



Modiul 3 – Lenas Wakabuk

Eneji Ifisiensi Beisiks

PIJIN LANGUAGE - SOLOMON ISLANDS

Slen fo fanding hem kam from:

An Patna Wetem:

CONTENTS

Leson plan.....	4	5 Eneji Ifisient teknoloji	30
Mining blong olketa wods ia (Glosari)	5	5.1 Olteneit Fiuls	31
Abbreviations Sot fom blong olketa wods an nems ia (Abriviesin)	6	5.2 Eneji ifisiensi teknolojis – laets an fans	31
1 Aes Breka Introdaksin.....	7	5.3 Eneji Ifisient Teknoloji – Entateinment an komunikasin	33
Aktiviti 1.....	8	5.4 Aedentifikeisin blong Eneji Ifisient Ikuipment.....	33
2 Eneji Ifisiensi Beisik	9	Aktiviti 5	34
2.1 Eneji Beisik.....	10	6 Eneji Ifisiensi leboling.....	36
2.2 Praemari an Sekondari Soses.....	10	Aktiviti 6	38
2.3 Komesial an Non-Komesial sos blong Eneji	10	7 Eneji Ifisiensi komiuniti inisitiv	39
2.4 Riniuabol an Non-Riniuabol sos blo Eneji.....	11	7.1 Rol blong olketa women, singol mamis, widous en ofens (valnerabol grups)	40
Aktiviti 2.....	14	Aktiviti 7.....	42
3 Eneji Ifisiensi an eneji konsavesin	18	Rol Plei	45
3.1 Eneji Odit.....	19		
Aktiviti 3.....	20		
4 Eneji konsavesin	22		
4.1 Kuling	23		
4.2 Eneji konsavesin praktis – Olketa Hom Aplaens ...	24		
4.3 Eneji konsavesin praktis – wota pams.....	25		
4.4 Eneji konsavesin – Aotbod moto enjins	26		
Aktiviti 4	27		

LIST OF FIGURES

FIGA 1: SDG Gols	10	FIGA 16: Taeps blong olketa pam	25
FIGA 2: Komesial en Non-Komesial	10	FIGA 17: Injin blong bot	26
FIGA 3: Riniuabol Eneji soses	11	FIGA 18: Baeomas Pelets	31
FIGA 4: Non-Riniuabol Eneji Soses	11	FIGA 19: Baeogas plant lo Solomo Aelans	31
FIGA 5: Tina Riva Haedropaoa Projek	11	FIGA 20: Laet soses	31
FIGA 6: Wat save kosim poluson an wat nao kosim	12	FIGA 21: Laet soses kompead	32
FIGA 7: Hiumen Ektivitis en Polusion	12	FIGA 22: Eneji Ifisient Ikuipmen	32
FIGA 8: Eneji konsaveisin eksampol	19	FIGA 23: Mobael saja an TV	33
FIGA 9: Eneji Ifisient Teknoloji – nomol vs LED	19	FIGA 24: Nem plet	33
FIGA 10: Wanfala woman karem na faea wud	23	FIGA 25: Nem Pleit Motos	33
FIGA 11: Faeawud kat go lo smol saeses	23	FIGA 26: MEPS an Leibo	37
FIGA 12: Kavaring a vesol (sospen) wetem lid	23	FIGA 27: Eneji Ifisiensi inisitivs	40
FIGA 13: Eneji Ifisient kuk stov	24	FIGA 28: Rol blong olketa women	40
FIGA 14: Hom applaens	24	FIGA 29: Tu konklud	43
FIGA 15: Waering wea hemi no stret	25		

LIST OF TABLES

TEBOL 2: Leson plan	4	TEBOL 6: Eneji konsaveisin vs Eneji ifisiensi	19
TEBOL 3: Kost blo Eneji lo lukluk	10	TEBOL 7: Eneji Odit Gaedlaen	19
TEBOL 4: Taeps en Soses blo Eneji	10	TEBOL 9: Compearison Eneji Ifisiensi fan en frij	32
TEBOL 5: Saets wea garew Eneji jenereiting inisitivs lo Solomon Aelans	11		

Eneji Ifisiensi Beisiks training module hemi wan modul wea introdusim nao beisiks blong eneji go long komiuniti. Disfala modiul hem kontiniu on from Grin ekonomi jenerol prinsipol modiul.

Taem yu finisim disfala kos bae yu save na lo olketa via:

- Save gud long wat nao eneji efisiensi.
- Save luksave weis fo promotim nao eneji efisiensi insaed long komiuniti.
- Save gud na eneji efisiansi standads insaet lo kandere.
- Ivaluatim en selectim na hae efisiensi aplaensis an ekuipmen fo residensis an komiuniti yus.
- Wakem nao wanfala eneji ifiseansi inisitivs fo olketa long komuniti.

LESON PLAN

TEBOL 2: Leson plan

Olketa Saptainsaed wakabuk ia	Olketa Leson taep insaed wakabuk ia
Stating seson	
1. Aes-breka introdaksin	Leson topic an Aktiviti 1
2. Eneji efisiensi beisiks	Leson topic
	Aktiviti 2
3. Eneji Ifisiensi an konseveisin	Leson topic
	Aktiviti 3
4. Eneji konseveisin mesas	Leson topic
	Aktiviti 4
5. Eneji efisient teknolojis	Leson topic
	Aktiviti 5
6. Eneji ifisiensi leboling	Leson topic
	Aktiviti 6
7. Eneji ifisiensi – komiuniti inisitivs	Leson topic
	Aktiviti 7

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

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

Foto long Buk kava: Australian Eneji reiting lebol. Source: <https://www.energy.gov.au/households/energy-rating>. Accessed on 13/08/21.

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

MINING BLONG OLKETA WODS IA (GLOSARI)

Seket Breka : Wanfala ikuipmen fo tripim nao elektrisiti taem garew nao paoa ovalod /sot seket.

Kombason : Wanfala miksa blong ea en fiul long raet amaont, raet tempreja an raet fiul fo bonem.

Komesial Sos blong Eneji : Wea yiu save pei fo sos blong eneji – kol, petrol, gas an elektrisiti.

Eneji Odit : Wanfala sekap long ekspektet eneji konsampson beis long reited paoa konsamson pe nem plet en akjual eneji konsamson from meta/eneji bil.

Eneji Conseveisin: Livim aot noma yus blong eneji taem no nidim (e.g, offum laets en fans, iusim nao wod stov taem no nidim, offum TV taem no wajim, aedol runing blong pumps) .

Eneji ifisiansi : yusim nao leitest teknoloji ikuipmen wea save seivim eneji diu long ius blo advans sistims (e.g, LEDS, Eneji ifisient pamps, eneji ifisient rifrijereitas etc.

Nem plet : Diteils wea garew nao ikuipmen infomeisin – volts, amps, watts.

Non-komesial sos blong eneji : Wea hem availabol fri – wud save kolektim from forest, biogas.

Poluson : Long disfala keis diswan hem kos bae smok kam out taem bo nem fiuls.

Praemari sos blong Eneji : Stap nao insaet long graon – kol, petroleum, gas, jakol.

Sekondari sos blong eneji Tekem nao from praemari sos blo eneji- eletrisiti, stim, hotwota.

ABBREVIATIONS SOT FOM BLONG OLKETA WODS AN NEMS IA (ABRIVIESIN)

AC	Olteneiting Karent
°C	Digri Selsias
BHP	Breik Hospaoa
CFL	Kompakt Florosent Lemp
CO₂	Kabon Dae Oxaed
CSR	Kopret Sosol Responsibilti
DG	Disol Jenereiting
EC	Eneji Konseveison
EE	Eneji Efisiensi
GB	Grin Bisnis
GE	Grin Ekonomi
GGGI	Globol Grot Institiut
GLS	Jenerol Laeting Sevis Bulb
HP	Hospaoa
HSD	Hae spid Disol
HVAC	Hiting Ventileison en Ea Kondisining
KOICA	Korea Intenasinol Koporeisen
km	Kilomita
KVA	Kilo Volt Ampia
LED	Laet emitting diod
LPG	Likwidifaed Petrolia Gas
LPH	Litas Pe Aoa
LW	Lenas Wakabuk
MEPS	Minimam Eneji pafomens standads
Mts	Minit
MW	Mega Wats
PIDF	Pasifik Aelans Divelomen Forum
PNG	Papua Niu Gini
RE	Riniuabol Sos blo Eneji
RO	Rives Osmosis
TG	Treina's Gaed
TOT	Treining fo oketa Treinas
TV	Televisin
USA	Unaeted Steits blo Amerika
V	Volts
W	Wats

1

Aes Breka Introdaksin —————

AKTIVITI 1

Introdusim yu seleva lelebet long everiwan taem treina askem yu. Bae yu talem nem blo iu, talem save blong iu lo topic ia en wat nao olketa ekspekteisons blo yu from disfala trening ia.

2

Eneji Ifisiensi Beisik

Disfala praktis blong enej i fisiensi an enej konseveison baebae risalt not onli long enej seivings bat long wanfala grin ekonomi tu osem enej sieved hemi lid go lo kat daon blo kabon footprint wea hemi link go lo SDG gols.

FIGA 1: SDG Gols¹

2.1 Enej Beisik

Kost blo enej blo oketa kantries kavad hem na lo list bilow ia:

TEBOL 3: Kost blo Enej lo lukluk

Particulars	Fiji	PNG	Solomon Islands	Vanuatu
Praes blo Grid Paoa (USD/KWh)	0.07 to 0.15	0.21	0.79	0.44
Praes blo Paoa jaged bae lokol – Mini/Maero-grid fo sola paoa (USD per KWh)	0.78 solar hybrid	NA	NA	NA
Praes blo faeawud (USD pe MT)	4.34	NA	2.96 to 3.56 per bundle	2.73 per bundle
Praes blo Kerosin (USD pe lita)	0.69	0.85	0.93	No usage
Praes blo HSD (USD pe Lita)	0.81	0.91	1.00	2.2

2.2 Praemari an Sekondari Soses

Enej long olketa kaontris ia saplaed go long oketa foms ia:

TEBOL 4: Taeps en Soses blo Enej

Taeps blo Enej	Soses blo Enej
Baeomas/wud fo kuing long rurol erias. Baeomas yusim nao hem wud an akrikalsa weist (kokonat hask an sels).	Praemari sos
Samfala poson blong baeomas hemi yused insaed wud an suga indastri fo jenereitim paoa.	Praemari sos
Impoted fosil fiuls meinli petroliam prodaks fo yus insaed wetem transpot, paoa jenereisin tru DG set.	Praemari sos
Elektrisiti jenereison hem kam mostly from haedro paoa wetem smol kontribusiu from wind/sola enej.	Sekondari sos

2.3 Komesial an Non-Komesial sos blong Enej

Wat kain enej u baem (jakol, kerosin, petrol, disol etc) wetem mani, hemi wan komerial sos blo enej. Non-komesial sos blo enej no nidim na slen for baem.

Difrens bitwin komerial en non-komesial soses na lo Figa 2.

FIGA 2: Komesial en Non-Komesial²

Commercial and Non-commercial Energy

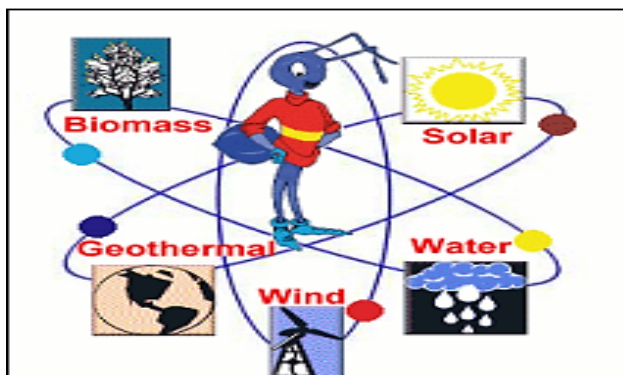
- **Commercial energy** is energy available at price
 - Examples are electricity, coal, lignite, oil, and natural gas
- **Non-commercial energy** is energy not available in market for a price
 - Examples are firewood, cattle dung and agricultural wastes, solar energy, animal power, wind energy

¹ Source: Adapted from Sustainable Development Goals Homepage, <https://spp.cmu.ac.th/category/sustainable-development-goals/>

² Source: Slideshare.net, "Slide 7- Commercial energy and Non-Commercial Energy", <https://www.slideshare.net/hanumantjagdale/energy-audit-and-mgt-unit-1>

2.4 Riniuabol an Non-Riniuabol sos blo Eneji

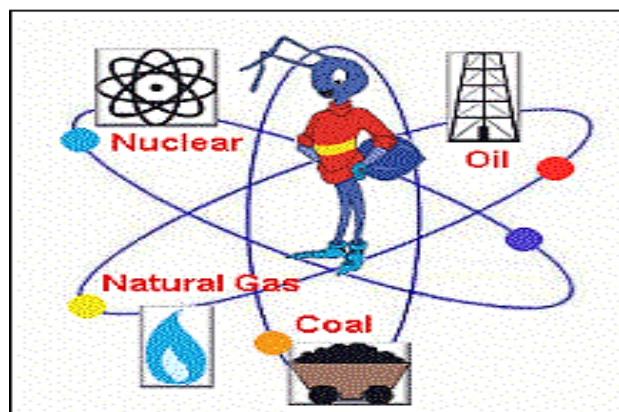
FIGA 3: Riniuabol Eneji soses³



Riniuabol Eneji: Hemi eneji wea olketa tekem from risoses, wea hemi najuroli replacim nao human taemskel osem sunlaet, win, rein, taeds, weivs an jiotemol hit etc.

Non-Riniuabol Eneji: Hemi wan najurol risosis wea no redili ripleis bae najurol mins kwik taem for save kip ap wetem konsamson osem fosil fiuls : kol, disol, petrol, najurol gas etc.

FIGA 4: Non-Riniuabol Eneji Soses⁴



Olketa ia nao oketa riniuabol eneji soses

1. Sola Eneji
2. Win Eneji
3. Baeomas Eneji
4. Jiotemol Eneji
5. Taedol Eneji
6. Weiv Eneji

Samfala eneji making ideas fo Solomon Aelans hemi given lo teibol lo daon ia.

TEBOL 5: Saets wea garem Eneji jenereiting inisitivs lo Solomon Aelans

Namba	Nem blo komuniti	Namba blong haushols	Popiuleisin	Aelan	Provins	RE : Rileited projeks
1	Selwin Kolej	63	700	Guadalkanal	Guadalkanal	SIG en Iuropian Iunion
2	Taro Taon	121	1207	Taro	Soisol	Sola Haebrid Sistim – Wold Benk
3	Aola Klinik	komiunitis	10,000	Guadalkanal	Guadalkanal	38 Kw Haebrid Sola sistim/WHO

Ius blong elektrisiti hemi also givim aot deti. Diswan hemi dipen long wea yiu tekem elektrisiti from, weda gas, o disol-beis paa plants. Elektrisiti prodius from sola/win/Piko-haedro hemi klin.

Biga haedro plants (insaet lo staka MW) osem lo Figa 5 save kosim na bikfala damej long forest en flading blong olketa vilejis.

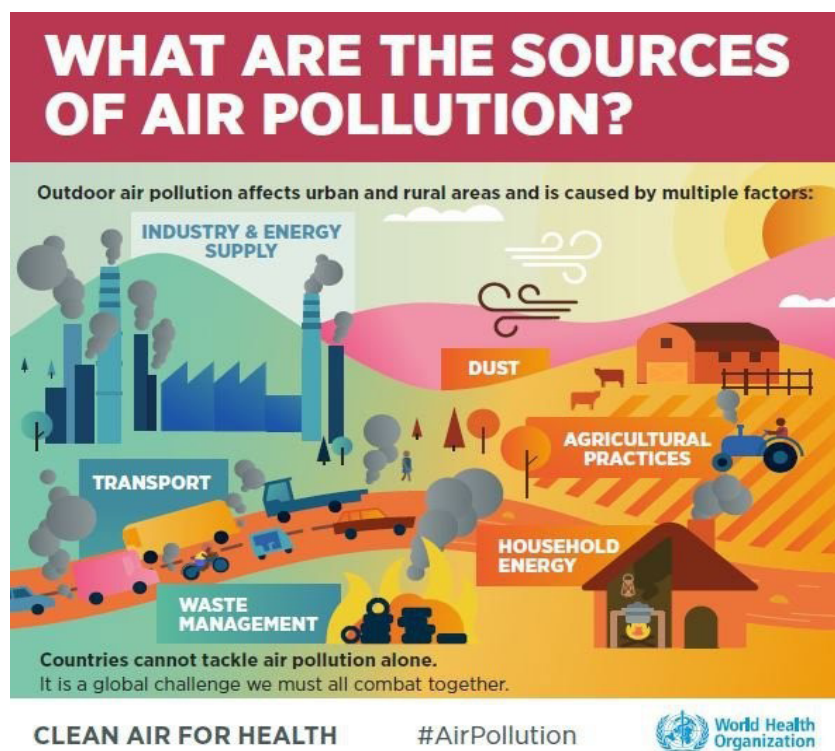
FIGA 5: Tina Riva Haedropaa Projek⁵



³ Adapted from Slideshare.net, "Renewable and Non-Renewable Sources of Energy", <https://www.slideshare.net/oneworldabhiraj/renewable-and-non-renewable-sources-of-energy>

⁴ Adapted from Slideshare.net, "Renewable and Non-Renewable Sources of Energy", <https://www.slideshare.net/oneworldabhiraj/renewable-and-non-renewable-sources-of-energy>

⁵ Source: NS Energy, "Solomon Islands secures \$200m financing to build 15MW Tina River hydropower project", image taken by Courtesy of soukmano/Pixabay, accessed <https://www.nsenergybusiness.com/news/solomon-islands-tina-river-hydropower/>

FIGA 6: Wat save kosim poluson an wat nao kosim⁶

Koses blong meija polutents hemi lo Figa 6.

Eni hiumen aktiviti jenereitim nao poluson. Yu yusim fiuls fo kuki an hiting, swimming an wasing, weist rabis (animol, vejitebol), bonem weist, yu travol lo motosaekol. Oketa bo ne aktivitis an transpot, imitim na smok en kosim nao deti evriwea.

Figa 7 som nao akrikalsa fams bo ne afta havest. Wael yiumi se hiumen aktivitis mas gohet, hemi impotent tumas fo tekem nao samfala weis fo katem daon na deti long ea.

FIGA 7: Hiumen Ektivitis en Polusion⁷

⁶ Adapted from the Climate and Clean Air Coalition; World Health Organization Releases New Global Air Pollution Data; <https://www.ccacoalition.org/en/news/world-health-organization-releases-new-global-air-pollution-data>

⁷ Source: GGGI Vanuatu.

Raetem not blong yiu long hia

AKTIVITI 2

Taget: Lokol gavman ofisols, provinsol kaonsols, Distrik Kaonsols, Taon Kaonsols, Aelan Kaonsols, etc

1. Wanem nao samfala eneji soses wea yiu laek fo promotim/lokolaesim go lo komiuniti?

2. Wanem nao samfala nan-riniuabol soses blong eneji yiu sud fokas long hem fo ridiusim nao yiusim oketa ap?

3. Wae nao elektrikol eneji hemi kold wanfala sekondari sos blong eneji?

4. Hao na rabis hem kat daon insaed long komiuniti blo yiu?

Taget: Tradisinol komiuniti/rilijas lidas, women, yut an valnarabol grups (singol mamis, olo man en mere) etc

1. Nemim nao eneji soses yus long Fiji, vanuatau, PNG a Solomon Aelans?

2. Luk lo piksa long daon ia en raetem weda hem riniuabol eneji o non-riniuabol soses blo eneji

Piksa	Raetem weda hem riniuabol or non-riniuabol
 8	
 9	
 10	
 11	

8 Source: Wikipedia, <https://en.wikipedia.org/wiki/Firewood>

9 Source: Smell of Petrol/gasoline Liquid Facebook page, <https://www.facebook.com/Smell-Of-Petrolgasoline-Liquid-112870246813830/>

10 Source: Hyperleap, "Micro Hydro", https://hyperleap.com/topic/Micro_hydro

11 Source: Power info Today, <https://www.powerinfotoday.com/wind-energy/dubai-to-build-uaes-first-wind-farm/>

3. Wae nao elektrisiti olketa kolem long sekondari sos blo eneji?

4. Wanem nao samfala soses blong poluson insaed long komiuniti?

5. Wae nao olketa bik haedro elektrikol plants olketa no envaeromentali frenli?

Taget: Lokol elektrisian, pipol wetem teknikol save etc

1. Wanem kain steps nao bae yiu save tekem fo yiu save muv from nomol eneji soses?

Taget: Smol Bisnis

1. Wanem nao samfala bisnis Aktivitis yu save konsidam beis long disfala sapta ia?

2. Hao na bae yiu meksave dat poluson hemi kat daon long bisnis aktivites blong yiu?

3

Eneji Ifisiensi an eneji
konsavesin

Umi nid fo andastandim na difrens bitwin eneji konsavesin an eneji ifisiansi. Eneji konsavesin hemi fo avoidim nao weistful yiuses blong eneji.

Plis rimemba mesej lo Figa 8 lo daon ia.

FIGA 8: Eneji konsaveisin eksampol¹²



Hemi barava nomol nomoa fo lukim dat laets en fans on taem oketa no iusim. Iumi sud mekem hem habit blo iumi na fo tanem of na laets en fans taem umi no iusim.

TEBOL 6: Eneji konsaveisin vs Eneji ifisiensi

Eneji konsaveisin	Eneji ifisiensi
Ofum na laets en fan taem no nidim	Iusim LEDs en eneji fans
Yiusim raet taep sospen fo kuki 1lita/0.5 lita en kavam wetem lid	Eneji ifisiensi wud stov fo kuki
Ofum TV taem no nidim	Baem eneji ifisient star reited TV
Meksua no livim pam on nating	Baem eneji ifisient pamp
Meksua no livim enjim blo boat on nating	Baem eneji ifisient enjin for bots

Olketa kaontris lo wold wea oketa develop tumas ia olketa ova advans an oketa rijim nao steij wea olketa yusim nao staka eneji an olketa bin traem staka methods fo help ridiusim eneji konsamson, inkludim nao eneji ifisiensi inisitivs.

Fo pasifik aelans, iumi stil develop yet en olketa eneji nids blong yumi olketa stil gro as iumi develop. Praktisim eneji ifisiensi taem yumi develop hem isi an lou den wakem nao eneji ifisiensi long sistem wea develop finis.

TEBOL 7: Eneji Odit Gaedlaen

Ikuipment	Namba blo yunits	Paoa	Namba blo aoas taem yusim	Eneji
LED Balbs	2	9 w	4 h	0.072 kWh/day
Fans	1	70 w	12 h	0.84 kWh/day
Frij	0	200 w	0 h	0 kWh/day
TV	1	100 w	6 h	0.6 kWh/day
Sel saj				0.05 kWh/day
Total (kWh/day)				1.562 kWh/day
Total (kWh/month)				46.86

FIGA 9: Eneji Ifisient Teknoloji – nomol¹³ vs LED¹⁴

Nomol laet Normal BulbLED LED



Eneji Ifisiensi hemi involvim nao yius blong eneji ifisient ikuipmen an applaensis. Somfala eksampol nao elektrik aplaensis osem eneji ifisient laets, aplaensis etc A nomal balb iused 60 W of elektrikol paoa, wea as LED yius onli 7W fo givim aot sem amaont blong laet.

3.1 Eneji Odit

Tem Eneji odit hemi minim wat nao ikuipment yiu instolim an hao mas eneji nao olketa yusim dipend long aoas blong hem taem waka. Wanfala representitiv gaedlaen nao long here:

¹² Source: The Cure Inc., https://www.thecuresafety.com/NOTICE_Turn_Off_When_Not_In_Use_Large_p/nga23pb.htm

¹³ ANY-LAMPCOM, <https://www.any-lamp.com/standard-incandescent-low-volt-clear-a55-e27-60w-36v-8719157999748>

¹⁴ Source: Media-amazon, Led bulb, <https://m.media-amazon.com/images/I/31R-yJ3hstL.jpg>

AKTIVITI 3

Taget: Lokol gavman ofisols, Provinsol kaonsols, Distrik Kaonsols, Taon Kaonsols, Aeland Kaonsols

1. Wanem nao samfala eneji konseveison en Eneji ifisiensi mesas yu babae save tekem lo ofis blo yu?

2. Hao na bae yu save karem aot nao eneji odit long ofis blo yu?

Taget: Tradisinol komiuniti/rilijias lidas, wimen, yuth en vulnerabol grups (singol mammies, eldalis) etc

1. Wanem nao difrens bitwin eneji konsaveisin an eneji ifisiensi?

Taget: Lokol elektrisian, pipol wetem teknikol save etc

1. Hao nao bae yu praktisim eneji konsaveisin an eneji ifisiensi long de tu de waka blo yu?

Taget: Smol Bisnis

1. Wanem mesas nao bbae yu tekem fo eneji konseveison an eneji ifisiensi?

Raetem not blong yu long here

4

Eneji konsavesin

4.1 Kucing

FIGA 10: Wanfala woman karem na faea wud¹⁵



Faeawud hemi nao meija fiul yius fo kuki. Kerosin hemi yus long smol wei an tu long samfala haoshol no garew nao yus fo gas (LPG). Disfala diskason long kuki ia hemi fokas go noma long yius blong faeawud osem fiul. Faea wud oketa kolektim from forest an akrikalsa filds kosap etc. Olketa faeawud olketa kolektim ia oketa taem ap insaet wan bandol. Oketa pipol, espeseli olketa women nao risponsibol fo karem (Figa 10).

FIGA 11: Faeawud kat go lo smol saeses¹⁶



Yus blong bigfala stik bae prodiusim faea fo long taem hem wan wei wea pipol nid fo rikonsida. Wat hapen nao hem bikos long difren saezes blong faeawud, ea distribiusin hemi no ifisient, wea hemi risalt long blak smok, hem na rison wae hemi gud for yusim faeawud wea olketa sem size.

FIGA 12: Kavaring a vesol (sospen) wetem lid¹⁷



Dipen lo saez an seip blong pot, fleim nid fo distribiut. Eneji ifisiensi long kuki hem depen lo saez blong sospen. Taem laek kuki, yu bae hev to siusim sospen dipend long amaont fo kukmi yia. If yiu nid fo boelam noma kap meleke, siusim noma smol pot. Fo boilam 1 lita blong wota, yusim lelebet big sospen. Noken yiusim nao big sospen fo kukim smol amount blong kaikai. Hem impotent tumas tu for kipim lid antap sospen taem kuki fo avoidim nao hit los (Figa 12).

15 Source: Vanuatu Images, <https://vanuatuimages.wordpress.com/2015/03/16/the-happy-people-of-vanuatu-2/>

16 Shutterstock.com "Burning wood", <https://www.shutterstock.com/search/burning+wood>

17 Source: Wikipedia, "Clay pot cooking", https://en.wikipedia.org/wiki/Clay_pot_cooking

FIGA 13: Eneji Ifisient kuk stovA¹⁸B¹⁹C²⁰

Waka prinsipol blong eneji ifisiensi kuki stov hem noa long hia:

1.0 Wan greit o fiul magasin fo putim fiu.



2.0 Kombason speis (jamba) wea ea go in long bottom en mix wetem na fiul



3.0 Top wea fo plesim sospen fo kuki an eksos gases



4.2 Eneji konsavesin praktisis – Olketa Hom Applaens

FIGA 14: Hom applaens²¹

18 Source: Environmental Camps for Conservation Awareness (ECCA) Homepage, "Improved cooking stove", <https://ecca.org.np/home/page/technology/cooking>

19 Pinterest.com, "Rocket Stove" adapted from Web Ecoist, <https://webecoist.momtastic.com/2013/01/28/14-off-grid-projects-to-cut-your-energy-and-water-usage/>

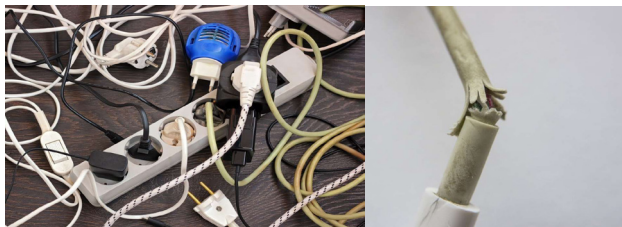
20 Source: Pinterest.com, "Stove" adapted from Daub & Stuff, <https://daubstuff.wordpress.com/tag/stove/>

21 Source: Financial Tribune, <https://financialtribune.com/articles/domestic-economy/57912/home-appliance-sector-mulls-capacity-expansion>

Figa 14 som nao hom aplaensis yus. Tips fo kipim nao eneji insaed domestik haushol hemi:

- Tanem of laets, fans en TV taem no nidim.
- Yius deilaet taem inaf sun hemi stap noma – diswan olketa lo vilij nao praktisim ovam oketa lo taon.
- Kipim windos open for letem na fres ea insaet.
- Plis rememba olowe for aotem nao mobael saj from paoa soket taem finis saj.
- Trae stop from konektim staka elektrik ikuipmen (divaes) go long wanfala soket noma en sekim an ripleisim eni kat waeas quiktaem, taem yu lukim osem lo Figa 15.

FIGA 15: Waering wea hemi no stret²²



4.3 Eneji konsavesin praktis – wota pams

Komiuniti save yiusim wota fo domestik risons (drink, was, an kuki) an fo akrikalsa. Impotent part blong pam nao hemi impela wea save tane raon bae elektrikol moto taem kapling.

FIGA 16: Taeps blong olketa pam

A²³



B²⁴



C²⁵



D²⁶



E²⁷



22 iStock, "Overcrowded power board", <https://www.istockphoto.com/photo/overcrowded-power-board-gm497064074-78919287>

23 National Geographic, "Freshwater pump", <https://www.nationalgeographic.org/encyclopedia/freshwater-access/>

24 Amazon.in, "Kirkoskar Aqua 50 Water pump", <https://www.amazon.in/Kirkoskar-0-Shp-Aqua-Water-Pump/dp/B07DRJ5QXM/ref=>

25 India MART, "Agricultural Submersible Pump", <https://www.indiamart.com/proddetail/agricultural-submersible-pump-21280879233.html>

26 India MART, "Solar Water Pump", <https://dir.indiamart.com/udaipur/solar-water-pump.html>

27 Sunny Power, "Diesel Engine and Electric Self-Priming Centrifugal Pump", <https://wfsunny-machinery.en.made-in-china.com/product/hwxfgsFvfRkO/China-Diesel-Engine-and-Electric-Self-Priming-Centrifugal-Sewage-Pump-Sh-24-Inches-Water-3170m3-H-Power-400kw.html>

Figa 16 som na taeps blong pams wea avelabol fo domestic an akrikalsa yus. Oketa nao:

- Han pam no elektrikol paoa, onli human paoa cost abaot 400 SBD.
- Horizontal pam – 3HP about 1600 SBD.
- Submesibol pam – 3 HP abaot 2400 SBD.

4.4 Eneji konsavesin – Aotbod moto enjins

FIGA 17: Injin blong bot²⁸



Injin blo bot o aotbod moto save yusim nao petrol osem fiul fo draevim nao olteneita (jenereita) fo jenereitim nao paoa. Samfala injin blong bot yusim nao disol fiul fo draevim nao aotbod moto.

Disol injin save yiusim fo draevim nao pam fo wota saplae.

Oketa gaedlaens lo daon ia bae help nao fo kipim fiul an no mekem tumas marin poluson:

- Taem sium Petrol injin, hem nas fitim nao yius blong hem. Fo bots, bae lukluk long hevi blong hem, namba blong pipol wea bae travol, hevi blong cargo osem.
- Petrol (fiul).
- Petrol injin yiusim nao miks blong petrol an oil (zum) osem fiul. Diswan tu strok injin. Fo strok petrol injin yiusim nao petrol osem fiul en oil fo mekem hem smut and waka gud. Injin yia save ranem long baeio gas, etanol en miks fiul.
- Hemi impotant tumas fo baem na gudfala kualiti fiul fo wanfala gud petrol pam.
- Injin save gareem nao tenk pas go long hem fo petrol storeij an hem flou go lo injin. Konekting paeplaen save yiusim metol, plastic o raba. Metol paeps na hem best wan kos hem no isi fo katem nao metol paep yia. Hemi wan good praktis fo yusim nao breided hose.
- Smok nao save talem that kombason hem popa wan. Hae amaont blo smok hem minim osem dat eksos gas no flo fri aot from injin go long atmosfera. Tik blak smok hemi minim osem dat gareem les ea o ea no klin. Waet smok mins wota. Smok shud bi laet braon an save lukim abaot wan mita apat from ekshos ia.

Raetem not blong yiu long hia

[illegible]

28 Sunny Power, "Diesel Engine and Electric Self-Priming Centrifugal Pump", <https://wfsunny-machinery.en.made-in-china.com/product/nwxfgsFvfrKO/China-Diesel-Engine-and-Electric-Self-Priming-Centrifugal-Sewage-Pump-Sh-24-Inches-Water-3170m3-H-Power-400kw.html>

AKTIVITI 4

Taget: Lokol gavman ofisols, provinsol kaonsols, Distrik kaonsols, Taon Kaonsols, Aelan Kaonsols etc

1. Wanem nao samfala enoji inifisient mesas insaet long komiuniti blo yiu?

2. Hao nao bae yiu helpim komiuniti blong yiu fo bikam enoji ifisient?

Taget: Tradisinol komiuniti/rilijious lidas, wimen, yut, valnerabol grups (singol mammies, ol man en mere)

1. Wanem nao samfala nogud ifeks blong metod blong kuki distaem ia insaet lo komiuniti?

2. Wanem nao beisik prinsipol blong enoji ifisient stov?

3. Listim daon samfala steps fo kipim enoji?

4. Raetim daon nao nem blong olketa pam ia go nao long taep blong pam yu lukim long piksa.

Piksa blong pam



5. Wanem nao samfala advaes fo kipim eneji isaet lo pams?

Taget: Lokol elektrisian, pipol wetem teknikol save etc

1. Listim daon samfala eneji ifisiensi mesas babae yiu save duim long waka ples blong yiu.

Taget: Smol Bisnis

1. Hao nao bae yiu save meksua dat bisnis aktivitis blong yiu hemi eneji ifisient?

5

Eneji Ifisient teknoloji —————

5.1 Olteneit Fiuls

FIGA 18: Baeomas Pelets²⁹



Baeomas Pelets olketa mekem from smol stiks, faeawud an log weistwea olketa tekem from forest an yusim fo fiul peposes. Wan adventeij blong hem na is fiul fo kuki hemi fre an garem ziro valiu taem hemi kam long slen, plas hemi save mekem no staka smok and poluson.

A baeogas plant save ius fo tekem baek baeogas for kuki en aotput blong baeogas plant osem fetilaezer. Baeogas save yusim tu fo injins en gas laet en not onli kuing.

(Disfala teknoloji ia hemi no yius long Solomon Aelans but osem eksampol blo developmen lo fiuja osem wan gudfala grin idea).

FIGA 19: Baeogas plant lo Solomo Aelans³⁰



Bisnis soes fo baeomas pellets en baeogas plants bae kavam lo Grin Bisnis Beisiks.

5.2 Eneji ifisiensi teknolojis – laets an fans

FIGA 20: Laet soses

A³¹



B³²



C³³



D³⁴



²⁹ India MART, "Biomass Pellets", <https://www.indiamart.com/utsav-biofuel-industries/biomass-wood-pellet.html>

³⁰ Source: SolBridge "Creating Renewable and sustainable energy from waste", <https://www.solbridgelt.com/biogaz-for-home>

³¹ Shutterstock Images, "Kerosene lamp", <https://www.shutterstock.com/image-photo/kerosene-lamp-lantern-on-wooden-background-560089849>

³² Source: ANY-LAMP.COM "Standard Incandescent Low Volt Clear", <https://www.any-lamp.com/standard-incandescent-low-volt-clear-a55-e27-60w-36v-8719157999748>

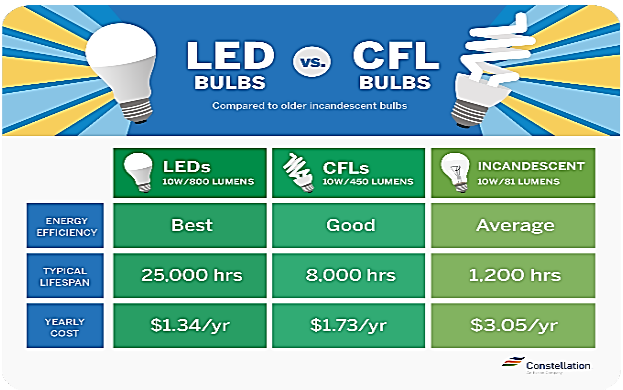
³³ Source: Amazon.in, "Philips Essential CFL (Cool Day Light, 14W)", <https://www.amazon.in/Philips-ESSENTIAL-14-00-Watts-Light/dp/B00K9096LK>

³⁴ Source: Amazon.in, "Luker-3-Watt Led Bulb (Pack of 3, Cool Day Light)", <https://www.amazon.in/Luker-3-Watt-Bulb-Pack-Light/dp/B0756BMR35>

Figa 20 hemi som nao hao laeting aplaensis olketa yiusim ova taem : Kerosin lams (20 A) , inkandisen balb (laet) (20 B) kompakt floresent lam (CFL) (20 C) Laet imiting Diod (LED) (20 D). Apart from kuki, bigfala eneji nid blo komiuniti nao hem ifisient laeting.

Nomal tekem ap 60 W blo elektrikaol paoa. CFL tekem ap 18 W, kompead to LED wea hem tekem ap noma 7W wetem sem amaont blo laet.

FIGA 21: Laet soses kompead³⁵



FIGA 22: Eneji Ifisient Ikuipmen³⁶



Nomol eneji ifisiensi fan an Frij na lo figa 22. Tebol 9 som nao komparisin blong eneji ifisient fan an frij.

TEBOL 9: Compearison Eneji Ifisiensi fan en frij

Ikuipmen Fan	Konvensonol Fan	Eneji Ifisiensi Fan
Paoa Konsamson – siling (W)	70	30
Averej Eneji Konsamson blong 1000 Hrs (kWh)	70	30
Eneji Konsamson lo loa spid	No sens	Barava lou bikos lo elektronik reguleisin
kost (USD)	15	45
Ikuipmen rifrijereita	Konvensonal rifrijireita	Eneji ifisiensi rifrijereita
(°C) Nomol opereiting tempereja	Dip Friza (-18) Frij 3-manuel control	Dip Frija (-18) Frij 3 – otometik kontrol
Aproximeit eneji konsamson (kWh) 250 litas	700	400
kost (USD)	500	650

35 LED Vs CFL Bulbs: Which is More Energy, <https://blog.constellation.com/wp-content/uploads/2016/03/CFL-vs-LED-bulbs.png>

36 Red refrigerator, <https://www.spiele-schenken.top/ProductDetail.aspx?iid=191426532&pr=87.99>

5.3 Eneji Ifisient Teknoloji – Entateinment an komiunikesin

Olketa, jipli praesed, poor saond an piksa kualiti hem nogud an hemi tekem ap tumas eneji. Piuva kualiti sas, yiusim ap moa paoa an tek long taem fo saj. In oda fo sevim eneji en seif, yiu mas meksua yiu yiusim nao gud kualiti ikuipmens/teknoloji wea olketa moa eneji ifisient.

FIGA 23: Mobael saja an TV³⁷



5.4 Aedentifikeisin blong Eneji Ifisient Ikuipment

Eni elektrikal divaes bae save kam wetem nem plet. Sekim nao volteij fo yiusim (220 – 240 V) en paoa konsamson (W). Ei representteitiv lo wat na nem pleit hem na lo figa 24.

FIGA 24: Nem plet³⁸



Nem pleit ia som na 10 W na paoa konsamson en opereiting volteij hemi 220 to 240 V:

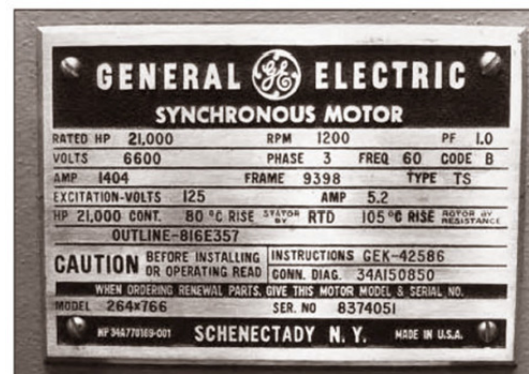
- Eneji ifisient leibling. Diswan bae diskraebem ng leita.
- Everi eneji ifisient ikwipmen kam wetem garanti blong olketa (5 yias fo LEDs, 3 yias fo fan, 10 yias fo rifrijireita kompresa). Olketa ia oketa eksampol an save vari from kaontri tu kaontri.
- Ei garanti mas givim.
- Tek kea long volteij saplae wea hem fitim nid blong yiu.

FIGA 25: Nem Pleit Motos

A³⁹ Nomol Moto



B⁴⁰ Eneji Ifisient moto (Si IE4 en 86.5 % ifisient)



GE Motor Name Plate Details

37 Energy Star "Television", <https://www.energystar.gov/products/televisions>

38 Source: Power Electronic Talks, <https://www.powerelectronicstalks.com/2018/10/ce-and-ce-mark-process.html>

39 Source: Electrical4u, Nameplate, <https://www.google.com/search?q=https%3A%2F%2Fwww.electrical4u.net%2Fnameplate-details%2Fsynchronous-motor-nameplate-details-explanations%2F&rlz=>

40 Montana Resource Efficiency Project; <https://www.electrical4u.net/nameplate-details/synchronous-motor-nameplate-details-explanations/%20/www.mtefficiency.org/energy-efficient-motors-toolkit/>

AKITIVITI 5

Fo everi taget grups

1. Wanem nao difrens bitwin baeomas pellets an baeogas?

2. Steitim nao weda olketa stetmen long teibol ia tru o noma

Laet Sos	Diskripsin	Tru o fals
	No save polut ova tumas	
	Sipest (lou) laet sos	
	Jenereitim bikifala hit	
	No ifisient tumas o ovam tumas bat midiam noma	

3. Wanem nao eneji yius blong eneji ifisient fan an eneji ifisient rifijireita?

4. Wanem nao nomol opereiting tempreja blong frij?

6

Eneji Ifisiensi leboling

Wanem nao eneji sta reiting?

Gavman oketa mekem klia nao olketa minimam Eneji pefomens standads (MEPS) fo olketa elektrikol aplaens o ikuipmen. Olketa Ikuipmen wea olketa tekem an yiusim mas folom nao standad weda lokol wans o impoted wans. Gareme olketa klia

test prosidias fo meksua dat eneji yius blong produkt ia hem yus insaed limits olketa talem ia tu. Leibol blong eneji sta ikuipment hemi kliali talem nao eneji konsamson long 1 haoa.

Program ia fo stat aplae go long rifrijireita an Frijas noma.

FIGA 26: MEPS an Leibol⁴¹



Solomon Aelans long Eneji polisi gareme nao enfosment blong Elektrikol Applaensis an Ikuipmen laeting prodaks akt. Folom nao akt ia, oketa aplaensis shud mitim nao standads blong Australia an New Zealand.

Raetem not blong yiu long hia

41 Sustainability Victoria, "Energy rating labels", <https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home/energy-rating-labels>

AKTIVITI 6

(For all target grup)

1. Wanem nao eneji sta reiting?



7

Eneji Ifisiensi
komiuniti inisitiv

Oketa komiuniti (man, wimen, en pikinini) pleim nao bikifala waka fo kipim enejji, mekem ap mesas fo tekem enejji ifisiensi ikwipment. Evriwan long komiuniti shud aprisiatim nao disfala nid fo kipim enejji, baem enejji ifisient ikwipment en yusim riniuabol sos blong enejji.

FIGA 27: Enejji Ifisiensi inisitivs⁴²



Oketa komiuniti membas save duim nao oketa ia fo kipim enejji:

- Yusim faeawud long raet wei. Diswan save duim taem umi transpotim faeawud gud, kipim oketa long raet wei en yusim wetem kea en yusim enejji ifisient kuki stov olowe.
- Muv awei from kerosin, weda fo kuki o fo laet. Diswan hemi poluson fiul ia an hemi givim lelebet laet noma
- Muv go lo yus blong sola lantens, sola home laeting sistims etc. Komuniti lida mas meksua everiwan long komiuniti nao diswan.
- Lukluk raonim na setim ap komiuniti baeogas plants fo enejji an fetilaeza. Ensua dat oketa gavman mas invest long hem.
- Narafala impoten sos nao hemi wota. Komuniti lida mas meksua dat wota mas yus waesly an no weistim. Plan an iverst nao long gudfala klin wota.
- Risaeklim nao weist wota fo akrikalsa risons.
- Komuniti lida mas meksua that everiwan garem nao akses long seif en klin drinking wota.
- Sift from jenereita go long sola paoa.
- Komuniti lida mas meksua dat sola pams yus ia mas no garem na nogudfala ova ius blo graon wota.
- Komuniti lida shud garem paoa fo stopim pipol from tekem on nao enejji inifisient praktisis.

- Pipol shud mekem habit blo oketa fo ofum laets, TVs taem no aniwan nidim. Oketa shud letem adas folom tu kain wei ia
- Everi ikuipment wea kaikaim tumas enejji shud mentein gud so dat oketa save last long taem.
- Wetem raet gaed, komiuniti save waka an karem aot na suitabol faenans modol fo raisim nao slen fo enejji ifisiensi en riniuabol enejji ikwipment.

7.1 Rol blong oketa women, singol mamis, widous en ofens (valnerabol grups)

Enejji ifisient inisitivs bae improvim nao laef blo oketa women ia.

FIGA 28: Rol blong oketa women⁴³



Oketa women na obae benefit tumas long ifisient inisitivs. Klina kuing wetem yus blong enejji ifisient stov, improvim helt an ridiusim kuing taem. LED lams an sola sistim givim oketa women ia moa taem fo waka an pikinini fo stadi.

Women, singol mamis, widos en ofans mas luksave long oketa osem ikual patnas long disfala inisitivs an oketa mas enkareij fo tek pat insaet long komiuniti diskasons so dat oketa garem tu opotiuniti fo searem experienss blong oketa.

⁴² Source: Market Business News, "What is energy efficiency? Definition and examples", <https://marketbusinessnews.com/financial-glossary/energy-efficiency/>

⁴³ Source: Asia pacific. UN Women.org, Photo taken by : SI Family Support Center, <https://asiapacific.unwomen.org/en/news-and-events/stories/2020/01/family-support-centre-and-un-women-strengthen-relationship-to-increase-support-services-to-victims>

Raetem not blong yiu long hia

AKTIVITI 7

Taget: Lokol gavman ofisols, provinsol kaonsols, Distrik kaonsols, Taon Kaonsols, Aelan kaonsols etc

1. Hao na bae yiu save promotim nao enji ifisiensi inisitiv insaet long komiuniti blong yiu?

2. Hao na bae yiu meksua women an olketa narafala valnarabol grups patisipeit insaet long oketa aktivitis ia?

Taget: Tradisinol komiuniti/rilijias lidas, wimen, yut en valnerabol grups (singol mamis, ol pipol) etc Lokol elektisians, pipol wetem teknikal save etc

1. Nemim samfala long olketa enoji ifisiensi inisitivs fo komiuniti?

2. Hao nao olketa women save benefit from oketa eneji ifisiensi inisitivs?

Taget: Smol Bisnisis

1. Hao na disfala sapta helpim yiu long Bisnis?

Fo konkludim teks ia:

FIGA 29: Tu konklud⁴⁴



Long taem an kontinuias edukeisin an aweanes kampen hemi nesereri fo pipol aprisietim olketa positive impakts blong eneji konsaveisin. Wans olketa long komiuniti stat praktisim nao eneji konsaveison, olketa bae lukim nao benefits of iusing eneji ifisient ikwipment en sift go lo lokol riniuabol sores blo eneji. En hem na hem kontribiut go lo eneji ifisient ekonomi, ridiused poluson en improvim nao kualiti blong laef.

Improvim nao abav mesas ea kontinual improvement save risalt long wan moa sasteinabol komiuniti.

44 India Mart; "Energy Conservation Building and Green building," <https://www.indiamart.com/protek-consult/power-conservation-products.html>

Diswan nao hemi Wei fo wan eneji ifisient sosaeti.

Raetem not blong yiu long hia

ROL PLEI

Membas blo komiuniti bae den actim aot na wanfala rol plei. Fo disfala rol plei lenas save volentia o treina save siusim lenas fo aktim aot samfala rols long plei ia. Fo disfala rol yia, 5 fala pipol nao bae nidim fo pleim nao rol blong Reimon (dadi), Manuela (Mami) Bened (son), Velariona (Tisa) en Pita (Prinsipol).

Reimon an Manuela stap nao long wanfala long olketa rurol komiunitis. Reimond waka osem wanfala makanik long wanfala taon kosap. Hem raed baesikol everi dei go long taon an riten long ivning. Reimond an Manuela garem nao wanfala 10 yia old son nem blong hem Benad. Hem go skul long wanfala ples kosap long ples olketa stap. Manuela save wekap eli, kuki kaikai an pekim lans fo Reimond an Benad. Afta Reimond go waka, Benad go long skul tu an Manuela go tekem nao wota from wanfala strim, 2 km awei an kolektim nao faeawud taem hem kam back. Kuki nids blong familia ia, faeawud kolekted from forest nao mitim an wan smol kerosin lamp. Smok from oketa faeawud ia mekem nao Manuela an benad kof, Benad save streinim nao ae blong hem fo rid.

Tisa blong Benad, Velariono attendim nao wanfa training program long riniuabol eneji. Skul maneijmen askem nao Velariono fo tisim nao oketa pikinini abaotim nao benefits blong riniuabol eneji. Hem hapi fo duim an hem hop noma samfala long olketa students ia praktisim tu long haos blong olketa.

Lo ivining Manuela kukim kaikai an Reimond relax afta hard waka long de yia an Benad hemi stadi den hem rimembam nao klas blong tisa blong hem.

Benad: Dadi! mami hemi kuki wetem faeawud stovaen mi stadi yiusim nao kerosin lam. Mi save herem mami kof olowe noma bikos long smok from stov ia. Mi bata streinim ae blong mi tu yiusim keresin lamp ia bikos laet from keresin lam ia hemi no inaf. Tisa blong mi talem tudei abaotim nao stov wea no garem nao smok en sola paoad laeting. Tisa talem tu dat iumi save sajim naO mobael fon from nao sola ia.

Dadi: Yes boe blo mi, mi herem tu abaotim nao sola laets an mi lukim tu long samfala haus taem mi go waka. Olketa laets yia braet forgud.

Benad: Dadi wae nao yumi no save baem wanfala:

Dadi: Olketa dia tumas ia an wetem lelebet slen mi tekem from waka hemi no inaf, mi no save baem. Taem mi enim moa slen nao yumi save seivim mani fo baem nao wanfala smokles stov en sola laet.

Benad no setisfae nao lo wat dadi blong hem talem long naet ia so hem ting ting gogo hem silipi na.

Neks day hem mitim nao tisa blo hem taem hem go insaet fo class.

Benad: Gudfala moning Tisa.

Velariono: Gudfala moning Benad. Yiu talem mami an dadi blo yiu tu abaotim nao riniuabol eneji diskasin blong yiumi yestedei?

Benad: Yes tisa mi talem oketa.

Velariono: Wanem nao dadi blo yiu se?

Benad: Hem se mifala pua an bae no save tekem wanfala.

Velariono: O kei osem bae mi lukluk hao nao bae mi save helpim yiu.

Benad: Tenkiu Tisa, Plis asistim mi.

Afta samtaems, prinsipol (Pita) blo skul ia askem nao Velariono abaotim nao klas blong hem long riniuabol eneji. Velariono talem nao prinsipol dat oketa students blo hem pua. Prinsipol se, hem no problem. Bank kosap long olketa garem na skim fo givim aot nao lon fo riniuabol eneji sistim. Investment long tufala eneji ifisient stov, sola panol an laets shud bi abaot 200 US Dolas. Diswan save beim back insaed long 36 manis.

Narafala dei lo skul

Benad: Gudfala moning tisa.

Velariono: Gudfala moning Benad. Mi tok long prinsipol an hemi se dat hem save areinj mani from benk fo baem nao stov an lamp. If dadi blo yiu interest talem hem kam an bae mi talem hem nao oketa diteils.

Benad: Bae mi tekem hem kam.

Lo ivining

Benad: Dadi tisa blong mi se dat skul prinsipol bae areinjim nao loan from bank an talem mi fo tekem yiu go long skul. Babae hemi explenim nao hao fo duim.

Reimon: Ok bae mi kam mitim Tisa.

Neks de: Benad an Reimond go long skul.

Reimon: Gudfala moning tisa. Benad talem mi abaotim nao sola eneji an loan from benk yia.

Velariono: Yes, yu garem nao smart boi. If yiu lilisin, hem save study fo mo taem an gro ap fo bikam profesonol.

Reimond: Madam, mi rialsaesim nao impotens blong gudfala laet an hao fo ridiusim smok an bae garew beta stov. Mi no save tekem cos mi no garew slen.

Den Pita prinsipol wakabaot kam insaet.

Velariono: Gudfala moning Sir.

Pita: Gudfala moning Velariono, wanem nao happen?

Velariono: Mitim Reimon – Benads dadi.

Pita: Helo Reimon, wanem nao mi save duim fo yiu?

Reimond: Benad talem mi nao abaotim nao stov an sola sistem. Mi ia laek tumas fo yiusim nao kuki wea no garew smok an sola sistem but mi no save tekem wanfala.

Pita: No wari Reimond, tumoro yiu tekem de from waka an bae mi tekem yiu go long beink, babae mi areinjim lon fo yiu.

Reimond: Tagio sir, bae lukim yiu tumoro.

Neks de prinsipol tekem nao Reimon go long benk fo rikuestim nao lon fo Reimond baem nao sola sistem an wanfala stov. Benk menaja ia agri fo givim nao lon. Hem talem nao prinsipol dat seleni ia bae olketa givim go nao olketa saplias blong ikuipment ia, bank bae aprovim. Instolment bae daerect go long benk. Reimon an Prinsipol go back afta komplitim nao fomalitis.

Wan wik leita ikuipmen saplaea arav kam wetem :

- Eneji ifisient stov yiusim faeawud.
- Sola sistem wetem wan LED lam, bateri an fan. Sistim ia garew noma wanfala mobael saj poen.

Sistem ia olketa instolim. Manuela barava hapi tumas wetem stov wea garew nao smol amaont blong smok noma.

Nomoa eni ricuring kofs. Benad hemi hapi tumas lo braet laet fo hem save stadi.

Tu des afta Reimon go nao long skul blong Benad fo tenkim nao tisa an prinsipol fo hel blong tufala. Hem invaetim tufala fo go long haus blong hem fo tufala lukim nao olketa sistim yia.

Velariono an Pita araev lo haus blong reimon long ivining

Reimon: Welkam Velariono an Pita. Diswan hemi Manuela, waef blong mi an Benad, iufala save lo hem finis.

Pita: Gud ivining, naes fo lukim gudfala laet an kuki stov.

Velariono Eksplen hao na stov an laet waka an hemi kompearim olketa wetem metirials hem yiusim when hemi treined.

Velariono: Sola panel ia nao jenereitim paoa an bateri ia na kipim paoa. Bateri yia save givim paoa fo abaot 4 aoas. Taem yuisim nao LED laet hemi ridiusim nao kaikai blong paowa bae abaot 60 % kompead go long nomol balb. Fan ia hem eneji ifisient tu ia. Wat abaotim na stov blo iu Manuela?

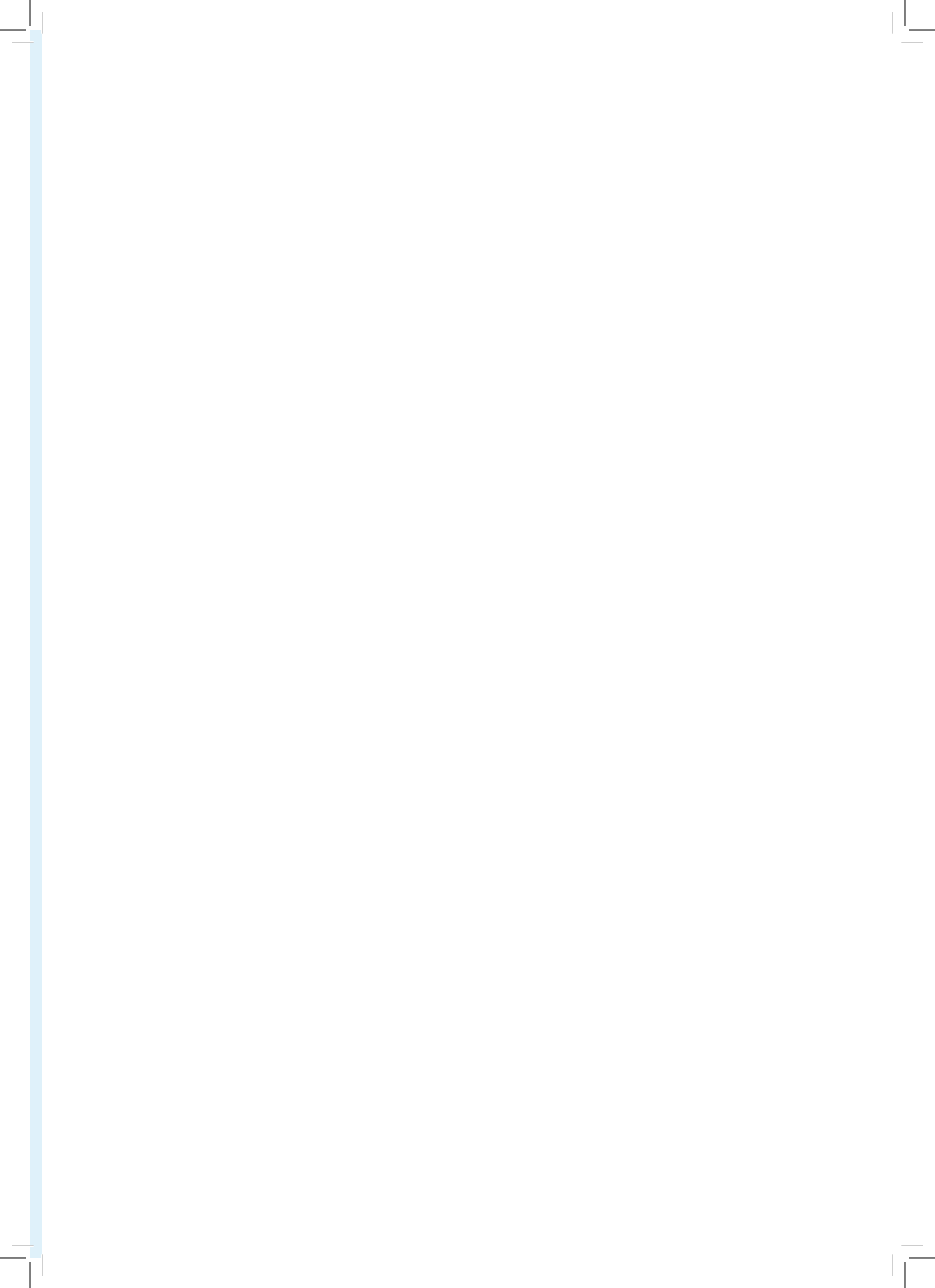
Manuela: Gud tumas, no eni smok, kuki fast an ridius fiul konsamson. Kuki taem blo mi hemi ridius by half.

Pita: Gudfala, rimemba fo kipim olketa seif gud. Reimon plis rimemba fo peim loan olowe everi manis. If yiu kliarim na lon ia babae iu save request go nao lo benk meneja fo givim iu moa na samfala slen. Benad yoiu garew na moa laet fo stadi nao.

Reimon: Tagio fo help blo yiufala. Babae mifala peim lon on taem olowe.

Benad: Tagio Sir an tisa, bae mi stadi gud.

Velariono an Pita liv filing setisfaed fo helpim nao famili ia.





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