

JACO CDM

Validation Report

Client: Japan Bank for International
Cooperation

Zafarana Wind Power Plant Project, Arab Republic of Egypt

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JACO CDM., LTD

Validation Report

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Approved by: Nobuhisa ITO CEO, President of JACO CDM	Project No.: CDM. Val.0601
Client: Client Name: Japan Bank for International Cooperation (JBIC)	Client ref.: Mr. Tomoharu OTAKE

Summary:

JACO CDM., Ltd has been ordered by Japan Bank for International Cooperation (hereinafter JBIC) to perform validation of the Zafarana Wind Power Plant Project (hereinafter the Project).

The purpose of the Project is to construct 120MW wind power station at the shore of the Red Sea about 200km southeast of Cairo, thus providing GHG free electricity to meet growing electricity demand of the country. The emission reduction from the Project has been conservatively estimated to be 248,609 tonnes of CO₂ per year.

The validation is the independent third party assessment of the project design, and is the requirement for all CDM projects. The project's compliance with the relevant UNFCCC and host country criteria are validated in order to confirm that the project design is sound and reasonable and meet the stated and identified criteria.

This validation report summarizes the findings of the validation.

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

The responses to 4 Corrective Action Requests and 4 Clarifications to the original PDD (May, 2006) were satisfactorily provided by the Project participants and the original PDD was revised.

In summary, it is JACO CDM's opinion that the Project as described in the revised PDD (September, 2006) meets all relevant UNFCCC requirements for the CDM and host country criteria, and correctly applies the baseline and monitoring methodology ACM0002. Hence, JACO CDM requests the registration of the "Zafarana Wind Power Plant Project" as a CDM project.

Report No.: GR06W0001D		
Report title: Validation Report Zafarana Wind Power Plant Project, Arab Republic of Egypt		
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Abbreviations

BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CERs	Certified Emission Reduction
CL	Clarification Request
CM	Combined Margin
DNA	Designated National Authority
DOE	Designated Operational Entity
EEAA	Egyptian Environmental Affairs Agency
EEHC	Egyptian Electricity Holding Company
ERs	Emission Reductions
EIA	Environmental Impact Assessment
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
JACO CDM	JACO CDM Co., Ltd
JBIC	Japan Bank for International Cooperation
JCF	Japan Carbon Finance, Ltd.
KP	Kyoto Protocol
LE	Egyptian Pound
NCV	Net Calorific Value
NGO	Non Governmental Organization
NREA	New and Renewable Energy Authority
OEP	Organization for Energy Planning
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PPA	Power Purchase Agreement
toe	Ton of oil equivalent

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Appendix A: Validation Protocol

Validation Protocol

1. INTRODUCTION

1.1. Objective

JBIC has commissioned JACO CDM to validate the Zafarana wind Power Plant Project, Arab Republic of Egypt. The validation serves as design verification and is a requirement for all CDM projects. The purpose of a 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 relevant UNFCCC and host country 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 a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

1.2. Scope

The validation scope is defined as an independent and objective review of the project design document (PDD), the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. JACO CDM has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

The validation was conducted by the following validation team through the assessment of the PDD(May,2006) and the additional documents listed in the Chapter 6 "References", also by the interviews with persons listed in the same Chapter.

The result of validation team activity was reviewed by the internal verifiers.

Validation Team

Osamu KOBAYASHI	Senior Chief Engineer of JACO CDM, validation team leader
Teruo FUKUDA	Senior Chief Engineer of JACO CDM, validation team member
Hideki KOBAYASHI	Senior Chief Engineer of JACO CDM, validation team member
Yumi GOSEKI	JACO CDM validation team member
Teiichi TAMATSUKURI	expert(wind power generation)

Internal Verifiers

Yoshihiro OTSUKA	General Manager of JACO CDM
Shigekazu OKA	Manager of Audit Department of JACO CDM

1.3. GHG Project Description

The Zafarana Project is a 120MW wind power generation project located on the shore of Red sea about 200km southeast of Cairo, Egypt.

The plant, located in an area with favorable wind conditions, has an expected capacity factor of 43%, resulting in 452,016MWh of electricity annually. The project is to be developed by the New and Renewable Energy Authority (NREA). The minimum plant operating life is 21 years.

Validation Protocol

The Project is to assist Egypt in its sustainable development in several ways: by providing zero greenhouse gas (GHG) emission power, enabling the country to export the natural gas which would, but for the Project, be combusted for power generation, and enhancing technology transfer.

The wind-generated electricity produced by the Project is to displace the grid electricity contributing to GHG reductions of 248,609 tCO₂e (tones of carbon dioxide equivalent) per year for the duration of the project activity. In the initial 7-year crediting period, the Project is expected to reduce approximately 1.74 million tCO₂e, generating the equivalent amount of Certified Emission Reductions (CERs).

2. METHODOLOGY

The validation consists of the following three phases:

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

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

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

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

The validation protocol is enclosed in Appendix A to this report.

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

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

The validation team may also use the term Clarification, which would be where:

- iv) Additional information is needed to fully clarify an issue.

Validation Protocol

validation Protocol Table 1: Mandatory Requirements			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), 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.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

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

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

Figure 1 Validation protocol tables

Validation Protocol

2.1. Review of Documents

The Project Design Document submitted by JBIC and additional background documents related to the project design and baseline were reviewed. Documents reviewed are listed in Chapter 6 "References".

The validation findings stated hereafter are based on the PDD version 03, dated May, 2006.

2.2. Follow-up Interviews

In the period of July 9, 2006 to July 12, 2006 JACO CDM performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of NREA (New and Renewable Energy Authority) head-office, NREA Zafarana Site, EEAA (DNA of Egypt), EETC head-office, EETC Zafarana Substation, Suez Governorate, and Romance Resort as one of local stakeholders were interviewed. Interviews with JBIC were held several times from April 19, 2006 to July 20, 2006. The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
JBIC (Project participant)	<ul style="list-style-type: none"> ➤ Project Overview ➤ Feasibility Study ➤ Project Design
NREA head office (Project participant)	<ul style="list-style-type: none"> ➤ Roles and Responsibility ➤ Project design issues incl. additionality ➤ Baseline calculations ➤ Monitoring plan ➤ Management system ➤ Environmental impacts ➤ Stakeholder comments ➤ Approval by the host country
NREA Zafarana Site	<ul style="list-style-type: none"> ➤ Project management, Monitoring
EEAA (DNA)	<ul style="list-style-type: none"> ➤ Roles and Responsibility ➤ CDM approval procedure and status ➤ EIA approval procedure and status
Suez Governorate	<ul style="list-style-type: none"> ➤ Governorate view on the Project
Romance Resort	<ul style="list-style-type: none"> ➤ Local stakeholder view on the Project
EETC	<ul style="list-style-type: none"> ➤ Roles and Responsibility ➤ Availability of data related to OM and BM calculation
EETC Zafarana Substation	<ul style="list-style-type: none"> ➤ Project management, Monitoring

2.3. Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for JACO CDM's positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by JACO CDM were resolved during communications between the Client and JACO CDM.

Validation Protocol

To guarantee the transparency of the validation process, the concerns raised and responses given are summarized in chapter 3 below and documented in more detail in the validation protocol in Appendix A.

Since modifications to the Project design document were necessary to resolve JACO CDM's concerns, the Client decided to revise the documentation. After revised PDD was submitted and reviewed, JACO CDM issued the final validation report and opinion.

3. VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.

2) Where JACO CDM had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A.

The validation of the Project resulted in three Corrective Action Requests, four Clarifications and one Observation

3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and JACO CDM to resolve these Clarification or Corrective Action Requests are summarised.

4) The conclusions for each validation subject are presented.

The validation findings relate to the project design as documented and described in the original project design documentation.

3.1. Participation Requirements

3.1.1. Discussion

The project participants are JBIC, NREA and JCF. Those participants have been authorized by the respective DNA to participate in the project activity.

Egypt as the host Party and Japan as the Annex-I Party meet the requirement to participate in the CDM.

Minister of Foreign Affairs of Japan has given approval for the project on behalf of the Japanese DNA.

Approval letter of Egyptian DNA has not yet been given. **(CAR 1)**

Approval letter of Japanese DNA has not yet been given for JCF. **(CAR 4)**

3.1.2. Findings

Corrective Action Request 1.

A copy of the letter of Approval issued by the DNA of Egyptian government shall be submitted to the validation team before the request for registration.

Response

The Egyptian DNA Letter of approval had been signed on 1st June, 2006. A copy of the letter was submitted to JACO CDM on Oct. 4, 2006.

3.1.3. Conclusion

CAR.1: The validation team confirmed the letter of approval. CAR.1 was resolved.

CAR.4: The validation team confirmed the letter of approval. CAR.4 was resolved.

Validation Protocol

The Project complies with the participation requirements.

3.2 Project Design

3.2.1 Discussion

(1) Boundary

Geographical boundaries are the Zafarana Area about 200km southeast of Cairo. The area has some preceding wind farms already. **(CL1)**

System boundaries are the geographical site and all the generation plant connected through National Grid.

(2) Technology

The Project uses the well established wind power technology. Similar plants were constructed and have been operated successfully. Extensive feasibility study was carried out for the Project and the Feasibility Study Report /11/ was submitted to the validation team. However, the study is towards 60MW plant comprising one hundred 600kw wind turbines. On the other hand, PDD states "the Project is considering adopting 1000kw wind turbines". The adoption of 1000kw turbines might result in different capacity factor, EPC cost, and O&M cost, which might affect the discussion on additionality and also on the amounts of GHG reduced. **(CL2)**

(3) Contribution to sustainable development

The Project is located in the desert area and will assist Egypt in its sustainable development by providing zero greenhouse gas (GHG) emission power, enabling the country to export the natural gas which would, but for the Project, be combusted for power generation, and enhancing technology transfer. The project is in line with the strategy of Egyptian government: where increasing renewable energy source up to 3% of the peak load by 2010 is planned. EEHC is planning to expand wind power generation capacity up to 555Mw by 2012. The Project is included in the plan.

(4) Public funding

The financial plans for the Zafarana Project involve public funding from Japan, an Annex I country. However, this does not result in the diversion of official development assistance and is separate from and is not counted towards the financial obligations of Japan. This is confirmed by the letter of Japanese Government /4/ and additionally the letter of the Government of Egypt /5/.

3.2.2. Findings

Clarification 1

Since the area has some preceding wind farms already, geographic location and the site boundary should be clearly defined in PDD. (e.g. In terms of longitude and or latitude of the reference point of the project site, and the width and the depth of the area in relation to them)

Response

The longitude and latitude of the the Project's site, the location relative to the preceding German and Spanish project were described in PDD.

Clarification 2

Technical explanation such as capacity factor, EPC cost, and O&M cost should also be given for other possible options (e.g. 120MW plant comprising 1000kW wind turbine units).

Response

Conceptual design report "Zafarana Wind Power Plant Project 120MW" /24/ shows 47 to 50% capacity factor, depending on the mast height of 60m and 70m for 1000kW unit based plant.

Validation Protocol

Descriptions on possible range of capacity factor, amount of generated electricity were added to PDD. Further revision of PDD and financial analysis were carried out according to CAR.3 response.

3.2.3. Conclusion

CL.1: Clarification 1 was resolved.

CL.2: Clarification 2 was resolved.

The Project complies with the requirements.

3.3. Baseline

3.3.1. Discussion

The project applies the methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 06. It has been verified that the methodology is applicable for the project.

In case of the plant with 600kW wind turbines, the capacity factor of the newly installed turbines is determined in a transparent manner /11/. The data provided for the existing wind power plant indicates that the capacity factor has been chosen based on proper data. However, the explanation for possible other options such as the plant with 1000kW wind turbines is not indicated as shown in 3.2.1 (2).

(1) Baseline calculation

Operating margin is calculated as the Simple OM. Since the Dispatch Data Analysis OM is recommended as the first choice, the reason of selecting simple OM should be justified.

(CL3)

In applying the Simple OM of ACM0002, “a 3-years average, based on the most recent statistics available at the time of PDD submission” is selected.

As for the BM (Build Margin), Option 1 of ACM0002 is selected.

(2) Additionality

- Considering that the higher capacity factor, lower EPC cost and O&M cost may also be realized by the adoption of larger WTG units such as 1000kW units, the project additionality should be studied for the case of the biggest capacity factor among possible options. **(CAR 2)**

Considering that the rating of the WTG is yet to be decided, project additionality is to be studied from the conservative viewpoint.

- As for the benchmark, not the instantaneous value, but the trend at the decision of CDM implementation is more preferable as the benchmark, confirmation of the treasury bill auction results of Oct., Nov. and Dec. of 2004 should be presented. **(CL4)**

The EPC cost, O&M cost is appropriate compared with the world’s experiences tabulated in various literatures. /15/, /16/

The electricity tariff for the project is set as 0.14LE/kWh and reflected to the PDD correctly. But the cost estimates of the FS /11/ are limited for the 60Mw plant which comprises one hundred 600kW wind turbines. Explanation on 120Mw plants should be given. **(CL4)**

- Common practice analysis: PDD asserts “several preceding wind farms in Egypt were all constructed under combination of soft loans and grants, since such situation is no longer the case for this project; the project is not the common practice”.

JACO CDM confirmed that the existing wind power projects in Zafarana (2 projects by Denmark and 2 projects by Germany) which are called Zafarana – 1 to 4 were financed through a combination of soft loans and substantial grants of 15 to 100%. On the other hand the NREA’s latest and future wind power projects in Zafarana financed by Denmark, Germany and Spain are planned without grant and under CDM.

Validation Protocol

It is confirmed that in case of the Project by JBIC, it will not receive any grants and it is agreed between NREA and JBIC to implement under the CDM to compensate the financial gap caused by the lack of grants.

JACO CDM confirms that the Project is not a part of common practice.

3.3.2. Findings

Corrective Action Request 2

Capacity factor of the plant directly affects electricity sales revenue. Therefore, the additionality should be studied for the case of the highest capacity factor among possible alternatives.

Response

Conceptual design report "Zafarana Wind Power Plant Project 120MW" /24/ was submitted to the validation team, where the higher capacity factor and practically identical costs for 1000kW turbine plant is described.

JBIC and NREA reviewed and revised the financial analysis based on the higher capacity factor of 1000kW unit plant and the results were reflected to PDD.

For emission reduction calculation, lower capacity factor was maintained, for conserve estimate.

Clarification 3

Since the Dispatch Data Analysis OM is recommended as the first choice, please explain what kind of deficiency of the nation's dispatching system and/or the lacking of data hamper the application of the Dispatch Data Analysis OM.

Response

During the interview, NREA and EETC explained that, in many old power stations the monitoring of the power station is carried out by analogue system and very difficult to apply the Dispatch Data Analysis OM.

Subsequently, EETC prepared and submitted the list /27/ showing the nature of the data acquisition system of each power station, where in the majority of thermal power stations, fuel consumption and electricity generation were read manually from the meters and recorded onto paper.

Clarification 4

- 1) As for the benchmark, confirmation of the treasury bill auction results of Oct., Nov. and Dec. of 2004 should be presented.
- 2) Explanation on 120Mw plants should be given.
- 3) Electricity tariff is set at 0.14LE/kwh. Explanation should be given on how the tariff is determined between EEHC and NREA including the presence and perspectives of the renewable energy incentives.

Response

- 1) NREA collected and provided the evidence. The same indicator as PDD was fluctuating between 10.4 and 11.3% during the period.
- 2) Conceptual design report "Zafarana Wind Power Plant Project 120MW" /24/ shows the cost of the plant with 1000kW units. PDD and financial analysis were revised according to the responses to CAR.3.
- 3) Evidence was forwarded about the basis of electricity tariff.

Validation Protocol

Note:

The detailed information on the demonstration of additionality is provided as Annex 5 to the PDD.

3.3.3. Conclusion

CAR.2: Although the PIRR was slightly improved by assuming higher capacity factor; it is still much lower than the indicator. The conclusion of the financial analysis remains unchanged. CAR.2 was resolved.

CL.3: Assertion of NREA and EEHC is reasonable. CL.3 was resolved.

CL.4:

- 1) The fluctuation of the indicator does not affect the conclusion of the financial analysis, the value adopted in PDD seems appropriate.
- 2) PDD and financial analysis was revised appropriately.
- 3) No further action required.

CL.4 was resolved.

The Project complies with the requirements.

3.4. Monitoring Plan**3.4.1. Discussion**

The project applies the methodology ACM0002. It has been verified that the methodology is applicable for the project.

The monitoring plan provides for the collection and archiving of all the relevant data necessary for the case where ex-ante simple OM and ex. ante BM were selected.

The authority and responsibility of project management is clearly indicated in NREA's organization chart. /18/

Procedures for the following items were identified during the interview and site visit.

- Training of monitoring personnel
- Calibration of monitoring equipment and installations
- Maintenance of monitoring equipment and installations
- Monitoring and reporting
- Day- to-day records handling
- Dealing with possible monitoring data adjustments and uncertainties
- Review of reported results/data
- Internal audits of GHG project compliance with operational requirements
- Project performance reviews before data is submitted for verification

More details are indicated in the Protocol. (Appendix A)

3.4.2 Findings

None.

3.4.3 Conclusion

The project complies with the requirements.

3.5. Calculation of GHG Emissions**3.5.1. Discussion**

It is found that fuel consumption/unit generation of Cairo North Power Station in 2003/2004 is approximately 10 times higher than that of ordinary combined cycle plant.

For the conservativeness of OM and BM, fuel consumption should not include extraordinary fuel consumption such as experimental fuel consumption.

Validation Protocol

In this sense, Cairo North Power Station data in 2003/2004 shall be reviewed and corrected. **(CAR3)**

As for the operating margin, the PDD has been revised from the original PDD to indicate the average for each of the 3 years according to the procedures of ACM0002 Ver.06.

The information about the fuel use for each plant was not publicly available. JACO CDM confirmed during on-site assessment by visiting the Egyptian Electricity Holding Company (EEHC) that there is no such disaggregated data that is made publicly available.

Instead, the following information is publicly available in the annual report of EEHC.

- Individual fossil fuel consumption for each plant in the grid (ton of oil equivalent (toe) basis)
- Aggregate percentage of natural gas and fuel oil use on a toe basis

Considering the unavailability of more disaggregated data, it is acceptable to use aggregated generation and fuel consumption data as stated in ACM0002 / version 06 foot note 4.

JACO CDM confirmed during the on-site assessment that country specific values for CEF and oxidation factors for fuel oils and natural gas are not publicly available in Egypt.

In the revised PDD version 04, CEF calculation based on the country specific values of each fuel toe* and the country specific Emission Factors of CO₂ for fuel oil and gas is presented.

Following information has been shown.

Fuel Oil: [TOE]	1 ton fuel oil = 0.972 TOE
[Emission Factor of CO ₂]	3.1094 (T-CO ₂ /T)
Natural Gas: [TOE]	1 ton natural gas = 1.111 TOE
[Emission Factor of CO ₂]	2.6115 (T-CO ₂ /T)

Using these values the CEF values are calculated as 20.8 for fuel oil and 15.3 for natural gas in the PDD. JACO CDM confirmed that this calculation is appropriate.

3.5.2. Findings

Corrective Action request 3

Fuel consumption data of Cairo North Power Station in 2003/2004 shall be reviewed and corrected.

Response

JBIC and NREA reviewed Cairo North Power Station data in 2003/2004.

Fuel consumption per unit generation was revised to that during '04/'05, when the station started normal operation.

The result was reflected to Operating margin, Build margin and emission reduction calculation. PDD was revised, accordingly.

3.5.3. Conclusion

CAR.3: CAR.3 was resolved.

The Project complies with the requirements.

3.6. Environmental Impacts

3.6.1. Discussion

Possible impacts are described in PDD and the potential of environmental impacts are concluded to be very low including bird migration. /25/

* Energy in Egypt 2000/2001 by Organization for Energy Planning, p36

Validation Protocol

Law on Protection of the Environment categorizes this type of project as grey classification. For such project, environmental screening form (ESF) shall be submitted to EEAA. ESF was approved by EEAA 30-Aug.-'99. /18/

3.6.2. Findings

None

3.6.3. Conclusion

The Project complies with the requirements.

3.7. Comments by Local Stakeholders

3.7.1. Discussion

Relevant local government and inhabitants of the vicinity have been consulted between Dec. 2004 and Feb. 2005 by non-technical summary of the project and a survey form were distributed and recovered. There were no negative comments received.

During the Interview of the governor of the Suez governorate /54/, the expectation to the Project such as supply of GHG free electricity to meet the growing demand at the Suez area, nationalization of the part of the equipments employed in the Project.

Also, no negative comments were expressed during the interview of the owner /60/ of the resort nearest to the Project site

3.7.2. Findings

None.

3.7.3. Conclusion

The Project complies with the requirements.

4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

JACO CDM published the project documents on its website linked with UNFCCC web site on 2006-06-02 and invited comments until 2006-07-01 by Parties, stakeholders and non-governmental organizations. No comments were received.

5. VALIDATION OPINION

JACO CDM has performed a validation of the Zafarana Wind Power Plant Project in Arab Republic of Egypt. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and subsequent decisions by the CDM Executive Board. The review of the project design documentation and the subsequent follow-up interviews have provided JACO CDM with sufficient evidence to determine the fulfilment of stated criteria.

JACO CDM has received a confirmation by the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

Emission reduction has been conservatively estimated to be 248,609 tonnes of CO₂ per year.

An analysis of the investment and technological barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

In summary it is JACO CDM's opinion, that the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. Hence, JACO CDM will request the registration of the Project as a CDM.

Validation Protocol

6. REFERENCES

Category 1 Documents:

Documents provided by the Client that relate directly to the GHG components of the project,

- /1a/ PDD version 03, September 04, 2006
- /1b/ PDD version 04, May 24, 2007
- /2/ ACM0002/Version06 Consolidated baseline(monitored) methodology for grid-connected electricity generation from renewable sources
- /3/ Tool for the demonstration and assessment of additionality (version 02)
- /4/ Approval of a CDM project under the Kyoto Protocol, the Government of Japan
- /5/ Letter of confirmation about funding, The Government of Egypt Ministry of International Cooperation
- /6/ Approval of a CDM project under the Kyoto Protocol, the Government of Japan, MOFA January 27, 2006
- /7/ Approval of a CDM project under the Kyoto Protocol by Egyptian Government
- /8/ Approval of a CDM project under the Kyoto Protocol, the Government of Japan, MOFA February 26, 2007
- /9/ Energy in Egypt 2000 / 2001 by Organization for Energy Planning (OEP)
- /10a/ WEC "Financing Large Scale Wind Farm in Developing Countries: Zafarana Wind Farm" by Dr. Sherif Aboulnasr (NREA); April, 2006
- /10b/ Energy Efficiency and Renewable Energy, Egypt - National Study (Final Report)
- /10c/ NREA Annual Report 2004 / 2005

Category 2 Documents:

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

- /11/ (1) The Feasibility Study on The Wind Power Plant Development Project in The Arab Republic of Egypt: Mar.1999 JETRO
(2) The Feasibility Study on The Wind Power Plant Development Project in The Arab Republic of Egypt: Mar.2003 JETRO
- /12/ Wind power and the CDM: June 2005 Riso National Laboratory
- /13/ Minute of Discussions on Zafarana Wind Power Plant Project: May 2003 NREA-JABIC
- /14/ EEHC annual report '01/'02, '02/'03, '03/'04: EEHC
- /15/ EUR21611 Energy Scientific and Technological Indicators and References: 2005
- /16/ Wind Energy 2003 :German Wind Energy Association
- /17/ Approval letter from EEAA to NREA for Zafarana Project: 30-Aug.-'99
- /18/ Organization Chart of NREA: NREA
- /19/ Power Purchase Agreement for Zafarana Wind Farm: 23-April 2003 NREA-EEHC
- /20/ Letter of Amendment to Power Purchase Agreement: 29-May-2005 EEHC
- /21/ Protocol of Cooperation between Ministry of Petroleum and Ministry of Electricity and Energy to Establish Renewable Energy Project Fund: 30-June-2004 MEE-Ministry of Petroleum
- /22/ Energy calculation minute (example): NREA Zafarana site
- /23/ Performance Indicators of Zafarana Wind Farm June '06: NREA Zafarana site

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- /24/ Zafarana Wind Power Plant Project 120MW Conceptual Design Final: May 2005, Decon &PCI
- /25/ Atlas of Bird migration at the Gulf of Suez, Egypt, June 2002, DANIDA
- /26/ The Treasury Bills interest rate Quarter, half year, and Yearly of 2004: NREA (Central Bank of Egypt)
- /27/ The list of Thermal power stations and the nature of Data Acquisition System: NREA (EEHC)

Persons interviewed:

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

- /41/ Tomoharu OTAKE: Director Division 2, Environment Analysis Department, JBIC
- /42/ Jun WATANABE: Deputy Director Division 2, Environment Analysis Department, JBIC
- /43/ Yoshikazu TERAJ: Deputy Director Division 2, Environment Analysis Department, JBIC
- /44/ Samir Mahmoud Hassan: Executive Chairman, NREA
- /45/ Rafik Youssef Georgy: Consultant, NREA
- /46/ Laila Georgy Youssef: Managing Director of Technical Affairs Sector, NREA
- /47/ Usama Said Said: Director, Wind Energy Dept. NREA
- /48/ Afaf Mekhail Tawfic: General Manager of Engineering, Economics & Environmental Studies, NREA
- /49/ Abou Bakr Abdel-Hameed M. Slim: General Manager of Maintenance, NREA
- /50/ Salah Abdel Hafiez Moustafa: General Manger of Operation, NREA
- /51/ Atef Marzouk: ZafaranaSite Manager, NREA
- /52/ El Sayed Sabry MANSOUR (Dr.): Supervisor of Climate Change Unit, Coordinator of Egyptian DNA, EEAA
- /53/ Samir Tantawi: Climate Change Unit, EEAA
- /54/ Mohamed Seef El Deen Galal: Governor of Suez Governorate
- /55/ Laila El-Khouli: G.D. Suez RBO
- /56/ Ismaeel Tolba: Head of studies & Project Sector, EETC
- /57/ Adel Tawfik Soliman (Dr): General Director for loads & Energy Planning EETC
- /58/ Mohamed Talaat Ibrahim: Head of Studies & Research Section, EETC
- /59/ Ezzat Said Salama Nofal: Director of Zafarana S/S, EETC
- /60/ Mohamed El Zahawi: General Manager of Romance Resort

APPENDIX A
CDM VALIDATION PROTOCOL

Zafarana Wind Power Plant Project
In Egypt

Validation Protocol

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

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK.	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	OK.	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK.	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	CAR 1 OK	Government of Japan approved the Project on January 27, 2006. Corrective Action Request 1. A copy of the letter of approval by the DNA of Egyptian government shall be submitted to the validation team before the request for registration. The Letter of approval by the Egyptian DNA had been signed on 1 st June, 2006. A

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			copy of the letter was submitted to the validation team on Oct. 4, 2006.
<p>5. Private and/or public entities shall have the authorization to participate in the CDM by the DNA of the Party in which the entity is a legal entity.</p>	<p>CDM Modalities and Procedures § 33</p>	<p>CAR-1 OK <u>CAR-4</u> <u>OK</u></p>	<p>Ditto. <u>Corrective Action Request 4.</u> <u>A copy of the letter of approval by the DNA of government of Japan shall be submitted to the validation team before the request for registration.</u> <u>The Letter of approval by the DNA of government of Japan had been signed on Feb.26, 2007. A copy of the letter was submitted to the validation team on Mar.7, 2007.</u></p>
<p>6. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change</p>	<p>Kyoto Protocol Art. 12.5b</p>	<p>OK.</p>	<p>Table 2, Section E</p>
<p>7. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity</p>	<p>Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43</p>	<p>OK.</p>	<p>Table 2, Section B.2</p>

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
<p>8. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance</p>	<p>Marrakech Accords /4/ /5/</p>	<p>OK.</p>	<p>The letter of Japanese government dated 27 Jan, '06 states that the funding is not the diversion of ODA. The letter of Egyptian government was submitted on May 29, 2006.</p>
<p>9. Parties participating in the CDM shall designate a national authority for the CDM</p>	<p>Marrakech Accords, CDM Modalities §29</p>	<p>OK.</p>	<p>The both countries have the DNA, which are registered in UNFCCC.</p>
<p>10. The host country shall be a Party to the Kyoto Protocol.</p>	<p>Marrakech Accords, CDM Modalities §30</p>	<p>OK.</p>	<p>Egyptian government has ratified Kyoto Protocol on 12-Jan.-'05.</p>
<p>11. 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</p>	<p>CDM Modalities and Procedures §31b</p>	<p>OK.</p>	
<p>12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received</p>	<p>Marrakech Accords, CDM Modalities §37b</p>	<p>OK.</p>	<p>Table 2, Section G</p>
<p>13. Documentation on the analysis of the environmental impacts of the project activity, including trans-boundary 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.</p>	<p>Marrakech Accords, CDM Modalities §37c</p>	<p>OK.</p>	<p>Table 2, Section F</p>

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	Marrakech Accords, CDM Modalities §37e	OK.	Table 2, Section B.1.1 and D.1.1
15. 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	Marrakech Accords, CDM Modalities §37f	OK.	Table 2, Section D

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16. 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	Marrakech Accords, CDM Modalities, §40	OK	Comments were invited from 2 nd .June '06 to 1 st July '06. No comments were received.
17. 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	Marrakech Accords, CDM Modalities, §45c,d	OK.	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	OK.	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	OK.	The PDD is in conformance with the PDD format ver.02.

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
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* MoV = Means of Verification, DR= Document Review, I= Interview

Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	Clarification.1 The Project site is the Zafarana Area about 200km southeast of Cairo. Since the area has some preceding wind farms already, geographic location and the site boundary should be clearly defined in PDD.(e.g. in terms of longitude and or latitude of the reference point of the project, and the width and the depth of the area in relation to them)	CL1	OK.
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	System boundaries are the geographical site at Zafarana and all the generation plant connected through National Grid. Total capacity of the wind firm is 120MW, but the rating of the wind turbines is yet to be decided.	OK	OK

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/ /11/ /12/ /41/ /42/ /43/ /45/	DR I	<p>The Feasibility Study Reports were submitted to the validation team, where the situation of the power sector, environmental aspects, expected performance of the Projects, and required funding etc. are extensively studied. The study is on the plant comprising 600kW wind turbine units of a specific turbine supplier. The study claims 43%capacity factor.</p> <p>On the other hand, the PDD states the Project is considering to use wind turbines with unit output ranging from 600kW to 1000kW .</p> <p>Increased hub-height of 1000kW class wind turbine, power curve of the different suppliers, and literatures /13/ all suggest the possibility of higher capacity factor. Lower EPC cost, and O&M cost may also be realized by the adoption of 1000kW class wind turbines.</p> <p>Clarification.2</p>	CL2	OK.

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			Technical explanation such as capacity factor, etc. should also be given for other possible alternative plants with larger unit output (e.g. 1000kW) wind turbines.		
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /2/ /3/	DR	Ditto.	CL2	OK.
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	Once the plant is constructed, the longer term operation of the plant is the key to recovering invested cost. Substitution of the project by other technology is very unlikely.	OK	OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/13/	DR I	There already exists similar wind farm at Zafarana site. Training and operating experience gained through those plants will help the stable operation of the project. Technology transfer incl. necessary training and workshop is to be included in the EPC contract.	OK	OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/13/	DR I	The provisions are not explicitly described in PDD, but the same comments as above apply.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /17/ /45/ /52/	DR I	The project is in line with plans in the host country. It is the strategy of Egyptian government to increase renewable energy source up to 3% of the peak load by 2010. EEHC is planning to expand wind power generation capacity to 555Mw by 2012. This project is included in the plan.	OK	OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/ /45/ /52/	DR I	Environmental Screening Form was submitted to EEAA according to Egyptian Law, and was approved on 30-Aug. 1999. The copy of the approval was submitted to the audit team. Favourable comments of local stakeholders were also acquired.	OK	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/ /52/ /54/	DR I	Ditto.	OK	OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /54/	DR I	Yes. The reduction of domestic consumption of natural gas and increase of export will contribute to the foreign currency acquisition. Increase of employment for EPC, O&M of the plant is also expected.	OK	OK

Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/ /2/ /3/	DR	Approved consolidated baseline methodology ACM0002 /2/ is applied.	OK	OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	<p>Since the methodology was developed for electricity generation by renewable energy source, which is connected to grid, its application is appropriate.</p> <p>The PDD examines all the applicability conditions, which are acceptable.</p>	OK	OK

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<p>B.2. Baseline Determination</p> <p><i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i></p>					
<p>B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?</p>	<p>/1/ /14/ /44/ /45/ /57/</p>	<p>DR I</p>	<p>Yes, the application of the methodology, the discussion and determination of the baseline are transparent except for the point discussed below.</p> <p><i>As for the additionality check, refer to question B.2.7.</i></p> <p>Operating margin is calculated as the Simple OM. PDD asserts Dispatch Data Analysis OM can not be applied due to unavailability of data.</p> <p>Clarification.3 Since the Dispatch Data Analysis OM is recommended as the first choice, please explain what kind of deficiency of the nation's dispatching system and/or the lacking of data hamper the application of the Dispatch Data Analysis OM.</p> <p>Build Margin is calculated using option 1 of the methodology.</p> <p>Amounts of electricity generation and fuel consumption of each plant are derived from EEHC annual report.</p>	<p>CL3</p>	<p>OK.</p>

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	Yes.	OK.	OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	Yes.	OK.	OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /45/ /57/	DR I	Yes. Following the requirement of ACM0002, the performance of the existing plants is taken into consideration for OM and BM calculation.	OK.	OK
B.2.5. Is the baseline determination compatible with the available data?	/1/ /45/ /57/	DR I	Yes. Available data has been used for baseline determination.	OK	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/ /45/ /57/	DR I	Ditto	OK	OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not	/1/ /3/ /10a/ /10b/ /10c/ /11/ /15/ /16/ /41/	DR I	Yes. Following the procedure of the 'additionality tool': /3/, the additionality is demonstrated. 1. The candidates of alternatives to the project are listed, screened and concluded that the only possible alternative is the continuation of the current situation. The discussion is acceptable. . 2. Investment analysis is carried out using Option III. PIRR and the auctioned interest rate of		

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
required by a Party's legislation/regulations)?	/42/ /43/ /45/ /47/		<p>Egyptian Government treasury bills were selected as the financial indicator and the benchmark respectively.</p> <p>The calculated PIRR is much lower than the benchmark, thus the project can not be BAU is concluded.</p> <p>PIRR calculation submitted to the audit team showed that the calculation process was appropriate, but as to the benchmark and variables, following questions were raised which needs correction and or clarification.</p> <p>The existing wind power projects in Zafarana (2 projects by Denmark and 2 projects by Germany) which are called Zafarana – 1 to 4 were financed through a combination of soft loans and substantial grants of 15 to 100%. On the other hand the NREA's latest and future wind power projects in Zafarana financed by Denmark, Germany and Spain are planned without grant and under CDM. The Project by JBIC does not receive any grants and it is agreed between NREA and JBIC to implement under the CDM to compensate the financial gap caused by the lack of grants.</p>	CAR2 CL4	OK. OK.

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>Corrective Action Request 2</p> <p>Capacity factor of the plant directly affects electricity sales revenue. Therefore, the additionality should be studied for the case of the biggest capacity factor among possible options.</p> <p>Clarification 4</p> <p>(1) Not the instantaneous value, but the trend at the decision of CDM implementation is more preferable as the benchmark, confirmation of the treasury bill auction results of Oct., Nov. and Dec. of 2004 should be presented</p> <p>(2) The EPC cost, O&M cost appears to be appropriate compared with the world's experiences tabulated in various literatures/16/, /17/. But the cost estimates of the FS/11/ is limited for the plant which comprises 600kw wind turbine units. Explanation on plants with 1000kW units should be given.</p> <p>(3) Electricity tariff is set at 0.14LE/kwh. Explanation should be given on how the tariff is determined between EEHC and NREA including the presence and perspectives of the renewable energy incentives.</p> <p>3. Barrier analysis</p>		

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>Barrier Analysis is referred only for commentary use. Since the methodology requires to use either investment analysis or barrier analysis, the reference is appropriate.</p> <p>4. Common practice analysis PDD asserts “several preceding wind farms in Egypt were all constructed under combination of soft loans and grants, since such situation is no longer the case for this project, the project is not the common practice”. The discussion is acceptable.</p> <p>Note: The detailed information on the demonstration of additionality is provided as Annex 5 to the PDD.</p>		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	No risks are foreseen.	OK.	OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.	OK.	OK
<p>C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i></p>					
C.1.1. Are the project’s starting date and operational lifetime clearly defined and reasonable?	/1/	DR	Yes	OK.	OK

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	/1/	DR	Yes, renewable crediting period of maximum two x 7 years is selected.	OK.	OK
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/ /2/	DR	Yes, ACM0002 “Consolidated monitoring methodology “is applied.	OK.	OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/ /2/	DR	Yes, the monitoring methodology is in line with the baseline methodology. The same discussion as in the question B.1.2. apply.	OK.	OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/ /2/	DR	Yes, the project chooses the monitoring of data which are needed for the Simple OM approach.	OK.	OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/ /2/	DR	Yes.	OK.	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	Since the project is the renewable energy source generation, no project emission needs to be monitored.	OK.	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Ditto.	OK.	OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Ditto.	OK.	OK
D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions?	/1/	DR	Ditto.	OK.	Ok
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Ditto.	OK.	OK
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /2/	DR	ACM0002 specifies “project participants do not need to consider emission sources such as emission due to construction etc.” as	OK.	OK

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Validation Protocol

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			leakage. Since the project is a renewable energy source generation, no other leakage is likely.		
D.3.2. Have relevant indicators for GHG leakage been included?	/1/ /2/	DR	Ditto.	OK.	OK
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /2/	DR	Ditto.	OK.	OK
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	/1/ /2/	DR	Ditto.	OK.	OK
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /2/	DR	Yes, the monitoring plan provide for the collection and archiving of all the relevant data necessary for the case where ex-ante simple OM and ex-ante BM was selected.	OK	OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/ /2/	DR	Yes	OK.	OK
D.4.3. Will it be possible to monitor the specified baseline indicators?	/1/ /2/	DR	Yes	OK.	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1.Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/ /2/	DR	No, applied monitoring methodology does not require monitoring of such data.	OK	OK
D.5.2.Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/1/ /2/	DR	Ditto.	OK	OK
D.5.3.Will it be possible to monitor the specified sustainable development indicators?	/1/ /2/	DR	Ditto.	OK	OK
D.5.4.Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/ /2/	DR	Ditto.	OK	OK
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1.Is the authority and responsibility of project management clearly described?	/1/ /18/ /45/ /49/	DR I	The authority and responsibility of project management is clearly indicated in NREA's organization chart.	OK	OK
D.6.2.Is the authority and responsibility for registration,	/1/	DR	JBIC will be responsible for the registration	OK.	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
monitoring, measurement and reporting clearly described?	/13/ /19/ /41/ /43/ /45/ /49/ /50/ /51/ /59/	I	of the project. Monitoring, measurement and reporting are primarily the responsibility of NREA. EEHC will be also responsible for the portions related to the sold amount of electricity. The responsibilities of each organization is defined in PPA./19/		
D.6.3.Are procedures identified for training of monitoring personnel?	/1/ /13/ /49/ /51/	DR I	Yes, procedures applied to the existing plant will be followed. Monitoring personnel of the existing plant are trained at manufacturer's factory and at site, and have certificates of training.	OK	OK
D.6.4.Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /51/	DR	No emergencies that can cause unintended emissions are expected.	OK	OK
D.6.5.Are procedures identified for calibration of monitoring equipment?	/1/ /19/	DR I	Procedures applied to the existing plant will be followed. Calibration will be carried out according to the instruction manuals of manufacturer.	OK	OK
D.6.6.Are procedures identified for maintenance of monitoring equipment and installations?	/1/ /23/ /49/	DR I	Ditto. Maintenance will be carried out according to the instruction manuals of manufacturer equipped at each site office.	OK	OK

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	/50/		It is recorded in the monthly report.		
D.6.7.Are procedures identified for monitoring, measurements and reporting?	/1/ /22/ /23/ /49/ /50/	DR I	Ditto. Monitoring of each turbine will be done at NREA's control room and the monitoring of the wind power output will be done by revenue meters of EETC's substation. All relevant data will be electronically archived. Monthly report is prepared by the joint meeting at site and mutually signed. Example of energy calculation minute /23/ was presented to the audit team	OK	OK
D.6.8.Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/ /50/ /51/	DR I	Ditto	OK	OK
D.6.9.Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/ /23/ /45/ /49/	DR I	Yes, monthly consolidated report indicates all relevant data of each month including the performance, faults and maintenance records. By this consolidated reports, possible monitoring data adjustments and uncertainties are identified. An Example of monthly report /24/ was presented to the audit team.	OK	OK
D.6.10.Are procedures identified for review of reported results/data?	/1/ /23/ /45/	DR I	Ditto	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	/49/				
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	Ditto	DR I	Ditto	OK	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	Ditto	DR I	Ditto	OK	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	Ditto	DR I	Ditto	OK	OK
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1. Predicted Project GHG Emissions <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	The project does not emit any GHG. This question does not need to be applied.	OK.	OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Ditto.	OK.	OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	Ditto	OK.	OK

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E.1.4.Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Ditto	OK.	OK
E.1.5.Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Ditto	OK.	OK
E.3.Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i>					
E.3.1.Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	The project yields no leakage. This question does not need to be applied.	OK.	OK
E.3.2.Have these leakage effects been properly accounted for in calculations?	/1/	DR	Ditto.	OK.	Ok
E.3.3.Does the methodology for calculating leakage comply with existing good practice?	/1/	DR	Ditto.	OK.	OK
E.3.4.Are the calculations documented in a complete and transparent manner?	/1/	DR	Ditto.	OK.	Ok
E.3.5.Have conservative assumptions been used when calculating leakage?	/1/	DR	Ditto.	OK.	OK
E.3.6.Are uncertainties in the leakage estimates properly addressed?	/1/	DR	Ditto.	OK.	Ok

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E.3. Baseline Emissions <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/ /9/ /14/ /41/ /43/ /44/ /45/ /52/	DR	Corrective Action Request 3 Fuel consumption/unit generation of Cairo North Power Station in 2003/2004 is approximately 10 times higher than that of ordinary combined cycle plant. For the conservativeness of OM and BM, fuel consumption should not include extraordinary fuel consumption such as experimental fuel consumption. In this sense, Cairo North Power Station data in 2003/2004 shall be reviewed and corrected.	CAR3	OK.
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes, the boundaries are the project and generation plant connected through national grid.	OK.	OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the GHG calculations are documented in a complete and transparent manner.	OK	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes	OK.	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.3.5.Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	No uncertainties are expected.	OK.	OK
E.3.6.Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	The project yields no emission. The baseline emission is determined appropriately except for the points discussed in question E.3.1.	OK.	OK
E.4.Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1 Will the project result in fewer GHG emissions than the baseline scenario?	/1/ /41/ /43/ /45/	DR	Yes the project will reduce CO2 emission by 247,705 ton/ year. Emission reduction needs to be recalculated considering the review results of E.3.1	(CAR3)	OK.
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1.Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /25/ /48/	DR	Yes, possible impacts are described in PDD and the potential of environmental impacts are concluded to be very low, including impacts on bird migration /25/.	OK.	OK
F.1.2.Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if	/1/ /17/	DR	No, Law on Protection of the Environment categorizes this type of project as grey	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
yes, is an EIA approved?			classification. For such project, environmental screening form (ESF) shall be submitted to EEAA. Detailed EIA is not required. ESF was approved by EEAA 30-Aug.-'99. The copy of the letter was confirmed by the validation team.		
F.1.3.Will the project create any adverse environmental effects?	/1/	DR	No.	OK.	OK
F.1.4.Are trans-boundary environmental impacts considered in the analysis?	/1/	DR	No, no trans-boundary impacts are foreseen.	OK.	OK
F.1.5.Have identified environmental impacts been addressed in the project design?	/1/	DR	Yes, refer to question F.1.1.	OK.	OK
F.1.6.Does the project comply with environmental legislation in the host country?	/1/	DR	Yes, refer to question F.1.2.	OK.	OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1.Have relevant stakeholders been consulted?	/1/ /45/ /48/	DR I	Yes, relevant local government and inhabitants of the vicinity have been consulted between Dec.2004 and Feb.2005.	OK	OK
G.1.2.Have appropriate media been used to invite comments by local stakeholders?	/1/ /45/ /48/	DR	Yes, non- technical summary of the project and a survey form were distributed and recovered.	OK	OK

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G.1.3.If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR I	No stakeholder process is required for the project categorized to “grey” by Law on protection of the Environment	OK	OK
G.1.4.Is a summary of the stakeholder comments received provided?	/1/	DR I	Yes	OK	OK
G.1.5.Has due account been taken of any stakeholder comments received?	/1/ /45/ /48/ /54/ /55/ /60/	DR I	There are no negative comments received. During the Interview of the governor of the Suez governorate /54/, the expectation to the Project such as supply of GHG free electricity to meet the glowing demand at the Suez area, nationalization of the part of the equipments employed in the Project. Also, no negative comments were expressed during the interview of the General Manager /60/ of the resort nearest to the Project site.	OK	OK

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Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CAR1. Corrective Action Request 1. The letter of approval by the DNA of Egyptian government should be submitted to the Audit Team before the request for registration.</p>	<p>(Table 1) 4</p>	<p>The Egyptian DNA Letter of approval had been signed on 1st June, 2006. A copy of the letter was submitted to the validation team on Oct. 4, 2006.</p>	<p>OK. The validation team confirmed the letter.</p>
<p>CAR.2 Corrective Action Request 2 Capacity factor of the plant directly affects electricity sales revenue. Therefore, the additionality should be studied for the case of the biggest capacity factor among possible alternatives.</p>	<p>B.2.7</p>	<p>Conceptual design report “Zafarana Wind Power Plant Project 120MW” /24/ was submitted to the validation team, where the higher capacity factor and practically identical costs for 1000kW turbine plant is described. JBIC and NREA reviewed and revised the financial analysis based on the higher capacity factor of 1000kW unit’s plant and the results were reflected to PDD. For emission reduction calculation, lower capacity factor was maintained, for conserve estimate.</p>	<p>OK. Although the PIRR was slightly improved by assuming higher capacity factor, it is still much lower than the indicator, the conclusion of the financial analysis remains unchanged.</p>

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CAR.3 Corrective Action Request 3 Fuel consumption/unit generation of Cairo North Power Station in 2003/2004 is approximately 10 times higher than that of ordinary combined cycle plant. For the conservativeness of OM and BM, fuel consumption should not include extraordinary fuel consumption such as experimental fuel consumption. In this sense, Cairo North Power Station data in 2003/2004 shall be reviewed and corrected.</p> <p>Emission reduction also needs to be recalculated considering the review results of E.3.1.</p>	<p>E.3.1 E.4.1</p>	<p>JBIC and NREA reviewed Cairo North Power Station data in 2003/2004.</p> <p>Fuel consumption per unit generation was revised to that during '04/'05, when the station started normal operation.</p> <p>The result was reflected to Operating margin, Build margin and emission reduction calculation. PDD was revised, accordingly.</p>	<p>OK</p>
<p>CAR.4 Corrective Action Request 4 <u>The letter of approval by the DNA of government of Japan should be submitted to the Audit Team before the request for registration</u></p>	<p>(Table 1) <u>5</u></p>	<p><u>The letter of approval by the DNA of government of Japan had been signed on Feb. 26, 2007.</u></p> <p><u>A copy of the letter was submitted to the validation team on Mar.7, 2007.</u></p>	<p><u>OK. The validation team confirmed the letter.</u></p>

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL1 Clarification.1 The Project site is the Zafarana Area about 200km south-east of Cairo. Since the area has some preceding wind farms already, geographic location and the site boundary should be clearly defined in PDD. (e.g. In terms of longitude and or latitude of the reference point of the project, and the width and the depth of the area in relation to them)</p>	A.1.1.	The longitude and latitude of the Project's site, the location in relation to the preceding German and Spanish project are described in PDD.	OK
<p>CL 2. Clarification.2 Technical explanation such as capacity factor, etc. should also be given for other possible alternative plants with larger unit output (eg.1000kW) wind turbines.</p>	A.2.1.	<p>Conceptual design report "Zafarana Wind Power Plant Project 120MW" /24/ shows 47 to 50% capacity factor, depending on the mast height of 60m and 70m for 1000kW unit based plant.</p> <p>The description of possible range of capacity factor and amount of generated electricity were added to PDD. Further revision of PDD and financial analysis were carried out according to CAR.3 response.</p>	OK.
<p>CL 3 Clarification.3 Since the Dispatch Data Analysis OM is</p>	B.2.1.	During the interview, NREA and EETC explained that, in many old power stations the monitoring of the power	OK. Assertion of NREA and EEHC is

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>recommended as the first choice, please explain what kind of deficiency of the nation's dispatching system and/or the lacking of data hamper the application of the Dispatch data analysis OM.</p>		<p>station is carried out by analogue system and very difficult to apply the Dispatch Data Analysis OM.</p> <p>Subsequently, EETC prepared and submitted the list /27/ showing the nature of the data acquisition system of each power station, where in the majority of thermal power stations, fuel consumption and electricity generation were read manually from the meters and recorded onto paper.</p>	<p>reasonable.</p>

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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL 4. Clarification 4 (1) Not the instantaneous value, but the trend at the decision of CDM implementation is more preferable as the benchmark, confirmation of the treasury bill auction results of Oct, Nov. and Dec. of 2004 should be presented (2) The EPC cost, O&M cost appears to be appropriate compared with the world's experiences tabulated in various literatures/16/, /17/. But the cost estimates of the FS/11/ is limited for the plant which comprises 600kw wind turbine units. Explanation on plant with 1000kW units should be given. (3) Electricity tariff is set at 0.14LE/kwh. Please explain how the tariff is determined between EEHC and NREA including the presence and perspectives of the renewable energy incentives.</p>	<p>B.2.7</p>	<p>(1) NREA collected and provided the evidence/26/. The same indicator as PDD was fluctuating between 10.4 and 11.3% during the period. (2) Conceptual design report "Zafarana Wind Power Plant Project 120MW" /24/ was submitted to the validation team, where cost of the plant with 1000kW units has been shown. PDD and financial analysis were revised according to the response to CAR.3. (3) Evidence was forwarded about following data. 0.10LE/kwh: PPA between NREA &ETC/19/ 0.02LE/kwh subsidy: Agreement between MEE & Ministry of Petroleum/21/ 0.02LE/kwh: EEHC's modification of tariff for new & renewable energy/20/</p>	<p>(1) OK. The fluctuation does not affect the result of financial analysis discussion. (2) OK. (3) OK.</p>