



VALIDATION REPORT

CGN INNER MONGOLIA DUERBOTE WIND FARM PROJECT IN CHINA

REPORT No. 2008-1050

REVISION No. 02



VALIDATION REPORT

Date of first issue: 2008-11-05	Project No.: 63602422
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Project Name: CGN Inner Mongolia Duerbote Wind farm Project
Country: China
Methodology: ACM0002
Version: 07
GHG reducing Measure/Technology: Wind power
ER estimate: 120 363 tCO₂e/year during the renewable crediting period of 7 years
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☒ Corrective Actions Requested
☒ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is DNV's opinion that the CGN Inner Mongolia Duerbote Wind farm Project in China, as described in the PDD version 3.0 of 4 December 2008, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002, version 07. DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2008-1050	Date of this revision: 2009/02/11	Rev. No. 02
Report title: CGN Inner Mongolia Duerbote Wind farm Project in China		
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Key words:
Climate Change
Kyoto Protocol
Validation
Clean Development Mechanism

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Abbreviations

BM	Building 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
CM	Combined Margin
DNV	Det Norske Veritas
DNA	Designated National Authority
EIA	Environmental Impact Assessment
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Return Rate
LoA	Letter of Approval
MP	Monitoring Plan
NCPG	North China Power Grid
NCV	Net Caloric Value
NDRC	National Development and Reform Committee
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
SCE	Standard Coal Equivalent
SEPA	State Environmental Protection Administration
SERC	State Electricity Regulatory Commission
RMB	Renminbi, Chinese currency (yuan)
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax



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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the CGN Inner Mongolia Duerbote Wind farm Project in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party 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 United Kingdom of Great Britain and Northern Ireland. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA from China confirmed that the project assists in achieving sustainable development.

The project correctly applies ACM0002 Version 07 “Consolidated methodology for grid-connected electricity generation from renewable sources”.

By generating renewable energy which will displace electricity in the North China Power Grid, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefit 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 120 363 tCO_{2e} per year over the selected 7 year renewable 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.

The monitoring methodology ACM0002 has been correctly applied and the monitoring plan sufficiently provides for collection of data to determine the project’s emission reductions. Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the CGN Inner Mongolia Duerbote Wind farm Project in China, as described in the PDD version 3.0 of 4 December 2008 meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002. DNV thus requests the registration of the project as a CDM project activity.



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2 INTRODUCTION

Carbon Resource Management Ltd has commissioned DNV to perform a validation of the CGN Inner Mongolia Duerbote Wind farm Project in China (hereafter called “the project”). This report summarises the findings of the validation of the project, performed 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.

2.1 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).

2.2 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. The validation team has, based on the recommendations in the Validation and Verification Manual /4/ 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.



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3 METHODOLOGY

The validation consisted of the following three phases:

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

- /1/ Project Design Document for CGN Inner Mongolia Duerbote Wind farm Project, version 1.0 of 2 April 2008 and version 3.0 of 4 December 2008.
- /2/ Letter of Approval issued by China DNA in July 2008.
- /3/ Letter of Approval issued by United Kingdom of Great Britain and Northern Ireland DNA on 22 October 2008.
- /4/ CDM Executive Board: “*Validation and Verification Manual*”, version 01, adopted at annex 3 of EB44: <http://cdm.unfccc.int/EB/index.html>.
- /5/ CDM Executive Board: ACM0002 Approved methodology, “*Consolidated methodology for grid-connected electricity generation from renewable sources*”, version 07 of 30 November 2007.
- /6/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, version 05.2 of 26 August 2008, adopted at EB39.
- /7/ CDM Executive Board: “*Tool to calculate the emission factor for an electricity system*”, version 01.1 of 29 July 2008, adopted at EB35.
- /8/ CDM Executive Board, Guidance for request for deviation titled “*Application of AM0005 and AMS-I.D in China*” (<http://cdm.unfccc.int/Projects/Deviations>).
- /9/ Feasibility Study Report (FSR) of CGN Inner Mongolia Duerbote Wind farm Project prepared by Inner Mongolia Power Exploration & Design Institute dated October 2007 and the approval letter by Development and Reform Committee of Inner Mongolia Autonomous Region dated 11 March 2008.
- /10/ Environmental Impact Assessment (EIA) of CGN Inner Mongolia Duerbote Wind farm Project prepared by the Inner Mongolia Power Exploration & Design Institute dated 23 October 2007 and the approval letter by Environmental Protection Bureau of Inner Mongolia Autonomous Region dated 17 December 2007.
- /11/ IPCC 2006 Guidelines for National Greenhouse Gas Inventories.
- /12/ China Electric Power Yearbook 2003-2007.
- /13/ China Energy Statistical Yearbook 2005-2007.



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- /14/ China NDRC, the emission factor calculation for each power grid of China, NDRC official website:
<http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2008/20081230102527637.pdf>.
- /15/ *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, Beijing: China Electric Power Press, 2003.
- /16/ The General Office of the State Council, *Notice on Strictly Prohibiting the Installation of Fuel-fired Generation with the Capacity of 135MW or below*, Decree No.: 2002.6.
- /17/ Financial Analysis Spreadsheet and Emission Reduction Spreadsheet.
- /18/ Intention letter on grid connection of CGN Inner Mongolia Duerbote Wind farm Project between CGN Wind Power Co., Ltd and Inner Mongolia Power (Group) Co., Ltd. dated 3 January 2008.
- /19/ Corporation license of CGN Wind Power Co., Ltd approved by Administration for Industry and Commerce of China, Registered No.:1000001004072.
- /20/ The construction contract of CGN Inner Mongolia Duerbote Wind farm Project signed between the project owner and China Second Metallurgy Construction Co., Ltd in June 2008.
- /21/ On-grid tariff approval document of CGN Inner Mongolia Duerbote Wind farm Project issued by NDRC, [2007] No.:3303, dated 3 December 2007.
- /22/ Preliminary approval for the land use of CGN Inner Mongolia Duerbote Wind farm Project by Inner Mongolia Department of Land and Resources, [2007] No.:398, dated 29 December 2007.
- /23/ Land using agreement between CGN Wind Power Co., Ltd and the Siziwangqi government dated April 2008, Contract No: WPC-08-154-C.
- /24/ Project construction starting permission by Inner Mongolia Kangyuan construction supervision Co., Ltd, dated 8 May 2008.
- /25/ Stakeholder questionnaires of CGN Inner Mongolia Duerbote Wind farm Project dated March 2008.
- /26/ The personnel training plan for Duerbote Windfarm staff issued by CGN Wind Power Co., Ltd dated 20 June 2008.
- /27/ CDM Monitoring and Quality Control Manual by CGN Wind Power Co., Ltd dated May 2008.
- /28/ Wind turbines purchase contract of CGN Inner Mongolia Duerbote Wind farm Project between CGN Wind Power Co., Ltd and Beijing Goldwind Science & Technology Ltd dated 29 April 2008.
- /29/ The meeting minutes of decision the proposed project as CDM project issued by the project owner on 8 November 2007.
- /30/ The contract on the purchase of CER (ERPA) signed between the project owner and Carbon Resource Management Ltd on 25 January 2008.
- /31/ The *Renewable Energy Law* issued by the Standing Committee of the National People's Congress on 28 February 2005.
- /32/ The solar PV is hardly to be developed and applied due to its lack of policy-encouragement, poor technical innovation and experts, lack of financial support:



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- http://www.newenergy.org.cn/html/0067/2006710_10767.html.
- /33/ Biomass is ruled out due to its lack of R&D competence, undeveloped market and bad management:
http://www.sdpc.gov.cn/zjgx/t20071123_174054.htm.
- /34/ The new renewable energy is being blocked by high cost:
<http://www.chinaenergy.gov.cn/news.php?id=15688>.
- /35/ No hydro energy resource available in the project site:
<http://www.shuidianzhan.net/snzy/250.html>.
- /36/ Data comparison for ACM0002 and AMS-I.D projects in China summarized by DNV.
- /37/ The price of the raw material such as steel and copper is increasing, which results in the price of wind turbines and equipments increasing, published by People's Daily:
<http://energy.people.com.cn/GB/5720709.html>.
- /38/ Governmental policies have obvious impact on the development of wind farm projects and the tariff are lowered markedly:
<http://www.eri.org.cn/manage/upload/uploadimages/eri200672795944.pdf>.
- /39/ Wind resource distribution diagram in China:
http://cwera.cma.gov.cn/upload/b_2_left_02.jpg.
- /40/ Cumulative wind installation in China till 2007:
http://www.cwea.org.cn/download/display_info.asp?cid=&sid=&id=19.
- /41/ Huitengxile wind project supported by Shuangjia Demonstration and soft loan from developed countries:
<http://www.nwtc.cn/Article/ShowArticle.asp?ArticleID=814>.
- /42/ Dali phase III wind project supported by national debt fund:
<http://www.chifeng.gov.cn/article/ReadNews.asp?NewsID=4141&BigClassID=1&SmallClassID=2&SpecialID=0>.
- /43/ The other wind farms are all applying for or have already received CDM registration:
<http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=2976>.

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

- 1) Revised the calculation of emission factor for the North China Power Grid on the basis of the latest 2006 data available at the time of web-hosting PDD;
 - 2) Reframed the description of timeline for the proposed project's key events;
 - 3) Revised the sensitivity analysis as per latest requirement;
 - 4) Updated to use the latest "*Tool to calculate the emission factor for an electricity system*" of version 01.1;
 - 5) Updated to use the latest "*Tool for the demonstration and assessment of additionality*" of version 05.2;
 - 6) Updated the starting date of the first crediting period as 1 May 2009;
 - 7) Changes related to the CARs and CLs identified in the DNV's draft validation report.
- After reviewing the PDD version 3.0 of 4 December 2008, DNV issued this final validation report and opinion.



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3.2 Follow-up Interviews with Project Stakeholders

During the follow-up interview on 11 July 2008, representatives of the project owner, CGN Wind Power Co., Ltd and the project consultant, Carbon Resource Management Ltd were interviewed to resolve the issues identified during the desk review of the PDD. Since the construction launch of the project was on 8 May 2008, not many issues can be assessed through a physical site visit in July 2008. Moreover, for a wind power project, the PDD, FSR, EIA and additional background documents related to the project design and baseline were effectively assessed as a part of the validation /2/-/43/. Hence, DNV did not undertake a physical site inspection on the project.

Table below provides the information regarding the issues discussed during the site visits:

	Date	Name	Organization	Topic
/44/	2008-7-11	Mr. Zhao Jingjing Ms. Lv Zheng	CGN Wind Power Co., Ltd (project owner and operator)	<ul style="list-style-type: none"> ➤ The development of wind power project in Inner Mongolia Autonomous Region ➤ The approval status (incl. EIA approval, the feasibility study report approval, CDM project approval) ➤ Emission reduction monitoring plan ➤ Consulting process for stakeholder's comments ➤ Information of project construction ➤ Project management ➤ Investment risks and barriers
/45/	2008-7-11	Mr. Shi Xiangfeng Mr. Sun Cuiqing Ms. Cheng Linglin	Carbon Resource Management Ltd (project consultant)	<ul style="list-style-type: none"> ➤ Baseline determination of the project ➤ Applicability of selected methodology ACM0002 ➤ Issues related to the additionality ➤ Common practice analysis ➤ Emission reductions calculation ➤ Emission reduction monitoring plan and project management



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3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which need be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. 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 two tables. The different columns in these tables are described in the figure below. The completed validation protocol for the CGN Inner Mongolia Duerbote Wind farm Project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM 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) CDM and/or methodology specific 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.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.



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Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
<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>		

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 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</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 and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<i>If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR or CL 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



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3.4 Internal Quality Control

The validation report underwent a 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.

3.5 Validation Team

The validation team consisted of the following personnel:

<i>Role/Qualification</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / Technical team leader	Deng	Cuiping	China				√		
CDM validator	Huang	Peng	China	√	√				
CDM validator / project manager	Lin	Wu	China	√	√	√			
Technical reviewers	Yang	Weidong	USA					√	

The qualification of each individual validation team member is detailed in Appendix B to this report.



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4 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.

The validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation version 3.0 of 4 December 2008.

4.1 Participation Requirements

The project participants are CGN Wind Power Co., Ltd of China /19/ and Carbon Resource Management Ltd of United Kingdom of Great Britain and Northern Ireland. Both China as the host Party and United Kingdom of Great Britain and Northern Ireland as the Annex I Party meet the requirements to participate in the CDM.

The DNA of China has issued a Letter of Approval (LoA) /2/ in July 2008, authorizing CGN Wind Power Co., Ltd as a project participant and also confirming that the project assists in achieving sustainable development.

The DNA of United Kingdom of Great Britain and Northern Ireland has also issued a Letter of Approval (LoA) /3/ on 22 October 2008, authorizing Carbon Resource Management Ltd as a project participant.

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.

4.2 Project Design

The project involves installation and operation of 33 wind turbines in Wulanhua Town, Siziwangqi County, Wulanchabu City, Inner Mongolia Autonomous Region of China. The installed capacity of each unit is 1.5 MW, thus constituting a total generation capacity of 49.5 MW.

The project's electricity generation will be delivered to the North China Power Grid (NCPG) under the intention letter of grid connection /18/, which is dominated by coal-fired power plants, and thus greenhouse gas (GHG) emissions are expected to be reduced.

The wind turbines will be supplied by Beijing Goldwind Science & Technology Ltd from China, whose technology is introduced from Germany /28/. And the wind technology is deemed to reflect current good practice in China.

The project's system boundaries are clearly defined as the NCPG /18/, which is in line with the delineation of the grid boundaries regulated by DNA of China.

The expected operational lifetime of the project activity is 20 years and the expected net supplied power to the grid is 114 110 MWh annually at the load factor of 26.3% (operation hours of 2 305) based on the feasibility study report (FSR) /9/, which was prepared by Inner Mongolia Power Exploration & Design Institute in October 2007 and approved by Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008.

The project activity has properly defined the start date of the project activity as 29 April 2008 /28/, which is the signing date of the wind turbines purchase contract of the proposed project.



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A renewable crediting period of 7 years has been chosen for the project, starting from 1 May 2009, which is deemed to be reasonable. The emission reductions are estimated to be 120 363 tCO₂e per year and 842 541 tCO₂e over the first seven-year crediting period.

4.3 Baseline Determination

The project correctly applies the approved baseline methodology ACM0002 version 07, “*Consolidated methodology for grid-connected electricity generation from renewable sources*”. The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:

- Grid connected zero-emission renewable power generation activity from wind energy /9/;
- The project does not involve switching from fossil fuel to renewable energy at the project site through the interview with the project participants /44//45/ and assessment of the relevant documents, such as the PDD, FSR and national regulations /1//9//16/;
- The project boundary is defined as the site of the project activity and all power plants connected physically to the North China Power Grid including Beijing Grid, Tianjin Grid, Hebei Grid, Shanxi Grid, Shandong Grid and Inner Mongolia Grid to which the project is connected. This is in line with the delineation of grid boundaries as provided by the DNA of China /14/.

Emission sources and gases included in the project boundary are:

	<i>GHGs involved</i>	<i>Description</i>
Baseline emissions	CO ₂	The North China Power Grid
Project emissions	N/A	Project emission is regarded as zero as the project is a renewable energy (wind source) project.
Leakage	N/A	There are no leakages that need to be considered in applying this methodology.

According to the methodology ACM0002 version 07, four alternatives have been selected and discussed:

- a) The proposed project activity undertaken without being registered as a CDM project activity;
- b) A fossil fuel-fired power plant with the comparable capacity or electricity generation;
- c) A power plant using other source of renewable energy with the comparable capacity or electricity generation, such as PV, biomass and hydro, etc; and
- d) Continuation of the current situation: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

DNV considers the list of realistic and credible alternatives to be complete.

As per the investment analysis discussion presented in Section 4.4 below, alternative a) is not a likely baseline scenario since it is not financially attractive with a project-IRR of 5.48%, which is lower than the benchmark of 8% /15/.



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Alternative b) is not consistent with the regulation “*Notice on Strictly Prohibiting the Installation of Thermal Power Generation Units with the Capacity of 135 MW or below*” /16/. The equivalent amount of annual electricity generation from capacity 49.5 MW wind farm is less than from the thermal power plant. In other words, the thermal power plant capacity with equivalent power generation must be less than 49.5 MW which is much less than 135 MW. Hence, alternative b) can not be considered as a realistic and credible alternative.

For alternative c), other renewable energy sources, such as hydro, biomass and solar PV have been eliminated from the baseline analysis. DNV was able to verify other renewable energy sources are either not available in the geographical area of the project or are not commercially viable at present /32/-/35/. The alternative c) is thus not a likely alternative.

Hence, the baseline scenario is that an equivalent of electricity would, in the absence of the project activity, have been generated by the operation of grid-connected thermal power plants and by the addition of new generation sources, i.e., North China Power Grid as the provider for the same electricity generation as the proposed project.

In accordance with the approved methodology ACM0002 version 07, a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) is calculated as per the procedures prescribed in the “*Tool to calculate the emission factor for an electricity system*” of version 01.1 /7/. The *ex-ante* method was selected on OM and BM calculation based on the most recent information available.

The project boundary is clearly defined as the site of project activity and the system boundary is defined as the NCPG of China, including Beijing Grid, Tianjin Grid, Hebei Grid, Shanxi Grid, Shandong Grid and Inner Mongolia Grid /14/. There are no significant transmission constraints between the power plants of the NCPG, nor with the proposed project. The selected sources and gases are justified for the project activity.

The application of the baseline methodology is transparent and conservative.

4.4 Additionality

The additionality of the project has been established using the “*Tool for the demonstration and assessment of additionality*” version 05.2, approved by the CDM EB /6/.

4.4.1 CDM consideration and continuous action to secure CDM status

The date of publication of the PDD for global stakeholder consultation is prior to the starting date of project activities determined from the contract for the wind mills.

The CGN Inner Mongolia Duerbote Wind farm Project planned its construction based on the results from the FSR prepared by Inner Mongolia Power Exploration & Design Institute in October 2007 and approved by Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008 /9/. DNV was able to confirm that without CDM revenue the project-IRR of the proposed project reduced is 5.48%, and hence financially unattractive /17/.

Considering the high risk of investment, on 8 November 2007 the project developer identified CDM as means to overcome the investment barriers to proceed with the project, as evidenced by the project owner’s meeting minute /29/. Subsequently the agreement on the purchase of CER (ERPA) was signed on 25 January 2008 /30/. And then the project participant has



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commissioned DNV to perform a validation on 13 March 2008, and the PDD was then made publicly available on DNV's climate change website to invite public comments from 25 April 2008 to 24 May 2008. On 29 April 2008, the wind turbines purchase contract of the proposed project was signed with Beijing Goldwind Science & Technology Ltd /28/, which is the earliest date for the project's implementation and is thus considered as the starting date of the project activity. Subsequently, the construction permission of the project activity was granted on 8 May 2008 by Inner Mongolia Kangyuan construction supervision Co., Ltd /24/. Then, the construction contract for the proposed project was signed between the project owner and China Second Metallurgy Construction Co., Ltd in June 2008 /20/. Hence, the date of publication of the PDD for global stakeholder consultation is prior to the start date of project activities. The CDM was therefore seriously considered in the decision to proceed with the project activity in compliance with EB41 annex 46.

4.4.2 Identification of alternatives to the project activity

Four alternatives to the project activity have been identified and discussed.

- a) The proposed project activity undertaken without being registered as a CDM project activity;
- b) A fossil fuel-fired power plant with the comparable capacity or electricity generation;
- c) A power plant using other source of renewable energy with the comparable capacity or electricity generation, such as PV, biomass and hydro, etc; and
- d) Continuation of the current situation: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

As mentioned in Section 4.3 alternative b) and c) are not realistic and credible alternatives and can be exempted from further consideration.

4.4.3 Investment analysis: Choice of approach

As the proposed project generates financial and economic benefits other than CDM related income through the sales of electricity and the alternative to the project does not involve an investment, a benchmark analysis (option III) was selected for conducting the investment analysis.

4.4.4 Investment analysis: Benchmark selection

According to *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Project*, an IRR of 8% (after tax) for total investment of a project is regarded as benchmark for investing in wind power plants in China /15/.

4.4.5 Investment analysis: Input parameters

A feasibility study report (FSR) in China is required to be developed by a third party accredited of this task directly by the government. An approval letter of the FSR will issued



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by the government only after it passes the public assessment of the sector experts designated by the government. It is in DNV's opinion that a FSR can be regarded as an accurate and trustworthy source of information coming from a recognized entity once it has the approval letter from the government.

The input parameters used in the financial analysis are taken from the FSR developed by Inner Mongolia Power Exploration & Design Institute in October 2007 and approved Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008 /9/. The input parameters used in the financial analysis can thus be 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 FSR /9/ and was able to confirm that the values applied are consistent with the values stated in the FSR.

The FSR was approved on 11 March 2008 /9/ and thus only 2 months prior to the decision to proceed with the project activity (i.e. the start date of the project) which was on 29 April 2008 /28/. Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity it is unlikely in the context of the project that the input values would have materially changed and that it is thus reasonable to assume that the FSR has been the basis of 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 the region, i.e. other wind power projects in the North China Power Grid, by comparing the investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs /36/. By in addition applying our sectoral competence, 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.

4.4.6 Investment analysis: Calculation and conclusion

The IRR calculations were provided in a spreadsheet /17/. The calculations were verified and found to in line with EB's guidance on investment analysis. The assumptions used in the calculations were deemed to be correct by DNV. The project-IRR for 20 years of operation without CDM revenues is 5.48%, which confirms that the project in the absence of CDM benefits and compared to the benchmark is not financially attractive. With CER revenues the project-IRR increases to 8.52%, which is above the benchmark.

4.4.7 Investment analysis: Sensitivity analysis

Moreover, a sensitivity analysis was carried out for parameters contributing more than 20% to revenues or costs in order to check the robustness of the financial analysis. Reasonable variations of the total investment, annual operational and maintenance costs, electricity output and on-grid tariff were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.

- Static investments: If the static investments decrease by 17.56%, the project-IRR will reach the benchmark of 8%. However, considering the increasing raw material price in China in recent year /37/, a 17.56% decrease in the static investment is unlikely.



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- Annual O & M cost: Even if reducing the O&M cost by 90%, the project-IRR can not be equal to the benchmark. Moreover, the price of raw material keeps rising recently /37/. Thus, this is highly unlikely.
- On-grid tariff: To reach the 8% benchmark, power tariff must increase 18.25%, which is not likely to happen. The guidance tariff from local government should not exceed the value which has been determined in the tariff document issued by NDRC /21/. Moreover, it is confirmed that the tariff will be lower in the future according to recent governmental policies /38/, which indicated that Chinese government is trying to conduct the concession bidding of wind power to lower the on-grid tariff of the wind farm project. Therefore, it is unlikely that the increased tariff will make the project-IRR reach the benchmark.
- Power supplied: The power generation is related to the power load factor, which depends on the average wind speed at the project site for a specific wind turbine. According to FSR /9/, the annual output is estimated based on the long term (from 1977 to 2007) weather statistic data provided by local meteorological station and wind resources measurement, and the power load factor is thus likely to fluctuate only within a small range. Hence, it is highly unlikely to increase by up to 18.25%.

The sensitivity analysis shows that even with substantial variation of the key indicators, the project-IRR of the proposed project is lower than the benchmark.

In conclusion, the investment analysis and sensitivity analysis have shown that the project activity is unlikely to be the financially attractive option. DNV is able to confirm this conclusion.

4.4.8 Common practice analysis

In China, most policies are promulgated in provincial level by combining the national policy with the region's condition. In addition, abundant and high quality wind resources in the Inner Mongolia Autonomous Region make this region different from other regions in the aspect of electricity output, eventually in the aspect of economic feasibility /39/. So, it is reasonable that Inner Mongolia Autonomous Region is selected as scope for common practice analysis.

Existing wind farms in Inner Mongolia Autonomous Region established till 2007 (installed capacity more than 15 MW) which are derived from "Cumulative wind installation in China" have been considered for the analysis /40/. It is confirmed that only two projects were constructed either with financial support from government of China or from national debt fund and such supports are no longer available in Inner Mongolia /41//42/. Due to the same financial unattractiveness as the proposed project activity, other similar wind farms have all applied for CDM project /43/. So based on above analysis, the project is not common practice and DNV was able to confirm.

In conclusion, the assessment of the arguments presented above is deemed to sufficiently demonstrate that the project is not a likely baseline scenario, and that emission reductions resulting from the project are additional.



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4.5 Monitoring

The project applies the approved monitoring methodology ACM0002 version 07, “Consolidated methodology for grid-connected electricity generation from renewable sources” /5/.

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

4.5.1 Parameters determined ex-ante

The combined margin emission factor is determined *ex-ante* based on the most recent information available. The parameters are listed in below table:

<i>Data and Parameters</i>	<i>Unit</i>	<i>Value applied</i>	<i>Source of data used</i>
Installed Capacity of the project activity	MW	49.5	FSR /9/
Operating margin of North China Power Grid (OM)	tCO ₂ /MWh	1.1169	China Energy Statistic Yearbook 2005-2007; China Electric Power Yearbook 2003-2007 /12//13/
Build Margin of North China Power Grid (BM)	tCO ₂ /MWh	0.8687	
Emission factor of North China Power Grid (CM)	tCO ₂ /MWh	1.0548	

4.5.2 Parameters monitored ex-post

The parameter monitored *ex-post* is the net electricity generation from the proposed project activity.

The net electricity generated from the project will be measured hourly and recorded monthly. This data will be cross verified against the sales receipt from the grid.

4.5.3 Management system and quality assurance

The project’s monitoring plan includes:

- A description of the responsibilities and authorities for project management;
- Procedures for training;
- A description of the installation of metering equipment;
- Procedures for the calibration of metering equipment;
- Monitoring of the net electricity delivered to the North China Power Grid;
- Data quality control;
- Data management system;
- Reporting and verification.

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



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4.6 Estimate 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 (L_y), 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) times the net electricity supplied by the project activity to the grid (EG_y in MWh).
- 2) Project emissions: There are no emissions from the project as the proposed project is a renewable wind energy project.
- 3) Leakage: No leakage has to be considered for the proposed project activity.

The grid 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) according to “Tool to calculate the emission factor for an electricity system” of version 01.1 /7/.

The PDD was published in April 2008 with the latest data for calculation of the grid emission factor at the time of being published /12//13/. The calculation is furthermore in accordance with the calculation of the combined margin emission factor published by the DNA of China /14/.

The assessment of the grid emission factor of the North China Power Grid (NCPG) is as follows:

The grid emission factor of the NCPG is determined *ex-ante* for the 7 years crediting period following “Tool to calculate the emission factor for an electricity system” of version 01.1 /7/, based on the most recent information available. It has been calculated as the weighted average ($w_{OM}=0.75$: $w_{BM}=0.25$) of the operating margin and the build margin.

According to the data from China Electric Power Yearbook 2003-2007 /12/, the low-cost/must run resources constitute only 0.89% in 2002, 0.86% in 2003, 0.76% in 2004, 0.75% in 2005 and 0.75% in 2006 among total electric power generation of the NCPG. Therefore, the OM is calculated using the “simple OM” method which is justified because low cost and must run power plants constitute less than 50% of the total grid generation.

Aggregated generation and fuel consumption data are used due to the fact that more specific data for the power plants are not available in the NCPG (option C). Country specific data for net calorific value of each type of fossil fuel /13/, IPCC 2006 default values for the carbon content and the oxidation factor of each type of fossil fuel /11/, and the total electricity delivered to the NCPG /12/ were selected and deemed reasonable. The OM is calculated to be 1.1169 tCO_2e/MWh as a generation weighted average for the years 2004, 2005 and 2006 /17/.

Because plant specific fuel consumption and electricity generation data are not publicly available in China, the guidance requested by DNV from the CDM Executive Board for a deviation of the baseline methodology of AM0005 has been applied for calculation of the build margin (BM) emission factor for this project /8/:

- Use of capacity additions from the years 2005 to 2006 is chosen and reaches 21.75% of the total installed capacity /12/;
- Use of weights estimated using installed capacity in place of annual electricity generation. Thermal power plant accounts for 95.64% of the total installed capacity additions in this period /12/. Since specific data for each technology is not available,



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- the fraction of fuels (coal 98.93%, natural gas 0.98% and oil 0.09% /12/) was estimated from the CO₂ intensity for the fuels used in the NCPG;
- Use of 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. This is 37.28% for coal power plants and 48.81% for oil power plants and gas power plants /12/.

Country specific net calorific value of each kind of fuel and IPCC 2006 default values of the carbon content and the oxidization factors /11/ are used to calculate the BM. The data applied are considered as the best data available for calculating the BM in the NCPG. The official supporting documentation has been verified. The BM is calculated to be 0.8687 tCO₂e/MWh /17/.

The latest data used to calculate OM and BM are derived from China Energy Statistical Yearbooks 2005 to 2007 /13/ and China Electric Power Yearbooks 2003 to 2007 /12/. The selection of these parameters is complete and transparent.

The resulting combined margin emission factor is 1.0548 tCO₂e/MWh, and the annual electricity delivered to the NCPG is expected 114 110 MWh /9/. Hence, the total emission reductions from the project are estimated to be on the average 120 363 tCO₂e per year over the selected 7 year crediting period. The baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV.

In summary, the GHG calculations are complete and transparent, and the data accuracy has been verified.

4.7 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 Environmental Protection Bureau of Inner Mongolia Autonomous Region approved the project activity on 17 December 2007 /10/.

4.8 Comments by Local Stakeholders

Besides the stakeholder consultation process stipulated in the Chinese EIA regulation, project developer have conducted an additional stakeholder consultations. The stakeholders from local residents and local government were invited through a questionnaire to provide comments on the project. In the survey, 50 questionnaires were distributed to local stakeholders and 50 questionnaires were returned giving a 100% response rate /25/.

DNV has checked all the questionnaires received. The survey shows that the proposed project receives support from the local people.



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4.9 Comments by Parties, Stakeholders and NGOs

The PDD (version 1.0) of 02 April 2008 was made publicly available on DNV's climate change website* and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 25 April 2008 to 24 May 2008.

No comments were received in this period.

* www.dnv.com/certification/climatechange/Projects/ProjectDetails.asp?ProjectId=1836



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APPENDIX A

CDM VALIDATION PROTOCOL



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

Requirement	Reference	Conclusion
About Parties		
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
The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
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 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
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
Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
The participating Annex I Party shall have in place a national system for estimating	CDM Modalities and Procedures §31b	OK



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Requirement	Reference	Conclusion
GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.		
About additionality		
Reduction in GHG emissions shall be additional to any that would occur in the 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
About forecast emission reductions and environmental impacts		
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
For large-scale projects only		
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
About stakeholder involvement		
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
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



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Requirement	Reference	Conclusion
Other		
The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
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
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
The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
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



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Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	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 boundaries (geographical) clearly defined?	/1/	DR	Yes. CGN Inner Mongolia Duerbote Wind farm Project is located in Wulanhua Town, SIziwangqi County, Wulanchabu City, Inner Mongolia Autonomous Region of China. The geographical coordinates of the project site is longitude 111°34’ East and latitude 41°31’ North.		OK
A.1.2. Are the project’s system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/ /14/	DR	Yes. The projects system boundaries are clearly defined. The power generated will be exported to the North China Power Grid including Beijing Grid, Tianjin Grid, Hebei Grid, Shanxi Grid, Shandong Grid and Inner Mongolia Grid, which is defined as project system boundary. This is in line with the delineation of grid boundaries as provided by the DNA of China.		OK
A.2. Participation Requirements					

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<i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	The host Party involved in the project is China and the Annex I Party is United Kingdom of Great Britain and Northern Ireland. CGN Wind Power Co., Ltd is the project participant from the Host Party (P. R. China). Carbon Resource Management Ltd from the Annex I Party (United Kingdom of Great Britain and Northern Ireland).		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/2/ /3/	DR	No. The letters of approval from the DNAs of China and United Kingdom of Great Britain and Northern Ireland have not been obtained.	CAR-1	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/2/ /3/	DR	China ratified the Kyoto Protocol on 30 August 2002. United Kingdom of Great Britain and Northern Ireland's assigned amount is 92% of the emission level in 1990.		OK

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			Both of them are voluntary participation. DNA of China is National Development and Reform Commission. The DNA of United Kingdom of Great Britain and Northern Ireland is the Department for Environment, Food and Rural Affairs.		
A.2.4 Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	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.		OK
A.3. 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.3.1. Does the project design engineering reflect current good practices?	/1/ /9/	DR	Yes. The project design engineering reflects current good practices.		OK
A.3.2. 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/ /9/	DR I	Yes. The technology used for the project is domestically produced and is of state of the art.		OK

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A.3.3 Does the project make provisions for meeting training and maintenance needs?	/1/	DR I	Yes. The project owner will make provisions for the training and maintenance needs before the operation of the project.		OK
A.4. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/2/	DR	Not yet. The LoA from the DNA of China has not been issued.	CAR-1	OK
A.4.2 Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /9/ /10/	DR I	Yes. As a renewable energy project, the project may substitute some coal fired power plant and produce positive environmental and economic benefits and contribute to the local sustainable development especially in reducing pollution, creating employment opportunities, promoting the local tourism industry ,improving the livelihoods of local people and assisting China in stimulating and accelerating the commercialization of grid-connected renewable energy technologies and markets in China		OK
B. Project Baseline					

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<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. Does the project apply an approved methodology and the correct version thereof?	/1/ /5/	DR	Yes, the project applies the methodology ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” version 07 approved by the EB.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /5/	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 (North China Power Grid) can be clearly identified.		OK
B.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					

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B.2.1. What is the baseline scenario?	/1/	DR	Provision of equivalent amount of annual power output by the grid (North China Power Grid) where the proposed project is connected into is the baseline scenario.		OK
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /15/ /16/ /32/ /33/ /34/ /35/	DR	Four alternative baseline scenarios to the project have been identified and discussed: 1) The proposed project activity undertaken without being registered as a CDM project activity; 2) A fossil fuel-fired power plant with the comparable capacity or electricity generation; 3) A power plant using other source of renewable energy with the comparable capacity or electricity generation, such as PV, biomass and hydro, etc; and 4) Continuation of the current situation: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. Alternative 1) has less financial attractiveness, as discussed in the analysis		OK

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			below; alternative 2) does not accord with the existing Chinese mandatory regulations; alternative 3) is not feasible for the project owner due to the lack of resource, experience and ability to develop other renewable energy power plants. Only alternative 4) “Continuation of the current situation: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources” is a realistic alternative consistent with current laws and regulations.		
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /5/ /7/	DR	The project proponent identified the most plausible baseline scenario using ACM0002, version 7. The proposed project is a wind farm project and the baseline scenario defined as follow: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM)		OK

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			calculations described in the “ <i>Tool to calculate the emission factor for an electricity system</i> ”.		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /5/	DR	The approved methodology ACM0002 has been applied. However, the project proponent is requested to adopt the latest published data and latest version “ <i>Tool to calculate the emission factor for an electricity system</i> ” to calculate emission factor.	CAR-2	OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /31/	DR	Yes. All relevant national and sectoral policies, regulations and department rules and disciplines are considered such as the renewable energy law and policies by central government.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /9/ /12/ /13/ /16/	DR	No. The latest data available shall be used to determine the baseline scenario.	CAR-2	OK
B.2.7. 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, this law does not need to be taken into account as it is being		OK

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			implemented only now i.e. after the entry into force of decision 17.CP 7.		
B.3. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /5/ /6/ /15/ /16/ /17/ /21/	DR	The project proponent is requested to apply the additionality tool with version 05.2. Step 1 – Identification of alternatives to the project activity consistent with current laws and regulations: Four alternative baseline scenarios to the project have been identified and discussed. Only alternative 4) “Continuation of the current situation: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources” is a realistic alternative consistent with current laws and regulations. Step 2 – Investment analysis: - The proposed project generates financial	CAR-3	OK

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				<p>and economic benefits through the sales 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 similar investment project so option II is not an appropriate one either. Benchmark analysis (option III of Step 2 of tool for the demonstration and assessment of additionality) is selected for conducting the investment analysis.</p> <ul style="list-style-type: none">- In China an IRR of 8 % (after tax) for total investment of a project is regarded as benchmark for investments in hydropower plants, fossil fuel fired plants and wind farm projects.- The input parameters used in the financial analysis of the CGN Inner Mongolia Duerbote Wind farm Project are taken from the Feasibility Study Report (FSR) prepared by Inner Mongolia Power Exploration & Design Institute in October 2007 and approved		

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			<p>by Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008 /9/.The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.</p> <ul style="list-style-type: none">- DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the FSR /9/ and was able to confirm that the values applied are consistent with the values stated in the FSR.- The FSR was approved on 11 March 2008 /9/ and thus only 2 months prior to the decision to proceed with the project activity (i.e. the start date of the project) which was on 29 April 2008 /28/. Given this relative short period of time between approval of the FSR and the decision to proceed with the project activity it is unlikely in the context of the project that the input values would have materially changed and that it is thus reasonable to		

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			<p>assume that the FSR has been the basis of the decision to proceed with the investment in the project.</p> <ul style="list-style-type: none">- The input parameters used in the financial analysis were compared with the data reported for other similar proposed CDM projects in the region, i.e. other wind power projects in the North China Power Grid, by comparing the investment costs per MW, electricity tariff, percentage of O&M costs relative to total investment costs. By in addition applying our sectoral competence /36/, 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.- The project-IRR without CER revenue is 5.48 % which shows that the project is not financially attractive in absence of CDM benefits and with CERs revenue is 8.52%.- A sensitivity analysis shows the influence of four parameters in the project's		

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			<p>financial performance: static total investment, on-grid tariff, power supplied and annual O&M cost.</p> <p>The project developer is requested to revise the sensibility analysis to determine each input parameter’s value at which the project-IRR will be equal to the benchmark and assess the likelihood of attaining the arrived values against each parameter and confirm that it is not likely that the project-IRR will become equal to the benchmark.</p> <p>Step 3 –Barrier analysis: Not applicable(only step2 is selected)</p> <p>Step 4 – Common practice analysis: As per the requirements of <i>Tool for the demonstration and assessment of additionality</i>: other CDM project activities are not to be included in this analysis. Hence, the project proponent needs to exclude the CDM project in common practice analysis. Further more, the selection of the region for the common practice analysis needs to be</p>	<div>CL1</div> <div>CL2</div>	

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			justified.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/ /6/	DR	The same as B.3.1.		
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /6/	DR I	The same as B.3.1		
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /9/ /24/	DR I	As per EB 41 requirements, the project participant is requested to provide a timeline to list the main events of the proposed project to finally determine the date of consideration CDM and project starting date as the same in section B.5 of the PDD.	CL3	
B.4. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /9/	DR	Project emission is regarded as zero since the project is a renewable energy (wind source) project as per the FSR which has been approved by Development and Reform		OK

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CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Committee of Inner Mongolia Autonomous Region on 11 March 2008.		
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Ditto		OK
B.4.3 Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Ditto		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/ /11/ /12/ /13/ /14/	DR	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). However, the project proponent is requested to adopt the latest published data to calculate emission factor.	CAR-2	OK
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Yes. The CO ₂ emission factors of the coal, oil and gas fuel-fired best technology for		OK

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			power generation in China is used as the CO ₂ emissions factors of the coal, oil and gas fuel-fired power plant for BM calculation.		
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	No significant uncertainties are foreseen for this project.		OK
B.6. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/	DR	According to ACM0002, There are no leakages that need to be considered.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Ditto		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Ditto		OK
B.7. Emission Reductions <i>The emission reductions shall be real, measurable</i>					

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<i>and give long-term benefits related to the mitigation of climate change.</i>					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes. The emission reductions are real, measurable and give long-term benefits related to the mitigation of climate change. The annual estimated emission reductions over the first crediting period are 120 363 tCO ₂ e.		OK
B.8. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/	DR	Yes. The monitoring plan is documented according to the approved monitoring methodology ACM0002 “Consolidated methodology for grid-connected electricity generation from renewable sources” and in a complete and transparent manner. The monitored parameter has been indicated as per monitoring methodology. The measurement equipment meters will be calibrated according to the national industry standard. All data including calibration records are archived electronically and be kept at least for 2 years after the end of the		OK

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B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/ /5/	DR	last crediting period. Yes. As mentioned in PDD, electronic data of electricity generation will be kept for 2 years following the end of the crediting period.		OK
B.9. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
B.9.1. 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/ /9/	DR	There are no emissions from the project activity as per the FSR which has been approved by Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008.		OK
B.10. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /11/ /12/ /13/	DR I	The project uses the <i>ex-ante</i> determination of emission factor for grid electricity. The electricity supplied to the grid will be monitored and double checked with the invoice of electricity sold to the grid. The proposed project generation is derived		OK



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			from the FSR which has been approved by Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008. And the emission factor is calculated based on the China Energy Statistical Yearbooks 2005 to 2007, China Electric Power Yearbooks 2003 to 2007 and 2006 IPCC.		
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	Yes.		OK
B.10.3. Is the measurement <i>method</i> clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Yes. The electricity delivered to the grid will be monitored directly through the main meter and a backup meter will also be installed in case the main meter has a failure.		OK
B.10.4. Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR I	Yes. From follow-up interview and desk review of the PDD, it is found that the electricity delivered to the grid will be measured through the main meter and the backup meter installed in the substation of the grid. The accuracy of the meters would not exceed 0.5s.		OK
B.10.5. Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with	/1/	DR	Yes. The metering equipments are calibrated annually to ensure accuracy. And the		OK

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erroneous measurements?		I	accuracy does not exceed 0.5s. Procedures to deal with erroneous measurements have been elaborated in the Item 6.1 of Annex 4 in the PDD.		
B.10.6. Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR I	As per methodology ACM0002, monitoring frequency of monitoring data should be hourly measurement and monthly recording, which have not been identified in the PDD. The project proponent needs to clarify.	CL4	OK
B.10.7. Is the <i>registration, monitoring, measurement</i> and <i>reporting</i> procedure defined?	/1/	DR I	Yes. The procedures for the registration, monitoring, measurement and reporting are defined in the PDD.		OK
B.10.8. Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	The maintenance of monitoring equipment and installations are according to the national industry standard. The project proponent is requested to provide the specific industry standard. The calibration intervals are once per year, and will be carried out by the qualified entity.	CL5	OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Yes. The procedures for records handling are identified in the monitoring plan in the PDD.		OK

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B.11. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	According to ACM0002, project proponents do not need to consider leakage.		OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	Ditto		OK
B.11.3. Is the measurement <i>method</i> clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	Ditto		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	Neither ACM0002 nor the Chinese DNA requires collection and archiving of relevant data concerning environmental, social and economic impacts. However the environmental impacts will be monitored by local environmental authority.		OK

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B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	The indicators of environmental impacts will be stipulated by local environmental authority.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Yes. This will be on local authority decision.		OK
B.13. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/ /27/	DR	Yes. The authority and responsibility of project management is described in the PDD.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/ /26/ /27/	DR I	Yes. All employees responsible for operating and maintaining the wind power station will be trained by the project owner in accordance with the monitoring plan. The training programs include the on-site operation rules, monitoring requirements, safety codes and inspection specifications, etc. Only qualified employees are designated by the project owner for the positions of operating the wind power station and data recording.		OK

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B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	No emergency situation which can cause unintended emissions is expected from the project.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/ /27/	DR I	Yes. The procedures for review of reported results/data has been identified in the monitoring plan. Detailed procedures will be in place and maintained and implemented at the latest prior to the start of the crediting period to enable subsequent verification of emission reductions.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	Yes. The monitoring plan could be modified according to actual conditions and requirements of DOE for more accurate monitoring and reporting.		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. Are the project’s starting date and operational lifetime clearly defined and evidenced?	/1/ /9/ /24/	DR I	The lifetime of the project is expected to be 20 years according to the FSR /9/, which was prepared by Inner Mongolia Power Exploration & Design Institute in October 2007 and approved by Development and Reform Committee of Inner Mongolia Autonomous Region on 11 March 2008.	CL3	OK

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			As per EB 41 requirements, the project proponent is requested to provide a timeline to list the main events of the proposed project to finally determine the date of consideration CDM and project starting date as the same in section B.5 of the PDD.		
C.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	Yes. A renewable crediting period 7 years is selected, starting on 1 May 2009.		OK
D. 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>					
D.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /10/	DR	Yes. The impacts are properly described, including the impacts of noise, discarded residue, waste water and sewage, dust and impacts on air quality, ecological environment.		OK
D.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /10/	DR	Yes. Environmental Impact Assessment has been approved by Environmental Protection Bureau of Inner Mongolia Autonomous Region on 17 December 2007.		OK
D.3. Will the project creates any adverse environmental effects?	/1/	DR	No significant adverse environment impact exists as per the EIA report.		OK

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	/10/	I			
D.4. Are transboundary environmental impacts considered in the analysis?	/1/ /10/	DR I	There are no transboundary environmental impacts foreseen for the project.		OK
D.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	Yes.		OK
D.6. Does the project comply with environmental legislation in the host country?	/1/ /10/	DR	Yes. The project complies with Chinese environmental legislation as EIA was approved by local authority.		OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
E.1. Have relevant stakeholders been consulted?	/1/ /10/ /29/	DR I	Yes. Besides the stakeholder consultation process required by Chinese EIA regulations, an additional stakeholder consultation process have been performed through inviting local residents to comment on the project activity.		OK
E.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /10/ /29/	DR I	Yes. The site surveys, distribution of questionnaires and meetings have been used to invite comments by local stakeholders.		OK

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E.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/ /10/ /29/	DR	Yes. The stakeholder consultation process is in accordance with Chinese EIA regulations.		OK
E.4. Is a summary of the stakeholder comments received provided?	/1/ /10/ /29/	DR	Yes. The summary of the stakeholder comments received is described in the PDD.		OK
E.5. Has due account been taken of any stakeholder comments received?	/1/ /10/ /29/	DR	No negative comments have been received on the proposed project. The local government and residents all support the project construction activity, confirm its social, economic and environmental benefits, and wish the construction could be started early and accelerated.		OK

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VALIDATION REPORT

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1: The letters of approval from the DNAs of China and United Kingdom of Great Britain and Northern Ireland have not been obtained.	A.2.2 A.4.1	The China and UK LoAs have been delivered to DOE.	OK. DNV was able to verify the LoAs issued by China and UK /2//3/. The CAR is closed.
CAR 2: The approved methodology ACM0002 has been applied. However, the project proponent is requested to adopt the latest published data and latest version " <i>Tool to calculate the emission factor for an electricity system</i> " to calculate emission factor. The latest data available shall be used to determine the baseline scenario.	B.2.4 B.5.1 B.2.6	The latest published data and versions of tools were used in the PDD. New data and new versions of the tools have been released since, and PDD is updated accordingly.	OK. DNV was able to verify that the latest published data has been adopted to determine the baseline scenario and the version 01.1 of " <i>Tool to calculate the emission factor for an electricity system</i> " has been used to calculate the emission factor in the revised PDD /1/. The CAR is closed.
CAR 3: The project proponent is requested to apply the additionality tool with version 05.2.	B.3.1	The latest published data and versions of tools were used in the PDD. New data and new versions of the tools have been released since, and PDD is updated accordingly.	OK. The version 05.2 of additionality tool has been used in the revised PDD /1/. The CAR is closed.



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 1:</p> <p>The project developer is requested to revise the sensibility analysis to determine each input parameter's value at which the project-IRR will be equal to the benchmark and assess the likelihood of attaining the arrived values against each parameter and confirm that it is not likely that the project-IRR will become equal to the benchmark.</p>	B.3.3	<p>EB Guidance requires a reasonable range of variations in the main variables. Only in cases where the benchmark is passed, an assessment of the probability of this scenario occurring needs to be presented. As shown in the sensitivity analysis, there is no reasonable scenario which will result in the project activity passing the benchmark or becoming the most financially attractive.</p> <p>However, for completeness the project-IRR calculation sheet includes the variations required in the main variable to pass the benchmark and none of these scenarios are likely to happen, as have been revised and demonstrated in B.5 of the PDD.</p>	<p>OK.</p> <p>The reasonable sensibility analysis was addressed in the revised PDD and DNV was able to verify /1/.</p> <p>The CL is closed.</p>
<p>CL 2:</p> <p>As per the requirements of <i>Tool for the demonstration and assessment of additionality</i>: other CDM project activities are not to be included in this analysis. Hence, the</p>	B.3.3	<p>CDM project activities have been excluded in the common practice analysis in the revised PDD.</p> <p>In China, the general environment of projects of this type of wind farm such</p>	<p>OK.</p> <p>The CDM project activities are not to be included in common practice analysis.</p> <p>The reason for selection of the region for the common practice is deemed to</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
project proponent needs to exclude the CDM project in common practice analysis. Furthermore, the selection of the region for the common practice analysis needs to be justified.		as the wind resources, on-grid tariff, investment climate are only similar and comparable in the same province (or Autonomous Region), as project approvals and tariffs are granted at the provincial level. On this basis, the common practice region and comparable framework is provincial and the project is compared to other projects in the Inner Mongolia Autonomous Region.	be reasonable and enable DNV to verify /1//39//40/. The CL is closed.
CL 3: As per EB 41 requirements, the project participant is requested to provide a timeline to list the main events of the proposed project to finally determine the date of consideration CDM and project starting date as the same in section B.5 of the PDD.	B.3.4 C.1	The timeline is included in the revised PDD. The CDM was considered in the feasibility study (submitted October 2007), and decided by the board on 08 November 2007. The starting date of the project activity is the date of the purchase contract of the turbines, 29 April 2008, which was after publication for stakeholder comments.	OK. DNV was able to verify that the elaboration of determination the date of consideration CDM and project starting date was to be in place in the revised PDD /1//9//28//29/. The CL is closed.
CL 4: As per methodology ACM0002, monitoring frequency of monitoring data should be	B.10.6	As stated in the PDD, the electricity generated by the proposed project activity will be monitored continuously,	OK. The monitoring frequency of monitoring data has been identified in



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
hourly measurement and monthly recording, which have not been identified in the PDD. The project proponent needs to clarify.		with monthly records obtained from the substation.	the revised PDD as per methodology requirements /1/. The CL is closed.
CL 5: The maintenance of monitoring equipment and installations are according to the national industry standard. The project proponent is requested to provide the specific industry standard.	B.10.8	Chinese electric industry regulation DL/T448-2000 will be used for equipment installation and maintenance.	OK. The specific industry standard DL/T448-2000 has been found to be in place in the revised PDD /1/. The CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Weidong Yang

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

GHG Auditor:	Yes				
Technical Area	CDM Validator	CDM Verifier	Sector Expert	Methodology Expert	Technical Reviewer
Landfill gas					
Hydro power					
Renewables Wind power				Jan 2009	Jan 2009
Other renewable					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N ₂ O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO ₂ recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF ₆					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Cuiping Deng

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>					
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Renewables Wind power</i>	Jan 2009	Jan 2009		Jan 2009	Jan 2009
<i>Other renewable</i>					
<i>Biomass</i>					
<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>					
<i>Efficiency of thermal power plants</i>					
<i>Coal mine methane</i>					
<i>Fuel switch</i>					
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>					
<i>Energy efficiency</i>					
<i>N₂O</i>		Jan 2009			
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann

Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Peng Huang

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

<i>GHG Auditor:</i>	Yes				
<i>Technical Area</i>	<i>CDM Validator</i>	<i>CDM Verifier</i>	<i>Sector Expert</i>	<i>Methodology Expert</i>	<i>Technical Reviewer</i>
<i>Landfill gas</i>					
<i>Hydro power</i>	Jan 2009	Jan 2009			
<i>Renewables Wind power</i>		Jan 2009			
<i>Other renewable</i>					
<i>Biomass</i>					
<i>Grid connection of isolated system</i>					
<i>Cement</i>					
<i>Waste-heat / waste-gas recovery</i>					
<i>Efficiency of thermal power plants</i>					
<i>Coal mine methane</i>					
<i>Fuel switch</i>					
<i>Manure management</i>					
<i>Waste / wastewater treatment</i>					
<i>Energy efficiency</i>					
<i>N₂O</i>					
<i>HFCs</i>					
<i>Flare reduction</i>					
<i>PFCs</i>					
<i>Charcoal</i>					
<i>CO₂ recovery</i>					
<i>Transport</i>					
<i>Non-renewable biomass</i>					
<i>Biofuel</i>					
<i>Pipeline leakage reduction</i>					
<i>SF₆</i>					

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services



CERTIFICATE OF COMPETENCE

Wu Lin

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

<i>GHG Auditor:</i>	<i>Yes</i>
<i>Technical Area</i>	<i>CDM Validator CDM Verifier Sector Expert Methodology Expert Technical Reviewer</i>
<i>Landfill gas</i>	
<i>Hydro power</i>	
<i>Renewables Wind power</i>	Jan 2009
<i>Other renewable</i>	
<i>Biomass</i>	
<i>Grid connection of isolated system</i>	
<i>Cement</i>	
<i>Waste-heat / waste-gas recovery</i>	
<i>Efficiency of thermal power plants</i>	
<i>Coal mine methane</i>	
<i>Fuel switch</i>	
<i>Manure management</i>	
<i>Waste / wastewater treatment</i>	
<i>Energy efficiency</i>	
<i>N₂O</i>	
<i>HFCs</i>	
<i>Flare reduction</i>	
<i>PFCs</i>	
<i>Charcoal</i>	
<i>CO₂ recovery</i>	
<i>Transport</i>	
<i>Non-renewable biomass</i>	
<i>Biofuel</i>	
<i>Pipeline leakage reduction</i>	
<i>SF₆</i>	

Høvik, 14 January 2009

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