Renewable Energy (RE) Technologies for Investors and Businesses

8th National Electrification Awareness Month

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Presentation Outline

I. *Governing Law*
   - RE Act of 2008

II. *Current Situation*

III. *Updates*

IV. *Way Forward*
   - *Renewable Energy Sectoral Roadmap*

R.A. 9513: The RE Act of 2008

Accelerate the development of the country's renewable energy resources : biomass, solar, wind, hydro, geothermal and ocean energy sources, including hybrid systems.

R.A. 9513: The RE Act of 2008

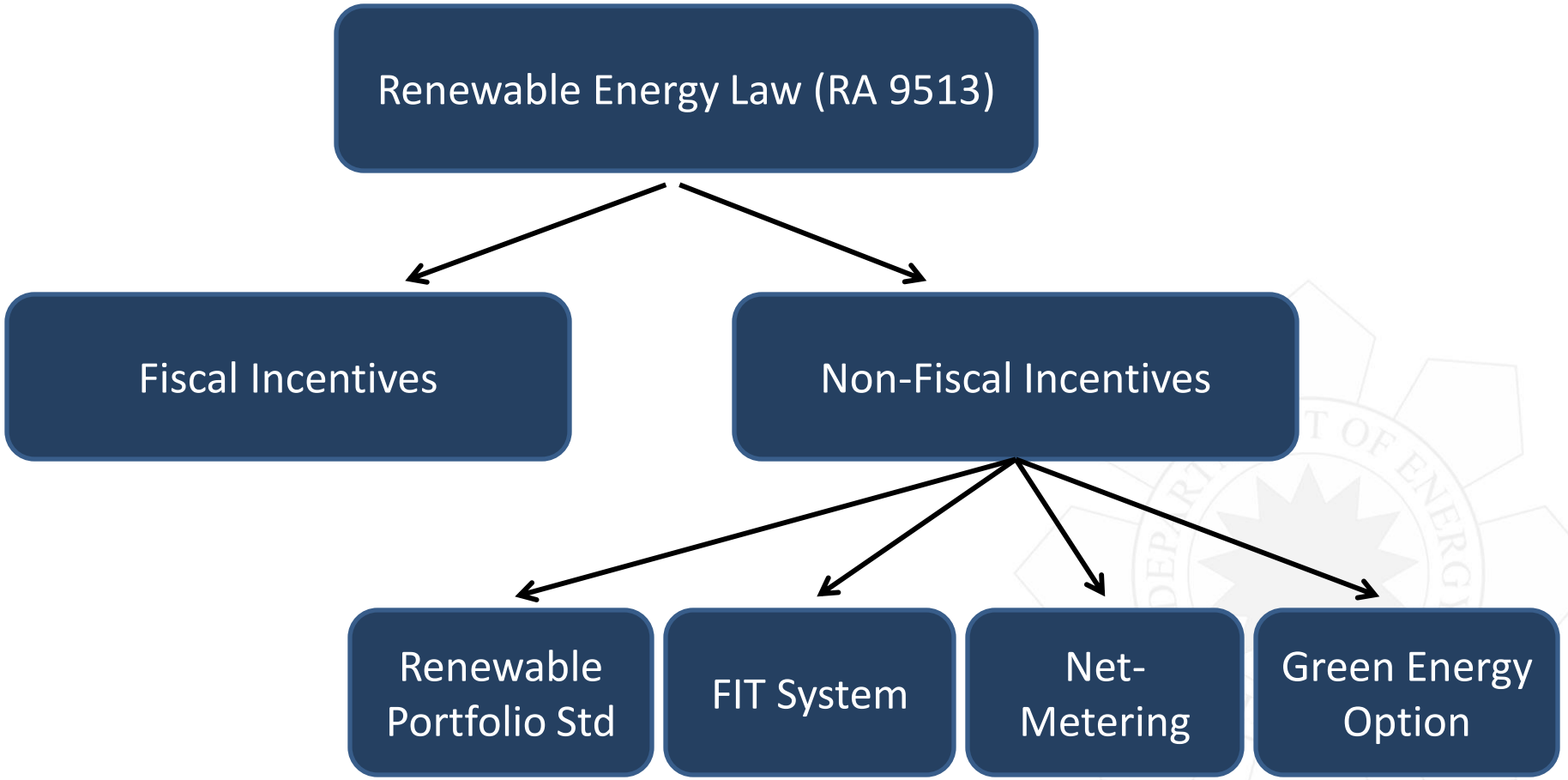
Policy Directions

- Accelerate the exploration and development of renewable energy resources

  - achieve energy self-reliance
    - to reduce the country's dependence on fossil fuels
    - minimize the country's exposure to price fluctuations
  - adoption of clean energy to mitigate climate change
  - promote socio-economic development in rural areas

- Increase the utilization of renewable energy by providing fiscal and non fiscal incentives;

Incentives Under the RE Act

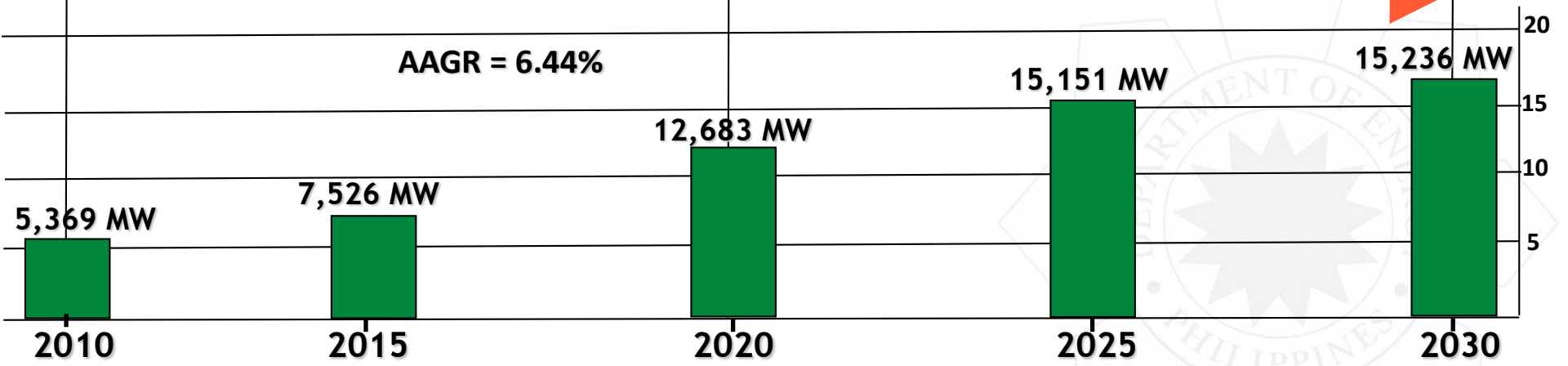


NREP Roadmap (2010-2030)

- 2012 - Full implementation of RA 9513
- 2015 - Target additional biomass capacity of 277 MW is reached
- 2018 – Commissioning of the 1st OTEC facility
- 2020 – Solar grid parity is attained

- Target additional RE capacities are reached by:
  - 2022 - Wind : 2,345 MW
  - 2023 - Hydro : 5,398 MW
  - 2025 - Ocean : 75 MW
  - 2030 - Solar : 284 MW*
  - Geothermal : 1,495 MW
- 2025 - Wind grid parity is attained

2010 **IMPLEMENTATION OF NREP SECTORAL SUB-PROGRAMS** 2030



Note: The National Renewable Energy Program (NREP) is currently under review of NREB to reflect developments on RE sector and the DOE's issuances of new Installation targets.

Source: Philippine Department of Energy/NREP

Regulatory Framework

- *2009 –establishment of Renewable Energy Management Bureau (REMB)*
- *2009 – creation of RE-Review and Evaluation Committee and started processing of RE Developer's registration*
  - On per project basis
  - If power is for grid use, apply RE Service Contract (RESC)
  - Allows conversion of existing RE projects awarded under old laws to be registered under RE Act including Biofuel Manufacturers

RESC Application Process

- *Requirements (legal, technical and financial qualifications)*

Modes:

  - Direct Negotiation for frontier areas
  - Open and Competitive Selection Process for non-frontier areas

- *Processing period: 25 working days*
- *RESC issued along with Certificate of Registration and Letters of Endorsement*

Salient Features of RE Service/Operating Contract

- Pre–Development - exploration, feasibility study.
  - Two (2) years, Five (5) years
- Development – Construction and commercial operation
  - Balance of 25 years renewable for 25 years
- Work Program – covers Pre-Development with milestone period (1st contract year, first 6 mos for solar and Biomass)
- Declaration of Commerciality - within the Pre-Development Stage. DOE to issue Certificate of Confirmation of Commerciality.
- Work Plan – every five years
- Performance Bond – until start of commercial operation
- Permits – to be secured before construction phase

Permits/Clearances

To be secured during Pre-Development Stage

1. LGU – Resolution of Support
2. DENR – Environmental Compliance Certificate and/or Certificate of Non-Coverage, FLAg, SLUP, Foreshore Lease Agreement
3. NCIP – Certification Precondition or Certificate of Non-Overlap
4. CAAP – Height Clearance Permit (Wind only)
5. DAR/DA/DENR – Land Conversion Order
6. NGCP – System Impact Study and Facilities Study
7. DU/EC – Distribution Impact Study and Distribution Asset Study
8. DPWH, DND – Right-of-Way
9. BOI – Registration
10. BOC – Duty-free Importation Certificates
11. BIR – Registration

Permits/Clearances

To be secured during Development Stage

1. LGU – Building Permit, Electrical Permit, Locational Clearance, etc.
2. NGCP – Connection Agreement, Transmission Service Agreement, Metering Service Agreement, Certificate of Approval to Connect
3. PEMC – WESM Registration
4. ERC – Certificate of Compliance, Point-to-Point Connection, etc.
5. DOE – Certificate of Endorsement under Power Development Plan and Memorandum of Agreement for ER1-94
6. TRANSCO – RE Payment Agreement
7. DU/EC – Power Purchase Agreement, RE Supply Agreement, etc.

Renewable Energy Current Status

SUMMARY OF RENEWABLE ENERGY AWARDED PROJECTS
(as of June 30, 2017)

AWARDED PROJECTS UNDER RE LAW

RESOURCES	AWARDED PROJECTS		POTENTIAL CAPACITY MW		INSTALLED CAPACITY MW	
	Grid-Use	Own-Use	Grid-Use	Own-Use	Grid-Use	Own-Use
Hydro Power*	445		13,419.73		965.04	
Ocean Energy	6		26.00			
Geothermal**	41		575.00		1,906.19	
Wind	62	1	2,381.50		426.90	0.0006
Solar	186	16	5,181.67	4.286	900.18	3.218
Biomass	51	23	326.68	23.07	389.58	119.86
Sub-Total	**791**	**40**	**21,910.58**	**27.356**	**4,587.89**	**123.08**
TOTAL	**831**		**21,937.94**		**4,710.97**	

NOTE:

** - excluding 55 installed projects with 3,050.47MW capacity under RA 7156, CA 120, PD 1645, RA 3601 & Own-Use*

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

PENDING APPLICATIONS UNDER RE LAW

RESOURCES	PENDING APPLICATIONS		POTENTIAL CAPACITY MW		INSTALLED CAPACITY MW	
	Grid-Use	Own-Use	Grid-Use	Own-Use	Grid-Use	Own-Use
Hydro Power	93		2,270.67			
Ocean Energy						
Geothermal	3		60.00			
Wind	22		80.00			
Solar	210		2,114.70			
Biomass	13		172.00			
Sub-Total	**341**	**-**	**4,697.37**	**-**	**-**	**-**
TOTAL	**341**		**4,697.37**		**0.00**	

Renewable Energy Current Status

ACCREDITED RENEWABLE ENERGY (RE) SUPPLIERS, MANUFACTURERS AND FABRICATORS

- Solar and Wind – 9
- Biomass – 1
- Geothermal – 4
- Hydropower – 1

- Term – 3 years renewable for the same period.

List of RE Projects Under Electric Cooperatives

AWARDED HYDROELECTRIC POWER PROJECTS under ELECTRIC COOPERATIVES as of June 30, 2017

ISLAND / REGION	REGION	PROVINCE	MUNICIPALITY	COMPANY NAME	NAME OF PROJECT	POTENTIAL CAPACITY (MW)	INSTALLED CAPACITY (MW)
Luzon	**CAR**	Benguet	**Buguias**	Benguet Electric Cooperative, Inc.	Man-asok	3.00	
		Ifugao	**Asipulo**	Ifugao Electric Cooperative, Inc.	Likud 2	0.60	
		Mt. Province	**Bontoc**	Mountain Province Electric Cooperative, Inc.	Talubin	4.90	
	II	Isabela	**Alicia**	Ganano Energy & Environment Electric Cooperative	Ganano River	50.00	
	IV-B	Oriental Mindoro	**Baco**	Oriental Mindoro Electric Cooperative, Inc.	*Linao-Cawayan (Lower Cascade)		2.10
					Linao-Cawayan (Upper Cascade)		2.10
		Romblon	**Cajidiocan**	Romblon Electric Cooperative, Inc.	Agbalit	0.89	
					Lumbang	0.49	
					Silum	1.52	
			San Fernando	Romblon Electric Cooperative, Inc.	*Cantingas		0.90
	V	Sorsogon	**Sorsogon**	Sunwest Water and Electric Co., Inc. - Sorsogon II Electric Cooperative, Inc. (SUWECO-SORECO II)	Upper Cawayan (Cawayan 1)		0.60

List of RE Projects Under Electric Cooperatives

AWARDED HYDROELECTRIC POWER PROJECTS under ELECTRIC COOPERATIVES as of June 30, 2017

ISLAND / REGION	REGION	PROVINCE	MUNICIPALITY	COMPANY NAME	NAME OF PROJECT	POTENTIAL CAPACITY (MW)	INSTALLED CAPACITY (MW)
Visayas	VI	Antique	Sebaste	Antique Electric Cooperative, Inc.	Caro-an	0.84	
					Ipayo	0.84	
	VIII	Leyte	Inopacan	Leyte IV Electric Cooperative, Inc.	Caminto River	0.50	
		Southern Leyte	St. Bernard	Southern Leyte Electric Cooperative, Inc.	Hinabian		0.81
		Leyte	Kananga	Leyte V Electric Cooperative, Inc (LEYECO V)	Bao	1.50	
Mindanao	X	Bukidnon	Valencia	Bukidnon II Electric Cooperative, Inc.	Upper Manupali	4.40	
	XI	Davao del Sur	Digos City	Davao de Sur Electric Cooperative, Inc.	Ruparan	5.00	
	XII	South Cotabato	Lake Sebu	South Cotabato I Electric Cooperative, Inc.	Takbo	15.00	
	XIII	Surigao del Sur	San Miguel	Surigao del Sur II Electric Cooperative, Inc.	Carromata	5.60	
					Sagbayan	0.64	
			Tandag City and San Miguel	Surigao del Sur II Electric Cooperative, Inc.	Calatngan	3.60	
Grand Total						99.32	6.51

Total Number of Projects – 22

Total Potential Capacity (MW) – 99.32 MW

Total Installed Capacity (MW) – 6.51

Existing and Updates on RE Policy Mechanisms

Feed-in-Tariff (FIT) issued Regulations

- August 12, 2010, The FIT Rules was promulgated (Fixed rate for 20 years)
- July 27, 2012, The ERC approved the FIT Rates.
- June 2013, DOE issued Selection Process of Renewable Energy Projects Under Feed-In Tariff System and the Award of Certificate for Feed-In Tariff Eligibility
- ERC issued FIT Allowance (FIT-ALL) Payment and Collection Guidelines
  - Approved FIT-ALL Rates 0.0406 PHP/kWh (2014-2015), Oct. 7, 2014 and effective January 2015
- 2014-2015 Amendment of DOE's installation target
  - April 30, 2014, 50mw to 500mw for Solar Energy Generation
  - April 24, 2015, 200mw to 400mw for Wind Energy Generation
- 2015, ERC issued new FIT Rates for Solar and Wind

Existing and Updates on RE Policy Mechanisms

Feed-in-Tariff (FIT) Rates

RE Technology	Approved Rates (PHP/kWh)	Installation Target (MW)
Run-of-River Hydro	5.8705***	250
Biomass	6.5969***	250
Wind	7.40*	(with initial target of 200) 400**
Solar	8.69*	(with initial target of 50) 500**

* *Feed in Tariff (FIT) rates for solar was revised in March 2015 under Resolution No. 6, series of 2015 issued by ERC from Php 9.68 to 8.69/kWh covering additional target of 450 MW. The second FIT rate for wind energy was issued by the ERC on October 2015 at Php 7.40/kWh from Php 8.53/kWh covering additional target of 200MW under ERC Resolution No. 14, series of 2015.*

** *Amended targets for wind energy and solar power up to March 15, 2016.*

*** *Under Resolution No. 1 series of 2017, the ERC on January 2017 issued the degressed FIT rates to cover January to December 2017 for Run-of-River Hyro Plants from Php 5.9 to 5.8705/kWh and Biomass Plant from Php 6.63 to 6.5969/kwh.*

Feed-In Tariff Monitoring Board (as of February 2017)

RESOURCE	WITH CERTIFICATE OF CONFIRMATION OF COMMERCIALITY		WITH CERTIFICATE OF ENDORSEMENT TO ERC	
	NO. OF PROJECTS	CAPACITY (MW)	NO. OF PROJECTS	CAPACITY (MW)
HYDRO	102	813.60	4	26.60
WIND	11	833.30	6	393.90
SOLAR	47	1,226.73	20	525.95
BIOMASS	18	155.40	13	109.55
TOTAL	**178**	**3,029.03**	**43**	**1,056.00**

Note: For the Northwind 33 MW Wind Power Project in Bangui, Ilocos Norte, the ERC on June 2014 issued a special rate of Php 5.76/kwh

Existing and Updates on RE Policy Mechanisms

Net-Metering Rules and Interconnection Standards

- Connection / sale of customers' RE generation to the grid
- The ERC approved the Net Metering Rules last May 27, 2013
- Total Number of Net Metering Customers as of March 2017 is 822 with a installed capacity of 5,324.63 kWp

Net-Metering System

- Not exceeding 100 kw/meter
- Energy saving
- Excess of consumption to be sold to the grid
- Amount exported to be off-set in the next billing

PV Rooftop Installations in Schools

Manuel L. Quezon University

St. Scholastica's College

Summary of Net Metering Customers (as of June 2017)

DUs	NO. OF CUSTOMERS	Capacity (kWp)
MERALCO	763	4793.76
VECO	27	159.62
CEBECO III	1	3.00
CEBECO I	5	84.00
DLPC	10	84.20
AEC	6	41.32
BATELEC I	1	10.00
PELCO II	4	26.00
LEYECO V	2	6.00
PANELCO	1	100.00
OEDC	2	16.73
Total	**822**	**5,324.63**

Existing and Updates on RE Policy Mechanisms

Renewable Portfolio Standards (RPS) for On-grid and Off-Grid Areas

Mandated minimum percentage of RE generation. The DOE conducted public consultations and Technical Working Group Meetings on the Rules governing the establishment of RPS in different areas:

- On-going NREB public consultation
- For Department of Energy's finalization

Green Energy Option Program (GEOP)

- End-users' option to purchase electricity from RE facilities (open access)
  - The NREB drafted the GEOP Rules on June 20, 2013
  - Draft GEOP Rules was endorsed to DOE by NREB on June 2017
  - For Department of Energy's finalization

Renewable Energy Programs

Hydropower Potential Sites- JICA resource inventory result

- 1,413 Sites with potential capacity of 20,599.05 MW
  - Out of the 1,413 Sites, 188 sites is located in Mindanao with a potential capacity of 912.13 MW.

USAID Biomass Resource Inventory Result

- 4,446.54 Mwe Potential Power Generation Capacity net of Competing uses (MW)
- 17.26 MtCO2 Potential GHG emission reduction (tCO2)

LOCALLY-FUNDED:
Low Enthalpy Geothermal Areas - ON GOING

Detailed Wind Resource Assessment Project launched last February 20, 2015

Household Electrification Program (HEP) – continuing

Biofuel Feedstock inventory – on going

Way Forward

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 • Conduct detailed RE technology and resource assessment • Review other RE policy mechanisms	• 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
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

Thank you!