

## TECHNICAL ASSISTANCE COMPLETION REPORT

Division: Infrastructure Finance Division 2

TA No., Country and Name			Amount Approved: \$630,000	
TA 7569-PHI: Three Wind Farm Projects in Luzon			Revised Amount: NA	
Executing Agency: Alternergy Philippine Holdings Corporation (APHC)		Source of Funding: Asian Clean Energy Fund under the Clean Energy Financing Partnership Facility	Amount Undisbursed: \$42,200.14	Amount Utilized: \$587,799.86
TA Approval Date: 30 Jul 2010	TA Signing Date: 1 Sep 2010	Fielding of First Consultant: 24 Jan 2011	TA Completion Date Original: 30 Sep 2012    Actual: 30 Nov 2013	
			Account Closing Date Original: 30 Sep 2012    Actual: 20 Feb 2014	
<b>Description</b>				
<p>The government approved the Renewable Energy Act in 2008 (RE Act 2008), which aimed to accelerate the development of renewable energy (RE) resources in the country by increasing RE-based installed capacity from the 2010 level of 5,438 MW to about 15,304 MW by 2030. Of this target capacity addition, 2,345 MW was allocated to wind technology.</p> <p>A wind mapping study conducted by the US National Renewable Energy Laboratory in 1999 shows over 10,000 square kms. of windy land area exist with a combined capacity of about 70,000 MW. However, RE development, such as wind, has been relatively slow because of the high cost of feasibility assessments and of developing and constructing plants. As of 2010, the Philippines only had one wind power plant, the Northwind Bangui Bay Power Plant, in the northern part of the country with a capacity of 33 MW.</p> <p>In December 2008, Alternergy Philippine Holdings Corporation (APHC) was awarded by the Department of Energy (DOE) the exclusive right to develop wind power projects in 3 locations: Pililla in Rizal, Abra de Ilog in Occidental Mindoro, and Kalayaan in Laguna. These locations were among those identified under the Philippine Wind Atlas as potential sites for wind farms due to good to excellent wind resources. APHC was subsequently awarded additional wind energy service contracts in 3 other locations in 2009. APHC is committed to implement the wind projects if the wind measurements and site specific studies demonstrate that the power plants are commercially viable.</p> <p>APHC, a renewable power company which develops wind power projects, is headed by former Energy Secretary Vincent Perez. In September 2009, APHC entered into a joint venture with Eurus Energy Japan Corp. and Korea East West Power Co. (EWP). Eurus Energy is a subsidiary of Eurus Energy Holdings Corp. of Japan which is in turn owned by Tokyo Electric Power Co., Inc. (TEPCO) and Toyota Tsusho Corp, while EWP is a subsidiary of Korea Electric Power Corp. (Kepco). It should be noted though that Eurus Energy has since withdrawn from the project because of TEPCO's problems in Japan as a result of the tsunami in 2011. A private equity fund specializing in renewable energy has stepped in.</p> <p>The TA was provided to APHC, the Executing Agency (EA), to finance the first phase of the preparatory work for the construction of the 3 potential wind farm projects in Luzon. The TA would produce site-specific feasibility studies for each of the proposed locations to determine the viability for commercial operations of a wind power project.</p>				
<b>Expected Impact, Outcome and Outputs</b>				
<p>The expected impact of the TA was to improve energy security in the country through increased capacity of RE, and the corresponding outcome would be an increased momentum in the development of wind farm projects. After completion of the feasibility studies, APHC will commence the construction of the 3 wind power projects with a combined capacity of up to 150 MW.</p>				
<b>Delivery of Inputs and Conduct of Activities</b>				
<p>The TA was well-defined, and the TA resources were adequate. The consulting services contract was signed with Garrad Hassan Pacific Pty Ltd., Australia (GH) on 24 January 2011. GH was selected for its strong technical knowledge of the wind power industry and a highly competent team. The TA utilized 22.8 person-months of</p>				

international consultants (21 person-months planned), and 4 person-months of national consultants (6 person-months planned) from January 2011-November 2013 for the preparation of the site-specific feasibility studies.

The consultant performed satisfactorily and completed a number of tasks which included, among others, wind and energy assessments, preliminary environmental and social impact assessments, and grid connection studies. APHC financed the procurement of wind measurement equipment, and provided the necessary office accommodation, counterpart staff, and related facilities. APHC also provided the consultant with information and documents including a copy of the installation report, auto CAD maps of the 3 sites, and single line diagrams. Both APHC and ADB performed satisfactorily, maintaining effective coordination among all parties during implementation through conference calls, emails and several tripartite meetings. The funds provided by ADB helped APHC to properly assess the energy potential and feasibility of the 3 sites.

A minor change in TA implementation was approved in February 2013 to prioritize the development of the Pililla, Rizal wind farm site and expand the study to Pililla Stage 2, which covers the southern portion of the area, as initial findings showed certain limitations in wind resource and constructability in the Laguna and Mindoro sites. Construction of a wind power project in Abra de Ilog, Mindoro, in particular, is not feasible until either the National Grid Corporation of the Philippines or the Philippine government has installed a submarine cable connecting Mindoro and Luzon. Based on the initial findings, further studies on the Laguna and Mindoro sites were discontinued; unutilized TA budget for these sites were reallocated instead to fund the study for Pililla Stage 2. The change did not lead to an increase in TA budget but required an extension of the TA completion date for the implementation of the expansion activities. The original TA completion date was extended for 14 months in total.

### **Evaluation of Outputs and Achievement of Outcome**

The consultant achieved all the required deliverables in accordance with the consulting services contract. The feasibility reports include detailed wind, energy, and uncertainty assessments for the proposed wind farm projects in Luzon based on approximately 2 years of wind data recorded at the sites. In addition, the TA expanded the study of the Pililla wind farm to cover Phase 2 which was not initially envisaged

The TA output envisioned the construction and operation of the 3 wind power projects in Luzon following the completion of the feasibility studies. APHC, however, has opted to focus on the development of the Pililla wind farm site which demonstrated stronger technical viability. Phases 1 and 2 of the Pililla wind farm project will have a total capacity of 135 MW (67.5 MW for each phase). Both sites will be connected directly to the Manila Electric Company, or Meralco, the Philippines' largest distributor of electrical power. APHC has already completed the tender process for the Engineering, Procurement and Construction contract for the Pililla wind farm and is in process of arranging financing for construction of a 67.5MW Phase 1 wind farm project. This will fulfill the expected TA outcome of increasing the momentum in the development of wind farm projects in the country.

### **Overall Assessment and Rating**

The TA delivered its intended outputs. Progress reports prepared by the consultant were comprehensive, and recommendations were sound. The scope of the TA was further enhanced with the expansion of the Pililla wind farm study. Moreover, the TA is consistent with the government's RE program and supports the goal of promoting technology shifts to mitigate the increase of greenhouse gas emissions in the country. Overall, the TA is rated successful.

### **Major Lessons**

While the Philippines has enormous potential for wind power given its geographic location, there are other factors to consider in preparing an assessment of the feasibility of a wind power project, and RE projects in general. The establishment of the necessary infrastructure, policies, and mechanisms are essential to successfully incentivize such projects. Since December 2008 when the government approved the RE Act 2008 to promote the utilization of RE in the country, key components of such policy, such as the Feed-in-Tariff (FIT), were yet to be finalized. RE project developers waited a long time for passage of the FIT, installation targets, and implementing rules and regulation among others. On 12 June 2010, the Energy Regulatory Commission (ERC) issued the FIT rules and regulation and on 27 July 2012, approved the FIT and installation targets. The disbursement and collection guidelines for the FIT system were approved in February 2014.

The DOE issued on 28 May 2013 Department Circular No. DC2013-05-0009 (Guidelines for the Selection Process of Renewable Energy Projects Under Feed-In Tariff System and the Award of Certificate for Feed-In Tariff Eligibility) confirming DOE's policy to grant FIT eligibility on a first come-first served basis. Under said guidelines, upon DOE's validation of a project's successful commissioning (connected to the grid or distribution utility), it shall issue a

Certificate of Endorsement (COE) for FIT eligibility to ERC on a first come-first served basis. The DOE shall issue the COEs for FIT eligibility to completed projects until the approved installation target for each RE technology is fully subscribed. This new policy presented a new risk to RE projects and caught the developers and the financing community by surprise; it adversely affected debt financing of RE projects in general. Most projects are being initially financed by either equity or corporate finance. To date, the DOE has granted Certificate of Confirmation of Commerciality to 10 wind farm projects (including Pililla Phase 1) with total capacity of 635.5 MW. These projects, in different stages of construction, are vying for the 200 MW installation target for wind technology eligible for FIT.

**Recommendations and Follow-Up Actions**

ADB continues to monitor progress of the Pililla wind farm project. In the event financing is secured and project construction is mobilized, we expect at least one-third of the disbursed TA amount to be reimbursed to ADB.

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