# VALIDATION REPORT

## HEILONGJIANG FUJIN 48MW WIND POWER PROJECT

**Report No: QT- EC0304 - 08 /109**

**Date: 2009-May-07**

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstrasse 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-3290
www.tuev-nord.de
www.global-warming.de

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|---|---|
| 2009-05-07 | Project No.: QT-EC0304-08/109 |
| Approved by: Mr. Rainer Winter | Organisational unit: TÜV NORD JI/CDM Certification Program |
| Client: Beijing Ruichi Electric Power Information Technology Co. Ltd. | Client ref.: Mr. Yang Lusi |

Summary/Opinion:
Beijing Ruichi Electric Power Information Technology Co. Ltd.has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project *"Heilongjiang Fujin Wind Power Project"* with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity exports electrical power from a renewable energy source (wind) to the Northeast China Power Grid (NEPG). The project intends to reduce GHG emissions to the extent of equivalent electricity generated by fossil fuel based power plants connected to NEPG.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

All Corrective Action Requests (CARs) and Clarification Requests (CRs) raised in the course of the validation were successfully closed.

In detail the conclusions can be summarized as follows:

- The project is in line with all relevant host country criteria (China) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of China vide the Letter of Approval (HCA) dated June 2008 and from DNA of Japan vide Letter of Approval (LOA) dated September 2008
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 886,669 $tCO_{2e}$ are most likely to be achieved within the 1st renewable crediting period (2009-2016).

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

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|---|---|
| Report No.: QT-EC0304-08/109 | Subject Group: Environment |
| Report title: *Heilongjiang Fujin 48MW Windpower Project* | |
| Work carried out by: Mr. Yong Jun Li, Martin Saalmann | |
| Technical review carried out by: Mr. Eric Krupp | |

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**Indexing terms**

Climate change
CDM
Validation
Kyoto Protocol

## Abbreviations

| | |
|---|---|
| **BAU** | Business as usual |
| **CAR** | Corrective Action Request |
| **CDM** | Clean Development Mechanism |
| **CER** | Certified Emission Reduction |
| **$CO_2$** | Carbon dioxide |
| **$CO_2e$** | Carbon dioxide equivalent |
| **CP** | Certification Program |
| **CR** | Clarification Request |
| **DNA** | Designated National Authority |
| **EB** | CDM Executive Board |
| **EIA** | Environmental Impact Assessment |
| **FSR** | Feasibility Study Report |
| **GHG** | Greenhouse gas(es) |
| **HCA** | Host Country Approval |
| **HWPF** | Heilongjiang Huafu Wind Power Fujin Co., Ltd. |
| **IRR** | Internal Rate of Returns |
| **LoA** | Letter of Approval |
| **MP** | Monitoring Plan |
| **NCV** | Net Calorific Value |
| **NDRC** | Chinese National Development and Reform Committee (DNA of China) |
| **NEPG** | Northeast China Power Grid |
| **ODA** | Official Development Assistance |
| **PDD** | Project Design Document |
| **PLF** | Plant Load Factor |
| **PP** | Project Proponent |
| **QC/QA** | Quality control/Quality assurance |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **VVM** | Validation Verification Manual |

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# 1 INTRODUCTION

Beijing Ruichi Electric Power Information Technology Co. Ltd. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project:

*"Helongjiang Fujin 48MW Windpower Project"*

with regard to the relevant requirements for CDM project activities.

## 1.1 Objective

The purpose of this validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol; the CDM modalities and procedures as agreed in the Marrakech Accords under decision 17/CP.7; the annex to the decision; subsequent decisions made by COP/MOP & CDM Executive Board,
- other relevant rules, including the host country (China) legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

## 1.2 Scope

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on ACM0002 / Version 07: Consolidated baseline methodology for grid-connected electricity generation from renewable sources), which are included in the PDD/PDD2/ and other relevant supporting documents.
The items covered in the validation are described below:

- **UNFCCC & Host Country Criteria**
  - UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the CDM as set out in decision 17/CP.7 (Marrakech Accords), the present annex, and relevant decisions by COP/MOP & CDM Executive Board
  - Host country requirements / criteria

- **CDM Project Description**
  - Project design
  - Project boundaries
  - Predicted CDM project GHG emissions

- **Project Baseline**
  - Baseline methodology
  - Baseline GHG emissions
  - Additionality

- **Monitoring Plan**
  - Monitoring methodology
  - Indicators/data to be monitored and reported
  - Responsibilities

- **Background investigation and follow up interviews**

- **Stakeholder consultation**
  - Publishing the PDD on TUV NORD website
  - Review of comments

- **Draft validation reporting with CARs & CRs, if any**

- **Final validation reporting.**

The information included in the PDD and the supporting documents were reviewed against the requirements and criteria mentioned above. The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entities for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

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

## 1.3 GHG Project Description

### 1.3.1 Project Scope

The considered GHG project can be classified as a CDM project in the sector given in Table 1-1 (according to List of Sectoral Scopes of UNFCCC).

**Table 1-1:** Project Scope(s)

| No. | Project Scope |
|---|---|
| 1 | Energy industries (renewable - / non-renewable sources) |

### 1.3.2 Project Parties

People's Republic of China and Japan are the two parties involved in the project activity.

### 1.3.3 Project Entities

The following entities are involved in the developing of the project:

| | |
|---|---|
| **Project Participant 1**<br>Project owner: | Heilongjiang Huafu Wind Power Fujin Co., Ltd.<br>99,West Center Street<br>Fujin City<br>Heilongjiang Province<br>People's Republic of China |
| Contact person: | Mr. Yili Li<br>Tel: 86-454-2350138<br>Fax : 86-454-2350136<br>Email: lithiumlee@126.com |
| **Project Participant 2**<br>Project buyer: | The Tokyo Electric Power Co., Inc.<br>1-3 Uchisaiwai-cho 1-Chome<br>Chiyoda-ku<br>Tokyo 100-8560<br>Japan |
| Contact Person: | Mr. Ikuo Nishimura<br>Group manager, International Environmental Business Group<br>Tel: 81-3-4216-6369<br>Fax: 81-3-3504-1570<br>ikuo.nishimura@tepco.co.jp |

### 1.3.4 Project location

The project is sited in the Bielayinshan of Jinshan Town, Fujin City, Heilongjiang Province, People's Republic of China. The geographical coordinates of the project are east longitude 129°11'33.9"and north latitude 46°44'02.3".

**Table 1-2:** Project Location

| No. | Project Scope |
|---|---|
| Host Country | Peoples Republic of China |
| Region: | Heilongjiang Province |
| Project location address: | on the Bielayinshan<br>Jinshan Town<br>Fujin City |
| Latitude: | 46°44'02.3" N |
| Longitude: | 129°11'33.9"E |

### 1.3.5 Technical project description

The total installed capacity of the project is 48 MW, served by 32 wind turbines with an unit capacity of 1.5 MW. According to the feasibility study, the annual utilized time is 2,313 hours and the estimated annual net electricity generation is 111,044 MWh. The generated electricity will be delivered to Northeast China Power Grid. The total estimated annual emission reductions are 126,667 $tCO_2e$.

The height of the individual wind turbine is 65 m, and the diameter of the impeller is 77.4 m. The turbines can automatically align the tip angle of the blades to optimize the position according to the wind speed and direction.

The key parameters for the wind power project are given in table 1-3:

**Table 1-3:** Key parameters of the wind power project

| **Parts** | **Parameter** |
|---|---|
| **Turbine** | |
| Type | FL1500 |
| Manufacture | Sinovel Wind Co. Ltd. |
| Quantity | 32 |
| Rated Power | 1500 KW |
| Life time | 20 years |
| **Impeller** | |
| Diameter | 77.4 m |
| Covering Area | 4657$m^2$ |
| Cut-in speed | 3 m/s |
| Cut-out speed | 20 m/s |
| Rated speed | 11 m/s |
| Material | GRP |
| **Generators** | |
| Rated voltage of generator | 690V |
| Frequency | 50Hz |

# 2 VALIDATION TEAM

The validation team was led by:

- **Mr. Yong Jun Li.** Mr. Li, Dipl. in Environment Technology, is a TÜV-CERT Lead auditor for ISO 9001/14001 and OHSAS 18001. Currently he is In-charge-CDM Manager for TÜV NORD China operation. He is an appointed assessor for JI/CDM certification program of TÜV NORD.

For this validation he was assisted by:

- **Mr. Martin Saalmann**, TÜV NORD CERT GmbH, is an appointed JI/CDM Assessor in the JI/CDM Certification Program of TÜV NORD.

The technical review was carried out by:

- **Mr. Eric Krupp**. He is a publicly appointed expert for the verification of $CO_2$ emissions within the German implementation of the European Union Emission Trading Scheme, appointed JI/CDM assessor and the deputy of TÜV NORD JI/CDM certification program.

The final approval was carried out by:

- **Mr. Rainer Winter**. He works at TÜV NORD as ISO 9001/ 14001 Auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. Mr. Winter is an authorized JI/CDM assessor and is global leader of the TÜV NORD JI/CDM CP.

# 3 METHODOLOGY

The validation of the project was carried out from April 2008 to December 2008. The validation consisted of the following three phases:

- A desk review of the PDD (incl. annexes) and supporting documents with the use of a customised validation protocol according to the Validation and Verification Manual;
- Back ground investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders;
- Reporting of validation findings taking into account the public comments received on TUV NORD website.

The report may include Corrective Action Requests (CAR), Clarification Requests (CR) and Forward Action Requests CR) identified in the course of this validation.

A **Corrective Action Request** is established if

- mistakes have been made in assumptions or the project documentation which directly will influence the project results,

- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions cannot be verified and certified.

A **Clarification Request** is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

After resolution of these CARs and CRs by the project proponent the validator issues the (final) validation report and opinion.

The final validation started after issuance of proposed corrective action (CA) of these CAR and CR by the project proponent. The validator has assessed the proposed CA with a positive result and after the closure of these CAR and CR the project proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

## 3.1 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables: Table 1 (Mandatory Requirements); Table 2 (Requirement Checklist); and Table 3 (Resolution of Corrective Action and Clarification Request) as described in Figure 1.

The completed validation protocol is enclosed in the annex to this report.

| ***Validation Protocol Table 1: Mandatory Requirements*** | | | |
|---|---|---|---|
| ***Requirement*** | ***Reference*** | ***Conclusion*** | ***Cross reference*** |
| *The requirements the project must meet.* | *Gives reference to the legislation or agreement where the requirement is found.* | *This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.* | *Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.* |

| ***Validation Protocol Table 2: Requirement checklist*** | | | | |
|---|---|---|---|---|
| ***Checklist Question*** | ***Reference*** | ***Means of verification (MoV)*** | ***Comment*** | ***Draft and/or Final Conclusion*** |
| *The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.* | *Gives reference to documents where the answer to the checklist question or item is found.* | *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.* | *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.* | *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). **Clarification** is used when the validation team has identified a need for further clarification.* |

| ***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*** |
| *If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.* | *Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.* | *The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.* | *This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".* |

**Figure 1:** Validation protocol tables

## 3.2 Review of Documents

The draft PDD submitted by Beijing Ruichi Electric Power Information Technology Co. Ltd. (consultant designated by the project owner) in April 2008 and supporting background documents related to the project design and baseline were reviewed. Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The documents that were considered during the validation process are given in chapter 7 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 7-1)
- Background investigation and assessment documents (Table 7-2)
- Websites used (Table 7-3).

In order to ensure the transparency of the decision making process, the reference codes listed in tables 7-1 to 7-3 are used in the validation protocol and –as far applicable – in the report itself.

## 3.3 Follow-up Interviews

On 24th April 2008, the TÜV NORD JI/CDM CP performed interviews with the project proponent, stakeholders and project developer to confirm selected information and to resolve issues identified in the document review. Further to these interviews the mentioned parties were contacted by e-mail to provide further clarifications.

The key interviewee and main topics of the interviews are summarised in Table 3-1.

**Table 3-1** Interviewed persons and interview topics

| Interviewed Persons / Entities | Interview topics |
|---|---|
| Project proponent representatives /IM01/ | - Chronological description of the project activity<br>- Technical details of the project realisation and Project Design Report<br>- Host Country Approval / Annex I country approval (Japan)<br>- Approval procedures and status<br>- Quality management system<br>- Monitoring and measurement equipment<br>- Crediting period and its starting date<br>- Project activity starting date<br>- Power purchase agreement with grid<br>- Sustainable development benefits because of |

| Interviewed Persons / Entities | Interview topics |
|---|---|
| | project<br>- Analysis of local stakeholder consultation<br>- Operational data – technical specification (capacity of turbine), start up power supply, wind availability, plant load factor.<br>- Training & competency of the staff members w.r.t project management, monitoring and reporting |
| Project consultant representatives /IM02/ | - Editorial aspects of PDD<br>- Methodology selection aspects<br>- Baseline study, leakage and additionality<br>- Details of emission reduction calculation |
| Project stakeholder representatives /IM03/ | - Stakeholder consultation<br>- Environmental issues<br>- Socio-economic issues/benefits benefits because of project |

## 3.4 Resolution of Clarification and Corrective Action Requests

In order to remedy any mistakes, problems or any other outstanding issues, which needed to be clarified for positive conclusion on the project design, CARs and CRs were raised. These requests can be resolved or "closed out" by the project proponent by providing the corresponding response in column 3 of table three as meant in Figure 1 and submission of revised PDD and supporting documents.

The CARs / CRs are documented in the Annex and addressed in section 4.

## 3.5 Public Stakeholder Comments

The PDD was made publicly available through TÜV NORD JI/CDM CP website www.global-warming.de. Comments on the PDD were invited within 30 days, i.e. 19/04/2008 to 18/05/2008.

No comments were received. In case comments would have been received, they would have also been made publicly available on this web site.

## 3.6 Finalising the report

The draft validation report was submitted to the project proponents. After reviewing the revised and resubmitted project documentation; resolving the CRs & CARs raised and outstanding concerns TÜV NORD JI/CDM CP issues this final validation report and opinion.

# 4 VALIDATION FINDINGS

In the following protocol the findings from the desk review of the draft PDD, visits, interviews and supporting documents are summarised.

The results are shown in table 4-1:

**Table 4-1:** Summary of CAR and CR issued

| Validation topic [1)] | No. of CAR | No. of CR |
|---|---|---|
| General description of project activity (A)<br>- Project boundaries<br>- Participation requirements<br>- Technology to be employed<br>- Contribution to sustainable development | 1 | 4 |
| Project baseline (B)<br>- Baseline Methodology<br>- Baseline scenario determination<br>- Additionality determination<br>- Calculation of GHG emission reductions<br>Project emissions<br>Baseline emissions<br>Leakage<br>- Emission reductions<br>- Monitoring Methodology<br>- Monitoring of<br>Project emissions<br>Baseline emissions<br>Leakage<br>Sustainable development indicators / environmental impacts<br>- Project management planning | 8 | 8 |
| Duration of the Project / Crediting Period (C) | - | 1 |
| Environmental impacts (D) | - | 1 |
| Stakeholder Comments (E) | - | - |
| **SUM** | **9** | **14** |

[1)] The letters in brackets refer to the validation protocol

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). The Annex also includes a detailed list of all CARs and CRs (Table 3), the response of the project participants and the final assessment of the validation team.

## 4.1 Participation Requirements

P.R. of China as a non Annex I party meets all relevant participation requirements. In the Host Country Approval[/HCA/] dated June 2008, the Chinese DNA, Chinese National Development and Reform Committee confirmed the voluntary participation of the as project participant in the CDM project activity.

Japan as Annex I party meets all relevant participation requirements. The Letter of Approval[/LOA/] (dt. 02/09/2008) was issued by the DNA of Japan.

## 4.2 Project design

The objective of the proposed project is to reduce GHG emissions by replacing electricity of the NEPG which predominantly uses fossil fuels. The project activity is estimated to reduce GHG emissions equivalent to 126,667 $tCO_{2e}$ annually.

The technology used is state of the art and the equipments e.g. turbines and generators are produced in the host country (China). The technology being used is environmentally safe.

According to sustainable development various social, economic and environmental benefits are achieved. The project activity would result *inter alia* in greenhouse gas emission reductions, while also enhances the employment of the local people during the construction and operation period.

Based on the financial information provided by the project participants, no ODA contributes to the financing of the project.

The location of the project is clearly defined.

The assumption of the operational lifetime to be 20 years was assessed to be reasonable.

However, CR A1-A4 were raised and have been successfully resolved.

## 4.3 Baseline and Additionality

***Baseline***:

Selection of Baseline Methodology:

The selected baseline methodology is ACM0002 (Version 07) – Consolidated baseline methodology for grid-connected electricity generation from renewable sources. The project fulfils the applicability criteria defined in ACM0002.

Baseline scenario identification:

According to methodology the baseline scenario is defined as:

"If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: Electricity delivered to the grid by the project 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) calculations described in the "Tool to calculate the emission factor for a electricity system."

Application of approved baseline methodology:

The emission baseline will be the electrical energy (in kWh) produced/ displaced by the renewable generating unit multiplied by an emission coefficient of the grid (measured in kg $CO_{2e}$/kWh).

In this project, the grid emission coefficient is calculated by "combined margin method" consisting of the combination of "operating margin (OM)" and "build margin (BM)" according to the procedures prescribed in the approved methodology ACM0002, version 7 and under consideration of the "Tool to calculate the emission factor for an electricity system" version 1.1 (Annex 12, EB35).

The calculation of the grid emission factor is in line with ACM0002 version 7 and the above mentioned tool. The operating margin as well as the build margin are determined ex-ante and thus remain fixed throughout the crediting period.

All the required data for baseline emission coefficient calculation are sourced from the latest version of China Energy Statistical Yearbook, China Electric Power Yearbook and the IPCC Reference Manual 2006 /GEF/ /IPCC-RM/. The data was publicly available when the PDD was published for global stakeholder consultation on the UNFCCC website. The DOE herewith confirms this.

The emission reductions ($ER_y$) of the project activity during the crediting period are the difference between the baseline emission ($BE_y$), project emission ($PE_y$) and leakage ($L_y$). As project emissions and leakage are not to be considered as per the applied methodology, the emission reductions are equal to the baseline emissions.

$BE_y$ is calculated by multiplying the grid emission factor ($EF_y$) and the net electricity exported to the NEPG ($EG_y$).

The grid emission factor ($EF_y$) is determined ex-ante and calculated as a combined margin (CM), consisting of the weighted average of operating margin ($EF_{OM}$) and build margin ($EF_{BM}$) factors.

The calculation method of OM and BM is derived from the guidance of OM and BM calculation issued by Chinese DNA in July 2008.

$EF_{OM,y}$ calculation: Due to the fact that the low-cost/must-run resources constituting less than 50% to the total grid generation and that the data for "Dispatch Data Analysis" is not available, the simple OM emission factor ($EF_{OM,y}$) calculation method is applied. The OM factor is calculated as generating sources serving the system (not including the low-cost and must-run power plants) of three years average data (2004-

2006). The $EF_{OM,y}$ is calculated to be 1.2561 $tCO_{2e}$/MWh and will not be changed during the first crediting period.

$EF_{BM,y}$ calculation: The build margin is calculated considering the following:

1) The capacity additions from the years 2003-2007 are chosen which does not exceed 20% (19.39%) of the total installed capacity.
2) According to the data in "Chinese Energy Statistical Yearbook 2006" the weighted averages of the newly added coal based capacity, newly added gas capacity and newly added oil based capacity are used to calculate $EF_{BM,y.}$
3) The coal emission factor 25.8 tC/TJ, gas emission factor 15.3 tC/TJ and oil emission factor 21.1 tC/TJ as well as the IPCC 2006 default value of carbon oxidization factor 100% are used for the BM calculation.
4) The BM is calculated as 0.7946 $tCO_{2e}$/MWh. According to newly published BM by Chinese DNA in December 2008, the BM of NEPG has been modified as 0.8068 $tCO_{2e}$/MWh. However, the value without the modification was applied in EF calculation, which was accepted as it is assessed to be conservative.

In accordance with ACM0002 and the "Tool to calculate the emission factor for an electricity system", weight factors of $w_{OM}$= 0.75, $w_{BM}$=0.25 have been used and the resultant grid emission factor ($EF_y$) works out as 1.1407 $tCO_2e$/MWh.

The calculation of $EF_y$ (without the modifications as described above) has been made publicly available by the Chinese DNA (National Development and Reform Committee) on its website/GEF/.

The validation team has re-calculated the EF; no mistakes could be observed. It is convinced of the result of the emission coefficient calculation. It is deemed to be adequate and transparent.

The power generated by the project activity is first transferred to the 220kV substation and then to Northeast China Power Grid (NEPG).

Altogether the project activity reduces emissions of 126,667 $tCO_2e$/yr and 886,669 $tCO_2e$ covering the 1st renewable crediting period (7 years).

However, CAR B5 was raised during the validation process and successfully resolved.

## Additionality

Consideration of CDM during management decision

The feasibility study report/FSR/ was compiled by authorized design institute in October 2007. The IRR was calculated to be lower than the benchmark rate of 8% as defined in "Interim Rules on Economic Assessment of Electrical Engineering Retrofit projects "/ADD/.

Considering the unattractive financial index, the project proponent hence decided to participate in CDM activity on general meeting of shareholders on Oct 29, 2007/MMD/. In November 2007 CDM development cooperation agreement/CDCA/ was signed between project owner and Beijing Ruichi Electric Power Information Technology Co. Ltd. The The Feasibility Study was approved by Heilongjiang provincial development and reform Commission on December 29, 2007. The construction of project was started on January 1st, 2008./PCSP/

All the evidences to support the CDM management decision have been verified by the validation team. The analysis of the evidences indicated that the proposed project was decided for implementation with serious consideration of CDM benefits. The validation team can confirm that the process of considering CDM benefits and the evidences provided fully meet the EB41 decision, Annex 46, paragraph 5.

Additionality Tool

The additionality was demonstrated acc. to the valid version 5.02 of the "Tool for demonstration and assessment of additionality". The individual arguments presented in the PDD to justify the additionality were summarised in table 4-2. This table also includes the assessment of the validation team.

**Table 4-2:** Additionality assessment

| Step[1)] | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| **1a** | Possible alternatives for the project activity are:<br>1.Construction of a fossil fuel-fired power plant with equivalent annual electricity;<br>2.The project activity not undertaken as a CDM project;<br>3.Construction of a power plant using other renewable energy to supply equivalent annual electricity generation;<br>4.Equivalent annual electricity supplied by NEPG (continuation of current practice). | The alternative 1 is not in compliance with Chinese laws.<br>The alternative 3 was excluded due to none availability of renewable resources at the project site (referring to *China Electric Power Yearbook 2007*)<br>In conclusion only alternative 2 and 4 remain as plausible and credible alternatives. | ☒ step passed<br>☐ step not passed<br>☐ not applicable |
| **1b** | The alternatives 2 and 4 mentioned above are in compliance with the applicable legal and regulatory requirements. | Alternatives 2 and 4 are in line with the national regulations. | |
| **2a** | Option III: benchmark analysis is selected for the investment analysis. | In accordance with the Additionality Tool, the option III is selected and deemed to be appropriate. | |
| **2b** | The financial indicator "Internal Rate of Return (IRR)" after tax of total investment for Chinese power industry is 8% as defined in the *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects.* It has been identified | The document was assessed to be appropriate as source for benchmark. It has been widely applied in financial assessment of projects investment within power industry in China such as wind power, hydropower etc. | ☒ step passed<br>☐ step not passed<br>☐ not applicable<br>(step 2 or 3 has to be passed) |

| Step[1)] | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| | as a financial indicator for bench mark analysis. | | |
| **2c** | The project IRR (without CDM revenue) is 6.81% which is less than the identified benchmark of 8%. | PP has calculated the IRR for the project activity on after-tax basis and compared it with the benchmark. The IRR calculation was reproduced by the validation team and assessed to be credible. The calculation is based on the project lifetime of 20 years and an electricity price including tax of 0.61 Yuan RMB/kWh which is approved by national development and reform commission./EET/ All values provided in the FSR are reasonable and adequate. A detailed evaluation of the basic parameters for the IRR calculation is provided in table 4 in the Annex to this report. | |
| **2d** | Four critical parameters were selected in the sensibility analyse:<br>- Static investment<br>- Annual O&M Cost<br>- Grid tariff<br>- Power generation<br>Sensitivity Analysis by varying these critical parameters from<br>-10% to +10% confirms that the proposed project activity is unlikely to be financially attractive. | The calculations within the sensitivity analysis were reproduced by the validation team and evaluated to be correct.<br>- It is unlikely that the static investment will decrease by 9.19% according to the main contracts e.g. equipment purchasing contract and construction contract etc. The contracts have been checked by validation team.<br>- When the annual O&M cost decreases by 10%, the IRR is still lower than benchmark.<br>- The grid tariff has been decided by national development and reform commission and will be fixed in a long time. In china, the feed-in tariff of wind power is totally regulated by central government. Therefore, the tariff is very unlikely to increase by 7.3%<br>- The annual power generation is unlikely to increase by 7.3% because the power generation is estimated by qualified design institute and calculated on basis of | |

| Step[1)] | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| | | 10 years average wind velocity and 1 year monitored data from wind testing tower.<br>The sensitivity analysis concludes that the project activity is unlikely to be financially attractive. | |
| **3a,b** | Not applied | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not a decisive barrier<br>☐ Argument justified / significant barrier | ☐ step passed<br>☐ step not passed<br>☒ not applicable<br>(step 2 or 3 has to be passed) |
| **4 a, b** | For the common practice analysis, the officially published "*Shi Pengfei: Chinese Wind Energy Association Statistics 2004-2007*" and other web links were used to identify wind power projects with a similar capacity (12 MW to 72 MW).<br><br>Two wind power projects which started construction after 2004 in Heilongjiang Province were identified for the analysis.<br><br>The analysis shows that compared with proposed project both of identified projects have significant advantage in aspects such as higher electricity tariff and favourable financing environment etc.<br><br>The statistics presented clearly indicate that the proposed project is not a common practice in this region (Heilongjiang province) at the time of PDD preparation. | The Information source for the common practice analysis is publicly available and checked by the validation team. The information used is evaluated to be credible. The common practice analysis shows that the proposed project can not be considered as common practice. | ☒ step passed<br>☐ step not passed<br>☐ not applicable |
| **Assessment of the validation team** | | ☒ **project is additional**<br>☐ **is not additional** | |

[1)] Steps as per Additionality Tool

During the validation process the following CARs and CRs regarding the baseline and additionality justification were raised: CAR B1-B4 and CR B1-B3. All CARs and CRs have been successfully closed out.

## 4.4 Crediting Period

The starting date of the crediting period as mentioned in the PDD under Section C.2. is 01/08/2009 or the registration date, whichever is later. The intended crediting period of the project is for a renewable period of seven years. The starting date of the project activity as mentioned in the PDD under Section C.1 and verified by the validation team is 19/12/2007 which is the signature date of construction contract./CC/ The project life time of 20 years indicated in the Section C.1.2 of the PDD was verified by the validation team with the turbine and generator purchasing contract/TGC/, which is longer than the 1st crediting period of 7 years ending in 2016.

## 4.5 Monitoring Plan

The project applies the monitoring methodology ACM0002 (Version 07): Consolidated methodology for grid-connected electricity generation from renewable sources.

In accordance with the methodology the net electricity ($EG_y$) which is supplied to the grid shall be monitored. Thus the net electricity supply ($EG_y$) which is the basis for emission reduction calculation will be calculated by subtracting the electricity imports ($EG_{in,y}$) from the electricity exports ($EG_{out,y}$). As the invoiced meters of the proposed project to monitoring the net electricity supplied to Grid are shared with other wind farms (Phase I and Phase II of Fujin Wind Power Projects), $EG_{out}$ will be calculated using a alternative method which was based on electricity computation stated in power purchasing agreement of Phase I and Phase II./PPA/ The method has been described detailed in PDD and assessed to be suitable. Furthermore, the value can be counterchecked by monthly sales invoices.

The OM and BM are calculated ex-ante and remain fixed throughout the crediting period.

The procedures for calibration, accuracy and maintenance of monitoring equipment and the responsibilities are clearly mentioned in section B.7. of the PDD.

The monitoring as described in PDD section B.7. is assessed to be sufficient and in accordance with the monitoring methodology.

Nevertheless CAR B6-B8 and CR B4-B8 were raised related to the monitoring plan and monitored parameter in the PDD. All were successfully closed out.

## 4.6 Calculation of GHG Emissions

The emission reduction calculation was carried out in accordance with the applied methodology.

As per ACM0002 project participants do not need to consider project emissions and leakage. Hence, emission reductions are derived from the emission coefficient of

NEPG multiplied by the net electricity generation. The calculations are documented transparently in section B.6.3 and in Annex 3 of the PDD.

Acc. to the final PDD the project is expected to reduce emissions of 886,669 $tCO_{2e}$/a in the 1st renewable crediting period.

## 4.7 Environmental Impacts

Social and environmental impacts of the project have been sufficiently addressed. No adverse environmental impacts as well as transboundary impacts have been envisaged from this project activity.

## 4.8 Comments by Local Stakeholders

HWPF informed various stakeholders such as local governmental officials, local residents and related employees about the project details through questionnaires /SSR/.

A summary of the comments received and a note on how due account was taken of the concerns raised in the above public consultation are included in PDD. No negative comments were identified.

# 5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the validation of CDM projects, TÜV NORD JI/CDM CP published the draft PDD on its website www.global-warming.de on 19/04/2008 and invited comments within 30 days, until 18/05/2008 by parties, stakeholders and UNFCCC accredited non-governmental organisations. No comment was received.

# 6 VALIDATION OPINION

Beijing Ruichi Electric Power Information Technology Co. Ltd. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project *"Heilongjiang Fujin Wind Power Project"* with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity exports electrical power from a renewable energy source (wind) to the Northeast China Power Grid (NEPG). The project intends to reduce GHG emissions to the extent of equivalent electricity generated by fossil fuel based power plants connected to NEPG.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

All Corrective Action Requests (CARs) and Clarification Requests (CRs) raised in the course of the validation were successfully closed.

In detail the conclusions can be summarized as follows:

- The project is in line with all relevant host country criteria (China) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of China vide the Letter of Approval (HCA) dated June 2008. and from DNA of Japan vide Letter of Approval (LOA) dated September 2008
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 886,669 $tCO_{2e}$ are most likely to be achieved within the 1st renewable crediting period (2009-2016).

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Essen, 2009-05-07

Li Yongjun
TÜV NORD JI/CDM Certification Program
Assessor

Essen, 2009-05-07

Rainer Winter
TÜV NORD JI/CDM Certification Program
Senior Assessor

# 7 REFERENCES

**Table 7-1:** Documents provided by the project proponent

| Reference | Document |
|---|---|
| **/ADD/** | Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects issued by the State Power Corporation of China |
| **/ADFS/** | Approval Document of Feasibility Study [2007] 1282, on 29. December 2007 |
| **/AEIA/** | Approval Document of EIA [2007] 99, on 09. August 2007 |
| **/AET/** | Approval of Electricity Tariff issued by National Development and Reforming Committee (Fagaijiage [2008] NO.1876) |
| **/CC/** | Construction Contract signed on 19/12/2007 |
| **/CDCA/** | CDM development service agreement signed on October 29, 2007 |
| **/EGA/** | Export to Grid Agreement dated on 11 October 2007 |
| **/EIA/** | Environmental Impact Assessment completed in May 2007 |
| **/FSR/** | Feasibility Study Report completed in October 2007 |
| **/HCA/** | Host Country Approval in June 2008 No.1152 |
| **/IRRC/** | Project Finance Evaluation & IRR Calculation |
| **/LOA/** | Letter of Approval from Japanese DNA on September 02,2008 |
| **/MOC/** | Modalities of Communication |
| **/MMD/** | Meeting of management decision held on 29 October 2007 |
| **/PCSP/** | Project Construction Starting Permission by Heilongjiang Electricity Power Construction Supervision Co. Ltd on 01. January 2008 |
| **/PDD1/** | Draft PDD: *Heilongjiang Fujin 48 MW Wind Power Project* Ver. 01; 28/11/2007 |
| **/PDD2/** | Final PDD: *Heilongjiang Fujin 48 MW Wind Power Project* Ver. 02; 15/1/2009 |
| **/PHT/** | Photographs of progress of construction activity at the project site |
| **/PPA/** | Power Purchasing Agreement of *Heilongjiang Fujin Wind Power Project* |

| Reference | Document |
|---|---|
| | *(phase I and phase II)* |
| **/SSR/** | CDM stakeholder survey record: Questionnaire samples. |
| **/TGC/** | Turbine Supplier, Generator Supplier contract signed on 31/12/2007 |

**Table 7-2:** Background investigation and assessment documents

| Reference | Document |
|---|---|
| **/ACM0002/** | Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 07) |
| **/CPM/** | TÜV Nord JI / CDM CP Manual (incl. CP procedures and forms) |
| **/GCP/** | Guidelines for completing the Project Design Document (CDM-PDD), and the proposed new baseline and monitoring methodologies (CDM-NM) Version 06,2 |
| **/GEF/** | Official data sources for Grid Emission Factor (NEPG Grid) published by the Chinese DNA based on the China Energy Statistical Yearbook and China Electric Power Yearbook dated on July 18, 2008 |
| **/IPCC-GP/** | IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 |
| **/IPCC-RM/** | Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual |
| **/KP/** | Kyoto Protocol (1997) |
| **/MA/** | Decision 17/CP. 7 (Marrakesh – Accords & Annex to decision 17/CP.7) |
| **/TA/** | Tool for the demonstration and assessment of additionality (Ver 5.02) |
| **/TEF/** | Tool to Calculate the Emission Factor for an Electricity System (Ver. 01) |
| **/VVM/** | IETA, PCF Validation and Verification Manual (V.4) |

**Table 7-3:** Websites used

| Reference | Link | Organisation |
|---|---|---|
| **/dna/** | http://cdm.ccchina.gov.cn | DNA of China |
| **/ipcc/** | www.ipcc-nggip.iges.or.jp | IPCC publications |
| **/unfccc/** | http://cdm.unfccc.int | UNFCCC |

**Tabelle 7-4:** List of interviewed persons

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| /IM01/ | V | ☒ Mr.<br>☐ Ms | Hou Xinmin | Heilongjiang Huafu Wind Power Fujin Co., Ltd. / general manager assisstant |
| /IM01/ | V | ☐ Mr.<br>☒ Ms. | Zhao Yu | Heilongjiang Huafu Wind Power Fujin Co., Ltd. / CDM project Manager |
| /IM02/ | V | ☐ Mr.<br>☒ Ms. | Yang Lusi | Beijing Ruichi Electric Power Information Technology Co. Ltd., / CDM project Manager |
| /IM03/ | V | ☒ Mr.<br>☐ Ms | Sun Mingli | Jinshan village / Villager |
| /IM03/ | V | ☒ Mr.<br>☐ Ms | Sun Changhe | Jinshan village / Villager |

1) Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

# ANNEX

Validation Protocol

# ANNEX – VALIDATION PROTOCOL

**Table 1: Mandatory Requirements for (CDM) Project Activities**

| Requirement | Reference | Conclusion |
|---|---|---|
| **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 | ~~CAR A1~~<br>~~The LOA from the Japanese DNA is not available~~ |
| The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC. | Kyoto Protocol Art.12.2. | ~~CAR A1~~<br>~~The HGA from the Chinese DNA is not available~~ |
| The project shall have the written approval of voluntary participation from the designated national authority of each Party involved. | Kyoto Protocol Art. 12.5a,<br>CDM Modalities and Procedures §40a | ~~CAR A1~~<br>~~The LOA from the Japanese and HGA from Chinese DNA are not available~~ |
| 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,<br>CDM Modalities and Procedures §40a | ~~CAR A1~~<br>~~The HGA from the Chinese DNA is not available~~ |
| 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,<br>CDM Modalities and Procedures Appendix B, § 2 | OK. Public funding from Annex I countries is not included in project financing |
| Parties participating in the CDM shall designate a national authority for the CDM. | CDM Modalities and Procedures §29 | Both parties, i.e. China and Japan have designated a national authority for CDM. |

| Requirement | Reference | Conclusion |
|---|---|---|
| The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol. | CDM Modalities §30/31a | Both parties have ratified the Kyoto Protocol |
| 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 GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7. | CDM Modalities and Procedures §31b | OK |
| **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 | ~~CAR B2 – B4~~ |
| **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 | ~~CAR B5~~ |
| **Environmental impacts** | | |
| 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 | ~~CR D1~~ |
| **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 |

| Requirement | Reference | Conclusion |
|---|---|---|
| Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available. | CDM Modalities and Procedures §40 | OK, the project was published on the UNFCCC website for 30 days.<br>(19/04/2008 to 19/05/2008) |
| **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 | ~~CAR B1~~<br>~~CR B1~~ |
| 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, the latest version of the PDD is used, i.e. Ver. 3.1 |
| 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 | ~~CAR B6 – B8~~<br>~~CR B4 - B8~~ |
| **Requirements for small-scale projects only** | | |
| The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c | N/A |
| The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e | N/A |

| Requirement | Reference | Conclusion |
|---|---|---|
| If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c | N/A |

**Table 2: Requirements Checklist**

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| ***A. General Description of Project Activity***<br>*The project design is assessed.* | | | | | |
| **A.1. Project Boundaries**<br>*Project Boundaries are the limits and borders defining the GHG emission reduction project.* | | | | | |
| A.1.1. Are the project's spatial boundaries (geographical) clearly defined? | /PDD/ (A 4.1.4), /FSR/ | DR | The unique identification of the project activity (131°41' east longitude and 47°00' north latitude) are indicated in the PDD, but it should be defined more precisely, i.e. in geographical seconds. | ~~CR A1~~ | OK |
| A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined? | /PDD/ (A.4.) (B.3.) /FSR/ | DR I | The project's system boundaries are clearly defined in PDD.<br>The project boundary includes 32 sets of turbines, whose type are FL-1500, as well as all power plants connected physically to the electricity system that the CDM project is connected to the Chinese Northeast Power Grid (NEPG), which covers three provinces (Liaoning, Jilin, Heilongjiang)<br>However components and facilities used to mitigate GHGs are not sufficient identified in PDD A.4.. Further description of the project's system boundaries is requested. | ~~CR A2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **A.2. Participation Requirements** *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.* | | | | | |
| A.2.1. Which Parties and project participants are participating in the project? | /PDD/ (A.3.) /LOA/ /HGA/ | DR | The following parties are involved in the project activity: China (Host Party) and Japan.<br><br>The project participants are: Heilongjiang Huafu Wind Power Fujin Co., Ltd. and The Tokyo Electric Power Co., Inc..<br>However the LOA and HGA are pending. | ~~CAR A1~~ | 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? | /PDD/ (A.3.) /LOA/ /HGA/ | DR I | In accordance with the CDM M&P at the time of making the PDD public at the stage of validation a Party involved may or may not have provided its approval. At the time of requesting registration the approval of the Parties involved is required.<br><br>At the time of the (pre-) validation the letters of approval of both countries' DNA are pending . | ~~CAR A1~~ | OK |
| A.2.3. Do all participating Parties fulfil the participation requirements as follows:<br>– Ratification of the | /LOA/ /unfccc/ /LOA/ /HGA/ | DR | All parties have ratified or accepted the Kyoto Protocol (China: Ratification 2002-08-30, Japan: Ratification 2002-06-04).<br>DNAs in all countries are established.<br>The voluntary participation is stated in the LOA and HGA, both of them are pending. Please refer to A.2.2. | ~~CAR A1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| Kyoto Protocol<br>– Voluntary participation<br>– Designated a National Authority | | | | | |
| A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance. | /PDD/ (A.4.5) | DR I | Public funding from an Annex I - country is not used to finance the project activity. | OK | OK |
| **A.3. Technology to be employed**<br>*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.* | | | | | |
| A.3.1. Does the project design engineering reflect current good practices? | /PDD/ (A.2) (A.4.3.) /IM01/ | DR I | Yes, the project intends to incorporate the latest technologies. The designed operation lifetime is 20 years. According to the PDD A.2., the project will generate about 111,043MWh annually, however it is not reasonable considering the installed capacity and annual utilization | ~~CR A3~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | hours. Clarification is requested. | | |
| 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? | /PDD/ (A.2.) (A.4.3.) /IM01/ | DR I | Yes, the project use the FL1500 type turbines manufactured by Sinovel Wind Co. Ltd, it could transfer the wind power efficiency. | OK | OK |
| A.3.3. Does the project make provisions for meeting training and maintenance needs? | /PDD/ (A.2.) /TP/ /IM01/ | DR I | Training and maintenance needs are supposed to be conducted by the project proponents.<br>However the plan of training and maintenance is not provided in PDD, clarification is requested. | ~~CR A4~~ | OK |
| **A.4. Contribution to Sustainable Development**<br>*The project's contribution to sustainable development is assessed.* | | | | | |
| A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development? | /HGA/ | | The HGA from the Chinese DNA is not available. | ~~CAR A1~~ | OK |
| A.4.2. Will the project create other environmental or | /PDD/ (A.2.) | DR | The view of project participants on the contribution of the | OK | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| social benefits than GHG emission reductions? | /FSR/ /IM03/ | | project activity towards sustainable development is briefly described in section A.2.<br>The project creates mainly economic benefits in addition to social benefits through the electricity supply, job position opportunities and air pollution reduction. | | |
| **Small scale project activity**<br>*Is it assessed whether the project qualifies as small-scale CDM project activity* | | | | | |
| A.4.3. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM? | /PDD/ (B.2.) | | N/A | N/A | ~~N/A~~ |
| A.4.4. Is the small scale project activity not a debundled component of a larger project activity? | /PDD/ (B.2.) | | N/A | N/A | ~~N/A~~ |
| **A.5. General Topics** | | | | | |
| A.5.1. Has the PDD been duly filled? | | | The PDD revision is requested. Refer to the CARs. | ~~Not OK yet~~ | OK |
| A.5.2. Has all necessary information been made | | | Several documents which are necessary to form a final assessment of the project activity are pending. Please | ~~Not OK yet~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| available to the validator. | | | refer to table 7-1 of the draft validation report. | | |
| ***B. Project Baseline***<br>*The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.* | | | | | |
| **B.1. Baseline Methodology**<br>*It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| B.1.1. Does the project apply an approved methodology and the correct version thereof? | /PDD/ (B.1.) (B.4.) /ACM0002/ /TA/ | DR | Yes, ACM0002 Ver.07, additionality tool Ver.05, and emission factor tool Ver.01 were applied for the project activity. | OK | OK |
| B.1.2. Are the applicability criteria in the baseline methodology all fulfilled? | /PDD/ (B.2.), /ACM0002/ | DR | The project fulfils the applicability criteria defined in ACM0002. This is justified as following:<br>1. The proposed project is a new build wind power project and the generated electricity will be delivered to the Northeast China Power Grid.<br>2. The project does not involve switching from fossil fuels to renewable energy at the site of the project activity.<br>3. The geographic and system boundaries of the Northeast China Power Grid can be clearly identified and information on the characteristics of the grid is available. | OK | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.2. Baseline Scenario Determination**<br>*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.* | | | | | |
| B.2.1. What is the baseline scenario? | /PDD/ (B.4.) | DR | The baseline scenario of the proposed project was equivalent electricity supplied by Northeast China Power Grid. | OK | OK |
| B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one? | /PDD/ (B.4.) /ACM0002/ | DR | The project activity is a new grid-connected wind power project, thus according to ACM0002 Ver.07, the baseline of 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) calculations described in the "Tool to calculate the emission factor for an electricity system".<br><br>4 alternatives identified in PDD B.4. were not required by ACM0002 Ver.07, therefore revision is requested. | ~~CAR B1~~ | OK |
| B.2.3. Has the baseline scenario been | /PDD/ (B.4.), | DR | Yes, the baseline scenario was determined based on information provided by the Chinese DNA. | ~~CAR B1~~ | OK |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|---|
| | determined according to the methodology? | /ACM0002/ | | However revision is requested. Refer to CAR B1. | | |
| B.2.4. | Has the baseline scenario been determined using conservative assumptions where possible? | /PDD/ (B.4.) | DR | Yes, the data used in baseline scenario were calculated based on China Energy statistical Yearbook.. | OK | OK |
| B.2.5. | Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | /PDD/ (B.4.) | DR | The baseline scenario was determined according to the information provided by the Chinese DNA, the relevant national policies and circumstances are described in the PDD. | OK | OK |
| B.2.6. | Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced? | /PDD/ (B.4.) | DR | Yes, scenario determination was compatible with the available data.<br>However, the relevant documentation or references should be referred accordingly in PDD B.4., preferably in a table form. | ~~CR B1~~ | OK |
| B.2.7. | Have the major risks to the baseline been identified? | /PDD/ (B.4.) | DR | No major risk was identified and was not to be expected. | OK | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.3. Additionality Determination** *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.* | | | | | |
| B.3.1. Is the project additionality assessed according to the methodology? | /PDD/ (B.5.) /TA/ | DR | Yes, the additionality is justified according to the Additionality Tool Ver.5.02.<br><br>*Step 1. Identification of alternatives to the project activity consistent with current laws and regulations*<br><br>Sub-step 1a. Define alternatives to the project activity:<br><br>Alternative 1: Construction of a fuel–fired power plant with equivalent amount of annual electricity generation;<br>Alternative 2: The proposed Project activity not undertaken as a CDM project activity;<br>Alternative 3: Construction of a power plant using other sources of renewable energy with equivalent amount of annual electricity generation; and<br>Alternative 4: Provision of an equivalent amount of annual power output by the grid into which the project is connected.<br><br>Alternative 3 is exclusive by proving the shortage in other renewable energy source such as hydropower and biomass, etc.<br>Sub-step 1b. Enforcement of applicable laws and regulations: | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | Alternative 1 is exclusive by the equivalent fuel-fired power plant installed capacity is 24 MW, which is less than 135MW, therefore conflicts with China's current regulations <*Notice on Strictly Prohibiting the installation of Fuel-fired Generators with the Capacity of 135 MW or Below*> issued by the State Council for electricity generation.<br><br>*Step 2. Investment Analysis*<br><br>Sub-step 2a. Determine appropriate analysis method<br><br>Option I: simple cost analysis;<br>Option II: investment comparison analysis, and;<br>Option III: benchmark analysis.<br><br>The proposed Project will use benchmark analysis method to assess the financial viability of the Project activity.<br><br>Sub-step 2b. Benchmark Analysis Method<br>The financial benchmark rate of return adopted by the Project is 8%. However, relevant authorized document from which the benchmark rate is derived should be given.<br><br>Sub-step 2c. Calculation and comparison of financial indicators<br>(1) Basic parameters for calculation of financial indicators<br>(2)Comparison of IRR for the proposed Project and the | ~~CAR B2~~<br><br>~~CAR B3~~ | OK<br><br>OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | financial benchmark<br>However, some issues are raised in IRR calculation.<br>- Data source used as basis of IRR calculation should be clearly indicated.<br>- Proof document of the electricity tariff used in IRR calculation should be submitted.<br>- According to Feasibility study chapter 14 average material fee was included in other fee. However, average material fee was separately listed and calculated in IRR calculation sheet. Explanation should be given.<br>- The amount of long-term loan and loan rate should be indicated.<br>- Explanation should be given, why the repairing fee is increasing with years since the repairing fee rate is fixed.<br><br>Sub-step 2d. Sensitivity analysis<br>In PDD page 10, sensitivity analysis was not sufficient. The analysis on variation of four critical parameters ( total investment, annual O&M cost, annual power generation and electricity tariff) should be more sufficiently demonstrated.<br><br>*Project participants proceed to Step 2 (Investment analysis) and skip Step 3 (Barrier analysis).*<br><br>*Step 4. Common practice analysis* | ~~CR B2~~<br><br>~~CAR B4~~ | OK<br><br>OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | Sub-step 4a. Analyze other activities similar to the proposed project activity<br>-The source of common practice in PDD page 11 was not indicated.<br>- Projects which are applying for CDM registration or have been registered as CDM projects should not be included in common practice analysis<br><br>Sub-step 4b. Discuss any similar options that are occurring.<br>- The justification in common practice analysis isn't sufficient. More evidences are requested to provide. | ~~CAR B4~~ | OK |
| B.3.2. Are all assumptions stated in a transparent and conservative manner? | /PDD/ (B.5.) /FSR/ /IRR/ | DR | Refer to CAR B2-B4. | ~~CAR B2- B4~~ | OK |
| B.3.3. Is sufficient evidence provided to support the relevance of the arguments made? | /PDD/ (B.5.) | DR | Refer to CAR B2-B4. | ~~CAR B2- B4~~ | OK |
| 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 | /PDD/ (B.5.) /CP/ /ADFS/ /MMD/ | DR I | The project started its construction on 01.January.2008.<br><br>Approval of Feasibility Study by Heilongjiang Development & Reform Commitment (dated 29 Dec. 2007, Document No: Hei Fa Gai Nengyuan [2007] 1282 ).<br><br>According to submitted information/documents of CDM | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| in the decision to proceed with the project activity? | | | introduction discussion on the Director Meeting (MMD was dated 29 Oct. 2007), CDM was seriously considered in the decision to proceed with the project activity.<br><br>However the evidence of the CDM management decision wasn't attached in PDD. Clarification is requested, if possible a list of key events related to CDM activity and documented record of MMD could be given. | ~~CR B3~~ | OK |
| **B.4. Calculation of GHG Emission Reductions – Project emissions**<br>*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.* | | | | | |
| B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.6.) /ACM0002/ | DR | The project is a new built wind power plant, therefore, according to methodology ACM0002, project emissions must not be considered. | N/A | N/A |
| B.4.2. Have conservative assumptions been used when calculating the project emissions | /PDD/ (B.6.) /ACM0002 | DR | Refer B.4.1 | N/A | N/A |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| B.4.3. Are uncertainties in the project emission estimates properly addressed? | /PDD/ (B.6.) /ACM0002 | DR | Refer B.4.1 | N/A | N/A |
| **B.5. Calculation of GHG Emission Reductions – Baseline emissions**<br>*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.* | | | | | |
| B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.6.) /ACM0002/ /TEF/ | DR | Yes, the baseline emissions are calculated according to ACM0002 Ver.07, the combined margin approach was adopted to calculate the emission coefficient of the Northeast China Grid.<br><br>According to TEF Ver. 01, EF should be identified as follows:<br>*STEP 1. Identify the relevant electric power system.*<br><br>The power to be generated from the Project will be delivered to the Northeast China Grid.<br>The ex-ante calculation method with fixed emission factors (for OM and BM) is selected. | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | *STEP 2. Select an operating margin (OM) method.*<br><br>The share of the low-cost/must run resources in the Northeast China Grid is 7.07% (2001), 5.44% (2002), 4.72% (2003), 6.88% (2004) and 8.28% (2005) respectively. Therefore, Simple OM is used reasonability.<br><br>*STEP 3. Calculate the operating margin emission factor according to the selected method.*<br><br>$EF_{OM,\ simple,\ y}$ is calculated based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system, excluding low-operating cost and must-run power plants.<br>$$EF_{grid,OMsimple,y} = \frac{\sum_{i,j} FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y}$$<br><br>*STEP 4. Identify the cohort of power units to be included in the build margin (BM).*<br><br>The calculation of BM of the Northeast China Grid is not transparent. If the BM calculation is derived from method issued by Chinese DNA, please demonstrate the calculation step and use the key parameter as defined in "Bulletin on the baseline emission factor of the Chinese Electricity Grid". | ~~CAR B5~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | *STEP 5. Calculate the build margin emission factor.*<br><br>The project uses the share of different type capacity in capacity addition as weighted average of emission factors of different type capacity is calculated as the Build Margin emission factor.<br>$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$<br><br>*STEP 6. Calculate the combined margin (CM) emissions factor.*<br><br>The weight of $EF_{OM}$ is 0.75 ($w_{OM}$) and The weight of $EF_{BM}$ is 0.25 ($w_{BM}$) by default.<br>$EF_y = w_{OM} \times EF_{OM,y} + w_{BM} \times EF_{BM,y}$<br><br>*STEP 7. Calculate the baseline emissions (BEy)*<br>$BE_y = EG_y \times EF_y$ | | |
| B.5.2. Have conservative assumptions been used when calculating the baseline emissions? | /PDD/ (B.6.) /dna/ /TEF/ | DR | Please refer to CAR B5 | ~~CAR B5~~ | OK |
| B.5.3. Are uncertainties in the baseline emission estimates properly | /PDD/ (B.6.) | DR | No uncertainties are expected in estimating the baseline emissions. | OK | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| addressed? | | | | | |
| **B.6. Calculation of GHG Emission Reductions – Leakage**<br>*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.* | | | | | |
| B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.6.) /ACM0002/ | DR | According to methodology ACM0002, leakage is not applicable. | N/A | N/A |
| B.6.2. Have conservative assumptions been used when calculating the leakage emissions? | /PDD/ (B.6.) /ACM0002/ | DR | N/A | N/A | N/A |
| B.6.3. Are uncertainties in the leakage emission estimates properly addressed? | /PDD/ (B.6.) /ACM0002/ | DR | N/A | N/A | N/A |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.7. Emission Reductions** *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.* | | | | | |
| B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change? | /PDD/ (B.6.) | DR | Please refer to B.5.1 and CAR B5 | ~~Not yet OK~~ | OK |
| **B.8. Monitoring Methodology** *It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.7.) /IM01/ /IM02/ | DR I | Please refer to CAR B6-B7, CR B4-B8. | ~~Not yet OK~~ | OK |
| 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 | /PDD/ (B.7.) | DR | All monitored data required for verification and issuance should be kept for two years after the end of the crediting period. However, it is not indicated in PDD. Correction activity is request. | ~~CAR B6~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| the last issuance of CERs, for this project activity, whichever occurs later? | | | | | |
| **B.9. Monitoring of Project Emissions** *It is established whether the monitoring plan provides for reliable and complete project emission data over time.* | | | | | |
| 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? | /PDD/ (B.7.) /ACM0002/ | DR | According to methodology ACM0002, project Emission is zero. | N/A | N/A |
| B.9.2. Are the choices of project GHG indicators reasonable and conservative? | /PDD/ (B.7.) /ACM0002/ | DR | Refer to B.9.1. | N/A | N/A |
| B.9.3. Is the measurement | /PDD/ | DR | Refer to B.9.1. | N/A | N/A |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|---|
| | method clearly stated for each GHG value to be monitored and deemed appropriate? | (B.7.) /ACM0002/ | | | | |
| B.9.4. | Is the measurement equipment described and deemed appropriate? | /PDD/ (B.7.) | DR | Refer to B.9.1. | N/A | N/A |
| B.9.5. | Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | /PDD/ (B.7.) /ACM0002/ | DR | Refer to B.9.1. | N/A | N/A |
| B.9.6. | Is the measurement interval identified and deemed appropriate? | /PDD/ (B.7.) /ACM0002/ | DR | Refer to B.9.1. | N/A | N/A |
| B.9.7. | Are the registration, monitoring, measurement and reporting procedure defined? | /PDD/ (B.7.) /ACM0002/ | DR | Refer to B.9.1. | N/A | N/A |
| B.9.8. | Are procedures identified | /PDD/ | DR | Refer to B.9.1. | N/A | N/A |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| for maintenance of monitoring equipment and installations? Are the calibration intervals being observed? | (B.7.) /ACM0002/ | | | | |
| B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) | /PDD/ (B.7.) /ACM0002/ | DR | Refer to B.9.1. | N/A | N/A |
| **B.10. Monitoring of Baseline Emissions** *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.* | | | | | |
| 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? | /PDD/ (B.7.) /IM01/ | DR I | Yes, monitoring plan was stated in PDD B.7.2., which was confirmed by project owner in interview. However, during the on-site validation period the grid connection agreement was absent and hence the grid connection schema was not clearly described in PDD. | ~~CAR B7~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| B.10.2. Are the choices of baseline GHG indicators reasonable and conservative? | /PDD/ (B.7.) /TC/ | DR | In PDD section B.7.1. $EG_y$ was determined as the net electricity supplied to the NEPG. However $EG_y$ was supposed to be calculated by the difference of the electriicity supplied to the grid and imported from the grid. Therefore, the electriicity data of supplied to the grid and imported from the grid should be added to the monitoring parameters. | ~~CAR B8~~ | OK |
| B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate? | /PDD/ (B.7.) | DR | According to PDD B.7., the metering instruments will be calibrated annually in accordance with the "Technical administrative code of electric energy metering (DL/T448－2000)". | OK | OK |
| B.10.4. Is the measurement equipment described and deemed appropriate? | /PDD/ (B.7.) | DR | The description of measurement in PDD B.7. was not sufficient, further description is required, if possible a meter and wire diagram is requested. | ~~CR B4~~ | OK |
| B.10.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | /PDD/ (B.7.) | DR | The measurement accuracy wasn't addressed and the procedure of dealing with erroneous action was not stated in PDD. Further information should be given. | ~~CR B5~~ | OK |
| B.10.6. Is the measurement interval for baseline data identified and deemed | /PDD/ (B.7.) | DR | Yes, the supplied electricity and imported electricity from the grid will be continuously monitored and recorded monthly according to PDD. B.7. | OK | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| appropriate? | | | | | |
| B.10.7. Are the registration, monitoring, measurement and reporting procedure defined? | /PDD/ (B.7.) | DR | Yes, according to PDD B.7., meter reading will be recorded monthly and will be counterchecked against electricity receipts. A specific staff will be appointed by the project owner to take the overall responsibility for monitoring. | OK | OK |
| B.10.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed? | /PDD/ (B.7.) | DR | Yes, according to PDD calibration should be implemented according to relevant standards and rules of the Northeast China Power Grid. However, the calibration interval was not clearly indicated in PDD. Further information should be given. | ~~CR B6~~ | 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) | /PDD/ (B.7.) /MM/ | DR | The description of day-to-day records handling is not sufficient in PDD. Some important information are not presented, e.g. storage area of records and how to process performance documentation. | ~~CR B7~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.11. Monitoring of Leakage**<br>*It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.* | | | | | |
| B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage? | /PDD/ (B.7.) | DR | N/A | N/A | N/A |
| B.11.2. Are the choices of project leakage indicators reasonable and conservative? | /PDD/ (B.7.) | DR | N/A | N/A | N/A |
| B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate? | /PDD/ (B.7.) | DR | N/A | N/A | N/A |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts** *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.* | | | | | |
| B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country? | /PDD/ (B.7.) | DR | The monitoring of sustainability indicators is not required according to Chinese legislation. | OK | OK |
| B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts? | /PDD/ (B.7.) | DR | See comments above. | N/A | N/A |
| B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country? | /PDD/ (B.7.) | DR | See comment above. | N/A | N/A |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.13. Project Management Planning**<br>*It is checked that project implementation is properly prepared for and that critical arrangements are addressed.* | | | | | |
| B.13.1. Is the authority and responsibility of overall project management clearly described? | /PDD/ (B.7.) /IM01/ | DR I | According to PDD and project owner, monitoring will be taken by a specific staff.<br>However, monitoring management structure is not stated clearly in PDD B.7., if possible a structure figure is preferable. | ~~CR B8~~ | OK |
| B.13.2. Are procedures identified for training of monitoring personnel? | /PDD/ (B.7.) /IM01/ | DR I | In PDD the procedures and responsibility for training of monitoring personnel are not identified, documents about training plan is pending. Refer to A.3.3. and CR A4 | ~~CR A4~~ | OK |
| B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions? | /PDD/ (B.7.) /IM01/ | DR | No emergencies are envisaged leading to unintended GHG emissions. | OK | OK |
| B.13.4. Are procedures identified for review of reported results/data? | /PDD/ (B.7.) /IM01/ | DR I | Refer to CR B11. | ~~CR B8~~ | OK |
| B.13.5. Are procedures identified | /PDD/ | DR | Refer to CR B11. | ~~CR~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| for corrective actions in order to provide for more accurate future monitoring and reporting? | (B.7.) /IM01/ | I | | ~~B8~~ | |
| ***C. Duration of the Project/ Crediting Period***<br>*It is assessed whether the temporary boundaries of the project are clearly defined.* | | | | | |
| C.1. Are the project's starting date and operational lifetime clearly defined and evidenced? | /PDD/ (C.1.) /IM01/ | DR I | The expected operational lifetime is 20 years.<br>The starting date of the project is 19/12/2007. | OK | OK |
| C.2. Is the start of the crediting period clearly defined and reasonable? | /PDD/ (C.2.) /IM01/ | DR I | Yes, the starting date of the renewable crediting period is 01. Oct. 2008. However the starting date of crediting period is considered not reasonable, revision is necessary. | ~~CR C1~~ | OK |
| ***D. Environmental Impacts***<br>*Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.* | | | | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| D.1. Has an analysis of the environmental impacts of the project activity been sufficiently described? | /PDD/ (D.1.) /EIA/ /EIAA/ | DR | Yes, The project environment analysis was described according with the EIA, which has been approved by EIAA (Hei Huan Jian Shen [2007] No.99, dated 2007.08.09). | OK | OK |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|---|
| D.2. | Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? | /PDD/ (D.1.) /EIA/ /EIAA/ | DR I | Yes, an environmental impact assessment is required in China. The EIA was approved by the Heilongjiang Environmental Protection Bureau (Hei Huan Jian Shen [2007] No. 99, dated 2007.08.09). | OK | OK |
| D.3. | Will the project create any adverse environmental effects? | /PDD/ (D.1.) /EIA/ /EIAA/ | DR | Yes, some adverse environmental impacts are expected during the project construction (noise, dust and exhaust gas, and solid waste) and operation (noise), but these impacts are assessed as not significant.<br>However, evidence should be given to support the statement "construction of the project will have little impact on the migration route of birds" | OK<br><br>~~CR D1~~ | OK |
| D.4. | Are transboundary environmental impacts considered in the analysis? | /PDD/ (D.1.) /EIA/ /EIAA/ | DR | No transboundary effects are expected. | OK | OK |
| D.5. | Have identified environmental impacts been addressed in the project design? | /PDD/ (D.2.) /EIA/ /EIAA/ | DR | Yes, the environmental impacts e.g. air pollution, noise, impacts on wild animals etc. are addressed in the PDD section D.1. | OK | OK |
| D.6. | Does the project comply with environmental legislation in the host country? | /PDD/ (D.1.) /EIA/ /EIAA/ | DR | Yes, the project activity is approved by the local authority (Heilongjiang Environmental Bureau dated 09 Aug. 2007 ). Refer to D.1. | OK | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | | | |
| **For Small- scale projects** | | | | | |
| D.7. Does host country legislation require an analysis of the environmental impacts of the project activity? | | | N/A | N/A | N/A |
| D.8. Does the project comply with environmental legislation in the host country? | | | N/A | N/A | N/A |
| D.9. Will the project create any adverse environmental effects? | | | N/A | N/A | N/A |
| D.10. Have environmental impacts been identified and addressed in the PDD? | | | N/A | N/A | N/A |
| ***E. Stakeholder Comments*** *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.* | | | | | |
| E.1. Have relevant stakeholders been | /PDD/ (E.1.) | DR I | Yes, the stakeholders consultation process was performed in form of questionnaire. The stakeholders | OK | OK |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|---|
| | consulted? | /IM03/ | | include relevant government personnel and local residents. | | |
| E.2. | Have appropriate media been used to invite comments by local stakeholders? | /PDD/ (E.1.) /IM03/ | DR I | Questionnaire was used for survey. | OK | OK |
| 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? | | | The Chinese regulation doesn't include requirements for stakeholder consultation processes. | OK | OK |
| E.4. | Is a summary of the stakeholder comments received provided? | /PDD/ (E.2.) /IM02/ | DR I | Yes, the summary of the comments received was provided. | OK | OK |
| E.5. | Has due account been taken of any stakeholder comments received? | /PDD/ (D.1.) (E.3.) /IM03/ | DR I | Project owner will take activity to control the negative impacts from garbage. | OK | OK |

**Table 3: Resolution of Corrective Action and Clarification Requests**

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CAR A1**<br>At the time of the (pre-) validation, the LOA and HGA are pending. | A.2.1<br>A.2.2<br>A.2.3<br>A.4.1. | Waiting LOA from Japan. | OK, letters of approval (LOA and HGA) have been submitted by project owner. |
| **CAR B1**<br>4 alternatives identified in PDD B.4. were not required by ACM0002 Ver.07, therefore revision is requested. | B.2.2.<br>B.3.3. | Revised PDD B.4. | OK, the baseline identification has been revised according to methodology. |
| **CAR B2**<br>Relevant authorized document from which the benchmark rate is derived should be given. | B.3.1.<br>B.3.2. | According to the *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects*, a project will be financially acceptable when the total investment Internal Return Rate (IRR) is better than 8% for investments in power industry. | OK, the authorized document *Interim Rules on Economic Assessment of Electrical Engineering Retrofit Project* was provide by PP. |
| **CAR B3**<br>some issues are raised in IRR calculation.<br>- Data source used as basis of IRR calculation should be clearly indicated.<br>- Proof document of the electricity tariff used in IRR | B.3.1.<br>B.3.2. | - *Data source used as basis of IRR calculation should be clearly indicated.*<br>A: All data were sourced from the FSR. | - OK, the date source for IRR calculation has been indicated and checked by |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| calculation should be submitted.<br>- According to Feasibility study chapter 14 average material fee was included in other fee. However, average material fee was separately listed and calculated in IRR calculation sheet. Explanation should be given.<br>- The amount of long-term loan and loan rate should be indicated.<br>- Explanation should be given, why the repairing fee is increasing with years since the repairing fee rate is fixed. | | - *Proof document of the electricity tariff used in IRR calculation should be submitted.*<br>A: The electricity tariff was sourced from the approval from national development and reform commission (Doc No. Fagaijiage [2008] NO.1876).<br>- *According to Feasibility study chapter 14 average material fee was included in other fee. However, average material fee was separately listed and calculated in IRR calculation sheet. Explanation should be given.*<br>A: Revised.<br>- *The amount of long-term loan and loan rate should be indicated.*<br>A: The Financial Interest was sourced from the FSR.<br>- *Explanation should be given, why the repairing fee is increasing with years since the repairing fee rate is fixed.*<br>A: According the FSR, the Rate of fixed assets maintenance is 1.5% | validation team.<br>- OK, the electricity tariff used in IRR calculation has been proved with evidence.<br>- OK, average material fee has been included in other fee and IRR calculation has been updated accordingly.<br>- OK, the financial cost derived from FSR has been indicated in IRR calculation sheet.<br>- OK. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | in first year of operation period and the Rate of fixed assets maintenance increase 6% in another operation period. | |
| **CAR B4**<br>- The source of common practice in PDD was not indicated.<br>- Projects which are applying for CDM registration or have been registered as CDM projects should not be included in common practice analysis<br>-The justification in common practice analysis isn't sufficient. More evidences are requested. | B.3.1<br>B.3.2 | Revised. Please see PDD B.5 Step 4. Common practice analysis. | OK, revision has been made in PDD according to the comments given by DOE. |
| **CAR B5**<br>The calculation of BM of the Northeast China Grid is not transparent. If the BM calculation is derived from method issued by Chinese DNA, please demonstrate the calculation step by step and use the key parameter defined in newly published "Bulletin on the baseline emission factor of the Chinese Electricity Grid". | B.5.1<br>B.5.2 | Revised PDD B.6.1. | OK, revision has been made in PDD according to the comments given by DOE. The emission factor has been revised according to the data available during time of publishing the draft PDD on the UNFCCC website. The data of the annual statistical yearbooks have |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | | been used for calculation. The books were already published during this time. Hence, as the data was publicly available, the client was requested to revise the emission factor calculation based on the latest data. This is fully in compliance with the CDM regulation. The emission factor therefore changed compared to the published PDD. The DOE can confirm that the calculation is correct and fully in line with the grid tool. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CAR B6**<br>All monitored data required for verification and issuance should be kept for two years after the end of the crediting period. However, it is not indicated in PDD. Correction activity is request. | B.8.2 | Revised PDD B.7.2 - **4.Data Management System.** | OK, revision has been made in PDD according to the comments given by DOE. |
| **CAR B7**<br>However, during the on-site validation period the grid connection agreement was absent and hence the grid connection schema was not clearly described in PDD. | B.10.1 | Revised PDD B.7.2 - **2. Meters and Calibration.** | OK, the grid connection schema was revised as per the information collected during on site. |
| **CAR B8**<br>However $EG_y$ was supposed to be calculated by the difference of the electriicity supplied to the grid and imported from the grid.<br>Therefore, the electriicity data of supplied to the grid and imported from the grid should be added to the monitoring parameters. | B.10.2 | Revised PDD B.7.1 and PDD B.7.2. | OK, revision is made. |
| | | | |
| **CR A1**<br>The unique identification of the project activity<br>(131°41′ east longitude and 47°00′ north latitude)<br>are indicated in the PDD, but it should be defined more precisely, i.e. in geographical seconds. | A.1.1. | The Project has geographical coordinates with east longitude of 129˚11´33.9˝ and north latitude of 46˚ 44´ 02.3˝. | OK |
| **CR A2**<br>Components and facilities used to mitigate GHGs identified are not sufficient in PDD A.4. Further description | A.1.2. | Revised PDD A.4.3 and B.3. | OK, the description of applied |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| of the project's system boundaries is requested. | | | technology has been deepened and project's system boundary has been described as per methodnology, |
| **CR A3**<br>The project will generate about 111043MWh annually, however it is not reasonable considering the installed capacity and annual utilization hours. Clarification is requested. | A.3.1. | Capacity: 48MW (FSR)<br>Electricity output: 111044MWh (FSR)<br>Operation hours: 111044MWh/48MW=2313.42h | OK, the updated annual power generation is assessed to be reasonable |
| **CR A4**<br>The plan of training and maintenance is not provided in PDD, clarification is requested. | A.3.3 | Revised PDD A.4.3. | OK. |
| **CR B1**<br>The relevant documentation or references should be referred accordingly in PDD B.4., preferably in a table form. | B.2.6. | Revised PDD B.4. | OK |
| **CR B2**<br>In PDD page 10, sensitivity analysis was not sufficient. The analysis on variation of four critical parameters (total investment, annual O&M cost, annual power generation and tariff) should be sufficiently demonstrated. | B.3.1. | Revised. Please see B.5 *Sub-step 2d. Sensitivity analysis.* | OK |
| **CR B3**<br>The evidence of the CDM management decision wasn't attached in PDD. Clarification is requested. If possible a clear list of key events about CDM project and document of MMD could be added. | B.3.4. | Added. Please see PDD B.5 first paragraph. | OK, revision has been made in PDD according to the comments given by DOE. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CR B4**<br>The description of measurement in PDD B.7. was not sufficient, further description is required, if possible a meter and wire diagram is requested. | B.10.4 | Revised PDD B.7.2. | OK, grid feed-in diagram was provided. |
| **CR B5**<br>The measurement accuracy wasn't addressed and the procedure of dealing with erroneous action was not generally stated in PDD. Further information should be given. | B.10.5. | Revised PDD B.7.2. | OK, the measurement accuracy has been addressed and the procedure of dealing with erroneous action has been stated in updated PDD. |
| **CR B6**<br>However, the calibration interval was not clearly indicated in PDD. Further information should be given. | B.10.8. | Revised PDD B.7.2. | OK, calibration frequency has been indicated in updated PDD |
| **CR B7**<br>The description of day-to-day records handling is not sufficient in PDD. Some important information are absent, e.g storage area of records and how to process performance documentation. | B.10.9. | Revised PDD B.7.2. | OK, revision is made as per comments. |
| **CR B8**<br>However, monitoring management structure is not stated clearly in PDD B.7., if possible a structure figure is preferable. | B.13.1.<br>B.13.4.<br>B.13.5. | Revised PDD B.7.2. | OK |
| **CR C1**<br>However the starting date of crediting period is considered | C.2. | Revised PDD C.2.1.1. | OK, the starting date of crediting |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| not reasonable, revision is necessary. | | | period has been revised. |
| **CR D1**<br>Evidence should be given to support the statement "construction of the project will have little impact on the migration route of birds" | D.3. | Revised section E.<br>The summary of the questionnaires showed that, "Among the negative impacts mentioned, the main issues concerned are garbage (50%)." The Project owner will actively take measures to control. (See Section D for details as below.)<br><br>D.1 ***Solid waste***<br><br>The most excavated earthwork during the construction period will be directly used, whose impact on the environment is insignificant. As to the municipal waste, the Project owner will arrange garbage cans classified by areas and types of garbage and dispose uniformly. | OK, the supported evidence derived from approved EIA was submitted. |

**Table 4:** Assessment of Financial Parameters

| Parameter | Value applied | Unit | Source of Information | Reference | DOE ASSESSMENT | | |
|---|---|---|---|---|---|---|---|
| | | | | | Correct-ness of value applied | Appropri-ateness of infor-mation source | Comment |
| Net electricity supplied to Grid | 111,044 | MWh | Feasibility Study Report | /FSR/ | ☒ | ☒ | The value is calculated by multiplying the installed capacity with annual operation time<br>The annual operation time of 2313 hours was estimated by authorized design institute and calculated based on 10 year average wind velocity and 1 year monitoring date from wind velocity testing tower. The calculation presented in FSR was checked by DOE and considered to be credible. |
| Installed capacity | 48 | MW | Feasibility Study Report | /FSR/ /TGC/ | ☒ | ☒ | The installed capacity is approved by local authority and proofed by turbine supplier contract. |
| Fixed assets investment | 46,830 | $10^4$ RMB | Feasibility Study Report | /FSR/ | ☒ | ☒ | The budgeted total investment was derived from the Feasibility study report, which was compiled by authorized design institute and considered to be credible. The total investment has been approved by Helongjiang province development and reform commission. Furthermore, during on site validation the main contracts including main equipment purchasing contract, construction contract was checked by validation team. |
| Electricity tariff (without VAT) | 0.56 | RMB/ kWh | Approval of electricity tariff | /AET/ | ☒ | ☒ | The grid tariff has been decided by national development and reform commission and will be fixed in a long time. In china, the feed-in tariff of wind power is totally regulated by central government. Therefore, the tariff is very unlikely to increase by 7.3% |
| Annual O&M costs | 1,411 in the first operational | $10^4$ RMB | Feasibility Study Report | /FSR/ | ☒ | ☒ | The O&M consists of repairs, salary, overhaul, insurance and other costs.<br>The salary is calculated as the number of employee (20) |

| | | | | | DOE ASSESSMENT | | |
|---|---|---|---|---|---|---|---|
| | year and will be increased with years. In the 20th operational year the O&M cost is increased up to 2,834 x$10^4$ RMB | | | | | | multiplied with the average annual salary (50,000 RMB/Employer)<br>According to Economic analysis in FSR the welfare is calculated as 41 % of total value of salary.<br>Insurance cost is calculated as 0.405% of fixed asset investment.<br>The overhaul is 1.5% of total investment in the first year and will be increased by 6% per year,.<br>Other cost is calculated as 70 RMB/KW.<br>The calculations of employees' welfare, insurance, material cost and other cost are in compliance with the requirements defined in the "Construction project financial evaluation method and parameter" Ver.03, issued by National Development and Reform Committee and National Construction Ministry in July 2006, which is widely used in project investment in China and is considered to be authoritative.<br>Moreover, because grid feed-in equipment of Fujin wind farm phase I will be shared with the proposed project, 42 x$10^4$ RMB will be spent annually for the utilization of these equipments. The value is derived from approved FSR and is included in the O&M cost. |
| Value added tax (VAT) | 8.5 | % | Feasibility Study Report | /FSR/ | ☒ | ☒ | The value is derived from the document No.（2001）198, issued by the National Financial Ministry and National Revenue Ministry. Hence, it should be considered to be reasonable. |
| City maintenance & construction tax | 5 | % | Feasibility Study Report | /FSR/ | ☒ | ☒ | 5% of VAT, the value is in accordance with *ordinance of city maintenance & construction tax of people's republic of China,* issued by State council in Feb. 1985. Hence, it should be considered to be reasonable. |
| Surtax for education | 3 | % | Feasibility Study Report | /FSR/ | ☒ | ☒ | 3% of VAT, the value is in accordance with *regulation of expropriation of surtax for education expense,* issued by |

| | | | | | DOE ASSESSMENT | | |
|---|---|---|---|---|---|---|---|
| expenses | | | | | | | State council in Oct. 2005. Hence, it should be considered to be reasonable. |
| Income tax | 25 | % | Feasibility Study Report | /FSR/ | ☒ | ☒ | The value is derived from approved document of national revenue bureau Document Nr. Guo shui fa (2002)47. Hence, it should be considered to be reasonable. |
| Depreciation rate | 6.4 | % | Feasibility Study Report | /FSR/ | ☒ | ☒ | According to FSR, the value is a general depreciation rate, which means that the depreciation time is 15 years and the residual value accounts for 4% of fixed assets. Hence, it should be considered to be reasonable. |
| Project Lifetime | 20 | year | Feasibility Study Report | /FSR/ | ☒ | ☒ | The value is proved by equipment purchasing contract. |

## CERTIFICATES

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Dipl-Ing. Rainer Winter**

born on 1963-02-21

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2010-07-05

Certification registration No. 04 02 154-03

Essen, 2007-07-06

Deputy of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Dipl.-Ing. Eric Krupp**

born on 1971-06-25

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2010-07-05

Certification registration No. 06 05 01 - 017

Essen, 2007-07-06

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

CERTIFICATE OF APPOINTMENT

Mr. Yong Jun Li

born on 1974-03-03

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

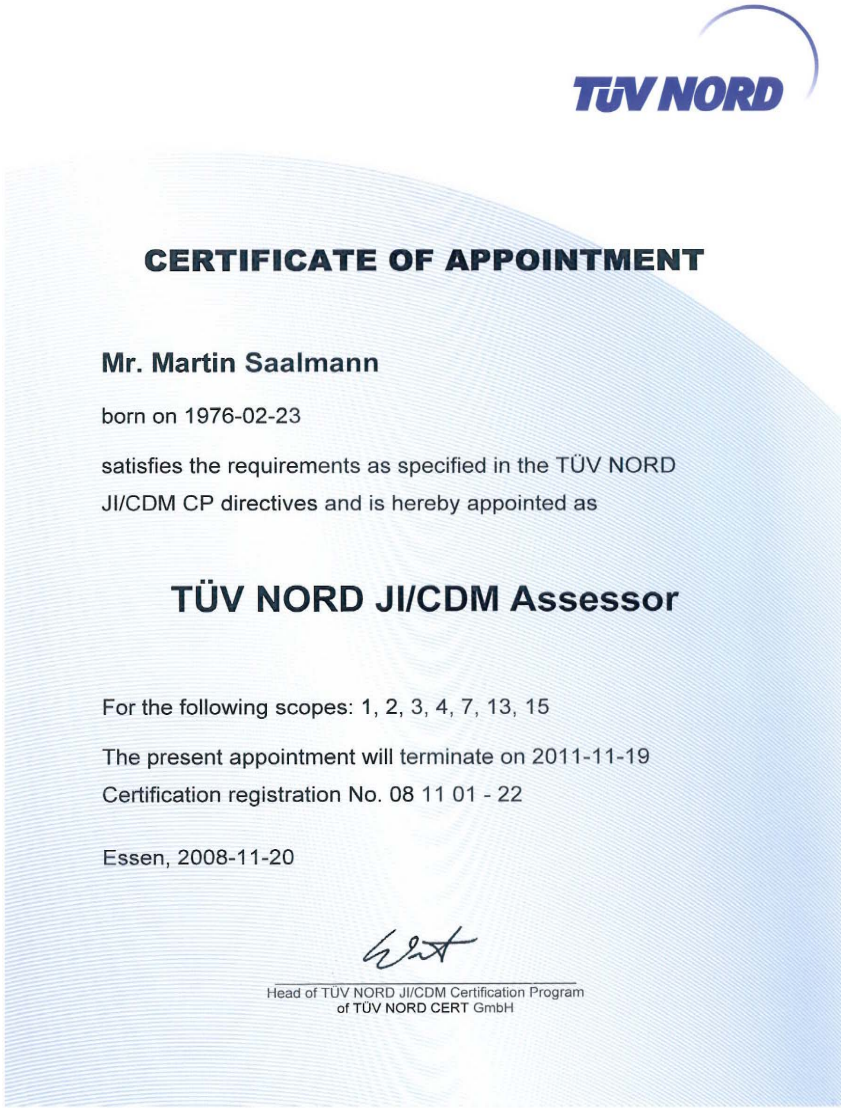
TÜV NORD JI/CDM Assessor

The present appointment will terminate on 2010-02-15

Certification registration No. 06 05 01 - 39

Essen, 2007-06-27

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH



CERTIFICATE OF APPOINTMENT

Mr. Martin Saalmann

born on 1976-02-23

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

TÜV NORD JI/CDM Assessor

For the following scopes: 1, 2, 3, 4, 7, 13, 15

The present appointment will terminate on 2011-11-19

Certification registration No. 08 11 01 - 22

Essen, 2008-11-20

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH