



VALIDATION REPORT

75 MW wind power project in Maharashtra by Essel Mining Industries Limited in India

REPORT No. 2007-0358

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VALIDATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

Climate Change Services

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Client: Essel Mining & Industries Limited (EMIL)	Client ref.: Mr. Arun Kedia

Project Name: 75 MW wind power project in Maharashtra by Essel Mining Industries Limited
Country: India
Methodology: ACM0002
Version: 06
GHG reducing Measure/Technology: Grid-connected electricity generation from renewable sources (wind energy)
ER estimate:
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☒ Corrective Actions Requested
☒ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected
 In summary, it is DNV's opinion that the 75 MW wind power project in Maharashtra by Essel Mining Industries Limited in India, as described in the PDD of 7 November 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002, version 06. DNV thus requests the registration of the project as a CDM project activity.

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VALIDATION REPORT

Abbreviations

BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
CL	Clarification request
CM	Combined margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CWET	Centre for Wind Energy Technology
DNA	Designated National Authority
DNV	Det Norske Veritas
EMIL	Essel Mining & Industries Limited
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
JMR	Joint meter reading
LoA	Letter of Approval
MERC	Maharashtra Electricity regulatory Commission
MNES	Ministry of Non-conventional Energy Sources
MoEF	Ministry of Environment and Forests
MP	Monitoring Plan
MSEB	Maharashtra State Electricity Board
MSEDCL	Maharashtra State Electricity Distribution Company Limited
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating margin
PDD	Project Design Document
PLF	Plant load factor
PPA	Power purchase agreement
SCADA	Supervisory Control and Data Acquisition
UNFCCC	United Nations Framework Convention on Climate Change
WEG	Wind Energy Generator
WREG	Western Regional Electricity Grid



VALIDATION REPORT

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION	5
2	INTRODUCTION	6
2.1	Objective	6
2.2	Scope	6
3	METHODOLOGY.....	7
3.1	Desk Review of the Project Design Documentation	7
3.2	Follow-up Interviews with Project Stakeholders	8
3.3	Resolution of Outstanding Issues	8
3.4	Internal Quality Control	10
3.5	Validation Team	10
4	VALIDATION FINDINGS	11
4.1	Participation Requirements	11
4.2	Project Design	11
4.3	Baseline Determination	11
4.4	Additionality	12
4.5	Monitoring	13
4.6	Estimate of GHG Emissions	14
4.7	Environmental Impacts	15
4.8	Comments by Local Stakeholders	15
4.9	Comments by Parties, Stakeholders and NGOs	15

Appendix A: Validation Protocol

Appendix B: Certificates of Competence



VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the “75 MW wind power project in Maharashtra by Essel Mining Industries Limited” in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The host country is India. No Annex I country has yet been identified. India fulfils the participation criteria and has approved the project and authorized the project participants. The DNA from India confirmed that the project assists in achieving sustainable development.

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

By generating electricity from wind sources, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 118 203 tCO₂e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the 75 MW wind power project in Maharashtra by Essel Mining Industries Limited in India, as described in the PDD of 7 November 2007, meets all relevant UNFCCC requirement for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002, version 06. DNV thus requests the registration of the project as a CDM project activity.



VALIDATION REPORT

2 INTRODUCTION

EMIL has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the 75 MW wind power project in Maharashtra by Essel Mining Industries Limited project in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

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

2.2 Scope

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

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



VALIDATION REPORT

3 METHODOLOGY

The validation consists of the following three phases:

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

- /1/ EMIL: CDM-PDD version dated 05 October 2006, version dated 6 June 2007 and version 04 dated 7 November 2007
- /2/ EMIL: CER calculations excel spreadsheets
- /3/ EMIL: IRR calculation spreadsheets
- /4/ EMIL: Internal note for establishing of benchmark for project evaluation dated 20 February 2004
- /5/ EMIL: Insurance premium receipts for all 60 WEGs
- /6/ EMIL: O&M contracts of EMIL with Suzlon Windfarm Services Limited
- /7/ EMIL: Break-up of administrative expenses
- /8/ EMIL: Minutes of the board meeting dated 27 September 2004 considering CDM benefits prior to project implementation including the assumptions for the financial considerations
- /9/ EMIL: PPA with MSEB
- /10/ EMIL: Communication from Suzlon suggesting CDM dated 22 August 2004
- /11/ EMIL: Stakeholder comments
- /12/ EMIL: Specifications for WEG
- /13/ EMIL: Environmental Impact Assessment dated November 2006
- /14/ EMIL: WEG Generation data sheets from MSEDCL for January-December 2006
- /15/ EMIL: Commissioning certificates of the individual WEGs
- /16/ CEA: CO₂ Baseline Database for the Indian Power Sector dated 04 October 2006.
- /17/ CEA: Report of the Expert Committee on Fuels for Power generation
- /18/ MNES: New and Renewable Energy Policy Statement 2005
- /19/ DNA of India: Letter of Approval dated 22 January 2007.
- /20/ International Emission Trading Association (IETA) & the World Bank's Prototype

VALIDATION REPORT

Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>

/21/ ACM0002: “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*”, version 06, sectoral scope 01, dated 19 May 2006.

/22/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*. Version 02 of 28 November 2005.

/23/ CDM Executive Board: *Meeting Report of EB meeting 35*

3.2 Follow-up Interviews with Project Stakeholders

On 05 January 2007, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of EMIL were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
EMIL Mr. Gopal Mohta Mr. Sanjay Baid	<ul style="list-style-type: none"> ➤ Starting date of project activity ➤ Assessment of project additionality and discussed barriers ➤ Validation of emission reduction calculations and data used therein ➤ Review of project design and technology used therein. ➤ Review of monitoring and verification procedure of the organisation and management structure of the organisation for the project activity. ➤ Review of the stakeholder consultation process.

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to DNV’s positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the 75 MW wind power project in Maharashtra by Essel Mining Industries Limited is enclosed in Appendix A to this report.

VALIDATION REPORT

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

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

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

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

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a corrective action request (CAR) due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.</i>

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

Figure 1 Validation protocol tables



VALIDATION REPORT

3.4 Internal Quality Control

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

3.5 Validation Team

The validation team consisted of the following personnel:

Subhendu Biswas	DNV Certification India	Team leader, CDM validator
Soumik Biswas	DNV Certification India	CDM validator
Michael Lehmann	DNV Certification Oslo	Sector expert
Chandrashekara Kumaraswamy	DNV Certification India	Technical Reviewer

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



VALIDATION REPORT

4 VALIDATION FINDINGS

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

The validation findings relate to the project design as documented and described in the final project design documentation dated 7 November 2007 which has been revised to take into account the decisions of the CDM EB at its 35th meeting.

4.1 Participation Requirements

The project participant is the private entity “Essel Mining & Industries Limited” of India. The project is proposed as a unilateral project and no Annex-I country has yet been identified. The host country India meets all the requirements for participating in a CDM project. The Ministry of Environment and Forests, the DNA of India has approved the project with a letter of approval dated 22 January 2007, which also confirms that the project assists in achieving sustainable development in India.

4.2 Project Design

The wind farm of EMIL has an installed capacity of 75 MW and the entire power generated is being exported to the state grid maintained by Maharashtra State Electricity Distribution Company Limited (MSEDCL) which is a part of western regional electricity grid. The wind farm has been implemented in three stages.

The WEGs installed under the project are supplied by Suzlon. Each WEG has a power generation capacity of 1250 KW. The S-70 models used in the project have greater swept area/MW than the conventional models used in India and thus are expected to perform better than the previous models. The project design thus reflects good practice. Stage I of the project with installed capacity of 15 MW was commissioned in March 2005, stage II with 30 MW installed capacity was commissioned in September 2005 and stage III with 30 MW installed capacity was commissioned in December 2005 to February 2006.

The power generated from the project is directly fed to the state grid which is part of the western regional grid thereby replacing an equivalent amount of fossil fuel based power generation. Therefore the project activity results in an equivalent amount of CO₂ emission reduction which otherwise would have resulted from fossil fuel combustion.

The starting date of the project activity has been selected as December 2004 and the lifetime of the project is 20 years. The lifetime of the project activity is reasonable. The project has selected a non-renewable crediting period of 10 years starting from 9 November 2007.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA.

4.3 Baseline Determination

The project selects the approved consolidated baseline methodology ACM0002, version 6 dated 19 May 2006. ACM0002 is applicable to grid connected renewable electricity



VALIDATION REPORT

generation projects. Since the project involves grid connected renewable energy generation from wind power, the methodology is applicable to the project.

The discussion of the baseline selection has been done in a transparent manner. Electricity generation by the existing grid connected power plants have been selected as the baseline. The baseline selection is compatible with the available data. The data required for calculating the combined margin is available from the CEA. The published OM and BM data provided by the CEA has been used to calculate the CM.

The continuation of electricity generation by the existing grid connected power plants is the most likely baseline scenario in the absence of the project activity.

4.4 Additionality

The project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 02.

Step 0: Since the project activity does not seek for retro active credits, this step is not applicable to the project activity. However, the project proponent has provided the board approval for the project considering CDM to DNV. The project was approved through a board resolution dated 27 September 2004 /8/ whereby the benefits of CDM were considered to offset the financial risks of the project and make the project viable as an investment option. This document has been appended to the PDD following the EB decision taken in its 35th meeting.

Step 1: Three alternatives to the project activity have been considered as the baseline scenario. These are i) coal-based power plant ii) project activity without CDM benefits and ii) continuation of current scenario of power generation from existing grid-connected power plants. All the alternatives are in compliance with the laws and regulations of India. According to MNES the cost of wind power generation is INR 2.25 to 2.75 per KWh¹ whereas according to CEA, the cost of coal based power generation is INR 1.88 per KWh² for power plants based on domestic coal sourced from a distance of 800 kilometres. The cost further reduces with decreasing distance. Hence coal based power generation is more economical than wind power generation in terms of cost of power generation. Also the project without CDM benefits face certain barriers in implementation as discussed later. However, for considering the baseline emissions the continuation of power generation from existing and future grid connected power plants have been selected as the baseline since this option results in lower baseline emissions than the coal based power plant option.

Step 2: To demonstrate the additionality of the project, the project proponent has calculated the IRR of the project for a period of 20 years. The project IRR has been calculated to be 11.86% and the return on equity has been calculated to be 14.28% /3/. The return on equity is lower than the internal benchmark of EMIL which is 16.9% /4/ as well as the expected rate of return on equity of 16% as provided by the MNES /18/. The IRR has been calculated based on a PLF of 20% while the actual PLF was found to be ~19%. It has been confirmed from the minutes of the meeting dated 27 September 2004 that the IRR calculated during approval of the project was based on a PLF of 20% only. The signed copy of the extracts of the board meeting has been added as appendix I to the PDD following a correction request by the CDM

¹ <http://mnes.nic.in/business%20oppertunity/pgtwp.htm>

² CEA: Report of the Expert Committee on Fuels for Power generation



VALIDATION REPORT

Executive Board. DNV reviewed the original minutes of the meeting to verify the information included in the extract.

The revenue generation from the project has been based on the cost of power as mentioned in the PPA /9/. A tax holiday of 10 years has been considered while calculating the IRR. A sensitivity analysis has also been performed with $\pm 5\%$ change in PLF. With a 5% increase in PLF, the IRR becomes $\sim 22\%$. However, a 5% increase in PLF is unlikely since it has been verified that the actual PLF of the project is $\sim 19\%$. Moreover, the PPA from MSEB explicitly mentions that the project should be posed for CDM benefits wherever possible.

Step 3: The tariff structure for wind power projects is a single part tariff structure compared to a two-part tariff structure for fossil fuel and hydro plants. Thus for fossil fuel fired and hydro plants the investment can be recovered independent of the level of generation. Also for wind power, the tariff is fixed ex-ante where as for fossil fuel and hydro based plants the tariff is fixed on a cost-plus approach which ensures that the cost of investment is recovered from the first year of operation. This poses a barrier for the wind power projects as the investment recovery is dependent on the PLF of the wind farm.

As mentioned earlier, the PPA with MSEB explicitly mentions that the project should be posed for CDM benefits. However, the PPA also stipulates that once the project becomes eligible for CDM revenues, MERC might review the tariff structure and decide on a mechanism for sharing of CERs. The decision of MERC will be binding on both parties. This generates doubts about the tariff available for the project as well as the benefits from CDM that will be available to the project proponent.

Step 4: The penetration of wind energy in Maharashtra at the end of 2005 was 0.74% of the total installed capacity. The installed capacity of wind power is only 495 MW as of 31 December 2005. Also, as of September 2003, the sales tax benefit which was being awarded to wind projects as a promotional measure have been withdrawn thus making wind farm projects financially less viable.

Step 5: The CDM benefits increases the equity IRR of the project to 17.05% thus providing the project with necessary financial back-up.

From the discussion above it can be concluded that the project is not a business-as-usual scenario and thus can be deemed additional to what would otherwise have occurred.

4.5 Monitoring

The monitoring methodology selected complies with requirements of ACM0002, version 6.

4.5.1 Parameters determined ex-ante

The baseline carbon emission factor of the western regional grid is determined from the published data of CEA and is fixed ex-ante. The operating margin (OM) has been calculated from the emission data of 2002-03, 2003-04 and 2004-05. These are the three most recent years for which the data is available from CEA. From these 3 years data, the average OM has been calculated to be $0.993 \text{ tCO}_2/\text{MWh}$. The build margin (BM) has been calculated from the data available from CEA for the year 2004-2005 to be $0.78 \text{ tCO}_2/\text{MWh}$. As required by ACM0002 for wind energy, weight factors of 75% and 25% have been used for OM and BM respectively for the calculation of combined margin (CM). The combined margin emission factor has been calculated to be $0.940 \text{ tCO}_2/\text{MWh}$ and is fixed *ex-ante* for the entire crediting



VALIDATION REPORT

period. All the data used in the calculations are publicly available data and the calculations are correct.

4.5.2 Parameters monitored ex-post

The net amount of electricity despatched by the WEGs to the MSEDCL grid will be monitored continuously. The net electricity exported to the grid will be reported on monthly basis and cross-checked with the invoices raised to MSEB. All data will be archived for 2 years after the crediting period.

Since the project involves electricity generation from wind sources, no monitoring is required for project emissions or leakages due to the project activity.

4.5.3 Management system and quality assurance

The responsibility of overall project management lies with EMIL. The monitoring of the WEG performance has been outsourced to Suzlon Windfarm Services Limited. Suzlon will provide for the training of the monitoring personnel. EMIL will also be responsible for the review of reported results. The electricity meters installed under the project activity are approved by the MSEB and deemed appropriate. The meters will be calibrated at a regular frequency. The electricity generation reports on joint meter reading are generated by MSEDCL and send to EMIL through Suzlon on monthly basis. The monthly electricity sales receipts from MSEDCL will also be archived until 2 years after the crediting period to facilitate cross-checking during the crediting period.

4.6 Estimate of GHG Emissions

The project being a wind energy generation project, there are no project emissions or leakages due to the project activity.

The calculation of the baseline emissions has been done in a transparent manner. Electricity generation by the existing grid connected power plants have been selected as the baseline. The baseline emission factor has been calculated as a combination of OM and BM emission factors and it is fixed ex-ante. The OM has been calculated by the Central Electricity Authority from the emission data of 2002-03, 2003-04 and 2004-05 following the simple OM approach. These are the three most recent years for which the data is available from CEA. From these 3 years data, the average OM has been calculated to be 0.993 tCO₂/MWh. The BM has been calculated from the data available from CEA for the year 2004-2005. The BM has been calculated to be 0.78 tCO₂/MWh. As required by ACM0002 for wind energy, weight factors of 75% and 25% have been used for OM and BM respectively for the calculation of CM. The combined margin emission factor has been calculated to be 0.94 tCO₂/MWh.

The electricity displaced from the grid by the project activity has been based on actual generation figures for the WEGs prior to the crediting period. The actual generation data from the project as obtained from the monthly generation details provided by the MSEDCL for a one year period has been used to estimate the electricity generation from the project during the crediting period.

The emission reductions from the project are real and measurable. Provided the underlying assumptions do not change, the project is likely to reduce 118 203 t CO₂ e per annum during its 10 years crediting period.



VALIDATION REPORT

4.7 Environmental Impacts

The project does not require an environmental impact analysis as per the EIA notification of the MoEF. However, an EIA was conducted by EMIL which has adequately described the environmental impacts of the project and also assessed the feed back from the local stakeholders. The project is not likely to create any adverse environmental effects. The project complies with environmental regulations in India. Necessary licences and environmental clearances have been obtained.

4.8 Comments by Local Stakeholders

The local stakeholders were invited for comments through notices in the local language as well as in English. Meetings were conducted to collate the views of the local stakeholders. The employees, contractual labours, contractors (Suzlon Windfarm Services Limited), the village head and the villagers have been consulted. The project did not receive any negative comment.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 5 October 2006 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 07 November 2006 to 06 December 2006.

Two comments were received and is given (in unedited form) in the below text box.

Comment By: A. Shah, Shiva Energy

Inserted On: 2006-12-04

Subject: Comments for the project: 75 MW wind power project in Maharashtra by Essel Mining Industries Limited

Comment:

Comment No. / reference from PDD/ Comment

1./ "The project activity includes "successful installation and generation of 75MW equivalent units of electricity....." / From this very first statement of the PDD, it appears that the project is able to successfully implement without any hassles/barriers and able to generate the required amount of power for better profitability. Statement implies that the project has not faced any barrier and is a cake-walk. This self contradicts any claim for investment additionality/ barriers mentioned in Section B.3. of the PDD.

2./ "Essel Mining & Industries Limited (EMIL), a group company of Aditya Birla Group, is the owner and project proponent of this Wind Power Project under Clean Development Mechanism of Kyoto Protocol." / Unless and until a project is registered the project cannot be claimed as a CDM project. It is rather a project that has considered the potential benefits of CDM. The statement has to be accordingly modified.

3./ "These machines were being tried for the first time in Maharashtra wind zones. EMIL is the first customer in India as well as in Maharashtra to use S-70 model machines. The specifications of the Suzlon Wind turbo Generator S70 has been briefly explained in section A.4.3."/ Uniqueness of the technology cannot be claimed for one state alone or one

VALIDATION REPORT

technology supplier alone. There are few other technology suppliers supplying individual wind generators with much higher capacity. This is a false way of indicating technological uniqueness, more so when Suzlon itself has already developed and installed 2MW wind turbogenerators (refer : http://www.suzlon.com/2_MW_System_design.htm for details)

4./ “Since the net imports of western regional grid for the last three years is maximum of 2.52% of its generation, this is insignificant as compared to the total generation of the grid and hence not considered within the grid boundary.” / ACM0002 methodology never has given guidance on what amount of import to regional grid is significant/ insignificant and should be excluded/ included. All imports have to be included. The grid estimation has to be changed accordingly.

5./ “As per Ministry of Non-Conventional Energy Sources (MNES), capital cost for wind power project ranges between 4.5 million to 5.5 million per MW, depending on site and the wind electric generator selected for installation. This gives a levelised cost of energy generation in the range of INR 2.50 to INR 3.00 per kWh, taking into consideration the fiscal benefits extended by the Government.”/ Capital cost figures mentioned for wind are wrong. Exact source of information has not been made public to ensure transparency in evaluating alternatives. Infact, setting up wind power projects by such mining companies has already become a common practice, the exact reasons for which have to be ascertained by validator.

6./ “The project is located in the Dhule and Nandurbar districts of Maharashtra. Dhule is one of the high wind potential areas of the state” and “The EMIL management seriously considered CDM incentive for the project activity at the planning stage.” / As far as the information goes, the project is a part of the big Dhule wind farm being set up by Suzlon, the wind farm being the largest in Asia and is poised to become the world’s largest wind farm with total capacity to touch 1000 MW (refer: http://www.suzlon.com/asias_largest_wind_park.htm). Most certainly, all the developers in the wind farm would not have gone for CDM because they are earning sufficient revenues from the project itself. Hence, if other project developers in the same area have installed projects without considering CDM, the need for CDM for EMIL does not arise. Further, when the EMIL itself claims that the project is a high wind zone, then the PLF quoted for IRR calculations seem to be underestimated. Hence, project additionality and claim for CDM has to be clearly checked by the validator, by independent government agencies.

7./ “The sensitivity analysis shows that only with higher PLF (more than 20%) the project is financially viable. However, the project has demonstrated average PLF of 18% (data includes performance throughout all seasons).” / Claim of 18% PLF just from one source (EMIL) for only one year for the entire Dhule wind farm is not sufficient and may be misleading. This may lead to underestimating the IRR leading to incorrect IRR calculations. Validator to check for the actual PLF from other wind developers in the area. MNES itself has said that the wind projects in Maharashtra fetch good returns with IRR in the range of 25 – 30%. (refer: http://www.prayaspune.org/energy/M26_Wind.pdf for details)

8./ Project falls under the highest wind velocity areas of India (refer : <http://mnes.nic.in/wpdmapofindia.pdf> map for details). Hence, claim for low PLF has to be clearly validated to establish additionality.

9./ Project will be earning / saving costs from many other financial incentives from Government of India and Maharashtra which may not have been accounted in IRR calculation. This may lead to incorrect IRR calculation. Validator to check that how all financial incentives have been dealt with.

VALIDATION REPORT

10./ “Furthermore, MNES, through Centre for Wind Energy Technology (C-WET), Chennai, mentioned in Draft New and Renewable Energy Policy Statement 2005, that, “wind electricity in the country has not reached the costcompetitiveness levels attained in the US and EU, especially when fiscal incentives are available ”. It further indicates that it is expected that wind power in India is likely to be commercial viable only by 2010 with high capacity and more efficient system”. / How can such a broad based statement be used by EMIL for determining the additionality of its project alone. This is not very clear and is disingenuous. Validator to check for the correctness and applicability of this statement as a barrier for the EMIL project alone. Rather EMIL has to establish barrier analysis specific to its project.

11./ “The project developer has tried the latest model S70 of Suzlon Energy, which was being tried for the first time in the entire region of Maharashtra”. Step 3 “First of its kind” cannot be established just because one new model of one particular technology supplier has been implemented in one only state”: As stated in comment 3 above, this is a false way of indicating technological uniqueness, when there are few other technology suppliers supplying individual wind generators with much higher capacity and even when Suzlon has already developed 2 MW wind turbogenerators (refer: http://www.suzlon.com/2_MW_System_design.htm for details). Further, the information is incorrect when similar large projects are being set up in the same Dhule wind farm totalling 1000 MW.

12./ “Step 4 Common practice analysis.....” Such a broad based analysis in the PDD is misleading and not in conformity with guidelines provided in Step 4 Tools of Demonstration and assessment of additionality.

13./ “Operating Margin emission factor for western regional grid 1.207tCO₂/MWh, Build Margin emission factor for western regional grid 1.066tCO₂/MWh, and Combine Margin CO₂ emission factor for western regional grid 1.171tCO₂/MWh”. / The OM and BM calculations appear to be on far higher side leading to very high Combined Margin figure as CEA itself has reported much lower Emission factor in its recent report. For eg. CEA reports OM as 1.01 and BM as 0.77 tCO₂ / MWh for Western grid whereas EMIL has claimed emission factors well above 1.207 and 1.06 , thus increasing overall factors by 19% and 38 % respectively over CEA figures. This will definitely lead to higher and inflated emission reductions. Validator to check for transparency and conservativeness of calculation, given that it is a well-known information that Indian power plants operate inefficiently.

14./ It may be brought to the notice validator/ EB that already two such similar wind power projects have been rejected by EB, which were developed by the same CDM developer. The two other projects are also comparable in size and the ratio of power generation Refer table below for details:

Project	MW	MU	Ratio (MU/MW)
Bajaj Wind Supa	20	40	2
Bajaj Wind Satara	45.2	82	1.814159
Essel Mining	75	130	1.733333

Therefore, this project too seems to be not appropriate to be eligible under CDM as the additionality claims may be incorrect and misleading. Validator to have a overall comprehensive check for all the claims.



VALIDATION REPORT

Comment By: Peter Smith, A.S. Associates

Inserted On: 2006-12-04

Subject: Comments for Essel Mining project

Comment:

- (1) Baseline emission factor is too high and needs to be reconciled with the actual calculations that have been used in other PDDs and been calculated in the CEA reports, which is authentic.
- (2) Additionality matrix needs to be redone especially with regard to the regulatory and policy issues.
- (3) Is this the second time this project is being posted for comments? Wasn't there an Essel Mining Project which was withdrawn or rejected earlier. DOE to clarify.

How DNV has considered the comment received in its validation:

DNV has assessed both comments in detail during the validation.

With regards to the first comment, DNV has confirmed that as per the latest certification report from Center for Wind Energy Technology, an autonomous R&D institution by the Ministry of Non-Conventional Energy Sources (MNES), Government of India, who certifies the patented wind turbines to be sold commercially in India, there is no technology supplier who have been certified to sell wind turbines of 1.25 MW other than Suzlon. This can be confirmed from the site http://www.cwet.tn.nic.in/html/departments_cs.html. Suzlon is yet to offer its 2MW capacity wind turbine for commercial sale in India. Essel Mining went for best of technology that was available for sale from various suppliers at the time of project inception.

The emission factors used in the calculations have been corrected as per the data published by CEA in the website www.cea.nic.in.

According to the MNES website <http://mnes.nic.in/business%20opportunity/pgtwp.htm>, the capital cost for wind power project ranges between 45 million to 55 million per MW, and cost of generation is estimated to be in the range of INR 2.50 to INR 2.75 per kWh. This statement has been corrected in the PDD.

Further, on common practice analysis – In India there are about 125 companies involved in iron ore mining. However, as per information available in public domain only two of the iron ore mining companies, namely MSPL and EMIL have set-up wind power projects. The MSPL project has already been registered as a CDM project.

The project is definitely not part of Suzlon's wind park in Satara, Asia's largest wind park, where the surveyed wind power density is in range of 250-300W/m². Whereas in Dhule district, where the EMIL project is located, the wind power density is in range of 200-250W/m². This information has been confirmed from the Center for Wind Energy Technology. Further, most of the wind farms in Satara itself have also applied for CDM benefits. A 20% PLF has been used in the IRR calculations whereas it has been observed from the actual generation data for 12 months in 2006 that the PLF for the wind farm is ~19%. The calculations and the underlying assumptions have been checked and found to be



VALIDATION REPORT

correct. The internal benchmark of EMIL has also been evidenced. It has been verified that the project could not attain the benchmark IRR without CDM benefits.

The promotional policies adopted by the Maharashtra Government during the 1999-2000 encouraged the investors to invest in the wind energy. Later, in September 2003, the sales tax benefit being awarded to the project promoters have been withdrawn. Since EMIL had put up the project in 2004-2005 EMIL did not get any benefit due to sales tax relief.

Based on actual generation data, the generated power to installed capacity ratio for EMIL project is 1.67 MU/MW (million units or million KWh per MW) and not 1.73 MU/MW as suggested in the comment. Further, the other two projects mentioned in the comment are from a different location having different wind densities. Thus, making comparative analysis for drawing conclusions between unequal locations does not seem to be justified.

With regards to the second comment, as mentioned earlier, the emission factor has been modified based on the published CEA data. The additionality discussion has taken into account several policy issues such as withdrawal of sales tax benefit, single-part tariff structure and probability of sharing of CDM benefits with MERC. DNV has clarified from the project proponent that the EMIL project was not rejected or withdrawn earlier.



VALIDATION REPORT

APPENDIX A

CDM VALIDATION PROTOCOL



VALIDATION REPORT

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

Requirement	Reference	Conclusion
About Parties		
The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	CAR-1 OK
The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR-1 OK
The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR-1 OK
In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK



VALIDATION REPORT

Requirement	Reference	Conclusion
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
About additionality		
Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	CL1 CL2 OK
About forecast emission reductions and environmental impacts		
The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About stakeholder involvement		
Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project	CDM Modalities and Procedures §40	OK



VALIDATION REPORT

Requirement	Reference	Conclusion
design document and comments have been made publicly available.		
Other		
The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

VALIDATION REPORT

Table 2 Requirements Checklist

CHECKLIST QUESTION		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
* MoV = Means of Verification, DR= Document Review, I= Interview						
A. General Description of Project Activity <i>The project design is assessed.</i>						
Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>						
Are the project’s spatial boundaries (geographical) clearly defined?	/1/ /15/	DR/I	The project has been set up in three stages at Dhule and Nandurbar districts of Maharashtra, India.		OK	
Are the project’s system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR/I	Yes, the project’s system boundaries are defined clearly. It includes the wind energy generators and the western regional electricity grid to which the generated power is despatched.		OK	
Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>						
Which Parties and project participants are participating in the project?	/1/ /19/	DR/I	The project participant is the private entity “Essel Mining & Industries Limited” of India. India is the host country. No Annex-I		OK	

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VALIDATION REPORT

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			country has been identified as yet.		
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?	/1/ /19/	DR/I	The Ministry of Environment and Forests, the DNA of India has approved the project. The letter of approval is to be submitted to the validator.	CAR-1	OK
Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /19/	DR	India has ratified the Kyoto protocol on 26 August 2002. The Ministry of Environment and Forests is the DNA of India.		OK
Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR/I	No public funding from any Annex-I country has been received.		OK
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>					
Does the project design engineering reflect current good practices?	/1/ /12/	DR/I	The WEGs installed under the project has been designed and commissioned by Suzlon Energy Limited. Suzlon is of international repute in the field of wind energy. The S-70		OK

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VALIDATION REPORT

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			models implemented under the project activity have a higher swept area than the models pre-dominantly used for wind power generation. EMIL was the first project proponent to use the S-70 models in India. The project design thus reflects good practice.		
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/ /10/	DR/I	The S-70 models used in the project are likely to result in significantly better performance than the commonly used WEGs in India. The turbine specifications given in page 6 of the PDD do not match with the specification provided by Suzlon. The project proponent is requested to modify the PDD accordingly.	CAR-2	OK
Does the project make provisions for meeting training and maintenance needs?	/1/	DR/I	The project will require some initial training and maintenance efforts for proper operation. The operation and maintenance of the WEGs have been out-sourced to the WEG suppliers themselves. This ensures proper maintenance and operation of the WEGs during the crediting period.		OK
Contribution to Sustainable Development					

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VALIDATION REPORT

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<i>The project's contribution to sustainable development is assessed.</i>						
Has the host country confirmed that the project assists it in achieving sustainable development?		/1/ /19/	DR/I	The LoA from the DNA of India Is to be submitted to the validator to confirm this.	CAR-1	OK
Will the project create other environmental or social benefits than GHG emission reductions?		/1/	DR/I	The project will help to decrease the dependence on fossil fuels for power generation and thus lower air pollution due to SO _x /NO _x emissions. The project will also lead to infrastructural development in the areas around the WEGs.		OK
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>						
Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>						
Does the project apply an approved methodology and the correct version thereof?		/1/ /21/	DR	Yes, the project applies the approved consolidated baseline methodology ACM0002, version 6.		OK
Are the applicability criteria in the baseline methodology all fulfilled?		/1/ /21/	DR	Yes, the selected baseline methodology ACM0002 is applicable to the project		OK

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VALIDATION REPORT

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			activity as the project provides grid connected renewable power generation through capacity addition from wind sources.		
Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
What is the baseline scenario?	/1/	DR	The baseline scenario is the continuation of current scenario, i.e. the electricity displaced by the project would have been by the generated by the operation of grid-connected power plants and by the addition of new generation sources.		OK
What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	Other than the baseline scenario, the option of setting up a coal based power plant and project without CDM benefits have also been discussed. However, coal based power plant option has not been considered as the baseline since this option would have required considerable amount of investment as compared to the baseline which do not require any investment at all. Also this		OK

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VALIDATION REPORT

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			option would have led to higher amount of emissions in the baseline. Also, the option of project without CDM has not been considered due to the presence of several barriers discussed later. Thus the selected baseline scenario is the most likely scenario in the absence of the project.		
Has the baseline scenario been determined according to the methodology?	/1/ /21/	DR	Yes.		OK
Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /2/	DR/I	The discussion of the baseline selection has been done in a transparent manner. Electricity generation by the existing grid connected power plants have been selected as the baseline. The baseline emission factor has been calculated as a combination of OM and BM emission factors. However, the project proponent is requested to use the published OM and BM data provided by the CEA to calculate the CM. The project proponent is also requested to use the 75%-25% weight factors for OM and BM as required by ACM0002 for wind energy.	CAR-3	OK
Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and	/1/	DR	Yes, relevant national and sectoral policies have been taken into account.		OK

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VALIDATION REPORT

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political aspirations?					
Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes, the baseline scenario selection is compatible with available data. The source for the data regarding potential of wind energy in India has not been mentioned (page 3 of the PDD). The project proponent is requested to provide the source for the data in the PDD.	CAR-4	OK
Have the major risks to the baseline been identified?	/1/	DR	There are no risks to the baseline.		OK
Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
Is the project additionality assessed according to the methodology?	/1/ /21/ /22/ /3/ /9/ /10/ /18/ /4/	DR/I	Yes, the project's additionality is demonstrated using "Tool for the demonstration and assessment of additionality", version 02. Step 0: Since the project activity does not seek for retro active credits, this step is not applicable to the project activity. However, the project proponent is requested to present the board approval for the project considering CDM.	CL-1	OK



VALIDATION REPORT

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			<p>Step 1: Three alternatives to the project activity have been considered as the baseline scenario. These are i) coal-based power plant ii) project activity without CDM benefits and ii) continuation of current scenario of power generation from existing grid-connected power plants. All the alternatives are in compliance with the laws and regulations of India. According to MNES the cost of wind power generation is INR 2.25 to 2.75 per KWh whereas according to CEA, the cost of coal based power generation is INR 1.88 per KWh for power plants based on domestic coal sourced from a distance of 800 kilometres. The cost further reduces with decreasing distance. Hence coal based power generation is more economical than wind power generation in terms of cost of power generation. Also the project without CDM benefits face certain barriers in implementation as discussed later. However, for considering the baseline emissions the continuation of power</p>		

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			<p>generation from existing and future grid connected power plants have been selected as the baseline since this option results in lower baseline emissions than the coal based power plant option.</p> <p>Step 2: The project proponent has calculated the IRR for the project. The IRR of the project has been calculated for a period of 20 years. The IRR has been calculated based on a PLF of 20%. However the actual PLF was found to be ~18%. The revenue generation from the project has been based on the cost of power as mentioned in the PPA. A tax holiday of 10 years has been considered while calculating the IRR. The project IRR has been calculated to be 11.86% and the return on equity has been calculated to be 14.28%. The return on equity is lower than the internal benchmark of EMIL which is 16.9% as well as the expected rate of return on equity of 16% as provided by the MNES. A sensitivity analysis has also been done with $\pm 5\%$ change in PLF. With a 5%</p>	CL-2	

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			<p>increase in PLF, the IRR becomes 24.06%. However, a 5% increase in PLF is unlikely since it has been verified that the actual PLF of the project for the past 1 year is ~19%. Moreover the PPA from MSEB explicitly mentions that the project should be posed for CDM benefits wherever possible. The project proponent is requested to provide the basis for the O&M cost and administrative cost used in the calculations. The project proponent is also requested to provide the insurance rate for all the 60 WEGs.</p> <p>Step 3: The project proponent has claimed that since the S-70 models were used for the first time in India, the project proponent had to face barriers due to implementation of a new WEG model. However, this barrier could not be validated since it has been confirmed from Suzlon that though the S-70 models were used for the first time in India, the operation of this model did not present any difficulty and the models are likely to be better performing than the previous</p>		



VALIDATION REPORT

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			<p>models.</p> <p>The tariff structure for wind power projects is a single part tariff structure compared to a two-part tariff structure for fossil fuel and hydro plants. Thus for fossil fuel fired and hydro plants the investment can be recovered independent of the level of generation. Also for wind power the tariff is fixed ex-ante where as for fossil fuel and hydro based plants the tariff is fixed on a cost-plus approach which ensures that the cost of investment is recovered from the first year of operation. This poses a barrier for the wind power projects as the investment recovery is dependent on the PLF of the wind farm which is lower than 20%.</p> <p>The PPA with MSEB also stipulates that once the project becomes eligible for CDM revenues, MERC might review the tariff structure and decide on a mechanism for sharing of CERs. The decision of MERC will be binding on both parties. This generates doubts about the tariff available</p>		



VALIDATION REPORT

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			<p>for the project as well as the benefits from CDM that will be available to the project proponent.</p> <p>Step 4: The penetration of wind energy in Maharashtra is 0.74% of the total installed capacity. The installed capacity of wind power is only 495 MW as of 31 December 2005. Also, as of September 2003, the sales tax benefit which was being awarded to wind projects as a promotional measure have been withdrawn thus making wind farm projects financially less viable.</p> <p>Step 5: The CDM benefits increases the IRR of the project to 17.05% thus providing the project with necessary financial back-up.</p> <p>From the discussion above it can be concluded that the project is not a business-as-usual scenario and thus additional.</p>		
Are all assumptions stated in a transparent and conservative manner?	/1/	DR/I	The PLF of the wind project has been assumed to be 20% while calculating the IRR. This is deemed conservative since the actual PLF of the plant is ~19%.		OK

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Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR/I	Please refer to earlier comments.	CL1 CL2	OK
If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/ /10/	DR	The starting date of the crediting period is after the date of registration of the project as a CDM project activity. Hence the project does not seek retro-active credits. However the project proponents have provided evidence that CDM was considered prior to the start of the project activity. Communications from Suzlon to the project proponent suggesting CDM benefits have been evidenced during the validation.		OK
Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The project being a wind energy generation project, there are no emissions from the project activity.		OK
Calculation of GHG Emission Reductions – Baseline emissions					

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VALIDATION REPORT

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<i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /2/	DR	The calculation of the baseline emissions has been done in a transparent manner. Electricity generation by the existing grid connected power plants have been selected as the baseline. The baseline emission factor has been calculated as a combination of OM and BM emission factors and it is fixed <i>ex-ante</i> . However, the project proponent is requested to use the published OM and BM data provided by the CEA to calculate the CM. The project proponent is also requested to use the 75%-25% weight factors for OM and BM as required by ACM0002 for wind energy.	CAR-3	OK
Have conservative assumptions been used when calculating the baseline emissions?	/1/ /2/ /14/	DR	The electricity displaced from the grid by the project activity has been based on actual generation figures for the WEGs prior to the crediting period. However the generation data provided does not match with the generation data used in the CER	CAR-5	OK

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VALIDATION REPORT

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			calculations. The project proponent is requested to provide the CER estimates based on the actual electricity displacement data as obtained from the monthly generation details provided by the MSEDCL and submit copies of the same to the validator.		
Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Please refer to earlier paragraphs.	CAR-3 CAR-5	OK
Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The project being a wind energy generation project, there are no leakages due to the project activity.		OK
Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
Are the emission reductions real, measurable and give long-term	/1/	DR	Yes, the emission reductions are real and		OK

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benefits related to the mitigation of climate change.			measurable. The project will reduce 118 203 tCO ₂ e emissions per annum over the 10 years crediting period.		
Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR/I	The monitoring methodology selected complies with requirements of ACM0002, version 6. The net amount of electricity despatched by the WEGs to the MSEDCL grid will be monitored continuously. The net electricity exported to the grid will be reported on monthly basis and cross-checked with the invoices raised to MSEB.		OK
Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR/I	The project proponent is requested to clarify the data archiving period in the PDD.	CL3	OK
Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
Does the monitoring plan provide for the collection and	/1/	DR	There are no emissions from the project		OK

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archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?			activity since this is a renewable energy generation project.		
Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.</i>					
Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	Yes, the monitoring plan provides for the monitoring and collection of the net electricity supplied to the grid. This is the only parameter that will be required for calculating the baseline emissions.		OK
Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	CO ₂ is the only relevant baseline indicator and it has been accounted for.		OK
Is the measurement <i>method</i> clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	The net amount of electricity despatched by the WEGs to the MSEDCL grid will be monitored continuously. The net electricity exported to the grid will be reported on monthly basis and cross-checked with the invoices raised to MSEB.		OK
Is the measurement <i>equipment</i> described and deemed appropriate?	/1/	DR/I	The electricity meters installed under the project activity are approved by the MSEB and deemed appropriate.		OK

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



VALIDATION REPORT

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Is the measurement <i>accuracy</i> addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR/I	The electricity meters installed under the project activity are highly accurate.		OK
Is the measurement <i>interval</i> for baseline data identified and deemed appropriate?	/1/	DR	Yes.		OK
Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?	/1/	DR	Yes.		OK
Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Yes.		OK
Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR/I	The electricity generation reports on joint meter reading are generated by MSEDCL and send to EMIL through Suzlon on monthly basis. The project proponent is requested to clarify the archiving details for the monthly electricity sales receipts from MSEDCL.	CL-4	OK
Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Leakage monitoring is not required for this project activity.		OK

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VALIDATION REPORT

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>						
Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?		/1/	DR	The DNA of India does not mandate the monitoring of sustainable development indicators.		OK
Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>						
Is the authority and responsibility of overall project management clearly described?		/1/	DR/I	The responsibility of overall project management lies with EMIL.		OK
Are procedures identified for training of monitoring personnel?		/1/	DR/I	The monitoring of the WEG performance has been outsourced to Suzlon. Suzlon will provide for the training of the monitoring personnel.		OK
Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?		/1/	DR/I	No emergencies due to the project activity will lead to unintended GHG emissions.		OK
Are procedures identified for review of reported results/data?		/1/	DR/I	Yes. EMIL will be responsible for the review of reported results.		OK

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VALIDATION REPORT

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/ /15/	DR/I	Yes, the starting date of the project has been identified as December 2004 when the project implementation was started. The lifetime of the project has been identified as 20 years. This is deemed reasonable.		OK
Is the start of the crediting period clearly defined and reasonable?	/1/	DR/I	The project has selected a crediting period of 10 years starting from 01 March 2007. Since the crediting period for the project cannot start prior to the registration of the project, the project proponent is requested to delay the starting date of the crediting period.	CAR-6	OK
D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /13/	DR	The project does not require an environmental impact analysis as per the EIA notification of the MoEF. However, an EIA was conducted by EMIL which has		OK

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VALIDATION REPORT

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			adequately described the environmental impacts of the project and also assessed the feed back from the local stakeholders.		
Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	The project does not require an environmental impact analysis as per the EIA notification of the MoEF.		OK
Will the project create any adverse environmental effects?	/1/ /13/	DR/I	The project is not likely to create any adverse environmental effects.		OK
Are transboundary environmental impacts considered in the analysis?	/1/ /13/	DR	There are no trans-boundary impacts of the project activity.		OK
Have identified environmental impacts been addressed in the project design?	/1/ /13/	DR	There no negative environmental impacts due to the project.		OK
Does the project comply with environmental legislation in the host country?	/1/	DR/I	The project complies with environmental regulations in India. The project has obtained necessary licences and environmental clearances.		OK
E. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
Have relevant stakeholders been consulted?	/1/ /11/	DR	The employees, contractual labours, contractors (Suzlon), the village head and		OK

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



VALIDATION REPORT

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview		Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				the villagers have been consulted.		
Have appropriate media been used to invite comments by local stakeholders?	/1/ /11/	DR		The stakeholders were invited for comments through notices in the local language as well as in English.		OK
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/ /11/	DR		A stakeholder consultation is not required by the DNA of India.		OK
Is a summary of the stakeholder comments received provided?	/1/ /11/	DR		Yes, a summary of the comments received have been provided.		OK
Has due account been taken of any stakeholder comments received?	/1/ /11/	DR		The project did not receive any negative comment.		OK

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

VALIDATION REPORT

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion				
CAR 1 The letter of approval is to be submitted to the validator.	The project has been awarded with host government approval on 22 nd January 2007, and letter of confirmation by Ministry of Environment and Forest, Government of India, the national DNA has been submitted for verification.	OK. The letter of approval from the DNA of India has been submitted to the validator.				
CAR 2 The turbine specifications given in page 6 of the PDD do not match with the specification provided by Suzlon. The project proponent is requested to modify the PDD accordingly.	The PDD had been modified as per the actual specifications submitted in support of the WTGs installed at the project site.	OK. The WEG specifications have been modified in the PDD to reflect the actual specifications provided by Suzlon.				
CAR 3 The project proponent is requested to use the published OM and BM data provided by the CEA to calculate the CM. The project proponent is also requested to use the 75%-25% weight factors for OM and BM as required by ACM0002 for wind energy.	<p>The emission factor of the project has now been modified by applying CEA data on ex-ante calculation of OM and BM of Western Regional Grid of India. The CM of western grid has been derived using weighted average of 75% OM and 25% BM.</p> <p>As per CEA data following is the details on emission factor calculation:</p> <table><tr><th>Parameter/ Variable</th><th>tCO2/MWh</th></tr><tr><td>OM Western Region (3 yrs average 2002-2003,</td><td>0.993</td></tr></table>	Parameter/ Variable	tCO2/MWh	OM Western Region (3 yrs average 2002-2003,	0.993	OK. The combined margin has been corrected as per data provided and published by CEA. The weight factors of 75% for OM and 25% for BM have been used according to the provisions of ACM0002, version 06.
Parameter/ Variable	tCO2/MWh					
OM Western Region (3 yrs average 2002-2003,	0.993					

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Summary of project owner response		Validation team conclusion
	2003-2004, 2004-2005)		
	BM (2004-2005)	0.78	
	75% of OM	0.75	
	25% of BM	0.19	
	CM for Western Region	0.94	
CAR 4 The source for the data regarding potential of wind energy in India has not been mentioned (page 3 of the PDD). The project proponent is requested to provide the source for the data in the PDD.	Refer to the source : http://mnes.nic.in/ach1.htm For reference on potential wind energy in India. Same reference has also been referred in the modified PDD.		OK. The data for wind power potential and actual installed wind power capacity has been checked from the MNES link provided and the values stated have been found to be correct.
CAR 5 The generation data provided does not match with the generation data used in the CER calculations. The project proponent is requested to provide the CER estimates based on the actual electricity displacement data as obtained from the monthly generation details provided by the MSEDCL and submit copies of the same to the validator.	The ex-ante estimates of emission reduction calculation has been modified and actual data on generation reports provided by MSEDCL for 12months period (from January 2006 to December 2006) has been used.		OK. The actual generation data from the project for a one year period has been used to estimate the electricity generation from the project during the crediting period. The average PLF for the project was found to be 19.14% which is lower than the 20% PLF assumed in the IRR calculations.
CAR 6	The based on the time period estimated for project registration, the starting of the		OK. The start of the crediting period has been delayed and the crediting period will

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
Since the crediting period for the project cannot start prior to the registration of the project, the project proponent is requested to delay the starting date of the crediting period.	crediting period has now been selected from 9 November 2007.	start from 9 November 2007 which is likely to be the date of registration of the project as a CDM project activity or the actual date of registration of the project.
CL 1 The project proponent is requested to present the board approval for the project considering CDM.	The extract from board resolution on project considering CDM has been provided as per the requirement.	OK. The board resolution dated 27 September 2004 has been evidenced. As per the board resolution, it was observed that the board approved the project taking into consideration the benefits from CDM.
CL 2 The project proponent is requested to provide the basis for the O&M cost and administrative cost used in the calculations. The project proponent is also requested to provide the insurance rate for all the 60 WEGs.	The scanned copies of the following documents have been submitted in supporting to the requirements requested. <ul style="list-style-type: none"> • O&M contract between EMIL and Suzlon • Insurance agreement with different banks and guarantor for standard fire and special perils covered for the project activities. • Expense heads and proportions allotted under administration cost. 	OK. The basis for the O&M and administrative costs has been provided. The O&M costs have been verified from the O&M contracts with Suzlon Windfarm Services Limited. The administrative costs include non-agricultural charges, electrical inspection charges, salaries and travel expenses, audit fees and telephone and other office expenses. The assumed administrative cost is reasonable. Insurance premium paid for all the WEGs have been checked from the premium receipts and the insurance costs were found to be in order.
CL 3 The project proponent is requested to clarify the data archiving period in the PDD.	The project data related to the parameters referred under the monitoring plan as described in the modified PDD will be archived for 12years from the start of the crediting period either on paper or in	OK. All data will be archived for till 2 years after the end of the crediting period.

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
	electronic media.	
<p>CL 4</p> <p>The electricity generation reports on joint meter reading are generated by MSEDCL and send to EMIL through Suzlon Windfarm Services Limited on monthly basis. The project proponent is requested to clarify the archiving details for the monthly electricity sales receipts from MSEDCL.</p>	<p>The reports on joint meter reading are generated by MSEDCL and send to EMIL through Suzlon Windfarm services Limited (O&M service provider) on monthly basis. Upon receipt of reports, EMIL generates invoices on sale of electricity and sends to MSEDCL via Suzlon. Thereafter, MSEDCL makes payments against the invoices within 3 months directly to EMIL.</p>	<p>OK. The JMR sheets from MSEDCL will be preserved till 2 years after the crediting period.</p>

APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Michael Lehmann

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	Yes
CDM Verifier:	Yes	JI Verifier:	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Chandrashekara Kumaraswamy

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	-
CDM Verifier:	Yes	JI Verifier:	-
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope-04 & 05		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Subhendu Biswas

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

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

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Soumik Biswas

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

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

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director