



The World Bank



Renewable Energy Market Transformation Initiative (REMTI):

Support to the Philippines Renewable Market Development

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- 1. ESMAP and REMTI**
- 2. Philippine Government Energy Strategy and the Role of Renewables**
- 3. ESMAP Support for the Philippine Renewable Energy Market Development**

Section 1. ESMAP and REMTI

ESMAP: A Global TA Program funded by donors and administered by the World Bank to provide energy solutions to developing countries

The Renewable Energy Market Transformation Initiative (REMTI) assists client countries diversify their energy supply mix and scale up deployment of renewable energy

Conduct Country-specific "Market Transformation Strategies" to Scale-Up Deployment of grid-tied renewable energy systems.

Road Maps to accelerate utilization of renewable energy resources (CSP, geothermal, wind, hydro) for grid-tied power supply.

Engagement Areas

Market Development Support Mechanisms to facilitate grid-tied deployment of RE technologies for power generation by low-income client countries.

Knowledge exchange on global best practices through Policy Notes, workshops & learning events, best practice case studies, and other external partnerships.

Section 2. Philippine Government Energy Strategy and Role of Renewables

Three regions with three distinct characteristics

Luzon

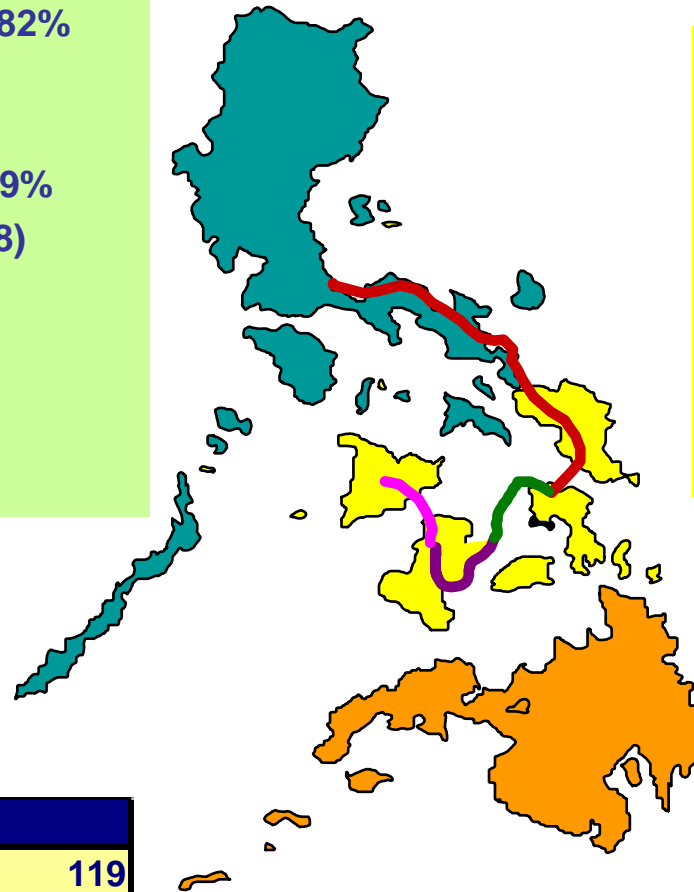
- Household electrification: 82%
- Per capita GDP: P14,670
- Poverty rate: 30.2%
- Share of PH economy: 65.9%
- Generation mix (GWh, 2008)
 - Hydro 12%
 - Geothermal 8%
 - Gas 44%
 - Coal 31%
 - Oil 4%
 - Wind 0.1%

Visayas

- Household electrification: 72%
- Per capita GDP: P11,281
- Poverty rate: 41.8%
- Share of PH economy: 16.5%
- Generation mix (GWh, 2008)
 - Geothermal 72%
 - Coal 9%
 - Oil 19%

Mindanao

- Household electrification: 59%
- Per capita GDP: P10,383
- Poverty rate: 49.9%
- Share of PH economy: 17.6%
- Generation mix (GWh, 2008)
 - Hydro 55%
 - Geothermal 10%
 - Coal 19%
 - Oil 16%

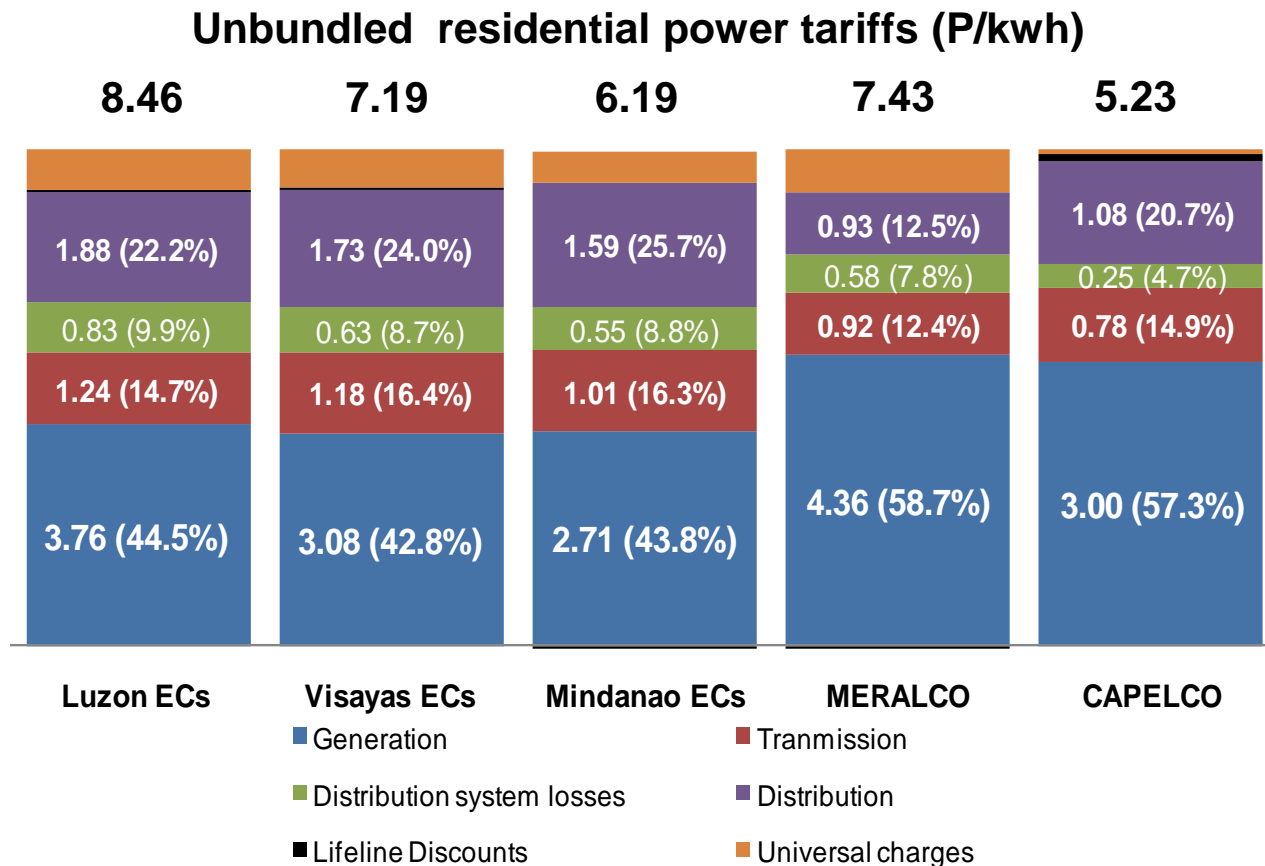


Distribution Utilities

Electric Cooperatives	119
Private Dist. Utilities	18
LGUs	2

Generation cost drives tariffs

- ❑ Generation costs represent around 43.8% of regulated electricity tariffs of Electric Cooperatives (ECs)
- ❑ In private distribution utilities (DUs), generation costs also represent the biggest share, e.g. CAPELCO in Mindanao and MERALCO in Luzon, generation costs make up 57 to 59% of the tariff



Note: Luzon,

Philippines Energy Development Plan: Framework and Funding

Building on successful policies in the past which have led to development of geothermal (1,958 MW) and hydro (around 3,300 MW)

- **Philippine Energy Plan**

- ❑ Attaining 60% **energy self-sufficiency** beyond 2010,
- ❑ Promoting a **competitive energy sector**: Power Sector Reform

- **Renewable Energy Act of 2008**

- ❑ Legal and policy framework for new renewable, and new institutions: the National Renewable Energy Board (NREB) and Renewable Energy Management Bureau (REMB)
- ❑ Broad menu of support mechanisms
- ❑ Priority connection and dispatch for new renewable generation
- ❑ Tax holidays and exemptions

- **Clean Technology Fund (CTF) \$250 million allocation**

- ❑ Concessional cofinancing, targets renewables, energy efficiency and implementation of environmentally sustainable transport strategy
- ❑ The World Bank is preparing an IBRD-CTF project, to support renewable investment and improving efficiency in distribution (electricity cooperatives)

Section 3. ESMAP Support to the Philippines Renewable Market Development

ESMAP Support: Rationale and Objectives

Rationale: Sustain and increase the development of RE resources in the Philippine power sector

- ❑ Support the country institutions in the implementation of the Renewable Act on critical policy and regulatory areas (regulations, grid integration, targets)
- ❑ Benefit from relevant international experiences and emerging new practices

Objectives

- ❑ Transform the Government goals and policies into an efficient and sustainable development of the renewable market
- ❑ Support the development of effective good practice regulations tailored to Philippines power sector structure and market reform, and at the same time manage system reliable supply and the impact on tariffs
- ❑ Capacity Building, dissemination and knowledge sharing

Multi-year Support (FY 10–11):

- ❑ First year (FY10) -- Support for feed-in tariff rules, capacity building and broad assessment of transmission
- ❑ Building on results and findings, activities for FY11 were tailored to scale up impact and transformation

Design of REMTI Program for the Philippines

Assessment of the Renewable Market

Philippine Context

Adapting power sector reform, regulations and operational practices to scaling up renewables agenda

Mainstreaming of Renewable Energy

Elements

- Capacity Building
- Incentives Mechanisms
- Transmission expansion planning/Connection and integration of RE

Impact Assessment

Scenario Building

- Cost evaluation of scenarios of RE development
- Modeling consumer tariff impacts

Design of REMTI Program for the Philippines (1/2)

▪ Successful Mainstreaming of Renewable Energy

❑ Capacity Building:

- ❑ Expert meetings with working groups
- ❑ Knowledge sharing on international experiences and emerging thinking on renewable scale-up, stakeholders workshops

❑ Incentives mechanisms: Feed-in Tariffs rules (FIT) (FY10)

- ❑ International consultants support to ERC on rules covering principles and procedures to (i) set FITs per RE technology; (ii) transfer incremental costs to end consumers tariffs, (iii) collection from DUs/ECs and (iv) payment to renewable developers

❑ Transmission expansion planning/Connection and integration of renewable

- ❑ International experiences, new practices
- ❑ Assessment of connection costs
 - Working in coordination with Transmission Company
- ❑ Transmission and distribution network regulation for renewables: planning, connection and pricing (FY11)

▪ Measuring the Impact of Renewable Penetration

❑ Scenarios of RE development

- ❑ Application of RETScreen tool to evaluate cost of renewable technologies

❑ Consumer Impacts

- ❑ Modeling and assessing tariff impact

❑ Assessment of back up reserve for reliability

Design of REMTI Program for the Philippines (2/2)

- **Electricity Transmission: An enabler for Renewable Development**
 - ❑ Transmission activity is recognized as a major enabler to achieve RE targets and competitive pricing / energy markets.

- **Main Findings and Challenges**
 - ❑ **RE generation is site-constrained**, more often than not far from demand load centers and existing network/grid infrastructure
 - ❑ Introducing **proactive planning practices** and associated regulatory mechanisms allows transmission systems to reliably keep up with demand, while simultaneously broadening markets and connecting and integrating renewable generation
 - ❑ Different to conventional power generation projects, building a (distant) RE power plant can take less time than building the interconnection line. Therefore, **timely planning** becomes more important
 - ❑ **Archipelago geography**: Planning / expansion issues among different regional grids/islands
 - ❑ **Minimizing costs**: New emerging practices to develop transmission “renewable corridors” to connect renewable-rich sites.

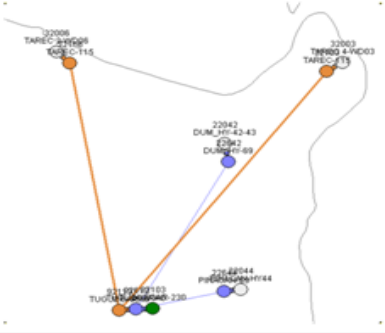
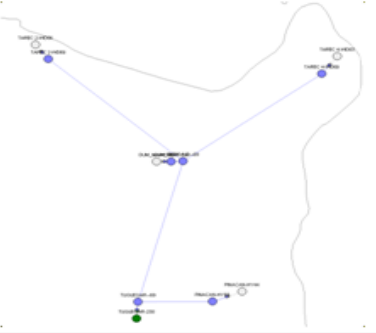
Thank you!

(WWW.ESMAP.ORG)

Annex

Transmission: Minimizing RE connection costs in Philippines

Impact in Cost Savings: Comparison and impact in tariffs of connecting upon request (reactive approach) and proactive approach building lines to link RE rich zones

Item		Reactive approach	Proactive approach
Schematic network diagram			
NPV, Total (CAPEX+OPEX) [kU\$]	TAREC 2	23,671	22,128
	TAREC 4	16,898	9,684
	DUMMON	7,964	1,831
	PINACAN	7,692	5,546
	ALL PROJECTS	56,225	39,189
IRR [% p.a.]	TAREC 2	6.1	6.3
	TAREC 4	2.6	5.5
	DUMMON	1.2	4.7
	PINACAN	3.4	4.1

- Link to Tuguegarao area in Luzon with potential 21 RE projects, out of more than 200 RE projects (wind, hydro, biomass, and others) that requested services contracts

Cost allocation impact in projects

Renewable Energy project	Technology	Installed capacity [MW]	IRR[% p.a.], proactive approach	
			100% CAPEX to generators	50% CAPEX to generators
TAREC 2	Wind	45	6.3	8.1
TAREC 4	Wind	12	5.5	8.1
DUMMON	Small hydro	4	4.7	5.4
PINACAN-HY44	Small hydro	8	4.1	5.1

Transmission price (\$/MWh)

Reactive	Proactive
23.7	20.9
66.5	36.3
56.5	12.1
27.0	19.3
33.8	22.3

Developing Renewables: Restructured Power Sector and Privatization

- **Power Sector Reform (EPIRA):** Unbundling of electricity activities (multiple sellers and many, mostly small, buyers), privatization, independent regulator, phase out cross subsidies, universal charges (UC) to recover rural electrification, etc.
- Each DU/EC has different power purchase costs transferred to end consumers tariffs
- **Investments in RE will rely strongly on the private sector.**
- New renewable energy, will be paid **feed in tariffs (FIT)**, except for geothermal
- **Key challenges: archipelago characteristics (grid expansion), and impact on tariffs**

