



Modul 3 – Wokbuk bilong sumatin

Beisik Bilong Eneji Efisiensi

BILONG PAPUA NIUGINI

Husait i givim moni long dispela wok

Wok Bung wantaim

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“Het tok bilong Eneji Efisiensi” em i wanpela treinin we em i kirapim tingting long lukluk long eneji i ken wok gud long komuniti. Dispela em i behainim modul bilong “Ol General prinsipol blon Grin Ekonomi”.

Lon pinis blo dispela kos, bai ol sumatin i lainim ol dispela ol samtin daun bilo:

- Luksave lo wanem samtin em “Eneji efisiensi”
- Painim aut sampela wei long tokaut moa long Eneji Efisiensi insait long Komuniti

- Luksave long sampela ol mak we Eneji Efisiensi i mas wok insait long kantri
- Skelim gud na makim ol masin na kago bilong igat bikpel efisiensi long halivim komuniti
- Kirapim sampela niupela wei long kamapim Eneji Efisiensi long komuniti

TEBOL 2: Lesen Plen

Sapta	Ol lesen
Stat bilong sesen	
1. Kirapim tingting – Ol toktok bilong statim sesen	Skul tingting na wok 1
2. Ol het tok bilon Eneji efisiensi	Skul tingting Wok 2
3. Eneji Efisiensi na wei bilong lukautim	Skul tingting Wok 3
4. Wei bilong lukautim eneji istap longpela taim	Skul tingting Wok 4
5. Ol teknoloji bilong Eneji efisiensi	Skul tingting Wok 5
6. Ol lebel bilong eneji efisiensi	Skul tingting Wok 6
7. Ol gutpela tingting i kirap long komuniti long Eneji efisiensi	Skul tingting Wok 7

Dispela Wokbuk bilong ol sumatin ol i bin kisim long Treina Gaid (TG). Ol samtin i stap insait long dispela Lenas wokbuk (LW) i stap klia tru wantaim ol piksa na ol toktok we bai halivim ol sumatin long lainim ol samting wantaim treina long taim bilong skul. Sapos yu laikim moa infomesen long sampela seksen, plis painim aut long treina gaid.

Piksa i stap long Kava: Em i soim mak bilong Eneji efisiensi bilong Ostralia, hap we yu ken painim dispela infomesen em: <http://www.energy.gov.au/households/energy-rating>.

Toksave: Global Grin Growth Institute. i tokaut olsem ol toktok ol i mekem insait long hia bai ino inap long kisim ol i go sanap long kot haus, na bai yu tu i noken sutim tok long ol long sapos ol man i usim dispela long wokim ol samting long laik bilong ol yet na kamapim ol birua. Olgeta toktok na piksa em bilong yu long lainim tasol na i no bilong bagarapim yu.

GLOSERI/ MINING BILONG OL TOKTOK I STAP INSAIT LONG DISPELA WOKBUK

Seket Braika – Wanpela samting long usim long stoppim elektriciti long aburusim mak bilong em.

Kombasten – Taim win na fiul i bung long rait kwantiti na tempresa na i kuk.

Komesol Sos blon Eneji – taim yu laik baim sos bilong eneji kain olsem, Koel, petrol, win na elektriciti

Eneji odit – em i wok bilong sekim mak bilong usim eneji we pawa.

Eneji Konsevesen – noken usim eneji taim yu nogat nid long usim kain olsem offim lite na fan, ol paiawud stov, puttim off TV taim yu no wats, na larim pam i ron natin nating.

Eneji Efisiensi – Usim ol teknologi ol wok long wokim niupela tasol long savim eneji kain olsem ol LEDs Eneji Efisiensi wara Pam, na ol masin bilong putim kaikai long stap longpela taim long kol we i save usim liklik eneji tasol.

Nem Plet – ol samting we ol save putim nem na infomesen bilon ol masin antap long en.

Nonkomesol sos bilong eneji – eneji we yu kisim fri tasol, yu no nid long baim – kain olsem paiawud long bus na win bilong wokim paia we i kamap long ol lip pipi bilong ol bus.

Polusen – simuk i save kamap long paia bilong ol fiul.

Primari Sos Bilong Eneji – namba wan sos bilong eneji i stap ananit long graun kain olsem koel, petrol, ges na sid bilong paia.

Sekondari sos bilong eneji – i kam arasait long primari sos bilong eneji kain olsem, elektriciti or pawa, win bilong hat wara, na hat wara yet.

MEKIM OL TOK I SOT

AC	Alternating Current
°C	Degrees Celsius
BHP	Brake Horsepower
CFL	Compact Fluorescent Lamp
CO ₂	Carbon Dioxide
CSR	Corporate Social Responsibility
DG	Diesel Generating
EC	Energy Conservation
EE	Energy Efficiency
GB	Green Business
GE	Green Economy
GGGI	Global Green Growth Institute
GLS	General Lighting Service Bulbs
HP	Horsepower
HSD	High Speed Diesel
HVAC	Heating Ventilation and Air Conditioning
KOICA	Korea International Corporation Agency
km	Kilometer
KVA	Kilo Volt Ampere
LED	Light Emitting Diode
LPG	Liquified Petroleum Gas
LPH	Liters per Hour
LW	Learner's workbook
MEPS	Minimum Energy Performance Standards
Mts	Minutes
MW	Mega Watts
PIDF	Pacific Islands Development Forum
PNG	Papua New Guinea
RE	Renewable Sources of Energy
RO	Reverse Osmosis
TG	Trainer's Guide
TOT	Training of Trainer
TV	Television
USA	United States of America
V	Volts
W	Watts

1

Introdaksen/
Kirapim Tingting

WOK 1

Ol sumatin i mas tokaut long nem bilong na tokaut liklik long yu yet kain olsem long bai yu save wokim wanem long kain taim olsem sapos yu no bin kam long dispela kos, na tokaut long wanem save yu laik kisim long kam bilon yu long dispela training. Yu yet tu ken tokaut moa long save yu gat long side bilong eneksi effisiensi, na sapos yu wokim sampla wok pinis wantem dispela topik, wanem kain ol hevi yu bin gat na wane

mol tingting bilong yu long behain taim na sampela tingitng long kamap wanem kain man na meri long behain taim. Na tu, sapos i gat taim yet ok yu ken tokaut long wanem tingitng bilong yu long said bilong ok grin bisnis. I nogat wanpela ansa i Karangi, bikpela samting em dispela em bilong wokim yu i stap long gutpla bel na stap long dispela sesen.

2

Enenji Efisiensi
Het Tingting

PIKSA 1: Gol bilong SDG¹

2.1 Eneji Efisiensi Beisik

Dispela Modul bilong eneji efisiensi em i sanap antap long ol ass tingiting bilong grin ekonomi, long taim yu usim liklik eneji tasol, bai i nogat planti kabon dioxide gas (gas nogut) igo long skai. Daun bilo long tebol namba 3 bai yu lukim wanem ol kantri we i save usim eneji long en.

TEBOL 3: Lukluk long ol eneji long ol fopela kantri we wok i kamap long ol.

Ol price na moni long wanpela kilowatt long wanpela aua	Fiji	PNG	Solomon Islands	Vanuatu
Pawa belong salim igo long ol haus na hamas bai yu baim long en	0.07 to 0.15	0.21	0.79	NA
Taim ol i skelim pawa long sola panel we i kam long san na hamas bai yu baim long en long wanpela kilowar aua long moni bilon USA	0.78 solar hybrid	NA	NA	NA
Long baim Paia wud nah amas bai yu bain long wanpela hip long moni bilong USA	4.34	NA	2.96 to 3.56 per bundle	NA
Karosin na hamas bai yu baim long wanpela lita long moni bilong USA	0.69	0.85	0.93	No usage
Hamas long HSD longwanpel lita long moni bilong USA	0.81	0.91	1.00	2.2

Long lukluk bilong ol gol bilong NDC, PNG bai lukluk long noken usim kabon long taim kristmas 2030 i kam kamap. Igat ol narapela ol wei we i sa halivim tu long nogat planti kabon i go long skai em eneji efisiensi em ol wok long kantri bilon wel na ges, long kar, balus na sip, na wok bilong katim ol diwai na ples graun.

2.2 Namaba wan wei na ol narapela ol wei bilon usim eneji

Namba wan wei long kisim eneji em long san. Eneji i kam long san i save halivim ol diwai long grow na taim ol i dai, ol save stap long graun longpela taim na kamap olsem graun, koel na wel bilon koel na ol samtin olsem. Komuniti i mas hamamas olsem ol dispela ol eneji i kam long mama graun na tu i save pinis hariap turu. Ol i save kisim longpela taim turu (planti

milionpela kristmas) long i kamap olsem dispela kain ol eneji we yumi ken usim.

Planti ol kantri is save usim dispela kain ol eneji kain olsem Tebol 3 em i soim

Ol narapela ol sos bilong eneji we i save kamapim elektrisiti na hat wara olsem ges. Dispela ol eneji i save nidim fiul kain olsem ol hap diwai bilon wokim paia na disel na ol kain samtin. Olgeta narapela sos em ol namabawan wei bilong kamapim eneji.

Elektrici we i save kamapim lait long haus na long ol pum bilong wara na kain ol samtin olsem em ol namba tu wei long kisim eneji. Elektrisiti we i save kam long ol fiul kain olsem disel na petrol na ol wei bilong usim ol sos bilong eneji we yumi ken usim gen i ken savim moni na yumi ken lukluk long grinpela ekonomi.

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

Ol enei insait long dispela ol kantri i kam long:

1. Ol Biomass o Palang bilong wokim paia long kukim kaikai long Ples. Ol bio mas olsem paia wud na ol pipia bilong ol kaikai na ol skin na sel bilong kokonus - em ol namba wan so bilong kisim enei
2. Sampela liklik ol hap enei blong bio mas i save kem long ol pipia belong suga na ol palan wer ol I usm long makm pawa.
3. Ol fosil fiul kain olsem petrol na disel i kam long ol narapela kantri we yumi save usim long ol kar, balus na sip, na ol masin we save usim DG long kamapim pawa - **Nambawan wei long kisim enei**
4. Elektriciti is kam long ol masin i ron long wok bilong wara kalap, na liklik tasol long win na enei we i kam long san em ol **narapela ol wei long kisim enei**

2.3 Komesol na Non-komesol sos bilong enei

Taim yu baim enei kain ol fiul olsem Koel, kerosin, petrol na disel wantem moni orait dispela em ol kolim long Komesol sos bilong enei. Na non-komesol sos bilong enei em bai yu no inap long baim wantem moni. Em ol i stap pinis long yu ken usim. Kisim ol hap diwai long bus, pekpek bilong ol abus, na ol pipia bilong ol kaikai long ol graun em ol samtin we yu ken usim na bai yu no inap baim long moni.

Daun bilo i soim olsem komisol na non - komisol em ol ino wankain.

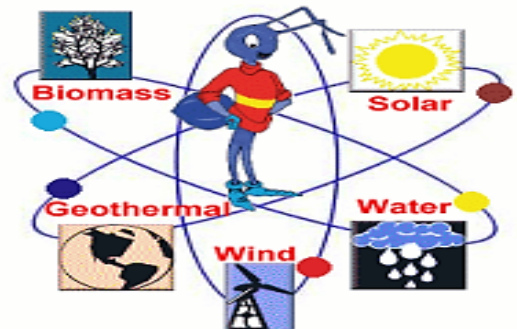
PIKSA 2: Em i soim olsem Komesol na non-komesol ino wankain²

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

2.4 Sos bilong enei we yu ken usim gen na sos bilong enei we ino inap long kisim bek gen tim yu usim

PIKSA 3: Enei we yu ken kisim bek gen³



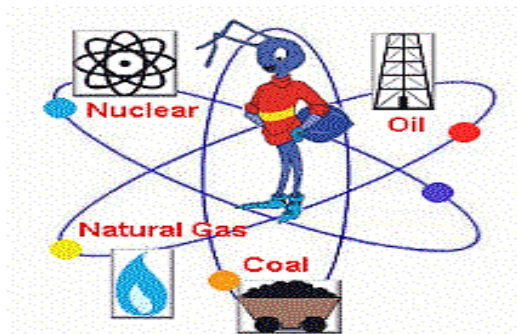
Enei billong usim gen (piksa 3) - em i enei we yumi ken kisim ken long lait bilong san, long win, taim em i ren, wara i tait, solwara kirap na taim sun i hatim graun long en. Enei we yumi ken usim gen i kam long fopela bikpela ol aria em: Elektriciti long kamapim pawa, hotim/kolim ol samtin, long ol kar balus na sip long ol i ken i go na i kam. Ol sos bilong kain ol enei em olsem:

1. Enei bilong lait I kam long san
2. Enei I kam long Win
3. Enei I kam long ol samtin i dai pinis long en
4. Enei I kam long ol hot bilong graun.
5. Enei i kam solwara i tait long en
6. Enei i kam long ol solwara i kirap long en

Enei we bai yu no inap usim gen.

1. Enei bilong Nuklia
2. Fosil Fiuls (Nataral ges, wel, koel, petrol na ol kain ol smatin olsem)

PIKSA 4: Ol enei wer yu no inap usim gen⁴



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

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

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

Taim yumi usim Pawa em i save kamapim planti bagarap long graun. Tasol bagarap i ba kamup sapos yu usim kain pawa long ol sos olsem ges na disel o fosil ful long ol hap ples bilong pawa.Tasol. Elektriciti we save kam long lait bilon san/ win / Piko hidro we i save usim liklik wara long wokim elektriciti, ol dispela ol i no save bagarapim ples graun yumi stap long en.

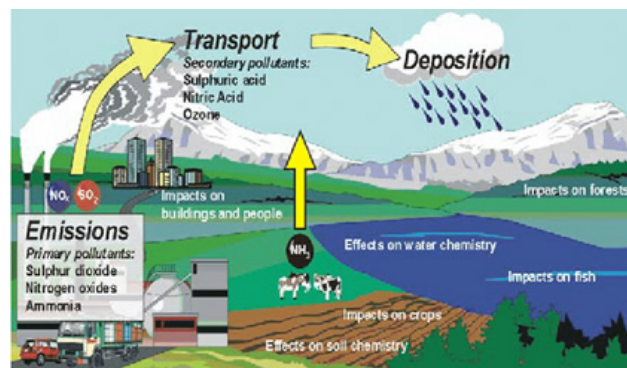
PIKSA 5: Wanpla bikpla hidro or Wara bilong wokim electricity long givim pawa⁵



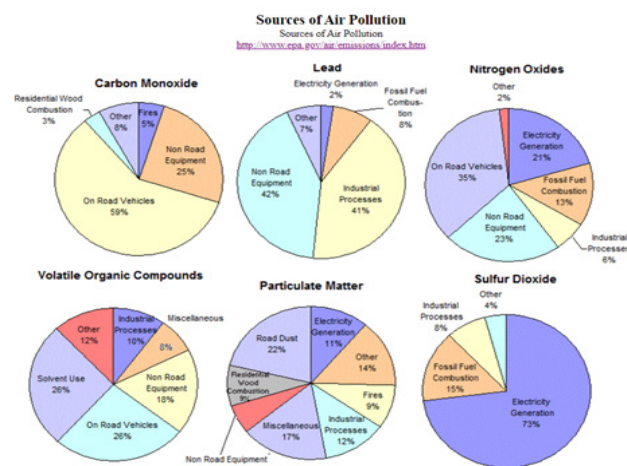
Ol bikpela ol Hidro (Wara) Pawa stesen long wokim elektriciti kain olsem long Piksa 5 em save kamapim bikpela bagarap long ol diwai na bus ples na taim wara i tait em save bagarapim ol ples we man meri i stap long en. Ol bikpela ol hidro pawa stesen i stap long planti ol ples we maunten I stap na ol bikpela ol han wara na igat plantin diwai i sanap. Long disla ol pawa stesen tasol na ol i save katim gut tru ol bus na diwai long wokim ol rot na wokim ol haus. Ol i save pasim wara na i kamap olsem raun wara long kisim pawa long en na taim wara pundaun i go daun bilo em ron olsem wanpla han wara gen. Olsem na planti ol ples we man meri i stap long en i ken hariap tru painim bagarap, taim wara tait i kam bungim ol. Dispela tu em i ken wokim na ol man meri lusim ples bilong ol na go stap long narapela hap taim wara bagarapim ples bilong ol na gavaman tu i lusim planti moni lo halivim ol man meri husait i painim dispela kain bagarap. Olsem na taim ol i katim olgeta ol diwai em i save wokim san be hot nogud tru. Na tu taim ol i wokim na katim.

PIKSA 6: Ol ass bilong ol samtin i save bagarapim environment

A⁶



B⁷



Piksa 6 em i soim ol sos bilong ol pipia we i save bagarapim enviromen. Na tu i sa gat ol bikpela paia i kamap long bus. Em i save bagarapim bus na tu simuk bilon paia i save go longpela hap tru na bagarapim ol man lon wanem hap em i go.

PIKSA 7: Simuk bilong ol paia wud long haus kuk⁸



⁵ Sirinumu Dam, TripAdvisor, https://www.tripadvisor.com/Attraction_Review-g294118-d15661829-Reviews-Sirinumu_Dam-Port_Moresby_Papua_Region.html#me-dia-atf/15661829/365843729:p/?albumid=-160&type=0&category=-160

⁶ Source: Research Gate, "Urban Air Pollution in Asia Foundation Course on Air Quality Management in Asia", https://www.researchgate.net/publication/263970537_Urban_Air_Pollution_in_Asia_Foundation_Course_on_Air_Quality_Management_in_Asia

⁷ Source: EPA, "Sources of Air Pollution", <https://www.epa.gov/environmental-topics/air-topics>

⁸ Photo Credit: Benjamin Keni, GGGI Papua New Guinea

Taim bilong rausim ol krop bilong salim. Taim ol paia wud i lait em i save kamapim simuk tu. Maski paia wud em i fri long komuniti i kisim simuk bilong en i save bagarapim environment

na sa kamapim sik bilong sot win. Em i save kamapim bikpela bagarap long ol Meri na ol pikinini.

WOK 2

Mak: Ol wokman bilong gavman long provins, distrik na Lokol level

1. Wanem kain ol enoji sos bai yu laik long tokaut moa long en long komuniti bilong yu?

2. Wanem sampela ol sos bilong enoji wer yu no inap kisim bek gen bai yu gat tingting long daunim pasim bilong usim ol.

3. Long wanem as tingting stret em ol i save tok enoji i kam long elektriciti em i namba 2 wei na ino namba 1 sos bilong enoji?

4. Long wanem kain wei bai yu daunim birua bilong bagarapim environment long komuniti bilong yu.

Mak: Ol bik man bilong ples na ol het man bilong lotu, ol meri na ol yampela man na meri na ol mama ol i stap ol yet na ol lapun

1. Namim ol sampela ass bilong eneji yumi save usim long PNG?

2. Lukluk long ol piksa na makim na writim olsem em yu ken usim gen or em bilon usim long wanpela taim tasol.

Picture	
 9	
 10	
 11	
 12	

3. Long wanem as tru elektriciti em i wanpla namba 2 sos bilong eneji na ino namba 1 we long kisim eneji.

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

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

11 Source: Hyperleap, Micro hydro, https://hyperleap.com/topic/Micro_hydro

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

4. Wanem em ol ass bilong ol samting i save bagarapim komuniti?

5. Long wanem as tru na ol elektriciti i kam lon ol wara pam ino gutpela long enviromen na save kamapim ol bagarap?

Mak: em ol save man meri husait i save stretim ol rop bilong pawa na ol manmeri i gat save lon ol dispela ol samtin

1. Wanem kain ol samtin bai yu mas wokim lon en long noken moa usim ol sos bilong eneji we yu nanap lon usim paia wud na ges na koel?

Mak: ol Liklik ol Bisinis

1. Wanem kain ol bisnis wok yu inap long mekim na tingim long en taim yu toktok long dispela toktok yumi lukluk long en?

2. Long wanem wei tru bai bisnis bilong yu bai halivim long daunim bagarap long kamap long enviromen?

3

Eneji efisiensi na
Eneji Konsevesen
(Lukautim Eneji)

Yumi mas luksave olsem eneji efisiensi na eneji konsevesen em i no wankain. Eneji Konsevesen em bilong lukautim eneji na noken usim nating nating. Yu mas tingim wanem toktok I stap long piksa 8.

PIKSA 8: Tok piksa bilong Eneji Konsevesen¹³



Planti taim bai yu painim olsem ol lait na fan i save on taim ol man na meri i no stap. Dispela i mas kamap wanpela pasin bilong yu long ofim lait na fan taim yu i no laik usim ol. Ol otomatik. Yumi mas lukluk lo ekonomi bilong komuniti na wanem mak em i stap long en, i nogat use long ol sistem we i save wok long ol yet. Yu mas tingim olsem lait bilong san em innap na pawa yu kisim long lait bilong san em fri, olsem na yu mas usim long olgeta

Paia i save lait yet stap taim kaikai i kuk pinis. Dispela i kamap bicos yu bai laik latim paia gen long wanpela aua i go pinis.

Yu mas save olsem latim paia long ol paia wud stove em i save kisim lonpela taim na bai yu hatwok long wokim paia tasol yu mas kilim paia na behain laitim gen long taim yu laik usim. Disla kain fiul em fri nau tasol bai yu pilim pen bilong en long behain taim. Narapela samtin tu em olsem, taim yu lusim paia i lait simuk bilong en i save go bagarapim ples na enviromnen taim em i kirap go antap long skai.

PIKSA 9: Ol teknologi we em i save wok gud long en: Lait ol Nomol¹⁴ lait na Lait i gat LED¹⁵ long en



Nomol Lait Lait i gat LED long en

Long narapela lukluk, baim ol masin we em i save wok gud na lukautim eneji em tu yu ken kolim dispela long Eneji Efisiensi. Kain olsem ol lait, ol masin, na ol stov we ol no save rausim planti simuk long en, Piksa 9 em i soim wanpela nomol lait na wanpela LED lait we em i save wok long lukautim eneji na usim liklik tasol. Wanpela nomol lait em i save usim 60W paw ana LED save usim tasol 7W pawa tasol em i save givim wankain lait olsem ol nomol lait. Hat bilong GLS lam i winim tru hat bilong LED insait long ol lait. Wanpela gutpela nomol lait em klostu olsem K20 na wanpela gutpela LED lait em i klostu olsem K30.

TEBOL 4: konsevesen Eneji na Eneji Efisiensi

Eneji Konsevesen	Eneji Effeciensi
Putim of ol Lait na Fan taim yu no usim.	Usim ol LED lait na Fan we i save usim liklik eneji or pawa tasol.
Usim ol gutpela ol pot long kukimkaikai size long 1liter/0.5 na karamapim wantem aye bilon en.	Ol gutpela ol stov na ol gutela paia wud i save lait gut long en.
Offim TV taim yu no watsim ol piksa.	Baim ol TV we ol i gat ol Eneji Efisiensi sta long ol.
Noken larim ol wara pam i ron nating nating.	Baimol pam ol save usim liklik eneji o pawa tasol.
Noken larim ol enjin bilong ol spid bot i ron nating stap.	Baim ol enjin bilong ol bot ol save usim liklik eneji tasol.

Ol kantri we ol i develop pinis, ol i stap long mak we ol i bin usim planti eneji na ol i kamapim ol rot bilong daunim ol use bilong ol eneji na usim liklik eneji long wokim bikpla wok. Tasol yumi long ol ailan long Pacific, yumi no kam long dispela kain mak yet, dispela i min olsem yumi gat planti ol we long lukluk lon daunim pasin bilong usim eneji na usim long

mak na kamap olsem ol kantri i develop pinis na stap. Wok i isi tru sapos yumi wok long eneji efisiensi long taim yumi wok long develop yet na tu bai yu no inap usim planti moni tumas. Dispela em i wanpela bikpela sans long yumi long ol Pacific kantri.

13 Source: The Cure Inc., https://www.thecuresafety.com/NOTICE_Turn_Off_When_Not_In_Use_Large_pnga23pb.htm

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

15 Source: Media-amazon, Led bulb, <https://m.media-amazon.com/images/I/31R-vJ3hstL.jpg>

3.1 Eneji Odit

Eneji Odit em i wanpela bikpela topik tru. Ol bikpela indastri, na long ol bikpela ol opis na long ol hotel bilong ol turis ol i save wokim dispela. Em i wok bilong luksave long ol wanem

kain ol masin ol save usim na hamas eneji o pawa ol dispela ol masin i save kaikai. Ol save lukim hamas eneji ol masin i kaikaim long pawa, fiul na ges na ol i save kamapim sampela wei long lukautim eneji na ol i ken lukluk long baim eneji tu. Daun bilo bai yu lukim sampela ol rot bilong dispela:

TEBOL 5: Rot bilong Eneji Odit

Appliance	No of units	Power	no of Hours	Energy
		w	use	kWh/dai
LED Lait	2	9	4	0.072
Fen	1	70	12	0.84
Fris	0	200	0	0
TV	1	100	6	0.6
Sasim fon long pawa				0.05
Bungim olgeta (kWh/de)				1.562
(kWh/month) Bungim olgeta long wanpela mun (kWh/mun)				46.86

WOK 3

Mak: Ol lida man meri long LLG, distrik na provinsol gavemen

1. Wanm em sampela ol rot bai laik kisim long konsevim eneji na lukluk long eneji efisiensi?

2. Long wanem rot bai yu wokim eneji odit long ofis bilong yu?

Mak: Ol lida long ples na long lotu, ol meri na ol yangpela na ol mama husait ol i nogat man long en na ol lapun

1. Wanem kain wei em eneji konsevesen em i narapela na eneji efisiensi em i narapela?

Mak: Ol man meri save stretim pawa na ol man meri igat ol save long ol teknikal wok

1. How bai yu lukautim eneji na eneji efisiensi long ol wok yu save wokim long olgeta dei?

Mak: Ol man meri usait i gat liklik ol bisnis

1. Bai yu wokim wanem samtin long konsevim eneji na eneji efisiensi?

Hap bilong raite

4

Ol rot Bilon
konsevim Eneji

4.1 Kukim kaikai

PIKSA 10: Wanpela meri i karim paiawud long go kukim kaikai¹⁶



Paiawud em i wanpela bikpela fiul long usim long kukim kaikai. Kerosine tu tasol em i liklik tru, na ges em nogat olgeta (LPG). Bai yumi lukluk moa long kukim kaikai wantem paiawud osem fiul bilong wokim paia. Ol paiawud i stap long ol hap ples bilong wok garden or ol katim ol diwai long en. Ol man meri i save bungim olgeta hap paiawud na save taitim wantem rop. Planti taim em ol meri i save wokim dispela wok long karim paiawud long het bilong ol na wokabaut go long haus bilong ol (Piksa 10). Liklik ol wanwan paiawud i save pundaun igo long graun taim ol i karim, dispela em fiul i save go natin.

Ol paiawud ol i katim long en long kainkain sise (Piksa 11) na ol i toromoi go insait long paia stov. Em ol brik tasol. Tripela i raunim na wanpela long holim paiawud. Pot em i sindaun antap long stov na kuk long paia stap.

Planti taim em ol i save katim ol 44 galen drum na putim lek long ol na sanapim na putim paiawud long en na kukim kaikai

PIKSA 11: Paiawud ol i katim go liklik na wanpela stov bilong putim paiawud long en

17



18



PIKSA 12: Karamapim ol dis o pot kaikai wantem lid¹⁹



Ol pot i gat kainkain sise bilong ol na paia i mas stap gud ananit long ol pot long kukim gud ol kaikai. Sise bilong pot tu em i ken afectim Eneji efisiensi bilong kukim ol kaikai. Ol i mas skelim long sise bilong ol kaikai ol bai kukim long en. Sapos yu laik hatim susu bilong kau orait usim liklik pot. Long hatim wanpela lita bilong wara yu mas usim wanpela pot em i bikpela liklik.

Piksa 13 daun bilo em i soim ol eneji efisiensi stov.

PIKSA 13: Eneji efisiensi kuk stov

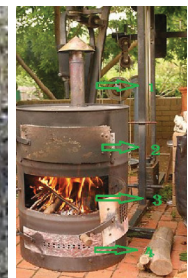
A²⁰



B²¹



C²²



¹⁶ Source: Shutterstock.com "African woman while carrying load wood", <https://www.shutterstock.com/image-photo/african-woman-while-carrying-load-wood-221777113>

¹⁷ Shutterstock.com "Burning wood", <https://www.shutterstock.com/search/burning+wood>

¹⁸ Photo Credit: Benjamin Keni, GGGI Papua New Guinea.

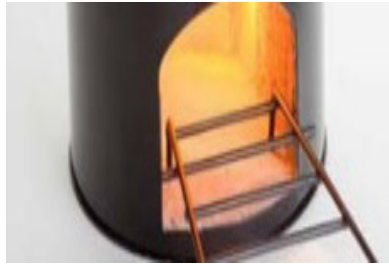
¹⁹ Source: Wikipedia, "Clay pot cooking", https://en.wikipedia.org/wiki/Clay_pot_cooking

²⁰ Source: Environmental Camps for Conservation Awareness (ECCA) Homepage, "Improved cooking stove", <https://ecca.org.np/home/page/technology/cooking>

²¹ 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/>

²² Source: Pinterest.com, "Stove" adapted from Daub & Stuff, <https://daubstuff.wordpress.com/tag/stove/>

Ol het tingting bilong ol eneji efisiensi kuk stove em olsem:

1.	Wanpela plate o ples bilong putim fiul na paiawud	
2.	Kombusten chemba em i ples we win i save go insait long stov long ananit bilong en na mix wantem paia wud	
3.	Ples bilong putim pot long antap long en long kukim kaikai na usim ges	

4.2 Ol sampla Eneji konsevesen wai bilong Ol masin i stap long haus

PIKSA 14: Ol Apliance bilong Haus²³



Piksa 14 em i soim ol sampela ol masin i save stap insait long ol haus na ol man meri i save usim long en. Igat ol kain ol masin long ol narapela komuniti tu dispela em liklik tok piksa tasol.

Daun bilo em ol narapela wei long konsevim eneji ino kauntim fon sasa na spika bilong harim music. Sampela ol liklik ol rot bilong konsevim eneji insait long ol haus em olsem:

- Offim ol lait, fen, na TV sapos yu no usim moa
- Usim lait bilong san taim ples i tulait yet – long ples em ol save usim moa yet na long citi i no tumas
- Ol windo bilong haus mas op i stap so win i ken raun go insati long haus na fen tu i ken winim gutpela win raunim haus
- Rausim ol mobile fon sasa olgeta taim long taim fon em i sas na pulap pinis
- Noken traim long plugim planti ol samtin igo long wanpela pawa sos
- Painim na senisim lo waiya ol i bagarap pinis long en (Piksa 15)

PIKSA 15: Noken wokim olsem²⁴



4.3 Ol eksen bilong Eneji konsevesen – pam bilong wara

Komuniti i save usim wara long dring, waswas na kukim kaikai na long kapsaitim long o lol gaden kaikai lon gro. Wampela hap masin insait long pam em ol i save kolim long impela i

save spin taim pawa i ron long wampela moto. Mono pam em em pam we dispela moto na pam i stap wantaim insait long wampel kontaina ol save kolim saft. Ol dispela kain ol pam ol i wokim long wokim wok bilong agrikalsa na bilong putim antap long ol tank i stap antap long kapa bilong haus na antap long ol pos. Ol moto bilon pam i mas wokim gud wok na i mas stap sindaun gud insait long pam.

PIKSA 16: Ol pam bilong Wara

A²⁵



D²⁸



B²⁶



E²⁹



C²⁷



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

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

26 Amazon.in, "Kirloskar Aqua 50 Water pump", <https://www.amazon.in/Kirloskar-0-5hp-Aqua-Water-Pump/dp/B07DRJ5QXM/ref=>

27 Amazon.in, "Kirloskar Aqua 50 Water pump", <https://www.amazon.in/Kirloskar-0-5hp-Aqua-Water-Pump/dp/B07DRJ5QXM/ref=>

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

29 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>

TEBOL 6: Ol pam bilon wara

No	Ol pam	Hamas long baim long Kina	Wok bilong pam
A	Han Pam –nogat pawa	50	Em i save pamim wara igo inap long 100 fit or 30 mitas
B	Pam sa siliplong graun –3HP	200	Em i save pamim wara igo long ol tank antap long haus kapa or i stap long pos.
C	Pam i save stap insait lon ples bilong wara	300	Em i save pamim wara bilong graun i go inap 500 fit o 150 mita
D	Pam bilong usim lait bilong san	1500	Pamim wara Bilong Graun
E	Pam i save ron wantem disel	500	Pam bilong wok agrikalsa

4.4 Eneji Konsevesen – Ol enjine bilong ol spid boet

PIKSA 17: Moto - spid bot³⁰



PIKSA 18: Moto bilong spid bot – ol enjin i save usim liklik fiul long ron³¹



Zoom na sampela time petrol i save tunim alternata long pawarim enjine bilong spid bot. Wankain enjin em ol i save usim long pamim wara lon pam. Long Pasific ailan i nogat wanpela pam em i save ron wantaim disel, maski i gat ol Disel Generata (DG) long kainkain sise, yumi mas tingting long usim ol kiln eneji sos. Yumi mas senisim ol genereta we i save usim disel wantaim ol generetas i save ron lon pawa bilon lait bilong san. Olsem na yumi no inap toktok moa long dispela.

Ol bot i save ron long ol Zoom enjin. HP (pawa) bilong enjin em 40HP. Yumi mas tingim sise bilong bot tu.

- Mas makim enjin long inapim wok bilong yu. Skelim hevi bilong bot, hamas man meri bai kalap, hevi bilong ol kago.
- Wel na petrol i save mix long kamapim zoom long ronim enjin. Em ol 2 strok enjin. Ol 4 strok enjin i save usim petrol olsem fiul na wel long wokim ol masin insait lon enjin i welwel na ron gut
- Em gutpela moa olsem yu mas baim gutpela fiul long ol sevis stesen. Sapos yu kisim long ol narapela hap em i ken bagarapim enjin bilon yu. Ol kain samtin olsem kerosin na wel i ken bagarapim.
- Noken baim fiul long ol narapela hap, em bai wokim enjin i nogat pawa na bai yu stap long bot longpela taim.
- Ol enjin i gat tank bilong ol i stap silip long bot na ol joinim wantem metol, plastic, raba pipe. Ol Plastic na Raba pipe i save bagarap hariap na save wokim fiul i kapsait. i gutpla moa long usim ol metol pipe tasol ino isi long katim ol metol. Em i gutpla long usim ol breded hose.
- Wankain olsem paiawud zoom, disel, petrol ol i mas gat win long bai ol i lati. Long hia bai yu no inap lukim paia long wanem em i stap insait lon enjin na temperesa em i antap tru. Long luksave long enjine i wok gut em ba yu lukim simuk bilong en. Sapos em i bikpela simuk em i minim olsem win i no ron gut kam arasait long enjin i go long skai. Sapos em i bilak nogud tru em i minim olsem nogat planti win i go insait o nogat em i no gutpla win. Sapos simuk em i wite em i minim olsem em wara. Simuk i mas braun liklik na yu ken lukim long 1 mita long we win i save kam arasait long enjin.

Narapela samtin we em i moa gutpela long tingim em lon lukautim petrol enjin. Ol we bilong lukautim enjin em olsem senisim wel, ol filta, ol spak plug, na klinim kabureta bilong enjin. Wanpela liklik toktok long lukautim enjine ba kam behain liklik. Ol enjin i mas gat enjin wel long wokim ol masin i welwel na ron gut insait long enjin

³⁰ Photo Credit: Benjamin Keni, GGGI, Papua New Guinea

³¹ 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>

WOK 4

Mak: Ol Lida long LLG, distrik na provins

1. Wanem sampela ol rot bai yu laik kisim lon wokim eneji efisiensi insiat long komuniti bilong yu?

2. Long wanem rot bai yu halivim komuniti bilong yu log kamapim ol wei long lukautim enji?

Mak: Ol Komuniti na lida bilon sios, meri ol yanpela, na ol singol mama na ol lapun

1. Wanem sampela bagarap i save kamap long taim bilong kukim kaikai?

2. Listim sampela ol rot bilong eneji konsevesen.

3. Lukluk long ol Pam long piksa na writim nem bilon ol i go daun?

Picture	
	
	
	
	

4. Wanem sampela ol gutpela tingting long eneji konsevesen long ol pam?

Mak: Ol elektrikal wokman na meri, na ol lain i gat save long ol wok bilong ol teknikal samtin

1. Wanem sampela ol samtin bai yu wokim long wok bilong yu we lon kamapim eneji efisiensi?

Mak: Ol liklik ol bisnis

1. Long wanem rot bai yu mas behainim long bisnis bilong yu we em bai kamapim eneji efisiensi?

5

Ol teknologi
we em i eneji
efisiensi

5.1 Ol narapela kain ol fiul

Dispela kain ol teknologi in no stap long ol kantri ba yumi lukluk long en tasol dispel em olsem wanpela tingting bilong behain taim long wokim gutpela ol grin bisnis.

PIKSA 19: Biomas Pelets³²



Bioges plent em i save kamapim gen biogas long kukim kaikai na ol pipia bilon bioges i save kamap gutpela kaikai bilong graun long planim ol kaikai. Bioges tu em i gutpela long ol ol enjin na ol laita bilon ges.

PIKSA 20: Bioges Plent³³



5.2 Teknologi bilong enej egiensi – Lait na Fen

PIKSA 21: Sos bilong lait

A²⁹



B³⁰



C³¹



D³²



Sampela ol komuniti long bus ples i save usim ol kerosin lam na ol kendol long kamapim lait. Kerosin lam i save kamapim simuk. Glas bilong lamp tu i mas stap klin olgeta taim. Bikpela samtin em olsem yumi mas noken usim ol kerosin lam planti na yumi mas lukluk long lait we em i enej egiensi.

Piksa 21B em i soim olsem ol lait bulb bilong bipo na em i liklik moni tasol. Namba 2 Piksa (Piksa 21C) em ol Compact Fluorescent Flight (CFL) na ol niupela ol lait em ol LED, piksa 21D (Lait Diod)

Kukim kaikai em wanpela wei na narapela em enej egiensi lait em bikpela nid long enej long komuniti

Wanpela nomol lait i save kaikaim 60W pawa. CFL save kaikaim 18W, tasol LED save kaikaim 7W pawa tasol i save givim hut lait wankain olsem wanpela nomol lait. GLS Lam i save hat bikpela tru na LED i liklik hat tasol. K20 long wanpela nomol GLS Lait tasol K30 long wanpela gutpela LED lait. Ol LED lait sa stap longpela taim, em i save givim planti moa lait na em i no save kaikai planti enej.

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

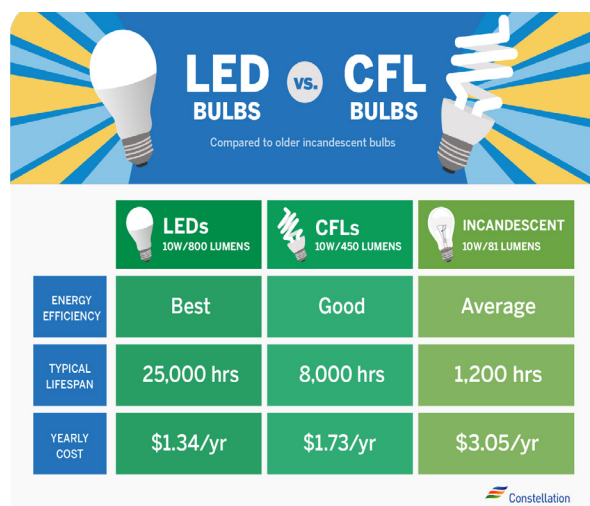
33 Energy Focus Newsletter, "Official launching of the Vanuatu Agriculture College Biogas System", <https://doe.gov.vu/images/docs/News-Events/ENERGY-Newsletter- One.pdf>

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

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

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

37 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>

PIKSA 22: Lukluk long ol sos bilong Lait³⁸**PIKSA 23: Ol masin we em i eneji efisiensi³⁹**

Piksa 23 em i soim wanpela fris na fen we em i eneji efisiensi.

Lukluk long dispela na lukluk tu long ol i stap lon Tebol 7.

TEBOL 7: Lukluk long ol Eneji efisiensi namel long Fen na fris

Fen	Nomol Pawa	Fen bilong usim eneji efisiensi
Fan em i save hangamap long insait long haus	70	30
Hama eneji ol mammeri i save usim long inapim 1000 auas (kWh)	70	30
Usim eneji long liklik spid	Nogat senis bilong en	Liklik tru bicos long ol regulasen bilong elektronics
Hamas long USD	15	45
Fris	Nomol fris	Fris bilong usim eneji efisiensi
Long nomol tempresa (°C)	Dip Fris (-18) Fris 3 -yu yet bai stretim na embai wok	Dip fris (-18) fris 3 -em ye save wok nogat man i stretim
Eneji em i save kaikai em (kWh) long 250 Litas	700	400
Hamas long USD	500	650

³⁸ LED Vs CFL Bulbs: Which is More Energy, <https://blog.constellation.com/wp-content/uploads/2016/03/CFL-vs-LED-bulbs.png>

³⁹ Red refrigerator, <https://www.spiele-schenken.top/ProductDetail.aspx?id=191426532&pr=8799>

5.3 Eneji Efisiensi Teknologi – Entatenmen na Komunikesen

Yu mas luksave long music na nois. Long sampela lain nois i ken pairap olsem music tasol long sampela ol lain em nogat tru. Ol sistem bilong music ino gutpela long en i save usim bikipela eneji na tu sound ino gutpela tumas, Wanplea lapun TV sapos ol i salim long liklik moni, piksa bilong en na saund kwaliti tu em i no gutpela na em i save kaikaim planti eneji.

PIKSA 24: Sasa bilong fon na TV⁴⁰



Long dispela kain ol taim bilong moden komunikesen, ol fon sasa em i wanpela samtin yu mas gat. Volt na mak bilong sasa mas wankain olsem phone bilong em. Ol nogud sasa i save kaikaim planti pawa na sa kisim longpela taim long sasim ol fon.

Usim ol gutpela kwaliti sasa em i savim eneji na tu em i sef, i mas stap gut long wanpela pawa soket wantem rait volt. Noken lus tingting long rausim sasa long pawa soket taim yu pinis. Planti ol sola pawa kit i save kam wantem ol USB pot long plugim ol fon long en, dispela em i wokim wok isi tru long sasim ol kainkain ol fon long dispela wanpela USB port.

PIKSA 26: Nem Plet bilong ol Moto

A⁴² Nomol Moto



5.4 Painim ol Ekwipmen we ol i eneji efisiensi

I save gat ol nem plet i save kam wantem ol sampela ol masin. Sekim volt (V) na pawa bilong ol (w). Daun bilo bai yu lukim wanpela piksa long dispela.

PIKSA 25: Nem Plet – LED⁴¹



Dispela nem plet em i soim 10W pawa na volt bilong en em 220 go inap long 240V.

- Lebel bilong eneji efisiensi, em bilong tingtin long behain taim.
- Olgeta eneji efisiensi ekwipmenti save kam wantem garenti. (5 krismas long LED, 3 krismas long Fen, 10 krismas long ol fris. Dispela em ol ino wankain long ol kainkain ol kantri. Yu mas toktok strong long kisim garanti.
- Mas lukluk gut long hamas volt i wok long ron i stap.

B⁴³ Moto em i gat eneji efisiensi (lukim IE4 na 86.5% efisiensi



⁴⁰ Energy Star "Television", <https://www.energystar.gov/products/televisions>

⁴¹ Source: Power Electronic Talks, <https://www.powerelectronicstalks.com/2018/10/ce-and-ce-mark-process.html>

⁴² Worldwide Electric Corporation, Electric Motor Nameplate", <https://www.worldwideelectric.net/articles/electric-motors-how-to-read-the-nameplate/>

⁴³ Grainger.com, <https://www.grainger.com/product/WEG-General-Purpose-Motor-6AH27>

WOK 5

Mak: Olgeta ol grup

1. Yu mas tok tru sapos tok ol tem i tru na fols sapos em i fols

Sos bilong lait	Tru o Fols	
	Em i save wokim bikpla bagarap long environmen	
	Dispela lait sos em liklik moni	
	Em i save kamapim bikpela hat	
	In liklik or ino bikpel tasol stap namel long efisiensi bilong en	

2. Hamas eneji ol fen na fris ol gat eneji efisiensi long en ol save usim.

3. Wanem em ol nomol tempresa we fris i save wok lon en?

6

Lebel bilong
Eneji efisiensi

Wanem samtin em i eneji sta retin?

Gavman i kamapim sampela lo ol ol i kolim Minimum Eneji Pefomens Stendads (MEPS). Igat ol sampela ol ekwipmen i save usim elektriciti long en. Ol ekwipmen yu kisim long en i mas stap insait long dispela ol stendad. Dispela ol lo em i karamapim.

ol ekwipmen i kam long arasait na i stap insait long kantri. I gat ol sampela ol test proces long sekim sapos ol ekwipmen i satap insait long dispela ol lo na mak. Ol lebel bilong eneji sta i soim hamas eneji dispela masin i save usim long wanpela aua

Daun bilo em i wanpela tok piksa lon ol Eneji sta ratin long ol fris long piksa 27.

PIKSA 27: MEPS sta ratin bilong ol Fris⁴⁴



Long PNG dispela Eneji Sta Ratin bilong ol Masin long wok wantem pawa em i stap insait long kantri o stap arasait na kam insait i mas stap long stendad bilong Australia/Niu Zilan olsem ol i tok insait long PNG Elektriciti Indastri Ect 2002.

Ol komuniti memba i mas usim tasol ol masin i gat dispela Eneji Sta Ratin.

⁴⁴ Sustainability Victoria, "Energy rating labels", <https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home/energy-rating-labels>

WOK 6

Mak: Olget grup

1. Wanem samtin em Eneji Sta Ratin?

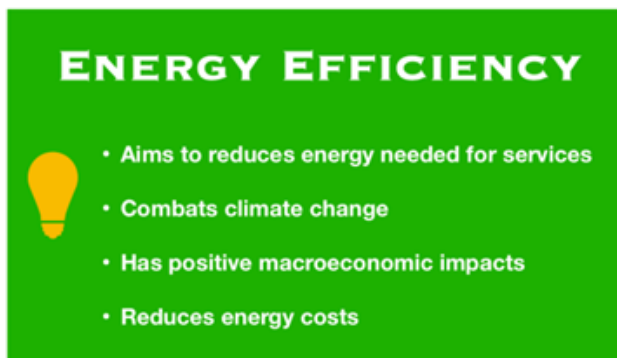
Hap bilong Raite

7

Ol komuniti
inisitive bilong
eneji efisiensi

Ol komuniti (mahn, meri na pikinini) sa playm bigpla wok lo savim eneji na makim kamup ol wai lo kism ol equipmen I sae usim liklik eneji. Ol pinm aut I showim olsm ol komuniti I sa usim piahwut, chakol na ol narapla lo kuk displela em primary need. Secondary ne dem ol nedim pawa lo lit, TV, sasim pon na ol narapla. Ol too nedim wara lo haus use na lo usim lo garten blo ol. Olgeta memba bilong komuniti mas luksa na amamas lo ned bilong savim eneji, lo baim ol equipmen I sae usim liklik eneji na lo usim ol eneji wer ikam lo renewable as. Komuniti (man, meri, na ol pikinini) i gat bikpela ol rol long pilai long konsevim eneji, kamapim sampela ol rul long kisim ol ekwipmen bilong eneji efisiensi.

PIKSA 28: Ol sampla insitiv bilong eneji efisiensi⁴⁵



Piksa 28 em i toktok klia moa long eneji efisiensi. Long eneji efisiensi, sapos yu savim wanpela watt bilong pawa ol narapela lain i ken usim tu. Dispela em i ken savim planti moni long kamapim ol pawa plent, ol komuniti lida i mas gat tok orait long stopim ol man meri long usim ol eneji we i no save kamapim eneji efisiensi.

- Ol man meri mas gat dispela pasin bilong ofim ol lait na TV taim ol i no usim. Ol i mas tokim ol narapela tu long wokim olsem
- Ol ekwipmen we i save usim eneji i mas stap gut na yu mas lukautim so ol ken stap longpela taim
- Ol komuniti tu i ken wok gut long kamapim ol gutpela wei long kisim moni long baim ol ekwipmen bilong eneji efisiensi na ekwipmen bilon renewable eneji

7.1 Ol wok bilong ol Meri, Mama husait nogat man, wido, na ol piknini nogat papa mama

Dispela ol grup ol i save wokabout longpela hap long kisim paia wud na wara. Dispela ol lain i save kisim taim long simuk bilong paia taim ol i kuk. Na taim ples i tudak, ol tasol bai sindaun klostu long kerosin lam. Kamapim ol rot bilong Eneji efisiensi bai oraitim wok bilong dispela ol meri na ol i ken sindaun gut

PIKSA 29: Ol meri na wok bilong ol⁴⁶



Olsem tasol ol meri em ol lain we bai kisim gutpela benefit long ol rot bilong eneji efisiensi. Ol ba stap helty sapos igat klinpela wei long kukim kaikai (ol stove i gat eneji efisiensi), na kaikai i ken tan hariap tru. LED Lam na pawa long lait bilong san i ken givim ol sampela moa taim long wok long nait na ol pikinini i ken wokim skul wok.

I mas igat bikpela luksave long Ol meri, singol mama, wido na ol ofen olsem ol i wankain olsem olgeta lain na ol tu mas gat maus long toktok long ol dispela kain ol topik na ol i ken sharim ol tingting bilong ol na ol i stap olsem wanem and taim ol wok bilong eneji efisiensi i kamap, oplgeta mas wok bung wantaim.

⁴⁵ Source: Market Business News, "What is energy efficiency? Definition and examples", <https://marketbusinessnews.com/financial-glossary/energy-efficiency/>

⁴⁶ Photo Credit: Benjamin Keni, GGGI – Papua New Guinea

WOK 7

Mak: Ol Lidaman long LLG, distrik na provins

1. Long wanem wei bai yu tokaut moa long usim eneji efisiensi insait long komuniti bilong yu?

2. Long wanem rot bai yu kisim long halivim ol meri na ol dispela ol grup ol i ken painim bagarap long en long stap insait long ol toktok bilong yupela?

Mak: Ol komuniti lida na lida bilong sios, ol meri, yangpela, na ol grup husait ken painim bagarap (singol mama, lapun)

1. Nemim sampela ol samtin yupela i wokim long komuniti we em i gat eneji efisiensi long en?

2. Long wanem rot ol meri i save benefit long ol wok bilong eneji efisiensi?

Mak: Ol liklik ol Bisnis

1. Long wanem rot dispela topik em i halivim bisnis bilong yu?

Hap bilong rait:

Pinisim Tok**PIKSA 30: Lukluk long behain taim long achivim Eneji efisiensi na konsevesen⁴⁷**

Skul toktok i mas go yet na luksave i mas kamap namel long ol man meri bilong dispela kantri long wokim ol i mas hamamas long eneji konsevesen. Taim komuniti i behainim dispela rot long eneji konsevesen, na lukim ol benefit bilong usim ol masin i save gat eneji efisiensi long en na lukluk long ol reniuabol sos bilong eneji insait long ples bilong ol yet – em ba stat bilon wanpel ekonomi we em i gat eneji efisiensi, nogat planti bagarap long enviromen, na sindaun bilong man i bai stap gut.

Improving the above measures and continual improvement results in a more sustainable community.

Sapos yumi wokim gut ol samtin mipla toktok antap pinis long en bai komuniti i ken stap longpela taim na i stap gut

DISPELA EM I ROT IGO LONG WANPELA KOMUNITI WE EM GAT ENEJI EFISIENSI**Rol Pilai 1**

Oliv na Jenifa save stap long wanpela rurol komuniti. Olive save wok olsem wanpela mekenic long wanpela taun i stap klostu tasol. Em i save ron long baisikol bilong em i go long taun olgeta dei na save kam bek long taim san i go daun. Tupela i gat wanpela pikinini man husait igat tenpela krismas nem bilong em Ema. Em i save go long wanpela skul klostu tasol. Jenifa i save kirap long bikpela monin long kukim kaikai bilong Oliv na Ema long karim i go. Taim Oliv i go long wok na Em i go long skul, Jenifa i save go long kisim wara long liklik han wara i stap 2km na save kisim paiawud tu na kam long

haus. Ol paiawud i save halivim Jenifa long kuk na tu em i gat wanpela kerosin lam. Simuk bilong paiawud i save wokim Jenifa na ema i kus. Ema save bagarapim ai bilong em taim em laik rid.

Tisa bilong Oliv Iruna i bin go long wanpela trenin bilong reniuabol eneji. Ol lida bilong skul i bin tokim Iruna long lainim ol skul pikinini long gutpela bilong reniuabol eneji. Em i bin hamamas tru long lainim ol pikinini long dispela na i bin gat bikpela laik olsem ol bai behainim sampela samting em i bin toktok long en.

Taim sun i go daun na Jenifa i kukim kaikai stap. Oliv em kam sindaun tasol long wanem em i hatwok long wokples. Ema i wok long wokim skul wok stap na em i tingim toktok bilong tisa long skul.

Ema: Papa!!! Mama em i kukim kaikai lon stov bilong paia stap, mi wok long lainim skul bilong kerosin lam. Mi save harim mama i kus planti taim simuk bilong paia i kisim em. Mi tu save painim hat long lukluk long nait bicos long liklik lait tasol i kam long kerosin lam. Tisa bilong mi i tokim mi long ol stov i nogat simuk long en na tu ol sola lait. Em tokim mi olsem mipela i ken sasim ol fon tu long dispela kain ol lait.

Oliv: Yes pikinini!!! Mi tu bing harim ol man toktok long dispela kain ol lait. Mi save lukim long ol haus bilong ol man taim mi save go long wok. Lait bilong en i gat kik tru.

Ema: Papa, olsem wanem na yumi no inap long baim wanpela?

Oliv: Dispela ol samtin i bikpela moni tru, liklik moni mi save kisim long wok bilong mi in inap long yumi kisim wanpela. Taim mi bikpela moa moni orait yumi ken savim igo inap yumi ken baim wanla stov i nogat simuk long en na dispela ol sola Lait.

Ema i bin gat tupla tingting long toktok bilong papa bilong en. Tingting long dispela go na em i silip.

Sun i kam antap na em i go long skul na em i bungim tisa bilong em.

Ema: Tisa gutpela monin long yu.

Iruna: Gutpela monin Ema. Yu bin toktok wantaim papa mama bilong yu tu long reniuabol eneji tu?

Ema: Yes tisa, mi toktok wantaim ol.

Iruna: Na Papa bilong yu i tok wanem?

Ema: Em i tok mipela i nogat planti moni long baim dispela kain ol samting.

47 Source: Cool and Smart, <https://www.coolnsmart.com/quote-energy-conservation-is-the-foundation-80640/>

Iruna: Oh!! Ba mi lukim sapos mi ken halivim yupela.

Ema: Tenkyu Tisa. Yu ken toksave long mi long ol tingting bilong yu.

Sampela taim i go pinis na Het masta (Abraham) bilong skul i go askim Iruna long ol sumatin bilong em long toktok bilong reniabol eneji. Iruna i tokim em olsem ol sumatin bilong ol i nogat planti moni. Het masta i tokim em olsem dispela i no bikpela hevi tumas. Wampela bank i stap klostu tasol i gat sampela ol wei long givimg moni long kisim ol riniabol eneji sistem. Ol i ken givim moni long kisim ol stov bilong eneji efisiensi, ol sola penel na lait long mak bilong 200 USD. Na yu ken bekimg dispela moni insait long 36 mun.

Narapela dei long skul.

Ema: Tisa, gutpela monin long yu.

Iruna: Gutpela moning long yu Ema. Mi toktok wantaim Het masta na em i tokim mi olsem em i ken stretim rot bilong yupela long kisim moni long bank long yupela i ken baim stov na lam bilong yupela. Sapos papa bilong yu em i laikim dispela tingting orait tokim em i kam na ba mi toktok gut wantaim em long dispela samting.

Ema: Ba mi tokim em na kism em kam.

Long nait.

Ema: Papa, tisa bilong mi i tokim mi olsem het masta bilong skul i ken stretim wampela lon long bank. Em i tokim mi long kam kisim yu i go long skul. Em bai toktok gut wantem yu long skul.

Oliv: OK. Ba mi kam na lukim tisa bilong yu.

Narapela dei.

Ema na Olive i go long skul.

Olive: Gutpela monin long yu tisa. Ema i tokim long sola eneji na dispela lon yu ken kisim long bank.

Iruna: Yes. Pikinini bilong yu em i gat planti save. Sapos yu gat gutpela lait bai pikinini bilong yu i ken wokim gut skul wok bilong em na em i ken kamap wampela bikpela save man long bihain taim.

Olive: Tisa! Mi save i gutpela tru long gat gutpela lait na gutpela stove i nogat planti simuk long en tasol mi ba hevi liklik long baim long wanem mi nogat planti moni.

Ol i toktok stap na et masta i wokabout kam insait.

Iruna: Gutpela monin long yu Bos.

Abraham: Gutpela moning Iruna. Yupela i wokim wanem stap?

Iruna: Dispela em Olive – Papa bilong Ema.

Abraham: Helo Oliv. Long wanem rot yu laikim mipela halivim yu?

Olive: Emma i tokim mi long dispela stov na sola sistem. Mi laik usim stov i nogat planti simuk long en na tu sola sistem tasol mi nogat moni long baim.

Abraham: Noken wari Oliv. Tumora yu ken lusim wok long wampela dei na mi kisim yu go long bank. Ba me stretim rot bilong yu long kisim wampela lon.

Olive: Tenkyu Bos, ba mi lukim yu tumora.

Long narapela dei het masta i kisim Oliv i go long benk na halivim em long askim bank long kisim moni long bank bilong sola sistem na stov. Ol bikman long bank i givim tok orait long ol i ken kisim moni long bank. Em tokim em olsem moni bai go stret long ol lain i save wokim dispela ol samtin we bank i luksave long en. Na Oliv i ken bekim moni bilong ol long olgeta mun. Olive na het masta i go bek gen long skul taim ol i pinis wantem ol lain long benk.

Long wampela wik igo pinis, ol lain i save wokim dispela ol samtin i kam kamap long haus na givim:

- Wampela stov bilong usim wantem paiauwud we em i eneji eifisiensi.
- Wampela sola sistem wantem wampela LED lam, bateri na fen. Na sistem tu i gat wampel hap bilong sasim fon.

Ol oi putim sistem. Jenifa i hamamas tru long niupela stov we i no save rausim planti simuk. Nogat moa kus. Ema em i hamamas tru long gutpela lait em i gat kik long en long em bai wokim ol skul wok bilong en.

Tupela dei i go pinis na Olive i go long Skul bilong Ema na to tenkyu long tisa na het masta long ol i halivim em. Em i askim ol long ol ken go long haus bilong em na lukim ol sistem em i gat long en.

Iruna na Abraham i kamap long haus bilong Oliv long avinun taim san i laik go daun.

Olive: Welcome Iruna and Abraham. This is Jennifer, my wife and you know Emma.

Oliv: Iruna na Abraham welkam long haus. Dispela em meri

bilang mi Jenifa na yupela i save pinis long Ema.

Abraham: Gutpela nait. Gutpela tru long lukim gutpela lait na ples bilang kukim kaikai.

Irana i givim liklik skul toktok na tingim wanem samting em i bin lainim ol sumatin long en.

Irana: Ol sola penel ol i save pawarim ol batri we pawa i save stap insait. Batri i ken givim pawa i go inap fopela aua. LED lait ino olsem nomal lait, em i save daunim enoji i kam daun long mak bilang 60%. Fen tu em i save usim enoji gut stret. Na stov bilang yu Jenifa?

Jenifa: Fit moa yet!! Nogat simuk. Kaikai save kuk hariap na mi save gat planti fiul i stap yet long usim. Nau mi save kuk hariap tru. Tenkyu tumas.

Abraham: Dispela em i gutpela tru!! Yupla mas lukautim ol dispela ol samting gut. Olive, yu mas noken lus tingtign long bekim dinau bilang yu long benk lon olgeta mun. Taim yu pinism dispela dinau, yu ken inap long kisim moa moni. Ema, nau yu gat gutpela lait so yu mas wokim gut long skul wok bilang yu.

Olive: Tenkyu tumas long yupela i halivim mipela. Ba mipela i mas tingting long bekim dinau long taim bilang bekim.

Ema: Tenkyu Bos na tisa. Mi bai wokim gut long skul wok bilang mi.

Irana na Abraham i lusim ol wantem hamamas olsem ol i bin halivim dispela famili.

Namba 2 Rol Pilai

Wanem hap drama bai kamap long en:

Em long wanpel ples long Mekeo, ol lida bilang ples i bung long toktok long ol rot bilang komuniti i ken luk save lon enoji efisiensi. Wanpela lida bilang ol meri nem bilang em Ma i wasim kolos lon haus bilang em na toktok wantem pikinini meri bilang em.

Ma: Suli yumi planti ol kolos long wasim tete long wanem ol mangi pilai soka long wiken. Graun pulap long ol kolos, bai kisim longpela taim long rausim dispela kain ol doti na wasim ol kolos.

Suli: Yes mi save Nana – Ba mi halivim yu, noken wari.

Ma: Na taim yumi wasim olgeta kolos pinis orait yumi go painim ol paia wud long kam kukim kaikai long arasait long haus.

Suli: Yes Nana – bai mi halivim yu long wokim dispela wok tu. Nana lukim, olgeta ol man i go long haus bung long toktok. Yu save long as bilang dispela bung?

Ma: Nogat, ol i no tokim mi long dispela bung – tasol em orait wasim kolos na stap – bai ol i kam tokim yumi klostu taim.

(5pela minit i lus pinis na ol man i kam paitim doa)

Yanpela man, Filip – Nana Ma – Sif is laikim bai yu kam long haus bung na yumi bung na toktok.

Ma Lida blong ol Meri: Ok bai mi kam – Dispela bung em bilang wanem? Na yu bin askim ol lida bilang ol Yanpela man na lida bilang ol yangpela?

Filip: Nogat Nana Ma, ol i tokim me long kam lukim yu pastem na nau bai mi go painim ol lida bilang ol yanpela.

Ma Lida blong ol Meri: Ol i mas toksave gut long dispela kain ol bung so mipela i ken redi gut na ol i mas tok save tu long ol narapela ol meri na ol lida bilang ol yangpela

Suli: Em i tru Na – tasol yu go – ba mi stap na wasim ol kolos

Sif blong Ples: Welkam long bung bilang yumi Ma, mipela kam long toktok long sampela rot long wokim komuniti bilang yumi i ken behainim enoji efisiensi. Wanpela ol lida bilang yumi i bin kisim wanpel treinin long Ofis bilang Eneji long taun na em i gat sampela ol gutpela toktok long mekim long yupela ol meri bilang yumi long dispela ples.

Bikman Charls: Yes, ol i bin lainim mipela long usim ol paia wud gut, long wei bilang karim, putim gut long haus na long usim gut. Mi bin toksave long ol lida long ples olsem ol yangpela ol man i mas kisim dispela wok long bungim ol paia wud bilang olgeta haus long ples na putim long wanpela hap namel long ples. Taim yupela i laik kukim kaikai orait yu ken i go na kisim long dispela hap. Yu ting wanem long dispela toktok Ma?

Ma: Dispela em i wanpela gutpela tingting – em bai wokim mipla no inap kisim bikpela taim long go painim ol paia wud na kisim i kam na tu mipela i ken lukluk long ol narapela wok i stap we mipela i mas wokim long komuniti. Dispela em i gutpela tingting – tenkyu tumas. Ol yanpela kisim toksave pinis?

Sif blon ples: Noken wari – ol yangpela bai harim toktok na bai ol i wokim – larim mipela bai lukluk long dispela na stretim

Ma: Tenkyu tru tasol ating yumi long behain yumi mas toksave long ol yangpela long ol i ken stap long dispela ol toktok na ol ken save tu.

Sif bilong Ples: Yes, ba mipla wokim olsem

Lida Sals: Ofis bilong Eneji i laik giving wanpela sola sistem bilong haus long yumi long dispela ples. Yu ting wanem long dispela?

Ma: Dispela em wanpela gutpela tingitng stret an em bai halivim ol planti meri long somapim ol kolos na ol samting ol i save wokim wantem han bilong ol long taim san i go daun. Mi

ken halivim long painim ol haus we ol i nogat planti samting – ol singol mama husait mipla mas halivim ol pastaim behain ok mipela olgeta ken kam long baksait.

Sif bilong ples: Em i gutpela tingting tru Ma. Mi hamamas tru olsem mipela i tokim yu long kam long dispela bung. Yu ken halivim mipla long kamap wanpela ples bilong usim eneji gut, ples bilong Eneji efisiensi.

Sif bilong ples i autim wanpela tok long ol man meri i harim long ples bung long toktok ol i bing mekim wantem Ma na lida Sals na bung i pinis na ol i go kam nambout long ples.



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