem.

A large, white, sans-serif number '8' is positioned in the lower-left quadrant of the page. The background is a solid blue color that transitions into a green gradient on the right side. The number is centered vertically within the blue section.

**Mentens blong
Hom Sola Sistem** —————

Taem yu gat sola PV sistem, yumi mas lukaotem gud, from i save go nogud isi sipos yu no lukaotem gud.

8.1 From wanem sola paoa sistem i no wok?

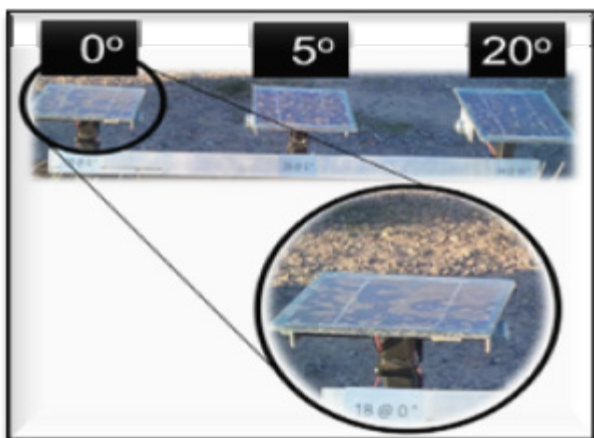
I gat plante wei we sola sistem blong yumi i stat blong givim problem. Dast i fulap long panel; ol batri i save ovajaj mo kontrola jaj i no save wok. Yumi mas krietem habit blong tekem kea oltaem long ol sola panel sipos no bambae yumi lusum ol komponent isi.

FIKA 46: Ol Damej Panel⁵⁸



3. Soil lus i inkrisim tilt anke blong go daon. Mekem sua ol panel oli no flat mo gat sam tilt.

FIKA 47: Ifek long Tilt Ankol long lus blong soil⁵⁹



8.2 Mentenens jeklis

Naoia yumi lukluk long olsem wanem yumi save karemaot mentenens oltaem long ol difren komponen blong sola PV sistem.

8.2.1 Ol Sola Panel

1. Inspektem ol PV array blong eni saen blong fisikol damej, olsem impak o brok
2. Sefes i mas klin oltaem, nogat damej, kilnim eni doti rabis.

8.2.2 Batri Mentenens

Batri mentenens i involvem samfala task dipen long taeb blong batri mo manufakjara rikwaemen, inkudum:

1. Inspektem mo klinim batri rack, ol kes tray mo teminesen
2. Mesarem batri voltej sipso yu gat wan multi-mita o blong risim nomo batri voltej long jaj kontrola.
3. Samfala jaj kontrola oli displei skrin be samfala oli simpol wan we oli soem amaon blong jaj level blong batri wetem red laet.

⁵⁸ Jim Dunlop Solar

⁵⁹ Source: ASU PV/ Reliability Laboratory

FIKA 48: LED laet i indiketem batri jaj level⁶⁰



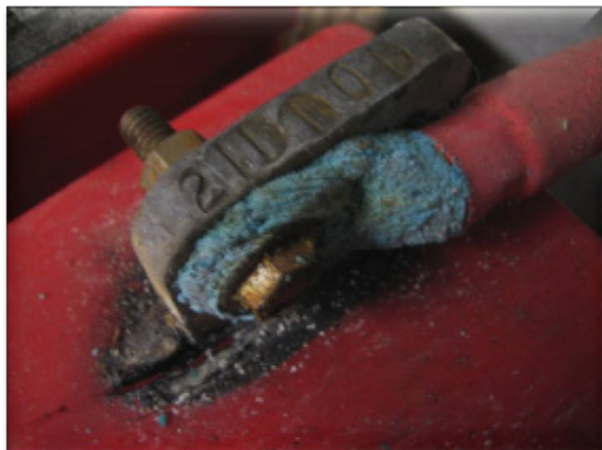
4. Samfala jaj kontrol oli displei batri voltej mo ol narafala mesamen daerek long displei skrin.

FIKA 49: Jaj kontrola wetem batri voltej displei⁶¹



5. Periodic batri mentenens i mas inkludum jekap blong evri teminol blong no mas nogud mo prapa fasin blong taetemap ol teminol. Mo tu jekem batri wota mo riplesem wetem distil wota blong flad lead asid batri sipos level i lo. Traem blong mekem hemia evri 2 – 4 wik olsem i rikwae.
6. Yusum stil bras blong klinim oksaed long ol koneksen. Werem insulesen gloves evri taem.
7. Jek from ol lus waea mo damej waea. Karem help kwiktaem blong ripere damej waea.

FIKA 50: Klinim Teminol Korosen⁶²



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

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

62 Source: Jim Dunlop Solar

Sefti Tip: Yusum stret sefti gogol mo raba glov taem yu sevesem ol batri. Werem olfala klos from yu save karem asid long olgeta (sipos batri we i flad)

Kipim wan open bokis blong beking soda mo wan plastik pan blong wota klosap taem yu sevesem batri blong yu—lukaot i gat wan spil, yu save putum beking soda long wota, stiaremap, mo yusum miks ya blong neutralaesem kwik wan asid we i spil

Loa voltej hemi no wan shock hazad, be hemi hae karent. Wan twist akros long teminol i save bonem hand blong yu kwik mo i save gat janis blong batri i eksplod. Yu mas lukaot!

8.3 Besik Mentenens Jeklis

TEBOL 2: Besik Hom Sola Mentenens Bi- Evri Wik- Evri Manis Jeklis

Aetem	Jek lis evri Wik - Besik	Finisim (tikim)
1	Jekem Panel from damej	
2	Jekem ol waea from damej o lus koneksen	
3	Klinim sola panel mo jekem tilt	
4	Jekem blong luk se panel i no gat sed long hem	
5	Jekem panel maonting se i sef	
6	Jekem panel voltej mo karent long jaj kontrola displei – sipos i posibol. Lukaot long LED indiketa displei jekem sipos i jaj fulwan long 4pm.	
7	Jekem batri voltej long jaj kontrola – sipos i posibol	
8	Jekem mo klinim any korosen long batri teminol	
9	Jekem mo taetem eni lus teminol koneksen	
10	Jekem batri wota long ol flad mo rifil wetem distil wota sipos level i lo	
11	Jekem se batri storej eria hemi kolkol mo ea i seculet gud	
12	Jekem se evri laet mo aplaens blong sistem oli wok	

OI Not:

AKTIVITI 10

Krietem wan mentenens jeklis blong wanem evridei wok we i nidim blong mekem blong ekstendem laef blong hom sola PV sistem blong yu- yu save ademap

moa i bitim wanem nao yu notem. Traem tingbaot olsem wanem bambae yu mekem jek mo askem trena blong yu ol kwesten long ol jek we yu no sua long hem.

AKTIVITI 11 – ROL PLE: JENIS I GO LONGSOLA

Pepos blong eksesaes hemi blong karem evri memba blong komuniti blong aprisietem ki rol we ol woman oli ple blong mekem disisen mo, long manejen, mo yus blong sola teknoloji. Ridim olgeta from kes stadi ya hemi helpem olgeta blong ansarem ol kwesten. Maet yu nidim blong aktemaot toktok blong mekem ol daealok oli moa ril.

Olsem wanem blong bringim jenis

Sala mo man blong hem Mario tufala i liv long Afo, long Malaita wetem trifala pikinini blong tufala. Oli nogat elektrik long vilej blong olgeta. Mario hemi wan fisaman mo hemi mas goaot long solwora bifo san i kam antap blong kasem ol gudfala fis mo dilivarem long fiseri stesen we hemi wan aes rum nomo long aelan. Samtaem Mario i karem ol smolsmol fis i go long haos blong kukum. Tufala i gat 3 pikinini, Lily we hemi 9 yia, Timoci 10 yia mo Salote 13 yia we oli go evriwan long skul samples 4 km longwe long haos blong olgeta. Oli wokbaot sam aoa long haos blong olgeta blong go long skul. Oli gat wan bigfala garen tu long haos blong olgeta. Plante swit potato, ol yam, kabij mo ol tomato blong evridei nid blong olgeta. Ol olfala papa mo mama blong Mario oli stap wetem olgeta tu. Mario i wok had mo i gat plante narafala samting blong mekem olsem mekem gud bot, karem aes, tekem ol pasenja i go long narafala aelan long naet. Sala hemi bisi tu blong lukaotem papa mo mama blong Mario, tekem kea long haos, lukaotem ol pikinini mo tu mekem wanem we komuniti i talem.

Wan naet 13-yia gel blong tufala Salote i stap stadi yusum kerosin laet. Smel blong kerosin i flatemgud haos from oli laetem 3fala laet evriwan long naet ya. Mario ino kam bak yet long ples blong neba blong olgeta from i go dring bia. Gel blong tufala Lily we hemi 9 yia hemi komplek tumas from smel blong kerosin i mekem hem i filim se bae i sik. Wan raurau i kamaot long medel blong ol pikinini from Timoci mo Salote tugeta i wantem yusum laet. Lily i stap jok nomo mo i pikimap laet mo ronron pleple raon from hemi wantem pleple. Taem oli stap ronronem olgeta raon long haos, laet i foldaon wantaem long han blong hem, i foldaon stret long map we i kasem faea wantaem. Salote i singaot from help taem ol neba oli hariap blong putum faea aot be plante buk blong Salote oli bon nogud long faea. Lily i fraet tumas blong yusum kerosin laet. Biaen long naet ya Salote i talem wan tingting long Mario.

Mario: Rilaks – nogat wan i bon, Bambae mi tekem ol niu buk blong hem long en blong wik ya. From wanem yu wari?

Sala: Mi ting se hemi taem blong yumi stop blong yusum ol kerosin laet ya long haos blong yumi.

Mario: Wanem? Yu kranke ya – bambae yumi yusum wanem?

Sala: Ok, Mi bin luk se Lusi mo famle blong hem oli jes pem wan sola sistem mo olsem wanem oli gat ol laet long naet olsem ol hotel. Oli gat wan frij tu blong kipim fis mo kakae blong olgeta blong longfala taem. Mo tu, fesbon blong tufala

Tima i stap mekem gud long skul from hemi save stadi isi long naet long braet laet.

Mario: O, yu bin stap lukluk gud Lusi. Yufala ol woman oltaem (Sala i distep)

Sala: Wanem nao yu minim “yufala ol woman”.

Mario: Umm.

Sala: Mifala ol woman i nidim blong draevem jenis from mifala i filim olsem wanem hemi laef we inogat elektrik. Mi mas wekap we tudak iet mo laetem keroasin laet ya we i smel mo kukum kakae. Mi mas tekem kea blong storem ekstra kakae mo fis, blong bambae ino save go nogud mo mekem yumi sik. Mi mas mekem sua se ol pikinini oli mekem homwok blong olgeta long smol laet blong laet ya. Mi mas sevem mane blong spendem long kerosin.

Mario: Ok mi agri yumi nidim blong karem sola sistem. Mi laekem blong gat wan sola paoa frisa blong kipim fis blong yumi. Be Jon i talem long mi se sola we hemi bin pem i wok blong wan wik nomo afta i stop. Olsem wanem sipos i go nogud mo ino save wok? Mo tu sola sistem ya bambae hemi mekem yumi spendem plante mane

Sala: Oh God blong mi. Yumi traem nomo. Yumi save sevem smol mane we yu mekem long fis we yu salem evri wik mo sipos yumi sevem evri wik naoia kasem Krismas yumi save sevem inaf blong pem sistem mo yu no wari long mentenens. Mi harem se i gat sam woman long wan vilej narsaed long aelan oli bin tren blong mentenem ol sistem ya. Wan long olgeta i bin go long India blong tren. Mi harem se oli ofarem sola trening. Mi save go atendem wan long ol sesen ya blong mi save lanem sam moa. Mo tu mi save help blong fiksime ol narafala sistem long vilej mo yumi save mekem sam ekstra mane.

Mario: Hemi gudfala tingting tumas Sala. Mi glad tumas we yumitu save agri long hemia mo mi hapi blong tekem kea long ol pikinini blong mi mo long papa mo mama blong mi taem yu nidim blong go long trening long sola sistem.

En blong rol ple

Blong mekem:

Go long ol grup mo helpem Sala. I gat plante Sala olbaot we oli nidim help blong yu afta yu mekem kos ya. Long ol tim blong yu tokbaot ol kwesten daon mo talem long trena blong yu wanem nekis samting nao Sala i mekem.

1. Wanem nao ol samting we Sala mo Mario bambae i lukaotem taem tufala i stap tingting blong pem wan hom PV sistem?

2. Olsem wanem nao Sala wetem ol woman bambae oli tekem kea long sola PV sistem, blong bambae i stap longtaem?

AKTIVITI 12

Adisonal Rol Ple: Sola long Komuniti

Rol ple ya hemi stap long wan grup blong ol yangfala we oli stap sidaon ananit long wan tri long wan vilej long rurol mo gat konvesesen.

Amelia: Hei Santos Mi bin harem bubu woman blong mi i tokbaot long narafala dei long sola trening we hemi bin atendem.

Santos: Tru? Mi ting se hemia nao we bubu woman blong mi i atendem tu. I naes tumas ya we oli stil lanem ol teknikal samting wetem hamas yia we oli gat naoia.?

Amelia: Yes, bubu woman blong mi i taf tumas – hemi bin stap talem long mi samfala samting we hemi bin lanem we hemi ol samting we yumi bin stap lanem long skul.

Santos: Ok, wanem nao i talem long yu?

Amelia: Yes, yu save long ol difren taem long dei enei long san hemi difren mo i produsum moa enei long dei we san i stap hot moa.

Santos: Yes, yumi evriwan i save hemia, ah?

Amelia: Yes, be i taf tumas taem mi harem bubu woman blong mi i tokbaot hemia mo traem blong tijim mi.

Santos: Yumi lanem hemia tu from yumi stap liv long Saoten hemisfia, ol sola panel we yumi yusum i mas fes i go long not stret long san blong karem maksimam rediesen.

Amelia: Yes, Mi bin neva tingbaot hemia – taem mi luk olgeta oli instolem sola panel – mi stap tingting, nating nomo se i stap antap long ruf – hemi sud produsum enei – be i nidim blong fesem san blong maksimam rediesen.

Daniel (joenem konvesesen): Yes, ol kaen wok blong hem yumi save be i gud blong yumi luk ol bubu blong yumi oli mekem hemia mo help blong karem laet i kam long vilej. i mekem wan bifgala jenis blong lukim evri haos oli gat laet

Amelia: Yes, Mi filim sef tu taem mi stap wokbaot tru long vilej long naet from laet. Hemi wan gudfala tingting.

Santos: Long bifo yumi bin luk ol man nomo oli mekem ol teknikal samting be hemi wan gudfala jenis tumas blong luk, ol bubu woman oli kam ol sola teknisian.

Daniel: Yes, karem plante rispek i kam long olgeta so i gat plante gudfala samting long hemia – yumi nidim nomo blong askem olgeta blong pasem samfala save long yumi mo tu yumi save sapotem olgeta long saed blong mentenens.

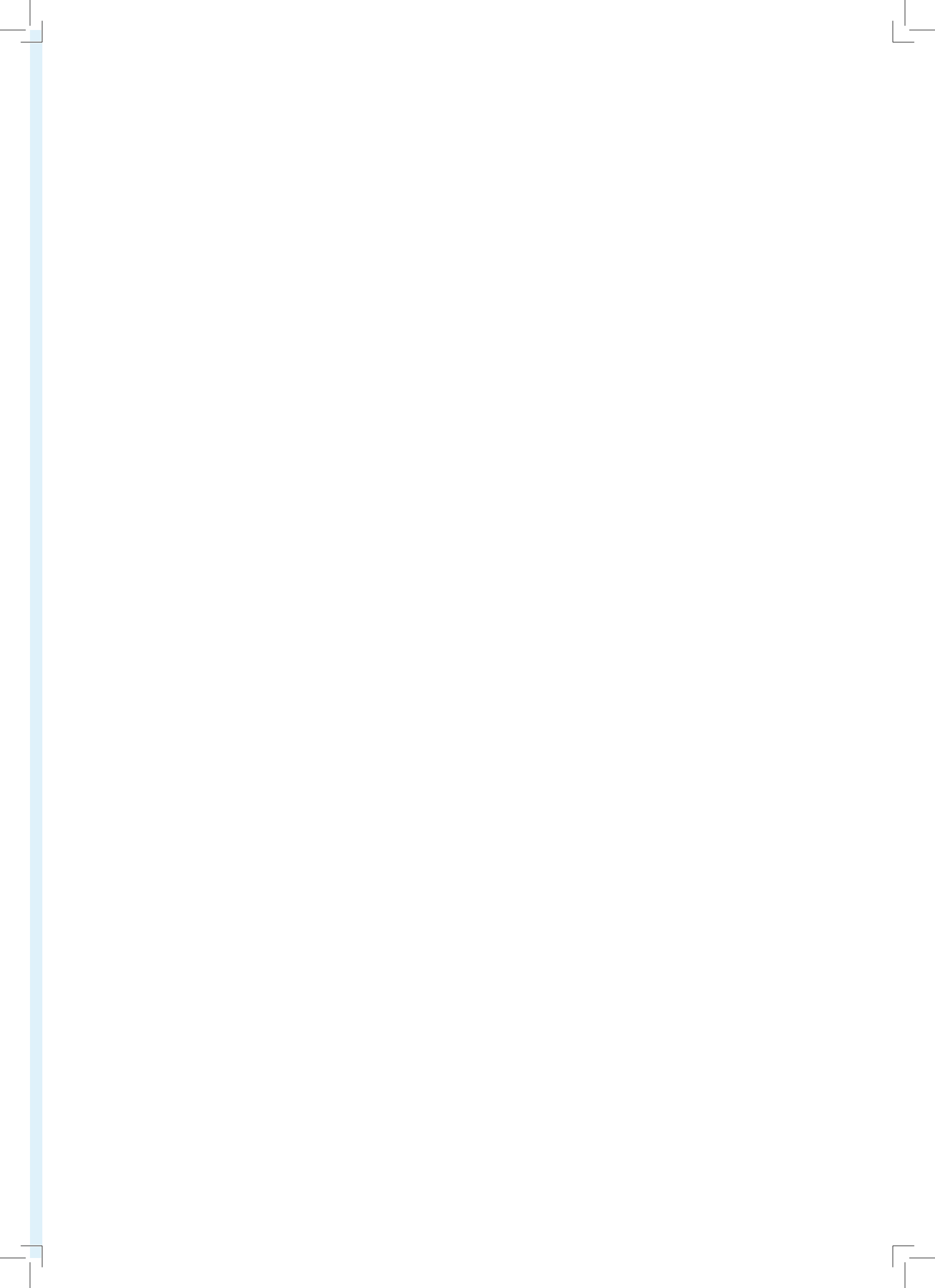
Amelia: Yes, mi ting se hemia wanem bubu woman blong mi i statem wetem mi. Mi intres blong lanem moa long hem.

OI kwesten

1. Wanem nao yu bin lanem aot long modul ya we yu no bin save bifo?

2. Yu ting se yu stap long gudfala posisen blong pem, operetem mo mekem besik mentenens blong sola hom sistem?

3. Hu nao yu ting se bae hemi injaj blong operetem mo mekem besik mentenens blong sola hom sistem blong yu?





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