



VALIDATION REPORT

SHIBEISHAN WIND POWER GENERATION PROJECT IN HUILAI COUNTY, GUANGDONG PROVINCE IN CHINA

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VALIDATION REPORT

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Summary:

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” in China on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design, baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV’s opinion that the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province”, as described in the project design document version 4.0 dated 15 August 2008, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0002 version 06. Hence, DNV requests the registration of the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” as a CDM project activity.

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Table of Content	Page
1 INTRODUCTION	1
1.1 Validation Objective	1
1.2 Scope	1
1.3 Description of the proposed project	1
2 METHODOLOGY	2
2.1 Review of Documents	4
2.2 Follow-up Interviews	4
2.3 Resolution of Clarification and Corrective Action Requests	4
2.4 Internal Quality Control	5
3 VALIDATION FINDINGS	5
3.1 Participation Requirements	5
3.2 Project Design	5
3.3 Baseline Determination	6
3.4 Additionality	7
3.5 Monitoring Plan	10
3.6 Calculation of GHG Emissions	11
3.7 Environmental Impacts	12
3.8 Comments by Local Stakeholders	12
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS	12
5 VALIDATION OPINION	14
REFERENCES.....	15
Appendix A Validation Protocol	
Appendix B Certificates of Competence	



Abbreviations

BM	Build Margin.
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CSPG	China Southern Power Grid
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LOA	Letter of Approval.
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
NDRC	National Development and Reform Commission
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
SCE	Standard coal equivalent



1 INTRODUCTION

UpperHorn Investments Ltd. has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” (hereafter called “the project”) in China. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Ms. Qinghong (Rowena) Jiao	DNV Beijing	Team Leader, GHG Auditor
Mr. Peng Huang	DNV Beijing	GHG Auditor
Ms. Ming (Mindy) Yue	DNV Beijing	CDM Validator
Mr. Wilson Tang	DNV Beijing	Technical Reviewer (draft report)
Ms. Anu Chaudhary	DNV Pune	Technical Reviewer (final report)
Mr. Michael Lehmann	DNV Oslo	Energy Sector Expert

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD) /1/. The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 version 06. The validation team has, based on the recommendations in the Validation and Verification Manual /18/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of the proposed project

The “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” consists of the construction and operation of a wind park located in Jinghai Town, Huilai County, Jieyang City, Guangdong Province of China. The project consists of 167 wind turbines



with a nominal capacity of 600 KW, providing a total capacity of 100.2 MW. The estimated average annual electricity supplied to the grid is around 198 960 MWh.

The power generated using wind power resources will be sold to the Guangdong power grid which is part of the China Southern Power Grid (CSPG). The project will thereby displace equivalent amount of electricity generated by the current energy mix in CSPG.

The project construction permission was obtained on 20 August 2004 /13/. The project is expected to result in an average emission reductions of 177 333 tCO₂e/year during the seven years of a renewable crediting period.

2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design, baseline and monitoring plan
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /18/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term “clarification” may be used where additional information is needed to fully clarify an issue.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



2.1 Review of Documents

The project design document (PDD) /1/ version 1.0 dated 01 September 2006 submitted initially and final PDD version 4.0 dated 15 August 2008 along with additional background documents /4/ - /17/ related to the project design and baseline were assessed as a part of the validation.

2.2 Follow-up Interviews

On 20 November 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the desk review. Representatives of Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. and UpperHorn Investments Ltd. (shareholder of Guangdong Yudean Shibeishan Wind Power Development Co. Ltd.) were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
- Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. - UpperHorn Investments Ltd.	- Project background information. - Project technology, operation, maintenance and monitoring capability. - Project additionality. - Project monitoring and management plan. - Project approval status (incl. EIA approval, CDM project approval status) - Stakeholder consultation process. - Applicability of selected methodology. - Baseline determination. - Emission reductions calculation. - Emission reduction monitoring plan.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV, presented to the project participant in DNV's draft validation report of 15 November 2006 (rev 0) were resolved through communications with Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in Table 3 of the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. decided to revise the PDD and resubmitted the PDD as version 4.0 on 15 August 2008. After reviewing and assessing the revised PDD, DNV issued this final validation report and opinion.



Main changes between the version published for the 30 days stakeholder commenting period and the final version submitted for registration:

- *The project participant Tokyo Electric Power Co., Inc. and the Annex I party Japan have been added.*
- *The version CDM-PDD template has been changed from version 02 to version 03.*
- *The Tool for the demonstration and assessment of additionality has been changed from version 02 to version 03.*
- *The IPCC default values used for OM & BM calculation have been changed from IPCC 1996 to IPCC 2006.*

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

3.1 Participation Requirements

The project participants are Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. from China and the Tokyo Electric Power Co., Inc. from Japan. The host Party China and the participating Annex I Party Japan meet all relevant participation requirements.

The DNA of China has issued a Letter of Approval /2/, authorizing Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. as project participant and also confirming that the project contributes to China's sustainable development.

The DNA of the Japan has issued a Letter of Approval /3/, authorizing Tokyo Electric Power Co., Inc. as project participant.

No public funding from an Annex I Party is involved in the project and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

3.2 Project Design

The project involves the installation and operation of 167 wind turbines in Jinghai Town, Huilai County, Jieyang City, Guangdong Province, China. The physical boundary of the project includes the wind turbines and transmission system along with the CSPG as the electrical grid to which the project is physically connected. The project's spatial boundaries are clearly defined.



The installed capacity of each unit is 600 kW, thus constituting a total generation capacity of 100.2 MW. The installation also includes a central control room for control, measurement and surveillance of the wind farm /4/. The wind turbines employed are of the type S43/600 produced by Xinjiang Gold Wind Technology Co. Ltd., which is domestic wind power technology providing company. The project uses state of the art technology.

The proposed project activity is expected to supply 198 960 MWh per year to the Guangdong provincial grid, part of the China southern power grid (CSPG).

The project activity started on 20 August 2004 /13/. The expected operational lifetime of the project activity is 23 years. A renewable crediting period of 7 years has been chosen for the project, starting from 01 October 2008.

The emission reductions are estimated to be 177 333 tCO₂e per year and 1 241 331 tCO₂e over the first seven-year crediting period.

3.3 Baseline Determination

The project applies the approved baseline methodology ACM0002 (version 06), titled “Consolidated methodology for grid-connected electricity generation from renewable sources”.

The applied baseline methodology is justified as it has been demonstrated that the project activity fulfils the following criteria:

- It is a grid connected zero emission renewable power generation activity from wind energy.
- The project does not involve switching from fossil fuel to renewable energy at the project site.

The project boundary is clearly defined as the site of the project activity and the CSPG including the Guangdong, Yunnan, Guizhou provincial grids and Guangxi municipal region grid to which the project is physically connected. There are no significant transmission constraints between the power plants of the CSPG, and there is negligible electricity export or import between the CSPG and other connected grids. The defined project boundary is in line with ACM0002 (version 06).

In the baseline scenario the electricity generated from the project activity would have been generated by fossil fuels based grid-connected power plants and by the addition of new generation sources. This is reflected in the combined margin (CM) - the weighted average of the operating Margin (OM) emission factor and the build margin (BM) emission factor. The weighting is set respectively to 75% and 25%, the default values stipulated by ACM0002 (version 06) for wind farm projects.

The CSPG is dominated by coal-fired power plants. It is deemed likely that coal-fired power plants will continue to dominate the power sector due to the local availability of low-cost coal. It is expected that renewable capacity additions will not have significant effects on the mix of the CSPG during the first crediting period.

The baseline determination is transparent and reasonable.



3.4 Additionality

The additionality of the project has been established using the “*Tool for the demonstration and assessment of additionality*” version 03 approved by the CDM-EB.

It has been demonstrated by the chronological events that CDM revenues were considered for the project activity prior to the start of construction.

- a) 16 February 2004, received *Evaluation Report on Shibeishan Wind Farm* from the bank /8/ which stated that applying for CDM project is one of the conditions the project owner should meet to be granted loans on the project;
- b) 15 June 2004, the 1st CDM consulting agreement with GIEC was signed /10/;
- c) 28 September 2004, actual construction was started (construction permission was obtained dated 20 August 2004) /13/;
- d) 22 July 2005, a directorate decision was made to slow down the construction progress due to the great difficulties on expropriation of land and equipment quality etc resulting in increased investment costs /15/;
- e) 28 September 2005, 1st wind turbine was commissioned (the electricity generation was only 10% of total generation of the project) /16/;
- f) 19 July 2006, the 2nd CDM consulting agreement with Tsinghua University was signed to speed up the PDD development process and obtain CDM registration in order to overcome the financial difficulties the project is facing/17/;
- g) 16 September 2006, CDM validation is requested;
- h) 11 February 2007, all 167 wind turbines were commissioned /16/.

The project FSR was approved on 29 January 2004 by the National Development and Reform Committee./4/ According to Chinese policy the Project Participant shall not make any investment before government approval of the FSR /30/. The project was permitted construction on 20 August 2004 /13/. According to Chinese policy the Project Participant shall not start construction before government approval of the construction /30/ DNV checked the project construction start permission approved by Guangdong Province Development and Reform Committee [2004] No. 688, /13/ and verified that the start date of this project is 20 August 2004. The construction permit in August 2004 is considered as the earliest of implementation, construction and real action.

After corrections were asked for this project after EB41, DNV re-checked the Modification of Financial Analysis on Shibeishan Wind Farm which is a component of the project preliminary design report (PDR) /11/ and verified that 2004 was the first year of the financial analysis instead of the year 2003. DNV also checked the Audit Report of the project by Tin Wha Huayue CPAs Guangdong on 14 January 2005, in which it is clearly announced that no investment had been made by the Project Participant before the beginning of year 2004 /31/ .



Hence, DNV verified all related documents and can confirm that there have not been any investment made in the year 2003 and the first investment on the project was made after 20 August 2004, the project construction permit.

All the relevant evidences supporting the information above have been verified by DNV.

Step 1: Identification of the alternatives to the project activity consistent with the current laws and regulations.

The alternative scenarios identified for the project activity are:

- a) No construction of the proposed project, and the local power grid as the provider for the same electricity output as the proposed project;
- b) The proposed project not undertaken as a CDM project activity;
- c) Construction of a fossil fuel power plant with the same capacity or annual electricity output as the proposed project.
- d) Construction of another type of renewable energy power plant with the same capacity or annual electricity output as the proposed project.

The option c) construction of a fuel-fired power plant with the same capacity of annual electricity output does not comply with the Chinese law because coal-fired power plants with a capacity less than 135 MW are prohibited to be built in areas covered by large grids such as provincial grids¹ and the construction of fuel-fired power plant under 100 MW will be forbidden within the connected area². The project owner, Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. is dedicated to wind farm business. Other renewable energy power plants such as hydropower plant shall not be a viable alternative for an independent power producer investing in wind energy. The proposed project itself, if not undertaken as a CDM project activity, is unlikely to be the baseline scenario as shown in the investment analysis below. Therefore, the only realistic and credible alternative for the baseline scenario is option a) the equivalent output of electricity provided by the CSPG.

Step 2: Investment analysis.

The proposed project generates financial and economic benefits through the sale of electricity other than CDM related income. Therefore, the simple cost analysis (option I) can not be applied. The alternative for the baseline scenario of the proposed project is not a similar investment project so option II is not an appropriate one either. The benchmark analysis (option III of Step 2 of tool for the demonstration and assessment of additionality) is thus selected for conducting the investment analysis.

In China an IRR of 8% for total investment of a project is regarded as benchmark³ for investments in hydropower plants, fossil fuel fired plants and wind farm projects. Based on data

¹ Notice on Strictly Prohibiting the Installation of Fuel-fired Generators with the Capacity of 135MW or below issued by the General Office of the State Council, decree No. 2002-6.

² http://www.gov.cn/jrzq/2005-12/22/content_134220.htm

³ State Power Corporation of China. Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects. Beijing: China Electric Power Press, 2003



in the Modification of Financial Analysis on Shibeishan Wind Farm by Guangdong Electric Power Design Institute /11/, the project IRR without CER revenues is 7.05% which confirms that the project in the absence of CDM benefits is not financially attractive.

All the input parameters used in the financial analysis are taken from the Modification of Financial Analysis on Shibeishan Wind Farm, which is a component of the project preliminary design report (PDR). The PDR was developed by the Guangdong Electric Power Design Institute in July 2004, and approved by Guangdong Province Construction Bureau dated 30 July 2004 /11/. The input parameters used in the financial analysis are thus considered information provided by an independent and recognized source.

DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the PDR and was able to confirm that the values applied are the same.

The PDR was developed only one month prior to the project's starting date /13/. Given this short period of time, it is unlikely in the context of the project that the input values would have materially changed. It is thus reasonable to assume that the PDR has been the basis for the decision to proceed with the investment in the project.

The input parameters used in the financial analysis were compared with the data reported for other similar proposed CDM projects in Guangdong Province, by comparing investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs. The input parameters used in the financial analysis were also cross-checked by DNV with its sectoral information according to our own wind power expertise in China. By having done so, DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

A sensitivity analysis shows that changes in the total investment and the electricity output can have an impact on the project's financial performance. If the total investment decreases by 10%, the IRR of the project could exceed the benchmark. However, it is unlikely that the total investment will decrease by 10% as the majority of the investment is related to the purchase of wind turbines, which has been contracted /9/. If the electricity output increases by about 10%, the IRR of the project could exceed the benchmark. However, increasing the electricity output will result in an annual operational time of 2200 hours, which is unrealistic according to the actual historical operation data of two wind power projects (one is the two-year operation data of the proposed project, the other one is 7 year data from year 2000 to 2006 of Huilai Haiwanshi Wind Farm which is near the proposed project^{4,5,6}). All the data shows that the historical annual operation hours are less than 1800 h, which strongly demonstrates that it is very unlikely that the electricity output from the proposed project will increase by about 10%. The electricity tariff is not considered in the sensitivity analysis as the tariff has already been fixed because the proposed project is a Franchise Rights project⁷.

In conclusion, the investment analysis and sensitivity analysis show that the project activity is unlikely to be the most financially attractive option.

⁴ <http://baike.baidu.com/view/94079.htm>

⁵ "Certificate of main operation date for Guangdong Huilai Shibeishan Wind Farm Project", Guangdong Yudean Shibeishan Wind Power Development Co. Ltd, Oct, 2007 has been submitted to DOE.

⁶ "Certificate of main operation date for Guangdong Huilai Haiwanshi Wind Farm Project", Guangdong Wind Power Co.Ltd, Oct, 2007 has been submitted to DOE.

⁷ *Franchise Rights Agreement of Shibeishan Wind Farm Project*

*Step 3: Barrier analysis.*

A barrier analysis has also been conducted for the proposed project. The main barrier to the project activity is described as below:

Investment barriers: The high initial investment cost and low IRR leads to difficulties in obtaining commercial loan or attracting foreign capital for the proposed project. The *Evaluation Report of Shibeishan Wind Farm* by China Industrial and Commercial Bank Guangdong Branch /8/ shows that the bank agreed to grant loans to the project only when considering the incentive of the CDM.

The barrier mentioned above would not prevent the baseline scenario, i.e. an equivalent amount of electricity service provided by the CSPG.

Step 4: Common practice analysis.

The common practice analysis assesses the existing wind farm projects with installed capacity above 20 MW in China southern power grid /27/. This analysis shows that there are three similar wind farm projects with installed capacity above 20 MW. As per the guidance provided in EB 38 paragraph 60, “*project participants may exclude registered CDM project activities and project activities which have been published on the UNFCCC CDM website for global stakeholder consultation as part of the validation process*”. Two of the three projects have been registered as CDM projects and are hence excluded /28/. The third project, Guangdong Honghaiwan Wind farm, is thus the only project considered in the common practice analysis. Compared with the proposed project, Guangdong Honghaiwan Wind farm started construction before year 2002 when the *Notice of Electric Power Sector Reform Programme* was issued by State Council /29/. This reform came into force on 10 February 2002, and involved that former single national power companies were divided into regional companies, separating generation and distribution responsibilities, and shaping the tariff competition policy. Before the reform, the investment of the wind farms were decided by state government and the tariff was also decided by government, while after the reform, the investment and the tariff became more flexible. This project thus had a different regulatory framework and is not comparable with the proposed project activity. DNV confirmed all sources mentioned in the analysis and could conclude that the construction of a wind farm project of 100.2 MW is not a common practice in Guangdong province.

3.5 Monitoring Plan

The project applies the approved monitoring methodology ACM0002 “Consolidated monitoring methodology for zero emissions grid-connected electricity generation from renewable sources”. The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using wind energy.

The combined margin emission factor is determined *ex-ante* based on the most recent information available. Hence, the parameter monitored *ex-post* is the electricity supplied from the proposed project activity to the grid. The net electricity supplied by the project will be measured continuously and recorded monthly. This data will be cross verified against the sales receipt from the grid.

Leakage accounting is not required under ACM0002 and thus has not been considered for the project.



Monitoring of sustainable development indicators is not required by the Chinese DNA. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime.

The project's monitoring plan includes:

- A description of the responsibilities and authorities for project management,
- Procedures for monitoring and reporting, and QA/QC procedures,
- A description of the installation of metering equipment,
- Procedures for the calibration of metering equipment,
- A description of training and maintenance needs.

Detailed procedures have been elaborated and are in place. These will be maintained and implemented to enable subsequent verification of emission reductions.

3.6 Calculation of GHG Emissions

The emission reduction ER_y by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (Ly), as follows:

- 1) Baseline emissions: baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor (EF_y in tCO_2/MWh) for the China northeast power grid (CSPG) times the electricity supplied by the project activity to the grid (EG_y in MWh)
- 2) Project emissions: there are no emissions from the project since it is a renewable energy project
- 3) Leakage: no leakage has to be considered for the proposed project activity
- 4) Emission reduction: $ER_y = BE_y - PE_y - Ly = BE_y$

The baseline emission factor for the project is determined *ex-ante* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM).

For the calculation of the OM emission factor, the simple OM emission factor calculation method is selected due to limited data availability for applying a dispatch analysis and since low-cost/must run resources⁵ constitute less than 50% of total grid generation. The average emission factor for the grid for each fuel type is calculated *ex-ante* based on a 3-year full generation-weighted average of the most recent statistics available (data available for 2002, 2003, and 2004 at the time of PDD submission). The simple OM emission factor is calculated as 0.9998 tCO_2/MWh .

Because plant specific fuel consumption and electricity generation data is not publicly available in China, the EB guidance on the request for deviation titled "Application of AM0005 and AMS-I.D in China" /19/ has been applied:

- Use of capacity additions for estimating the build margin emission factor for grid electricity.
- Use of weights estimated using installed capacity in place of annual electricity generation.



- Use the efficiency level of the best technology commercially available in the provincial/regional or national grid of China, as a conservative proxy, for each fuel type in estimating the fuel consumption to estimate the build margin (BM).

Following the EB's guidance the build margin is calculated as follows:

- The capacity additions from the years 2002 to 2004 is chosen and this represents 21.07% of total installed capacity in 2004.
- The weight of installed capacity additions for coal-fired power plant and oil fired power plant accounted for 53.56% and 10.94% of total installed capacity additions, respectively.
- The standard coal consumption of 336.66g SCE/kWh for coal-fired power and 268.13g SCE/kWh for oil-fired power which are defined as the best technology commercially available in China by the DNA of China⁸ are used to determine the BM emission factor.
- The local value of 29.27 GJ/t standard coal equivalent, 25.8 tC/TJ for carbon content of the coal, 21.1 tC/TJ for carbon content of the oil and the IPCC 2006 default value of carbon oxidation factor of 100% are used to calculate the BM.
- The BM emission factor is calculated *ex-ante* as 0.5658 tCO₂/MWh.

The weights ω_{OM} and ω_{BM} are selected as 0.75 and 0.25, respectively, as stipulated for wind project by ACM0002 (version 06). The combined margin emission factor of 0.8913 tCO₂/MWh is fixed *ex-ante* for the entire first crediting period.

The data used to calculate OM and BM emission factors are derived from the China Energy Statistical Yearbooks 2000-2005 and China Power Electric Power Yearbooks 2003 to 2005. These are the most recent statistics available at the time of PDD submission.

3.7 Environmental Impacts

An Environmental Impact Assessment (EIA) has been conducted according to Chinese law & regulation. The potential environmental impacts have been sufficiently identified. No significant environmental impacts are expected from the project activity. The local Environmental Protection Bureau has approved the project activity on 8 August 2006 /5/.

3.8 Comments by Local Stakeholders

On 01 September 2004, the project owner held a public comment meeting in Huilai County. The public representatives are from Jinghai Town and the Qianzhan Town of Huilai County. There were no adverse comments on the project activity and all comments are supportive of the project /14/. A summary of comments was provided and reviewed by DNV.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The project design document of 01 September 2006 was made publicly available on DNV's climate change website⁹ and Parties, stakeholders and NGOs were through the CDM website

⁸ <http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1051.pdf>

⁹ http://www.dnv.com/focus/climate_change/projects/projectdetails.asp?ProjectId=768



invited to provide comments during a 30 days period from 16 September 2006 to 15 October 2006.

No comments were received during this period.



5 VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is China and the Annex I Party is Japan. Both countries fulfil the participation criteria and have approved the project and authorized the project participants. The DNA of China confirmed that the project assist in achieving sustainable development.

The project correctly applies ACM0002 version 06: “Consolidated baseline & monitoring methodology for grid-connected electricity generation from renewable sources”.

By generating renewable energy the project will displace grid electricity from China Southern Power Grid (CSPG). The project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 177 333 tCO₂e per year over the first 7-year crediting period. The emission reduction forecast has been checked, and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training, operating, maintenance and monitoring procedures will be finalised and put in place prior to the start of the crediting period.

In summary, it is DNV’s opinion that the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” in China as described in the PDD version 4.0 of 15 August 2008 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 version 06. DNV thus requests the registration of the “Shibeishan Wind Power Generation Project in Huailai County, Guangdong Province” as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ Ms. Tong Qing, Global Climate Change Institute of Tsinghua University: CDM PDD Version 1.0 dated 01 September 2006, version 3.0 dated 03 September 2007, and revised version 4.0 dated 15 August 2008.
- /2/ Letter of Approval issued by DNA of China dated 13 December 2006.
- /3/ Letter of Approval issued by DNA of Japan dated 03 April 2007.
- /4/ Project feasibility study report in November 2003 and approval letter by National Development & Reform Commission dated 29 January 2004.
- /5/ Environmental impact assessment in July 2006 and approval letter by local Environmental Protection Bureau dated 08 August 2006.
- /6/ Training plan and records by Guangdong Yudean Shibeishan Wind Power Development Co. Ltd.
- /7/ The minutes for pre-evaluation of the bank loan, January 2004
- /8/ China Industrial and Commercial Bank Guangdong Branch: *Evaluation Report on Shibeishan Wind Farm*, February of 2004.
- /9/ Wind turbines purchase contract, March 2004
- /10/ Consulting agreement between the project owner and China Academy of Sciences Guangzhou Institute of Energy Conversion (GIEC) dated 15 June 2004.
- /11/ Guangdong Electric Power Design Institute: Modification of Financial Analysis on Shibeishan Wind Farm-- component of the project preliminary design report (PDR) of July of 2004 and the approval letter of the PDR by Guangdong Province Construction Bureau dated 30 July 2004.
- /12/ The 1st Directorate decision for *Shibeishan Wind Farm project dated 21 July 2004*
- /13/ The notice of new start construction projects for the 8th & 9th group of 2004 issued by Guangdong province NDRC dated 20 August 2004 (Doc. No: [2004] 688#)
- /14/ Meeting memo of the stakeholder consultation, 01 September 2004
- /15/ The 2nd Directorate decision for *Shibeishan Wind Farm project dated 22 July 2005*
- /16/ *The important events record of project construction* by Guangdong Yudean Shibeishan Wind Power Development Co., Ltd. (Evidences for the 1st wind turbine commissioned dated 28 September 2005 & 167 wind turbines commissioned dated 11 February 2007)
- /17/ Consulting agreement between the project owner and Tsinghua University dated 19 July 2006

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /18/ International Emission Trading Association (IETA) & the World Bank's Prototype



- Carbon Fund (PCF): Validation and Verification Manual. <http://www.vvmanual.info>
- /19/ CDM Executive Board: ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” version 06 of 19 May 2006.
 - /20/ CDM Executive Board: Tool for the demonstration and assessment of additionality, version 03, EB 29 meeting.
 - /21/ China Electric Power Yearbook 2003-2005
 - /22/ China Energy statistical Year book 2000-2005
 - /23/ Chinese National Standard GB2589-81
 - /24/ CDM Executive Board: Guidance for request for deviation titled “Application of AM0005 and AMS-I.D in China” (<http://cdm.unfccc.int/Projects/Deviations>)
 - /25/ Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories
 - /26/ State Power Corporation of China. Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects. Beijing: China Electric Power Press, 2003
 - /27/ The Statistics of China Wind Farm Installed Capacity 2006, webpage:
<http://www.cwea.org.cn/upload/200612391640820.doc>
 - /28/ Guangdong Nanao Wind farm, EB registration webpage:
<http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1144397841.66/view> Guangdong Jiadong Wind farm ,EB registration webpage:
<http://cdm.unfccc.int/Projects/DB/BVQI1189424843.32/view>
 - /29/ The Notice on Issuing Electric Power Sector Reform Programme by State Council on 10th February 2002.
 - /30/ The policy the Project Participant shall not make any investment before government approval of the FSR , Webpage
: <http://www.law110.com/law/jiwei/16044.htm>; <http://www.cec.org.cn/news/showc.asp?ID=11937>
 - /31/ The Audit Report of Guangdong Yudean Shibeishan Wind Power Development Co. Ltd. dated 14th Jan 2005 and a Certificate dated 5th Jun 2008 issued by Tin Wha Huayue CPAs Guangdong. And the web page of the CPAs :
<http://www.gdtwhycpa.com/index2.asp>

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /32/ Guangdong Yudean Shibeishan Wind Power Development Co. Ltd.
Mr. Cai Chun
- /33/ UpperHorn Investments Ltd.
Mr. Wang Hui, Mr. Shen Ying

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR 1 OK	LoA by DNA of China has been received.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR 1 OK	The written approvals of voluntary participation from China and Japan have been received.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	The validation did not reveal any information that indicates that the project can be seen

Requirement	Reference	Conclusion	Cross Reference / Comment
			as a diversion of official development assistance (ODA) funding towards China.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	DNA of China is the State Development and Reform Commission DNA of Japan is the Liaison Committee for the Utilization of the Kyoto Mechanisms Ministry of Foreign Affairs.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	China ratified the Kyoto Protocol on 30 August, 2002. Japan ratified the Kyoto Protocol on 4 June 2002.
➤ The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The Japan assigned amount is 94% of the emissions in 1990.
➤ The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	The validation has not in detail assessed Japan's compliance with article 5 and 7 of the Kyoto Protocol. UK

Requirement	Reference	Conclusion	Cross Reference / Comment
			has in place a national system for estimating GHG emissions and annually submits its most recent inventory to the UNFCCC.
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
12. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD was published on www.dnv.com/certification/ClimateChange , Parties, stakeholders and NGOs were invited through the UNFCCC CDM

Requirement	Reference	Conclusion	Cross Reference / Comment
			website to provide comments on the validation requirement during a period of 30 days, from 16 September 2006 to 15 October 2006.
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	The PDD is in line with PDD format version 3.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/ /4/	DR	Yes. The project is located in Jinghai Town, Huilai County, Jieyang City, Guangdong Province of China.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The China southern (regional) power grid (CSPG) is defined as the project system boundaries.		OK
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes. The project design engineering reflects current good practices in China.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /27/	DR I	Yes. The wind turbines employed are S43/600 produced by Xinjiang Gold Wind Technology Co. Ltd., which is domestic wind power technology. The project uses state of the art technology.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within	/1/	DR	The project technology is unlikely to be substituted by other or more efficient		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Page A-5

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
the project period?			technologies within the first crediting period.		
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/ /6/ /27/	DR I	Yes. Training is required for the project.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/ /6/ /27/	DR I	Training has been provided by the project owner and Xinjiang Gold Wind Technology Co. Ltd.		OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /4/ /5/	DR	Yes. The project has been approved by the National Development & Reform Commission. The EIA has been approved by the local Environmental Protection Bureau.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/ /2/	DR	The letter of approval from the DNA of China confirming the project being in line with the host country CDM requirements has not been received.	CAR1	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/ /2/	DR	The letter of approval from the DNA of China confirming the project being in line with the sustainable development policies of the host country has not been received.	CAR1	OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. The project will also mitigate local environmental pollution caused by gas, water and solid waste emissions from fossil fuel power generation.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/ /19/	DR	Yes. The project applies ACM0002 (version 06) "Consolidated monitoring methodology for grid-connected electricity generation from renewable sources".		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /19/	DR	Yes. The project is a capacity addition from a renewable energy source and does not involve on-site fuel switch from fossil fuels to a renewable source. The geographic and system boundaries for the relevant electricity grid (China southern power grid, CSPG) can be clearly identified.		OK
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/ /19/	DR	Yes. The baseline is determined as continued operation of the existing power plants and the addition of new generation		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			sources to meet electricity demand.		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	Yes.		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	Yes. The project specific situation is taken into account.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Yes. The renewable energy law, sectoral policy and development trends in CSPG have been taken into account.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/ /21/ /22/	DR	Yes. The latest data at the time of PDD submission (September 2006) is the year of 2004 derived from the China Electricity Power Yearbook 2005 and China Energy Statistical yearbook 2005.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/ /19/	DR	Yes. The continuation of the operation of the existing power plants and the addition of new generation sources to meet electricity demand represent the most likely baseline scenario.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/ /4/ /13/ /11/ /20/ /26/	DR	The project additionality is demonstrated by applying the "Tool for the demonstration and assessment of additionality" version 03. The starting date of the project activity, i.e. 20 August 2004, is before the date of validation. Evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity should be provided. <i>Step 1: Identification of the alternatives to the project activity consistent with the</i>	CL-1	OK

* State Power Corporation of China. Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects. Beijing: China Electric Power Press, 2003

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			current laws and regulations. It has been demonstrated that the only realistic and credible alternative for the baseline scenario is the equivalent capacity or electricity service provided by the CSPG. <i>Step 2: Investment analysis.</i> Benchmark analysis (Option III of Step 2) is justified to conduct the investment analysis. - The benchmark IRR of 8 % for total investment of project is regarded as a benchmark* for investing in the hydropower, fossil fuel fired plants, also the windfarm projects in China is selected as the benchmark for the investment analysis of the proposed project. - The IRR in investment analysis has been calculated with a number of assumptions than differ from the feasibility study. The project developer is requested to justify the increase of the total investment and decrease of electricity tariff with respect to the investment and electricity tariff foreseen in the feasibility study. <i>Step 3: Barrier analysis.</i> A barrier analysis has been conducted as supplementary to the investment analysis. The main barrier to the project activity is considered as below: Investment barrier: the high initial investment cost and low IRR lead to difficulties in obtaining commercial loan or	CL-2	

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			attracting foreign capital for the proposed project. The barrier mentioned above would not prevent the baseline scenario- equivalent electricity provided by the China northeast power grid- from implementation. <i>Step 4: The common practice analysis.</i> References need to be provided for the analysis in common practice as to the listed wind farms in China southern region and the statement that the referred projects have applied or plan to apply CDM registration.	CL-3	
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	There are no significant risks to the baseline except the enforcement of the Chinese renewable law. However, as this law is being implemented only now, i.e. after the entry into force of decision 17.CP 7. It does not need to be taken into account.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/ /13/	DR	Yes. The project construction permission was obtained on 20 August 2004. The estimated lifetime of the project is 23 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A renewable crediting period (7 years) is selected starting on 01 October 2008.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/ /19/	DR	The project applies the approved monitoring methodology, ACM0002 Version 06 "Consolidated monitoring methodology for grid-connected electricity generation from renewable sources".		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/ /19/	DR	Yes. The project is a grid-connected renewable power generation (wind sources) project activity.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Yes. The electricity generated delivered to the CSPG will be directly monitored. This reflects good practice.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/ /19/	DR	There are no emissions from the project activity.		OK
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /19/	DR	Project participants do not need to consider leakage in applying this methodology.		OK
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	The project uses the <i>ex-ante</i> determination of emission factor for grid electricity. Only electricity generated will be monitored and double checked with the invoice of electricity sold to the grid. In the data monitored, the description of measurement methods and procedures to be applied should include a specification which accepted industry standards or	CL-4	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/ /13/	DR	The choice of baseline indicators is in line with ACM0002.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	The electricity generated will be directly monitored.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	The baseline emissions will be calculated based on the net electricity supplied to the grid and double checked with invoices.		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	DNA of China does not require collection and archiving of data related to environmental, social and economic impacts. The environmental impacts will be monitored by local environmental authority.		OK
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/1/	DR	The indicators of environmental impacts will be stipulated by local environmental authority.		OK
D.5.3. Will it be possible to monitor the specified	/1/	DR	Yes. This will be on local authority decision.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
sustainable development indicators?					
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/ /5/	DR	Yes. This will be on local authority decision.		OK
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	The authority and responsibility of project management is clearly described in the management manual.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	Further information on the authority and responsibility for registration, monitoring, measurement and reporting needs to be described.	CL-5	OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Detailed procedures are needed and have to be elaborated.	CL-6	
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No emergency situation which can cause unintended emissions is expected from the project.		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Detailed procedures are needed and have to be elaborated.	CL-6	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Item	CL-6	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Item	CL-6	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process	/1/	DR	Item	CL-6	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
performance documentation)					
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Item	CL-6	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	Item	CL-6	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Item	CL-6	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	Item	CL-6	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Item	CL-6	OK
E. Calculation of GHG Emissions by Source					
<i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1. Project GHG Emissions					
<i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/ /19/	DR	Project emission is regarded as zero as the project is a renewable energy (wind source) project.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2.Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/ /19/	DR	There are no leakages that need to be considered in applying this methodology.		OK
E.3.Baseline Emissions <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	All the power plants connected to the SCPG are included for calculating the OM and BM.		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes. The China southern power grid (SCPG) is clearly defined as the baseline boundaries.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/ /19/ /21/ /22/ /24/ /25/	DR	Yes. Baseline emissions are calculated as the net electricity generated from the renewable source times the CSPG emission factor. The grid emission factor is correctly calculated in line with ACM0002 as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM). The data used to calculate OM is derived from the China Energy Statistical Yearbooks		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			of the years 2000 to 2005. The data used to calculate the BM is derived from China Power Electric Power Yearbooks of the years 2003 to 2005. These are the most recent statistics available at the time of PDD submission.		
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes.		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Yes.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Yes.		OK
E.4.Emission Reductions <i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	Yes.		OK
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /5/	DR	Yes. The impacts on air, water, and the neighbourhood environment are elaborated in the PDD.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /5/	DR	The Environment Impact Assessment and its approval need to be provided.	CL-7	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
F.1.3. Will the project create any adverse environmental effects?	/1/ /5/	DR	The EIA needs to be provided.	CL-7	OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /5/	DR	There are no transboundary environmental impacts foreseen for the project.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /5/	DR	Yes.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/ /5/	DR	Yes.		OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/ /14/	DR	Detailed information is needed on the local stakeholder process regarding the media to invite for comments and the specific groups or individuals consulted.	CL-8	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /14/	DR	Detailed information is needed on the local stakeholder process regarding the media to invite for comments and the specific groups or individuals consulted.	CL-8	OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/ /5/ /14/	DR	Yes. The stakeholder consultation process is in accordance with Chinese EIA regulations.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/ /14/	DR	Yes. A summary of the stakeholder comments received is described in the PDD.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
G.1.5. Has due account been taken of any stakeholder comments received?	/1/ /14/	DR	There were no adverse comments on the project activity.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1 The letters of approval for the project from DNAs of China and Japan have not been received.	Table 1	The Project received the LoA from DNA of China on 13 Dec 2006 and received the LoA from DNA of Japan on 3 April 2007.	OK. The CAR is closed.
CL 1 The starting date of the project activity, i.e. 28 September 2004, is before the date of validation. Evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity should be provided.	B.2.7	The <i>Evaluation Report on Shibeishan Wind Farm</i> by China Industrial and Commercial Bank, Guangdong Branch dated February 2004 was submitted as the evidence of considering CDM. In the report, the bank agreed to grant a loan to the project owner relying on the project owner's considering that the project risks would be partially compensated by the potential CER revenues.	OK. The <i>Evaluation Report on Shibeishan Wind Farm</i> has been verified by DNV. It has been demonstrated that the incentive of CDM was considered in the decision to proceed with the project. The CL is closed.
CL 2 The IRR in investment analysis has been calculated with a number of assumptions than differ from the feasibility study. The project developer is requested to justify the increase of the total investment and decrease of electricity tariff with respect to the investment and electricity tariff foreseen in the feasibility study.	B.2.7	All data for the IRR calculation are from the <i>Modification of Financial Analysis on Shibeishan Wind Farm</i> . The results of both IRR and sensitivity analysis are revised accordingly.	OK. The IRR calculation in the investment analysis has been updated using the data in the <i>Modification of Financial Analysis on Shibeishan Wind Farm</i> . The result has been verified to be below the benchmark. The CL is closed.
CL 3 References need to be provided for the analysis in common practice as to the listed wind farms in China southern region and the statement that the referred projects have applied or plan to apply CDM registration.	B.2.7	The reference to the listed wind farms in China southern region is http://www.cwea.org.cn/upload/200612391640820.doc. The references to the statement that the referred projects have applied or plan to apply CDM registration are http://www.ycwb.com/gb/content/2005-	OK. The references have been verified and deemed reliable. The CL is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		02/28/content_856358.htm and http://www.shanwei.sti.gd.cn/kjgg/filygg.doc .	
CL4 In the data monitored, the description of measurement methods and procedures to be applied should include a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval.	D.4.1	The monitoring plan will be executed and implemented by the monitoring principal who is appointed by the project owner. The local power grid company should cooperate in the check of data. The monitoring equipments in this monitoring plan are equipments to measure the electricity output to the grid, such as the meters. The meters should meet the standard of national I type measurement reaching 0.5S of the precision and the license of Grid-connected Electric Equipments of Guangdong Province. The meters are produced by Hunan Weisheng Company and Shenzhen Kelu Electrical Company. The project site will install two series of measurement and monitoring equipments, one as the main equipment and the other as standby. Guangdong Province Electric Science Institute will do on-site calibration of the monitoring equipments every year.	OK. The procedures have been included in the monitoring plan. The CL is closed.
CL5 Further information on the authority and responsibility for registration, monitoring, measurement and reporting needs to be described.	D.6.2	The automatic measurement system will automatically read, transmit and copy all the data which are the original data for monitoring. The monitoring principal will arrange the unit operators to collect the electricity data monthly. At the end of each month, the monitoring data measured in the whole month will be copied into a CD and also printed out. The monitoring principal also needs to save the copies of	OK. The information on the authority and responsibility for registration, monitoring, measurement and reporting have been included. The CL is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		electricity sales slip which the project owner provides for the power grid and the balance receipts which the local power grid provides for the project owner in order to check the data. The final electricity connected to the grid should be added and gathered each year. The electrical and paper documents of data should be kept in the whole crediting period and two years after of the crediting period.	
CL-6 The procedures for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance has not been be elaborated.	D.6.3 D.6.5-13	The procedures for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance has been included.	OK. The CL is closed.
CL-7 The Environment Impact Assessment and its approval need to be provided.	F.1.2 F.1.3	The Environment Impact Assessment and its approval have been provided.	OK. The Environmental Assessment Report of the proposed project was completed by South China Institute of Environmental Sciences in July 2006 and the EIA was approved by the Environmental Protection Bureau of Jieyang City on 8 August 2006. The CL is closed.
CL-8 Detailed information is needed on the local stakeholder process regarding the media to invite for comments and the specific groups or individuals consulted.	G.1.1	Detailed information on the local stakeholder process regarding the media to invite for comments and the specific groups or individuals consulted have been included.	OK. The CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0030	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0031	Yes
ACM0004, ACM0012	Yes	AM0032	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0035	Yes
ACM0007	Yes	AM0038	Yes
ACM0008	Yes	AM0041	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0034	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0043	
AM0009, AM0037	Yes	AM0046	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	AM0047	
AM0014	Yes	AMS-II.A-F, AM0044	Yes
AM0017	Yes	AMS-III.A	Yes
AM0018	Yes	AMS-III.E, AMS-III.F	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Anu Chaudhary

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

GHG Auditor: Yes

CDM Validator: Yes

JI Validator: Yes

CDM Verifier: --

JI Verifier: --

Industry Sector Expert for Sectoral Scope(s): --

Technical Reviewer for (group of) methodologies:

ACM002, AMS-IA-D, AM0019, AM0026, Yes
AM0029, AM0045

Høvik, 26 September 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Qinghong (Rowena) Jiao

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 18 July 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Wilson Tang

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 13		
Technical Reviewer for (group of) methodologies:			
<i>ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G</i>	Yes		
<i>ACM002, AMS-IA-D, AM0019, AM0026, AM0029</i>	Yes		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Mindy (Ming) Yue

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 24 January 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director