



RENEWABLE ENERGY DEVELOPMENT IN THE PHILIPPINES

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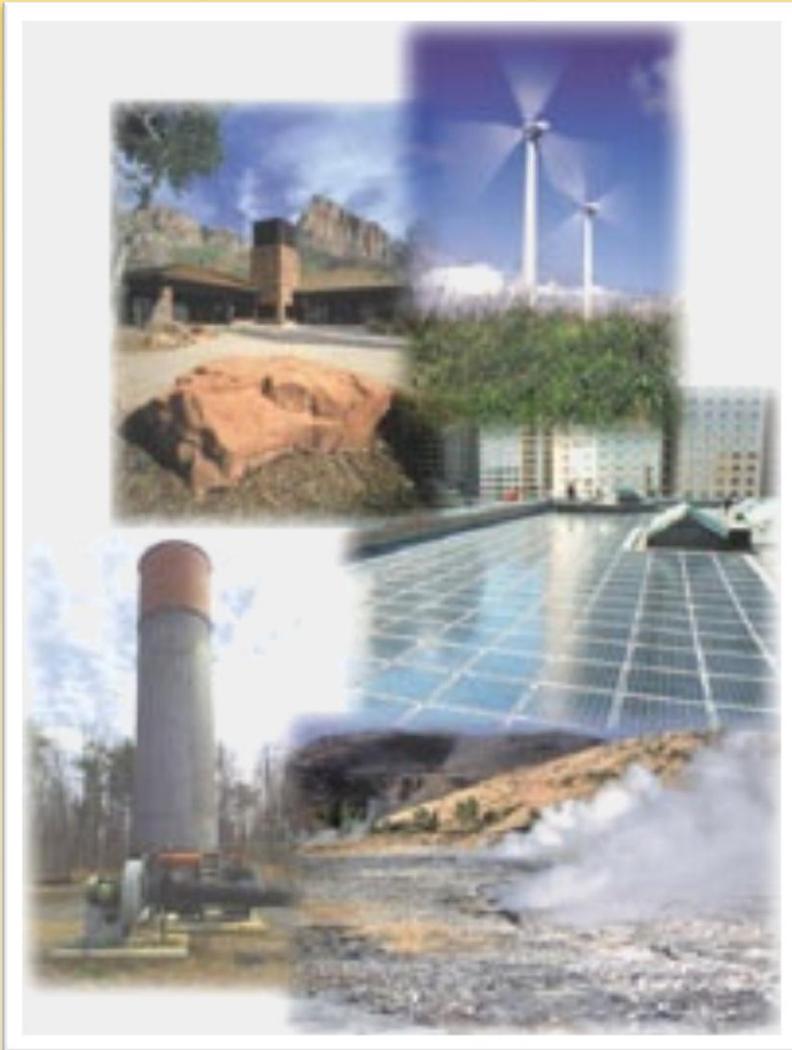
Outline of Presentation



- I. Government Policy – National Renewable Energy Program
- II. Status of Renewable Energy Development
 - Renewable Energy Policy Updates
 - Where are we now
 - Renewable Energy Projects
- III. Challenges
- IV. Way Forward



Renewable Energy



- # **B**iomass / **B**iofuels
- # **G**eothermal
- # **S**olar Power
- # **H**ydropower
- # **O**cean
- # **W**ind Power



National Renewable Energy Program

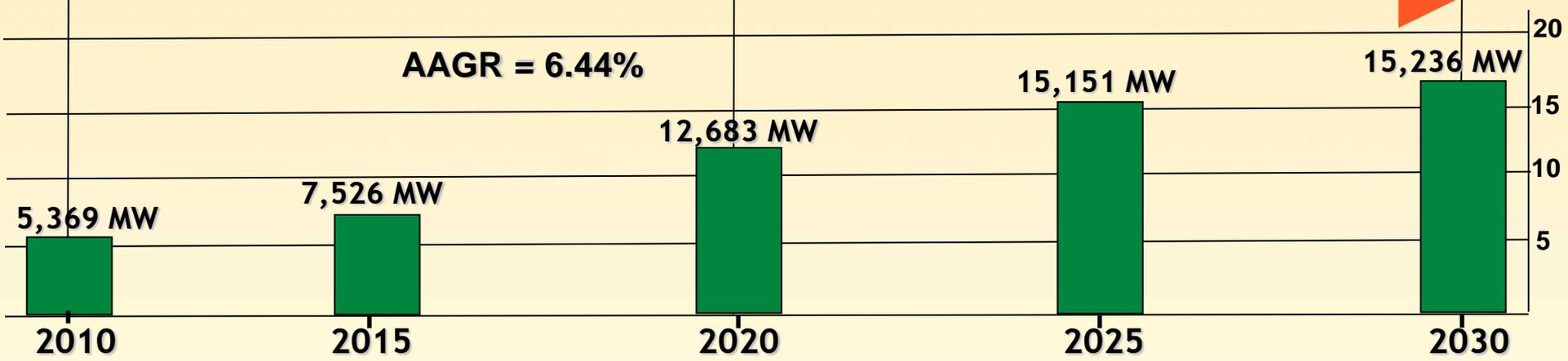
- **Increase RE-based capacity by 200% within the next 20 years (2011-2030)**
- **Increase non-power contribution of RE to the energy mix by 10 MMBFOE in the next ten years**
 - Be the number one geothermal energy producer in the world (additional 1,495 MW)
 - Be the number one wind energy producer in Southeast Asia (up to 2,500 MW)
 - Double hydro capacity (additional 5,400 MW)
 - Expand contribution of:
 - ✓ biomass - 265 MW
 - ✓ solar - at least 280 MW
 - ✓ ocean energy – at least 10 MW

National Renewable Energy Program 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



Note: The National Renewable Energy Program (NREP) is a live document and will be subjected to public consultations. Figures presented may change based on regular updates of the NREP.

Source: Philippine Department of Energy/NREP



1. Feed-in-Tariff (FIT)

- Priority connection to the grid
 - Priority purchase and transmission of and payment for by grid system operators
 - Fixed tariff for 12 years
 - To be applied for generation utilized in complying with RPS
- ✓ The FIT Rules was promulgated on August 12, 2010.
 - ✓ The ERC approved the FIT Rates on July 27, 2012.
 - ✓ FIT Allowance - FIT-ALL Payment and Collection Guidelines
 - The ERC Approved the Guidelines on December 2013
 - ✓ Amendment of DOE's installation target
 - The DOE issued a Certification to amend installation targets of Solar and Wind Energy Generation (50mw to 500mw for solar, 200 MW to 400 MW for wind)



Feed-In Tariff (FIT) Rates



Resource	ERC-Approved FIT Rates		Installation Targets (MW)
	PhP/Kwh	US\$/Kwh	
Run-of-River Hydropower	5.90	0.13	250
Biomass	6.63	0.15	250
Wind	8.53	0.19	400*
Solar	9.68** (8.69)	0.22	500*
Ocean	deferred		10

* Amended solar energy installation target from 50 MW to 500 MW and 200 MW to 400 MW for Wind

** Php 9.68 is effective until March 15, 2015, while new rate Php 8.69 was approved by ERC effective until March 15, 2016

2. Renewable Portfolio Standard (RPS)

Mandatory (percentage) utilization of RE generation system in on-grid systems



3. Net-Metering Rules and Interconnection Standards

Connection / sale of customers' RE generation to the grid

- ✓ Net Metering Rules approved on May 27, 2013
- ✓ Nationwide IEC for LGUs, DUs, consumers

4. Renewable Portfolio Standards (RPS) for Missionary Areas

Mandated minimum percentage of RE generation

5. Green Energy Option Program

End-users' option to purchase electricity from RE facilities (open access)

RE Projects under RE Law (As of March 2015)

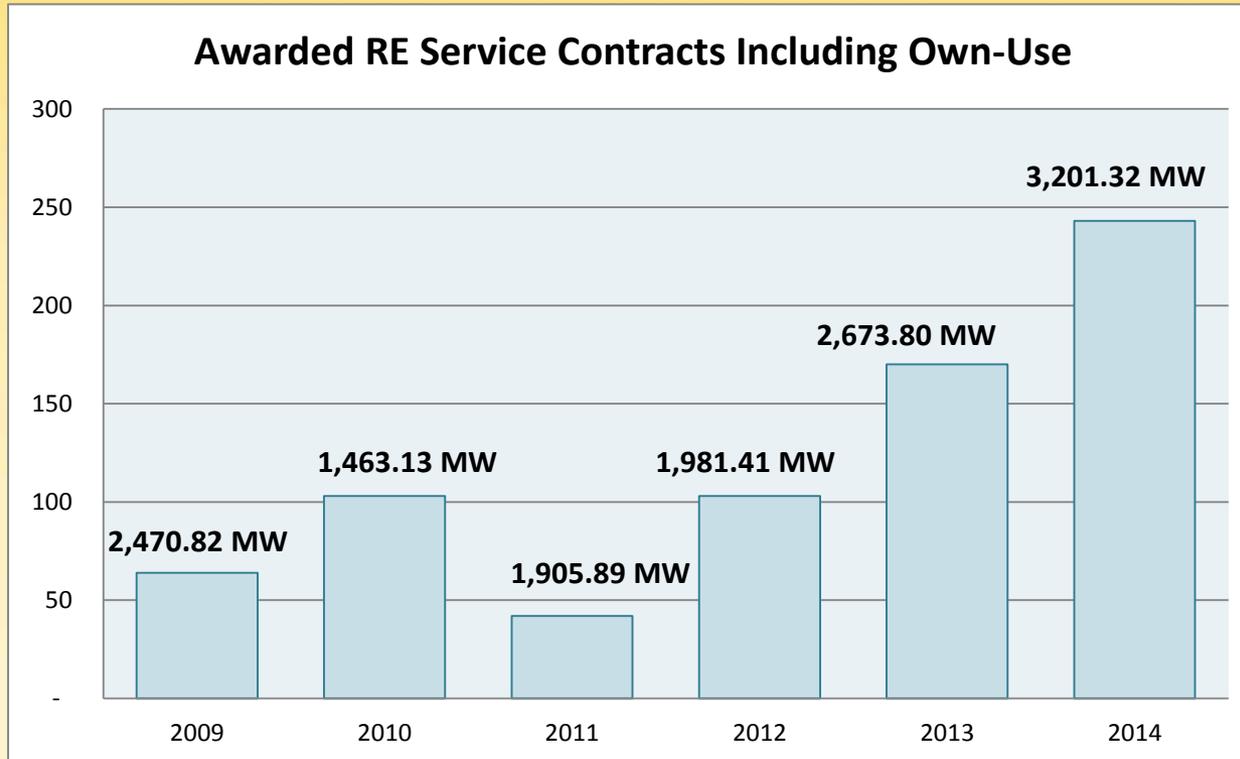


RESOURCES	AWARDED PROJECTS		POTENTIAL CAPACITY (MW)		INSTALLED CAPACITY (MW)	
	GRID-USE	OWN-USE	GRID-USE	OWN-USE	GRID-USE	OWN-USE
Hydropower	402	1	6,627.20	1.50	122.73	-
Ocean Energy	6	-	31.00	-	-	-
Geothermal	41	-	750.00	-	1,896.19	-
Wind	50	1	1,222.00	0.006	336.19	-
Solar	70	11	1,630.13	3.580	77.40	-
Biomass	44	22	361.00	5.80	175.80	143.18
Sub-Total	613	35	10,621.33	10.886	2,609.02	143.18
Total	648		10,632.22		2,752.20	

BIOFUELS REGISTRATION / ACCREDITATION

RESOURCES	No. of Companies	No. of Projects
Bioethanol	10	10
Biodiesel	11	11
Total	21	21

RE Projects Awarded by Year



Year	2009	2010	2011	2012	2013	2014
No. of RESCs	64	103	42	103	170	243
Capacity (MW)	2,470.82	1,463.13	1,905.89	1,981.41	2,673.80	3,201.32

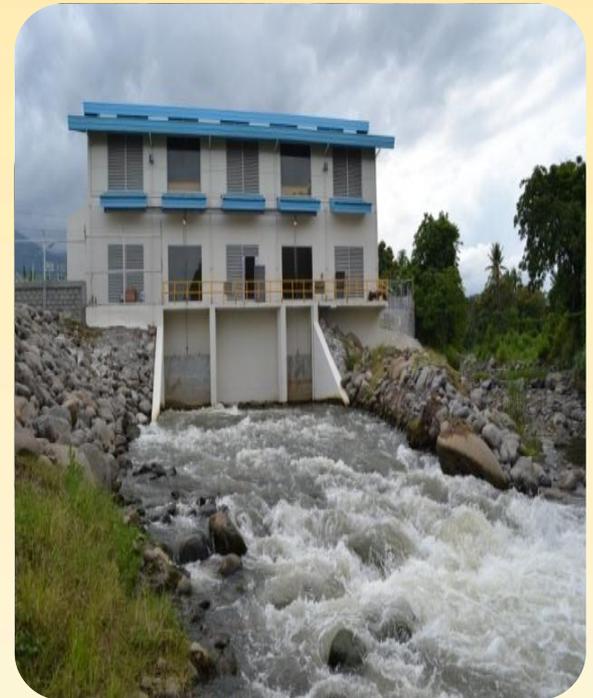
Total Renewable Energy Projects awarded as of Dec. 2014 is 725



Completion and Commissioning of Renewable Facilities

Hydropower

- 45 kW Lateral – B Hydroelectric Power Plant (San Mateo, Isabela)
- 7 MW Tudaya 2 Hydroelectric Power Plant
- 6.6 MW Tudaya 1 Hydroelectric Power Plant
- 3 MW Linao-Cawayan Upper Cascade Hydroelectric Power Plant
- 8 MW Villasiga Hydroelectric Power Plant



7 MW Tudaya 2 Hydroelectric Power Plant



Major Accomplishment



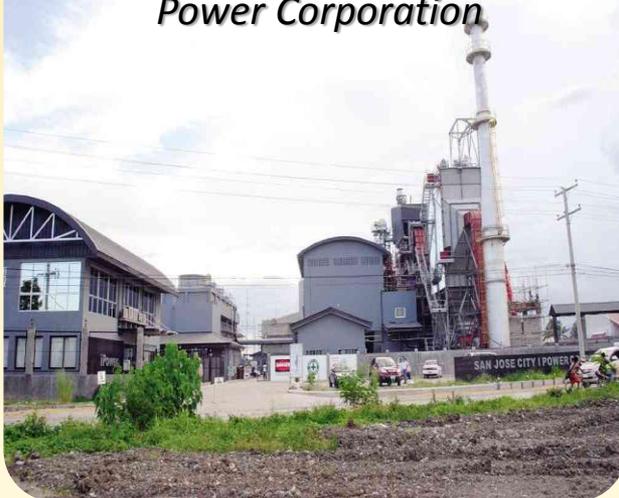
Geothermal

- 20 MW Maibarara Geothermal Power Plant
- 30 MW Southern Negros Geothermal Production Field (Nasulo Project)



20 MW Maibarara Geothermal Power Plant

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



Biomass

- 12 MW (Phase 1) San Jose City I Power Corporation
- 16 MW (Phase 1) Universal Robina Corporation
- 8 MW Victorias Milling Company Incorporated
- 4 MW Hawaiian-Philippine Company
- 3 MW Philippine Trade Center, Inc.



Major Accomplishment



Wind

- 18.9 MW (Phase 3) Bangui Wind Power Project
- 150 MW Burgos Wind Power Project
- 81 MW Pagudpud (Caparispisan) Wind Power Project
- 54 MW San Lorenzo Wind Power Project (Guimaras)



Solar

- 22 MW San Carlos Solar Power (SACASOL)
- 325 kWp Solar PV Facilities for Own-Use by Private Academic Institutions (PAIs)



Major Accomplishment



■ Accredited Biofuel Manufacturers

➤ **BIOETHANOL – 89.12 Million Liters/Year**

- Balayan Distillery, Inc. (30 Million Liters / Year)
- Far East Alcohol Corporation (15 Million Liters / Year)
- Kooll Company, Incorporated (14.12 Million Liters / Year)
- Universal Robina Corporation (30 Million Liters / Year)

➤ **BIODIESEL – 98 Million Liters/Year**

- Econergy Corporation (30 Million Liters / Year)
- Phil Biochem Products, Inc. (68 Million Liters / Year)



Major Accomplishment



- Energized 6,978 HH with total installed capacity of 209.3 kWp through Household Electrification Program (HEP)

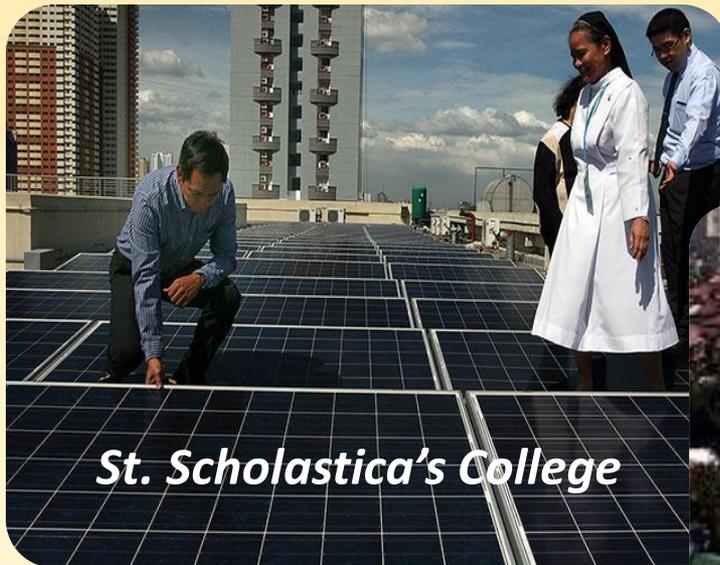




Major Accomplishment



- Installation of 775.78 KWp under Net-Metering Program (as of Dec. 2014)



St. Scholastica's College



Manuel L. Quezon University

RE Installed Capacities



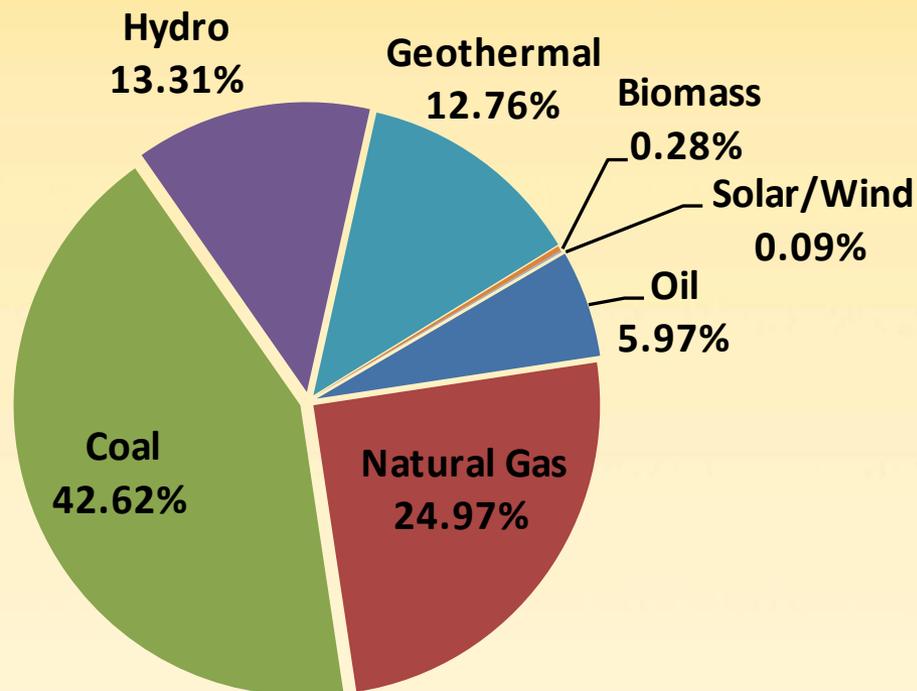
RESOURCES	INSTALLED CAPACITY (MW)					
	2009	2010	2011	2012	2013	2014
Geothermal	1,953	1,966	1,783	1,848	1,868	1,918
Hydro	3,291	3,400	3,491	3,521	3,521	3,543
Wind	33	33	33	33	33	283
Solar	1	1	1	1	1	1
Biomass	30	39	83	119	119	131
Total	5,309	5,439	5,391	5,522	5,542	5,875

Power Generation Mix



2013

RESOURCES	GWh	%Share
Oil	4,490.60	5.97
Natural Gas	18,791.29	24.97
Coal	32,081.01	42.62
Hydro	10,019.31	13.31
Geothermal	9,604.60	12.76
Biomass	211.97	0.28
Solar /Wind	67.07	0.09
Total	75,265.84	100.00



Renewable Energy : 26.44 %

Energy Virtual One Shared System (EVOSS)



WHAT

- Monitor the application status of energy projects nationwide (Endorsement, Permit, Service Contract, etc.)

- Process flow in setting-up & operating an energy project

- Download the necessary forms

- Establish a database

- Institutionalize operation of the EVOSS



HOW

- Design an inter-agency monitoring system with notification features for both investors/proponents and agencies on the status of the application thru email/SMS

- Examine existing procedures of each agency
- Validate no. of days
- Identify procedures that could be streamlined

- Examine data requirements of each agency
- Harmonize FORMS

- Company profile, project profile, endorsements issued, reports submitted, updates, etc.

- Signing of Memorandum of Agreement to:
 - Establish a Steering Committee & Technical Working Group



- Awareness and social acceptance
 - Streamlining of Administrative Process
 - Environment and socio-cultural concerns
 - Full implementation of Policy
- Mechanisms under the RE Law



Full implementation of the Renewable Energy Act

- *Finalization / Approval of Guidelines on other RE Policy Mechanisms (Renewable Portfolio Standard (RPS), Green Energy Option, etc.)*
- *Establish Energy Investment Coordinating Center and Linkages with other Government Regulatory Agencies*
- *Resource Inventory and Establishment of RE Database*
- *Capacity Building / Information, Education and Communication Campaigns*
- *More Investment Missions / Business Meetings*





Thank You...



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