

NATIONAL ENERGY EFFICIENCY AWARENESS CAMPAIGN



Hi friends, I'm SWITCH. I will guide you to be more energy efficient through our simple Energy Guide Book. Remember, **SWITCH!** **SWITCH** off when you are not using **SWITCH** to Energy Efficient products

ENERGY GUIDE BOOK (FOR PRIMARY SCHOOL)

Dear friends, log on to www.switch.org.my to check how much electrical energy you consume in your house. Don't forget to PLEDGE to reduce the usage as well!

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SWITCH



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NATIONAL ENERGY EFFICIENCY AWARENESS CAMPAIGN (SWITCH!)

Energy is one of the foundations in developing a country. The main issue is the ability of a country to cater to the needs of the people and the ever increasing energy cost concurrently. Domestic, commercial and industrial consumers must realise the importance of 'efficiency' in the usage of energy and to play our roles and responsibility together with the government.

Realising this, Water and Energy Consumer Association of Malaysia (WECAM) or formerly known as Environment Desk of FOMCA has developed a 10 year framework known as National Energy Efficiency Plan. This campaign is the first step in the implementation of the plan. This campaign is also supported by the Ministry of Energy, Green Technology, and Water (formerly known as Ministry of Energy, Water and Communications), Energy Commission, Tenaga Nasional Berhad, and the Malaysia Energy Centre.

SWITCH! is an effort by Non-Government Organisation (NGO) with the support from government and industries for the benefit of the people and country.

SWITCH!

SWITCH off when you are not using

SWITCH to Energy Efficient products

MAIN OBJECTIVES

- I. To raise the awareness of Malaysians regarding the concept of energy conservation;
- II. To promote the practice of energy efficiency among domestic, commercial and industrial consumers;
- III. To encourage the use of Energy Efficient equipments among domestic, commercial and industrial consumers.



SWITCH



CAMPAIGN CORE AIMS

The campaign will convey simple and exact messages to consumers on the issue of energy conservation and energy efficiency through:

- Practical conservation tips
- Billing facts
- Energy usage chart
- Auditing energy usage in homes and work place
- Interactive activities
- Awareness of energy efficient products

This booklet is developed by Persatuan Pengguna Air Dan Tenaga Malaysia (WECAM) for the purpose of National Energy Efficiency Awareness Campaign (SWITCH). The booklet is a copyright of WECAM.

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Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Energy guide book (for primary school)

ISBN 978-983-44962-4-1

1. Electric power--Handbooks, manuals, etc.. 2. Power resources--
Handbooks, manuals, etc..
333.7932

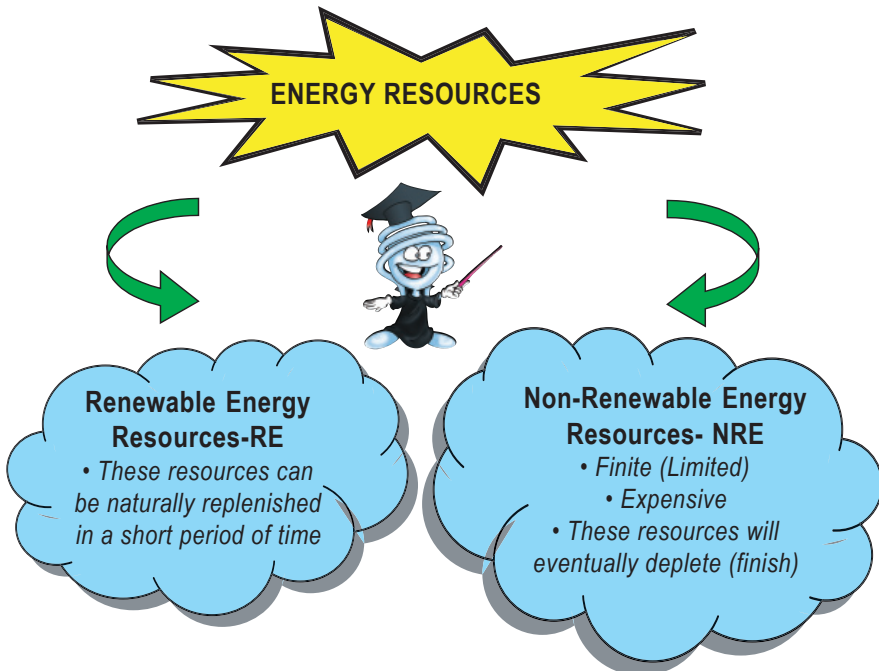
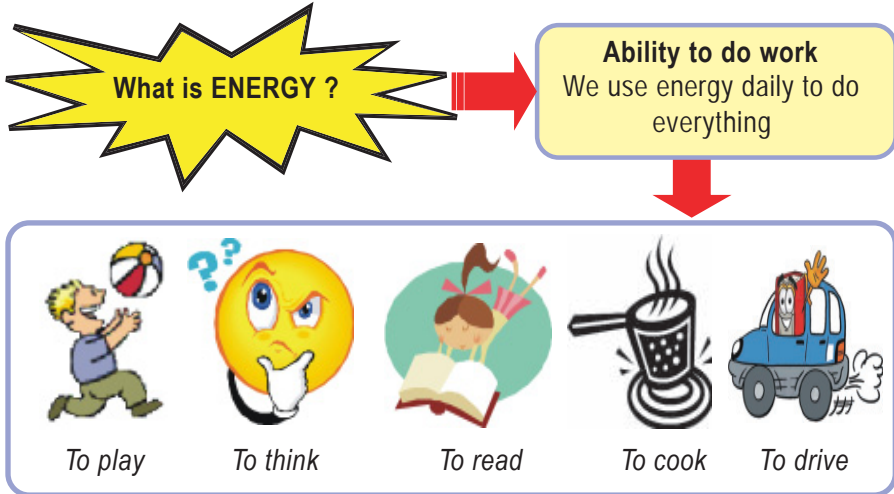
Printed by :

Percetakan Asas Jaya (M) Sdn Bhd ^(663879W)

No. 5B Tingkat 2, Jalan Pipit 2, Bandar Puchong Jaya,
47100 Puchong Jaya, Selangor D. E.



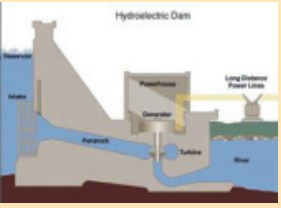
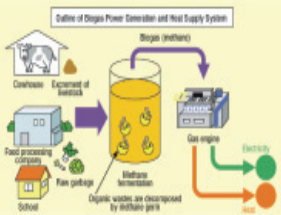



PART 1: WHAT IS ENERGY?








Examples of Renewable Energy Resources (RE)

Resources	Picture	Description
Wind		Energy that comes from air that moves (wind)
Solar		It is the result of converting sunlight into electricity
Water		Moving water that are trapped in a dam creates electricity
Biomass		It is a biological material derived from living, or recently living organisms. Biomass may include biodegradable wastes that can be burnt as fuel.
Geothermal		It is the heat energy that is stored in earth's crust



Examples of Non-Renewable Energy Resources (NRE)

Resources	Picture	Description
Petroleum		It is also known as crude oil. It is a flammable liquid found in rock formations in the Earth.
Coal		It was formed from layer upon layer of plant remains accumulating slowly over a period of time.
Natural Gas		Gas that is trapped in between earth's layers and usually found together with petroleum.

Energy Conversion Process into Electricity

- Most of NRE and some RE will go through the process as below:

Energy Resources → Heat Energy → Kinetic Energy → Electricity

*Example : **Coal** (→ burnt to produce) **Heat Energy** (→ heat up water to produce steam and rotates turbine to produce) **Kinetic Energy** (→ finally) **Electricity** (is produced).*

- Most RE

Energy Resources → Kinetic Energy → Electricity

*Example : **Wind** (→ turns turbine – in the shape of fan to produce) **Kinetic Energy** (→ finally) **Electricity** (is produced).*



How Electricity Reaches Your Home?



Power Plant

This is where energy resources are converted into electricity.



Transmission

Electricity flows through cables connected by huge steel structures.



Medium Voltage Distribution

Electricity is later distributed to industrial users.

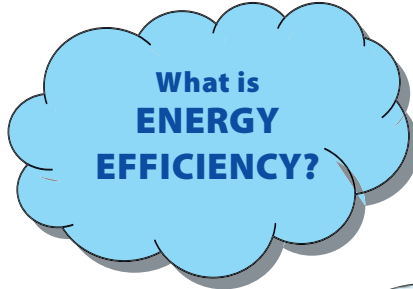


Low Voltage Distribution

Electricity is distributed to our houses and offices.



PART 2: ENERGY EFFICIENCY



Use **MINIMUM / LESSER** energy to do **LARGE** amount of work.



What is Energy Audit?

- It is a study or survey of energy usage.
- Energy audit is done to look for opportunities to reduce the amount of energy usage.
- Energy audit also provides essential information on how much, where and how energy is used daily by us.
- It can be used as a check of how energy is being used and wasted.

What Causes High Energy Consumption?

Quantity of Appliances / Electrical Equipments







Duration of Appliances Used / Usage Period



Equipment That Consume High Electrical Energy At Home

Let us see how they function.

<i>Equipment</i>	<i>Picture</i>	<i>Description</i>
Refrigerator		It is extensively used to store foodstuff to keep it fresh. It is a cooling appliance.
PROCESS: ROTATE → COOLING		
Air conditioner		It is designed to extract heat from an area via a refrigeration cycle. Its purpose, in a building is to provide comfort during either hot or cold weather.
PROCESS: ROTATE → COOLING		
Water heater		It is used to heat up water for bathing purposes.
PROCESS: ROTATE → HEATING		
Electric Kettle		It is a kitchen appliance used for boiling water to make tea or other beverages that require hot water.
PROCESS: HEATING		

We can see clearly that rotating, heating and cooling equipments use high amounts of electricity.






PART 3: CONSUMER ACTIVITY

Activity 1

Based on the information shown below, calculate and compare the total cost of electricity for Ejat's House and May's House. Determine which house consumes more electrical energy, and give your reasons.



  		
<p>EJAT'S HOUSE Usage period: 4 hours a day for 30 days</p>		
<p>Energy cost for 1 computer = RM 3.92</p>	<p>Energy cost for 1 air conditioner = RM 26.16</p>	<p>Energy cost for 1 TV = RM 22.24</p>
<p>MAY'S HOUSE Usage period: 10 hours a day for 30 days</p>		
<p>Energy cost for 1 computer = RM 9.81</p>	<p>Energy cost for 1 air conditioner = RM 65.40</p>	<p>Energy cost for 1 TV = RM 55.60</p>



Activity 2

Based on the information shown below, calculate and compare the total cost of electricity for Meng's House and Tan's House. Determine which house consumes more electrical energy, and give your reasons.



MENG'S HOUSE

Usage period: 8 hours a day for 30 days

2 fans

Energy cost for 1 fan = RM 4.97

So, energy cost for 2 fans = RM 9.94

1 Air Conditioner

Energy cost for 1 air conditioner = RM 52.32

1 TV

Energy cost for 1 TV = RM 44.47



TAN'S HOUSE

Usage period: 8 hours a day for 30 days

3 fans

Energy cost for 1 fan = RM 4.97

So, energy cost for 3 fans = RM 14.91

2 Air Conditioners

Energy cost for 1 air conditioner = RM 52.32

So, energy cost for 2 air conditioners = RM 104.64

2 TVs

Energy cost for 1 TV = RM 44.47

So, Energy cost for 2 TVs = RM 88.94



Activity 3

Based on the information shown below, calculate and compare the total cost of electricity for Nabil's House and Aini's House. Determine which house consumes more electrical energy, and give your reasons.



NABIL'S HOUSE

Usage period: 12 hours a day for 30 days

2 Air Conditioners

Energy cost of 2 air conditioners = RM 156.96



2 Radio

Energy cost for 2 Radio = RM 15.70



2 TVs

Energy cost for 2 TVs = RM 133.42



AINI'S HOUSE

Usage period: 5 hours a day for 30 days

2 Air Conditioners

Energy cost of 2 air conditioners = RM 65.40



2 Radios

Energy cost for 2 Radios = RM 6.54



2 TVs

Energy cost for 2 TVs = RM 55.59





Activity 4

Based on the information shown below, calculate and compare the total cost of electricity for Syarina's House and Abu's House. Determine which house consumes more electrical energy, and give your reasons.



SYARINA'S HOUSE

Usage period: 12 hours a day for 30 days

3 fluorescent lights

Energy cost for 1 light = RM 4.71

So, energy cost for 3 lights = RM 14.13

3 TVs

Energy cost for 1 TV = RM 15.70

So, energy cost of 3 TVs = RM 47.10



ABU'S HOUSE

Usage period: 12 hours for 30 days

5 fluorescent lights

Energy cost for 1 light = RM 4.71

So, energy cost for 5 tubes = RM 23.55

5 TVs

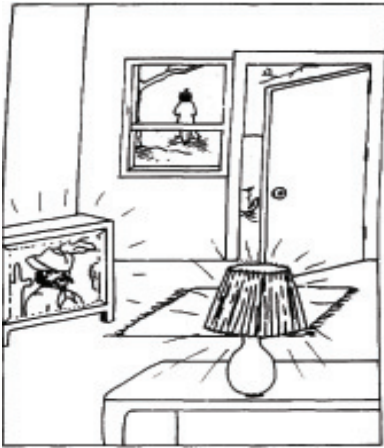
Energy cost for 1 TV = RM 15.70

So, energy cost of 5 TVs = RM 78.50

Activity 5

Based on the pictures shown below, **circle** the behaviours that are considered as **wasting electricity**.

PICTURE 1



PICTURE 2



PICTURE 3



PICTURE 4





Answers to Consumer Activity

Activity 1

Answer: May's house (RM 130.81) consumes more electrical energy as compared to Ejat's house (RM 52.32)

Explanation: In May's house, the duration of appliances used/ usage period is longer.

Activity 2

Answer: Tan's house (RM 208.49) consumes more electrical energy as compared to Meng's house (RM 106.73).

Explanation: There is more electrical equipments/ appliances in Tan's house.

Activity 3

Answer: Nabil's house (RM 306.08) consumes more electrical energy as compared Aini's house (RM 127.53).

Explanation: In Nabil's house, the duration of appliances used/ usage period is longer.

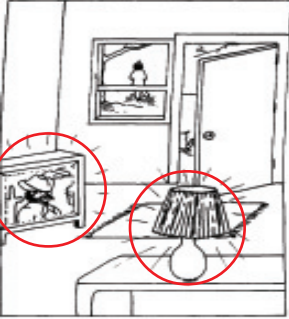

Activity 4

Answer: Abu's house (RM 102.05) consumes more electrical energy as compared to Syarina's house (RM 61.23).

Explanation: There is more electrical equipments/ appliances in Abu's house.



Activity 5

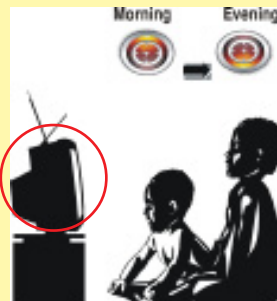
Answer	Solution
<p>Picture 1</p> 	<p><i>Explanation: He should switch off the electrical appliances before going out.</i></p> <ul style="list-style-type: none">• Switch off and unplug electrical appliance when not used. All electric appliances such as DVD player, VCR player, television and radios draw small amount of electricity when they are in standby mode.• Use natural daylight to light the room.• Open curtains in the morning, rather than turning on the light.• Use desk lamps where most light is needed. So, less lighting is required in the rest of the room.
<p>Picture 2</p> 	<p><i>Explanation: The electrical appliances are being extensively used.</i></p> <ul style="list-style-type: none">• Switch off and unplug electrical appliance when not used.• Only boil the amount of water you need in a kettle. Excess water heating is just a waste of electricity.• You should never put warm or hot food into the fridge. This will make the fridge works extra hard to try and keep it cold. Always allow food to cool down first.• Do not open the deep freezer or refrigerator door too often.• Think ahead and plan what you need to take out. Opening the fridge door too often causes cold air to escape out causing more energy needed to maintain the fridge temperature.• Keep the refrigerator stocked at least two third full or freezer at least three quarters full and cover liquids and wrap food stored in the refrigerator. Uncovered foods and empty refrigerator takes more energy to cool.


Answer
Picture 3

Solution

Explanation: He should not switch on the air-conditioner and fans at the same time during cold weather.

- Switch off and unplug electrical appliance when not used.
- Switch off the fans when you are not in the room.
- Set the air-conditioner at the temperature of 24°C – 26°C.
- Windows and doors must also be shut to avoid cold air from escaping.
- Dress appropriately according to the weather. This could reduce the need for lower temperature of air-conditioning.
- Clean all the electrical appliances regularly. Over time, dirt builds up and reduces the output of the appliance or forces it to work harder to maintain its output which consumes more energy.

Picture 4


Explanation: The kids should not watch TV for a long periods of time (morning to noon).

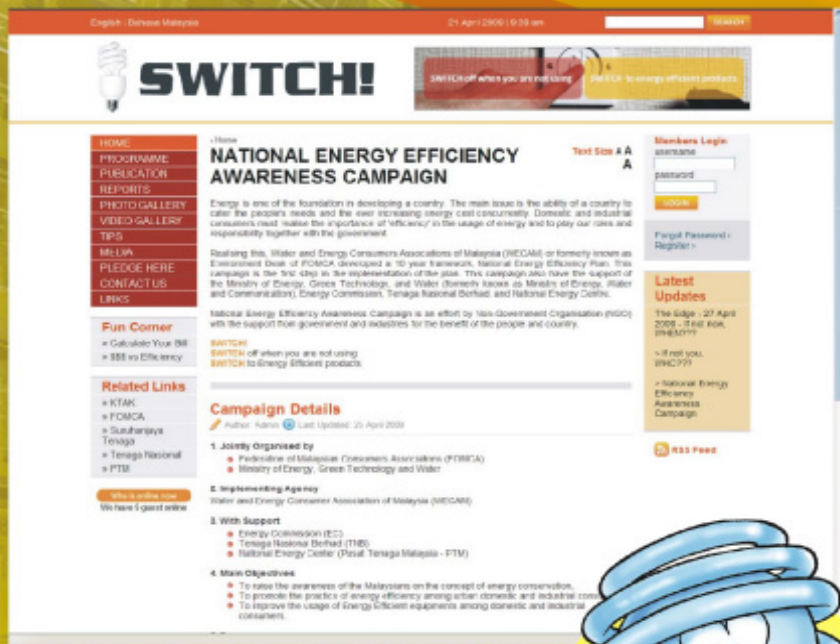
Switch off and unplug electrical appliance when not in use. All electrical appliances such as DVD player, VCR player, television and radio draw small amount of electricity when they are in standby mode.



SILA CARI PERKATAAN DI BAWAH DAN BULATKAN



- | | |
|-----------------|---------------|
| 1. Kuasa | 11. Gas Asli |
| 2. Tenaga | 12. Petroleum |
| 3. Diperbaharui | 13. Biomasa |
| 4. Janakuasa | 14. Angin |
| 5. KiloWattJam | 15. Suria |
| 6. Arang Batu | 16. Kenyir |
| 7. Elektrik | 17. Peti Ais |
| 8. Label Tenaga | 18. Kipas |
| 9. Nuklear | 19. Masa |
| 10. Solar | 20. Bil |



Dear Friends, log on to **www.switch.org.my** and click **PLEDGE HERE** to pledge to reduce your energy consumption.



NATIONAL ENERGY EFFICIENCY AWARENESS CAMPAIGN (SWITCH!)

Jointly Organised by:
 Federation of Malaysian Consumers Associations (FOMCA)
 Ministry of Energy, Green Technology and Water (KeTTHA)

Implemented by:
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Supported by:
 Energy Commission (EC)
 Tenaga Nasional Berhad (TNB)
 National Energy Centre (NEC)

