

### Introduction

The Philippines remains the top wind producer in Southeast Asia with its 33 MW wind turbines that started operation in 2005. A study by the US National Renewable Energy Laboratory (US NREL) shows that there are 10,000 sq. km. of land areas with good-to-excellent wind resources here in the country. Using the conservative assumption of about 7 MW per sq. km., these windy areas could support a potential installed capacity of 70,000 MW. Most of these windy areas can be found in the northern part of the country, particularly in the Ilocos region.

### Market Opportunities

#### Increase in consumption

- total additional power generation capacity needed (from renewable and non-renewable energy sources): 4,000 – 4,350 MW
- Visayas and Mindanao islands are starting to experience power shortages
- around 23 power plants with an estimated total capacity of 557 MW are being targeted by the government by 2014 (333 MW in the Northern Luzon Agribusiness Quadrangle, 124 MW in Metro Luzon Urban Beltway, 85 MW in Central Philippines, and 15 MW in Mindanao).
- generation of wind energy increased from 25 MW in 2005 to 33 MW in 2008

### Philippine Advantage

#### Natural resources

- Philippines' potential for wind energy is attributed to its location in the Asia-Pacific monsoon belt.
- total wind potential installed capacity of 70,000 - 76,600 MW
- over 10,000 sq. km. of windy land areas estimated to exist with a good-to-excellent wind resource potential
- wind power density at 500 W/m<sup>2</sup>

#### Technology Situationer

- wind turbine – active stall type
- resource assessment on selected sites by wind mapping
- grid-connected wind farms

#### Support industries/infrastructure

- high voltage backbone system of interconnected transmission lines, sub-stations and related facilities exist in Luzon, Visayas, and Mindanao  
Luzon Grid – 19,271 MVA, Visayas Grid – 3,269 MVA, Mindanao Grid – 2,103 MVA
- National Grid Corporation of the Philippines (NGCP) is a corporate body that is responsible for the planning, construction, and centralized operation and maintenance of high-voltage transmission facilities, including grid interconnection and ancillary services

#### Ideal locations

- the best wind resources are found in the following regions:
  1. higher interior terrain of Luzon, Mindoro, Samar, Leyte, Panay, Negros, Cebu, Palawan, eastern Mindanao, and adjacent islands
  2. islands of Batanes and Babuyan, north of Luzon
  3. northwest tip of Luzon (Ilocos Norte)
  4. well-exposed east-facing coastal locations from northern Luzon southward to Samar
  5. wind corridors between Luzon and Mindoro (including Lubang Island)
  6. between Mindoro and Panay (including the Semirara Islands and extending to the Cuyo Islands)
- Wind mapping is the process that helps the DOE to determine potential wind farms in the country:
  - Luzon (456.5 MW)*
    - Ilocos Norte (183 MW)
    - Ilocos Sur (40 MW)
    - Pangasinan (60 MW)

- Nueva Ecija (50 MW)
- Quezon (50 MW)
- Laguna (25 MW)
- Marinduque (8.4 MW)
- Occidental Mindoro (10 MW)
- Oriental Mindoro (20 MW)
- Romblon (10.10 MW)
- Visayas (85 MW)*
  - Masbate (5 MW)
  - Negros Occidental (30 MW)
  - Antique (40 MW)
  - Aklan (10 MW)
- Mindanao (15 MW)*
  - Surigao del Sur (15 MW)

#### Human resources

- Manpower Requirement
  - Engineers
  - Meteorologists
  - Plant Operators
  - Maintenance personnel
  - Administrative staff
- Availability
  - 517,427 total graduates in 2009
  - 63,919 graduates of various Engineering courses
- Quality
  - competitive labor force
  - world-class English language proficiency with capability with some Asian languages
  - fast learning curve (needs only 6-8 weeks to learn technical skills)
  - long tradition of excellence in the professions
  - strong work ethics and customer orientation
  - universal cultural adaptation

#### Industry Players

##### Existing company

- North Wind Power Development Corporation (33 MW) in Bangui Bay, Ilocos Norte

#### Industry Potentials

##### Growth in numbers of wind power plants

- USDOE-NREL study showed that out of the 73 provinces in the Philippines 47 have at least 500 MW in wind potential and 25 with at least 1,000 MW
- there are 6 wind farm projects under development:
  - PNOC-EDC 140 MW in Ilocos
  - UPC Asia (100 MW)
  - Energy Logics (40-60 MW)
  - A Spanish firm in Burgos province (10-15 MW)
  - Aklan Project (10-15 MW)
  - Bulalacao Project (40 MW)
- 23 new plants are expected to be on-stream by 2014

##### New investments

- the recently passed Philippines Renewable Energy Act of 2008 is expected to accelerate the exploration and development of renewable energy resources in the Philippines and that includes wind.

##### Increasing share in electricity generation

- current installed capacity of 33 MW represents less than 1% of total power generation capacity

- by 2014, installed capacity is expected to reach 590 MW or 2.9% of the total power generation capacity

#### Rural employment opportunities

- the industry provides opportunities for direct labor sourced particularly from rural areas

#### Increasing contribution to the economy

- will continue to contribute to foreign exchange savings as it substitutes imported fuel oil
- will be a substantial earner of foreign exchange through carbon credits under the Clean Development Mechanism

### Government Support

#### Enabling laws/policies

- Renewable Energy Act of 2008 (R.A. 9513) - establishes the necessary infrastructure and mechanisms to carry out the government's thrust to promote the development, utilization and commercialization of renewable energy sources which includes wind energy
  - promotes the purchase, grid connection and transmission of electricity generated from renewable energy sources to ensure its market
  - provides incentives such as exemption from various taxes and duties to renewable energy developers to make investments more attractive

#### Development plans and programs

- intensify development and utilization of renewable energy sources and technology

#### Market support

- To contribute to the growth of the renewable energy industry by diversifying energy supply, the Renewable Portfolio Standards (RPS) policy requires electricity suppliers to source a certain portion of their energy supply from eligible wind energy sources.
- Feed-in Tariff or price premium for electricity produced from eligible RE resources like wind

#### Technical/R & D support

- Government identifies potential sites of wind energy resources through wind mapping
- assists private entities that have identified frontier areas by providing technical and financial assistance in further determining if these areas warrant the establishment of a wind farm.
- tapping of Japanese technology to jump-start the development of wind energy projects

#### Financial Support

- Project Preparation Fund (PPF) managed by the Land Bank of the Philippines
- Loan Guarantee Fund (LGF) - LGU Guarantee Corporation, and Banco de Oro – Universal Bank will act as the Program Manager and Escrow Agent, respectively
- New and Renewable Energy Financing Programme (NREFP) managed by the Development Bank of the Philippines
- United Nations Development Programme-Global Environment Facility
- Philippine Export-Import Credit Agency

### Incentives

#### Fiscal Incentives:

- Income Tax Holiday (ITH) for 7 years
- Duty-Free Importation of RE Machinery, Equipment and Materials
- Special Realty Tax Rates on Equipment and Machinery.
- Net Operating Loss Carry-Over (NOLCO)
- Corporate Tax Rate of 10% on net taxable income after 7 years of ITH
- Accelerated Depreciation
- Zero Percent Value-Added Tax Rate
- Tax Exemption on Carbon Credits
- Tax Credit on Domestic Capital Equipment and Services - value-added tax and custom duties

### Other Benefits

- Renewable Portfolio Standard
- Priority connection to the grid
- Priority purchase and transmission by grid system operators
- Feed-in Tariff or price premium for electricity produced

### Costs of Doing Business

#### Average Investment Cost

P 84.6 Million/MW (US\$ 1.8 Million/MW)

#### Salaries and wages

Monthly Salary Range (in US dollars @ \$1 = P48)

- Engineers/Meteorologists – 833 to 854
- Plant Operators – 458 to 479
- Maintenance Personnel – 438 to 458
- Administrative Staff – 583 to 625

#### Taxes and royalties

- The government share on development projects is equal to one percent (1%) of the gross income resulting from the sale of renewable energy produced and such other income incidental to and arising from the renewable energy generation.

### Contacts

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