



Lesoni 7 – iVolanivuli

Noda Sola

VOSA VAKAVITI RARABA

Vakailavotaka na:

KOICA
Korea International
Cooperation Agency

Ena veitauriliga kei:




Pacific Islands
Development Forum





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Na leseni “Noda Sola” na ivakamacala taumada ni yavu ni sola (photovoltaic power system).

Ni oti na leseni qo, e dodonu me rawa na veika qo:

- Vakamacalataka na igu sola
- Vakamacalataka na yavu ni ivakarau ni livaliva (V, I, P & E, AC, DC)
- Kila na gacagaca yadudua ni sola
- Vakamacalataka na itavi ni gacagaca yadudua ni sola

- Vakamacalataka na veimataqali sola
- Veivosakitaka se cava me nanumi nida voli sola se kena gacagaca
- Tukuna na bibi ni kena maroroi na sola

Vakatau:

- Kila na iyaragi ni vakatovolei sola kei na kena vakayagataki vakadodonu

TEVELI 2: iTuvatuva ni Leseni

Wase	Mataqali Leseni
1. Taumada – Tou veikilai mada	Vuli kei na iVakadre 1
2. Cava na igu sola?	Vuli
	IVakadre 2
	IVakadre 3
3. Yavu ni livaliva	Vuli
	IVakadre 4
4. Gacagaca ni sola	Vuli
	IVakadre 5
5. Mataqali sola	Vuli
	IVakadre 6
6. Qaqarauni ena sola	Vuli
	IVakadre 7
	IVakadre 8 (Vakatau)
7. Voli sola	Vuli
	IVakadre 9
8. Qaravi sola ni vale	Vuli
	IVakadre 10
	IVakadre 11
	IVakadre 12

Na ivolanivuli qo e yavutaki ena kena Salavata nei Qasenivuli (Trainers Guide). Sa vakarawarawataki na lewenivola ka vakalekalekataki, qai vakabibitaki kina na droini, yaloyalo kei na kena ivakadre me ratou veimaliwai vinaka tikoga kina na lewe ni vuli kei qasenivuli ni toso tiko na vuli. Ke o gadreva

na ikuri ni ivakamacala ni wase cava ga, mo raica na Salavata nei Qasenivuli.

Taba e waqanivola: Vuli Sola mai Rukua. iVurevure: Mohammed Tazil, GGGI, Fiji.

Moni Kila: Na Global Green Growth Institute e sega ni yalataka, se yalataka lo madaga, ni donu se taucoko na itukutuku ena ivola qo, se rawa ni veilewaitaki ke cala, ni dua e vakayagataka na vua ni itukutuku se iyaya se cakacaka e volai kina, wili kina ni beci na dodonu ni kena itaukei.

iVolavosa

Beleti (ni qaqarauni) – mataqali iyaya ni qaqarauni me tarova noda lutu nida cakacaka tiko mai vanua rewa.

Cowiri ni Wai – Kena dau cowiri tuga na wai e vuravura kei macawa, vu mai na serau ni siga.

Kui – Na kui ni livaliva na kena drodro e na waya se sala cava.

iGu – Kaukaua e vu mai na iyaubula se kemiki, vb me rawa kina na cina se katakata se yavala kina na misini.

iGu katakata – igu e vu mai na yavavala ni molekuli.

iGu kemiki – iGu maroroi e na isema ni kemiki cokovata, mv atomi se molekuli. Na igu qo e dau sereki ni yaco na vuki vakemiki.

iGu mekeniki – igu e vu mai na kena yavala kei na kena itutu.

iGu sola – igu vu mai na matanisiga, dau vuki me igu katakata se livaliva

Livaliva dodonu (DC) – Mataqali livaliva dei, vu vakalevu mai na ulunisola se bateri.

Livaliva dri (AC) – Mataqali livaliva dau “dri” tale mai, se veidriyaki, vu vakalevu mai na ivuki (inverter), jenereita, kei na iqaqi lelevu ni livaliva.

Serau – igu kaburaki me vodo ena ua se ka matailalai, vb serau livaliva-makeneta mv katakata se ua ni veilovi (x-ray). Na ua livaliva-makeneta e kau igu e maliwalala. Na cila ni siga e dua na mataqali serau.

iVolakabi – ivola kabi ena iyaya, volai kina na yacana, o cei a bulia, kei na itukutuku tale eso.

Volt – kedrau veisivi e rua na vanua ena sala livaliva, vu ni drodro ni livaliva ena sala sogo.



1

Taumada – Tou
veikilai mada

IVAKADRE 1

Vakamacalataki iko vakalekaleka vei iratou na lewe ni kalasi.
Tukuna na ka o sa bau kila oti tu baleta na sola ena koro kei
na inaki ni nomu mai vuli.



2

Cava na iGu
Sola?

2.1 Cava na iGu?

Sa dau tukunitaki makawa na kaukaua ni matanisiga. Na igu ni siga e dewa vei ira na kau, era qai keda na tamata kei na manumanu. E dau vaka me rokovi na matanisiga ena veiyasai vuravura. E rawa ni kainaki ni igu e levu na votukana, e dau vukivuki me yaga vei keda. Qo e so na votukani igu:

- iGu katakata – Nanuma toka nomu vakawaqa buka me toka kina na kuroniti. Nida volekata na buka waqa, eda vakila na kena igu.

YALOYALO 1: O bau nanuma se vakatakata vacava na wai?¹



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

- iGu mekeniki – qo na igu ni idini ni boto e cowiri kina na ivocevoce me toso kina na boto. Se na igu ni idini ni lori e vakadewataki ina taya me toso kina.
- iGu kemiki – na kemiki e tawa ena loma ni bateri, e maroroi kina na igu me rogo kina na retio, jajitaki na talevoni, se waqa na cina ena bogi.
- iGu livaliva – qo na igu e drodrova na waya me yavala kina noda iyaya livaliva.

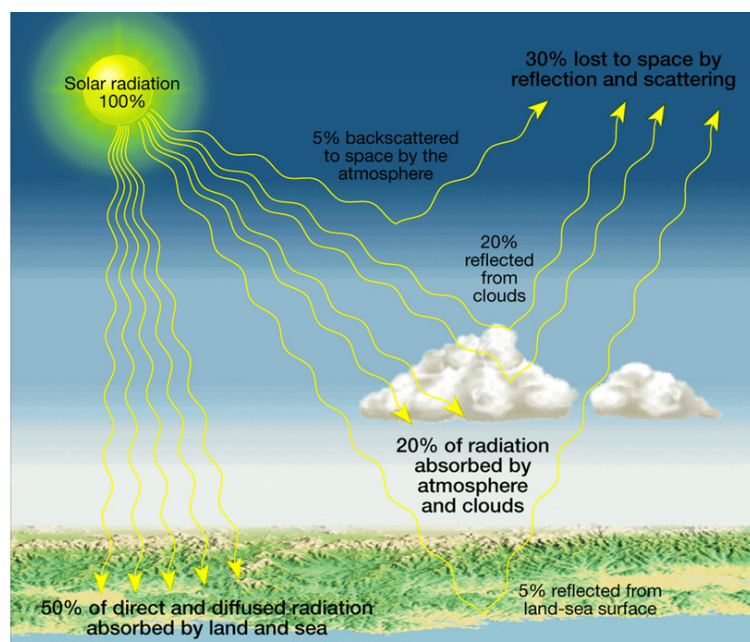
Na igu sola na igu livaliva-makeneta ni serau ni siga. E rawa ni soqoni qai vuki me igu yaga, mv katakata se livaliva, e vica tiko kena icakacaka. E dua, na ulunisola (Solar Photovoltaic (PV) panel) e rawa ni vukica me livaliva. E tiko talega na kena (thermal collector) e dau vakatakata na wai meda sili kina.

Na matanisiga na ivurevure levu ni igu e vuravura. Voleka ni igu kece era bula kina na veiyalava e vuravura (draki, yalava ni veikabula, cowiri ni wai &s.) e vu mai na matanisiga. Na matanisiga e katakata kina o vuravura, cowiri kina na wai, qai rawa kina na bula.

Ni yacovi vuravura mai na cila ni siga, e katakata kina na vanua, waitui kei na macawa. E so na cila ni siga e lauta na delai vuravura, na o se na waicevata qai dri lesu. E levu na cila ni siga ni yacovi keda mai e maroroi qai katakata kina o vuravura. Ia, na cila ga ni siga e vakavuna na draki kei na bula e vuravura.

E levu na igu ni siga e dau yali ni se bera ni tau e vuravura, me vaka e laurai ena Yaloyalo 2 e ra.

YALOYALO 2: Veidewayaki ni serau ni siga²



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

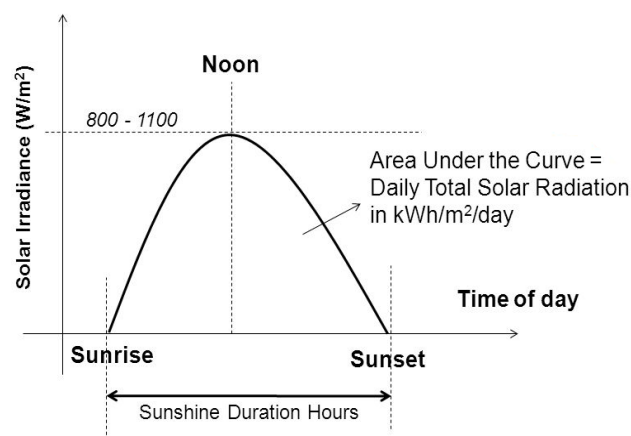
² iVurevure: SlidePlayer, "Slide 42 of Weather and Climate", https://player.slideplayer.com/72/12257222/slides/slide_42.jpg, wiliki ena 25 June 2021.

Dua ga na iwase lailai sara ni igu ni siga e tau e vuravura e vuki me livaliva ena sola.

Me vaka ni dau veitubuyaki na serau ni siga ena loma ni dua na siga, e na vaka talega kina na iyaya era vukica na serau qori me igu.

Ni cabe na siga, e sega ni serau, koya e sega kina ni rawa na livaliva mai na sola. Ni qai cabe tale na siga, sa tubu na kena igu, ena sigalevu tutu sa tudonu, oti ni siro tale na siga e siro vata kaya na livaliva e rawa, me yacova ni sa saiva tale ni dromu na siga. Qo e laurai ena Yaloyalo 3 e ra.

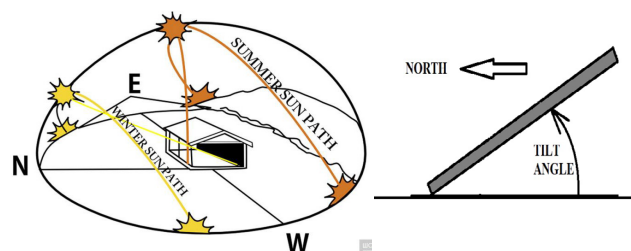
YALOYALO 3: Droini ni serau ni siga³



E dau rawa ga e levu na livaliva mai na sola, ni qarava tuga na siga na ulunisola. Ni davo ga na ulunisola e delanivale se qara tani, ena lusi na igu sola, qai rawa ni tini guce se mate sara kina.

E sega ga ni rawa nida dau veivukiyaka na ulunisola me qara tuga ina matanisiga ni cabesiro tiko. E tiko na kena misini, ia e saulevu qai sega ni veiraurau kei na isau ni sola lalai. Eda kalougata ga ni tiko na sala rawarawa me vaqarai kina na ulunisola me mana. Na dikiri ni kena kala kei na vanua me qara kina e vakatau ena yasai vuravura cava eda tiko kina.

YALOYALO 4: Sala ni siga e loma ni yabaki⁴ kei na kala ni ulunisola⁵



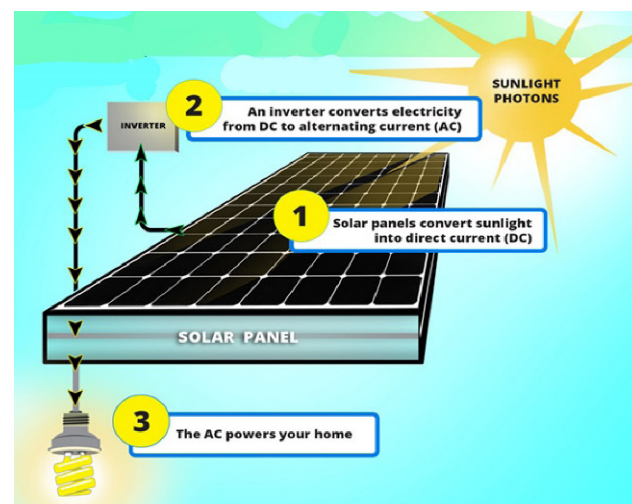
Me vaka e laurai ena Yaloyalo 4, e rewaicake na matanisiga ena vulaikatakata (Diseba) qai rewaira sara ina Noca ena vulaililiwa (June) e Viti. Ena rawa gona ni soqoni vakalevu na igu sola e noda vanua ena loma ni yabaki taucoko nida vakalā na ulunisola kece ena 15-20 dikiri me qara ina Noca.

Ke o vakasola, e qara donu tiko na ulunisola ka donu na kena kala?

Ke sega, o sa vakalusi igu sola beka e veisiga.

Me vaka sa vakamacalataki oti, na igu sola e rawa ni vukici me rua na mataqali igu, na livaliva kei na katakata, me yaga talega. Na Yaloyalo 5 e laurai kina na ulunisola ni vukica na igu sola me livaliva.

YALOYALO 5: Sola ni Vale⁶



Na sola e vukica na igu ni siga me livaliva dodonu (direct current, DC). Sa qai dua na ivuki (inverter) me vukica me livaliva dri (alternating current, AC). Na livaliva qori (240V) e waqa kina na cina.

Na Yaloyalo 6 ina 9 e laurai kina na dui yaga ni igu ni siga. Na Yaloyalo 6 e laurai kina na taqe ni sola (collector) e vakayagataki kina na igu ni siga me vakatakataki na wai (sega ni vakalivaliva). Na Yaloyalo 7 e laurai kina na marama e vakaduri ulunisola me rawa kina na livaliva (vakayagataki na cila ni siga me rawa na livaliva).

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 IVurevure: Wolf Architects, "Good orientation for energy efficiency", <https://wolfarchitects.com.au/wp-content/uploads/2015/01/North-Facing.jpg> wiliki ena May 2021.

⁵ Mohammed Tazil, GGGI

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

Volavola:

[illegible]

10 Yavutaki ena 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>

IVAKADRE 2

1. Cava na ivurevure ni igu ena yaloyalo kece, vola kina na "V"

2. Raica se cava e vukica na igu sola ina livaliva, vola kina na "S"

3. Raica se cava so na mataqali igu e rawa, vola kina na "G"

4. E soli wale na igu sola?

5. E savasavā na igu sola?

6. Na o e vakalailaitaka na igu sola?

7. Na kala ni ulunisola kei na vanua e qara kina e dau vakatau kina na kena vukici na igu sola?

8. Cava na kena yaga vei keda na igu sola?

9. Veivosakitaka vakalasi na vakayagataki ni igu sola vei ira na turaga kei na marama e nomu yasayasa.

IVAKADRE 3

1. Gauna cava e loma ni siga eda rawata vakalevu kina na livaliva? Baleta?

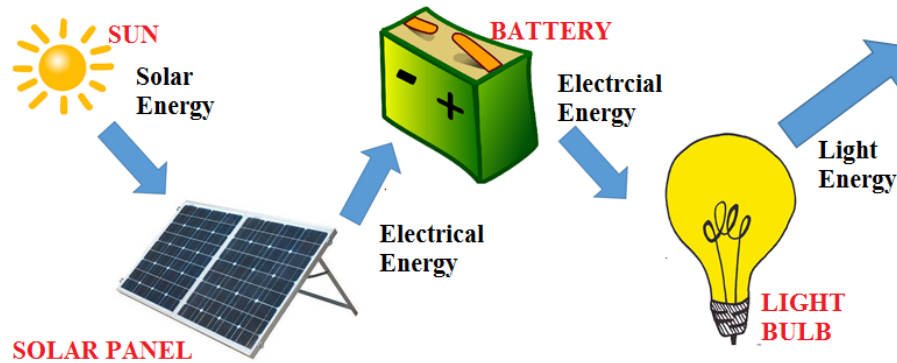
3

Yavu ni
Livaliva

3.1 iGu livaliva

Na igu livaliva e dua ga na mataqali igu. E rawa na livaliva ena levu na sala savasavā, me vaka na haidro, cagi, se igu sola.

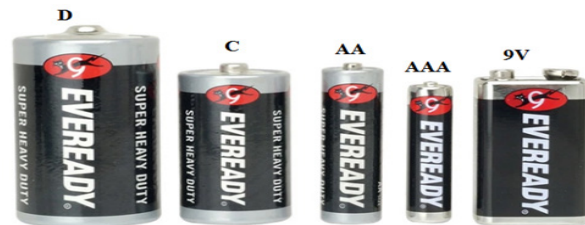
YALOYALO 10: Vuki na igu sola me igu rarama¹¹



Ena Yaloyalo 10, eda raica kina ni ulunisola e vukica na igu sola ni matanisiga me igu livaliva.

Qaqarauni: Na mataqali igu kece e rerevaki sara, se livaliva mai na sola se na bateri se cava, ka rawa ni veivakamavoataki ke da sega ni qarauna matua. Dau muria na idusidusi ni qaqarauni nio cakacaka ena ivurevure ni igu.

YALOYALO 12: So na mataqali bateri lalai¹³



3.2 Na igu ena bateri

Na igu ena bateri e maroroi ena kemiki ra tawa e loma. E so na bateri e sega ni rawa ni jajitaki (me vaka na kena e dau vakayagataki ena retio, na idusi (remote) &s, me vaka e laurai ena Yaloyalo 12. Era maca ga ra biu laivi. Ia na bateri ni sola e jajitaki, me vaka ena Yaloyalo 11 e ra.

YALOYALO 11: Bateri 'Lead Acid' dau jajitaki¹²



3.3 Pawa

Na ivakamacla rawarawa ni 'pawa', na igu e vakayagataki ena gauna yalataki. Na ivakarau ni pawa na Watt (W). Nida kila na pawa era gadreva na iyaya yadudua, eda na kila kina se vica na igu ni bateri e na vakayagataki. E okati talega me 'pawa' na igu livaliva era solia na ulunisola.

YALOYALO 13: Matanicina 4W¹⁴



¹¹ Yavutaki ena Electricity Basics, Arizona State University (VOCTEC), <http://voctec.asu.edu>

¹² Ivurevure: JICA

¹³ Ivurevure: Lazada, "Eveready battery", https://ph-live-01.slatic.net/p/6abf377c3bd40ff76088f4764c8624cb.jpg_2200x2200q80.jpg_webp, wiliki ena 25 June 2021.

¹⁴ Ivurevure: 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>

YALOYALO 14: Ulunisola¹⁵

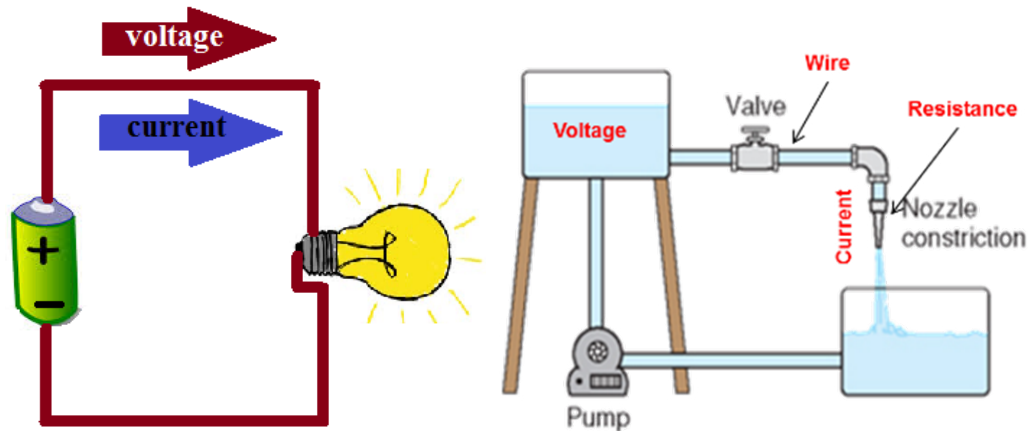


Rawa nio wilika ena yaloyalo qori se vica na pawa e dau solia na ulunisola lailai qo?

3.4 Volt kei na Kui

Na 'volt' na ivakarau ni bi ni livaliva (electrical potential), na bi e biligi ira na mata ni atomi (electron) ena waya, e via vaka toka na bi ni wai ena paipo.

YALOYALO 15: Na volt kei na kui rau cokovata ena pawa – na volt e vaka na bi ni wai ena taqe¹⁶



Na ivakarau ni bi ni livaliva na volt, na ivakarau ni kena kui na Ampere, vakalekaleka na Amp. E rawa ni kainaki ni volt e vaka na titobu ni wai, ia na kui na kena kui tiko. Na wai lalai vovodea madaga eda rawa ni luvu kina, ke kaukaua na kui. E vaka kina na livaliva, veitalia ni lailai na volt – ke kaukaua na kui, eda rawa ni mate kina.

Qaqarauni: na kui kei na volt e rawa nida mavoa bibi kina se mate sara ke curuma na yagoda. Kua sara ni tara na waya tavoci, se mo cakacaka ena sala ni livaliva bula. Muria tikoga na idusidusi ni qaqarauni, se me dua na daunilivaliva vakaivola.

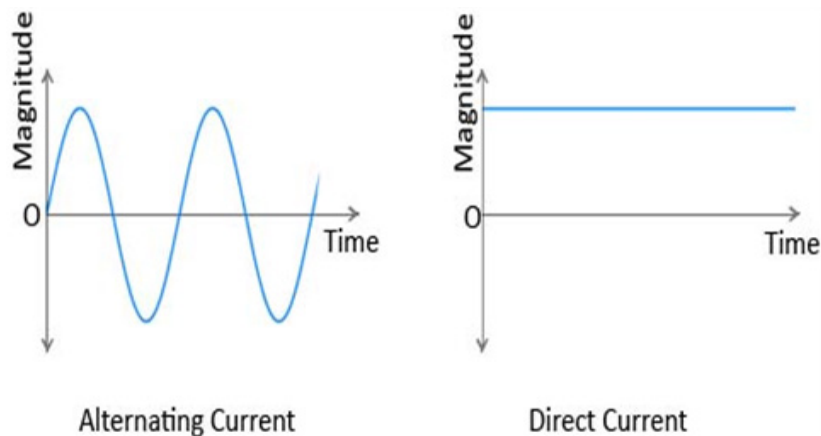
3.5 Livaliva dodonu, Livaliva dri

Na pawa ni bateri e kui tuga. Na kui mai na bateri se sola e vakatokai me livaliva dodonu (direct current, DC). Na livaliva dodonu e kui tuga mai uluniwai (positive) i gusuniwai (negative). E so tale na iyaya, me vaka na jenereita se ivuki (inverter), era soli livaliva dri (alternating current, AC), ni vakauaua tu na kena kui, me vaka e laurai e ra.

¹⁵ Ivurevure: 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 Yavutaki ena Electricity Basics, Arizona State University (VOCTEC), <http://voctec.asu.edu>

YALOYALO 16: Erau duidui na livaliva dri (AC) kei na livaliva dodonu (DC) ni duidui na kena drodro ni toso na gauna¹⁷



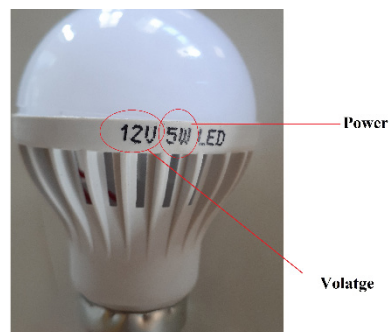
Qo na sabolo ni ivolakabi ni dip (firisa) livaliva dri (AC):

YALOYALO 17: Sabolo ni ivolakabi ni dip (firisa)¹⁸

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	Power Usage			
Rate Current:	0.35A				
Climate Class:	4	Current Usage			
Weight:	46kg				
Haier Medical and Laboratory Products Co.,Ltd.					
Haier Industrial Park,Economic Technology Development Zone, Qingdao 266510.P.R.China					

Eda fikataka na pawa ena noda vakalevutaka (multiply) na volt kei na kui. Ena Yaloyalo 17, eda raica kina na 220V vakalevutaki ena 0.35A kui, sa kena isoqoni na pawa e 77W, me vaka e volai ena ivolakabi ni pawa. E yaga qo ni sega ni tukuni mai na pawa, ni rawa nida vakalevutaka na volt kei na kui. Qo e dua na ivolakabi ni matanicina livaliva dodonu.

YALOYALO 18: iVolakabi ni matanicina livaliva dodonu



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

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

Volavola:

[illegible]

IVAKADRE 4

O dauveituberi me solia vei iratou na lewe ni kalasi e 2 se sivia na ivolakabi ni iyaya livaliva dri (AC) me vaka na matanicina se na irinicagi. E solia talega e 2 na ivolakabi ni iyaya livaliva dodonu (DC) me vaka na matanicina kei na katoniwaililiwa (ke rawa). Me qarauna me kua ni tukuni vei iratou na duidui ni iyaya. Me ratou cakava qo vakaiwasewase:

- Dusia na iyaya livaliva dri kei na kena livaliva dodonu.
- Wilika na volt kei na kui ni iyaya qori.
- Tukuna se vica na pawa ratou dui vakayagataka.

YALOYALO 19: Matanicina livaliva dri 220-240V, 3W, 0.01A¹⁹



YALOYALO 20: Irinicagi livaliva dri, 220V, 55W, 0.25A²⁰



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

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

YALOYALO 21: Cina livaliva dodonu 12V, 6W, 0.5A²¹



YALOYALO 22: Dip (firisa) livaliva dodonu, 12V/24V, 55W, 4.58 A/ 2.29A²²



21 Ivurevure: AliExpress.com, <https://www.aliexpress.com/item/1316122622.html>, wiliki ena 25 June 2021.

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

4

Gacagaca
ni Sola

Na gacagaca lelevu ni sola kei na kedratou itavi e laurai ena teveli e ra.

IVAKADRE 5

YALOYALO 23: Ulunisola (PV Module)²³



- Na ulunisola (photovoltaic (PV) module) e vukica na igu sola me livaliva. Na ivurevure ni igu na cila ni siga, na vuana na livaliva dodonu (DC). Na ulunisola e sema kei na idoladola (controller) me jajitaki na bateri.

YALOYALO 24: Bateri²⁴



- Na bateri na iyaya e maroroi kina na igu livaliva ena igu kemiki, qai vukici kina na igu ya me livaliva. Na bateri 'lead acid' kune vakalevu e rawa kina e 12V na livaliva dodonu (DC). Rau sema na bateri kei na kena idoladola (controller).

YALOYALO 25: iDoladola²⁵



- Na itavi levu ni idoladola (charge controller) me lewā na kena jajitaki na bateri mai na ulunisola. E tarova kena jajitaki sivia kei na soli livaliva vakasivia, e lewā tale beka ga na volt ni bateri me kua ni lailai se sivia. Ke sega qo, e rawa ni guce kina na bateri se lekaleka na kena bula, e rawa talega ni rerevaki vei keda. E yaga sara gona kina vakalevu na idoladola me bula balavu kina na bateri.

YALOYALO 26: iVuki²⁶



- Na ivuki (inverter) na iyaya livaliva se sala ni livaliva e vukica na livaliva dodonu (DC) me livaliva dri (AC).
- Na ivuki e dau gadrevi kina na livaliva dodonu e dei vinaka tu (12V, 24V &s) e rauta mera yavala kina na iyaya livaliva dri (AC).

Na vua ni ivuki e dau vakalevu me lewai me tautauvata kei na volt ni lawalevu (grid), vakalevu me 240 V AC.

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

²⁴ Ivurevure: JICA

²⁵ Yavutaki ena System Components: Charge Controllers & Inverters, Arizona State University (VOCTEC), <http://voctec.asu.edu>

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

YALOYALO 27: Wa²⁷



- Na wa ni livaliva e dau sema kina na iyaya, me dewa kina na itukutuku se na igu livaliva. Na wa ni sola e dodo mai na ulunisola ina idoladola, dewa sara ina bateri kei na iyaya livaliva dodonu (DC).

YALOYALO 28: iVakariba (circuit-breaker/Isolator)²⁸



- Na ivakariba (circuit breaker) na gacagaca e dau riba vakataki koya me kua ni ca kina na sala ni livaliva ni usabi se sot. E tarova na drodro ni livaliva ni sa kune e dua na leqa.
- Na isolator e latia na iyaya se sala livaliva mai na ivurevure ni livaliva.

YALOYALO 29: Suiti²⁹



- Na suiti (switch) na gacagaca livaliva me dolava se sogota na livaliva ni cina &s.

YALOYALO 30: Na vu ni livaliva³⁰



- Na vu ni livaliva (power outlet se powerpoint) na gacagaca e coba kina na wa ni iyaya me sema kei na livaliva dri (AC).

27 Ivurevure: Global Market, http://newimg.globalmarket.com/PicLib/group0/5e/73/c477defc613ecc9a0e47b82452f4_1.jpg

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

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

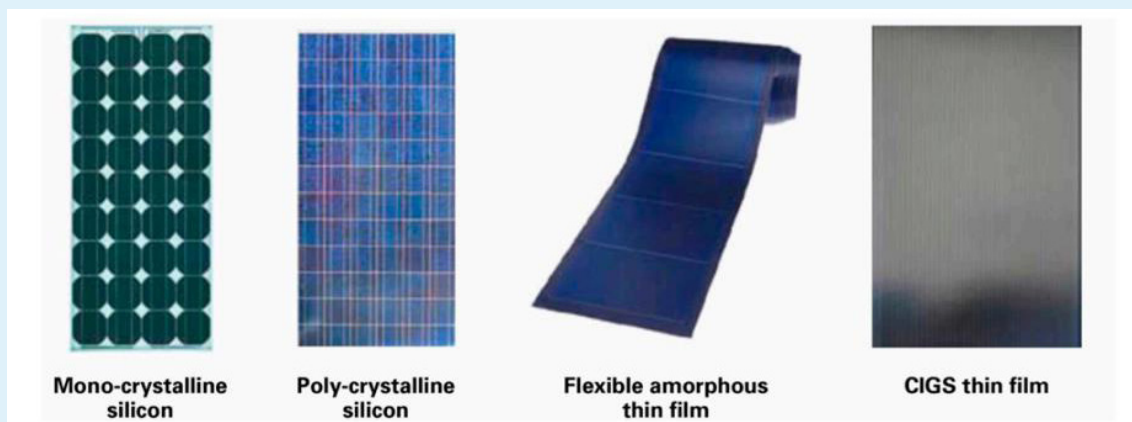
1. Cava na yaga ni ivuki (inverters)?

2. Cava na yaga ni bateri?

Volavola:

Me veivosakitaki tale: Mataqali Ulunisola

E levu tu na mataqali ulunisola, ia e vakayagataki vakalevu na 'mono-crystalline' kei na 'poly-crystalline' me vaka e laurai e ra. E duidui nodratou gumatua na vukica na igu sola me livaliva.

YALOYALO 31: Mataqali ulunisola³¹

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

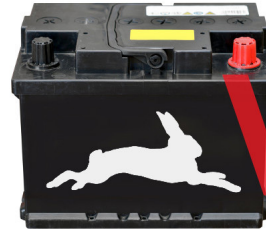
4.1 Mataqali Bateri

E levu tu na mataqali bateri ni sola, ia e vakayagataki vakalevu na 'lead acid'.

E vakamacalataki na duidui ni bateri 'totolo' kei na ka 'malua' ena Yaloyalo 32 e ra.

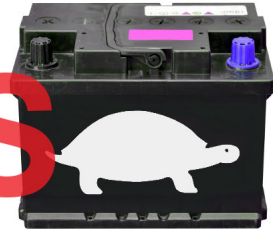
YALOYALO 32: Bateri totolo (starter) kei na malua (deep cycle)³²

Starter Battery:



Like the "hare", starter batteries are great for quick bursts of power, but not so good for slow and steady power delivery.

Deep Cycle Battery:



While deep cycle batteries can be used for any purpose, they're typically utilized as a source of continuous power...sort of like the "tortoise."

Volavola:

³² | Vurevure: Off Road Aussie.com, "Deep-Cycle vs Starter Batteries", <https://offroadaussie.com/wp-content/uploads/2015/07/deep-cycle-vs-starter-battery.jpg>, wiliki ena 25 June 2021.

5

Mataqali
Sola

Sa oti nodatou dikeva na gacagaca ni sola ena vica na wase sa sivi, kena qo me datou raica kina na veimataqali sola (PV system).

E tolu na mataqali sola:

- Sola tugalala (sega ni lawalevu)
- Sola lawalevu
- Sola veimama

Dina ni levu tu na mataqali sola, ena leseni qo datou na dikeva matua ga na sola tugalala livaliva dodonu (DC standalone system, sola ni vale) me rawarawa vei ira na lewe ni kalasi.

5.1 Sola tugalala (sega ni lawalevu)

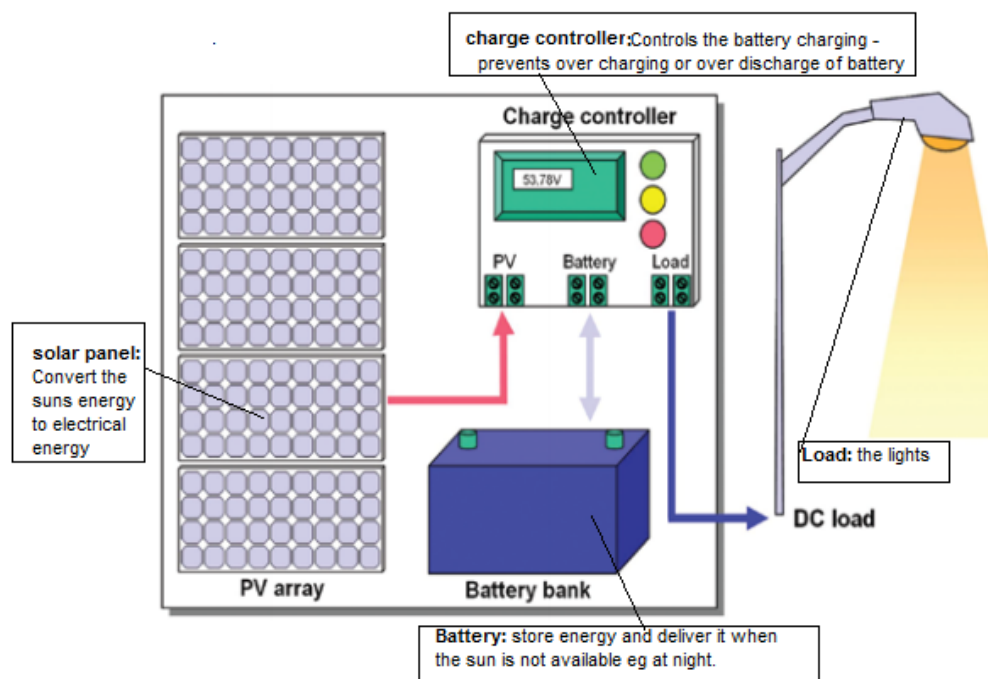
Na sola tugalala e sega ni sema kei na lawalevu (grid), e vakadurī vakalevu ena vanua yawa sega ni sema kei na lawalevu, se na vanua e sega ni gadrevi vakalevu kina na livaliva. Era dau yadua tu na bateri me soli livaliva dodonu ena bogi. E so e tiko na kena ivuki (inverter), me yavala kina na iyaya livaliva dri (AC).

5.1.1 Sola tugalala livaliva dodonu (DC)

Na gacagaca ni sola tugalala livaliva dodonu (DC) e volai tu e ra:

- Ulunisola
- iDoladola
- Bateri
- iYaya livaliva dodonu (Matanicina, Retio &s)

YALOYALO 33: Sola tugalala livaliva dodonu³³

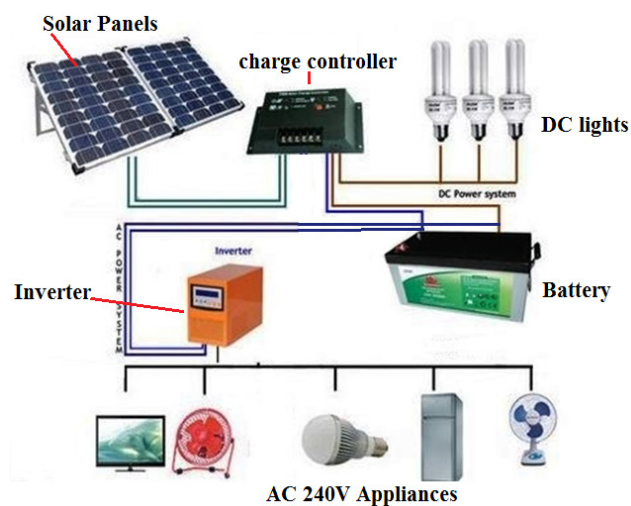


Na inaki ni sola tugalala livaliva dodonu me waqa se yavala kina na iyaya ni vale mv cina, jaja, irinicagi beka se retio. Me vaka ni sega na ivuki (inverter), e sega ni rawa ni yavala kina na iyaya lelevu livaliva dri (AC).

5.1.2 Sola tugalala livaliva ruarua (AC+DC)

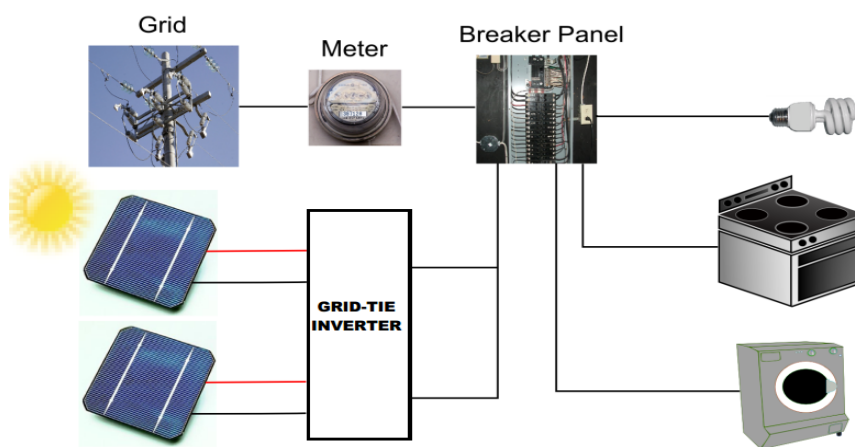
Na sola tugalala livaliva ruarua e via vaka ga na kena livaliva dodonu, qai tiko tale na kena ivuki (inverter) koya e rawa ni cici talega kina na iyaya livaliva dri, me vaka e laurai ena Yaloyalo 34.

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

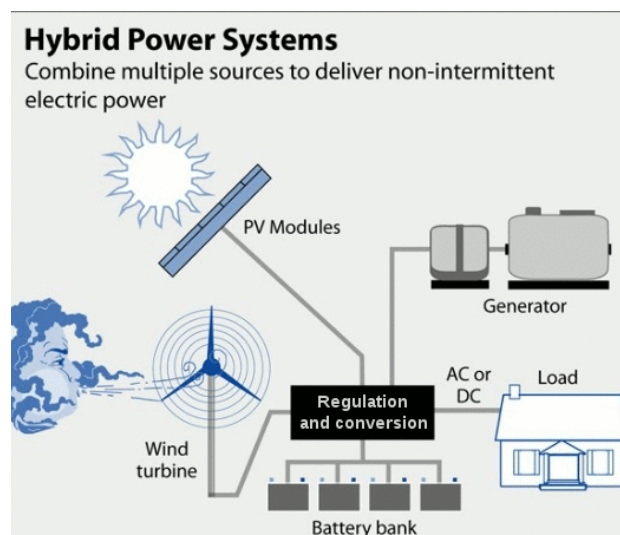
YALOYALO 34: Sola tugalala livaliva ruarua (AC/DC)³⁴**5.2 Sola lawalevu**

Na mataqali sola qo e sega ni ganita na vanua yawa sega kina na lawalevu (grid).

E dau kune vakalevu ga ena vanua e tu kina na lawalevu. Na ivuki (inverter) e vukica na livaliva ni sola – livaliva dodonu (direct current, DC) – me livaliva dri (AC) me veiganiti na livaliva kei na lawalevu. Na mataqali sola qo e sega ni rawa ni lawalevu vakataki koya, e rawa ga ni sema kei na lawalevu sa tu rawa me soli livaliva kina.

YALOYALO 35: Sola sema ina lawalevu³⁵**5.3 Sola veimama**

Na sola veimama sa mai taleitaki vakalevu. E ganita na vanua e bau tarabi kina na isau ni livaliva ni lawalevu. Na bateri e rawa ni jajitaki ena siga qai vakayagataki ena bogi.

YALOYALO 36: Sola/cagi veimama³⁶

³⁴ Ivurevure: India mart.com, Solar Grid Tie Energy Storage System, <https://5.imimg.com/data5/VV/TV/MY-11206303/solar-energy-storage-system-500x500.jpg>, wiliki ena 25 June 2021.

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

³⁶ Ivurevure: www.energy.gov, Yavutaki ena, "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/>

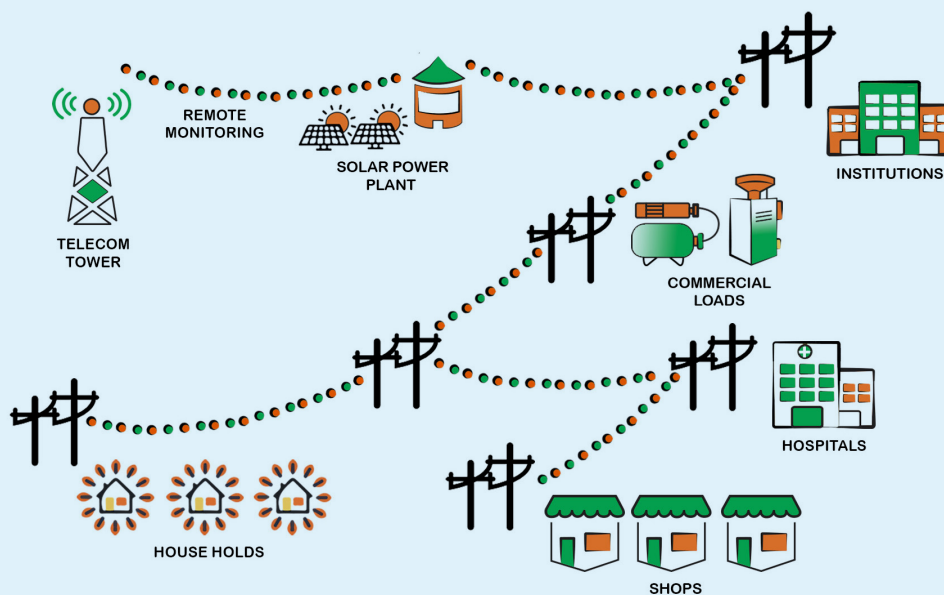
Volavola:

IVAKADRE 6

Talanoa Dikevi ni Sola Lawa Lalai e Viti

Na sola lawa lailai na sola livaliva dri (AC) bau ka levu toka me rauta e dua taucoko na koro, sega ni dua ga na vale. E rawa ni vakamita na vale yadudua, me saumi kina na livaliva.

YALOYALO 37: Sola Lawa Lailai³⁷



Na kena livaliva e tautauvata ga kei na kena e kune ena veitaoni era vakalawa levu, sa na rawa gona ni cici kina na veimataqali iyaya livaliva dri, ia ena vakatabui beka kina e so

na iyaya lelevu de qai guce. Na ilavo e rawa mai na mita e dau vakalevu me suka vei itaukei ni sola, me yaga ena kena qaravi, voli gacagaca, se cava tale e gadrevi ena kena cicivaki.³⁷

³⁷ Vurevure: <https://www.taraurja.com/mini-grid-model/>, Wiiki ena 4/11/2020

Talanoa dikevi 1: Sola Lawa Lailai mai na yanuyanu o Vio

YALOYALO 38: Sola lawa lailai mai Vio³⁸



Na sola lawa lailai mai na yanuyanu o Vio mai Lautoka e soli igu sola savasavā vei ira na sivia na le 200 na lewe ni yanuyanu. A vakaduī ena Fiji Rural Electrification Fund (FREF) ena 2019.

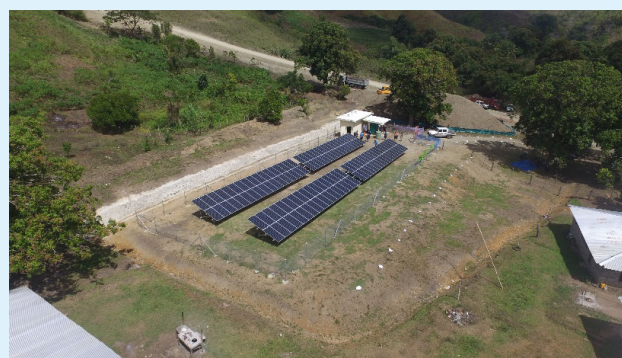
Na sola qo (Yaloyalo 38)³⁹ e vakayagataki kina na veiyaya vovou me vaka:

- Ulunisola e qele se delanivale,
- Bateri **kei na ivuki** (e lalaga, dromodromo damudamu),
- Bateri levu 'lead acid' sogo tuga, sega ni gadrevi me qaravi (e ra, dravudravu),
- iYaya ni tataqomaki kei na veivotayaki (kisi dravudravu e lalaga)
- Idini disili (mawi) de qai guce se mate na sola ni veitaravi na siga rugurugua,
- Ka bibi duadua, na icakacaka ni mita e laurai ena veilawa (kompiuta).

Sa inaki ni FREF me vakalivaliva e 300 na koro se itikotiko ena yabaki 10 mai qo.⁴⁰

Talanoa dikevi 2: Sola Lawa Lailai mai Nakoro

YALOYALO 39: Sola Lawa Lailai mai Nakoro



38 Vurevure: GGFI Fiji, 2020

39 Ivurevure: Clay Energy, 2020.

40 Ivurevure: Fiji Sun News, [https://fijisun.com.fj/2019/05/03/pm-villagers-will-realise-true-economic-potential-new-businessopportunities/Wiiki ena 15/06/2021](https://fijisun.com.fj/2019/05/03/pm-villagers-will-realise-true-economic-potential-new-businessopportunities/Wiiki%20ena%2015/06/2021)

Na sola lawa lailai mai Nakoro, Navosa, e soli igu sola savasava vei ira na sivia na le 200 na lewenikoro ena 41 na vale.⁴¹ Vakadurī ena 2020, na sola qo (Yaloyalo 39)⁴² e vakayagataki kina na iyaya vovou sara, me vaka:

- Ulunisola 50kW e qele,
- Bateri kei na ivuki (inverter) (loma ni valeniidini),
- Bateri levu Lithium (loma ni valeniidini),
- iYaya ni tataqomaki kei na veivotayaki (loma ni valeniidini)
- Idini disili (matau, drokadroka) de qai guce se mate na sola ni veitaravi na siga rugurugua,
- Ka bibi duadua, na icakacaka ni mita e laurai ena veilawa (kompiuta).

Volavola:

41 Ivurevure: Fiji Times, <https://www.fijitimes.com/pm-bainimarama-commissions-hybrid-solar-power-system/>, Wiliki ena 16/06/2021

42 Ivurevure: Clay Energy, 2020.

6

Qaqarauni
ena Sola

Qo e so na idusidusi meda muria nida qarava na sola, de qai yacovi keda na leqa.

1. Me dau boko na livaliva nio vakarau sema e dua na iyaya, se dikeva se moica e dua na ka. E tabu na cakacaka ena sala ni livaliva bula.

YALOYALO 40: Volai meda qaqarauni⁴³



2. Kevaka o via cakacaka ena sola se waya ni vale, qai sega ni matata vei iko kena icakacaka, kerea vua e dua na kenadau vakaivola me cakava. Kua sara ni tovolea mo cakacaka ena waya ni vale, de qai caka cala qai vakavuna na kama, kati livaliva, mavoia se mate.

YALOYALO 41: Vaqaniliga⁴⁴



3. Dau qaqarauni matua, yawaki ira na gone mai na veika livaliva. Ke dua e cakacaka ena iyaya levu na kena volt, me vakaiyaya ni qaqarauni (PPE, personnel protective equipment) mv qaniliga rava, matailoilo ni tataqomaki kei na kena ivava bibi, ke tiko.
4. Kua sara ni tovolea mo ripeataka na bateri. Na bateri e tawa kina na kemiki rerevaki, ke cila mai e rawa nida mavoia bibi kina. Na bateri e tawa vakalevu talega kina na igu, ke sottaki – me rau sota na sucuna ruarua – e rawa na mavoia bibi se mate.

YALOYALO 42: Me qarauni na waikama⁴⁵



5. E tabu ni maroroi na bateri e yasa ni matadravu se loma ni rumunigade – e so na bateri era kuvuraki kasi gaga se kasi kama rawarawa, dina nida sega ni raica.

YALOYALO 43: Me qarauni na kubou⁴⁶



6. E tabu ni maroroi na bateri e vanua qiko se veitikivi kei na benisini se karasini, de qai lidika qai caudre. Na bateri me dau maroroi e vanua cagicagi.

YALOYALO 44: Me qarauni na bateri⁴⁷



7. Ke rawa, vakabeleti ni qaqarauni (harness) me vesu ena vale se ka e dei nio kaba e delanivale se vanua rewa mo vakaduri sola. Ke o sega ni kena dau, e vinaka mo kerea e dua me veivuke se cakava na cakacaka.

⁴³ Ivurevure: AviationPros, <https://www.aviationpros.com/tools-equipment/safety-equipment/article/11148860/ground-handling-safety-signs>

⁴⁴ Ivurevure: Safety workblog.com, <https://safetyworkblog.com/assets/understanding-the-2015-edition-of-nfpa-70e-the-arc-flash-hazard.jpg>

⁴⁵ MSDS online, <https://www.msdsnline.com/2014/07/22/sulfuric-acid-safety-tips-sulfuric-acid-msds-information/>

⁴⁶ Ivurevure: National Safety Signs, <https://nationalsafetysigns.com.au/wp-content/uploads/2020/02/D10332-Toxic-Fumes-sign.png>

⁴⁷ We Need Signs.com, "Ansi Battery Charging Safety Signs", <http://www.weneedsigns.com/home.php?cat=403>

YALOYALO 45: Vakabeleti me vesu vakavinaka⁴⁸


8. Mo kila ni ulunisola e vakavure livaliva tuga, se lailai vakacava na cila ni siga. Qarauna mo kua sara ni tara na waya, veitalia nio qarava tiko se samaka tiko.

YALOYALO 46: Qaravi ulunisola na marama⁴⁹


9. Na ulunisola kei na kena duru e rawa ni katakata sara ena siga, vaka talega kina na delanivale, mo qarauna gona mo vaqaniliga kei na iyaya ni tataqomaki (PPE), ke tiko, nio tara na ka katakata nio qarava se samaka tiko.

YALOYALO 47: Vaqaniliga kei na iyaya ni tataqomaki⁵⁰


10. Qarauna mo dau muria na lawa ni ikabakaba nio kaba mo qaravi sola e delanivale. Na ikabakaba me kala ena 75 na dikiri se sivia mai na qele. Qarauna me toka dei na ikabakaba ena qele tautauvata. Me dua e taura dei na vu ni ikabakaba me kua ni sisi.

YALOYALO 48: Muria na lawa ni ikabakaba⁵¹


48 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>

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

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

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

Volavola:

IVAKADRE 7: VAKADURI SOLA LIVALIVA DODONU (DC)

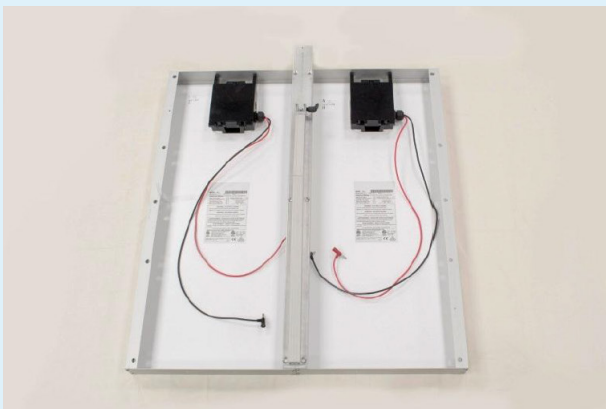
Ena ivakadre qo, o dauveituberi me vakaraitaka kena semasemai na sola livaliva dodonu. E rawa ni lesi e so na lewe ni kalasi me ratou veivuke. Ena gadrevi kina na iyaya qo (mai na VOCTEC):

1. Ulunisola, kena duru kei na skru
2. Veiwaya (wiring board) MTT
3. Qaniliga kei na matailoilo ni qaqarauni

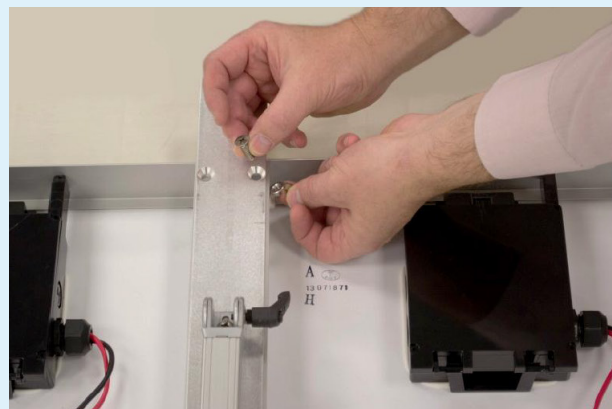
4. Bateri kei na kena bereki
5. iVakariba livaliva dodonu
6. Lawalawa ni sola (me vakarurugi)

Semasema mada na ulunisola e rua. Muria na idusidusi ena yaloyalo e ra. Lewe ni kalasi me vakatarai me vaqaqaco ga vakalailai.

1.



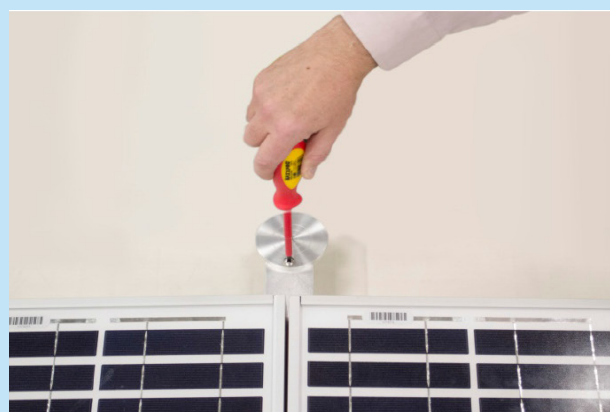
2.



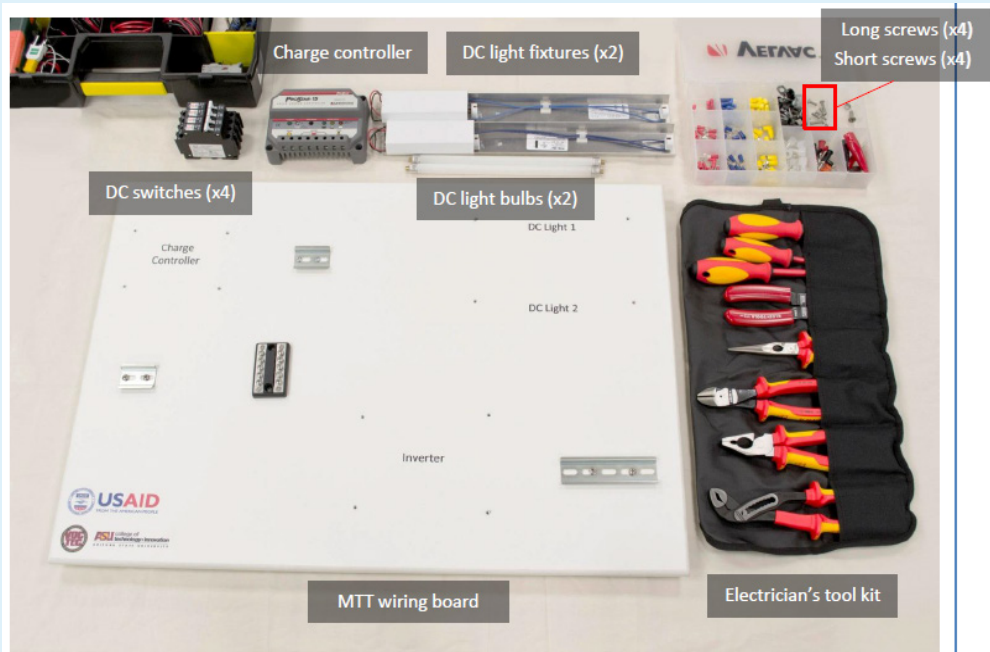
3.



4.

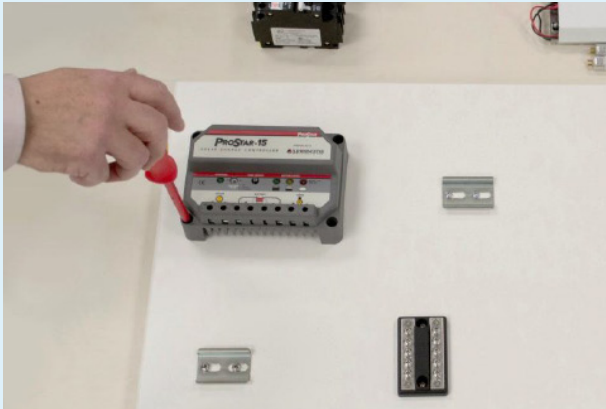


Na yaloyalo tarava e laurai kina na iyaya ni vuli sola na VECTEC.

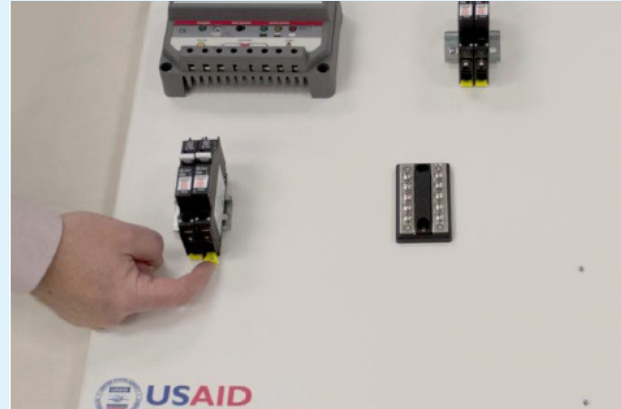


Na veitaratatavi ni semasema e tabaki ena tabana tarava. Me ratou vakarorogo na lewenikalasi vei dauveituberi.

1.



2.



3.

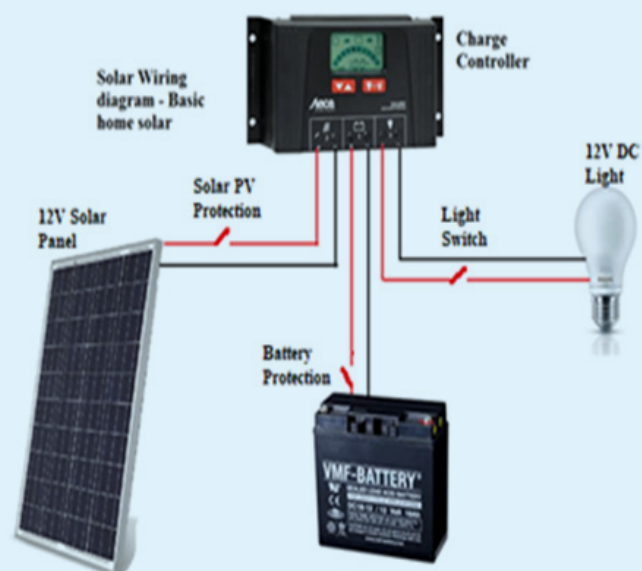


4.



Semasema ni waya

YALOYALO 49: Droini ni semasema⁵²



52 Yavutaki ena Electricity Basics, Arizona State University (VOCTEC), <http://vottec.asu.edu>

1.



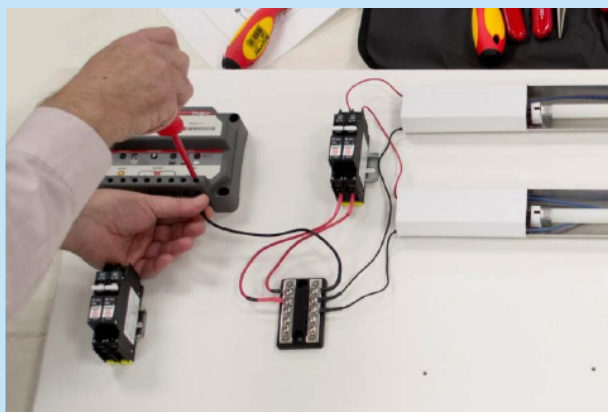
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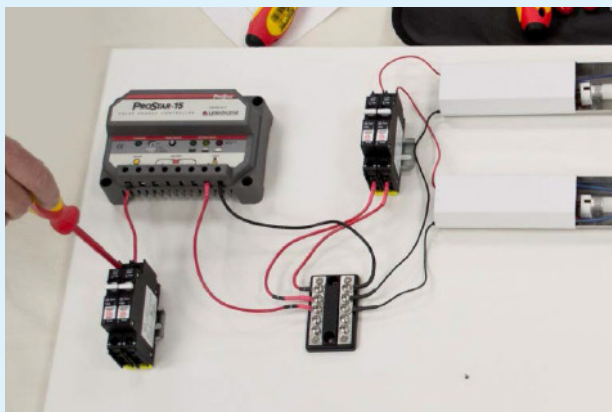
3.



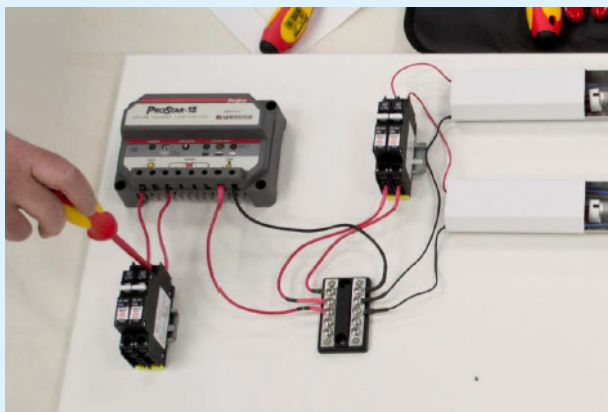
4.



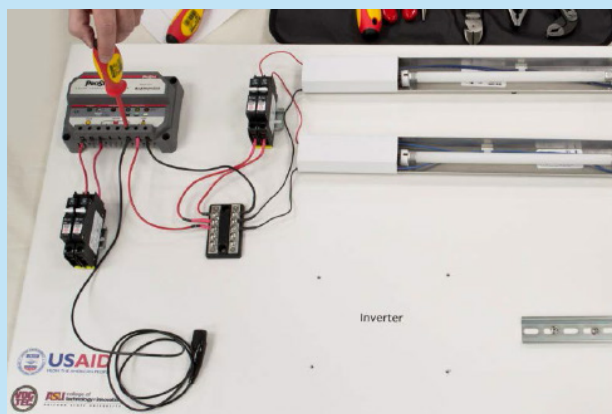
5.



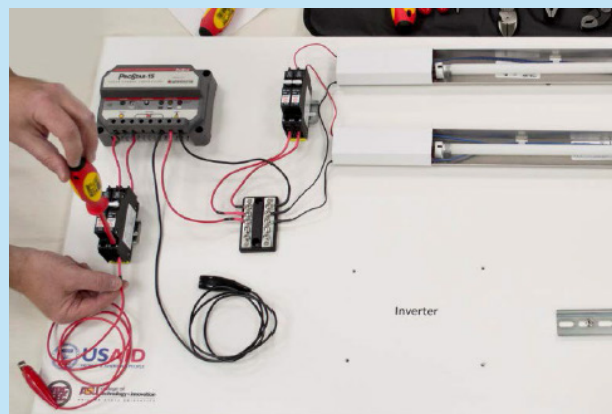
6.



7.

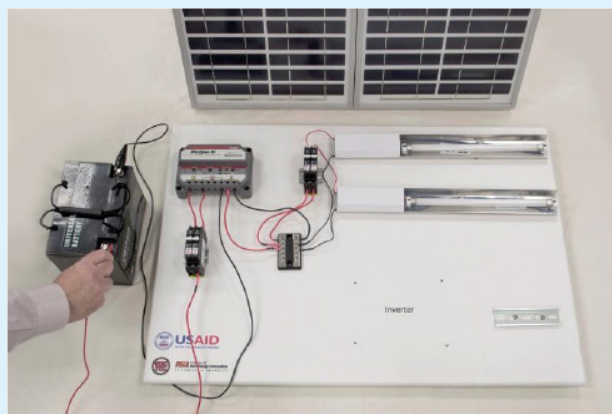


8.

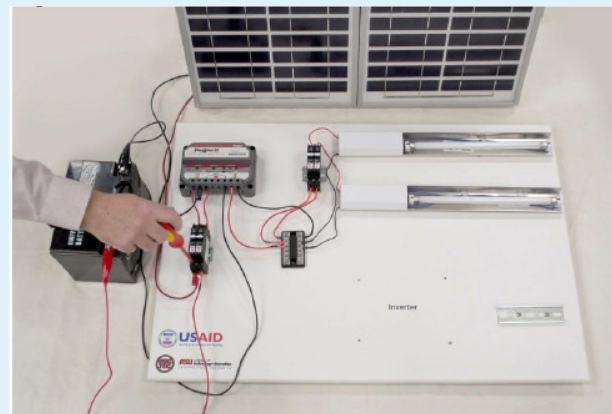


Otioti ni Semasema

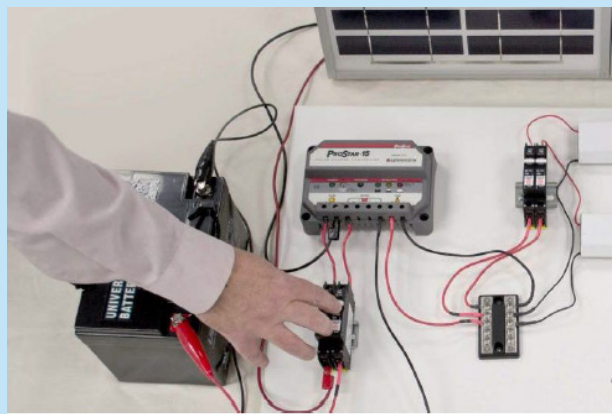
1.



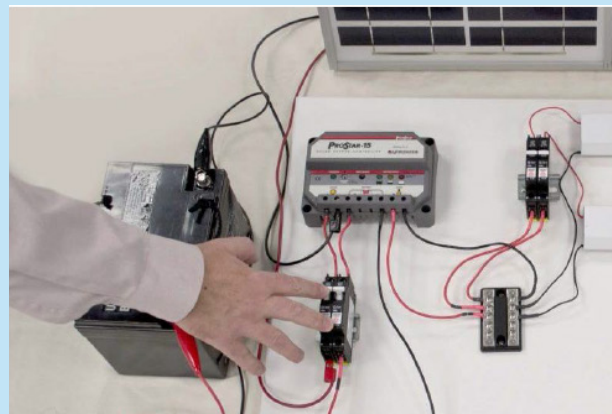
2.



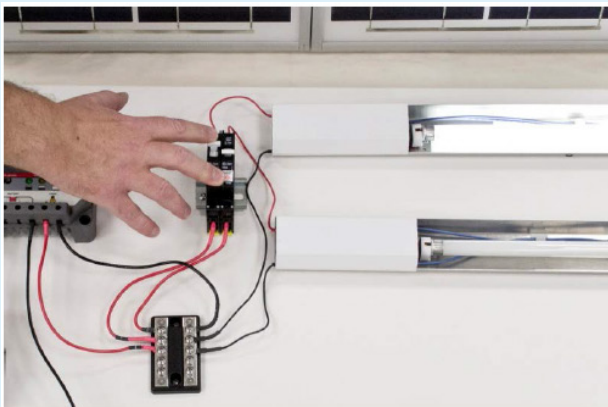
3.



4.



5.



6.



Ni dola ga na kena livaliva, na idoladola (controller) ena jajitaka na bateri ena qai waqa na cina livaliva dodonu. Me ratou dikeva na lewenikalasi qai vakatataro.

IVAKADRE 8: VAKARUGUTI NI ULUNISOLA

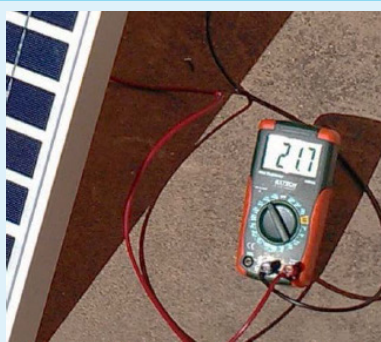
Ena ivakadre qo eda vulica kina ni vakaruguti e lailai na igu e rawa mai na ulunisola.

Eda vulica talega kina na vakayagataki ni mita liga (multi-meter) kei na mita iqamu (clamp meter). E laurai ena yaloyalo e ra na veitarataravi ni ivakadre, kena ivakamacala e itavi nei dauveituberi.

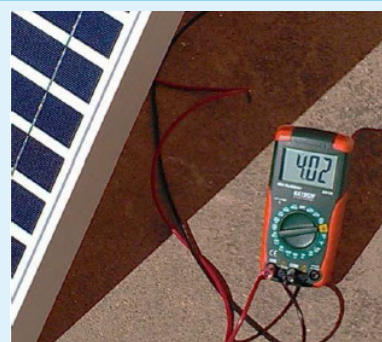
1.



2.



3.



Baleta na vakarautaki volt:

- E vakarautaki dui sala (in parallel) na volt ni ulunisola.
- Na mita liga me dusimaki kina na "DC Voltage".
- Na ligana damudamu me tara na waya + (positive) ni ulunisola.
- Na ligana loaloa me tara na waya - (negative) ni ulunisola.
- Ena vakaraitaki ena mita na volts ni ulunisola.

Baleta na vakarautaki kui:

- E vakarautaki salavata (in series) na kui ni ulunisola.
- Na mita liga me dusimaki kina na "DC Current".
- Na ligana damuamu me tara na waya + (positive) ni ulunisola.
- Na ligana loaloa me tara na waya - (negative) ni ulunisola.
- Ena vakaraitaki na kui ni ulunisola.

Qaqarauni: KUA SARA NI VAKARAUTAKA NA KUI NI BATERI. Qo ena sottaki kina na bateri, vakacacani na iyaya, rawa nida mavoa bibi kina. E rawa ga ni vakarautaki na kui ni ulunisola yadua se sala ni livaliva ena iyaya.

Vakarautaka tale na volt kei na kui me vakaruguti, me vaka e laurai e ra:

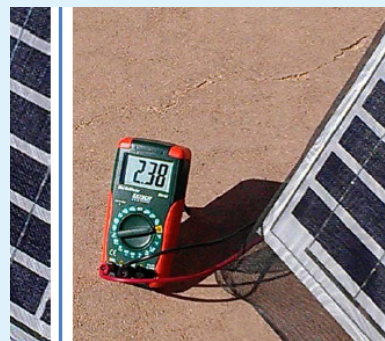
1.



2.



3.



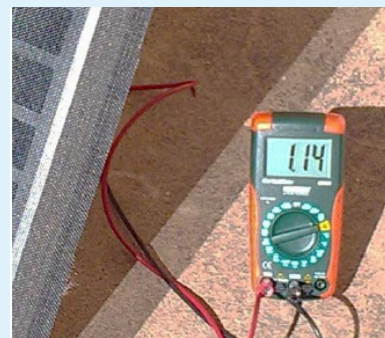
4.



5.



6.



O na vakadinadinataka ni noda vakaruguta na ulunisola se noda vagolea tani mai na matanisiga, e na lutu ruarua na volt kei na kui, mani lutu vaka kina na igu e solia.

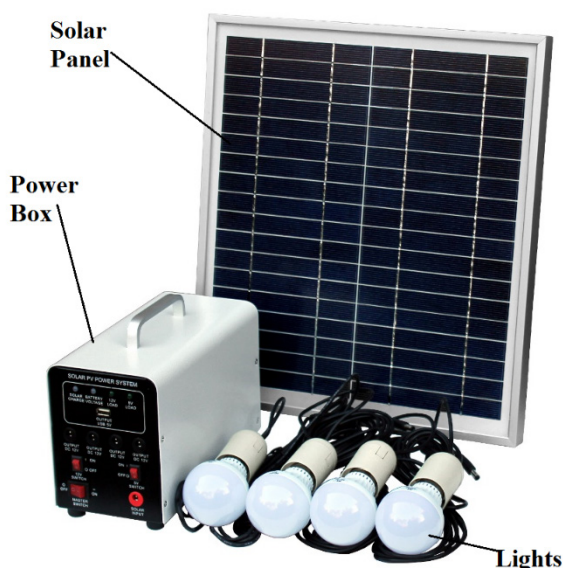
7

Voli Sola

7.1 Voli sola ni cina

Qo e dau vakalevu me dua na ulunisola, kena kato kei na vica na matanicina. Na kato ni sola e tiko kina na bateri, idoladola kei na vunilivaliva me sema kei na cina, e so talega e tu kina na mataqali vunilivaliva (USB port) me jajitaki kina na talevoni.

YALOYALO 50: Sola ni cina⁵³



Nida voli sola ni cina, meda dikeva se vica na dede ni kena yalataki (warranty), na ka vivinaka dau yabaki 2, na ka sega so ni vinaka e rawa ni vula vica ga.

7.2 Voli sola ni vale (solar home system, SHS)

E lalai na sola ni cina, lelevu na sola ni vale, levu na kena gumatua, ka rawa ni cici kina na cina, irinicagi, firisa, ivuki (inverter), bateri, idoladola (charge controller) kei na iyaya tale eso.

Ia e sega ni rawa mo lai volia na sola ni vale cava ga me cici kina na iyaya ni vale. E gadrevi me dua na kena dau me vakarautaka na kena levu qai tuvatuva me veirauti kei na iyaya me na cici kina.

Qo me tarogi vei koya e volitaka:

1. E yalataki na kena vinaka (warranty)?

YALOYALO 51: iVolakabi ni Yalayala (Warranty)⁵⁴



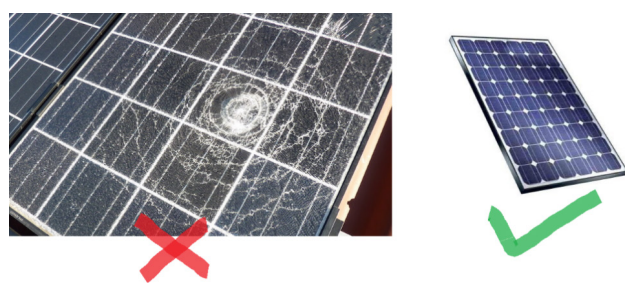
2. Na ulunisola e volitaki vata kei na kena itutu (mounting fixture)?

YALOYALO 52: iTutu ni Ulunisola⁵⁵



3. Vakadeitaka ni sega ni ca.

YALOYALO 53: Ulunisola ca⁵⁶



4. Nida voli bateri, meda kerei koya e volitaka me vakaraitaka kena volt.

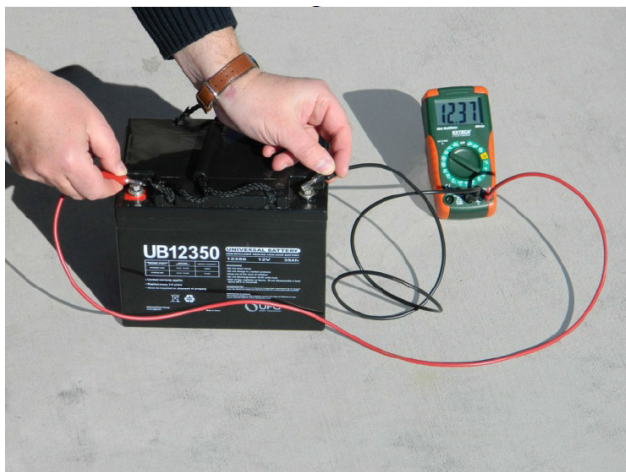
⁵³ Ivurevure: Amazon, "Complete Solar Lighting Kit", <https://www.amazon.co.uk/Off-Grid-Lighting-System-Lights-Battery-White/dp/B00HOEGHSY>, wiliki ena 25 June 2021.

⁵⁴ Ivurevure: PNGWING, <https://www.pngwing.com/en/free-png-kfvth>

⁵⁵ 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/>

⁵⁶ Twitter.com, Solar Energy World, <https://twitter.com/solareworld/status/1186417038610386945>

YALOYALO 54: Kere veivuke vei koya e volitaka⁵⁷



5. Vaqara na yaca ni kabani rogo ena iyaya vivinaka

YALOYALO 55: Kabani rogo ena iyaya vivinaka⁵⁸



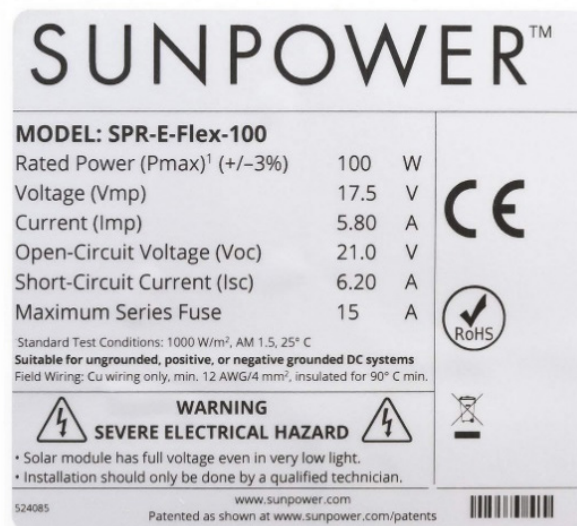
6. Nida voli ivuki (inverter), tarogi koya e volitaka se vu mai kina na ua savasavā (pure sine wave), baleta qori e vu mai kina na livaliva uasivi.

YALOYALO 56: iVuki⁵⁹



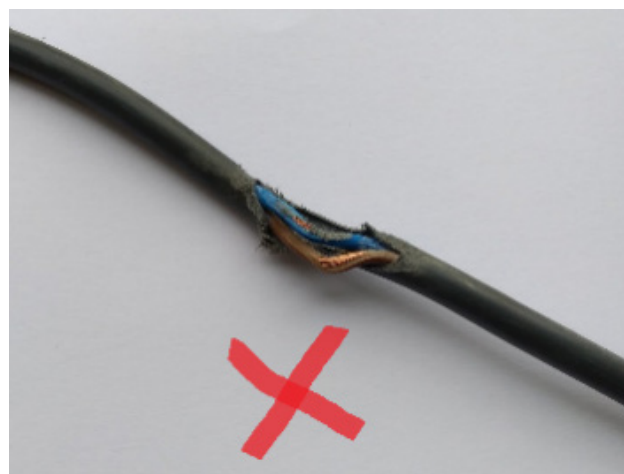
7. Dikeva matua na ivolakabi ni gacagaca kece. E so na iyaya e dau tawa cala ena kateni.

YALOYALO 57: iVolakabi⁶⁰



8. Qarauna ni sega ni rerevaki na vakayagataka.

YALOYALO 58: Kua ni volia na iyaya vakacacani⁶¹



9. Dau vakacuru sitoa mo kila na itukutuku matailalai ni iyaya o via volia – kena isau, kena vinaka, kena yalataki (warranty), kena levu, kabani, nuitaki &s.

⁵⁷ Amazon.com, "Electric Measuring instrument", <https://www.amazon.com/Electric-Measuring-Instrument/s?k=Electric+Measuring+Instrument>, wiiki ena 25 June 2021.

⁵⁸ Coulee Energy, "How to choose a right panel solar", <https://couleenergy.com/how-to-choose-a-right-solar-panel/>

⁵⁹ Goughlui.com, "The Power Inverter", <https://goughlui.com/2014/07/30/review-teardown-hip-300-300w-pure-sine-wave-power-inverter/>

⁶⁰ Ivurevure: Pinterest, "SunPower Marine Flexible Solar Panels", <https://www.pinterest.com/pin/714735403339440675/>

⁶¹ Ivurevure: IOL, "How to fix frayed cables", <https://www.iol.co.za/technology/how-to-fix-frayed-cables-49412981>

Volavola:

IVAKADRE 9

Voli sola

E so na taro bibi meda taroga:

1. Vica na kena isau?
2. Vica na volt, kui se pawa?
3. E yalataki (warranty) – vica na kena dede?
4. (Ni bateri) vakaraitaka mada kena volt.
5. (Ni matanicina) tovolea mada se vinaka se sega.
6. E tiko vei kemudou kena isosomi?
7. E soli mai kena ivoladusidusi (instruction manual)?
8. Kerea mo vakaraitaka kena vakadurī kei na kena vakayagataki.

8

Qaravi Sola
ni Vale

Na sola kece e dodonu me qaravi wasoma me cici vakavinaka kina qai kua ni vakavu leqa, me bula balavu talega. Ni sega ni qaravi wasoma, ena guce mai, qai tini ca koso na kena gacagaca, qai saulevu kedra ripeataki se sosomitaki.

8.1 Cava era dau ca kina e so na sola?

E levu na ka e rawa ni vakavu leqa ni sola. E so eda vakila ni sa leqa tiko mai, e so tale e dau leqa vakasauri, tabutatau. Kena iwali ga meda vulica na kena ilakolako, qai dau qarava wasoma. Dua na kena sala uasivi me dua noda ivola ni itavi me qaravi (checklist).

8.2 Qaravi Gacagaca

Tou goleva mada kedratou qaravi na dui gacagaca ni sola.

8.2.1 Ulunisola

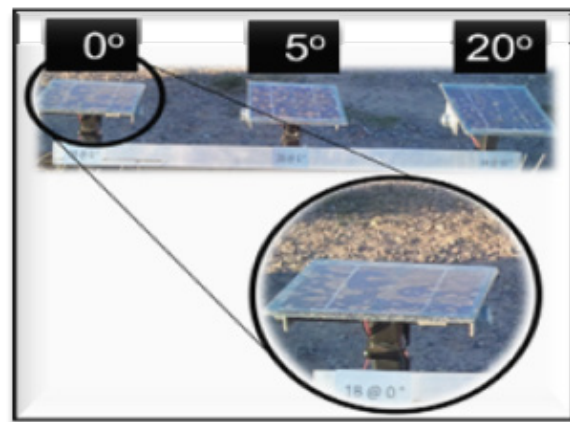
- Dikeva na ulunisola de mavoa ni lauta e dua na ka se kamusu.
- Qarauna me savasava na matana, kau tani na duka se soqosoqo.

YALOYALO 59: Ulunisola Caca⁶²



- Ni duka na ulunisola ena lailai mai na igu e solia

YALOYALO 60: Kena duka e vakatau ena kena kala⁶³



8.2.2 Qaravi bateri

Na qaravi bateri e duidui na kena icakacaka, vakatau se mataqali bateri cava kei na idusidusi ni kabani a bulia, me vaka:

- Dikevi ka samaki na vata ni bateri kei na kena gacagaca kece
- Vakaraautaki na volt ni bateri ke dua nomu mita liga, se o raica ga ena idoladola (charge controller).
- E so na idoladola e vakamatana (display screen), e so na kena lalai era vakacina led me laurai kina na igu ni bateri.

⁶² Jim Dunlop Solar

⁶³ IVurevure: ASU PV/ Reliability Laboratory

YALOYALO 61: Na cina led e dusimaka na igu ni bateri⁶⁴


- E so na mata ni idoladola e vakaraitaki kina na volt ni bateri kei na ivakarau tale eso. Mo wilika kena ivoladusidusi me matata kina na iwalewale ni vakaraitaki ni dui ivakarau.

YALOYALO 62: iDoladola e laurai kina na volt ni bateri⁶⁵


- Na qaravi bateri me dau oka kina noda dikeva na sucuna de veveka se luluqa. Ke bateri luvu, raica na kena wai, ke drekea me tomani ena wai ni bateri. Qo me caka ena veiya 2 – 4 na macawa.
- Na barasi sitila me qua kina na sucuna de veveka mai, ia mo qarauna mo kua ni shottaka. Vaqaniliga rava, ke tiko.
- Dikeva na waya de via taluva se mavoa. Ni mavoa na waya, vaqara na kenadau me veivuke.

YALOYALO 63: Qua sucu ni bateri veveka⁶⁶


Qaqarauni: E daumaka mo vakamatailoilo ni tataqomaki kei na qaniliga rava ni o qaravi bateri. Nio qarava na bateri luvu (vakawai), mo vakaisuai, de sikavi iko na waikama. Me dua na kava ivakatubu dola rawa kei na taku wai, ke mani tasova na waikama me sova na ivakatubu i loma ni wai, ulia, qai sui sara kina na waikama me kua ni vakamai keda.

Qarauna me kua ni lutu na iyaya vakacakacaka e dela ni bateri, de qai shot qai vakavuna na mavoa vakayago se leqa ni iyaya.



Dua na sabolo ni ivola ni itavi e volai tu e ra.

⁶⁴ Ivurevure: Sundaya Apple, "Sundaya Apple Regulator, Quick Start Manual", https://assets.websitefiles.com/5a2fb65f5701c800018e826f/603e4f42254a71b39b6e33a9_Sundaya%20apple%20-%20English.pdf

⁶⁵ Ivurevure: Amazon, "iSunergy MPPT Solar Charge Controller", <https://www.amazon.com/iSunergy-Controller-Intelligent-Regulator-Batteries/dp/B081GSFDDK>, wiliki ena 25 June 2021.

⁶⁶ Ivurevure: Jim Dunlop Solar

8.3 iVola ni iTavi

TEVELI 3: iVola ni itavi me qaravi vakamacawa ena sola ni vale

Naba	iTavi me qaravi e veimacawa	Oti (tikitaka)
1	Raica na ulunisola de mavo	
2	Raica na waya de tavoci se via taluva	
3	Raica na kala ni ulunisola kei na kena igolegole	
4	Raica de vakaruguti na ulunisola se duka	
5	Raica me dei vinaka tu na itutu ni ulunisola	
6	Raica na volt kei na kui ni ulunisola e mata ni idoladola – ke rawa. Qarauna ni jajitaki tiko na bateri ena siga qai sinai tu ena 4 ena yakavi ni draki vinaka.	
7	Raica na volt ni bateri ena idoladola – ke rawa. Kena volt me tiko ena maliwa ni 12V (ni drekea) kei na 14V (ni sinai tu)	
8	Raica na sucuna qai quata ke veveka	
9	Raica na isema ni sucuna, ke luluqa me vaqacotaki	
10	Ke bateri vakawai, raica na levu ni wai, ke drekea mo tomana	
11	Raica na vanua e maroroi kina na bateri me liliwa qai cagicagi	
12	Raica se vinaka kece tu na matanicina kei na iyaya livaliva	
13	Na iyaya livaliva me qusi me kua ni duka se tauvi kuvu. Qusia mamaca na qara ni cagi	
14	Qarauna mera kua na curuma na iyaya dredre na manumanu lalai.	

Volavola:

IVAKADRE 10: IVOLA NI ITAVI

Vola e dua na ivola ni itavi kece me qaravi me bula balavu kina na sola.

IVAKADRE 11: DRAMA: VEISAU MEDA SOLA

Nodra vakavu veisau na marama

O Sala kei na watina o Mario kei iratou na luvedrau e le tolu ratou tiko mai Afo, mai Malaita. Segi ni vakalivaliva na koro. O Mario e dauqoli, veimataka lailai ni bera ni cabe na siga sa tu mai waitui me rawata na ika lelevu me qai kau ina tabana ni qoli e tiko kina na vale duadua ni waicevata e yanuyanu. E so na siga e dau kauta mai vale na ika lalai me kedratou. E tolu na luvedratou, o Lilly sa yabaki 9, o Timoci yabaki 10 kei Salote yabaki 13, nodratou koronivuli e rauta ni 4 km kena yawa mai vale, ni taubaletaki e via via dua na aua. Dua nodratou iteitei levu e vale. Levu na kumala, uvi, kaveti, kei na tomata me kedratou e veisiga. Rau tiko talega e vale na itubutubu i Mario, rau sa qase toka. E turaga dau cakacaka o Mario qai levu na veimataqali cakacaka me qarava, mv botani na boto, kau waicevata, usa pasidia i veiyanyanu ena yakavi. Osooso talega o Sala na qaravi rau na itubutubu i Mario, sasamaki, qaravi iratou na gone, kei na cakacaka vakoro.

Dua na yakavi e vuli leseni tiko ena cina karasini na luvedrau yabaki 13 o Salote. Sa curuoso na iboi ni karasini ni tolu vakadua na cina karasini e waqa tiko na bogi ya. O Mario se bera ni suka mai na vale a lai gunu yaqona kina. Tagicaka vakalevu o Lili, goneyalewa yabaki 9, na iboi ni karasini ni lako vakaca vua. Rau sa veivalataka na cina o Timoci kei Salote. Sa qai tomika na cina o Lilly, veiciciyaka vaqitoqito e loma ni vale ni sa via qito. Nodratou veicemuri gona qai lutu vakasauri e ligana na cina karasini, tau ena ibe qai kama sara. Kaila o Salote ena kere veivuke, ratou qai cici mai o iratou e yasa ni vale me ratou bokoboko, leqa ga ni levu na ivola nei Salote a kama. Sa qai dau rere o Lilly na vakacina karasini. Toso tiko na yakavi sa qai tukuna o Sala vei Mario nona vakasama.

Mario: Kua ni leqa – segi ni dua e kama, Se bera ni dromu na macawa au na volia nona ivola vovou. Cava o leqataka?

Sala: Au kila sa kena gauna me sa kua na cina karasini e nodatou vale.

Mario: A? O lialia – me datou qai cina cava?

Sala: Io, au sa raica ni ratou sa volia o Lusi e dua na sola, nodratou cina ena bogi sa qai vaka na cina ni otela! Tiko talega na katoniwaililiwa me dede kina kedratou ika kei na kakana.

Nodrau ulumatua talega o Tima sa toso vinaka sara nona ka ni vuli, ni rawarawa na vuli leseni ena cina ramase.

Mario: Kemudou, sa levu sara tiko nomu vakamuri Lusi. Nomuni itovo na marama na dau (takoso o Sala)

Sala: Cava “o kemuni na marama”.

Mario: Mm.

Sala: O keimami ga na marama me keimami vakavu veisau, baleta ni tarai keimami na dredre ni bula ni segi na livaliva. Au dau yadra ni se bogi meu vakawaqaca na cina karasini boi ca, qai vakasaqa. Au dau qarauna matua me maroroi na vo ni ika kei na bulagi, me kua ni ca datou qai tauvimate kina. Au raica me ratou vuli leseni na gone ena rama ca ni cina. Au dau maroroi ilavo me ivoli ni karasini.

Mario: Io, e donu vei au me dua nodatou sola. Au vinakata na frisa sola me maroroi kina na ika. Ia e tukuna o Jone ni a voli sola qai oti macawa dua ga sa ca. Vakacava ke qai ca? Dua tale, e saulevu talega na sola.

Sala: Isalei. Tou tovolea madaga. Daru maroroya vakalailai e veimacawa na ilavo ni ika, qai Siganiisucu sa na rauta me voli kina na sola. Kua ni leqataka kena qaravi. Au rogoca ni so na yalewa mai na koro e dakunivanua ratou sa vulica na qaravi sola. Dua vei iratou a lai vuli i Idia. Sa caka tiko na vuli sola. Au na lako ina dua na kena vuli meu bau vuli kina. Au na qai rawa ni qarava na sola tale eso ena koro me dua kina nodaru ilavo.

Mario. Wananavu qori Sala. Au sa marau dina ni daru sa duavata kina, qai noqu itavi na raici iratou na gone kei rau noqu qase nio na lai vuli sola.

Oti na drama.

Vukei rua o Sala kei Mario me rau sauma tale na taro e rua qo:

- Cava me rau qarauna o Sala kei Mario ni rau voli sola ni vale?
- Cava so me ratou cavaka o Sala kei iratou na yalewa me bula balavu kina na sola?

IVAKADRE 12: DRAMA: VAKAITAVI KECE.

Vakaitavi kece

Na drama qo e baleta e dua na ilala itabagone ratou dabe ena ruku ni kau mai na koro ratou veitalanoa tiko.

Amelia: I Santos, na siga ya au rogoci buqu ni talanoataka na vuli sola a lako kina.

Santos: E dina? Qori beka na vuli vata ga a lako kina o buqu. Bau set tiko nira sa bui era se vulica tiko so na ka yaga.

Amelia: Io, sa yawa sara o buqu – sa talanoataka vei au e so na ka sa vulica mai, na ka saraga keimami vulica mai koronivuli.

Santos: Oi, cava a tukuna vei iko?

Amelia: Io, kila ni dau duidui na igu mai na matanisiga e loma ni siga, ni qai katakata na siga e levu sara na igu e rawa.

Santos: Io, qori eda kila kece, se vacava?

Amelia: Dina, ia sa bau maleka vei au meu rogoci buqu ni talanoataka qai via vakavulici au tale.

Santos: Eda vulica talega nida tiko ena ceva kei vuravura, koya gona na ulunisola me qara ina vualiku qai kala toka me rawata vakalevu na igu sola.

Amelia: Io, au sega ni bau vakasamataka qori – noqu raica ni vakadurī tiko na ulunisola – au kaya ga me toka e delanivale sa o koya – ena soli igu – ia e vakatau se matanitu cava eda tiko kina, meda vakaduria vakadodonu, ke sega ena lusi e levu na igu ena loma ni yabaki.

Daniel (mai veitalanoa): Io, qori na ka eda kila tu, ia e vinaka nira sa cakava qo na buda, qai mai rawa kina na cina ena koro. Sa dua na veisau vinaka ni waqa ni cina ena vale kece ena bogi.

Amelia: Io, au sa sega tale ni lomaleqa niu taubale tiko e loma ni koro ena bogi ni sa vakacina na koro. Sa dua na vakasama wararasa.

Santos: E liu era dau cakacaka vakamatai ga na tagane, sa qai dua na ka vinaka nira sa dau ni sola na buda.

Daniel: Io, era sa dokai vakalevu talega kina, sa levu gona na ka vivinaka e kauta mai – qai vo ga meda kerei ratou me ratou bau vakadewā mai nodratou vuku, me datou na qai vukei iratou na qaravi sola.

Amelia: Io, au kila qori sa tekivu vakavulici au kina o buqu. Au sa via vulica saraga. Na vulica na icakacaka ni sola ni vale kei na kena qaravi e rawarawa sara. O kedatou me datou sa yavala sara me datou vuli qai veivakavulici tale. Sa levu na itukutuku lasulasu sa veicawiyaki tiko, na sala duadua me balavu kina na bula ni noda sola meda vulica vakavinaka, wili kina o ira na uabula kece, vakabibi o ira na marama.

Oti na drama

Cava so eda sa vulica ena leseni qo?

- Cava so na ka vovou o sa vulica ena leseni qo?
- O vakabauta ni o sa mai kila vinaka na voli sola ni vale, na kena icakacaka kei na kena qaravi?

Ena nomu rai, o cei e dodonu me vakatulewa ena kena cakacakataki ka qaravi nomudou sola ni vale







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