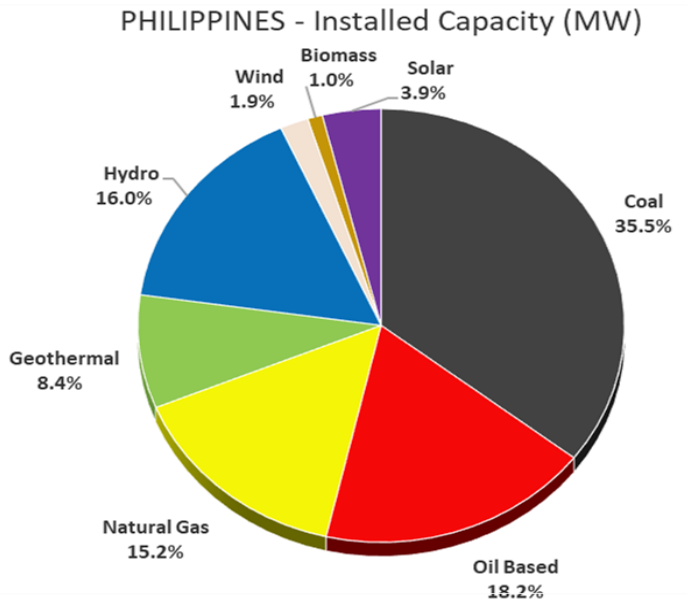
PRE-EGNRET MEETING: PHILIPPINES

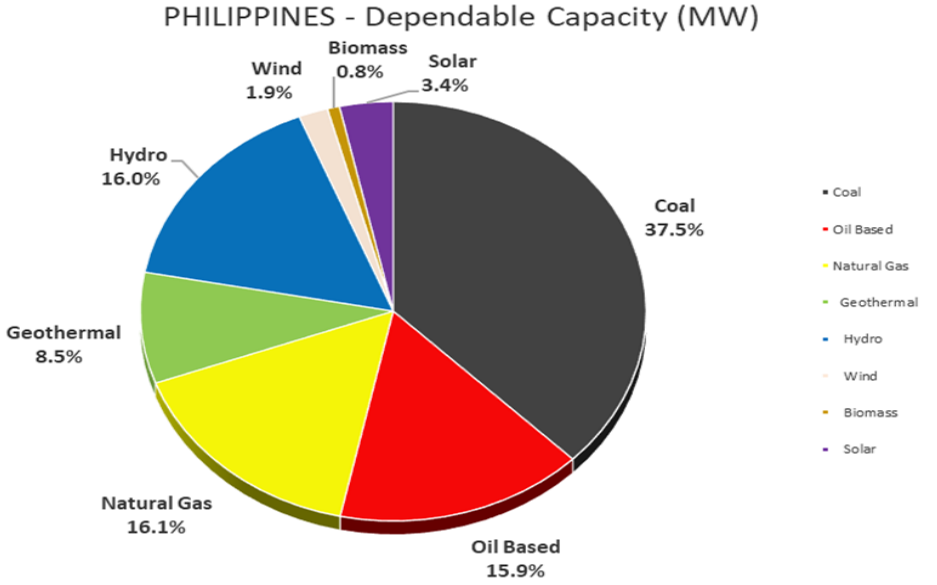
Marissa P. Cerezo
Department of Energy

I. Power capacity and generation mix
II. Laws governing RE resource development
III. RE potential and roadmap for development
IV. Status of PV solar installations
V. Policy mechanisms to accelerate RE deployment
VI. Challenges and way forward

CAPACITY MIX (As of 31 December 2017)

FUEL TYPE	PHILIPPINES			
	Capacity (MW)		Percent Share (%)	
	Installed	Dependable	Installed	Dependable
Coal	**8,049**	**7,674**	**35.4**	**37.4**
Oil Based	**4,153**	**3,286**	**18.3**	**16.0**
Diesel	*2,682*	*2,216*	*11.8*	*10.8*
Oil Thermal	*650*	*530*	*2.9*	*2.6*
Gas Turbine	*822*	*540*	*3.6*	*2.6*
Natural Gas	**3,447**	**3,291**	**15.2**	**16.0**
Renewable Energy	**7,079**	**6,264**	**31.1**	**30.5**
Geothermal	*1,916*	*1,752*	*8.4*	*8.5*
Hydro	*3,627*	*3,269*	*16.0*	*15.9*
Wind	*427*	*383*	*1.9*	*1.9*
Biomass	*224*	*160*	*1.0*	*0.8*
Solar	*885*	*700*	*3.9*	*3.4*
TOTAL	**22,728**	**20,515**	**100.0**	**100.0**





Note:

Installed - The generator nameplate capacity expressed in megawatts (MW).

Dependable - The load-carrying ability of a station or system under adverse conditions for a specified period of time.

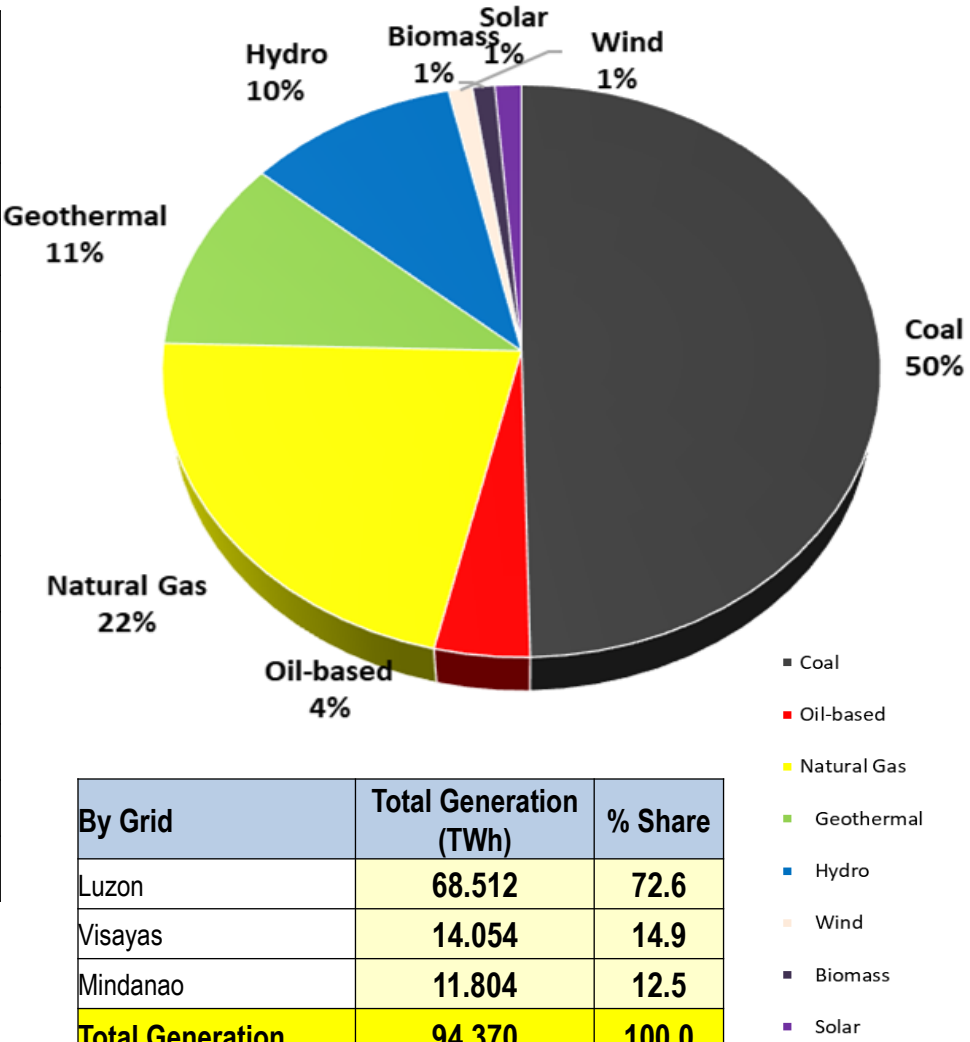
Source: DOE List of Existing Power Plants as of 31 December 2017, released 15 February 2018
US Energy Information Agency (EIA)

GENERATION MIX (As of 31 December 2017)

Plant Type	Total Generation (MWh)	% Share
Coal	**46,847,274**	**49.6%**
Oil-based	**3,787,093**	**4.0%**
Combined Cycle	*405,022*	0.4%
Diesel	*3,100,113*	3.3%
Gas Turbine	*0*	0.0%
Oil Thermal	*281,958*	0.3%
Natural Gas	**20,547,239**	**21.8%**
Renewable Energy	**23,188,735**	**24.6%**
Geothermal	10,270,077	10.9%
Hydro	9,610,799	10.2%
Biomass	1,013,148	1.1%
Solar	1,201,152	1.3%
Wind	1,093,558	1.2%
Total Generation	**94,370,341**	**100.0%**

Note:

Gross Generation - The total amount of electric energy produced by generating units and measured at the generating terminal in kWh or MWh.



By Grid	Total Generation (TWh)	% Share
Luzon	**68.512**	**72.6**
Visayas	**14.054**	**14.9**
Mindanao	**11.804**	**12.5**
Total Generation	**94.370**	**100.0**

Source: DOE Power Statistics 2017 (including off-grid generation), revised as of 30 April 2018
US Energy Information Agency (EIA)

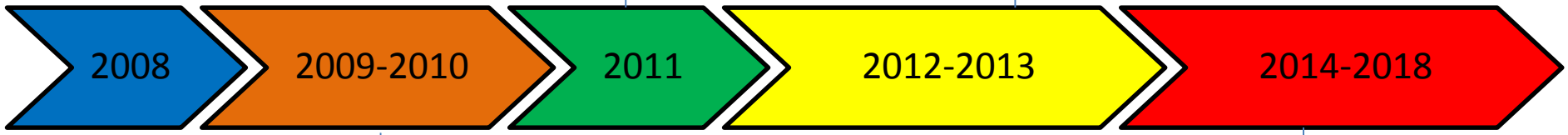
RENEWABLE ENERGY ACT OF 2008

Milestones: RA 9513

Enacted the R.A. 9513: Renewable Energy Act of 2008

National Renewable Energy Program
2010-2030

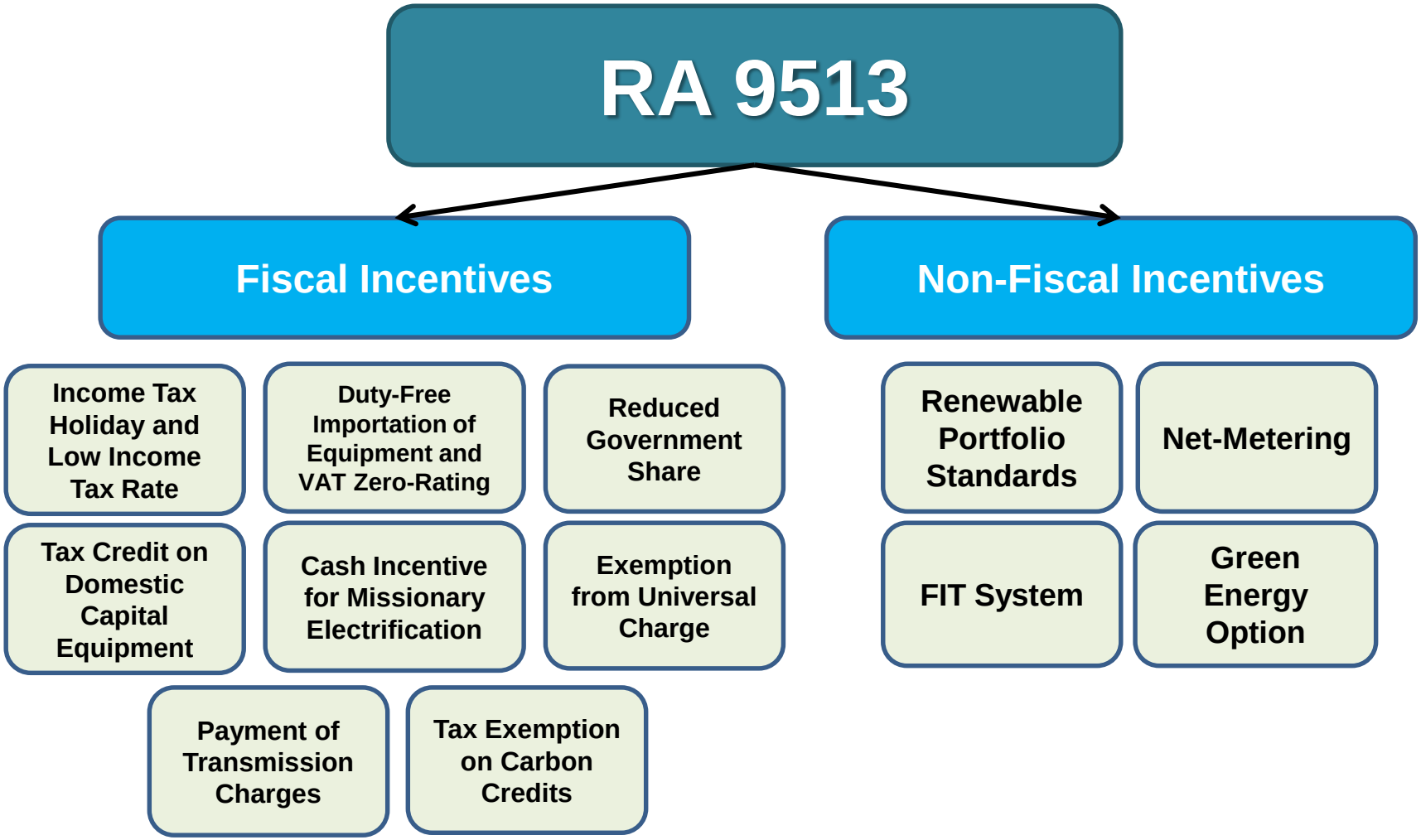
- 1st FIT Rates
- Guidelines for the Selection Process of RE Projects under FIT System and Award of Certificate for FIT Eligibility)
- Rules on Net-Metering Program
- FIT Allowance Payment and Collection Guidelines



- Implementing Rules and Regulations of RE Act
- Renewable Energy Management Bureau
- Registration of RE Developers
- National Renewable Energy Board)
- Feed-in-Tariff (FIT) Rules

- 2nd FIT Rates
  - Amendment of Installation Target
    - April 2014, 50 MW to 500 MW for Solar
    - April 2015, 200 MW to 400 MW for Wind
- Renewable Portfolio Standards Rules (On-Grid)
- FIT installation target completion for Biomass and Hydropower extended until Dec. 2019
- Green Energy Option Program Rules

INCENTIVES UNDER THE RE ACT



RE RESOURCE POTENTIAL

Geothermal	> 4,000 MW
Wind resource	> 76,600 MW
Hydropower	> 10,000 MW
Solar	> 5 kWh/m2/day
Ocean	> 170,000 MW
Biomass	> 500 MW *(bagasse & rice hulls only)*

- Largest producer of coconut oil
- Ranks 10thin world sugarcane production

RENEWABLE ENERGY ROADMAP

	Short-Term (2017-2018)	Medium-Term (2019-2022)	Long-Term (2023-2040)
ACCELERATION OF RE POSITIONING	• Review and update 2011-2030 NREP • Monitor and assess RESCs awarded for the conversion of indicative projects to committed • Finalize rules and implement RPS and REM • Finalize rules and implement Green Energy Option	• Intensify development in off-grid areas for wider populace access to energy • Determine realistic RE potential • Update the NREP 2017 – 2040	• Continue and accelerate implementation of RE projects • Conduct regular updating of RE resource database
	• Conduct detailed RE technology and resource assessment • Review other RE policy mechanisms		
CREATION OF CONDUCIVE BUSINESS ENVIRONMENT	• Streamline administrative processes of RESC applications • To work on DOE energy projects to be declared as projects of national significance • Enhance EVOSS for RE projects • Provide technical assistance to lower investment cost • Promote and incentivize local technology producers • Establish RE Information Exchange • Explore and initiate on the harmonization of LGU and national government related programs and policy		
RELIABLE AND EFFICIENT INFRASTRUCTURE	• Strengthen resiliency of RE systems and facilities • Harmonize transmission Development Plan with RE targets • Develop geographical installation target • Enhance local technical capabilities • Conduct R&D on the efficiency of RE technologies on the Smart Grid System		

INCREASED RE INSTALLED CAPACITY TO AT LEAST 20,000 MW

RENEWABLE ENERGY ROADMAP

Short-Term (2017-2018)	Medium-Term (2019-2022)	Long-Term (2023-2040)

PROMOTE AND ENHANCE RD&D AGENDA

- Strengthen the management and operation of ARECS
- Continue conduct of RE technology research and development studies
- Identify viability of new technologies
- Construct Ocean pilot/demo Energy projects
- Implement, monitor and evaluate pilot/demo projects for new RE technologies

OTHER ACTIVITIES

- Identify parameters to determine the viable Ocean Energy tariff rate
- Continue technical capacity building on RE
- Conduct research and promote low-enthalpy geothermal areas for power generation and direct use/non-power application for development
- Harmonize the DOE related programs with agro-forestry policies for an integrated use of biomass
- Continue the conduct of IEC to attain social acceptability

INCREASED RE INSTALLED CAPACITY TO AT LEAST 20,000 MW

REGISTERED RE PROJECTS

SUMMARY OF AWARDED RE PROJECTS (as of March 15, 2018)

RESOURCES	AWARDED PROJECTS		POTENTIAL CAPACITY MW		INSTALLED CAPACITY MW	
	Grid-Use	Own-Use	Grid-Use	Own-Use	Grid-Use	Own-Use
Hydro Power	455		13,445.16		975.79*	
Ocean Energy	7		26			
Geothermal	40		555		1,906.19*	
Wind	64	1	2,381.50		426.9	0.006
Solar	216	16	6,512.12	4.286	925.34	3.218
Biomass	57	24	334.17	16.77	449.01	128.16
Sub-Total	**839**	**41**	**23,260.17**	**21.056**	**4,683.23**	**131.38**
TOTAL	**880**		**23,281.23**		**4,814.61**	

NOTE:

* - *excluding 49 installed projects with 2,643.68MW capacity under RA 7156, CA 120, PD 1645, RA 3601 & Own-Use*

** - *excluding 1 potential project with 20MW capacity under PD 1442.*

RE CAPACITY ADDITIONS

From 2009 – December 2017

RESOURCES	2009	2010	2011	2012	2013	2014	2015	2016	2017	Own-Use	Net Metering	Total
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
Biomass	37.33	35.90	19.00	19.00	0.876	12.00	124.50	40.80	17.14	128.16		434.71
Geothermal	-	-	-	-	-	50.00	10.00			-		60.00
Solar	-	-	-	-	-	22.00	141.77	728.58	-	3.22	8.163	903.73
Hydro Power	-	2.00	2.10	11.80		16.65	14.82	10.00	8.50	-		65.87
Ocean Energy	-	-	-	-	-	-				-		-
Wind	-	-	-	-	-	303.90	90.00			0.006		393.91
TOTAL	**37.33**	**37.90**	**21.10**	**30.80**	**0.88**	**404.55**	**381.09**	**779.38**	**25.64**	**131.38**	**8.16**	**1,858.20**

SOLAR INSTALLED CAPACITY (as of June 2018)

PARTICULARS	NO. OF PROJECTS	CAPACITY (MW)
FIT System	**20**	**525.94**
PhP9.68/kWh	6	108.90
PhP8.69/kWh	17	417.04
Non-FIT System	**18**	**374.23**
Under WESM	16	361.03
Under PPA	2	13.20
Net-Metering	**(1698 end-users)**	**13.37**
Total	**38**	**913.54**

RENEWABLE ENERGY GREEN JOBS

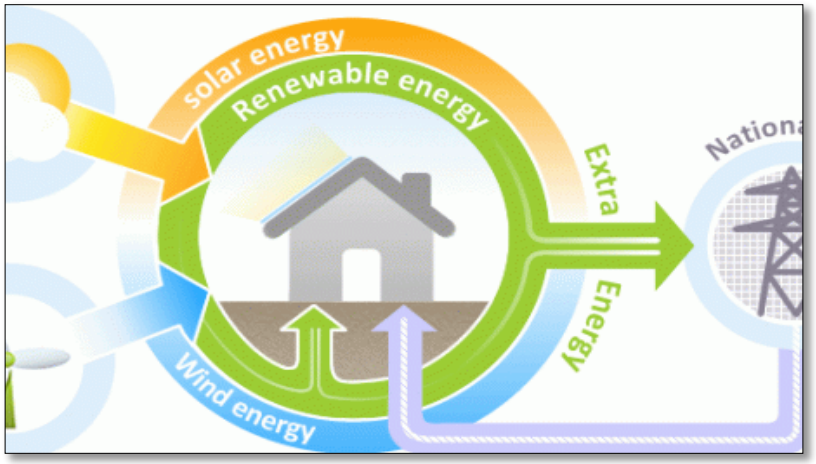
2009-2017	BIOMASS	SOLAR	WIND	HYDROPOWER	GEOTHERMAL	TOTAL
Additional Capacity	**306.55**	**892.35**	**393.9**	**65.87**	**60.00**	
Construction Jobs	12,875	80,312	35,451	4,051	720	133,409
O & M Jobs	1,379	1,606	1,773	474	306	5,539
TOTAL	**14,255**	**81,918**	**37,224**	**4,525**	**1,026**	**138,947**

138,947 Green Jobs



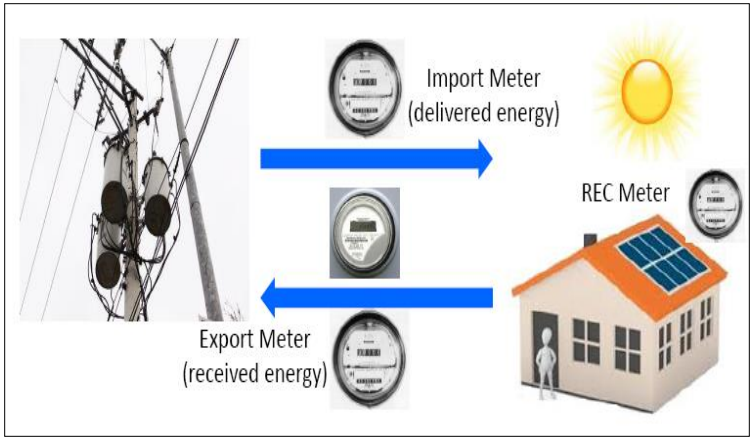

POLICY MECHANISMS FOR RENEWABLES

- On-Grid Renewable Energy Development
  - Net-Metering for Renewable Energy
  - Feed-In Tariff System
  - Renewable Portfolio Standards
  - Renewable Energy Market
  - Green Energy Option
- Off-Grid Renewable Energy Development
  - Minimum RE Generation Capacities



NET-METERING RULES

- Facilitate customer to produce its own electricity supply @ 100 kW or below.
- Connection/Sale of customers' RE Generation to the Grid
  - ERC approved the Net Metering Rules on 27 May 2013
- As of June 2018, a total of 1698 net metering customers have an estimated compounded capacity of 13,373.44 kWp (all solar PV systems)



FEED-IN-TARIFF SYSTEM

FIT-Eligible Projects as of December 2017

RESOURCE	INSTALLATION TARGET	ERC APPROVED FIT RATES	ERC APPROVED DEGRESSION RATES RATES	WITH CERTIFICATE OF ENDORSEMENT TO ERC		INSTALLATION TARGET BALANCE
	CAPACITY (MW)	(PhP/Kwh)		NO. OF PROJECTS	CAPACITY (MW)	CAPACITY (MW)
HYDROPOWER	250	5.90	.5% after year 2 from effectivity**** of FIT	5	34.60	215.40
		5.8705***			-	-
WIND	200	8.53	.5% after year 2 from effectivity of FIT	3	249.90	6.10
	200 *	7.40**		3	144.00	
SOLAR	50	9.68	6% after year 1 from effectivity of FIT	7	108.90	-
	450 *	8.69**		17	417.05	
BIOMASS	250	6.63	.5% after year 2 from effectivity of FIT	15	125.16	111.39
		6.5969***		4	13.45	
OCEAN	10	Deferred	-	-	-	-
TOTAL	**1,400.00**			**54**	**1,079.61**	**332.89**

** - Additional installation targets*

*** - FIT rates for the respective additional installation targets* (***W*** *-ERCRes14,s2015;* ***S*** *-ERCRes6,2015)*

**** - Degressed FIT rates (H&B-ERCRes1,2017)*

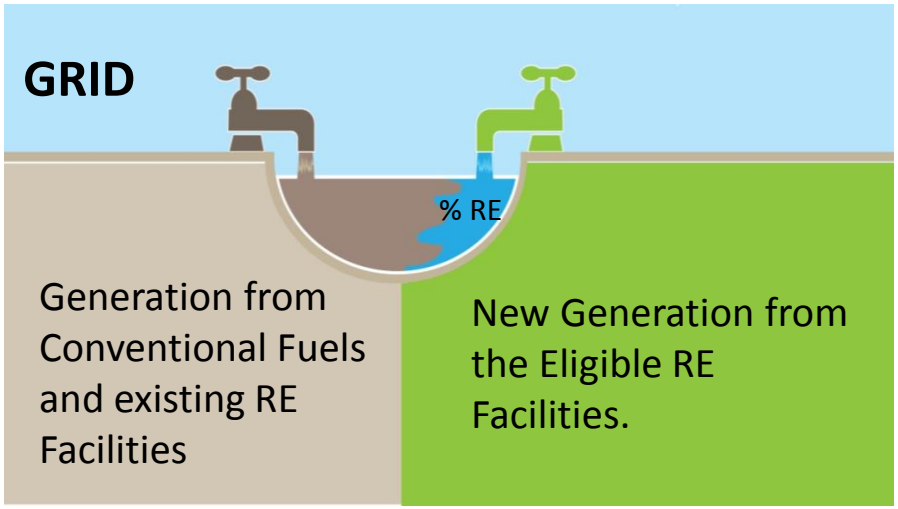
***** - Reckoning date is January 2015 (Deadline: December 2019)*

US $1.00 = Php 53.37 (20 August 2018)

RENEWABLE PORTFOLIO STANDARDS (RPS)

Separate rules for on-grid and off-grid

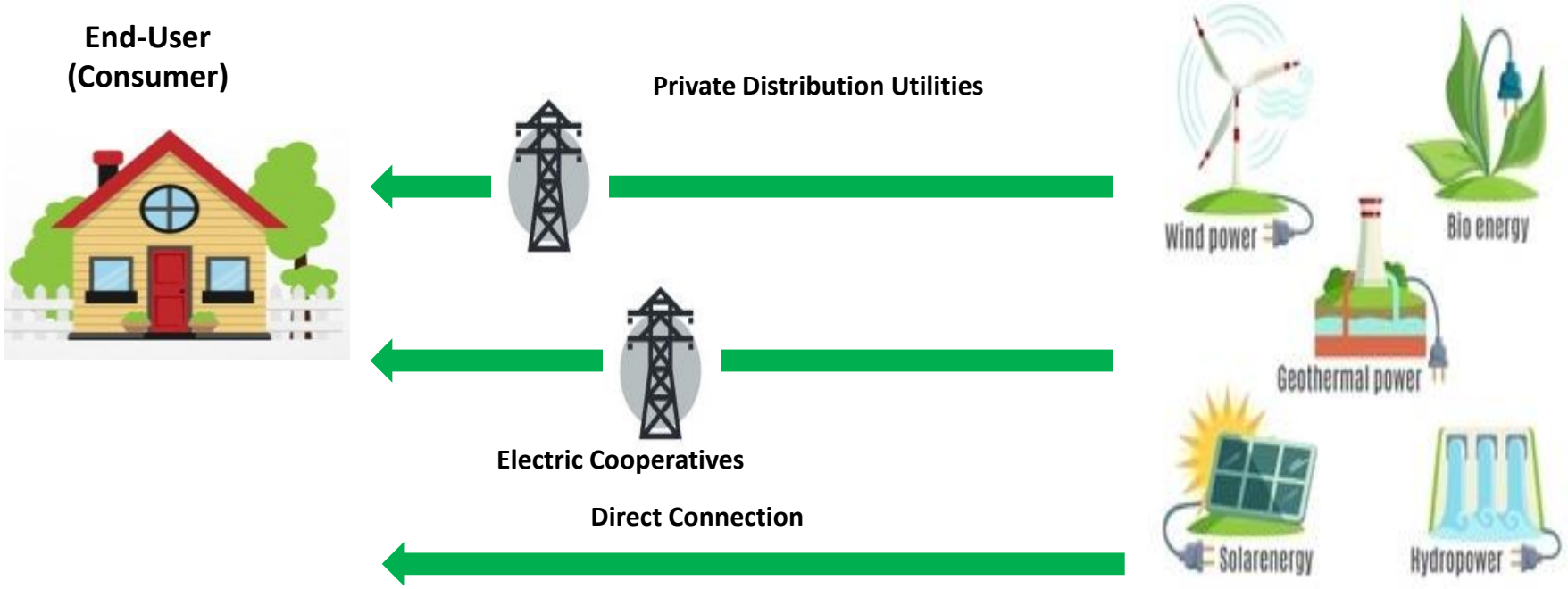
- Mandates minimum percentage of RE generation to the total supply of electricity.
- Mandating all utilities and GENCOs with directly connected costumers.
- Full implementation in 2020.
- Generates RE Certificates for compliance



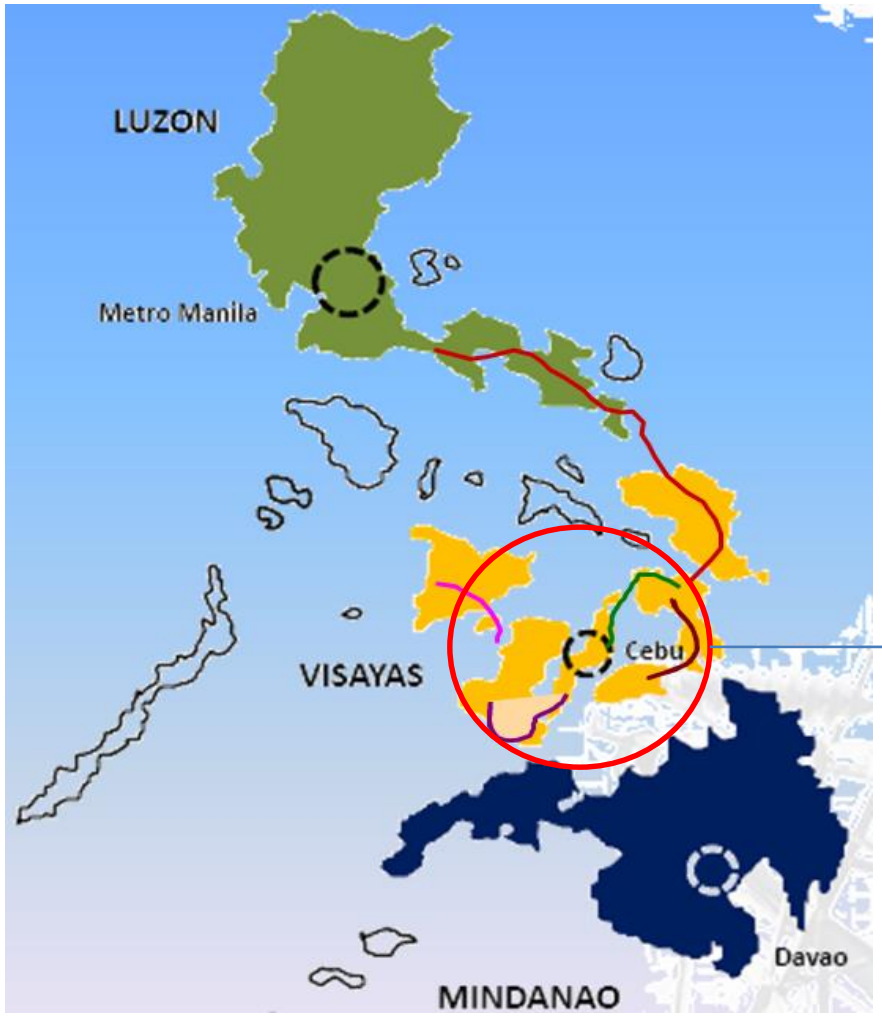
GREEN ENERGY OPTION PROGRAM

Guiding Principles

- Provides end-users the option to choose RE Resources as their source of energy.



CHALLENGES AND WAY FORWARD



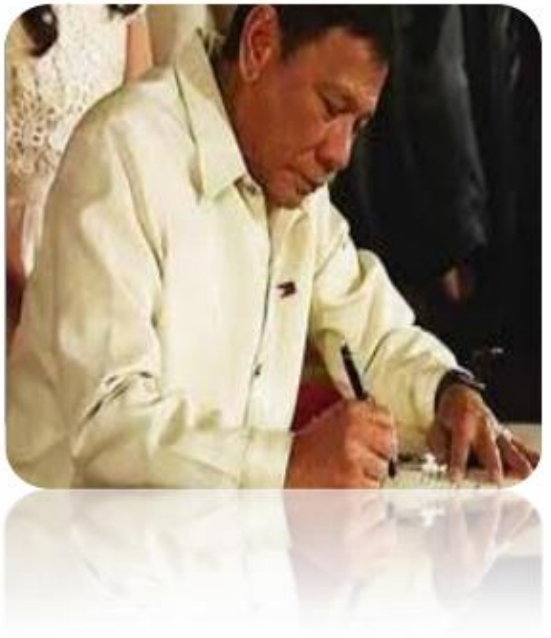
- Grid Congestion brought about by limited transmission line capacity
- NGCP to upgrade grid by 2020

On-going studies:

- Competitive RE Zoning
- Variable RE Cost-Benefit Analysis applying (RECD) Model

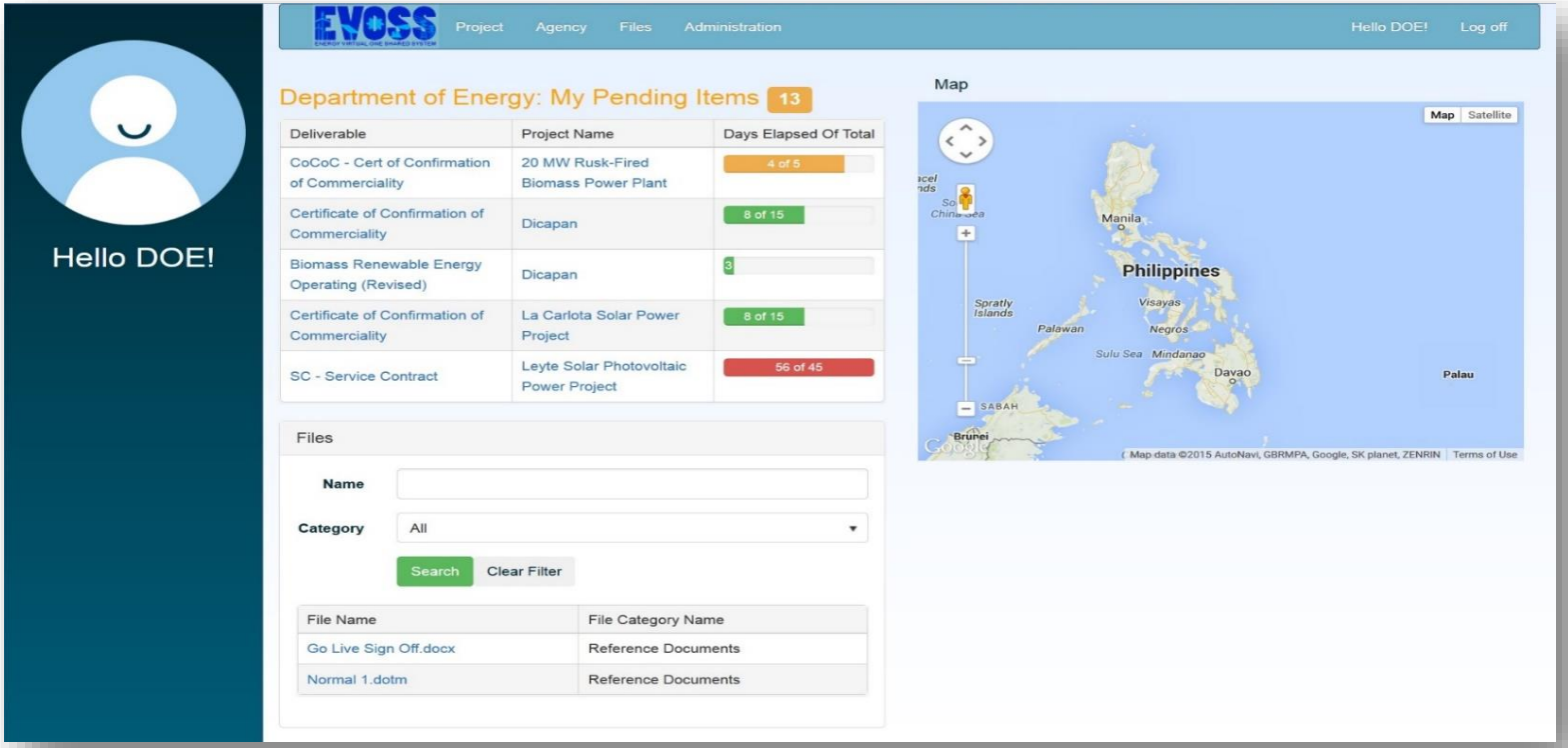
NEW POLICY INITIATIVES

- Executive Order No. 30 (EO 30)
  - Creating the Energy Investment Coordinating Council (EICC) in Order to Streamline the Regulatory Procedures Affecting Energy Projects
  - Classification of Energy Projects of National Significance (EPNS)
- Republic Act No. 11032 or "Ease of Doing Business and Efficient Government Service Delivery Act" – May 2018



ENERGY VIRTUAL ONE SHARED SYSTEM (EVOSS)

- Web-based monitoring system to facilitate approval process of applications in the energy sector and contains a database of processes, existing forms, fees, project related information and permits issued



NEW POLICY INITIATIVES

- Energy Resiliency Policy
  - "Adoption of Resiliency Planning and Program in the Energy Industry to Mitigate Adverse Effects Brought About by Disasters"
  - Promotes planning and investment to ensure nation's energy infrastructure continues to deliver while anticipating and reducing vulnerabilities

THANK YOU!


(+632) 479-2900


marissa.cerezo@doe.gov.ph
maris.cerezo@gmail.com


www.doe.gov.ph


//doe.gov.ph


@doe_ph