



Conservation Starts At Home



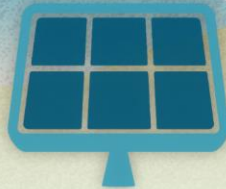
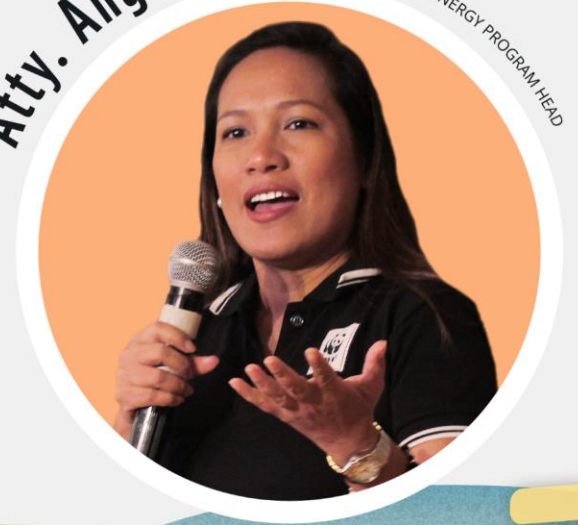
Karen Ibasco WWF-PHILIPPINES ADVOCATE



The Great REset: Energy in the New Normal

21 AUGUST 2020 | 5:00 PM

Atty. Angela Ibay WWF-PHILIPPINES
CLIMATE AND ENERGY PROGRAM HEAD



**Energy cannot be
created or destroyed,
it can only be changed
from one form to another.**

1st law of Thermodynamics

Types of Energy

ENERGY

Energy is what makes matter move or change



KINETIC ENERGY

Energy of motion

Energy that comes from movement

POTENTIAL ENERGY

Stored energy

Energy that is stored for later use

Mechanical Energy

Energy due to motion of an object



Chemical Energy

Energy stored in bonds of atoms and molecules



Electrical Energy

Energy from flow of electric charge



Nuclear Energy

Energy stored in atoms' nucleus



Thermal Energy

or heat energy, involves vibration or movement of particles



Gravitational Energy

Energy stored in an object's height

Radiant Energy

or light energy is electromagnetic energy that travels in transverse waves



Elastic Energy

Energy stored in elastic objects



Sound Energy

Vibration transferred through an object in a wave to produce sound



Energy



Power



Energy



Power



Energy is the capacity to do work.

Definition

Power is the rate at which work is done, or energy is transmitted, moved, used, or converted

Generate energy

Save energy

Features

Generate power

Save power

Consumption and production

Grid

Installed capacity

Joules (J) = Watt - Seconds
kilowatt-hour (kWh)
Megawatt-hour (MWh)

Unit

Watt (W) = Joules / Second
kilowatt (kW)
Megawatt (MW)

$E = \text{Power} \times \text{Time}$

Equation

$P = \text{Energy} / \text{Time}$

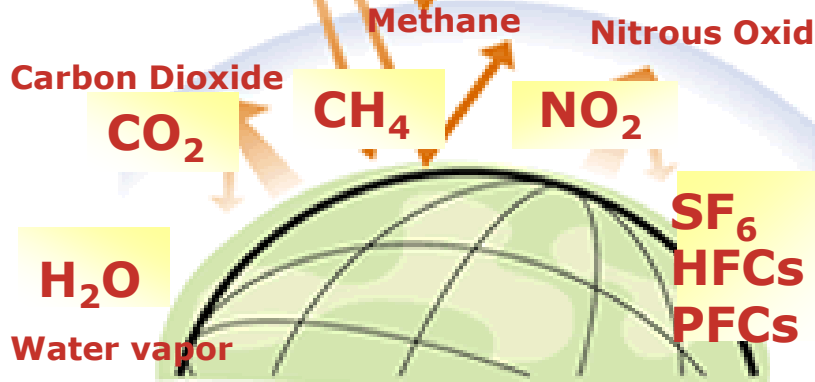
I left a 60W light bulb on for 30 days, which raised my electric bill by 43.2 kWh (kilowatt-hours)

Example

My car's battery can provide 500 amps at 12 volts, which equals 6kW of power.



Greenhouse gases (GHGs) trap heat from the sun to keep the Earth warm.



Increasing levels of GHGs in the atmosphere make for a warmer world leading to abrupt changes in climate!



The Greenhouse Effect



COAL POWER PLANTS LAST FOR A MINIMUM OF 30 YEARS. WHY?

- ▶ coal developers need longer period of time to recover investment cost and turn a profit
- ▶ almost no developer will agree to any contract for less
- ▶ price of coal is projected to rise and surpass cost of all renewable energy within 10 years
- ▶ if you wanted to close the coal plant in 10 years and switch to renewable energy, you can BUT:

PALAWAN WILL HAVE TO PAY A HUGE FINE FOR BREACH OF CONTRACT! AND THIS WILL BE PAID FOR BY THE PEOPLE!

EXTERNAL COSTS - ENVIRONMENT AND SOCIAL IMPACTS

Fossil fuel plants such as coal also don't take into account the external costs to the environment, health and livelihood of the people as well as cooling water to keep machines running efficient. The proposed coal plant site is going to be right by the sea because the coal plant will need a port to offload their coal shipments as well.

arsenic
vanadium
mercury
cadmium
lead
nickel
chromium
selenium
CO₂
molybdenum
antimony
thallium
cobalt
boron

Historically, coal power plants that have been built in different parts of the country (Cebu, Zambales) have had higher incidences of respiratory and skin diseases than other areas. This is in part due to the release of harmful chemicals into the surrounding atmosphere

Possible grounding and spills of fossil fuel in the sea from maritime transport accidents

THERMAL POLLUTION
(dumping of hot water from cooling the coal plant, killing coral reefs)

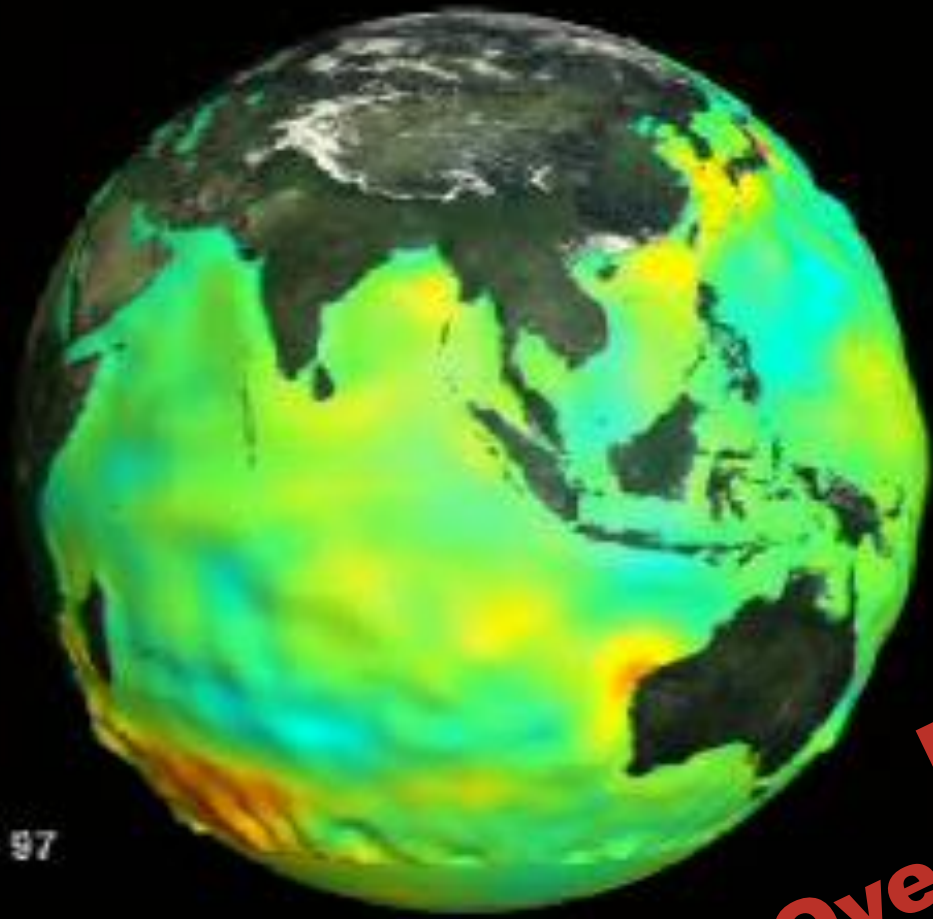


THERE IS NO SUCH THING AS CLEAN COAL!

CLEAN COAL is actually just "cleaner" coal, reducing the amount of harmful acid rain causing substances (sulfur dioxide, nitrogen oxide) but not all harmful substances such as mercury and climate change causing CO₂.

"Clean coal" really refers to Circulating Fluidized Bed Technology

- ▶ produces FOUR TIMES more coal ash
- ▶ coal ash disposal NOT a foolproof process!
- ▶ particulates during disposal can still be released into air and water!



Jan 97

Humanity's Global Footprint

60%

Beyond the Planet's Sustainable Limits

Earth Overshoot Day

1.6 Planet Earths

For 2020, this day is
22 August

WHAT ARE THE DIFFERENT SOURCES OF RENEWABLE ENERGY?

There are now safer and cleaner ways of generating electricity! Newer technologies include Biomass, Geothermal, Solar, Hydro, Ocean and of course, Wind! These are called Renewable Energy (RE) sources.



GEOTHERMAL



HYDRO



BIOMASS



SOLAR



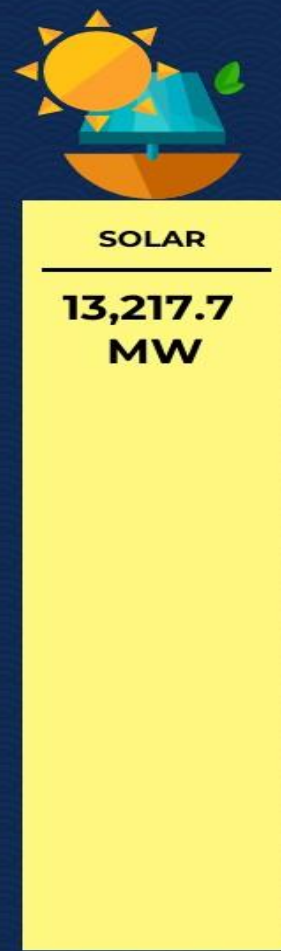
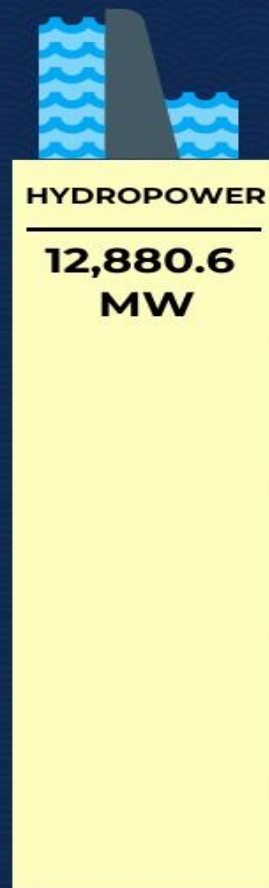
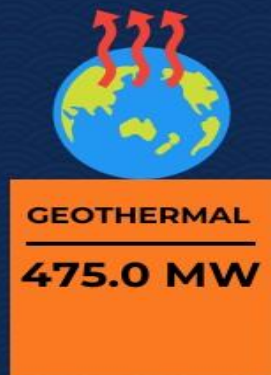
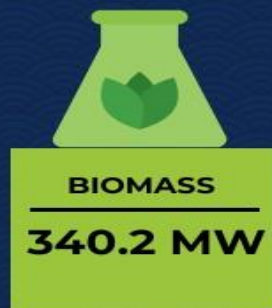
WAVE



WIND

PHILIPPINES RE POTENTIAL CAPACITY

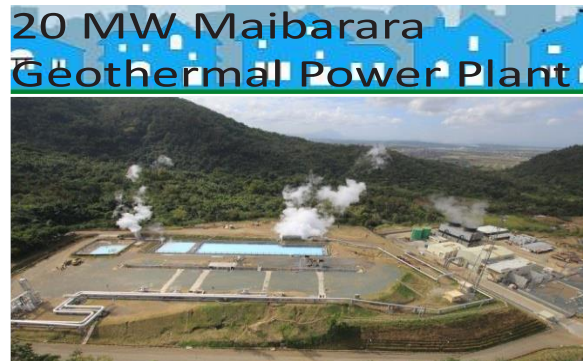
Based on the Department of Energy Awarded RE Contracts as of June 2020



900 kW Catingas Run of River hydro,
ROMELCO (Sibuyan Island)



20 MW Maibarara
Geothermal Power Plant



22 MW San Carlos Solar Power



150 MW Burgos Wind
Power Project



12 MW (Phase 1) San Jose
City I Power Corporation



54 MW San Lorenzo
Wind Power Project
(Guimaras)

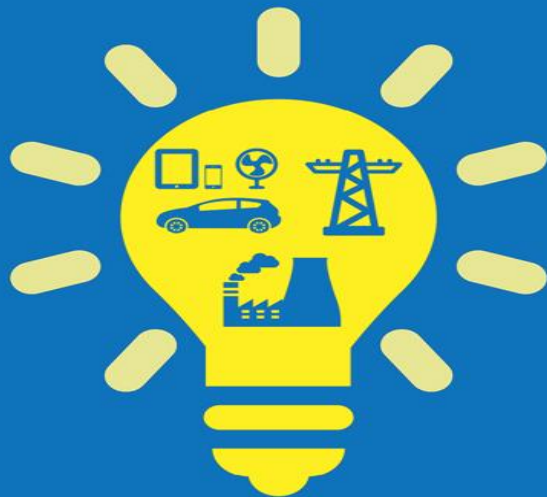


What is electricity?

Electricity is the flow of electric charge that can power machines, appliances, and gadgets.

Electricity is conventionally generated by burning fossil fuels, such as coal, oil, or gas.

Steam produced by burning these fossil fuels is used to spin turbines. The mechanical energy produced is transformed by generators into electricity.



WHAT IS A WATT?

A Watt is the basic unit of power. It describes the capacity or size of electric generation or consumption.

Larger systems use the unit kilowatt (kW) or 1000 Watts and even larger systems use megawatt (MW) or 1 million Watts.

**2 MW Wind Turbine
= 2,000,000 Watts!**

What is the difference between a kilowatt (kW) and kilowatt-hour (kWh)?

A kilowatt refers to the amount of electricity generated or consumed.

A kilowatt-hour refers to the amount of electricity produced or used over a period of time.

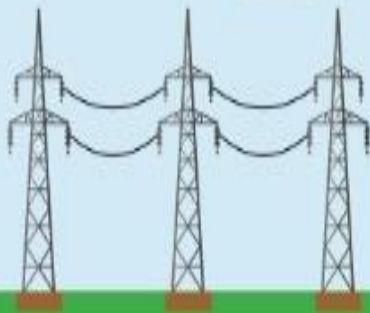
For example a typical light bulb is rated at a power of 100 Watts. If you turn it on for 10 hours, then you will consume 1000 Watt-hour of electricity!

POWER	X	TIME	=	ELECTRICITY CONSUMPTION
	X		=	
100 Watts		10 hours		1,000 Watt-hour or 1 kWh

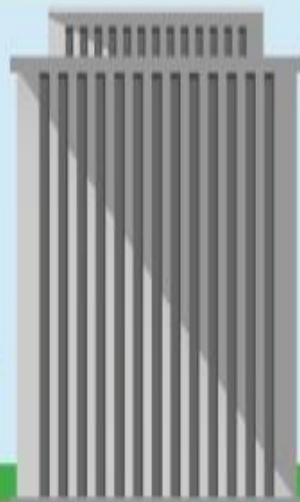
How do we transport electricity?



POWER PLANT



TRANSMISSION LINES

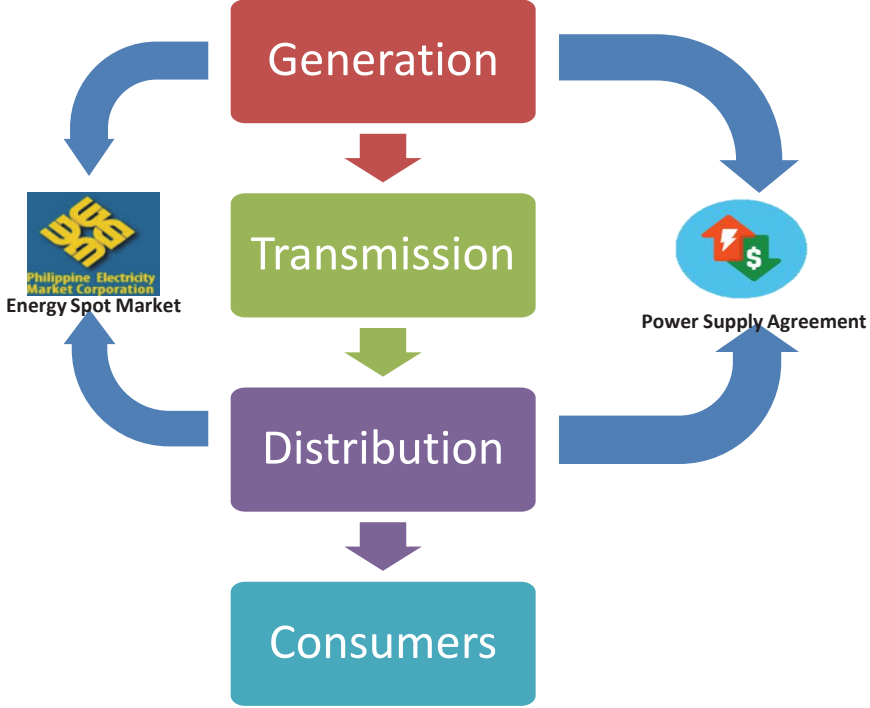


DISTRIBUTION UTILITY



HOUSEHOLDS

Philippine Electricity Market Structure



Power Generators



National Grid



Electric Coop/Distribution Utility



Households

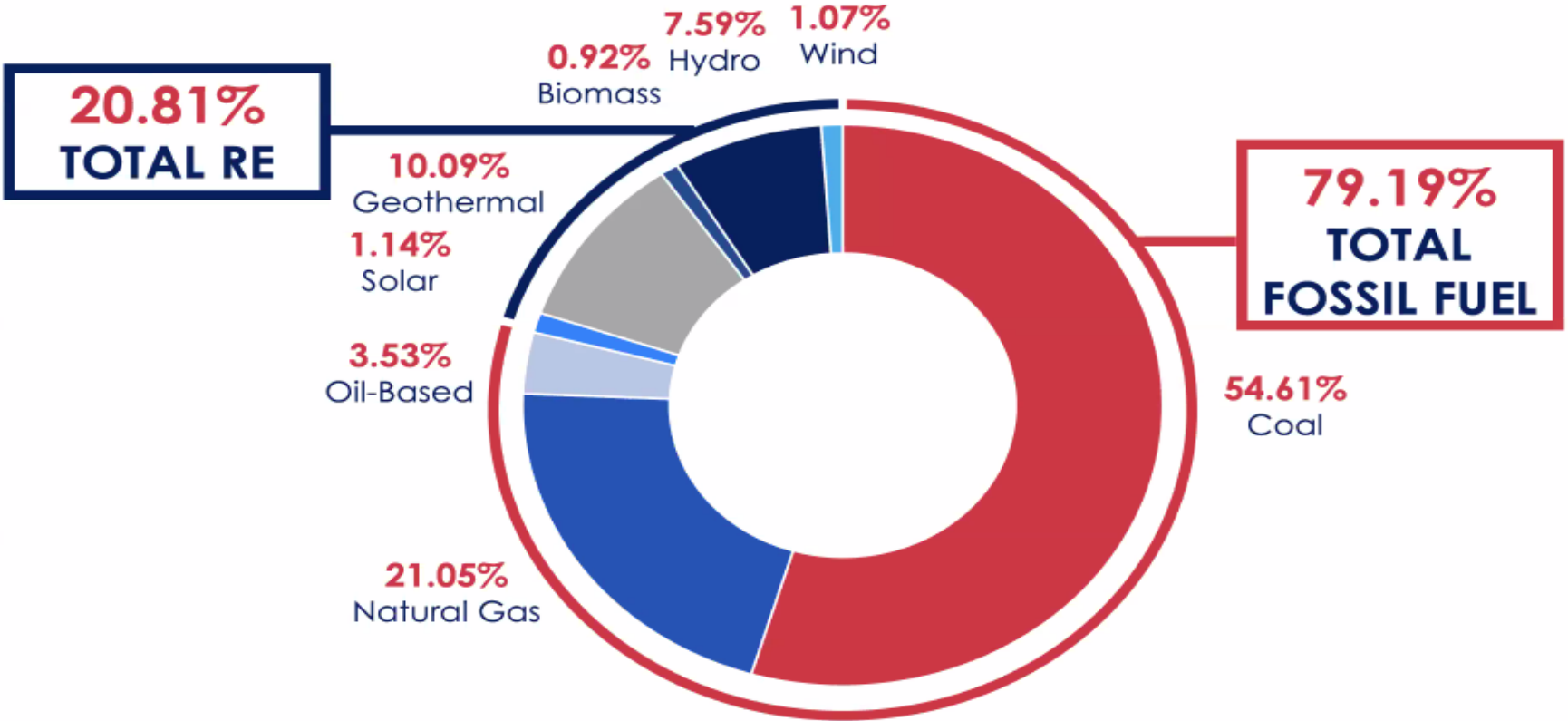
Ensuring **Adequate Supply** of **Energy** during **Pandemic**

Demand-Supply Situation as of 7 June 2020

Grid	Available Capacity (MW)	Peak Demand (MW)	Excess Capacity (MW)	% Excess Capacity above Peak
Luzon	12,837	9,003	3,834	30%
Visayas	2,342	1,694	648	28%
Mindanao	2,567	1,467	1,100	43%

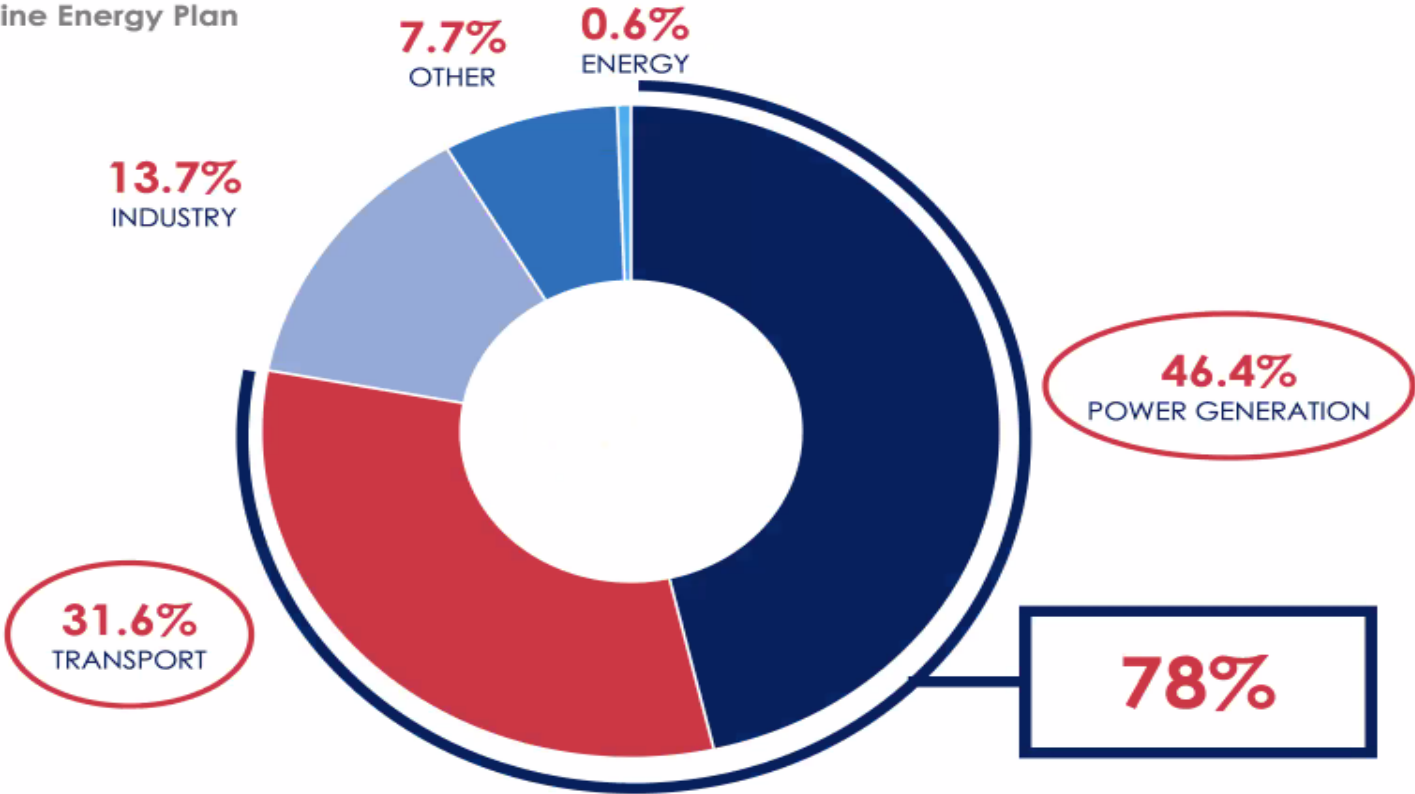
2019 POWER GENERATION MIX

Source: DOE (2019)



2017 GREENHOUSE GAS EMISSION PER ENERGY SUBSECTOR

Source: DOE Philippine Energy Plan



In line with *AmBisyon Natin 2040*

ENERGY SECTOR STRATEGIC DIRECTIONS 2017 – 2040

1

**ENSURE
ENERGY
SECURITY**

2

**EXPAND
ENERGY
ACCESS**

3

**PROMOTE A
LOW CARBON
FUTURE**

4

**STRENGTHEN
COLLABORATION
AMONG ALL
GOVERNMENT
AGENCIES INVOLVED
IN ENERGY**

5

**IMPLEMENT,
MONITOR AND
INTEGRATE SECTORAL
AND TECHNOLOGICAL
ROADMAPS AND
ACTION PLANS**

6

**ADVOCATE THE
PASSAGE OF THE
DEPARTMENT'S
LEGISLATIVE
AGENDA**

7

**STRENGTHEN
CONSUMER
WELFARE AND
PROTECTION**

8

**FOSTER
STRONGER
INTERNATIONAL
RELATIONS AND
PARTNERSHIPS**



SHIFTING TO RENEWABLE ENERGY

Fossil fuel accounts for about **65%** of the world's GHG emissions resulting in global warming

In 2010, DOE had over

30 coal mine sites in the development and operating stages

42 oil and gas, and coal mine sites for exploration

In 2013, DOE power sources that went on stream in Luzon comprised:

621 MW of coal and bunker fuel
81.7 MW of RE

Harnessing and utilizing the country's huge RE resources is key to reducing its carbon emissions and addressing energy security.

- ✓ Existing Capacity as of June 2015
- ↑ Estimated Potential Capacity as of 2008

GEOTHERMAL

1,918 MW
4,600 MW

HYDROPOWER

3,556 MW
10,500 MW

BIOMASS

183 MW
235.7 MW

SOLAR

110 MW
Untapped Vast Potential

WIND

373 MW
76,600 MW

OCEAN

0 MW
170,000 MW

NOW IS THE TIME TO ACT.

Sources: Building Momentum for Low Carbon Development in the Philippines, 2014; Department of Energy, 2015

ACCELERATE EXPLORATION & DEVELOPMENT OF RE RESOURCES

To achieve self-reliance through adoption of sustainable energy development strategies. This will reduce dependence on fossil fuels, hence, minimize exposure to price fluctuations in the international markets

ESTABLISH NECESSARY INFRASTRUCTURE & MECHANISMS

RENEWABLE ENERGY ACT OF 2008

REPUBLIC ACT NO. 9513

INCREASE RE UTILIZATION

- Provide Fiscal and Non-Fiscal Incentives to promote RE's efficient and cost-effective commercial application.
- Institutionalize the development of national and local capabilities in the use of RE systems.

EFFECTIVELY PREVENT OR REDUCE HARMFUL EMISSIONS

Balance the goals of Economic Growth and Development with the Protection of Health and Environment

RENEWABLE ENERGY ACT OF 2008

REPUBLIC ACT NO. 9513

FISCAL Incentives

- 1 7-YEAR INCOME TAX HOLIDAY
- 2 DUTY-FREE IMPORTATION OF MACHINERY, EQUIPMENT & MATERIALS
- 3 SPECIAL REALTY TAX RATE
- 4 ZERO VAT RATE
- 5 CASH INCENTIVES FOR MISSIONARY ELECTRIFICATION

NON-FISCAL INCENTIVES

market creation & promotion

- 1 RENEWABLE PORTFOLIO STANDARDS
On-Grid & Off-Grid
- 2 NET METERING
- 3 FEED-IN TARIFF SYSTEM
- 4 RE MARKET
- 5 GREEN ENERGY OPTION PROGRAM



2009 National Renewable Energy Program

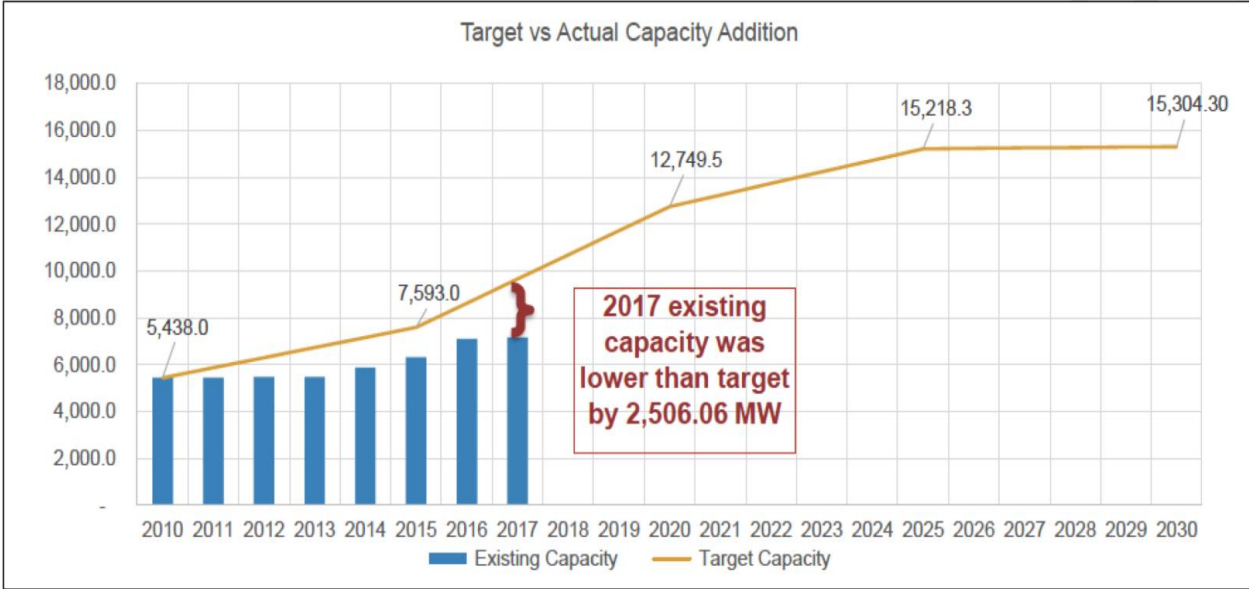
TABLE 3. RE-BASED CAPACITY INSTALLATION TARGETS, PHILIPPINES¹⁰

Sector	Installed Capacity, (MW) as of 2010	Target Capacity Addition by				Total Capacity Addition (MW) 2011-2030	Total Installed Capacity by 2030
		2015	2020	2025	2030		
Geothermal	1,966.0	220.0	1,100.0	95.0	80.0	1,495.0	3,461.0
Hydro	3,400.0	341.3	3,161.0	1,891.8	0.0	5,394.1	8,724.1
Biomass	39.0	276.7	0.0	0.0	0.0	276.7	315.7
Wind	33.0	1,048.0	855.0	442.0	0.0	2,345.0	2,378.0
Solar	1.0	269.0	5.0	5.0	5.0	284.0 ¹¹	285.0
Ocean	0.0	0.0	35.5	35.0	0.0	70.5	70.5
TOTAL	5,438.0	2,155.0	5,156.5	2,468.8	85.0	9,865.3	15,304.3

- CURRENT NREP DEVELOPED IN 2009
- COVERING THE PERIOD 2010-2030

Findings from NREP review

Target vs Existing Capacity



Source: NREP 2011-2030, data from RE sectors

Philippine Generation Mix (GWh)

Resource	2014	2015	2016	2017	2018
Coal	42.78%	44.51%	47.69%	49.64%	52.05%
Oil-Based	7.39%	7.14%	6.23%	4.01%	3.18%
Natural Gas	24.19%	22.91%	21.87%	21.77%	21.38%
Renewable Energy	25.64%	25.44%	24.21%	24.57%	23.38%
TOTAL in GWh	77,261	82,413	90,798	94,370	99,765

2019 REVIEW:

RE INSTALLATIONS WAY BELOW TARGETS

RENEWABLE ENERGY ADDITIONAL CAPACITY INSTALLATIONS UNDER RA9513 (As of December 31, 2019)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	TOTAL
Total Installed Capacity, MW	51.33	94.45	23.20	30.80	0.88	401.55	384.79	786.97	51.82	135.85	234.72	2,196.34
Hydro	10.40	57.30	4.20	11.80		13.65	17.82	10.45	8.50	78.92	48.59	261.63
Geothermal						50.00	10.00			12.00	10.50	82.50
Biomass	40.93	37.15	19.00	19.00	0.88	12.00	124.50	40.80	18.12	41.74	130.08	484.19
Wind						303.90	90.00				16.00	409.90
Solar						22.00	142.47	735.72	25.20	3.20	29.55	958.13
Ocean	-	-	-	-	-	-	-	-	-	-	-	

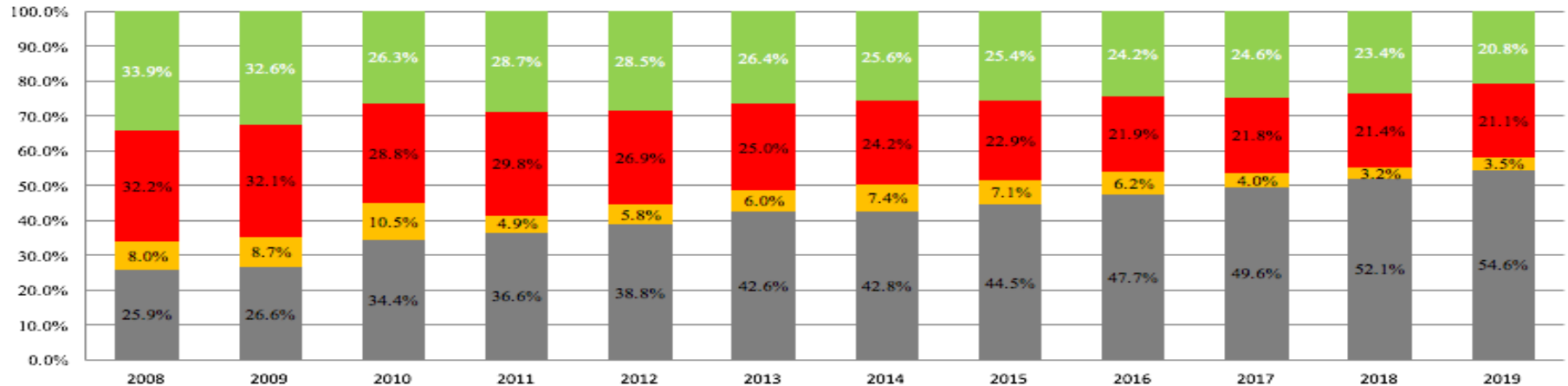
RE CAPACITY ADDITIONS
(post 2008)

2019 REVIEW:

DIMINISHING RE SHARE IN SUPPLY

Power Generation by Source in % Share, Total Philippines

■ Coal ■ Oil-Based ■ Natural Gas ■ Renewable Energy



2019 REVIEW:

DECLINING LEVEL OF SELF-SUFFICIENCY

Power Generation by Source in % Share, Total Philippines

Resource	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coal	25.9%	26.6%	34.4%	36.6%	38.8%	42.6%	42.8%	44.5%	47.7%	49.6%	52.1%	54.6%
Oil-Based	8.0%	8.7%	10.5%	4.9%	5.8%	6.0%	7.4%	7.1%	6.2%	4.0%	3.2%	3.5%
Natural Gas	32.2%	32.1%	28.8%	29.8%	26.9%	25.0%	24.2%	22.9%	21.9%	21.8%	21.4%	21.1%
Renewable Energy	33.9%	32.6%	26.3%	28.7%	28.5%	26.4%	25.6%	25.4%	24.2%	24.6%	23.4%	20.8%
Geothermal	17.6%	16.7%	14.7%	14.4%	14.1%	12.8%	13.3%	13.4%	12.2%	10.9%	10.5%	10.1%
Hydro	16.2%	15.8%	11.5%	14.0%	14.1%	13.3%	11.8%	10.5%	8.9%	10.2%	9.4%	7.6%
Biomass	0.0%	0.0%	0.0%	0.2%	0.3%	0.3%	0.3%	0.4%	0.8%	1.1%	1.1%	1.0%
Solar	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	1.3%	1.3%	1.2%
Wind	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.9%	1.1%	1.2%	1.2%	1.0%
Total in GWh	60,821	61,934	67,743	69,176	72,922	75,266	77,261	82,413	90,798	94,370	99,765	106,041
Self-Sufficiency	67.09	65.81	57.49	61.14	58.78	56.24	53.47	53.15	51.02	53.85	51.04	46.85

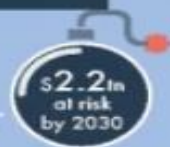
Stranded asset risks in the energy sector

For the oil and gas sector:



Oil and gas majors are exposed to stranded asset risk in a low-carbon world...

***in a 1.6°C demand pathway*



Shareholder returns are at risk

...and since 2018 they have invested \$50 bn in major projects that undermine climate targets and threaten shareholder returns.



Majors' production cuts needed

To stay within budget, majors need to reduce upstream production from current levels

by 35% by 2040.



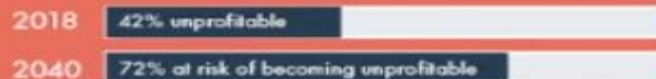
For the power sector:



To meet the global warming target set out in the Paris Agreement, 1 coal unit will need to close every day until 2040.



Is global coal capacity profitable?



Due to combination of renewable energy costs, carbon pricing and air pollution regulations.

Energy transition drivers:



Renewable electricity costs less than fossil fuel electricity in 2/3 of the world**.

***According to BloombergNEF*



Renewables costs are falling

Solar, wind and batteries costs fall by 15-20% for every doubling in capacity**.



When will fossil fuel demand peak?

In many cases it has already peaked:



Source: Carbon Tracker, January 2020

100% Renewable Energy Philippines

Transition to 100% wind, water, and solar (WWS) for all purposes
(electricity, transportation, heating/cooling, industry)



Residential rooftop solar
15.5%



Solar PV plant
9.6%



CSP plants
10.1%



Onshore wind
7.7%



Offshore wind
11.5%

2050

**PROJECTED
ENERGY MIX**

Commercial/govt
rooftop solar
29.6%



Wave energy
0.6%



Geothermal
11.2%



Hydroelectric
3.9%



Tidal turbine
0.3%



Why we should go RE?



Renewable energy is sustainable

It is clean and does not emit carbon and other greenhouse gases
Renewable energy does not cause air pollution
RE helps minimize the impact of climate change




Renewables provides energy security

It is an indigenous resource
With RE, we don't need to import fuel from other countries
Renewable energy powers our remote islands with distributed energy systems



RE is good economically

Decreasing cost of renewable energy
Global investments in new RE is more than double than that of new coal and other fossil based generation
RE promotes local job generation
RE sources can lower the cost of electricity

A photograph of a dense, lush green forest. The trees are tall and varied in species, with many palm trees visible. The forest is partially obscured by thick, white mist or low-hanging clouds that rise between the trees, creating a sense of depth and atmosphere. The overall scene is vibrant and natural.

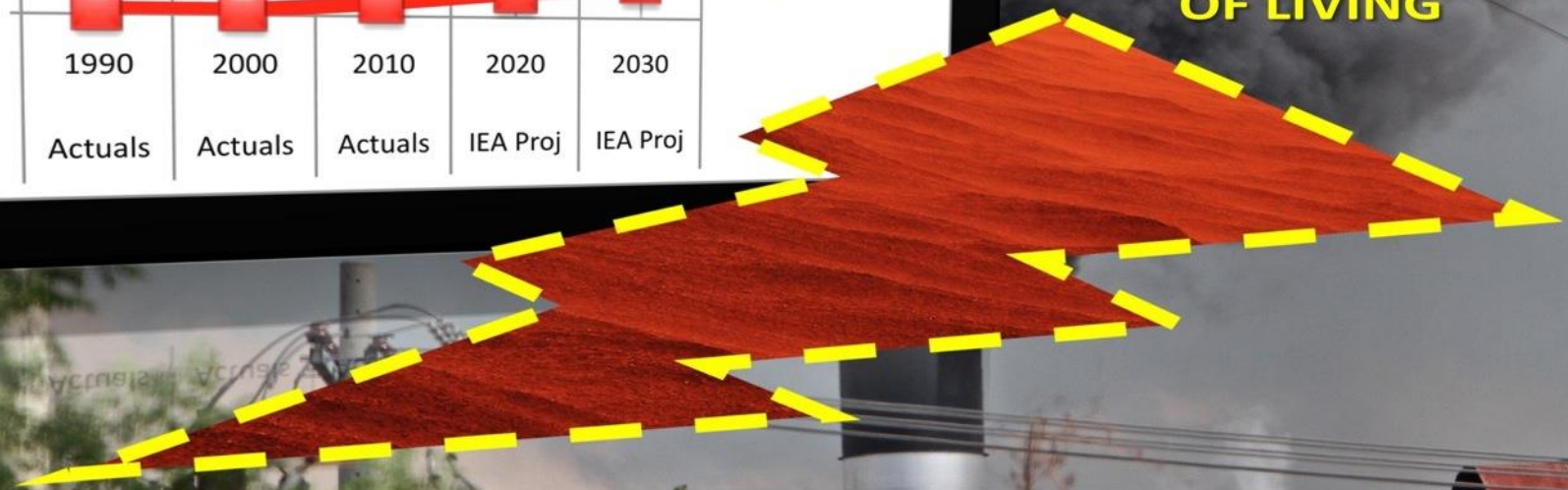
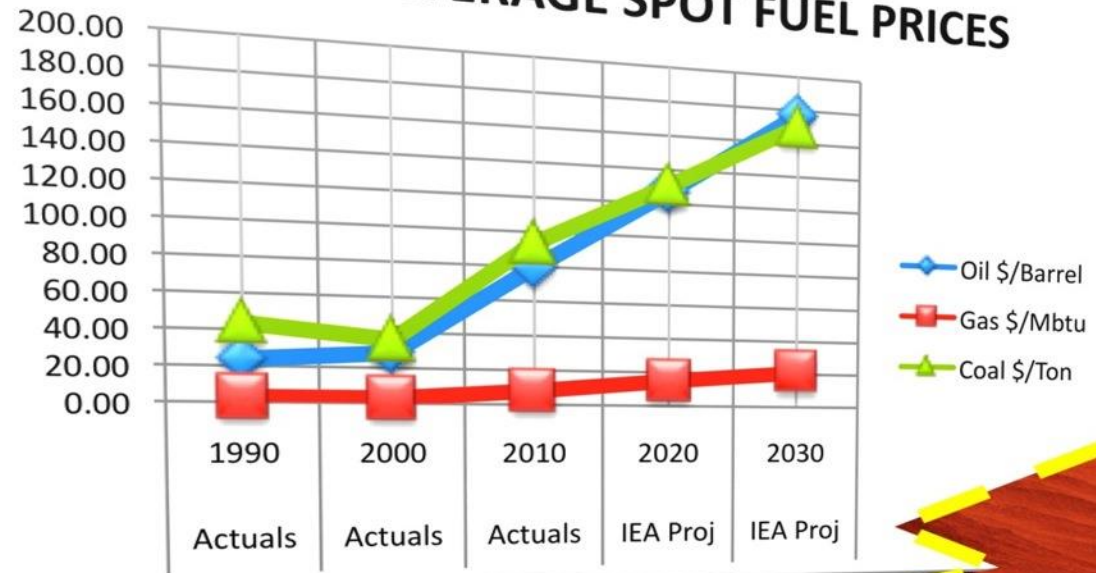
**BALANCE
ENERGY MIX**

**MANAGE
ENERGY MIX**

**THE COST
OF DOING
BUSINESS**

**THE COST
OF LIVING**

ANNUAL AVERAGE SPOT FUEL PRICES





THE REALITY OF BASELOAD

ANCHORED ON FOSSIL FUELS

Do we have sufficient energy?
Do we control fuel prices? Supply?
Is it competitively priced? Or expensive?
Have we eliminated brownouts?



KRA

- Seize Control of your Energy Mix
- Reduce Grid Dependence
- Build Indigenous Energy Sources
- Acquire Prior Dispatch Rights



REPORT

PH

2014



BUILDING MOMENTUM FOR LOW CARBON DEVELOPMENT IN THE PHILIPPINES



Increase in energy saving and efficiency, through:
A. Reduction of specific energy use in application
B. Distributed power generation
C. Combined power generation
D. Energy recovering through recycling



Fuel switch towards lower emission and safer fuels like Natgas
Natgas to serve as back up and bridge energy source during transition process towards 100% RE based economy



Replacement of fossil energy with RE based energy



Increase RE based coverage through energy storage & buffering systems
A. Hydro storage
B. Battery storage
C. Physical phase change storage systems
D. Conversion of surplus RE energy from wind and PV to hydrogen (H₂) and further into RE-methane (RE-CH₄)
E. Thermal and cooling energy storage systems

SEIZE YOUR POWER



**THE SHIFT TO INVESTING IN
RENEWABLE ENERGY STARTS NOW**



FinRE

**FINANCING AND INTEGRATING
RENEWABLE ENERGY
IN THE CITY OF BUTUAN**

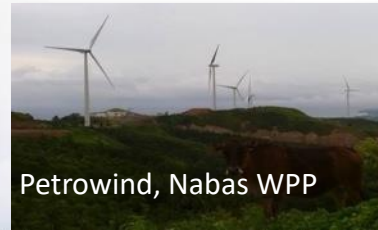


Seize the Sun

To increase uptake and acceptability of solar development projects through multi-sectoral engagements and information education campaign.



AWOC, Piliia WPP



Petrowind, Nabas WPP



TAREC, San Lorenzo WPP

SEIZE THE WIND



97.78%

LUZON

THE CHALLENGE OF HOUSEHOLD ELECTRIFICATION

93.88%

VISAYAS

79.99%

MINDANAO

92.96%

HOUSEHOLDS

1.6 Million households remain unserved out of 22.98 Million households in the country

DOE Estimate as of 31 December 2019



Around 12 million of Filipinos are deprived of access to electricity sources, relying mainly on expensive and highly dangerous kerosene lamps for lighting especially at night.

**Stories
from the
frontline
CLIMATE**

Solar-powered LED night landing and charging stations for Small-scale Fisherfolk





Earth Hour Gift of Light



Source: WWF Philippines



Earth Hour Village





Island Light & Water
Energy Development Corp.



Solar coMmunity-based Island tourism and Livelihood Energizer Platform (SMILE)

Model - Cobrador Island





BENEFITS OF ENERGY EFFICIENCY

Stimulating the Economy

Every **\$1 million** invested in energy efficiency generates **\$3-4 million** of economic growth.¹



13 jobs are created for every **\$1 million** invested in energy efficiency.²



Money in your Pocket



Living in an energy efficient building can **lower your heating bills** by **more than 50%**.³



Energy efficient buildings and homes experience **higher resale value** and **last longer**.⁴

Comfortable Buildings



Canadians spend 90% of their time indoors. An energy efficient building keeps you **warmer in winter** and **cooler in summer**.⁵

Energy efficient buildings stay more comfortable and safe during a **blackout or disaster**.⁶



A Healthier You

Energy efficiency has direct and indirect benefits to health ⁷



Energy efficiency benefits



Health impacts



Outcomes

Lower heating bills



Better mental health

Improved wellbeing

Higher air quality



Decreased respiratory disease

Reduced mortality

Reduced mould



Decreased cardiovascular disease

Reduced chronic pain

Less drafty



Reduced chronic disease

Increased productivity

Warmer and drier

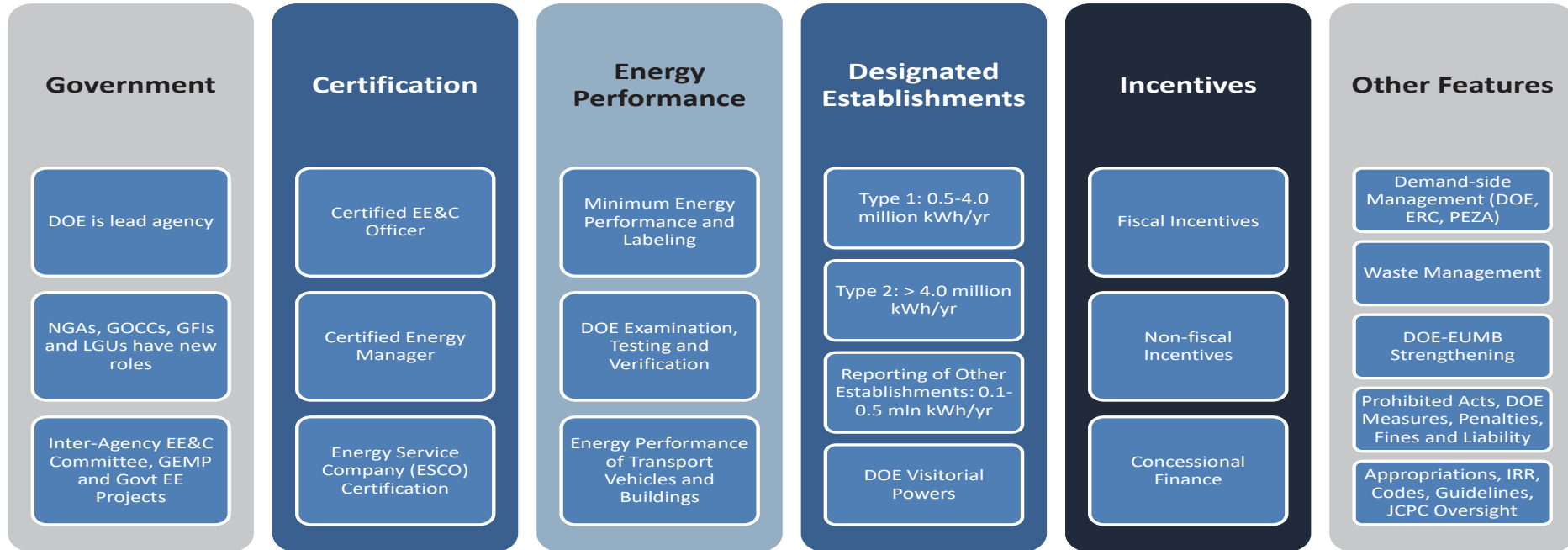


Less temperature related illnesses and deaths

Reduced hospitalization

Republic Act No. 11285

Energy Efficiency and Conservation Act

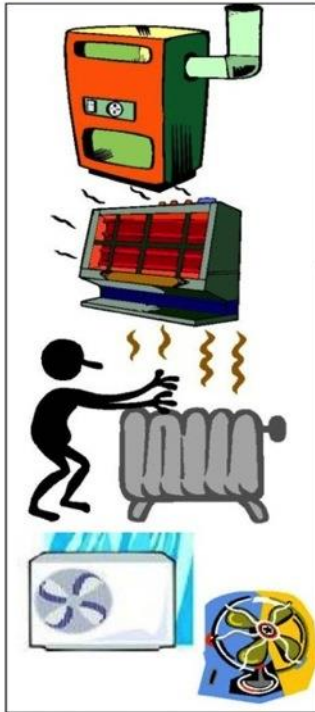


Source: A. Ablaza, 2019

An Act Institutionalizing Energy Efficiency and Conservation, Enhancing the efficient Use of Energy and Granting Incentives to Energy Efficient and Conservation Projects

ENERGY EFFICIENCY & CONSERVATION TIPS

44%



Heating & Cooling

26%



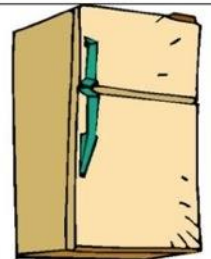
Cooking & Appliances

14%



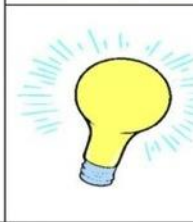
Hot Water

9%



Refrigerator

7%



Lighting

Undertake a basic Energy Audit

- How many appliances?
- How much energy your appliances use?
- Identify appropriate EE&C measures.



COOLING TIPS

AIR CONDITIONING UNIT

AIR CONDITIONERS ENERGY GUIDE
for cooling capacity of 12,000 kJ/h and above. This model is classified as:

lowest highest
MORE STARS MEANS HIGHER EFFICIENCY

ENERGY EFFICIENCY RATIO
For this model, the minimum EER standard set by the government for the year 2006 is 8.8

10.0

Approximate monthly cost of operating this unit \blacktriangleleft Cost of Operation Pesos = Power input in Watts (W) \times Monthly Usage hours (h) \times Power Rate Pesos/kW-h

Electrical Appliances Philippines Corporation

Brand : Room Air conditioner
Model :
Type : WINDOW

Cooling Capacity : kJ/h
Power Input : W
Frequency : 60 Hz
Voltage : 230 V

REMOVAL OF THIS LABEL BEFORE CONSUMER PURCHASE IS A VIOLATION OF REPUBLIC ACT NO. 7394

For additional information ask your dealer or write / call the Department of Energy, Lighting and Appliance Testing Laboratory, PNO-C-ERDC Compound, Commonwealth Avenue, Diliman, Quezon City. Tel. Nos. 929-54-43, 927-72-01 or Fax 929-54-74.
website: www.doe.gov.ph

4709 28003649
DOE CONTROL NO.

AH-107510

- Purchase air conditioning unit with higher Energy Efficiency Ratio (EER);
- Install in coolest and shady part of the room
- Set the thermostat at comfortable temperature and use fans in conjunction with your air conditioning unit;
- Seal and insulate ductwork;
- Keep your air conditioning unit clean
- Have your cooling system checked annually.


Energy Efficiency Ratio (EER)



COOLING TIPS

- Match your aircon horsepower (HP) to the size of your room

AIR CONDITIONERS ENERGY GUIDE
for cooling capacity of 12,000 kJ/h and above. This model is classified as:

lowest  highest
MORE STARS MEANS HIGHER EFFICIENCY



ENERGY EFFICIENCY RATIO
For this model, the minimum EER standard set by the government for the year 2006 is 8.8

10.0

Approximate monthly cost of operating this unit \blacktriangleleft Cost of Operation Pesos = $\frac{\text{Power input in Watts (W)}}{1000 \text{ W/kW}} \times \text{Monthly Usage hours (h)} \times \text{Power Rate Pesos/kW-h}$

Electrical Appliances Philippines Corporation

Brand : Room Air conditioner Cooling Capacity : kJ/h
Model : Power Input : W
Type : WINDOW Frequency : 60 Hz
Voltage : 230 V

dti   **REMOVAL OF THIS LABEL BEFORE CONSUMER PURCHASE IS A VIOLATION OF REPUBLIC ACT NO. 7394**

For additional information ask your dealer or write / call the Department of Energy, Lighting and Appliance Testing Laboratory, PNOG-ERDC Compound, Commonwealth Avenue, Diliman, Quezon City. Tel. Nos. 929-54-43, 927-72-01 or Fax 929-54-74.
website: www.doe.gov.ph

AH-107510 4709228003649
DOE CONTROL NO.

Room Size	Aircon Horsepower (HP)
6 to 11 sq. m	0.5 HP
12 to 17 sq. m	0.75 HP
18 to 22 sq. m	1.0 HP
23 to 27 sq. m	1.5 HP
28 to 40 sq. m	2.0 HP
41 to 54 sq. m	2.5 HP

Based on Meralco Power Lab tests on different aircon and room size scenarios at 25°C night time use.

- Adjust according to the amount of sunlight your room gets
- Put into account the number of people using the room

REFRIGERATOR /FREEZER TIPS

The Energy Label Guide

Check whether the brand and model of the product match the information on the label.

This refers to the net total space inside the unit available for storage of food.

This indicates the energy consumption of the model per 24 hr as tested under standard test conditions.

Use this formula to estimate the daily cost of operating the unit and compare it with other brands with similar storage volume.

This is the cost of energy in your area. Your monthly electricity bill will give a good estimate of the power rate.

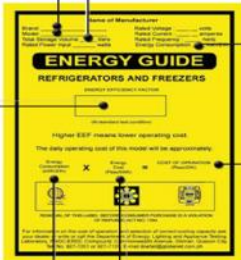
Example: kWh used = 500 kWh,
Net Bill Amount = P 4,415.00

This shows the energy consumption of the model as stated at the top-right corner of this energy label.

The box contains a number that indicates the efficiency of the model certified by an independent testing laboratory.

Higher EEF means lower operating cost.
The daily operating cost of this model will be approximately

Net Bill Amount
Energy Cost = $\frac{\text{kWh Used}}{\text{kWh Used}}$
= P 8.83/kWh



- Consider refrigerator that suits your need with a higher Energy Efficiency Factor (EEF).
- Keep the coils clean;
- Don't keep the door open;
- Make sure the door seals are airtight;
- Set the temperature of the refrigerator between 3° and 4°C, set the freezer between -18° and -15°C;
- Keep the freezer full, even if you just fill it with containers of water; and
- Defrost freezer when the ice is ¼" thick.



LIGHTING TIPS

The Energy Label Guide



The rate at which light is emitted by a lamp or light source expressed in lumens.

The time rate at which electric energy is used by the lamp/ballast combination expressed in watts.

The ratio of light output to the power input expressed in lumens per watt.

The expected time in hours, at which half of a large group of lamps have failed under standard test conditions.

Note : The values shown in the figure are arbitrary.

Lamp Specifications *	
Brand Name : Model/Type :	
Light Output	900 lumens
Power Consumption	15 watts
Efficacy	60 lumens per watts
Average Life	8,000** hours
For lamps of similar light output, higher efficacy means more energy savings	
* when tested at standard test conditions ** rated average life at 50% failure	
 	

- Change incandescent bulbs (lbs) to compact fluorescent lamps (CFLs) and LEDs
- Look for Energy Label Guide when buying CFLs
- CFLs use 1/5th of the energy of lbs, last 8 times longer and are cost effective.
- Turn lights off in any room you're not using
- Use task lighting
- Keep bulbs and luminaires clean
- Take advantage of day-light.



PHANTOM LOAD



- Phantom load is an electrical device that is operating 24 hours a day 365 days a year, even if you think the device is turned off.



Cordless Phone

PL = 4 watts
Electricity Cost per month
: P 25.43

PL = 15 watts
Electricity Cost per month
: P 95.36



Microwave w/
clock



Instant-on TV

PL = 28 watts
Electricity Cost per
month : P 178.01

- Set appliances and equipment to energy saving features



THIS
EARTH HOUR
#CONNECT2EARTH



EARTHHOUR.ORG



© WWF-Philippines / Alo Lantin

WE CAN STILL
#CHANGETHEENDING



Humans can live in harmony with nature



OPPORTUNITIES FOR GREEN RECOVERY IN THE NEW NORMAL

- Focus on long-term needs for a sustainable Philippines
- Need to be more self-reliant as a country, even in terms of our energy needs
- Tap into our bountiful renewable energy sources and implement stronger energy efficiency initiatives
- Invest in natural capital for ecosystem resilience and regeneration. Ensure protection and rehabilitation of our country's carbon sinks, forests, reefs
- Policies that integrate sustainability practices in the systems that provide our basic needs
- Promote low-carbon living, establishment of safe, inclusive and sustainable mobility solutions and green infrastructure, promoting circular solutions to address plastics
- Proper integration, implementation, consultation, and engagement in bringing economic, health, and environmental plans to fruition
- Robust financing and getting the banking sector involved to push for sustainable environmental impacts
- Integration of green/sustainability considerations in monetary policy

A FUTURE IN

BALANCE

WITH NATURE



A photograph of a wind farm at sunset or sunrise. The sky is a mix of orange, yellow, and light blue. Several wind turbines are visible, with their blades blurred by motion. A dark semi-transparent rectangular box is centered over the image, containing white text.

**BUILD A FUTURE WHERE
PEOPLE AND NATURE THRIVE
TOGETHER POSSIBLE**

Thank you!



Resources:

<https://energy.gov/eere/energyliteracy>

<https://www.doe.gov.ph>

National Renewable Energy Board (NREB)

Philippine Energy Efficiency Alliance (PE2)

Source: <http://revivedinteriors.com/>



Visit  bit.ly/wwfpandataalks



or go to our Facebook page and click the  button.





Please support the lives of those who support ours.

GCash
SCAN TO DONATE

WWF Philippines A



Together, we can help our fellow Filipinos rise above this crisis.



SUPPORT THE LIVES OF THOSE WHO SUPPORT OURS



ACCOUNT NAME: Kabang Kalikasan ng Pilipinas Foundation, Inc.
ACCOUNT NUMBER: **4210003967**



ACCOUNT NAME: Kabang Kalikasan ng Pilipinas Foundation, Inc.
ACCOUNT NUMBER: **1993053194**

You can email your transaction confirmation to donations@wwf.org.ph
and receive updates regarding the campaign.