

GLOBAL WARMING

Global warming results from the effect of what is called the 'greenhouse effect'. Carbon dioxide (CO₂), methane, water vapor, nitrous oxide, and ozone are the main greenhouse gases.



What do we mean by Greenhouse Effect?

The phenomenon whereby the earth's atmosphere traps solar radiation, caused by the presence in the atmosphere of gases such as carbon dioxide, water vapor, and methane that allow incoming sunlight to pass through but absorb heat radiated back from the earth's surface.



The greenhouse effect

The sun



gives the earth solar energy.



The extra energy goes back into space.



But pollution keeps the extra heat on earth.



As a result of increased greenhouse gases, the average temperature of the Earth is increasing and this natural phenomenon is known as 'global warming'. It is also defined as a sustained change in the atmosphere that causes abnormal climate changes.





The Polar Ice Caps Are Melting!



Papa Bear Has Nowhere To Go!



Water Water



EVERY
WHERE!



Dying Corals



Super Storms!



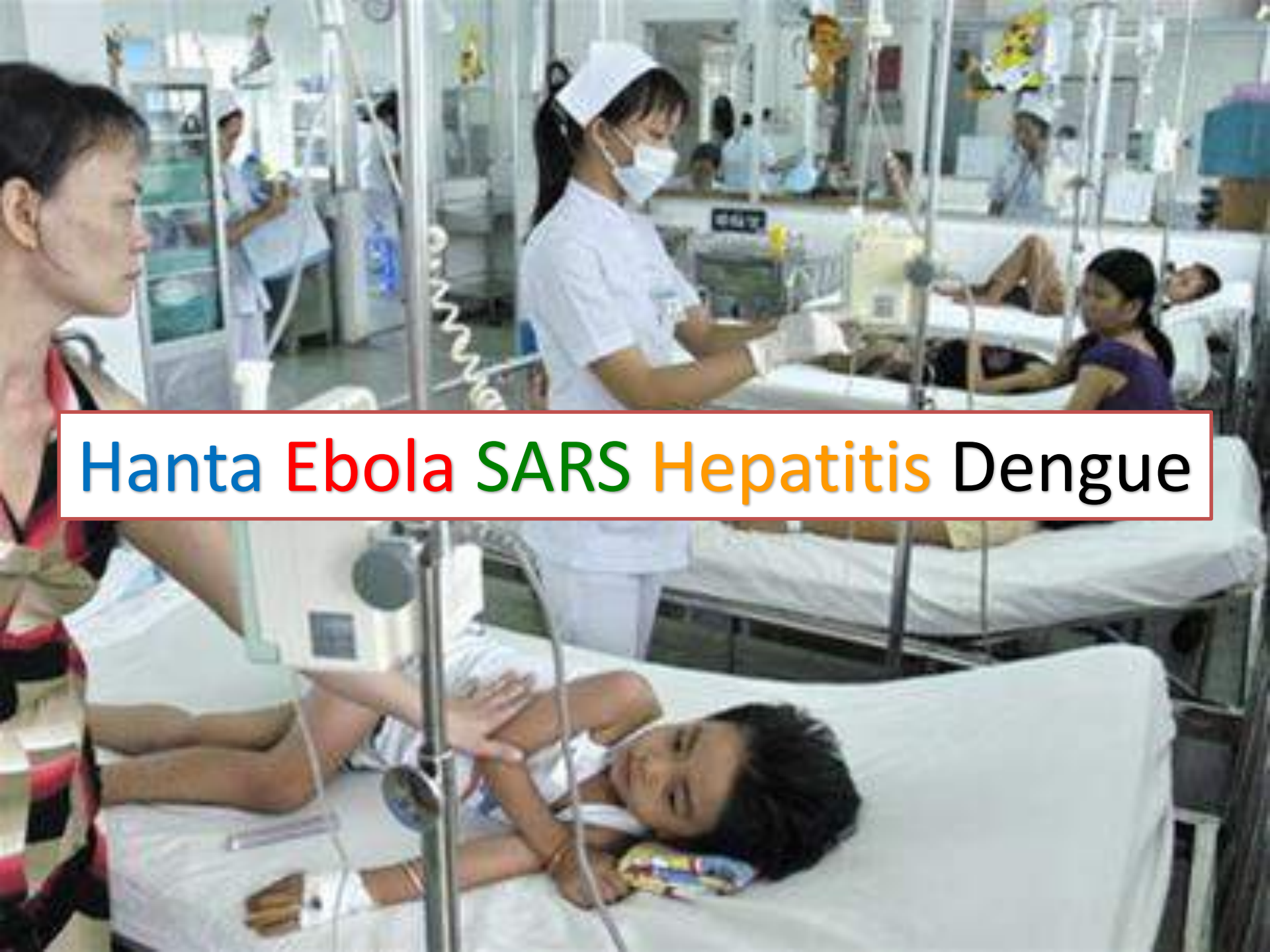
Hunger

Becoming Normal



Fish Kills!!





Hanta Ebola SARS Hepatitis Dengue



Dying Trees





24-Hour Smog



Tornado



El Niño

Power Plants



Transportation



Iron & Steel



Cement



Gas Refineries



Municipal Solid Waste Combustion



Lime Manufacture



Ammonia Production



Health Impacts of CO₂

Carbon dioxide in its gas form is an asphyxiant, which cuts off the oxygen supply for breathing, especially in confined spaces. Exposure to concentrations of 10 percent or more of carbon dioxide can cause death, unconsciousness, or convulsions. Exposure may damage a developing fetus.



Health Impacts of CO₂

Exposure to lower concentrations of carbon dioxide can cause hyperventilation, vision damage, lung congestion, central nervous system injury, abrupt muscle contractions, elevated blood pressure, and shortness of breath. Exposure can also cause dizziness, headache, sweating, fatigue, numbness and tingling of extremities, memory loss, nausea, vomiting, depression, confusion, skin and eye burns, and ringing in the ears.



Earth Hour – What Is It?



Earth Hour is a worldwide movement for the planet organized by the WWF. The event is held worldwide annually encouraging individuals, communities, households and businesses to turn off their non-essential lights for one hour, from 8:30 to 9:30 p.m. on the last Saturday in March, as a symbol for their commitment to the planet.

Energy Savings and Equivalent Carbon Dioxide Emission

2010	606 MW	254.52 tons
2011	362 MW	180.18 tons
2012	362 MW	152.04 tons
2015	229.93 MW	96.57 tons

The figure 254.52 tons of CO₂ reduced is AGAIN
REGENERATED after the Earth Hour.

In 24 hours 6,108.48 tons
In 1 month 183,254.4 tons
In 1 year 2,199,052.8 tons
(1,994,967,613.17 kilograms)

One healthy 15-year old tree absorbs about 6 kilograms
of CO₂ annually. Therefore we need 332,494,602.20
healthy 15-year old trees to absorb the CO₂.

Seminar on Energy Efficiency & Conservation in the Government
Hotel Supreme, Baguio City, 25 April 2018



**Energy Efficiency
& Conservation
the in
Government**

Crizaldo Gaddi Santos, SRS II
Energy Efficiency & Conservation Division, EUMB, DOE

Implementing Rules and Regulations Directing the Institutionalization of a Government Energy Management Program

Administrative Order No. 103

Administrative Order No. 110

Administrative order No. 126

Administrative Order No. 110-A

Administrative Order No. 183

Memorandum Circular No. 55

ENERCON Measures

- **Aircon operating time from 9:00 am to 4:00 pm**
- **Setting A/C to fan mode during 12:00nn to 1:00pm**
- **Setting room temperature not lower than 25⁰C**
- **Electric fans and other cooling devices may be used during the 12:00 noon to 1:00 p.m. break period in lieu of airconditioning units.**
- **Mandatory replacement of 40-W and 20-W fluorescent lamps and incandescent bulbs with slim type fluorescent lamp tubes and CFLs.**
- **Lights shall be turned off during lunch breaks and after office hours**
- **Elevators shall be programmed to bypass the 2nd floor.**
- **Use of 1% CME to all diesel fed vehicles (prior the Biofuel Act implementation)**
- **Preventive maintenance schedule of service vehicles**

RULE III

Section 3.1 **Efficiency and Conservation in Electricity Use**

Each government entity shall adopt and implement an electricity efficiency and conservation program to reduce monthly electricity consumption by at least ten (10%) percent benchmarked on the average monthly consumption during the 1st semester of 2004

Section 3.2.a

Aircon operating time from 9:00 am to 4:00 pm.

The operation/use of air-conditioning systems may be extended to a maximum duration of eight (8) hours during summer months (March to May) upon the discretion of the Head of Agency.

Section 3.2.a

Setting A/C to fan mode during 12:00nn to 1:00pm.

Setting room temperature not lower than 25°C.

The temperature reading must be based on the measured surrounding temperature as indicated by a thermometer, not from the temperature indicated on the aircon unit.

Section 3.2.a

Observe regular maintenance servicing and regular cleaning and replacement of filters as necessary.

Linisin ang filters ng aircon upang mapakinabangan ang malamig na hangin.

Karagdagang 5 to 15% konsumo sa maduming filter.

Can cause asthma, bronchitis and hypersensitivity pneumonitis.

It can cause headaches, dry eyes, nasal congestion, nausea and fatigue.



Sources: DOE Tipid Tips sa Bahay , Hubpages.com

Section 3.2.b

Electric fans and other cooling devices may be used during the 12:00 noon to 1:00 p.m. break period in lieu of airconditioning units.



Mandatory replacement of 40-W and 20-W fluorescent lamps with energy efficient slim type fluorescent lamp tubes. Replace incandescent bulbs with compact fluorescent lamps (CFL).



Fluorescent Lamps

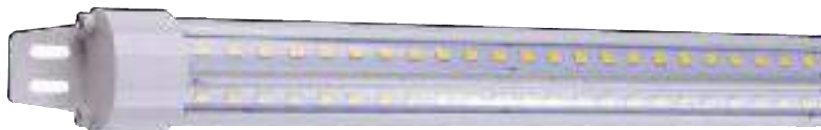
We Recommend to Install **28-watt slim type Fluorescent Lamp (FL)** or **16-watt linear LED lamp** and replace the old **40-watt fluorescent lamp**.



← FL 40 watts



← Slim FL 28 watts



← LED 16 Watts



Compact Fluorescent Lamps

**Replace Incandescent Bulb
(IB) with Compact Fluorescent
Lamp (CFL) or LED.**

**Use 20-watt CFL or 10-watt LED instead of 100-watt
IB.**

CFL uses 70-80% less energy compared to IB.

LED uses 50% less energy compared to CFL.



Electric Lamps



Incandescent
Bulb (IB)



Compact
Fluorescent
Lamp (CFL)



Light
Emitting
Diode (LED)



Popularity of Incandescent Bulbs

IB has color rendering index of 100,
almost similar to the effect provided by
the sun.

Brings out the
natural beauty in
anything.

Used commercially.



COLOR RENDERING INDEX



CRI = 50



CRI = 70



CRI = 90

Lights shall be turned off during lunch breaks and after office hours, except in offices where continuous work of service to the public is being conducted.



**Gawing regular ang paglinis
ng ilaw; 50% ng liwanag ay
natatabunan ng dumi o
alikabok.**

**Use natural lighting
whenever and wherever
necessary.**

Turn off the lights.



Computers are strictly for official use only and shall be shut down when not in use.

Monitors can be programmed to shut down when leaving the premises for 15 minutes onwards.



Program the monitor to turn off during lunch or break time. The monitor consumes 60% of the total PC consumption.

Change the CRT monitor to LCD which consumes half wattage.



Computers

Desktop Computer



A standard Desktop Computer consumes approx. 300 watts while a laptop consumes only around 100 watts

Laptop Computer



Computer

Laptop computers draw 90 to 100 Watts of electricity during regular use, compared to 300 Watts for a conventional desktop computer and monitor.

Source: www.safetyathome.com



Section 3.2.f

Elevators shall be programmed to bypass the 2nd floor or, if possible, set to service alternate floors. A sign to this effect shall be placed conspicuously at the entrance of the elevator for the proper guidance of agency employees and visitors.



RULE III

Section 4.1 **Efficiency and Conservation in Fuel Use of Government Vehicles**

Each government entity shall adopt and implement a program that will reduce its fuel consumption by at least ten (10%) percent benchmarked on the average monthly consumption during the 1st semester of 2005

Section 4.2.a

Use/purchase or lease of vehicles capable of using Alternative Fuel.

Section 4.2.b

Use of biodiesel products that comply with the Philippine National Standard (PNS 2020:2003) by blending a DOE-accredited biodiesel product with the diesel to comply with one percent (1%) Coco-Methyl Ester (CME) for use in all diesel-fed vehicles.



Section 4.2.c

Proper inflation and alignment of tires and proper alignment and balancing of wheels.

Periodic / regular oil change and oil filter replacement.

Regular engine tune-up and replacement of air and fuel filters.



Section 4.2.c

Proper scheduling of daily trips to avoid unnecessary short trips.

Smooth / moderate acceleration of vehicles and driving at a steady pace to avoid unnecessary and repetitious speeding up and slowing down.

Strict prohibition on idling of engines when vehicle is parked.

Prohibition on overloading of vehicle.



Additional Measures

Electric Stove

Huwag ng gumamit ng electric stove. Instead, use the LPG-burner as this is more efficient and economical.

Devise a systematic way of cooking; the recipe-oriented way of cooking.



Television

CRT TV or box type TV consume more electricity. **Mas malakas ang volume ng TV, mas malakas ang konsumpsyon ng kuryente. The bigger the size, the more power it consumes.**



Television – CRT vs. PLASMA vs. LCD vs. LED

PLASMA



CRT



LCD



LED



***4-1 (Highest to lowest Energy Consumption)**

TV

	32" 160-W CRT	32" 90-W LCD
Wattage	160	90
Energy Consumption/month in kW (W x 8 hrs x 30 days)	38.4	21.6
CO2 Emission @ 0.46/kWh	17.664	9.936
Difference, kWh	16.8	
Difference, CO2 emission	7.728	
Running cost @ Php10/kWh	384	216
Difference in cost, Php	168	



TV

LED TVs consumes
20% to 30% less
energy than LCD TVs.
**Plasma TVs consumes
more power.**



Electric Fan



Lock the oscillator instead of allowing the electric fan to move side to side. **Start running the fan from low mode.** The higher the level of fan speed, the more energy it consumes.

Electric Iron

i-Schedule ang pamamalantsa sa araw ng Saturday o Sunday sa loob ng isang linggo, imbis na mamalantsa ng damit na isusuot sa isang araw.



Electric Iron



Better to iron clothes in the morning when the surrounding is cool and there is ample daylight. Remember, multiple usage of electrical appliances is more electricity-consuming.



Washing Machine

Top Loader



Front Loader



Washing Machine

i-Schedule ang paggamit ng washing machine sa araw ng Saturday o Sunday na gagamitin sa buong isang linggo; imbis na maglaba ng damit na isusuot sa kinabukasan.

A unit with heater/dryer consumes 4 times more electricity than without.



Washing Machine

Hang out to dry. Isampay sa clothesline and mga damit upang maiwasan ang paggamit ng dryer. **Wear it more than once. Jeans and denims can be worn 2 or 3 times before washing.**



QUALITY MARKS & ENERGY LABELS



CERTIFIED
Product Quality

**Philippine Standard
Mark (PS Mark)**



**Import Commodity
Clearance Mark (ICC Mark)**

Refrigerator



Gawing regular ang pag-defrost ng ref kung may $\frac{1}{4}$ inch of ice sa freezer.



Ref

Ang frost-free na ref ay may karagdagang 23% na electricity.

Therefore, if an 8 cubic feet ref consumes 56.16 kWh/month, a frost-free ref consumes 12.92 kWh/month **MORE.**



Ref

**Do the door
and peso bill
test.**



Refrigerators – Condenser Coil



Keep the
Condenser
Coil **Clean.**

Ref

**Tulad ng aircon ilagay ang ref
malayo sa TV o cooking stove.
Ilayo sa naaarawang lugar ang
refrigerator.**

**Avoid leaving the ref door open
longer than necessary.**

**Huwag masyadong
punuin ang ref.**



Ref

Huwag
masyadong
punuin ang
ref.



Inverter Technology

Inverters or the “Variable Frequency Drive” component controls the speed of the motors more efficiently by adjusting the frequency instead of voltage.



SMART
CONVERTIBLE

DIGITAL
INVERTER
10 YEAR WARRANTY

Twin Cooling™



Microwave Oven

Works well with small or medium-sized meals. Uses 50% less energy.



Cellphone

As of September 2016, according to Newsbytes Phils., there are 3 out of 10 Filipinos with cellphones in the Philippines.

Assuming the country's population is 100 million, there are 30 million cellphone users.

Source: [Newsbytes Philippines/infographic2016](#)



Hand & hair dryer should never be used for purposes other than that which it is intended for.

Never let a faucet drip.
1 drip/second wastes 233.33 litres
or 58.33 gallons per month.

Miscellaneous



Remember

The power that is **CHEAPER**
and **CLEANER** is the power
that we **DO NOT HAVE**
TO USE.



**Maraming Salamat Po
Sa Inyong Lahat.**





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doe.gov.ph/neecp

