



Positive Climate Care
0.70 MW Wind Power Project Activity
in the State of Gujarat,
India

Total Available Volume: **3007 VCUs**

Monitoring period:
April 1st, 2006 - June 30th, 2009

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VER PORTFOLIO DESCRIPTION

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Project Type	Type 1: Renewable Energy Projects
Project Locations	The project site is located at village <i>Bhandaria</i> under district <i>Bhavnagar</i> in the state of <i>Gujarat, India</i> .
Description of Project	The referenced small-scale project activity involves generation of wind power through operation of two wind electric generators (WEGs) of individual installed capacity of 0.35 MW each. The electricity generated is fed to the state electricity utility, i.e. Gujarat Electricity Board (GEB). The GEB grid is primarily based on fossil fuel dominated power plants, emitting significant amount of greenhouse gases in to the atmosphere. Hence, the current project displaces electricity from fossil fuel dominated plants and reduces the anthropogenic emissions of hazardous greenhouse gases.
Methodology	AMS I D - Grid Connected Renewable Electricity Generation Methodological Tool: "Tool to calculate the emission factor for an electricity system"; EB 35, Annex 12, version 01.1; Valid from: July 29 th , 2008
Volume / Vintage	817/ Year 2006 859/ Year 2007 923/ Year 2008 408/ Year 2009 Total Volume Available 3007 / (April 1 st , 2006 - June 30 th , 2009)
Transaction Type / Availability for Delivery	Out of the total issued volume 2190 VCUs are readily available for sale.
Unit Price	Quotes are welcome.
Verification Standard	Voluntary Carbon Standard (VCS) 2007.1
Monitoring Standard / Methodology	Title: "Grid connected renewable electricity generation" AMS I D, version 14; valid from 31 st July 2009 Reference: Clause 31 of Appendix B - the simplified modalities and procedures for small-scale CDM project activities. The first monitoring report submitted to VCS, covered the period from April 1 st , 2006 through June 30 th , 2009. The monitoring as per the AMS I D standard procedure includes measurement of electricity supplied to the grid by the project, with instruments approved for national standard electricity metering. Monthly joint meter reading of the exported electricity to grid is taken at uploading station of GEB (Gujarat Electricity Board), by the joint team of O&M contractor at wind farm and GEB personnel. The meter at the uploading station is under custody of GEB. Gujarat Electricity Development

	<p>Authority issues monthly certificate for actual power exported by each WEG on the wind farm. This reading is derived using above meters. Reading recorded in this certificate is used for calculation of actual estimations reduction. The meters located at the grid sub-station are sealed, maintained and calibrated by the state electricity utility. The procedure for metering is as per the provisions of the Wheeling & Banking agreement between the project proponent and the state electricity utility.</p> <p>At the WEG end, metering equipment is electronic tri-vector meters, which are self calibrated to ensure and maintain online system diagnostics. Records of joint meter readings are maintained at the site and a copy is maintained at the head office as well. All the meters are tested for accuracy every calendar year with reference to a portable standard meter. As the instruments are calibrated and marked at regular intervals, the accuracy of measurement can be assured at all times. Necessary records of calibration are maintained by state electricity board.</p> <p>For flawless round the clock performance of the turbines at the wind farm, and for responsibility of safety in operation as well as scheduled /breakdown maintenance requirements, the project proponent signed an operation and maintenance (O&M) agreement with the supplier of the wind turbines (WEGs), i.e. Suzlon. The agreement is for a period of 10 years. Suzlon adopted ISO 9001:2000 standard to perform and manage the O&M activities at the site.</p>
<p>Additionality</p>	<p>The entire Gujarat region is dominated mainly by coal based power plants and to some extent by hydro electric power plants. The project proponent (PP) showed their concern towards environmental protection by taking up this project activity despite of a number of barriers associated with it. The most important among them is the investment barrier. To prove the financial unattractiveness (without VCS benefits) of the wind power project, the PP carried out a detailed Investment Analysis of the project activity. Project IRR (Internal Rate of Return) was chosen as the financial indicator while Weighted Average Cost of Capital (WACC) was considered the suitable benchmark. The project IRR for the project activity without carbon benefits was estimated to be 10.04% which was lower than the benchmark IRR or WACC of 11.99%. The plant load factor (PLF) was determined the major variable influencing IRR. It encompasses variation in wind profile, variation in off-take (including grid availability) and machine downtime. Hence, the project was adjudged financially unattractive before accounting for carbon revenue.</p> <p>In addition to financial barrier, other barriers were also faced by the PP, including organizational barriers. The PP never ventured in such a power project activity before. Though wind farms are usually developed and maintained by developers on contract basis, but lack of knowledge about functioning, monitoring and operation of wind power projects is deemed a constraint. Moreover, the wind power project is a sheer diversification to power sector economies, where the PP has to meet challenges of power policies, delivery/non-delivery of power, techno commercial problems associated with electricity generation, distribution and dealing with power sector economies, bureaucracy etc. Another roadblock they faced was- late disbursement of funds from financial institution. The question of wind availability as per design discharges immediately raises the level of perceived risk by prospective financiers. The bank, therefore, refused to disburse funds, so PP borrowed the funds from their promoters for a short time. However, on repetitive request, the bank eventually disbursed funds two years past commissioning of the project activity.</p> <p>Last but not the least, frequent delay in signing of Wheeling and Banking Agreement with the GEB was an obstacle resulted in financial loss to investors as well as delay in project activities.</p> <p>Nevertheless, the consideration of carbon revenue that would be obtained through</p>

	sale of the emission reductions accrued from the project activity, increase the financial attractiveness of the project and make it financially viable .
Registry	APX VCS Registry System – Project ID 301
Co-Benefits	<p>The purpose of the project is to harness renewable energy in the state and country, and thereby displacing non-renewable natural resources, to be in line with the goals of sustainable economic and environmental development of the Government of India. Several co-benefits are associated with the ongoing project activity, such as:</p> <ul style="list-style-type: none"> • The project activity created immense employment opportunities in the project area during construction phase and it continues the same during operation and maintenance of the wind farms. Creation of direct and indirect employment opportunities in rural areas has long been recognized as a major concern for sustainable development and to stem the mass exodus from rural to urban areas. To this extent, the project activity directly addresses a core national concern. • The project contributes to the economic sustainability around the plant site which promotes decentralization of economic power. • The project activity also promotes industrial growth by catering to the energy needs arising out of the supply-demand gap of electricity. • The wind energy based electricity generation helps in displacing fossil-fuel burning in the system and thus less GHG emissions in the atmosphere. Use of renewable energy source (such as wind energy) also helps in conservation of natural resources like coal and petroleum fuels. • As wind power projects produce no end products in the form of solid waste (ash etc.), they address the problem of solid waste disposal encountered by most other sources of power. Also, as there is no fuel used for electricity generation, there is no effluent discharged into water bodies. • Wind farm marks step towards cleaner and inexhaustible source of energy . • Carbon Revenue would provide financial incentives, which encourage channelling more investment into cleaner energy projects and a lso results in improved returns to the project stakeholders.

Photographs Taken During Stakeholder Consultation Meeting





Wind Mill Photographs



