

50TH EGNRET MEETING AND ASSOCIATED EVENTS
20-22 March 2018, Honolulu, Hawaii

RENEWABLE ENERGY DEVELOPMENT IN THE PHILIPPINES

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Presentation Outline

- I. Capacity Building activities**
- II. Updates in RE development**
- III. Challenges**
- IV. Way Forward**



IECs/Public Consultation

- E-power mo! – a nationwide IEC campaign where all sectors in the energy provide updates on the implementation of plans and programs of the government.
- Energy Investment Forum – annual forum targeting potential investors by providing recent information on the areas for investment.
- Trainers' training – in rolling out RPS implementation and other guidelines.
- IECs for local communities hosting RE projects.
- Talks on RE technologies in academic events.
- Workshops on Smart Grid technology, Energy resiliency, etc.



RE workshops/conferences

- High-level Geothermal Conference – signed Florence Declaration to have collective effort in scaling up the deployment of geothermal resources, Florence, Italy, 18 Sept 2017
- Bioenergy International Conference, Canada – 2017
- Hydropower Workshop with IEEJ – 1Quarter, 2018
- ASEAN Regional Campaign Strategy on Renewable Energy – Bangkok, Thailand, 14-15 March 2018
- Rural Electrification Energy Access Investment Forum, Sicily, Italy, March 2018
- IRENA Council Meetings, ASEAN workshops/RE Project Award



BIOFUEL PRODUCERS

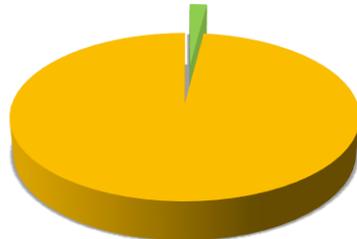
BIODIESEL

11 Accredited Biodiesel Producers

574.9 Million Liters Production Capacity

Feedstock CNO

2% Biodiesel



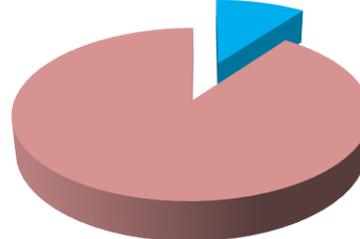
BIOETHANOL

10 Accredited Bioethanol Producers

282.12 Million Liters Production Capacity

Feedstock Sugarcane and Molasses

10% Bioethanol



Actual Annual Biofuel Report

	Registered with Notice to Proceed Construction		Accredited		2016 (in million liters)		2017 (in million liters)	
	# of Projects	Annual Capacity	# of Projects	Annual Capacity	Production	Sales	Production	Sales
Biodiesel	2	165	11	574.9	225.87	217.70	222.13	203.48
Bioethanol	3	149	10	282.12	230.18	226.88	234.65	234.90



90 ML Chemrez Technologies Inc., Biodiesel Plant
(Bagumbayan, Quezon City)



54 ML Green Future Innovation Inc., Bioethanol Plant
(San Mariano, Isabela)



Additional Capacity

Year	Biodiesel	Potential Annual Rated Capacity
		(in million liters)
2018	Greentech Biodiesel Inc.	100
2019	Archemicals Corporation	15
	BIOREV	150

Year	Bioethanol	Potential Annual Rated Capacity
		(in million liters)
2018		
	1 st Emperador Distillers, Inc.	66
	2 nd Victorias Milling Company, Inc.	16.5
	3 rd Cavite Biofuel Producer, Inc.	38
	Kooll Company, Inc.	15.88
2020	Canlaon Alcogreen Agro Industrial Corporation	45



Biodiesel Production and Sales, 2007-2017

Year	Mandated Blend	Actual Production	Sales
		<i>(in million liters)</i>	
2007	1%	49.1	48.48
2008	1%	65.67	64.48
2009	2%	136.52	130.93
2010	2%	123.55	124.51
2011	2%	132.99	122.96
2012	2%	137.88	137.47
2013	2%	154.95	152.50
2014	2%	171.65	163.46
2015	2%	204.03	200.57
2016	2%	225.87	217.70
2017	2%	222.13	203.48



Bioethanol Supply and Demand, 2007-2017

YEAR	LOCAL SUPPLY	DEMAND		
		LOCAL SALES	IMPORTED	TOTAL DEMAND
<i>(in million liters)</i>				
2007	0	0	3.18	3.18
2008	0.97	0.42	12.56	12.98
2009	23.28	23.11	64.24	87.35
2010	10.17	9.17	140.4	149.57
2011	4.14	2.87	218.78	221.65
2012	32.50	38.18	246.88	285.06
2013	71.54	63.20	253.69	316.89
2014	115.11	118.89	301.58	420.47
2015	167.87	168.42	310.69	479.11
2016	230.18	226.88	241.25	468.13
2017*	234.65	234.90	293.39*	528.29*

Note: *tentative data



BIOFUELS

OVERALL
OBJECTIVE
BY 2040

SHORT-TERM
(2017-2019)

MEDIUM- TO LONG-TERM
(2020-2040)

BIODIESEL

B2

Maintain 2%
biodiesel
blending on
diesel

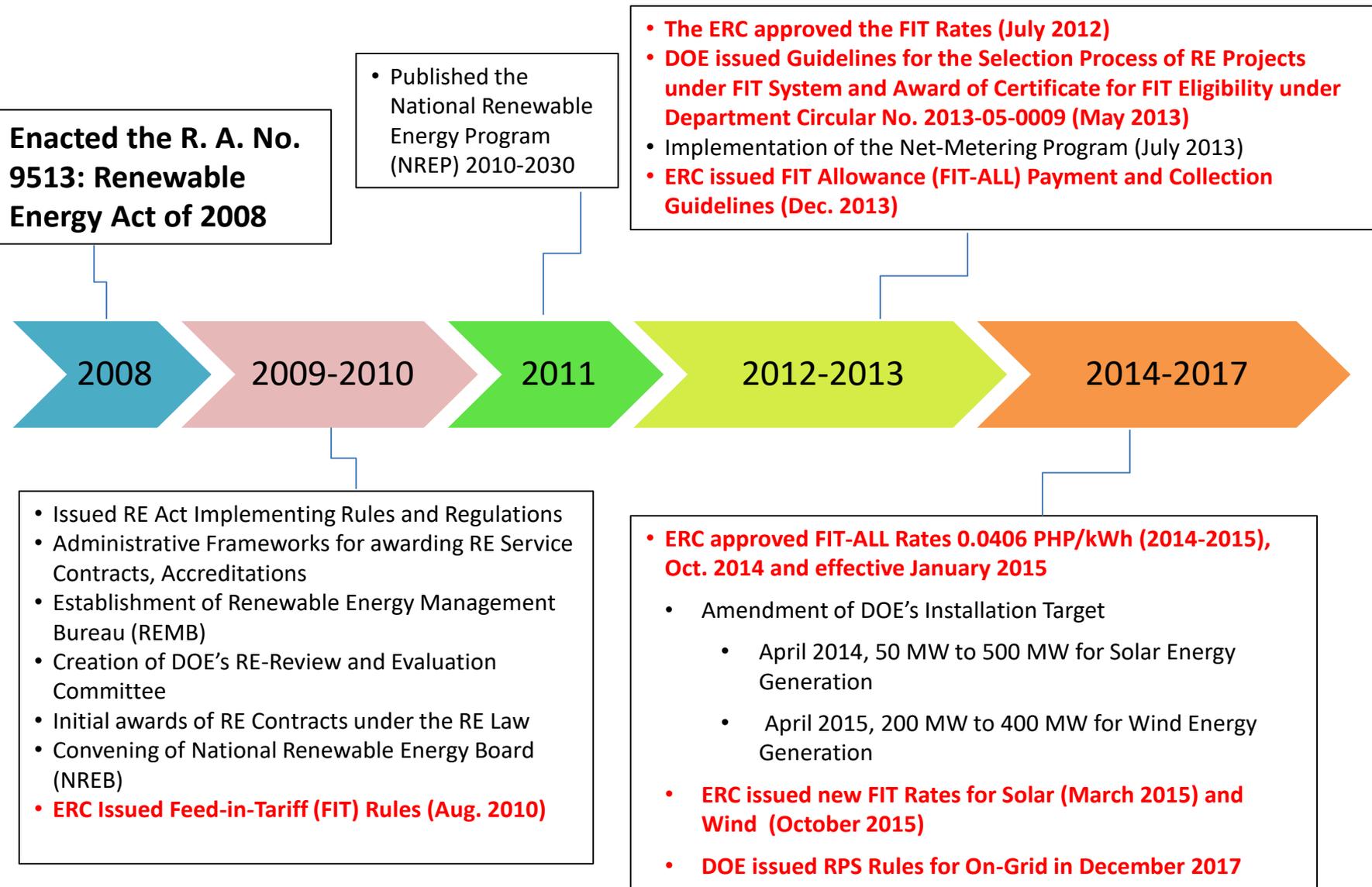
E10

Review the
bioethanol
mandate

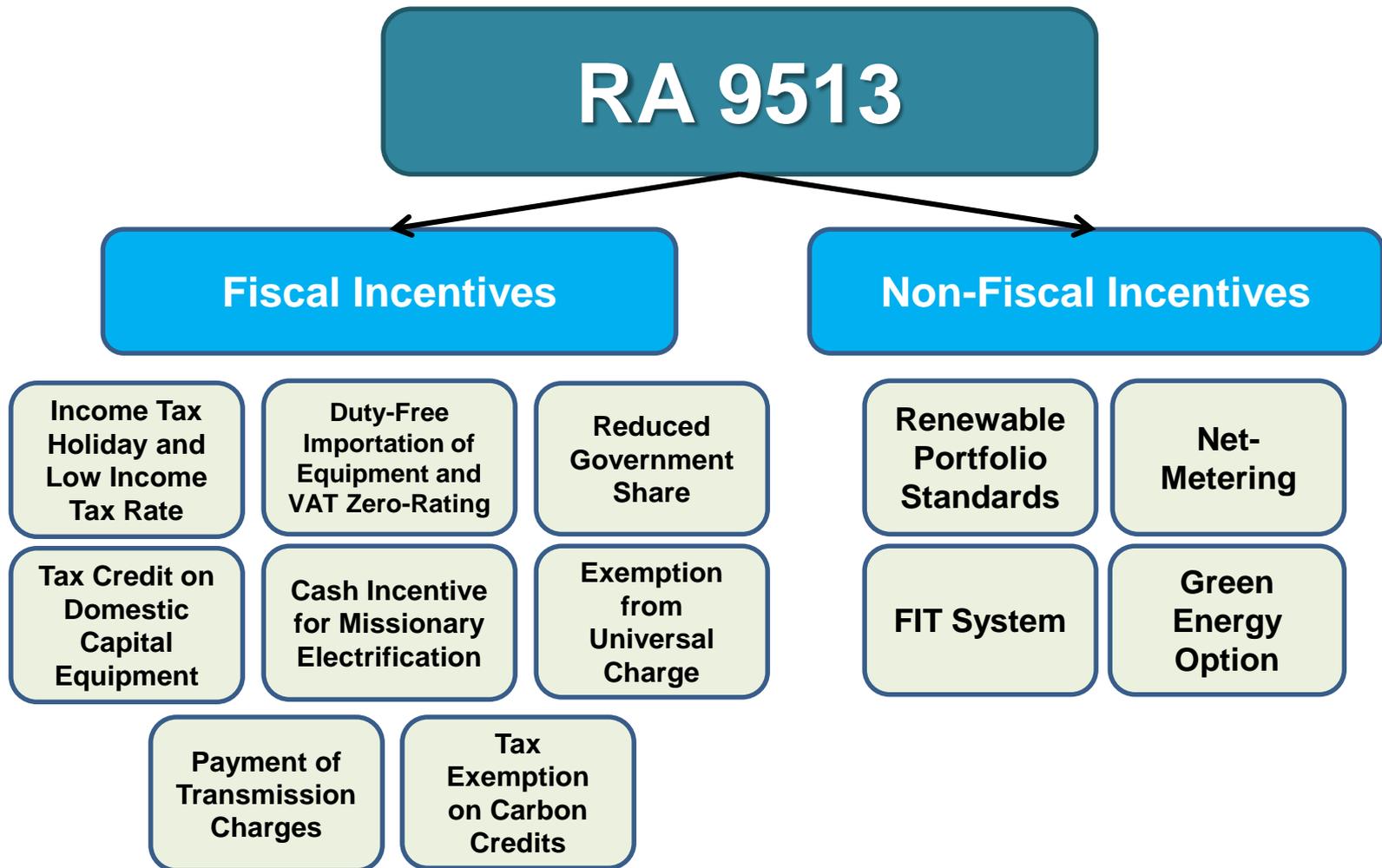
- Revisit blending requirement and available feedstock
- Continuous conduct of research and development on feedstock sources

PURSUE THE DEVELOPMENT OF BIOFUELS IN COMPLIANCE WITH THE
BIOFUELS ACT OF 2006 (R.A. 9367)

RE Development Timelines

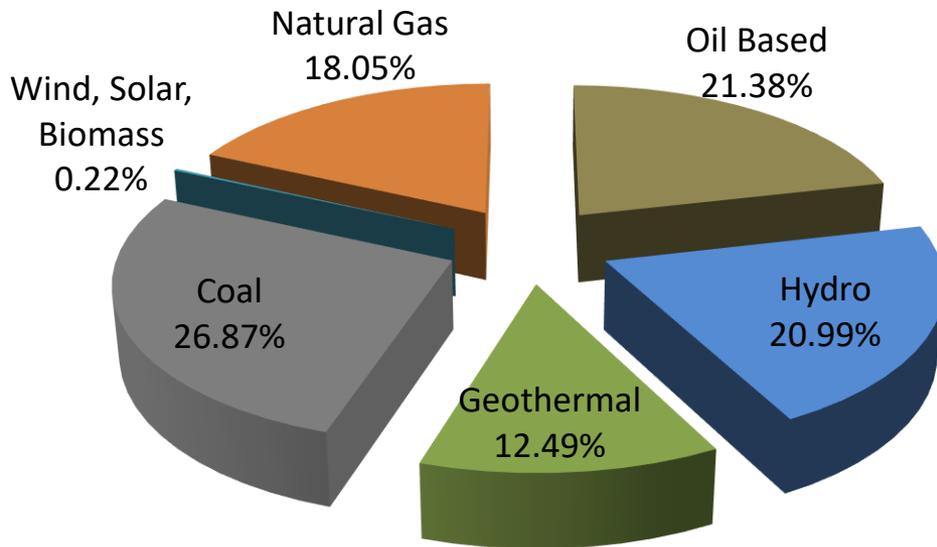


Incentives under the RE Act

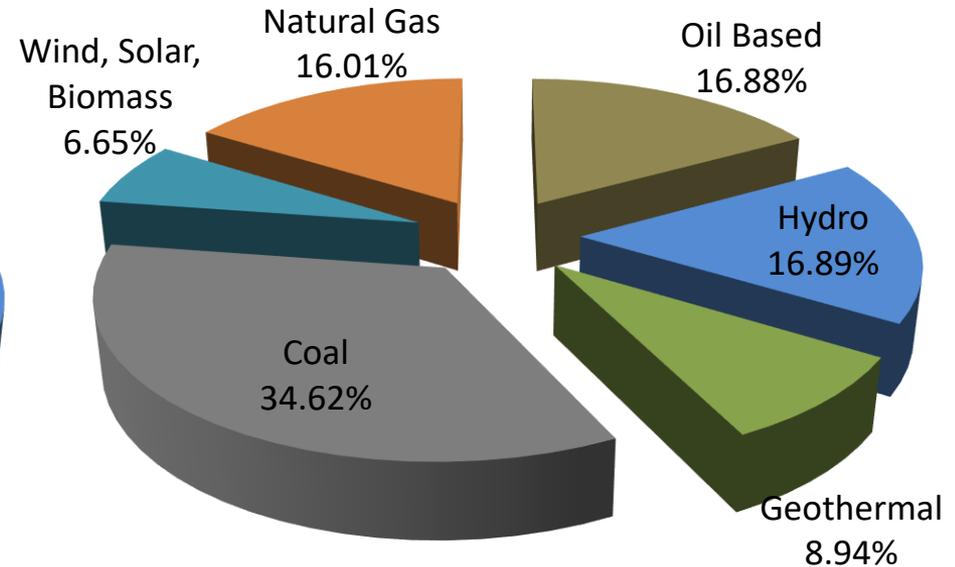


2008 and 2016 Total Installed Capacity Mix (MW)

Before RE Law (2008)



After RE Law (2016)

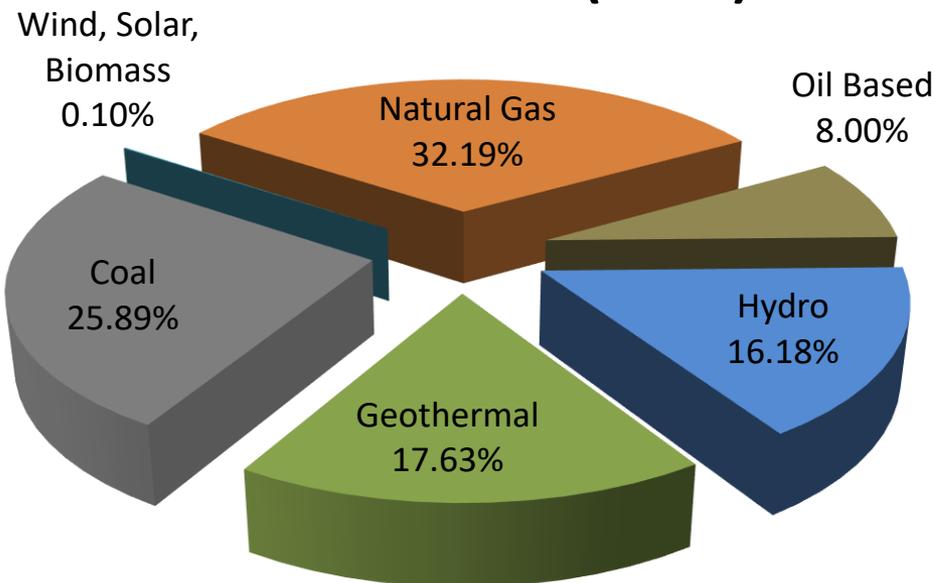


Installed Capacity	2008	2016
Total Installed	15,681MW	21,423MW
Total RE	5,283MW	6,959MW
% RE Share	33.69%	32.48%

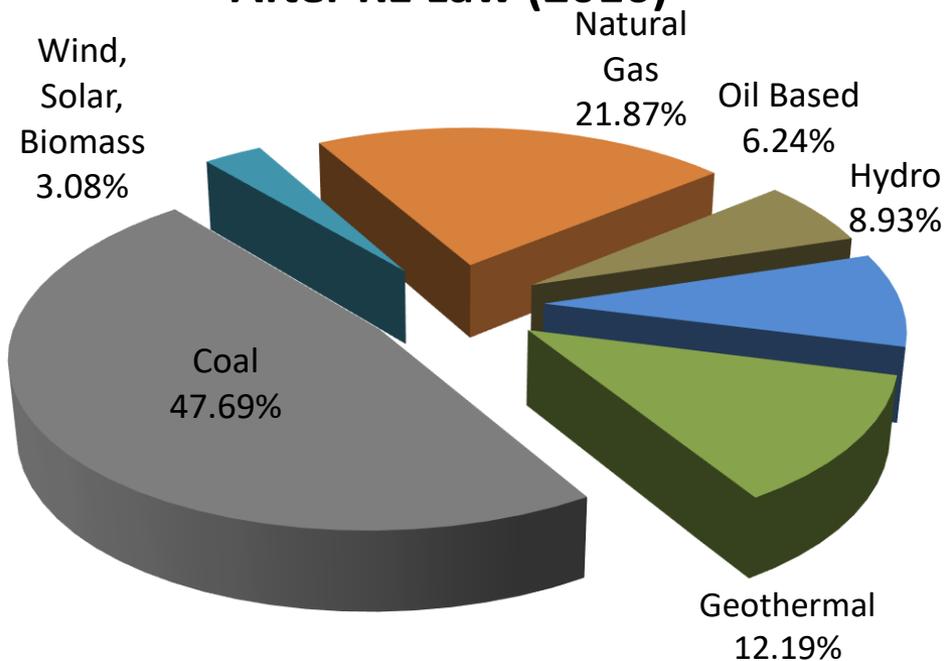


2008 and 2016 Total Installed Generation Mix (GWh)

Before RE Law (2008)



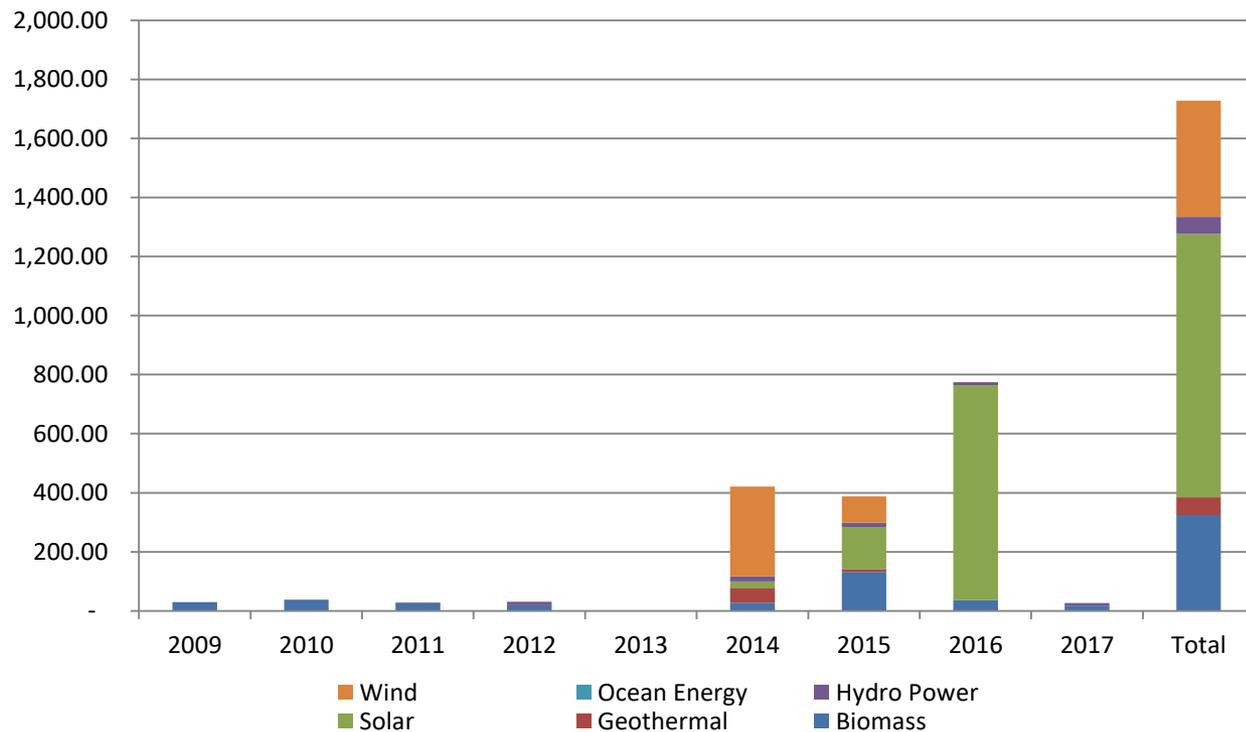
After RE Law (2016)



Generation Mix	2008	2016
Total Generation	60,821GWh	90,798GWh
Total RE	20,628GWh	21,979GWh
% RE Share	33.92%	24.21%



Renewable Energy Additional Capacity Installations under RA 9513



FIT Eligible from RE Capacity Additions (as of Nov. 2017)

RESOURCE	With CERTIFICATE OF ENDORSEMENT to ERC for FIT ELIGIBILITY	
	NO. OF PROJECTS	CAPACITY (MW)
HYDROPOWER	5	34.60
WIND	6	393.90
SOLAR	24	525.95
BIOMASS	19	138.61
OCEAN	-	-
TOTAL	54	1,093.06

Out of the 88 RE projects of the total **Capacity Additions** under RE Law, 54 projects of **1,093.06 MW** installed capacity are **FIT Eligible**



Feed-In-Tariff (FIT) Monitoring Board

As of November 2017

RESOURCE	INSTALLATION TARGET	ERC APPROVED FIT RATES	With CERTIFICATE OF ENDORSEMENT to ERC for FIT ELIGIBILITY		INSTALLATION TARGET BALANCE	POTENTIAL CANDIDATES BY DECEMBER 2017	
	CAPACITY (MW)	(Php/Kwh)	NO. OF PROJECTS	CAPACITY (MW)	CAPACITY (MW)	NO. OF PROJECTS	CAPACITY (MW)
HYDROPOWER	250	5.90 (11.3c)	5	34.60	215.40		-
		5.8705*** (11.25c)		-	-	5	82.70
WIND	200	8.53 (16.36c)	3	249.90	6.10		
	200 *	7.40** (14.19c)	3	144.00			
SOLAR	50	9.68 (18.57c)	7	108.90	-		
	450 *	8.69** (16.67c)	17	417.05			
BIOMASS	250	6.63 (12.71c)	15	125.16	111.39		
		6.5969*** (12.65c)	4	13.45		1	2.60
OCEAN	10	Deferred	-	-	-	-	-
TOTAL	1,400		54	1,093.06	332.89	6	85.30

* - Additional Installation Targets

Exchange rate (3.22.18): \$1 = Php 52.0559

** - FIT rates for the respective additional installation targets

*** - Degressed FIT rates



Feed-In-Tariff System

- Emerging Renewable Energy Resources
 - Wind
 - Solar
 - Ocean
 - Run-of-River Hydro
 - Biomass
- Power generated by FIT-eligible RE Projects may be used as compliance with the Renewable Portfolio Standards (RPS)



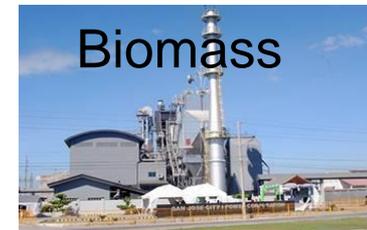
150-MW Burgos WPP
Burgos, Ilocos Norte



132.5 MW SPP: Cadiz City,
Negros Occidental



14 MW HPP: Sabangan,
Mountain Province



12 MW San Jose City Rice
Husk-Fired Biomass
Power Plant Project
(Phase I)



Implementation Updates: RA 9513

Max. Capacity = 100 kW
Situated within the premises of a
qualified end-user

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 July 2017 is 822 with a installed capacity of 6,304.44 kWp



UPDATE ON NET-METERING AS OF 31 July 2017

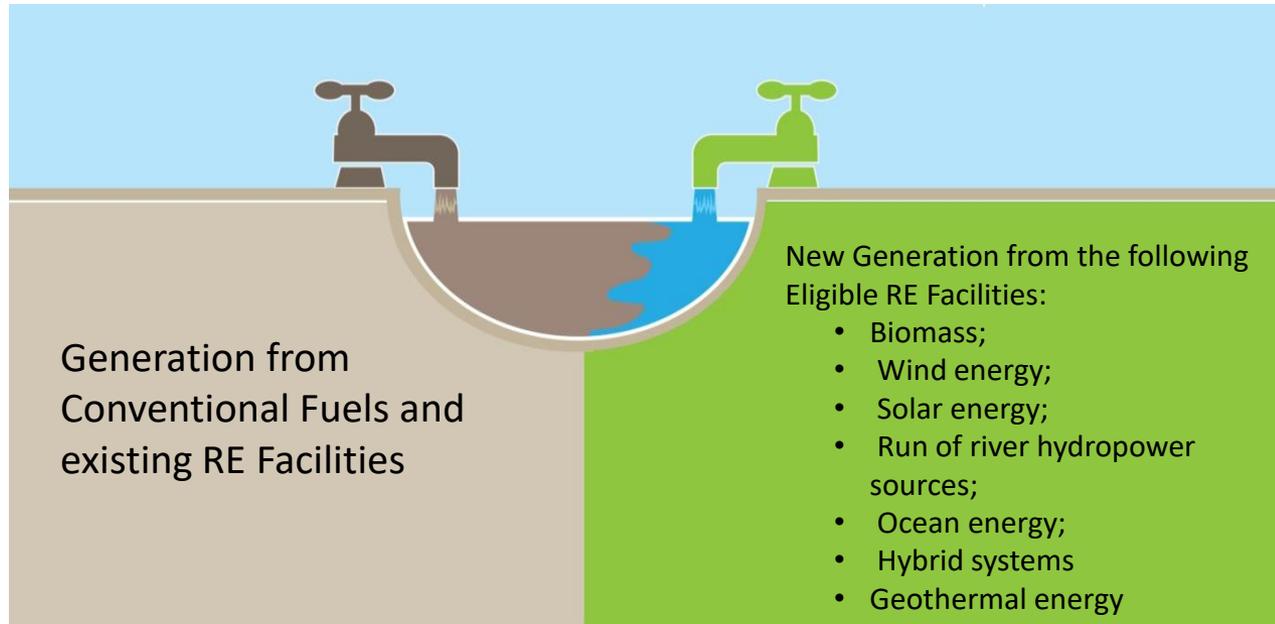
DUs	NO. OF CUSTOMERS	Capacity (kWp)
MERALCO	880	5610.48
VECO	32	193.21
CEBECO III	1	3.00
CEBECO I	5	84.00
DLPC	14	193.20
AEC	9	48.82
BATELEC I	1	10.00
PELCO II	6	39.00
LEYECO V	2	6.00
PANELCO	1	100.00
OEDC	2	16.73
Total	953	6304.44

Colleges/Universities



Renewable Portfolio Standards (RPS)

- ✓ Mandated Renewable Energy electricity blend to the total supply of electricity for on-grid and off-grid areas.

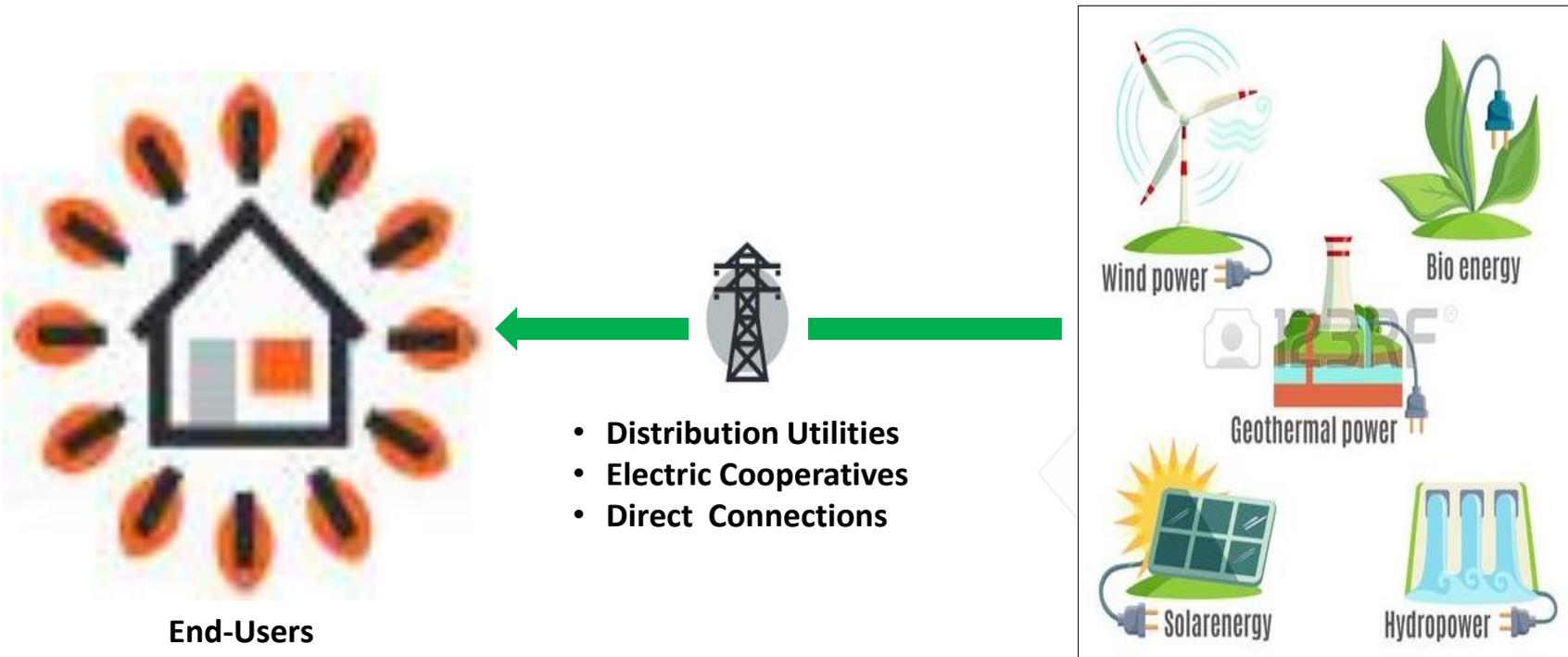


RPS Rules for On-Grid was issued in December 2017 but has to await establishment of REM for full implementation. A separate rules will be issued for Off-grid areas.



Green Energy Option Program

- ✓ A Renewable Energy Policy Mechanism which shall provide end-users the option to choose RE Resources as their source of Energy.



Implementation Updates: RA 9513

ACCREDITED RENEWABLE ENERGY (RE) SUPPLIERS, MANUFACTURERS AND FABRICATORS

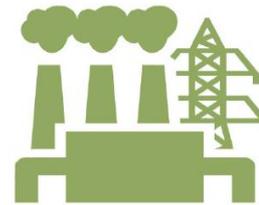


Solar



Wind

= 9



Geothermal

= 4



Biomass

= 1



Hydro

= 1

Term: Three (3) years renewable



Environmental Impact

Year	Capacity Addition (MW)	Emission Reduction (t-CO ₂ /year)	Cumulative Emission Reduction (2009-2015)
2008	3.6	11,600.45	11,600.45
2009	29.33	94,511.48	106,111.93
2010	23	71,876.27	177,988.20
2011	29.1	91,420.71	269,408.91
2012	30.8	86,045.66	355,454.57
2013	1.476	4,085.00	359,539.57
2014	468.65	1,138,632.50	1,498,172.07
2015	361.09	1,163,557.80	2,661,729.87
2016	782.21	2,520,553.18	5,182,283.05
Total	1,729.3	5,182,283.05	5,182,283.05



**5,182,283 tons CO₂
Emission Reduction**

SOCIAL IMPACTS

2009-2017	BIOMASS	SOLAR	WIND	HYDROPOWER	GEOTHERMAL	TOTAL
Additional Capacity	324.75	892.35	393.9	57.37	60.00	
Construction Jobs	13,640	80,312	35,451	3,528	720	133,650
O & M Jobs	1,461	1,606	1,773	413	306	5,559
TOTAL	15,101	81,918	37,224	3,941	1,026	139,209

**139,209 Green Jobs
Generated (2009-2017)**



Challenges and Way Forward

- Awareness and social acceptance
- Streamlining of Administrative Process
- Full implementation of Policy Mechanisms under the RE Law
- Harmonization of laws/policies
- Renewable Energy development hindered by geographical boundaries



RE Resource Assessment

Hydropower Potential Sites- JICA resource inventory result (concluded)

USAID Biomass Resource Inventory Result (concluded)

NREL Detailed Wind Resource Assessment Project (concluded, 2015)

IRENA – published RRA and Mini Grid Study (2017)

Support Climate Change Commission Project with GIZ – On-going

Detailed resource assessment of selected Low Enthalpy Geothermal Areas - On-going

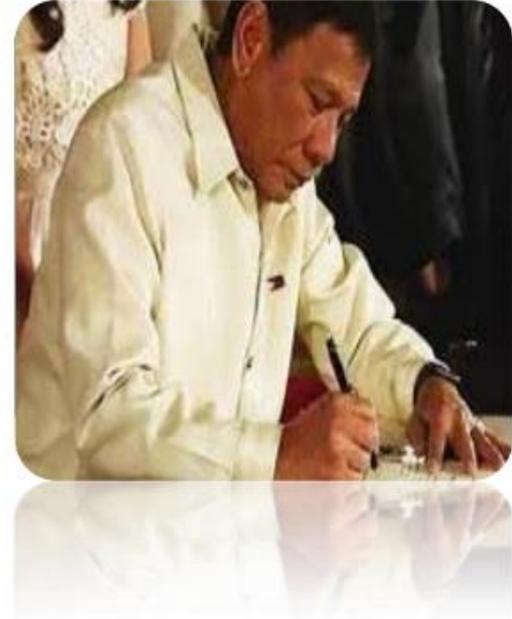
ONGOING

- **Development for Renewable Energy Applications Mainstreaming and Market Sustainability (DREAMS) with UNDP**
- **Enabling Distributed Solar in the Philippines- NAMA Facility Fund/CCAP**
- **RE Zoning (Greening the Grid) with USAID**



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)
 - Capital Investment of at least PhP 3.5 Billion
 - Contribution to the country's economic development
 - Consequential economic impact
 - Potential contribution to the country's balance of payments
 - Impact on the environment
 - Complex technical processes and engineering designs
 - Infrastructure requirements



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



March 2018 – Forged agreement with Philippine Institute of Volcanology and Seismology (PHIVOLS) on Energy Resiliency



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Thank you!

Philippines Renewable Energy Development

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