

# ORIENTAL MINDORO POWER DEVELOPMENT PROGRAM



*Presented by:*  
**HON. RODOLFO G. VALENCIA**  
Chairman, Oriental Mindoro Investment

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# **I. POWER PROBLEM IN THE PHILIPPINES**

A photograph of a white wind turbine standing in a green field with mountains in the background under a cloudy sky. The image is partially obscured by a red vertical bar on the left and a dark blue horizontal bar at the top.

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## A. The Mindanao Power Crisis.

- Higher Electricity Cost or No Electricity.
- Power Supply deficit up to 270 MW
- Earliest to set up new power plant, 2014.
- Problem could have been prevented if gov't decided to invest in RENEWABLE ENERGY – Sen. Angara.



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## B. Power Outage in Visayas.

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SATURDAY, MAY 19, 2012

ACROSS THE NATION

**INQUIRER** *Visayas*

E-mail: [pr\\_inquirer@inquirer.com](mailto:pr_inquirer@inquirer.com)  
Website: [www.inquirer.net/visayas](http://www.inquirer.net/visayas)

Editor: Jun Bantayan  
Bureau Chief: Connie E. Fernandez

# Millions lost in Iloilo City blackouts

By Nestor P. Burgos Jr.  
Iloilo City

**I**T TOOK only three days for an air-conditioning unit that Carlos Castells, a manager of a travel agency, bought for his 17-year-old office in Iloilo City, to break down when a citywide blackout occurred on May 2.

The intermittent power disruption, lasting from seven to 19 hours, also damaged taxi computer units, sending sales transactions of the Internet-dependent Amiga Travel and Tours Corp. in limbo.

Castells said he never realized that he would have to use a 3.3-kilowatt generator set, which the agency acquired three years ago in the midst of brownouts occurring almost daily.

He said he had thought that the power supply, especially in the city's business district, would stabilize when a 164-megawatt coal-fired power plant began operating in the

**PANAY Energy Development Corp.** has assured consumers of a stable power supply to Iloilo City through its 164-megawatt coal-fired power plant in La Paz District. The city, however, continues to suffer brownouts due to power distribution problems of Panay Electric Co.

(Peco), the lone power distributor.

Peco has been operating since 1923, servicing 53,000 households, commercial establishments and offices.

Consumers, however, have been criticizing the company for inefficiency, poor service

Mahlig wants Congress to review the franchise of Peco and open power distribution to other players so as to improve service as a time investments and development projects are increasing in the city.

Peco is owned by the Cadu family (70 percent) and the

blong. "We understand and know fully well the inconvenience and setbacks suffered by the citizens and businesses of Iloilo City as a result of the incident," Cadu said.

Roddy Pastilero, Peco vice president for operations, said the blackout was triggered by a "relay coordination" problem in the interconnection line between its network and that of its supplier, PEDC and Panay Power Corp (PPC), which are both subsidiaries of Global Business Power Corp.

A "flash-over" or mini-explosion in one of its five substations affected the whole network because automatic safety measures that cut off supply to all substations were triggered, Pastilero said. Efforts to solve the problem resulted in the total blackout, he added.

He also stressed the need to coordinate the activation of the safety measures between Peco and PEDC-PPC to ensure that malfunctions would be localized and isolated.

Nilo Madrid, PEDC plant manager, said the company's system automatically shuts off its supply to Peco when the latter's system malfunctions to

have declared that power supply is stable. Demand is at a maximum of 830 MW during peak hours, especially around 2 p.m. PEDC's coal-fired plant supplies 65 MW to the city while PPC diesel plant covers for a maximum of 15 MW.

Pastilero said PPC supplies more electricity when needed. PEDC coal will provide additional 3 MW, which was over the city's energy needs until 2014 even with additional investments, Madrid said.

Pastilero said it was under contract for a discretionary review of the company's franchise. Six years have lapsed, he said.

### P240-M upgrade

He said the company had started implementing a P240-mill development and upgrading program that would be completed in the next four years.

The program includes procurement of additional and more advanced equipment and facilities.

Under the Electric Power Industry Reform Act, power transmission and distribution "natural monopolies" with no one franchise, given in a particular area, Pastilero said. P



## C. The LUZON Power Crisis NEXT

# Brownouts Loom

## Meralco: Luzon Grid Reserves 'Thin'

By ELLSON A. QUISHORISO

Saying the Luzon power is experiencing "deficiency" in supply, the Manila Electric Company (Meralco) yesterday warned its customers in Metro Manila and nearby provinces of possible rotating brownouts in the coming days.

Dina Lomotan, Meralco's corporate communications manager, said the company has received an advisory from the National Grid Corporation of the Philippines (NGCP) that it has raised the "yellow alert" for the grid.

The NGCP spokesperson, Cynthia Alabanza, said the Luzon grid went on yellow alert on Thursday. "This means that while power plants in the Luzon grid can still meet the demand of consumers, our power reserve is quite thin," Alabanza explained.

She said the reserve had hit 300 megawatts, half of the ideal 647 megawatts.

The Power Situation Outlook posted on the NGCP's website on (Turn to page 4)

### Brownouts...

(Cont'd from page 3)

Friday left blank the system capacity, system peak and reserve levels for the Luzon grid.

Figures on the website are usually updated daily.

Lomotan said it would be best for Meralco customers to start conserving electricity at home or at commercial establishments.

"We should still save electricity since we're on yellow alert. We have a low reserve. Hopefully no power plant will go offline, or else the reserve will get wiped out," she said.

Meralco had apparently scheduled brownouts in Cavite (Kawit, Imus) and Metro Manila (Caloocan, Las Piñas, Pasig, Tondo, Balintawak, Kuning, Kalipunan) from 10 to 11 a.m. and 1 to 2 p.m. on today.

The morning brownouts did not push through, because the demand was low.

"There was a reduction in system demand probably because we made an advisory on us," she said.

Power demand is usually low during Saturdays, Lomotan said.

The Department of Energy (DOE) said the yellow alert for the Luzon grid came as a result of the shutdown of three plants, the Caltex coal-fired power plant and the Sta. Rita and San Lorenzo natural gas-fired power plants.

While the Meralco areas were spared outages, the NGCP announced that parts of Nueva Ecija and Aurora will have brownouts on July 5, when transmission facilities areas will be shut down to isolate and reconnect power.

The NGCP said woodpoles and line hardware along Talavera-Bongabon-Baler 69-kV transmission line will be replaced.

NGCP's Corporate Communications and Public Affairs Officer Lilibeth P. Gaydown said power will be cut from 8 a.m. to 8:30 a.m. and from 3:30 p.m. to 6 p.m.

Areas to be affected in Nueva Ecija are Talavera, Gen. Natividad, Llanera, Palawan City, Bantayan.

Gabaldon, Laur and Rizal.

In Aurora, the outages will affect Dingalan, San Luis, Ma. Aurora, Baler and Dipaculan.

Just last Tuesday, the NGCP received its Integrated Management System (IMS) certification from TÜV Rheinland Philippines, a third-party auditing firm specializing in international standards accreditation.

The country's sole transmission service provider and power system operator was certified in three management systems: Quality Management System - ISO 9001:2008, Occupational Health & Safety Management System - OHSAS 18001:2007 and Environmental Management System - ISO 14001:2004.

NGCP applied for certification in March 2011, taking almost a year to complete. By February this year, after two rounds of certification audits, TÜV recommended NGCP to be IMS certified.

The IMS certification is the latest in NGCP's various efforts to provide more reliable transmission services to meet the growing demands of its customers and the public. (Additional report from Mark Manuel)



**IN THE DARK** - Left without electricity after a fire struck nearby houses, students at the Apolinario Samson Elementary School in Balintawak, Quezon City, use a flashlight to illuminate the blackboard yesterday, June 22, 2012. A shortage of power in the Luzon grid could lead to outages in Metro Manila. (KJ Rosales)



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## D. Luzon Grid needs more Power Sources.

THE Luzon grid must have not less than 1,500 megawatts of new generating capacity by 2017, Energy Secretary Jose Rene Almendras told reporters on Wednesday. At the sidelines of the Financial Executives Institute of the Philippines's general membership meeting, Almendras also made it clear that he has yet to talk to any proponent and that he brought the matter up because it was ideal to look into it now considering the gestation period of building such power plants.



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## E. Renewable Energy, primary and immediate solution to nation's power crisis..



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**A8** Monday, May 28, 2012 **BusinessMirror**

### Govt to build 40 mini-hydro plants

THE Department of Agriculture will put up 40 mini-hydropower plants in irrigation systems in the country to help ease the power crisis, particularly in Mindanao which is now suffering from rotating blackouts.

In a statement, Agriculture Secretary Proceso Alcala said the hydropower plants would be completed by December.

The Department of Agriculture and its attached agency, the National Irrigation Administration (NIA), said it has already identified 79 sites where the hydro plants could be set up.

An irrigation system, the DA said, could produce at least 20 megawatts of electricity daily.

A total of 20 will be placed in Luzon, 10 in the Visayas, and also 10 in Mindanao.

Each mini-hydro power plant, the department said, would cost P20 million and would be shouldered by local investors.

The DA and NIA did not identify the investors.

# 5 firms to tap natural gas

By Robert A. Evora

**CALAPAN CITY**—A consortium of five foreign firms will start drilling natural gas in the southern part of Mindoro Island in the second quarter of next year, the Department of Energy said.

Huge oil and gas seeps were indicated on Mindoro Island adjacent to the Palawan Basin, which hosts all the producing oil and gas wells in the Philippines.

Drilling is scheduled at Roxas, Mansalay, and Bulacao, in Oriental Mindoro, and Magsaysay, San Jose, and Sablayan, in Occidental Mindoro.

"Operations will begin shortly," according to the United Kingdom-based Pitkin Petroleum (Philippines) Plc, main operator of Service Contract 53, which was approved by the DoE on July 8, 2005 in favor of a consortium of Pitkin, Resource Management Association (Hongkong) Ltd., The Philodrill Corp., Anglo-Philippine Holdings Corp.,

and Basic Energy Corp.

DoE Undersecretary Jose Layug was please over the prospects in Mindoro.

"The service contract area coverage is 724,000 hectares," he said. "The exploration period covers seven years (started in 2005) with different sub-phases."

Pitkin Petroleum said "numerous onshore oil and gas seeps plus two gas discoveries are located in the contract area and more than 15 prospective structures with individual areas of closure of between seven and 65 square kilometers have been identified from previous work."

The firm has a participating interest of 70 percent in the block, with the remaining 30 percent held by the Philodrill Corp. Basic Consolidated Inc. and Anglo-Philippine Holdings Corp.

Oriental Mindoro Congressman Rodolfo Valencia

welcomed the move "considering the fact that it will bring economic boom to our province."

He said the National Grid and Transmission Corporation has approved the Batangas-Mindoro Submarine Interconnection Project worth P11 billion.

The underwater link aims to convey surplus electric power from Mindoro Grid to Luzon.

Layug said the agency is not only focusing its exploration works on the traditional energy sources, such as oil and gas, in Mindoro Island, but also on renewable sources of energy, such as geothermal, wind, and hydro power.

Last March, this year, President Benigno Aquino III led the switch-on ceremony of the island's first hydro-power plant in Bgy. Linaw-Kawayan, in San Teodoro municipality.

Now operational, the mini-hydro, with a construction cost of P405 million borrowed from

the Development Bank of the Philippines, is capable of producing 4.5 megawatts of electricity.

The groundbreaking and construction of the country's second wind power projects, the province's second renewable energy project, was undertaken last September 7.

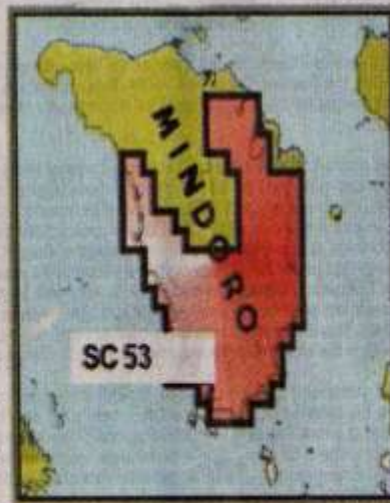
Situated on a 1,296-hectare mountain village overlooking the scenic beach resorts of the Verde Island Passage, the three-48-mw wind farm costs PhP6-billion.

The construction of the first phase, capable of generating 16 megawatts of electricity and costing P2 billion, will last in two years in 2014.

The first operating wind farm facility is in Bangui, Ilocos Norte, with 20 units of wind mills capable of generating 33 megawatts of electricity. Each unit stands 70-meter high, and blade diameter of 41 meters each.

The Bangui wind farm was originally designed to only produce clean electricity without emitting carbon, people call them as "giant electric fans" that have become a major tourist destination in Northern Luzon.

The Puerto Galera wind project is a component of the Power Development Program of Oriental Mindoro supported by the Provincial Development Council (PDC).



## **II. ORIENTAL MINDORO POWER DEVELOPMENT PROGRAM**

A photograph of a white wind turbine standing in a green field with mountains in the background under a cloudy sky.

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## A. Electrification Level in Oriental Mindoro (As of October, 2013)

City/Municipality	Barangays			Sitios			
	Potential	Energized	%	Potential	Energized	%	UnEnergized
Calapan City	62	62	100	347	337	97.12	10
Naujan	70	70	100	403	320	79.40	69
Victoria	32	32	100	195	157	80.51	38
Baco	27	27	100	157	117	74.52	40
San Teodoro	8	8	100	69	35	50.72	34
Puerto Galera	13	13	100	74	41	55.41	29
Socorro	26	26	100	175	123	70.29	52
Pola	23	23	100	153	93	60.78	62
Pinamalayan	37	37	100	237	192	81.01	45
Gloria	27	27	100	189	131	69.31	58
Bansud	13	13	100	92	43	46.74	42
Bongabong	36	36	100	224	131	58.48	81
Roxas	20	20	100	135	111	82.96	12
Mansalay	17	17	100	77	44	57.14	22
Bulalacao	15	15	100	48	27	56.25	21
Totals	426	426	100	2575	1903	73.90	613

Source: ORMECO, Inc.

**Note:** All 426 Barangays are energized. However, 26.10% of all the 2,575 Sitios are still unenergized. Pres. Aquino promised to fully energized the province by 2016.

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## B. Oriental Mindoro Power Demand Forecast

### 1. Type of Forecast

#### a. ORMECO DEMAND FORECAST

Forecast is based on an average minimal increase of power consumption ranging from 4% to 7 % per year.

#### b. ORMINVEST FORECAST

Forecast is based on development programs i.e. eco-tourism and agro-industrial development, commercial and housing programs. An estimated increase in power demand is projected at 20% per year.

#### Note:

ORMECO - Oriental Mindoro Electric Cooperative

ORMINVEST – Oriental Mindoro Investments, Inc.



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## Oriental Mindoro Projected Demand for Power

Year	ORMECO		ORMINVEST	
	FORECAST	GROWTH	FORECAST	GROWTH
2010	28.56 MW		28.56 MW	
2011	30.37 MW	6.35%	34.27 MW	20.00%
2012	32.51 MW	7.04%	41.13 MW	20.00%
2013	34.64 MW	6.58%	49.35 MW	20.00%
2014	36.78 MW	6.17%	59.22 MW	20.00%
2015	38.92 MW	5.81%	71.07 MW	20.00%
2016	41.06 MW	5.59%	85.28 MW	20.00%
2017	43.19 MW	5.21%	102.34 MW	20.00%
2018	45.33 MW	4.95%	122.80 MW	20.00%
2019	47.47 MW	4.72%	147.36 MW	20.00%
2020	49.74 MW	4.72%	176.84 MW	20.00%

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## C. Renewable Energy, Major Possible Power Sources in Oriental Mindoro

### A. HYDRO POWER:

San Teodoro	50 MW
Baco	25 MW
Naujan	20 MW
Victoria	25 MW
Bongabong	20 MW
Bansud	10 MW
Occidental Mindoro,	<u>20 MW</u>
Combined Capacity	<u>160 MW</u>

Note: *35 WATERFALLS HAVE YET TO BE  
EXPLORED FOR HYDROPOWER PROJECT.  
for hydro power resources.*

### B. WIND POWER:

Puerto Galera	48 MW
Victoria	20 MW
Bulalacao	40- 70 MW
Abra de Ilog	<u>10- 20 MW</u>
Combined Capacity	<u>118-158 MW</u>

### C. GEO-THERMAL:

Naujan	<u>20-70 MW</u>
GRAND TOTAL	300-388 MW

### D. COAL:

Semirara	<u>50-100 MW</u>
GRAND TOTAL	350-488 MW

### E. NATURAL GAS (For Exploration)



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## D. Mindoro Renewable Energy, In Support to National Power Program

- Based on DOE, about 203 MW to be installed in Mindoro Island by Year 2016.
- Mindoro Island excess power capacity can be exported to Main Luzon Grid thru a Submarine Cable.
- Mindoro Island has still other sources of Renewable Energy like:
  - a. 35 Waterfalls,
  - b. other sources to be explored i.e.: Natural Gas and Biomass.



### LEGEND:

● SITES OF RENEWABLE ENERGY SOURCES

— PROPOSED SUBMARINE CABLE

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# Letter of Hon. RGV to Pres. Aquino re: Mindoro Renewable Energy Resources



Republic of the Philippines  
House of Representatives  
Quezon City, Metro Manila

25 June 2012

His Excellency  
BENIGNO S. AQUINO, III  
President of the Republic  
Malacanang Palace  
City of Manila

Subject: Mindoro's Renewable Energy Resources  
In Support to Your Excellency's Power Development Program

Dear Mr. President:

Greetings!

We are very grateful to Your Excellency for the support you have been extending to the Province of Oriental Mindoro, thru the Department of Energy, particularly on the initial development of our renewable energy resources, i.e., hydro and wind power.

We are honored by your presence recently, upon the invitation of Gov. Alfonso V. Umali, Jr., in the launching of the 2.2-MW hydro power (part of a 4.5 MW) in the Municipality of San Teodoro. Lately, with the assistance from the DOE, the Energy Sales Agreement (ESA) for the 16-MW (first phase of the 48-MW) wind power in Puerto Galera was officially executed between Oriental Mindoro Electric Cooperative (ORMECO) and the Philippine Hybrid Energy Systems, Inc. (PHESI). The project is expected to groundbreak this month of July and we will again be honored by your presence, Mr. President, as our Guest of Honor.

Aside from the aforesaid projects, we have already identified about 300 MW of renewable energy resources such as hydro, wind and geo-thermal. We have yet to quantify our coal reserves in the Municipality of Bulalacao, south of Mindoro, and our bio-fuel potentials.

Mr. President, we are very much inspired by your statement during your last visit to our Province, and we quote: "Before I end my term in 2016, I want to see Mindoro exporting its surplus power to Luzon". This is further strengthened by Energy Secretary Jose Rene D. Almendras, stating that "Because of the enormous renewable energy resources of Mindoro Island, we will consider it as the Green Island of the Philippines and the Country's Renewable Energy Power Capital."



-3-

With these positive developments, may we reiterate our request for Your Excellency's assistance on the APPROVAL of the following:

1. APPLICATION OF THE NATIONAL GRID CORPORATION OF THE PHILIPPINES (NGCP) FOR AUTHORITY TO START DEVELOPMENT OF THE BATANGAS-MINDORO INTERCONNECTION PROJECT (BMIP)

Pending with the Energy Regulatory Commission under ERC Case No. 2011-108 (R.C).

2. ENERGY SERVICE CONTRACTS FOR THE DEVELOPMENT OF RENEWABLE ENERGY RESOURCES OF MINDORO.

Pending with the Department of Energy (DOE) namely:

- a. 10-MW Hydro Power at Mag-asawang Tubig River in the Municipalities of Naujan and Victoria
- b. Wind Power in the Municipality of Bulalacao

3. PROPOSED AMENDMENT TO DOE CIRCULAR 2004-01-001 ALLOWING NPC TO ENTER INTO NEW OBLIGATIONS, I.E., POWER SUPPLY AGREEMENTS AND/OR OFF TAKE AGREEMENTS SPECIALLY WITH NEW POWER PROVIDERS (NPPs) FOR THE SUPPLY OF POWER IN EXISTING NPC-SPUG AREAS.

This is in connection with the enhanced Private Sector Participation Program (PSP) in existing National Power Corporation-Small Power Utilities Group (NPC-SPUG) areas.

Thank you and More Power, Your Excellency.

Very truly yours,

  
RODOLFO G. VALENCIA

Congressman, Oriental Mindoro 1<sup>st</sup> District  
Chairman, Committee on Housing & Urban Development  
Member, Committee on Energy

- cc: Gov. Alfonso V. Umali, Jr., Province of Oriental Mindoro  
Rep. Reynaldo V. Umali, Oriental Mindoro 2<sup>nd</sup> District





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# **III. ORIENTAL MINDORO POWER DEVELOPMENT UPDATES**

## A. 4.2 MW Hydro Power Project in San Teodoro, Or. Mindoro.



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**LINAW-KAWAYAN MINI-HYDRO POWER PLANT**  
**Development Bank of the Philippines (DBP) Loan extended**  
**to ORMECO. Photo was taken during the**  
**Groundbreaking Ceremony.**

## BLESSING AND RIBBON CUTTING (MARCH 2, 2012)



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***2.1 MEGAWATTS LINAW-KAWAYAN MINI-HYDRO PROJECT  
AT SAN-TEODORO, ORIENTAL MINDORO.***

## CEREMONIAL SWITCH ON



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***2.1 MEGAWATTS LINAW-KAWAYAN MINI-HYDRO PROJECT  
AT SAN-TEODORO, ORIENTAL MINDORO.***

## CEREMONIAL SWITCH ON with PRES. AQUINO and Sec. ALMENDRAS



### **2.1 MEGAWATTS LINAW-KAWAYAN MINI-HYDRO PROJECT**

**CEREMONIAL SWITCH ON - MARCH 02, 2012**

***Other Officials: CONG RGV, GOV. BOY UMALI, CONG. REY UMALI, AND OTHERS.***

## B. Diesel Bunker Power at Calapan City 6.4 MW



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**A P400 MILLION  
POWER  
DEVELOPMENT  
IN 2011**

## C. Diesel Bunker Power at Calapan City 15 MW



*Contract Awarding of 15 MW ORMECO to DMCI Power Corp. From Left: Romeo Cuasay, Gen. Manager, Nerstor Dadiwas, President, DMCI Power Corp., Hon. Rodolfo G. Valencia, Chairman, Orminvest, (witness), and Audel Araga, President, ORMECO.*

## D. The 48 MW Wind Energy Project in Puerto Galera

### *Project Background*

#### *1. A long 7 Years Process*



*Dec., 2010. Meeting with House of Representative, Department of Energy, National Power Corporation, Contractor and Italian Ambassador Luca Fernari.*

## ***2. Finally Approved under Sec. Jose Rene D. Almendras***



***Signing of Service Contract for 16MW Wind Power Project By Energy Sec. Jose Rene D. Almendras, Cong Rodolfo G. Valencia , Gov. Alfonso V. Umali, and CMC Asia Chairman Andy de Rossi with Congress Chief of Staff Nico Valencia and Nicky Villaseñor, PHESI President***

## Latest Development



***Signing of MOA between PHESI, CMC-ASIA and GAMESA EOLICA S.L. UNIPERSONAL, witnessed by Vice President JEJOMAR BINAY, Cong. RGV, Gov. Umali, Cong. Umali and other LGUs.***

## Latest Development

*Signing of ESA with Oriental Mindoro Electric Cooperative.*



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## Latest Development

*Official Signing and Awarding Ceremony, Shangri-la Hotel, Makati.*



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POWER PROJECT  
GALERA, OR. MINDORO  
Signing and Awarding Ceremony  
16 MW PROJECT - May 30, 2012



48 MW

WIND ENERGY PROJECT

PUERTO GALERA, ORIENTAL MINDORO, PHILIPPINES

PHASE 1 - 16 MW







**CONG. RODOLFO G. VALENCIA**

**H.E. VICE PRES. JEJOMAR C. BINAY**



**48-MW Wind Energy Power System (WEPS)** in Puerto Galera, Oriental Mindoro at a Project Cost of PhP 6 Billion, the single biggest investment in the Province to-date. Shown in photo (L-R) Project proponent Oriental Mindoro 1<sup>st</sup> District Cong. Rodolfo G. Valencia, K-4 Oriental Mindoro Council President Nico Valencia, Italian Ambassador Luca Fornari, Gov. Alfonso V. Umali, Jr., 2<sup>nd</sup> District Cong. Reynaldo V. Umali, Department of Energy Usec. Jay Layug, and Philippine Hybrid Energy Systems Inc. (PHESI) Chief Executive Officer (CEO) Engr. Armando De Rossi.



# GROUNDBREAKING CEREMONY

## 48 MW WIND ENERGY PROJECT

### PHASE I - 16 MW

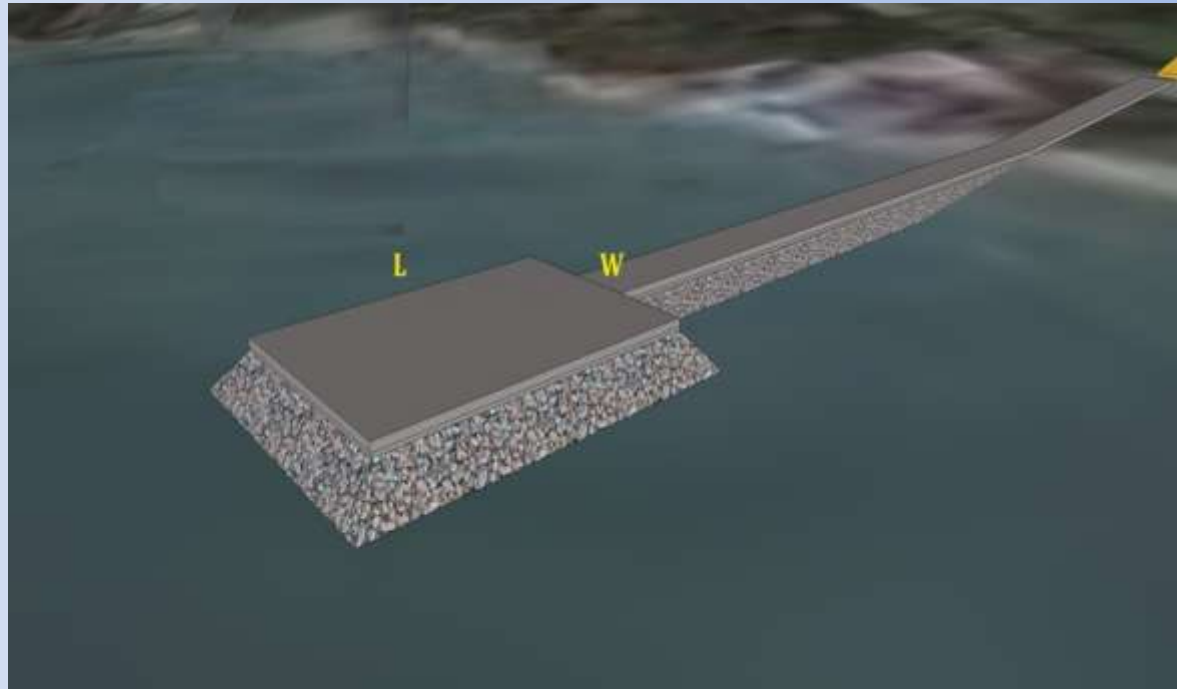
Puerto Galera, Oriental Mindoro  
November 7, 2012



## Brief Technical Background

### 1. JETTY

- A Jetty has been designed (armor rock plus a concrete) to unload the equipment

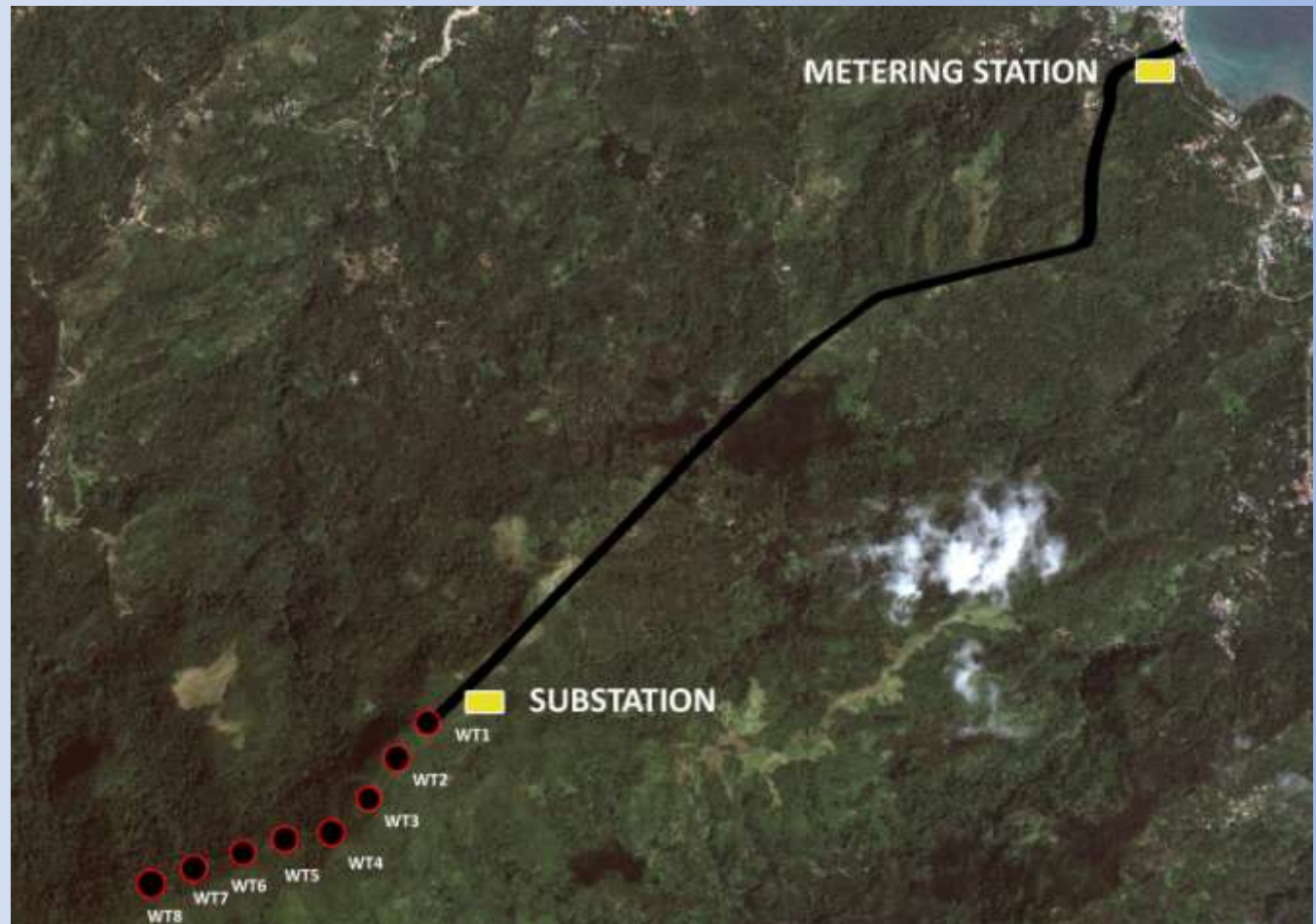


### SPECIFICATION

Dimension: 35 meters width (W); 45 meters length (L)

## Brief Technical Background

### 2. ACCESS ROAD



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## Brief Technical Background

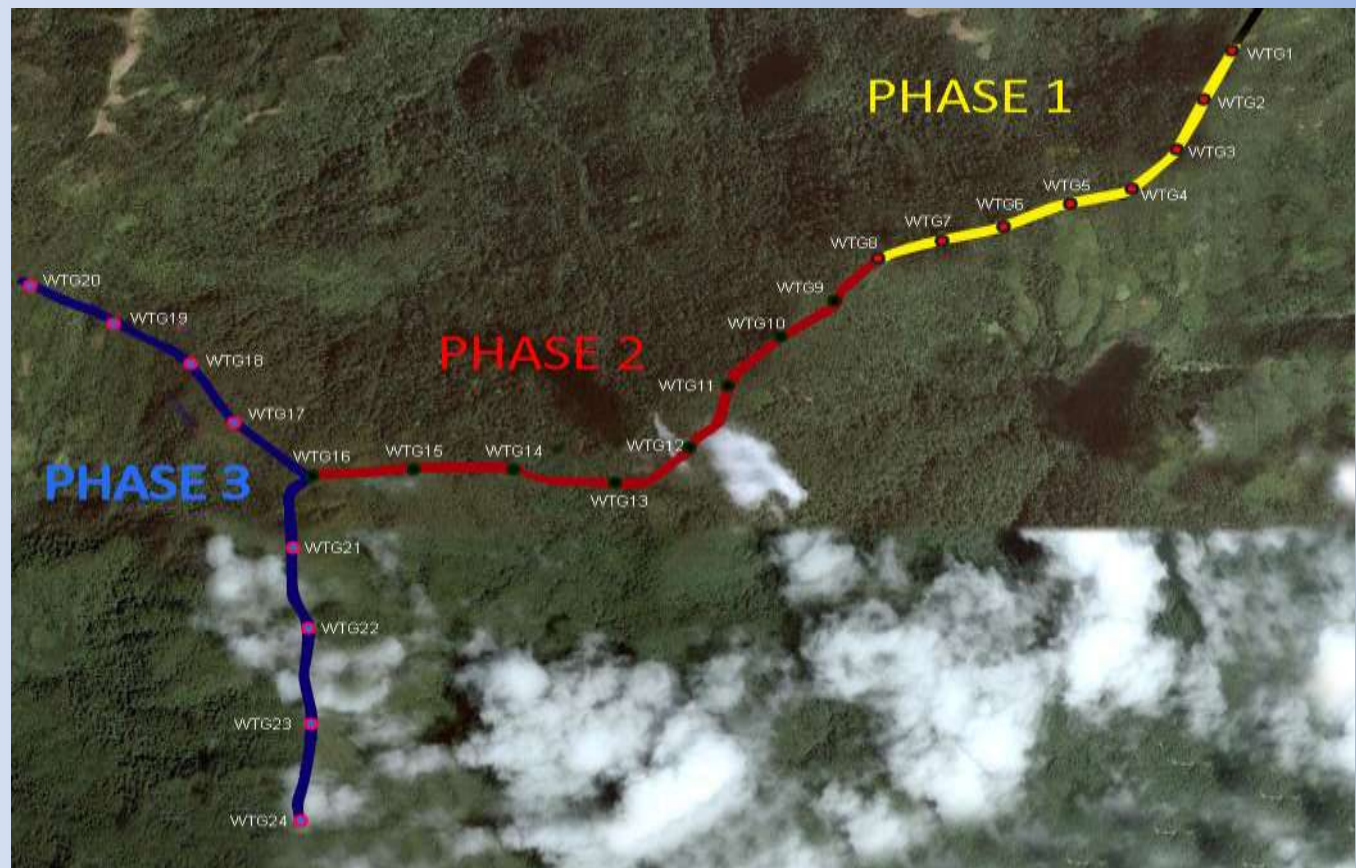
### 3. INTERNAL / SERVICE ROADS



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## Brief Technical Background

### 4. PHASE 1, 2 & 3 LAYOUT



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## Brief Technical Background

### 5. The WIND TURBINE

Gamesa G8X -2.0 MW



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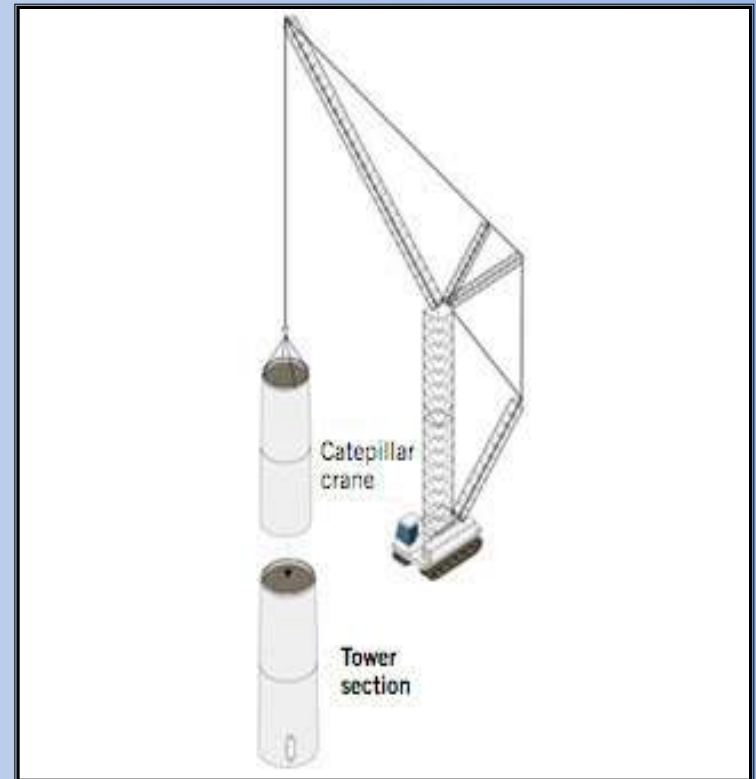
## Brief Technical Background



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Transporting of Towers

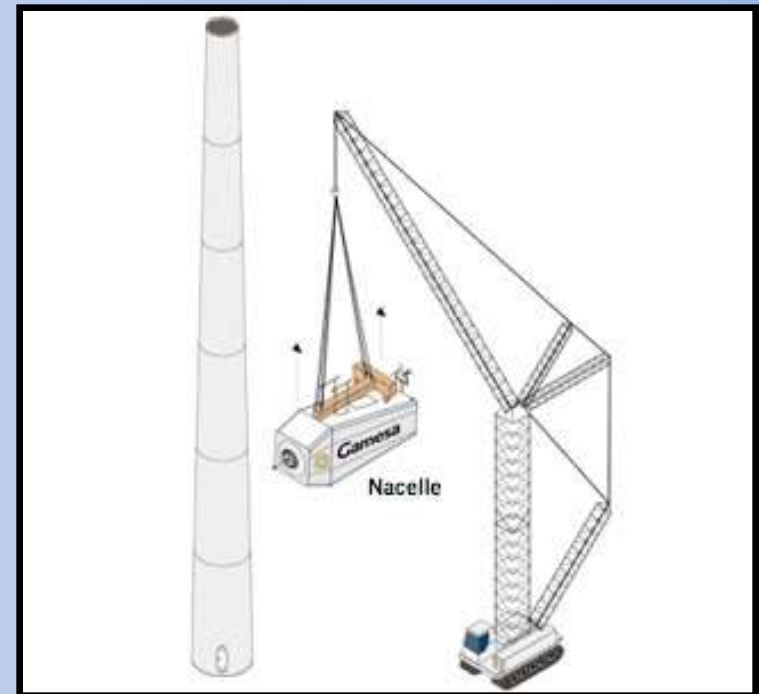


Erection of Towers

## Brief Technical Background



Conveying of Nacelle



Installation of Nacelle

## Brief Technical Background



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Transporting of Blades

Installation of three-blades



## Brief Technical Background

### 6. The SUB-STATION

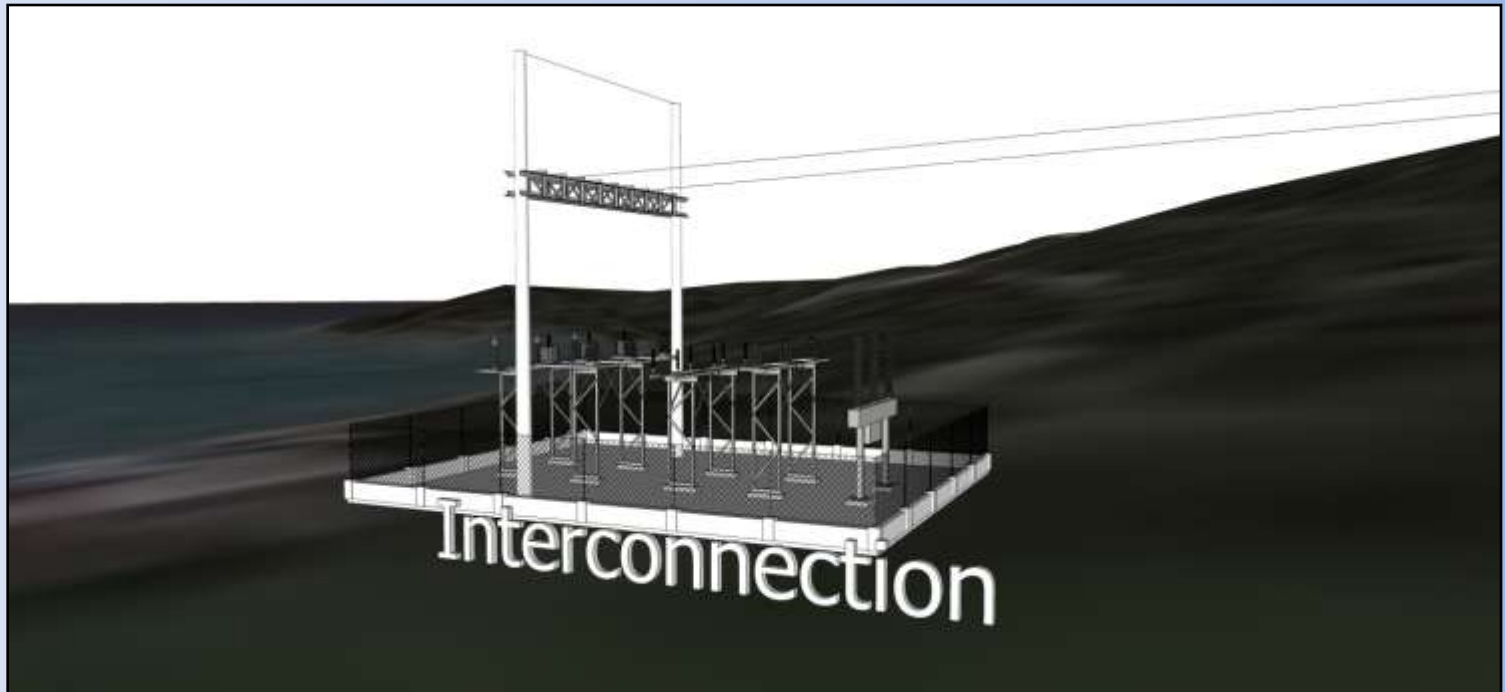


- The substation is composed of the following main bays:
  - ❖ A single 24 kV Busbar
  - ❖ One 22.8/69 kV 20 MVA transformer bay
  - ❖ A single 69 kV Busbar system (simple)
  - ❖ One 69 kV line bay (going)

## Brief Technical Background

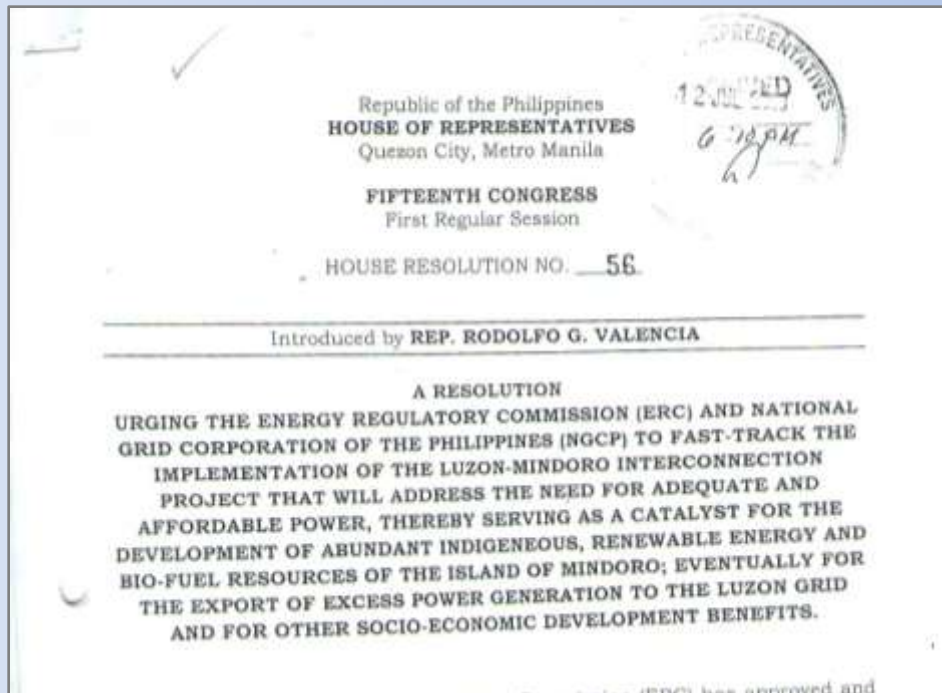
### Metering Interconnection Station

- Equipped with metering equipment to measure the flow of electricity in both directions at the same rate
- Has a SF6 circuit breaker and a disconnect switch.

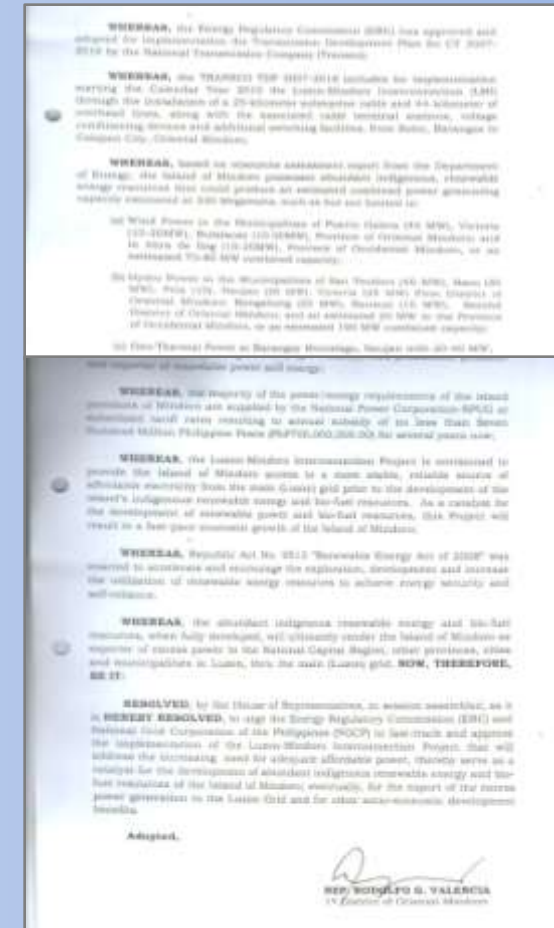


## D. Luzon-Mindoro Interconnection Project (Submarine Cable)

***1. Initiated by Hon. RGV through House Resolution No. 56***



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## 2. Filed by NGCP to ERC

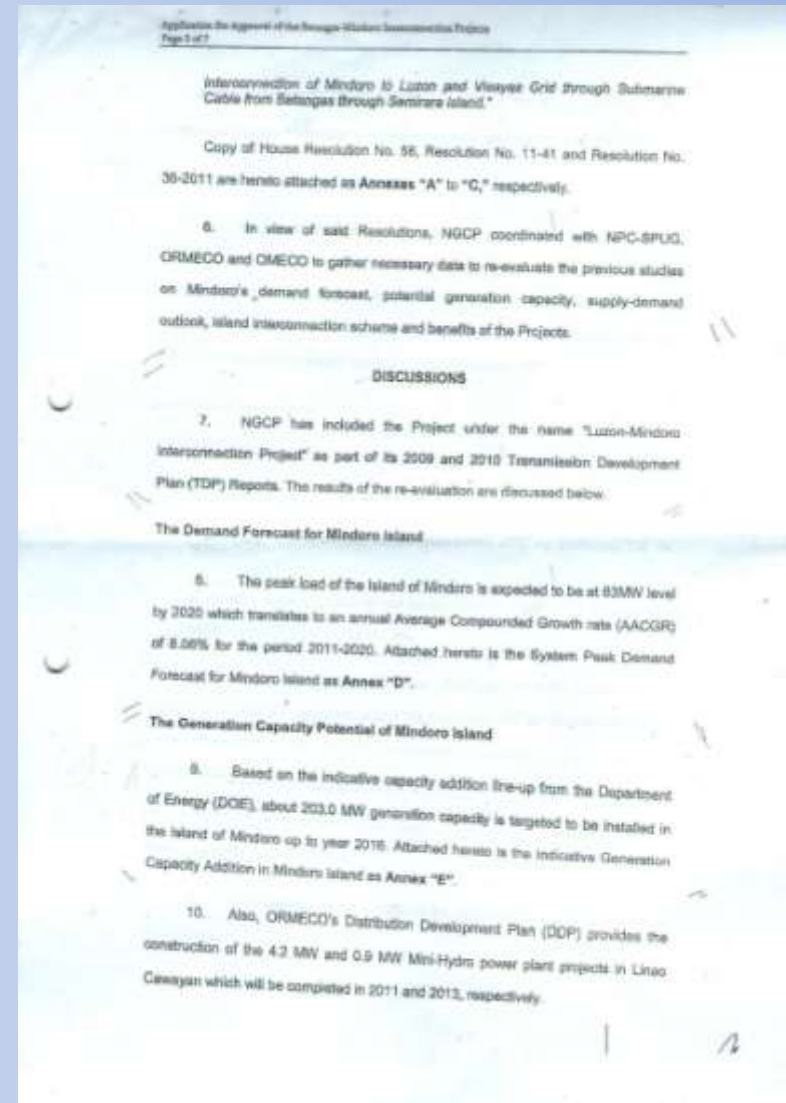
**Filed: August 1, 2011  
with ERC Case No. 2011-108**

**Supported by:**

- ☐ **H.R. No. 56 by: Hon. RGV**
- ☐ **Resolution No. 11-41 of  
Board of Directors,  
ORMECO**
- ☐ **Resolution No. 36-2011 of  
Board of Directors,  
OMEKO**

**NGCP has included the Project  
under the name “Luzon-  
Mindoro Interconnection  
Project” as part of 2009-2010  
Transmission Development Plan.**

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### 3. Project Benefits:

- a. Reliability of Power Supply in Mindoro will improve
- b. Cheaper Power for All
- c. Mindoro Grid will become part of NGCP Operation thus will strengthen the Transmission
- d. Mindoro will become conducive for expanding business in tourism, manufacturing and other industries thereby improving the economy of the island.
- e. Possible development of coal-fired power plants since Mindoro is rich in coal resources.



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## LATEST DEVELOPMENTS

The local government leaders of Oriental Mindoro are throwing their support to the proposed Batangas-Mindoro interconnection so the area could also gain leverage of exporting any excess supply to the main grid.

This was formally verbalized to President Benigno S. Aquino III during his recent visit to Calapan City, wherein discussions on the enhanced utilization of renewable energy has been proposed as part of the solution in addressing the current island grid's unreliable power supply.

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### MANILA BULLETIN

Sunday, April 15, 2012

## Batangas-Mindoro Power Link Pushed

By MYRNA M. VELASCO

The local government leaders of Oriental Mindoro are throwing their support to the proposed Batangas-Mindoro interconnection so the area could also gain leverage of exporting any excess supply to the main grid.

This was formally verbalized to President Benigno S. Aquino III during his recent visit to Calapan City, wherein discussions on the enhanced utilization of renewable energy has been proposed as part of the solution in addressing the current island grid's unreliable power supply.

The leaders backing the interconnection plan are Oriental Mindoro Congressmen Rodolfo G. Valencia and Reynaldo V. Umali of the province's first and second districts.

Valencia, who is a member of the House committee on energy and chairman of Orminvest (Oriental Mindoro Investments) Foundation Inc., noted that when Mindoro's massive renewable energy and biofuel resources will be harnessed, these can potentially yield generation capacity of more than 300 megawatts.

On that scale of capacity, the island-grid's power supply will already be fully covered and it will still have excess that it can export to the grid.

Valencia stressed that the area's potential for hydro could be 200 megawatts, wind potential will be for 70MW, and 30MW for geothermal. This will be in addition to the proposed coal-fired power plant in Bulalacao town.

The President was also reportedly informed that a 15-MW hydropower

plant is under way in San Teodoro, while negotiations "are ongoing for other hydro projects covering 10MW in Mag-asawang Tubig River and 20MW in Bongabong town."

The NGCP has proposed two options on the link-up project. One, would be to interconnect Mindoro to the main grid of Luzon via the Batangas 230-kilovolt substation; and two, to connect it to the Luzon grid via the Ilijan 500-kilovolt substation.

In its filing with the Energy Regulatory Commission, the grid operator qualified that "although Ilijan site was not identified as a good cable landing area for the project, Ilijan 500 kV substation can still be considered as a connection point."

Of the two, however, the prefer-

ence would be grid connection via the Batangas 230-kV substation.

"With the improvement of adequate

and reliable power supply in the island as a result of the interconnection project, Mindoro will become more conducive for expanding businesses in tourism, manufacturing and other industries, thereby improving the economy of the island," NGCP said.

The forecast demand growth for Mindoro will be on a steady rise - hence, an additional capacity of 203MW is already integrated in the Department of Energy's indicative power projects' line-up until 2016.

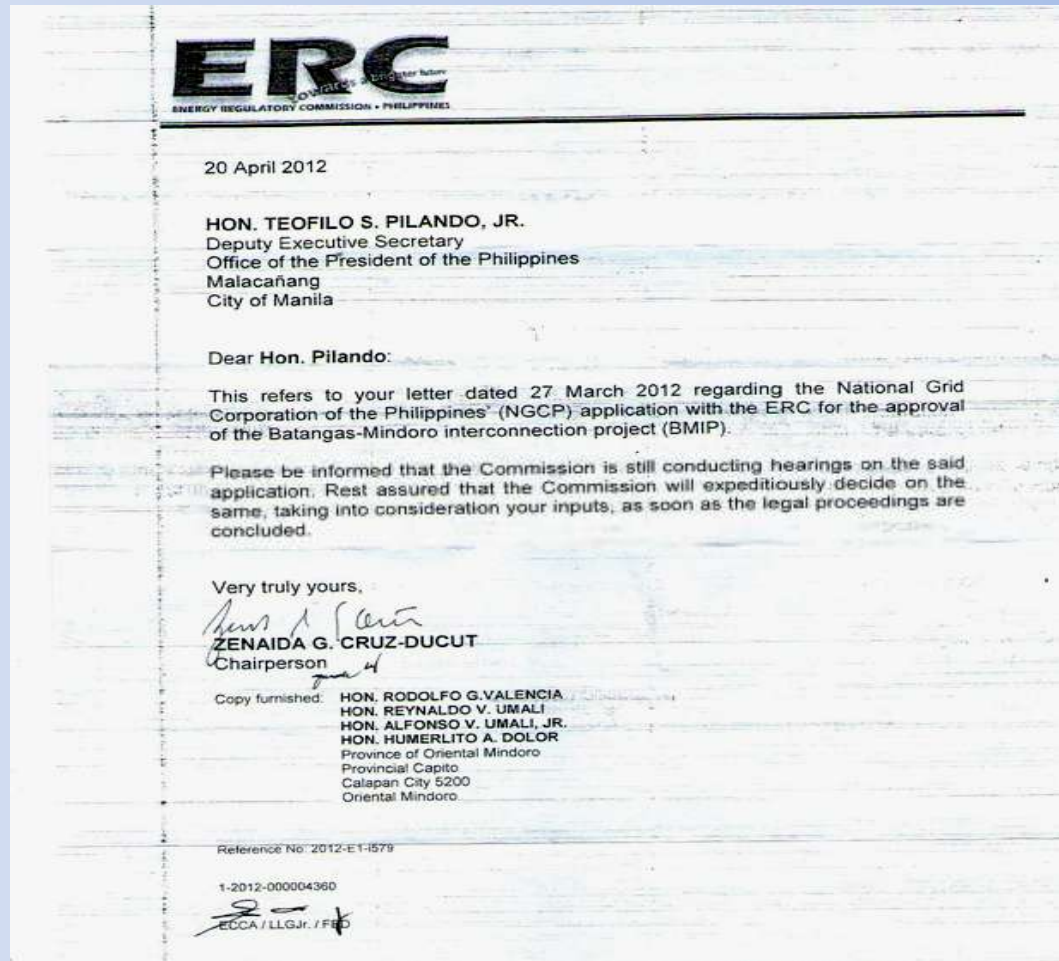
## LATEST DEVELOPMENTS



**SUBMARINE POWER CABLE** The National Grid Corporation of the Philippines has included the Batangas-Mindoro Interconnection Project in its Transmission Development Plan for 2009-10 espoused by House Resolution 56 sponsored by First District Rep. Rodolfo G. Valencia (center) of Oriental Mindoro. President Aquino vowed to support Mindoro's bid to export electricity to Luzon during his recent visit in Oriental Mindoro. With Aquino are (from left) Energy Secretary Jose Rene Almendras, Second District Rep Rey V. Umali, Construction & Management Consultancy of Asia Inc. President Armando di Rossi, Gov. Affonso V. Umali Jr. and Vice Gov. Humerlito A. Dolor.

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## LATEST DEVELOPMENTS



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## LATEST DEVELOPMENTS



Cong. Rodolfo G. Valencia and Nico Valencia in their meeting with ERC Chairperson Zenaida Ducut-Cruz last November 2012.

## LATEST DEVELOPMENTS

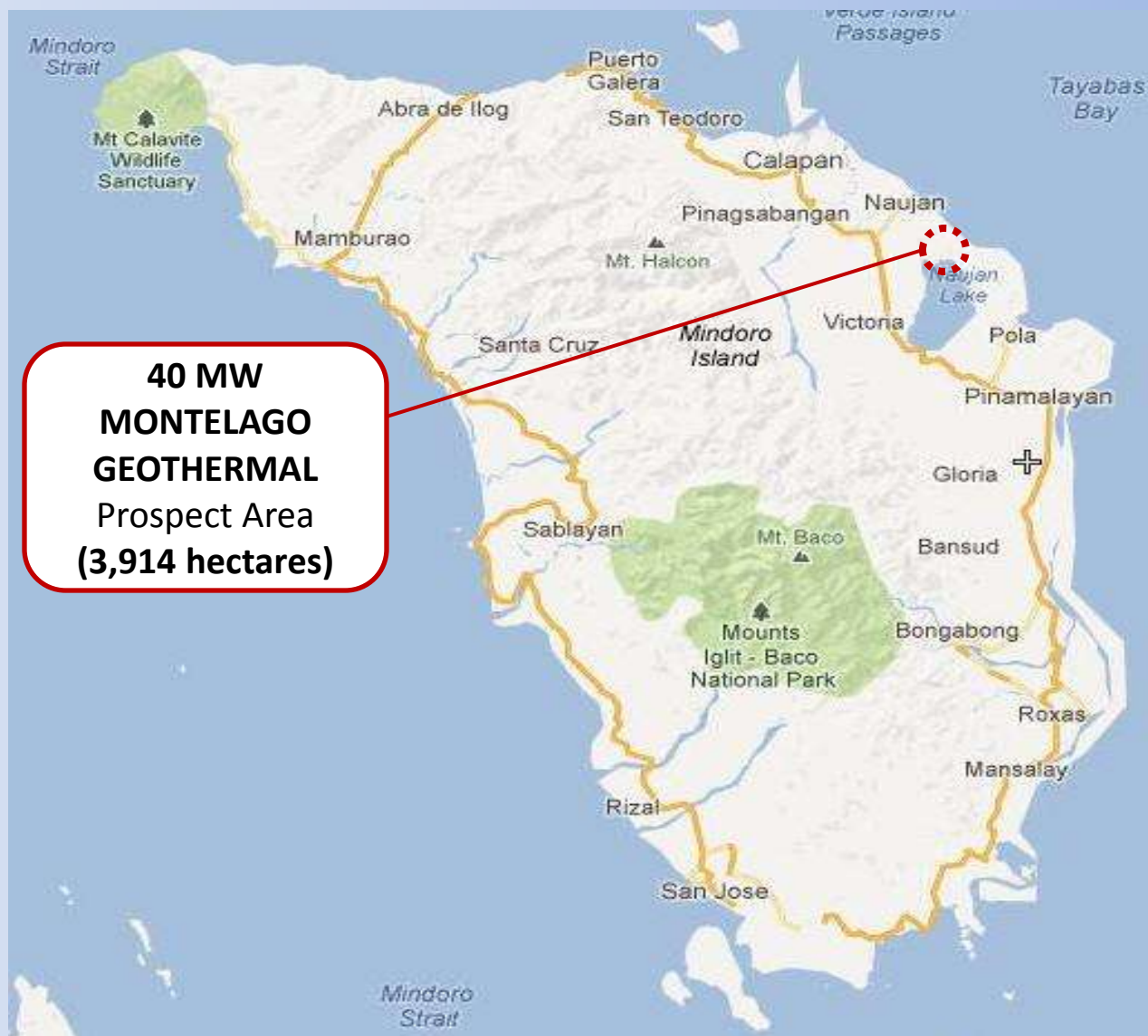


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Hon. Rodolfo G. Valencia in his meeting with Mr. Henry Sy, Jr., President and C.E.O. of National Grid Corp. of the Philippines regarding the Batangas-Mindoro Inter-connection Project.

## F. MONTELAGO GEOTHERMAL POWER PROJECT (Naujan, Oriental Mindoro)



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## ₱7.92-B geothermal power project seen in Mindoro

By JOEL MAGSINO

CALAPAN, Oriental Mindoro – A \$180-million (₱7.92-billion) geothermal power project in this Naujan, this province, is seen to produce electricity by mid-2016, the Filipino-owned Emerging Power, Inc. (EPI) announced recently.

EPI said it has earned the go-signal for the project from the Protected Area Management Board (PAMB) of the Department of Environment and Natural Resources (DENR) after declaring the area of Montelago, Naujan town, as a multi-use zone.

Earlier, the Department of Energy (DOE) granted to EPI the geothermal renewable energy service contract.

Using the geothermal energy in selected areas in the municipality of Naujan, EPI sees significant savings for the two provinces of Mindoro Island, decrease reliance on fossil fuels, and help reduce pollution since

some gases released are deemed environment-friendly.

The project will provide 40 mega-

watts of electric power, giving each provinces equal share of 20 megawatts.



Geothermal Power Imagery Only

## PROJECT UPDATES

1. Geothermal Service Contract (GSC-2010-02-013) was granted by DOE last February 1, 2010.
2. Constellation Energy Corp. (CEC) has already conducted various project studies and assessment.
3. In January to June 2011, Siclair Knight Merz (SKM) conducted a review of the project which includes **Geological, Geochemistry, Geophysics, Conceptual Model, Resource Assessment, and Market Data Assessment.**
4. Other on-going studies are: **Environmental Impact Study, Grid/Distribution System Impact Study, Exploration Drilling, Feasibility Study, and Conceptual Engineering and Design.**

## G. MINDORO NATURAL GAS

### Manila Standard TODAY

#### Mindoro to tap natural gas

By Robert A. Evora September 08, 2012 |

**PUERTO GALERA—An oil firm starts drilling natural gas in southern Mindoro next year, the Department of Energy said on Friday.**

**Undersecretary Jose Layug said the seismic survey is expected to be completed on or before December.**

**“Drilling will follow in early 2013,”** he said. The 2D survey was undertaken by Pitkion Petroleum Plc. on its service contract 53, which is part of two other contracts covering about 20,000 square kilometers on- and offshore areas in all. “Mindoro has the potential reserves of oil and natural gas not only renewable energy sources,” said Layug, who represented Secretary Rene Almendras at the groundbreaking of the Puerto Galera wind farm’s first phase.

Rep. Rodolfo Valencia expressed surprise over Layug’s update.

“Mindoro can now compete with other provinces because of the discovery and the upcoming drilling operation of natural gas,” he said.

“We have already identified about 300 megawatts of renewable energy sources, such as hydro, wind, and geothermal.”

The 48-MW Wind Energy Power System in Barangay Baclayan sits on a 1,296-hectare site overlooking Verde Island Passage.

It has three phases each costing P2 billion and rated for 16MW capacity.

Joining Layug and Valencia at the ceremonies were Italian Ambassador Luca Fornari, Gov. Alfonso Umali, second district Rep. Reynaldo Umali, Mayor Hubbert Dolor, officials of CMC Asia Inc. an Italian power firm led by its chairman, Armando de Rossi, also the chief executive officer of the Philippine Hybrid Energy System Inc., project developer, along with executives of Gamesa Eolica S.L. Unipersonal, PHESI chief operating officer Nicky Villasenor, officers of Oriental Mindoro Electric Cooperative and wellwishers.

Puerto Galera wind farm is a component of the Power Development Program of Oriental Mindoro supported by the Provincial Development Council.

**With Alena Mae S. Flores**



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## Locations of natural Gas under Service Contract

### **Oriental Mindoro:**

Roxas,  
Mansalay and  
Bulalacao

### **Occidental Mindoro:**

Magsaysay  
San Jose, and  
Sablayan

Total Area:  
**724.000 hectares**



Hypothetical Location of Natural Gas  
under Service Contract to five (5)  
Foreign Firms per DOE Report.

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# Manila Standard TODAY

Vol. XXVI No. 186 14 Pages, 2 Sections  
P18.00 Thursday, September 20, 2012

ISSN 1908-3009



## Mindoro to bank on green energy

By Robert A. Evora

CALAPAN CITY—Oriental Mindoro is turning to new sources of alternative energy to become surplus producer of electricity even as it needs a “fallback position” to avert supervening shortages.

Rep. Rodolfo Valencia said the entire island is known to be naturally endowed to make a significant contribution to the Luzon Grid.

“There are more than 35 waterfalls and rivers as renewable sources of energy listed in the Oriental Mindoro Power Development Program awaiting to be tapped and funded,” he said.

“These river-based alternative sources of power are projected to generate 160 megawatts of electricity more than enough to supply our present power needs.”

Hydro power is the first renewable energy project on the island bankrolled by a P405 million loan from the Development Bank of the Philippines taken out by Oriental Mindoro Electric Cooperative.

But OMEC president Audel Arago said things may worsen

before full capacity is achieved.

“Oriental Mindoro must be prepared (for) a serious power crisis in two years,” he said, referring to the supply level.

Last June, the cooperative admitted during a public consultation that the province needed 28.87 to 30.5 MW but the present two fuel-run plants, a generator and two mini hydros could only deliver 28.60 MW.

The franchisee said Calapan alone required 9.37 MW and 11 MW at peak demand from 15 barangays of the city.

Gov. Alfonso Umali Jr. has endorsed to Malacañang Valencia’s proposal for power interconnection between Mindoro and Batangas, among other projects to diversify the energy sector.

“We hope to see a progressive Mindoro Oriental among the revitalized provinces heading the drive towards a future of sustainable growth,” Umali said.

Energy Secretary Rene Almendras has described the province as the “Green Island” and “Renewable Energy Power Capital of the Philippines.”



Valencia

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## H. POWER DISTRIBUTION FROM SEMIRARA COAL POWER PLANT



**DMCI POWER**  
CORPORATION



There is a proposal from DMCI Power Corp. of Power Distribution to the entire Mindoro Island from **Semirara Coal Power Plant** through a Submarine Cable. It is now with on-going study.



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## SUPPORT FROM NATIONAL GOVERNMENT



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***To our valued guests:***

***Our province, Oriental Mindoro, is one of the few places in the world with a well protected environment .***

***We preserved its natural beauty because we love our place. We do not want anybody to destroy it.***

***We welcome investors who want to help us develop its natural beauty into a world class tourist destination.***

***We are also open to those who are interested to venture in our agri-eco-tourism projects tapping our rich natural resources.***

***However, the high cost of power impedes the development of Oriental Mindoro. This is the reason we launched the power development program of the province that will enable all of us to be a productive and self- sufficient people living in a community with ecologically-balanced environment.***

**Hon. Rodolfo G. Valencia**

Chairman, ORMINVEST