

To,

The UNFCCC CDM Registration Team  
Germany

November 7, 2006

**Subject: Project No. 570 – 11.35 MW wind farm at Village Pohra, District Jaisalmer, Rajasthan.**

**Submissions from the Project Participant: Senergy Global Private Limited**

**Comment 1: Evidences are missing on how CDM was taken into account at the time of the implementation of the project activity. It is a prompt start project which started in 2003 and requests retroactive credits but there are no evidences that the CDM was taken into account at the moment of the decision making of the project activity.**

**Reply:** All the owners of wind turbines were very well aware about the signing & ratification of the Kyoto protocol by the union government of India. They have also reconfirmed the eligibility of the wind installations under the CDM for additional revenue stream to mitigate the risk involved in the investment through EPC Contractor (M/s Suzlon Energy Limited) as the projects were going to be implemented in the state of Rajasthan where specifically the generation of electricity was to happen because of the temperature difference between day & night (as these are not the coastal sites where wind is available for a larger duration in a year and additionally the sites normally enjoy two monsoon seasons).

The additional revenue stream through CDM is clearly indicated in the board resolutions of the investors as well as in the communication between EPC contractor and the investor. For your reference the same is **attached as Annexure 1**.

S. No.	Project Proponent	Documentary Evidence
1.	Vishal Exports Overseas Limited	Copies of the board resolution dated December 9, 2000 & July 10, 2001
2.	Vishal Plastomers Limited	Copy of the board resolution dated July 23, 2001
3.	Jaswant Mathur	Copy of the communication between project participant & EPC Contractor dated July 30, 2004
4.	Shrenik Marbles Limited	Copy of the communication between project participant & EPC Contractor dated August 8, 2004
5.	Arora Textiles Private Limited	Copy of the board resolution dated July 25, 2004
6.	Chirash Associates Private	Copy of the board resolution dated November 25,

	Limited	2004
7.	Kanhaiyalal Kalyanmal	Copy of the communication between project participant & EPC Contractor dated December 30, 2004
8.	Laxmi Spinning Mills	Copy of the communication between project participant & EPC Contractor dated July 25, 2004
9.	Bhawnani's Rajni / Prakash / Vijay / Deepak	Copy of the communication between project participant & EPC Contractor dated August 8, 2004

The project was implemented using the term loan from financial institutions / IREDA (Indian Renewable Energy Development Agency – A Government of India Enterprise to Promote Renewable Energy). The loan sanction documents clearly indicate the consideration of CDM as one of the possible additional revenue stream for the project. The sanction document is **attached as Annexure 2** for your ready reference & kind perusal (Please see clause XXIX & XXX on page 17 under the terms & conditions of loan sanction).

**Comment 2: the calculation of the baseline emission factors is not provided in the PDD and therefore it cannot be checked. Specifically, the PDD used estimated emission factors stating – but not showing other corroborating figures – that such estimates were performed using data available from several different government sources.**

**Reply:** The detailed calculations for establishment of baseline emission factors were provided to the DOE during validation of the subject candidate CDM project and the same was checked by the DOE.

The detailed data as well as the calculations for the same is attached with the replies as **Annexure 3** in the form of Microsoft Excel Sheet.

The data used for calculations has been obtained from Central Electricity Authority (Govt. of India) and NRLDC (Northern Region Load Dispatch Centre – the government of India entity responsible for maintaining the complete northern grid).

Additionally we would like to submit that the baseline calculations have been carried out using the latest version of AMS 1D (version 9, 28 July 2006) for small scale grid connected wind energy projects. The baseline value so obtained is most conservative for the grid connected projects in northern grid of India. There are 2 projects from the same grid of India (Northern Grid) are already registered with UNFCCC at a relatively higher baseline value namely:

Project Ref: 376 registered on 4<sup>th</sup> June 2006 with baseline emission factor of 0.95.

Project Ref: 330 registered on 21<sup>st</sup> July 2006 with baseline emission factor of 0.942.

With complete & exhaustive calculations using the three year average (using ACM 002 as the benchmark for AMS 1D) of all the operating facilities of northern grid, which we have used as the basis of our baseline calculations, the baseline emission factor for our project comes out to be: 0.8645 which is conservative in all respects.

We hope our submission clarifies the concerns raised by the members of the CDM Executive Board.

Thanking you

Sincerely

**Chintan Shah**

Senegy Global Private Limited  
9<sup>th</sup> Floor Eros Corporate Tower  
Nehru Place  
New Delhi – 110019



## VISHAL EXPORTS OVERSEAS LIMITED

(A Government of India Recognised Star Trading House)

\* Vishal House\*

Opp. Sales India, B/H. Oriental Bank of Commerce, Ashram Road, Ahmedabad - 380 009, INDIA  
Tels: 0091-79-7544591 Fax: 0091-79-7541994 E-mail: vishalied1@sancharnet.in Website: www.vishalexports.com

### CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY AT THEIR MEETING HELD ON 9<sup>TH</sup> DECEMBER, 2000 AT THE REGISTERED OFFICE OF THE COM

The Chairman suggested that the Company should diversify into the generation of electricity through Wind Turbine Generator. Thereafter at the request of the Chairman, the President briefed the Board about the proposed project cost thereof and its advantages. The Company Secretary also informed that the members of the Company at their Extra Ordinary General Meeting held on November 20, 2000 have authorized the Board of Directors to commence and carry on the business of generation of electricity through Wind Turbine Generator. The chairman informed the board of the Companies decision to set up 5 nos of wind turbines of 350 kw capacity at Village Badabaugh, District Jaisalmer Rajasthan. He appraised the board that the technical committee of the company had studied visited the project site and has given a positive recommendation for setting up 1.75 mw wind farm project at the above site. The committee was of the opinion that in the light of the successful experience in earlier 0.70 mw wind turbine at combatore, the wind turbines may be procured from M/S Suzlon Energy Limited. The chairman also informed the board the wind farm projects were largely dependent on wind forces for the project region, the local grid conditions and the power purchase policy of the State Electricity Board. He further informed that, though every project is fraught with certain risks, wind farms had peculiar risks in a sense that the wind, the key factor for the wind power generation was not fully predictable and vagaries in wind could significantly affect the project. Also the wind power electricity generated could not be stored, if the grid was down/or shortage of evacuation facilities persisted.

The Chairman also added that in the light of the Kyoto Protocol convention it is expected that wind energy would also become eligible for Clean Development Mechanism benefits. This he added was on account of the fact that wind energy is one of the eco friendly and non polluting methods of power generation with a proven track record of well over twenty years. Further since India has a sizable installation in the country as well as a dedicated Ministry for renewable, he added that it was a matter of time when India would also adopt the Kyoto protocols and provide the mechanism/procedure for enabling the green power/ renewable energy producers in India to be eligible for CDM benefits.

He asserted to the board that the CDM benefits will augment the finances of the wind farm projects and will make the projects financially viable too.



## **VISHAL EXPORTS OVERSEAS LIMITED**

*(A Government of India Recognised Star Trading House)*

"Vishal House"

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The chairman, further informed that given the vagaries of the wind and grid conditions in India, the wind farm project was fraught with risks. However, it being a eco-friendly renewable power source, and with the world energy focus being channeled towards clean power, the company must make a headway to be one of the pioneer developers of wind farm India. Further the CDM benefits are likely to be made available to the wind farm projects in near future. Therefore looking to the long term benefits of the wind industry as well the CDM benefits, it is necessary that the company start implementing wind farm projects in right earnest without waiting for the formation off the CDM benefit procedures/rules as these are national policy issues likely to take a significant time and also on account of the facts that the prime locations would not be available for long time/and the financial implication of loss of generation would be large if the company waited for the formulation of CDM rules. The Chairman concluded that in the light above background the company must go forward for the investment in the wind farm projects on yearly basis.

The Board appreciated the proposal and after detailed discussion passed the following resolutions unanimously -

**RESOLVED THAT** the consent of the Board of Directors of the Company be and is hereby accorded for the commencement and carrying on of business of the generation of electricity through Wind Turbine Generator and Shri Pradeep S. Mehta, Managing Director and Shri Dipak S. Mehta, Jt. Managing Director be and are hereby severally and/or Jointly authorized to finalize all the matters relating to the said Wind Power Generation Project, including the selection of the Wind Turbine Generator, the Vendor, the site at which the Wind Turbine Generator will be installed and all other matters related thereto and they are further authorized to applications, agreements, deeds, other papers and documents as may be required for the purpose of commencing and carrying on the business of generation of electricity through the Wind Turbine Generator and to appear before any Government, Semi Government and Local Authorities and to represent the Company before any such authority and to authorize any other persons to do all of any of the aforesaid acts, deed and thing for and on behalf of the Company.

**RESOLVED FURTHER THAT** the Common Seal of the Company be affixed to any of the aforesaid agreements/deeds/documents in the presence of any one of the aforesaid Directors of the Company and the said document be signed by the Director in whose presence the seal is so affixed.

**CERTIFIED TRUE COPY  
FOR VISHAL EXPORTS OVERSEAS LIMITED**

**DIPAK S. MEHTA  
JT. MANAGING DIRECTOR**



## VISHAL EXPORTS OVERSEAS LIMITED

(A Government of India Recognized Star Trading House)

"Vishal House"

Opp. Sales India, B/H. Oriental Bank of Commerce, Ashram Road, Ahmedabad - 380 009, INDIA  
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### **CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY AT THEIR MEETING HELD ON TUESDAY, 10<sup>TH</sup> JULY, 2001 AT 4.00 P.M. AT THE REGISTERED OFFICE OF THE COMPANY**

The Chairman informed the Board that the Company is intending to install Wind turbine generators at Jaisalmer in Rajasthan for generation of Electricity. Then he briefed the Board about the details of the said wind farm project and its advantages and benefits, etc. He further informed the Board that the company has already obtained Sales Tax registration in the state of Rajasthan. Since the company proposed to start and carry on the business of generation and supply of electricity, it is necessary to amend the Sales Tax registration accordingly. The chairman informed the board of the companies decision to set up 5 nos of wind turbines of 350 kw capacity at Village Badabaugh District Jaisalmer, Rajasthan. He appraised the board that the technical committee of the company had studied visited the project site and has given a positive recommendation for setting up 1.75 mw wind farm project at the above site. The committee was of the opinion that in the light of the successful experience in earlier 0.70 mw wind turbine at coimbatore, the wind turbines may be procured from M/S Suzlon Energy Limited. The chairman also informed the board the wind farm projects were largely dependent on wind forces for the project region the local grid conditions and the power purchase policy of the State Electricity Board. He further informed that, though every project is fraught with certain risks, wind farms had peculiar risks in a sense that the wind the key factor for the wind power generation was not fully predictable and vagaries in wind could significantly affect the project. Also the wind power electricity generated could not be stored, if the grid was down/or shortage of evacuation facilities persisted.

The Chairman also added that in the light of the Kyoto Protocol convention it is expected that wind energy would also become eligible for Clean Development Mechanism benefits. This he added was on account of the fact that wind energy is one of the eco friendly and non polluting methods of power generation with a proven track record of well over twenty years. Further since India has a sizable installation in the country as well as a dedicated Ministry for renewable, he added that it was a matter of time when India would also adopt the Kyoto protocols and provide the mechanism/procedure for enabling the green power/ renewable energy producers in India to be eligible for CDM benefits.

He asserted to the board that the CDM benefits will augment the finances of the wind farm projects and will make the projects financially viable too.



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The chairman further informed that given the vagaries of the wind and grid conditions in India, the wind farm project was fraught with risks. However, it being an eco-friendly renewable power source, and with the world energy focus being channeled towards clean power the company must make a headway to be one of the pioneer developers of wind farm India. Further the CDM benefits are likely to be made available to the wind farm projects in near future. Therefore looking to the long term benefits of the wind industry as well the CDM benefits, it is necessary that the company start implementing wind farm projects in right earnest without waiting for the formation of the CDM benefit procedures/rules as these are national policy issues likely to take a significant time and also on account of the facts that the prime locations would not be available for long time and the financial implication of loss of generation would be large if the company waited for the formulation of CDM rules. The Chairman concluded that in the light above background the company must go forward for the investment in the wind farm projects on yearly basis.

The Board discussed the matter in detail and passed the following resolution unanimously

"RESOLVED THAT Company do apply for amendment in Sales Tax Registration in the state of Rajasthan to carry on the business of generation and supply / distribution of electricity and that Mr. Biren Nanavati, an employee of the company be and is hereby authorized to represent the company before the relevant Sales Tax authorities or any of their officers for submitting the Applications/Executing/Amending the same depositing necessary forms & signing/executing/amending the same, depositing necessary forms & signing/executing/amending all other documents in connection therewith and to make any statements, submit file and/or withdraw any documents, make corrections, alterations, modifications, amendments, deletions, incidental or ancillary to this effect and to authorise any other person to do all or any of the aforesaid acts, deeds and things."

**CERTIFIED TRUE COPY  
FOR VISHAL EXPORTS OVERSEAS LIMITED**

**DIPAK S. MEHTA  
JT. MANAGING DIRECTOR**



**VISHAL PLASTOMER Pvt. Ltd.**

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E-Mail vishal@ad1.vsnl.net.in

Vishal House Opp. Sales India

Bh. Oriental Bank of Commerce

Ashyam Road Ahmedabad-380 009 INDIA

**CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY AT THEIR MEETING HELD ON 23<sup>RD</sup> JULY, 2001 AT THE REGISTERED OFFICE OF THE COMPANY.**

The Chairman informed the Board that the Company intends to carry on business in generation and supply of electricity and for the purpose it is proposed to instal One Wind Turbine Generator having capacity of 350 KW at Jaiselmer in the State of Rajasthan. He gave a brief account of the advantages of starting this new venture by the Company. He also informed the Board the necessary effective steps initiated by the Company to implement the said Wind farm project. Then he placed on the table the quotation received from M/s. Suzlon Energy Ltd., Ahmedabad for purchase of one Wind Turbine Generators having capacity of 350 KW at a cost of Rs 140 lacs. He further stated that the work order for erection, installation and commissioning of said Wind Turbine Generator will be executed by M/s. Suzlon Energy Ltd. at an additional cost of Rs 12 lacs. The Board discussed the matter in detail about the proposals put-forth by the Chairman. The Board unanimously decided to carry on the generation and supply of electricity at Jaiselmer in Rajasthan and approved the purchase of One Wind Turbine Generator from M/s Suzlon Energy Ltd. including work order for erection and installation of the same.

The Chairman also added that in the light of the Kyoto Protocol convention it is expected that wind energy would also become eligible for Clean Development Mechanism benefits. This he added was on account of the fact that wind energy is one of the eco friendly and non-polluting methods of power generation with a proven track record of well over twenty years. Further since India has a sizable installation in the country as well as a dedicated Ministry for renewable, he added that it was a matter of time when India would also adopt the Kyoto protocols and provide the mechanism/procedure for enabling the green power/renewable energy producers in India to be eligible for CDM benefits.

He asserted to the board that the CDM benefits will augment the finances of the wind farm projects and will make the projects financially viable too.

The chairman further informed that given the vagaries of the wind and grid conditions in India, the wind farm project was fraught with risks. However, it being a eco-friendly renewable power source, and with the world energy focus being channeled towards clean power the company must make a headway to be one of the pioneer developers of wind farm India. Further the CDM benefits are likely to be made available to the wind farm projects in near future. Therefore looking to the long term benefits of the wind industry as well the CDM benefits, it is necessary that the company start implementing wind farm projects in right earnest without waiting for the formation off the CDM benefit procedures/rules as these are national policy issues likely to take a significant time and also on account of the facts that the prime locations would not be available for long time and the financial implication of loss of generation would be large if the company waited for the formulation of CDM rules. The Chairman concluded that in the light above background the company must go forward for the investment in the wind farm projects on yearly basis.





**VISHAL PLASTOMER Pvt. Ltd.**

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B/h. Oriental Bank of Commerce  
Ashram Road, Ahmedabad-380 009, INDIA

The Board passed the following resolution

**"RESOLVED THAT** pursuant to clause -35 under "Other Objects" in Memorandum of Association of the Company, the Company do start and carry on the business of generation, distribution, selling and supply of Electricity through Wind Energy by setting up Wind farm project at Jaisalmer in the State of Rajasthan with immediate effect.

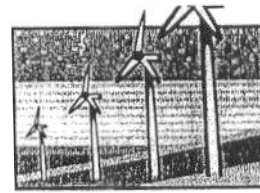
**RESOLVED FURTHER THAT,** Shri Pradeep S. Mehta and Shri Dipak S. Mehta, Directors of the Company be and is hereby severally authorised to take necessary effective steps for implementation of the said Wind Farm Project and to carry out other incidental and ancillary work in relation thereto."

**RESOLVED FURTHER THAT** the Company do place a purchase order with M/s Suzlon Energy Ltd, Ahmedabad for one Wind turbine generator at a cost of Rs 140 lacs plus work order for erection and installation of the same at an additional cost of Rs 12 lacs as per quotations submitted to this meeting

**CERTIFIED TO BE TRUE  
FOR VISHAL PLASTOMER PRIVATE LIMITED**

**DIPAK S. MEHTA  
DIRECTOR**

**JASWANT MATHUR**



11/1-A G Sector, Extn.  
Shastri Nagar, Jodhpur- 342003

30/07/2004

Mr. Rohit Chauhan  
M/s. Suzlon Energy Limited,  
Jaipur (Rajasthan)

Thank you very much for detailing us the advantages of installation of Suzlon turbines to the other machines available in the market.

I was convinced with your explanation of the mechanisms under the Kyoto Protocol and the additional revenue it can generate for Wind energy. Keeping in mind all these and wind energy being a clean and sustainable form of energy, I would like to go in for harnessing the energy from wind.

I request you to kindly keep me updated whether my project would qualify for the same and also facilitate the needful.

Thanking You.

Yours faithfully,

*Jaswant Mathur*

**Jaswant Mathur**



# Shrenik Marbles Limited

Makrana Road, Madanganj-Kishangarh 305 801 (Raj.) ☎ 01463-250832, 250732, 309271

08/08/2004

SML/SEL/039

Shri Rohit Chauhan  
Suzlon Energy Limited  
Jaipur

Dear Shri Chauhan

Thank you very much for explaining the benefits of installation of Suzlon turbines vis-à-vis other machines available in the market.

The points discussed with you were taken up during the last meeting of the senior members of the company. The generation guarantee and other performance related issues which can adversely affect the cash flows are still need to be properly addressed.

We would also like to have further details on the additional benefits available to wind energy investments through Kyoto Protocol.

You had apprised us about the same during last meeting. We shall be grateful if you could send us some literature pertaining to it and our eligibility for the same.

If the possible additional revenue through generation of electricity from clean sources is sufficient, this will help us in taking the decision towards making the investment in wind energy.

Thanking you

Yours very truly,  
For Shrenik Marbles Limited

Authorized Signatory

# M/s. VIJAY BHAWNANI

Plot No. 655, 12th C Road,  
Sardarpura. JODHPUR

Ref. No Dated :-

Dated 10/3/2004

Mr. Rohit Chauhan  
Suzlon energy Limited  
Jaipur (Rajasthan )

Thank you very much for the meeting explaining the benefits of installing Suzlon wind turbines in comparison to the wind turbines already available in the market.

I had studied the details provided by you and given due considerations to the issue of generation and performance which can affect the revenue. I would also like to have additional details on the benefits available for wind energy investments through Kyoto Protocol, which you had briefed me the meeting. I would be glad if you can send me more details regarding the same.

All these details would help me in making the decision to invest in wind energy.

Thanking You,

Yours faithfully,  
Vijay Bhawanani

  
Authorized Signatory

**M/s. PRAKASH BHAWNANI**

Plot No. 688, 12th C Road,  
Sardarpura, JODHPUR

Dated 10 / 8 / 2004

Ref. No Dated :-

Mr. Rohit Chauhan  
Suzlon energy Limited  
Jaipur (Rajasthan )


Thank you very much for the meeting explaining the benefits of installing Suzlon wind turbines in comparison to the wind turbines already available in the market.

I had studied the details provided by you and given due considerations to The issue of generation and performance which can affect the revenue. I would also like to have additional details on the benefits available for wind energy investments through Kyoto Protocol, with you had briefed me the mention. I would be glad if you can send me more details regarding the same.

All these details would help me in making the decision to invest in wind energy.

Thanking You,

Yours faithfully,  
Prakash Bhawanani

  
Authorised Signatory

**M/s. DEEPAK BHAWNANI**

---

Plot No. 655, 12th C Road,  
Sardarpura, JODHPUR

Dated 10 / 8 / 2004

Ref. No. Dated :-  
Mr. Rohit Chauhan  
Suzlon energy Limited  
Jaipur (Rajasthan )

Thank you very much for the meeting explaining the benefits of installing Suzlon wind turbines in comparison to the wind turbines already available in the market.

I had studied the details provided by you and given due considerations to The issue of generation and performance which can affect the revenue. I would also like to have additional details on the benefits available for wind energy investments through Kyoto Protocol, which you had briefed me the meeting. I would be glad if you can send me more details regarding the same.

All these details would help me in making the decision to invest in wind energy.

Thanking You,

Yours faithfully,  
Deepak Bhawanani



Authorized Signatory

TIN : 08792706321

0291-2430895

## M/s. Rajni K. Bhawnani

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Plot No. 655, 12th C Road,  
Sardarpura, JODHPUR

Ref. No. Dated :-  
Mr. Rohit Chauhan  
Suzlon energy Limited  
Jaipur (Rajasthan )

Dated 10/8/2004

Thank you very much for the meeting explaining the benefits of installing Suzlon wind turbines in comparison to the wind turbines already available in the market.

I had studied the details provided by you and given due considerations to the issue of generation and performance which can affect the revenue. I would also like to have additional details on the benefits available for wind energy investments through Kyoto Protocol, which you had briefed me the meeting. I would be glad if you can send me more details regarding the same.

All these details would help me in making the decision to invest in wind energy.

Thanking You,

Yours faithfully,  
Rajni Bhawanani

  
Authorized Signatory

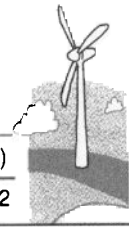


# LAXMI SPINNING MILLS

90-91, Industrial Area, Bikaner 334001 (Rajasthan) ● Phone : 0151-2523438 (F), 2542482 (R)

Manufacturer of All kinds of Carpet Woollen Yarns

TIN 08391350772



**Dated : 25.07.2004**

To,

**Mr. Rohit Chauhan**  
Suzlon Energy Ltd  
Jaipur

Dear Sir,

Thank you very much for the meeting we had explaining the benefits of installation of Suzlon turbines with respect to the other turbines available.

Our management had an internal meeting in which the issues related to generation and other seasonal constraints of wind energy which has an impact on the cash flow were taken up. As stated by you regarding the Indian government's ratification of the Kyoto Protocol, the management is of the opinion that we should also apply for the benefits of additional revenue through the market mechanisms of the protocol.

We further are of the opinion that we should not loose out on the generation of electricity and should go for investment in wind energy on an immediate basis.

We request you to kindly facilitate the project to comply with the mechanisms under the protocol as and when applicable.

For LAXMI SPINNING MILLS

(PROPRIETOR)



**Arora Textiles Pvt. Ltd.**

*Manufacturers & Suppliers of :- Carpet Woolen Yarn*

**Add. Office: 21D, Industrial Area, Rani Bazar, BIKANER**

TIN -08221353048

CST/RST No. 0712/03090

☎2545213, 2547172 (O), 2547722 (R)

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email- arorawool@yahoo.com

Fax: 0151-2204126

Ref. No.....

Date.....

**CERTIFIED TRUE COPY OF BOARD RESOLUTION PASSED IN THE MEETING OF THE BOARD OF DIRECTORS OF M/S ARORA TEXTILES (P) LTD. HELD ON 25.07.2004**

The Board discussed the nuances of investing in wind energy. The inherent risks of generation in wind energy due to the high degree of dependence on season, was also discussed. The anticipated investment risk can be curtailed to a smaller extent through the Clean Development Mechanism under the Kyoto Protocol. Market knowledge confirmed that wind energy being an environment friendly source of energy should qualify for the availment of the benefits under the Clean Development Mechanism. The board is also aware that the mechanisms are still evolving.

The Board hereby resolves that we will go ahead with the proposed wind energy investment and would take up the installations for availment of CDM benefits, once the process is evolved.



Sd -  
(Brahm Prakash Arora)  
Director

***Chirash Associates Pvt. Ltd.***

***Park Plaza***

C-59, Prithvi Raj Road, C-Scheme,

**Jaipur-302 001**

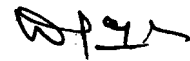
PHONE # 2360202, Fax # 2360707

**Certified true copy of the resolution of board of directors of M/s Chirash Associates Pvt. Ltd. passed its board meeting held at the registered office on 25<sup>th</sup> November, 2004.**

The Kyoto Protocol was ratified by the Government of India in August 2002. Indian projects having potential of reducing green house gas reductions qualify for additional revenue through the market mechanisms specified in the protocol. Wind energy, being seasonal in nature, does have investment risks. This investment risk can be contained to a small extent through the additional revenue that the Kyoto Protocol promises.

The Board hereby resolves to invest in wind energy taking into consideration the additional revenue stream of the Clean Development Mechanism.

TRUE COPY



(DIRECTOR)



## **Kanhaiyalal Kalyanmal**

K.K. House, Bharat Mata Path,  
Jamuna Lal Bajaj Marg, C-Scheme,  
JAIPUR-302001, INDIA.

Tel: (0141)2 371128,  
2371236

Fax: (0141)2 371186

E-mail:  
klkm@kkjaipur.com

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**30.12.2004**

To,

**Mr. Rohit Chauhan**  
Suzlon Energy Ltd  
Jaipur

Sub: Wind Energy

Dear Sir,

Thank you very much for elaborating us the benefits of installation of Suzlon turbines in comparison to the other machines available.

The points of discussion were taken up in the last meeting of the senior members of the company. The meeting also emphasized on the mechanisms under the Kyoto Protocol, which you had explained as an additional source of revenue stream from the project. Wind being a real time source of energy, we would like to take up the project with no further delay, as delay leads to loss in generation. Kindly advice us at a later date whether our project would qualify for the additional stream through Clean Development Mechanism.

For Kanhaiyalal Kalyanmal

(O.P. Mittal )  
Partner

**Speed Post**

No.221/2228/WE/2003 - IREDA

15<sup>th</sup> September, 2003

M/s. Vishal Exports Overseas Ltd.  
'Vishal House' Opp. Sales India  
B/h. Oriental Bank of Commerce  
Ashram Road  
**AHMEDABAD - 380 009.**

Dear Sirs,

Sub	Loan Assistance of Rs.1590.00 lakhs for setting-up of 6.25 MW (5 Nos. of 1250 KW WEG) Wind Farm Project to be set up at Village Pohara, District Jaisalmer in the State of Rajasthan - Under Project Financing Scheme (Project No. 1633)
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Please refer to your application and subsequent correspondence and discussions your representatives had with us regarding financial assistance for setting-up of 6.25 MW (5 Nos. of 1250 KW WEG) Wind Farm Project at Village Pohara, District Jaisalmer in the State of Rajasthan - Under Project Financing Scheme. Your proposal has been considered and Indian Renewable Energy Development Agency Ltd. (IREDA) is agreeable, in principle, to grant to your Company, as Borrower, Term Loan **Rs.1590.00 lakhs (Rupees One Thousand Five Hundred and Ninety Lakhs Only).**

2. The aforesaid rupee loan is subject to the General Conditions (IREDA's General Conditions) copy whereof is enclosed and which are deemed to be part of this Sanction Letter, in addition to the normal terms and conditions as set-out in **Appendix-I**. The above facility is also subject to such additional conditions as may be stipulated by IREDA.

3. The Borrower shall enter into Loan Agreement with IREDA for the term loan.

4. A Specimen copy of the Loan Agreement (which is subject to such modifications before execution/issue as may be considered necessary) containing the normal terms and conditions for grant of such financial assistance is enclosed (**Appendix-II**). Draft of the Loan Agreements would be forwarded to the Borrower by IREDA after accepting by you of the terms and conditions of this Loan Sanction Letter.

5. In case the above terms and conditions are acceptable to you,

- I) you may furnish to us within 30 days two certified copies of the Resolutions duly passed by the Board of Directors of your Company as per the pro-forma in **Appendix-III**. This Resolution must provide that the Borrower is agreeable to enter into the Agreement in the forms mentioned above within the time stipulated by IREDA and that till such the Agreements are executed, there is no obligation or commitment on the part of the IREDA to advance any money, or incur any obligations.
- II) You may, within the same time as in (I) above, furnish to us a statement of anticipated draws of loan indicating probable dates and amounts of draws.

6. Please note that IREDA reserves the right to review/revoke the sanctioned loan and in case the loan has already been disbursed to withhold disbursement of the loan and recall the loan already advanced in the event of subsequent developments coming to the notice of IREDA which may materially affect the financial health of the Borrower/Project and you shall be bound by the decision of IREDA in this behalf.


7. Please note that this communication should not be construed as giving rise to any binding obligation on the part of IREDA unless you communicate to IREDA within 30 days from the date of receipt of this letter that the terms and conditions set out therein are acceptable to it and unless the Loan Agreement and other documents relating to the above facility are executed by the Borrower in such form as may be required by IREDA within 6 months from the date of this Loan Sanction Letter or such further time as may be allowed by IREDA in its absolute discretion and first disbursement of loan is drawn within further period of six months (over and above the period of 6 months mentioned above).

8. List of formalities to be complied with and certificate/documents to be submitted by the Borrower for facilitating early execution of loan documents and creation of security etc. is annexed hereto as **Appendix-IV**. The Borrower is requested to carefully go through the list and comply with the formalities and submit the documents; this will expedite the matters.

9. **Subject to the submission of documents/certificates precedent to the execution of Loan Agreement and which documents/certificates are found in order by IREDA, we are fixing the tentative date for Loan Execution on 21<sup>st</sup> October, 2003.** Meanwhile kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,



**(K.S. Sridharan)**  
**Chief General Manager(PTS)**

Encl : Appendices I,II,III,IV and V.

Copy forwarded for information and necessary action to:

- I) Director(Finance)
- II) Director (Technical)
- III) AGM(Law)
- IV) AES To MD

**Main Terms and Conditions forming part of the Loan Sanction Letter dated 15<sup>th</sup> September, 2003 issued to M/s. Vishal Exports Overseas Ltd.**

**1. Rupee Loan :**

I) **Amount :** Rs.1590.00 lakhs (Rupees One Thousand Five Hundred and Ninety Lakhs Only).

II) **Front-End fee :**

The Borrower shall pay one time lump-sum Front-End Fee @ 1.30% of the loan amount sanctioned on or before the date of execution of Loan Agreement. The Front-End Fee once paid is not refundable in any circumstances.

III) **Interest :**

The Company shall pay to IREDA interest on the principal amount of loan @ 11.00% p.a. exclusive of Interest Tax i.e. plus interest tax at applicable rate, if any.

Such interest shall be payable quarterly each year on the 31<sup>st</sup> March, 30<sup>th</sup> June, 30<sup>th</sup> September and 31<sup>st</sup> December.

**Rebate :**

The Borrower will be allowed a rebate in interest rate @ 0.50% on the condition that the Borrower pays the dues of IREDA both in respect of installments of principal and interest on or before due dates.

IV) **Additional Interest on Interim Loan(s) :**

Additional interest at the following rates over and above the applicable rate of interest will be charged till creation of mortgage security of immovables and which interim loan may be sanctioned to the Borrower on the merits of the case and at the sole discretion of IREDA and on the security of Bank Guarantee.

**Period :**

a)	Upto 3 months from the date of disbursement of first interim loan.	1.50%
b)	Above 3 months and upto 6 months from the date of disbursement of first interim loan.	2.00%
c)	Above 6 months and upto 9 months from the date of disbursement of first interim loan.	2.50%

V) Further interest :

All interest which shall become due during the currency of the loan or any part thereof and for the time being remaining unpaid, and all other moneys which have become payable by the Borrower Company to IREDA, in case the same is not paid on the dates on which thereby fall due, carry further interest and shall be computed from the respective date(s) of such interest or moneys accruing due and all such interest and further interest which have become payable but not paid, shall become payable upon the footing of compound interest with rests taken or made quarterly as herein before provided.

VI) Liquidated damages :

In case of default (i) In payment of installment of principal, interest and all other monies (except liquidated damages) on their respective due dates; (ii) In submission of quarterly progress report of the previous quarter alongwith draft towards payment of dues for the current quarter; the Borrower shall pay on the defaulted amounts, liquidated damages @ 6.50% p.a. for the period of default on the amounts due in respect of this loan as also in respect of previous loans and future loans during a particular quarter shall be payable so long as any default in compliance of the above undertakings/conditions subsist and/or is not removed to the satisfaction of IREDA. Liquidated damages shall be payable in the manner and on the dates as specified in the Loan Agreement for payment of interest. Arrears of liquidated damages shall carry interest at the rate applicable to loan.

The above two conditions shall apply to Group Companies within the same management as defined in the Companies Act and to the existing loans sanctioned/to be sanctioned to the Borrower. The Borrower shall obtain undertakings from Group Companies to the said effect.



**VII) Period of repayment of the loan :**

There will be a moratorium of maximum of Six Months from the date of execution of Loan Agreement and thereafter loan will be repaid as under:

Rs.1590.00 lakhs in 36 equal quarterly installments.

Provided further that the Borrower shall note and agree that the moratorium shall be linked to the disbursement or expiry of six months from the date of execution of Loan Agreement, whichever is earlier of the said two dates at the sole discretion of IREDA and that the Borrower shall abide by the decision of IREDA.

The repayment of installments of principal and payment of installments of interest will, however, become due and payable on 31<sup>st</sup> March, 30<sup>th</sup> June, 30<sup>th</sup> September and 31<sup>st</sup> December, each year.

**VIII) Last dates of Withdrawal of Loan:**

Unless IREDA otherwise agrees and on such terms and conditions as IREDA might stipulate which may include the condition for charging higher rate of interest than what is mentioned in the Loan Agreement, the terminal dates shall be as follows:-

- (i) To sign Loan Agreement - on or before **14.03.2004**
- (ii) To draw first installment of loan - on or before **09.09.2004**.
- (iii) To draw final installment of loan - on or before **09.09.2005**.

and that the Borrower shall be abide by the decision of IREDA in this behalf.

- (X) **Project: Setting-up of 6.25 MW ( 5 Nos. of 1250 KW WEC ) Wind Farm Project to be set up at Village Pohara, District Jaisalmer in the State of Rajasthan - Under Project Financing Scheme.**

**(A) Details of Project Cost :**

Description	COST (Rs. in Lakhs)
Land and Site Development	20.00
Plant & Machinery including civil works, packing, forwarding, erection, testing & commissioning and charges towards opening of TRA	2405.00
Preliminary & Pre operative Expenses	20.00
<b>Total</b>	<b>2445.00</b>
Cost per MW	391.20

**(B) Means of Finance:**

Sl. No	Source	Amount (Rs. in lakhs)
1	<b>Promoters Contribution:</b>	
	a) Equity Share Capital	00.00
	b) Internal Accruals	855.00
	c) Unsecured/Subordinate Loans (repayable after repayment of IREDA's loan with no interest liability)	00.00
	<b>Total Promoter's Contribution</b>	<b>855.00</b>
2	Subsidy/Grant, if any	00.00
3	Term Loan proposed for the project from IREDA	1590.00
4	From others	00.00
	<b>Total Project Cost</b>	<b>2445.00</b>
<b>Source of Financing</b>		
	IREDA/KfW	1590.00
	<b>TOTAL</b>	<b>1590.00</b>

## **II : SPECIAL TERMS AND CONDITIONS :**

### **Security :**

The loan together with the interest, interest tax, liquidated damages, commitment fee, premia on repayment or on redemption, costs, expenses and other monies shall be secured/guaranteed by

- (1) **Exclusive First Charge by way of Mortgage** in favour of IREDA in such form as IREDA may require on all the immovable properties of the Borrower both existing and future pertaining to proposed 6.25 MW ( 5 Nos. of 1250 KW WEG ) Wind Farm Project to be set up at Village Pohara, District Jaisalmer In the State of Rajasthan - Under Project Financing Scheme.
- (2) **Exclusive First Charge by way of hypothecation** in favour of IREDA in such form as IREDA may require on all the movable properties of the Borrower both existing and future pertaining to proposed 6.25 MW ( 5 Nos. of 1250 KW WEG ) Wind Farm Project to be set up at Village Pohara, District Jaisalmer In the State of Rajasthan - Under Project Financing Scheme.
- (3) **Personal Guarantees of :**

- a) Shri Subhash Chandra C. Mehta
- b) Shri Pradeep S. Mehta
- c) Shri Dipak S. Mehta

Promoter Directors of the Borrower.

- No guarantee commission shall be payable to the Guarantor and the guarantee shall be joint and several.
- The Borrower shall ensure and give undertaking to IREDA that the financial stake of the Guarantors in the share capital of the Borrower shall not be less than 50% of the total paid-up/equity capital at any stage during the currency of loan.
- Please furnish us the details of age, father's name and residential addresses of the Guarantors giving guarantee. If any of the Guarantor is a Non Resident Indian or a Company incorporated abroad, approval of Reserve Bank of India will be required.

- (4) **Deposit of Post dated cheques** towards payment of Installments of principal loan amount in accordance with agreed repayment schedule and for Installments of interest payable thereon.
- (5) **Exclusive charge on Trust and Retention Account** to be opened with M/s. ICICI Bank Ltd. or any other Bank in such form and manner as is acceptable to IREDA for receipt of sale proceeds/revenue of power revenue and the said Account shall be opened **before drawal of first installment of loan**. All costs and charges to be incurred on the opening and operation of Trust and Retention Account including fees payable to Trustee Bank shall be borne by the Borrower.
- (6) The Borrower shall agree and undertake that the **Borrower shall assign Performance Guarantees/Guarantees** for achieving prescribed level of Generation of Electricity being obtained by it from M/s. Suzlon Energy Limited pursuant to the Machinery Supply Agreement entered into with them in such form as IREDA might require **before availing of first disbursement of loan** and both the Borrower and M/s. Suzlon Energy Limited shall abide by the decision of IREDA and shall not raise any objection thereto.
- (7) The Promoter Directors/Promoters/Promoter Company of the Borrower shall give undertakings that i) they shall meet the shortfall, if any, occurring in the cost of the project and/or for working capital requirements;(ii) they shall not pledge/dispose off their share holdings in the company during the currency of IREDA loan, and the Company shall not register any transfer or lien on the said shares without prior permission of IREDA in writing. Further whole time directors would give undertakings that they shall not resign their office/s as Managing Director/Whole time Director(s) without the approval of IREDA.

**A) Pre-disbursement conditions:**

Before availing of loan assistance from IREDA, the Borrower shall comply/ agree to comply with the following conditions to the satisfaction of IREDA :-

- (1) Complete legal documentation including creation of security.
- (2) Furnish certificate from your Statutory Auditors showing the item-wise expenses incurred on the project and amount already invested in the project and means of finance for the same with reference to approved component of project costs/sources of funds.
- (3) Compliance of terms and conditions indicated in this Loan Sanction Letter.
- (4) The Borrower shall submit No Lien Account opening letter from a Scheduled Commercial Bank foregoing their right to set off on the said Account as per draft enclosed before signing of Loan Agreement.
- (5) To send compliance of the formalities/conditions as are listed in IREDA's Legal Form No.118 and which are precedent to the execution of Loan Documents well before signing of Loan Agreement.
- (6) To submit Resolution as passed by the Board of the Borrower at a regularly convened Board Meeting, authorising borrowing of loan as per this Sanction Letter and execution of Loan Documents in the prescribed form of IREDA well before signing of Loan Agreement.
- (7) To deposit Front End Fee @ 1.30% of amount of loan sanctioned, by Demand Draft payable at New Delhi on or before signing of Loan Agreement. The Front End Fee once paid is not refundable in any circumstances.
- (8) To submit Statutory Auditor's Certificate that the Borrower's existing borrowings together with the proposed borrowings from IREDA are within limits as approved by shareholders under Sec.293(1)(d) of the Companies Act, well before signing of Loan Agreement.
- (9) The Borrower shall produce certificate from the Advocate that the Borrower has acquired land required for the project by proper Sale Deed/Lease Deed and the Borrower has good and marketable title thereto well before signing of the Loan Agreement. In case the Borrower has acquired lands from the State Govt. and/or State Govt. Agency, the Borrower shall obtain letter from the State Govt. and/or State Govt. Agency according permission to mortgage the lands in favour of IREDA.

- (10) Application for obtaining electrical connection has been tendered to the Electric Utility for the project and necessary deposit has been made/paid for the said purpose.
- (11) The Borrower shall provide Stamp Papers of the State and in which State the documents are signed; that is to say, if the documents are signed at New Delhi, as is the practice with IREDA, the Stamp Papers of Delhi State will need to be furnished on or before the date fixed for execution of Loan Documents. The cost of the Stamp Papers will be around Rs.500. It is further clarified that if the documents attract Stamp Duty on advelorem basis at the place where the Borrower's Registered Office and/or project are situated, the Borrower shall provide additional Stamp Papers of the said State **before execution of Loan Documents.**
- (12) The Borrower shall furnish signatures of the Directors/Executives who would be dealing/corresponding/executing documents with IREDA for and on behalf of the Borrower duly attested by an official of the Borrower's Bankers **within 30 days from the date of this Sanction Letter.**
- (13) The Borrower shall declare and confirm **on or before signing of Loan Agreement** that the Contracts/Sub-contracts/orders for supply of Plant and Machinery and contracts/Sub-contracts/orders for Civil Works have not been awarded or proposed to be awarded to the Firms and Group Companies of the Borrower and that the directors of the Borrower are not interested/connected in any way in such Firms/Companies, otherwise the Borrower shall obtain prior permission/approval of IREDA for placing order and award of Civil Contracts to the Machinery Suppliers/Contractors.
- (14) The Borrower shall open Trust and Retention Account with M/s. ICICI Bank Ltd. or any other Bank in such form and manner as may be required by IREDA for deposit of sale proceeds of power for repayment/payments of dues of IREDA and on which Account IREDA will have exclusive charge and that the Account shall be opened **before drawing first disbursement of loan.** All costs and charges to be incurred in this connection shall be borne and paid by the Borrower.
- (15) The Borrower shall agree and undertake that the Borrower shall furnish to IREDA list of all the directors on its Board alongwith list of the companies in which they are interested as directors and that the said list shall be furnished to IREDA **on or before signing of the Loan Agreement** and at every time when new director is taken on its Board till such time as loan of IREDA is paid in full. The Borrower shall declare that none of its Director is willful defaulter nor its Directors are on the Boards of the companies declared as willful defaulters within the Guidelines of RBI.

- (16) The Borrower shall agree and undertake to submit satisfactory account operation certificates from Banks/Institutions **before signing of Loan Agreement** to the satisfaction of IREDA.
- (17) The Borrower shall arrange/execute such documents as may be required by IREDA with regard to assignment of performance guarantees given by the Machine Suppliers towards the project in favour of IREDA to the satisfaction of IREDA **before availing of first disbursement of loan.**

**C) Special conditions as applicable to the Borrower :**

1. The Borrower shall undertake and satisfy IREDA that
  - (a) The Borrower has not availed any finance from any source for the project.
  - (b) Machines installed/to be installed on the project are new and these are/shall not be transferred to any third party without prior consent of IREDA in writing.
  - (c) Machine Manufacturer has not used any damaged components (out of Gujarat cyclone affected machines)
  - (d) The Borrower shall give an undertaking to IREDA and shall satisfy IREDA that the Manufacturers of Wind Turbines, M/s. Suzlon Energy Limited shall provide self-certification about the quality and performance of their Equipments. They will be penalised if their machines are found not to perform as per the performance certified by them. This clause is stipulated by the Government of India, in the Ministry of Non-conventional Energy Sources (MNES) as per the new guidelines and Certificate is to be obtained from Machine Manufacturers by the Borrower. Further, the Borrower has to take care of this clause as per its project needs and stipulate necessary penalty clause in the Contract/Agreement with Machinery Suppliers - M/s. Suzlon Energy Limited. The Borrower shall certify that they have complied/ensured compliance of the guideline of MNES to the satisfaction of IREDA.
2. The Borrower shall agree and confirm that if IREDA finds out at a later stage, that the Project has got any International Assistance/Grant, **the loan amount shall stand reduced** by the amount of Assistance/Grant and the Borrower shall abide by the decision of IREDA.

5. The Borrower shall enter into an Annual Maintenance Contract with M/s. Suzion Energy Limited to the satisfaction of IREDA, if required.
4. The Borrower shall agree to comply with the Procurement Procedures for the project and also Environmental and Social Impact Assessment Conditionalities for availing loan out of KfW Line of Credit/IREDA funds as per requirement/Guidelines of KfW/IREDA and that the Borrower shall abide by the decision of IREDA and shall not raise any objection thereto.

D) **Other conditions :**

The Borrower shall submit the following documents/comply with the following conditions :

- i) The Borrower shall agree and undertake that the Borrower shall furnish an authenticated copy of permission of State Government or other Government Departments including State Electricity Board, if any, required, for implementation of the project.
- ii) The Borrower shall agree and undertake that the Borrower shall obtain requisite approvals / No Objection Certificates/ enter into agreements for implementation of the project from/with State and Central Government Agencies, particularly State Electricity Board, State Pollution and Environment Control Board and local bodies and furnish copies of the same to IREDA, if required.
- iii) The Borrower shall agree and undertake that the promoters of the Borrower and/or the Borrower shall bring in an amount of **Rs. 855.00 Lakhs** as promoter's contribution or any such higher amount required to meet any shortfall if it arises to meet the cost of the Project as per Means of Finance and/or for working capital requirements. The Borrower agrees and undertakes that it shall increase its authorised capital, if required.
- iv) The Borrower shall implement the project within the projected time schedule and within the overall cost of **Rs. 2445.00 lakhs**, in accordance with the financing plan as approved by IREDA. Cost overrun, if any, shall not be borne by IREDA and you and/or your promoters will have to arrange at their own.
- v) The Borrower shall furnish a detailed schedule of implementation of the project to IREDA to the satisfaction of IREDA.
- vi) The Borrower shall furnish copy of plan/ map for the land/project site, to IREDA.



- vii) The Borrower agrees and undertakes to affix plate on the Systems, Machinery and Equipments, that the Project has been financed by IREDA out of KfW Line of Credit so long as IREDA's loan subsists and shall satisfy IREDA about its compliance by producing photographs of the Machines and Equipments with plate affixed thereon at regular intervals.
- viii) The Borrower shall make arrangements for erection and commissioning of the said Project to the satisfaction of IREDA.
- ix) The Borrower shall at its own cost keep the mortgaged / charged property in good condition and shall keep the same **insured** in the joint names of the Borrower and IREDA with usual bank clause covering all risks as per industry's norms as mentioned in the Loan Agreement. The Borrower shall further agree and undertake that in case the Borrower takes out Insurance Policies covering other risks not mentioned in the Loan Agreement, then in that event the Borrower shall also obtain Insurance Policies with the name of IREDA as mortgagee with usual Bank Clause and shall deposit originals of these Insurance Policies along with other Insurance Policies with IREDA. The Borrower shall further undertake to get the insurance policies renewed every year well before the expiry of Insurance policies.
- x) The Borrower shall obtain the project clearance for the Project from State Electricity Board and/or State Government, if required.
- xi) The Borrower shall agree and undertake that the Borrower shall not change its present constitution in any way and the Borrower shall not go for merger/demerger/amalgamation and/or any scheme of arrangement without the previous consent of IREDA in writing and IREDA shall have right to refuse/impose such conditions as it may consider essential.
- xii) The Borrower shall agree and undertake that IREDA's loan will be utilised only for the project approved by IREDA and to meet the eligible cost of expenditure and materials and for no other purposes whatsoever.
- xiii) The Borrower shall agree and undertake to pay to IREDA the inspection and legal charges etc., incurred in connection with the project from time-to-time.
- xiv) The Borrower shall agree and undertake not to change supplier(s) of machinery(ies) as already approved by IREDA, without previous consent of IREDA in writing.

- xv) The Borrower shall agree and undertake to furnish two copies of its Annual Reports every year to IREDA during the currency of IREDA's loan.
- xvi) The Borrower shall agree and undertake that the scope of the project beyond the quantity, design and specifications approved by IREDA shall not be changed without the approval of IREDA in writing.
- xvii) The Borrower shall agree and undertake to use and utilise the project loan money solely for the project and for no other purposes. The Borrower shall not, without the prior permission of IREDA Invest any part of the loan money advanced by way of deposits, loans, share capitals or otherwise in any concern. The Borrower agrees, undertakes and confirms that in case it is found that the Borrower has not utilised the loan for the purposes for which it has been advanced and/or has misutilised the loan, the Borrower shall refund/reimburse the loan amount with interest at the rate of interest 16.00% p.a. without rebate plus interest tax at the applicable rate plus liquidated damages to IREDA and the Borrower shall abide by the decision of IREDA in this behalf.
- xviii) The Borrower shall ensure as far as feasible at least 25 trees are planted at project site and in the neighbourhood.
- xix) The Borrower shall agree and undertake that it shall not start implementation of the Project without obtaining IREDA's approval to designs/drawings/specifications of the Project proposed to be put up.
- xx) The Borrower shall agree and undertake that it shall furnish quarterly progress report(s) and provide other information on the progress of the work/project including photography of the Project.
- xxi) The Borrower shall agree and confirm that all interest concessions/rebates will be available to the Borrower on the condition that the Borrower pays the instalments of loan and interest on or before due dates and the Borrower shall abide by the decision of IREDA.
- xxii) The Borrower declares that the Borrower does not belong to any Group in the country going by the principle of commonality of Management and Effective Control by other Companies. Supported by Statutory Auditor's certificate.

- xxliii) The Borrower shall agree and undertake to IREDA that the Borrower shall not ask for release of last 10% of the loan amount for the project until the project has been commissioned and/or Commissioning Certificate issued by the State Electricity Board or any other prescribed Authority has been furnished to the satisfaction of IREDA and that the Borrower shall abide by the decision of IREDA and shall not raise any objection thereto.
- xxiv) The Borrower shall agree, note and confirm that if any subsidy is sanctioned by Government/Government Agency and which subsidy is routed/monitored by IREDA, IREDA shall pass on interest subsidy to the Borrower by way of adjustment only after the dues of IREDA for relevant quarter has been paid in full by the Borrower and that the Borrower shall abide by the decision of IREDA.
- xxv) The Borrower shall agree and undertake to IREDA that if any Subsidy and/or Grant and/or loan is sanctioned to the Borrower by any Bank/Institution/Government and/or Government Agency over and above the amounts mentioned in the Means of Finance, the same shall be utilised towards reduction of loan of IREDA and that the Borrower shall abide by the decision of IREDA.
- xxvi) The Borrower notes and confirms that IREDA shall have the right to review/revoke the sanction of loan to the Borrower and in case loan has already been disbursed to withhold disbursement of balance loan and to recall the loan already advanced in the event of subsequent developments coming to the notice of IREDA, which may materially affect the health of the Borrower and if Borrower comes to the conclusion that the Borrower shall not be able to implement the Project and the Borrower shall abide by the decision of IREDA.
- xxvii) The Borrower shall agree and undertake that it shall not take any additional loan and/or take-up new Project and/or expansion of existing Project involving heavy Capital Expenditure without the prior approval of IREDA in writing.
- xxviii) The Borrower shall agree and confirm that in case the Borrower commits default in repayment of the loan/advances or in repayment/payment of installment of interest or any other agreed installment of the loan on due date/s, IREDA shall have an unqualified right to disclose or publish the Borrower's name and names of its directors as defaulters in such manner and through such medium as IREDA in its absolute discretion may think fit and that the Borrower shall not raise any objection thereto."

- xxix) The Borrower shall agree and undertake to IREDA that if any loan and/or subsidy and/or grant and/or incentive and/or benefit is/are sanctioned/granted to the Borrower under Clean Development Mechanism/Programme and/or Carbon Credit Programme by any Bank/Institution and/or State Govt. and/or Central Govt. and/or Govt. Agency and/or by Foreign Country and/or by a International Agency and/or by any International Institution, the Borrower shall obtain No Objection/Clearance in writing from IREDA before availing of loan and/or Subsidy and/or Grant and/or incentive/benefits under the above programmes and the Borrower shall abide by the decision of IREDA.
- xxx) The Borrower shall agree and undertake to IREDA that if any loan and/or subsidy and/or grant and/or incentive and/or benefit is/are sanctioned/granted to the Borrower under Clean Development Mechanism/Programme and/or Carbon Credit Programme by any Bank/Institution and/or State Govt. and/or Central Govt. and/or Govt. Agency and/or by Foreign Country and/or by a International Agency and/or by any International Institution and which loan and/or Subsidy and/or Grant and/or Incentive and/or benefit is/are not provided in the means of Finance as approved by IREDA, the same shall be utilised towards reduction of loan of IREDA and that the Borrower shall abide by the decision of IREDA and that the Borrower shall not raise any objection thereto.
- xxxi) The Borrower notes that IREDA has sanctioned loan of Rs.1590.00 lakhs to the Borrower for setting-up of 6.25 MW ( 5 Nos. of 1250 KW WEG ) Wind Farm Project to be set up at Village Pohara, District Jaisalmer in the State of Rajasthan - Under Project Financing Scheme. In this connection, the Borrower shall agree and undertake that in case, circumstances so warrant and in case it is decided by IREDA at its sole discretion and which decision shall be binding on the Borrower, IREDA shall reserve/have the right by inserting a suitable clause in the Loan Agreement to ask the Borrower to hive - off the present Wind Farm Project being financed by IREDA from other Projects/Units by transferring the present project so hived -off to a new Company to be incorporated for the said purpose and the Borrower shall complete the formalities to give effect to this condition within time bound programme as may be intimated by IREDA to the Borrower.

## BUILD MARGIN FOR NORTHERN REGION FOR 2004-05

Tariff Orders/Orders

Calculated Values-B/g colour

Ref: Addition in generating capacity (utilities only), CEA General Review 1994-95, 1995-96, 1996-97, 1997-98, 1998-99, 1999-2000, 2000-01, 2001-02, 2002-03, 2005

MNES Rept -Baseline for RE proj under CDM

Name of the Plant	Year-Commissioning	Agency/Owner	Fuel Type	Installed Cap. (MW)	Gross Gen. (MU)	Operating Heat Rate	NCV	Fuel Consumption (Fi) (000 Tonnes)	COEFi	Fi*COEFi (000 tCO2)
NJ HEP Unit 6	31-03-04	SJVNL & HP	Hydro	250	851.4616667					
NJ HEP Unit 5	03/09/2004	SJVNL & HP	Hydro	250	851.4616667					
Chemara HEP II Unit 3	26-02-04	HP NHPC	Hydro	100	448.0233333					
NJ HEP Unit 4	13-02-04	SJVNL & HP	Hydro	250	851.4616667					
NJ HEP Unit 3	22-01-04	SJVNL & HP	Hydro	250	851.4616667					
Chemara HEP II Unit 2	12/05/2003	HP NHPC	Hydro	100	448.0233333					
NJ HEP Unit 2	23-11-03	SJVNL & HP	Hydro	250	851.4616667					
Chemara HEP II Unit 1	11/04/2003	HP NHPC	Hydro	100	448.0233333					
NJ HEP Unit 1	20-09-03	SJVNL & HP	Hydro	250	851.4616667					
KOTA TPS-IV Unit-6	30.7.2003	RRVUNL	Coal	195	1470	2695	4021	985.2399901	1.5484	1525.545601
SURATGARH-III Unit 5	30.6.2003	RRVUNL	Coal	250	1955	2439.21	4021	1185.937714	1.5484	1836.305957
Baspa - II Unit3	27-05-03	HP Jai Prakash	Hydro	100	398.94					
Baspa - II Unit2	02/08/2003	HP Jai Prakash	Hydro	100	398.94					
Pragati CCGT Unit-III	31.1.2003	PrPCL	Gas	121.2	935.6684019	2061	12428.57	155.1596504	2.91535	452.3446868
Baspa - II Unit1	24-01-03	HP Jai Prakash	Hydro	100	398.94					
Pragati CCGT Unit-II	9.11.2002	PrPCL	Gas	104.6	807.515799	2061	12428.57	133.9084112	2.91535	390.3898865
Ramgarh CCGT Stage-II GT-2	24.8.2002	RRVUNL	Gas/HSD	37.8	119.554960000	3056	12428.57	29.39678159	2.91535	85.70190721
Ramgarh CCGT Stage-II GT-2	7.8.2002	RRVUNL	Gas/HSD	37.5	118.606110000	3056	12428.57	29.16347353	2.91535	85.02173254
Malana Unit1	07/09/2001	IP Malana Powe	Hydro	43	133.04					
Malana Unit2	07/05/2001	IP Malana Powe	Hydro	43	133.04					
Upper Sindh II Unit1	29-03-02	J&KSEB	Hydro	35	48.57758621					
Upper Sindh II Unit2	09/11/2001	J&KSEB	Hydro	35	48.57758621					
Pragati CCGT (Unit-1)	15.03.2002	DVB	Gas	104.6	807.515799	2061	12428.57	133.9084112	2.91535	390.3898865
Suratgarh TPS Unit4	25-03-02	RRVUNL	Coal	250	1951	2439.21	4021	1183.511243	1.5484	1832.548809
Suratgarh TPS (Unit-3)	29.10.2001	RRVUNL	Coal	250	1876	2439.21	4021	1138.014912	1.5484	1762.102289
Wind Power Stations	06/01/2001	RRVUNL	Wind	2.15	6.45					
Ghanvi Unit2	12/07/2000	HPSEB	Hydro	11.25	37.03					
Ghanvi Unit1	30-07-00	HPSEB	Hydro	11.25	37.03					
Gumma Unit2	14-10-00	HPSEB	Hydro	1.5	2.175					

Gumma Unit1	31-08-00	HPSEB	Hydro	1.5	2.175					
Chenani III Unit3	31-07-00	J&KSEB	Hydro	2.5	6.365091463					
Chenani III Unit2	31-07-01	J&KSEB	Hydro	2.5	6.365091463					
Chenani III Unit1	31-07-02	J&KSEB	Hydro	2.5	6.365091463					
Ranjit Sagar Unit1	10/11/2000	PSEB	Hydro	150	282.8425					
Ranjit Sagar Unit2	16-09-00	PSEB	Hydro	150	282.8425					
Ranjit Sagar Unit3	20-08-00	PSEB	Hydro	150	282.8425					
Ranjit Sagar Unit4	08/12/2000	PSEB	Hydro	150	282.8425					
Panipat TPS St IV (Unit-6)	31.03.2001	HPGCL (Haryana)	Coal	210	1482	3180	4021	1172.036807	1.5484	1814.781792
Faridabad CCGT (Steam) Unit-	31.7.2000	NTPC	Gas/Neptha	144	1058.868837	2175	12428.57	185.3020678	2.91535	540.2203834
Rajasthan Atomic power pla	23-12-00	NPC	Nuclear	220	1309.7					
Jaisalmer Wind	06/01/2000	RSPC	Wind	2.25	6					
Upper Sind II Unit 1	01/05/2000	J&KSEB	Hydro	35	48.57758621					
Faridabad CCGT (Unit-2) Gas Turbine Unit	18.10.1999	NTPC	Gas/Neptha	143	1051.515581	2175	12428.57	184.0152479	2.91535	536.468853
Faridabad CCGT (Unit-1) Gas Turbine Unit	28.6.1999	NTPC	Gas/Neptha	143	1051.515581	2175	12428.57	184.0152479	2.91535	536.468853
Suratgarh TPS (Unit-2)	28.3.2000	Rajasthan SEB	Coal	250	1704	2439.21	4021	1033.676658	1.5484	1600.544937
Rajasthan Atomic power pla	03/10/2000	NPC	Nuclear	220	1309.7					
Unchachar TPP (Unit-4)	22.10.1999	NTPC	Coal	210	1748	2515	4021	1093.315096	1.5484	1692.889094
GHTP Bhatinda (Unit-2)	16.10.1998	PSEB	Coal	210	1536	2899	4021	1107.402139	1.5484	1714.701472
Suratgarh TPS (Unit-1)	10.5.1998	Rajasthan SEB	Coal	250	1876	2439.21	4021	1138.014912	1.5484	1762.102289
Unchachar (Unit-3)	27.1.1999	NTPC	Coal	210	1690	2515	4021	1057.03805	1.5484	1636.717717
					<b>35160.9591</b>					<b>20195.24615</b>

$$EF\ BM = \frac{\sum(F_i * COEF_i)}{\sum(Gross\ Gen.)} \text{ (tCO}_2\ / \text{ MWh)}$$

Gross Gen (MUs)		(Fi*COEFi) (000 tCO2)	
Total	35160.9591	20195.24615	

Gen from new TPS comprising of total thermal gen of NR grid (%) **20.97654307**

EF BM	0.574365622	tCO2/MWh
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**NORTHERN GRID** Calculated Values-Big colour  
**Baseline for FY 2002-03, 2003-04, 2004-05**

(Ref 1) Electricity Data 2003-04, 2004-04, CEA, General Review 2005, www.cea.nic.in  
 (2) NLDL Annual Report 2002-03, 2003-04, 2004-05 www.nldl.org  
 (3) Performance Review of Thermal Power Station 2002-03, 2003-04, 2004-05, CEA

**Data Collection from Different Sources-marked with different colours**

NLDL Annual Report 2002-03, 2003-04, 2004-05  
 CEA General Review 2005  
 CEA Performance Review of Thermal Power Station 2002-03, 2003-04, 2004-05  
 MNES Reg- Baseline for RE project under CDM  
 CERF Website

**Formulas:**

Fuel Cons (Fi) '000 tons = (Gross Gen MU \* OHR kcal/kWh)/(NCV kcal/kg)  
 COEfi (tCO2/kg of fuel) = (NCV\* EFCO2)/OXID  
 OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas) - Ref. Revised 1996 IPCC Guidelines  
 NCV (kcal/kg) /Ref. Baseline for RE project under CDM, MNES report/www.mnec.nic.in/baseline/rep.htm  
 Coal (default)=4021, Lignite=2800, Gas/NG/LNG=12428.57, Diesel=10316, Naptha=10750

**NCV + EFCO2/Ref. MNES Report)**

Coal (Default)=1.58  
 Lignite=1.19  
 Gas/NG/LNG=2.93  
 Diesel=3.2  
 Naptha=3.3

Name of the Plant	Year-Commission	Agency/Owner	Fuel Type	Inst.Cap. (MW)	Gross Gen. (MU) 2002-03	Gross Gen. (MU) 2003-04	Gross Gen. (MU) 2004-05	Fuel Cons. (Fi) (000 Tonnes) 2002-03	Fuel Cons. (Fi) (000 Tonnes) 2003-04	Fuel Cons. (Fi) (000 Tonnes) 2004-05	Oper. HR (kcal/kWh) 2002-03	Oper. HR (kcal/kWh) 2003-04	Oper. HR (kcal/kWh) 2004-05	NCV kcal/kg	NCV x EFCO2 Kg of CO2/Kg of fuel	COEfi (kg of CO2/kg of fuel) 2002-03	F1*COE (tCO2) 2002-03	F2*COE (tCO2) 2003-04	F3*COE (tCO2) 2004-05

CHANDIGARH																				
<b>THERMAL</b>																				
Diesel Gen Set		Govt Chandigarh	Diesel	2	0	0	0	0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0
<b>TOTAL THERMAL (Chandigarh)</b>				<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>											<b>0</b>	<b>0</b>	<b>0</b>

DELHI																				
<b>THERMAL</b>																				
Indraprastha (IP) TPS Unit-1		IPGCL	Coal	62.5	200	166	237	173.399652	143.4300274	215.0151704	3486.2	3474.29	3648	4021	1.58	0.98	1.5484	268.492	222.08705	332.9295
Indraprastha (IP) TPS Unit-2		IPGCL	Coal	62.5	275	176	150	238.424521	152.0703905	136.0855509	3486.2	3474.29	3648	4021	1.58	0.98	1.5484	369.1765	235.46579	210.7149
Indraprastha (IP) TPS Unit-3		IPGCL	Coal	62.5	110	247	284	95.3698085	213.4169684	257.6553096	3486.2	3474.29	3648	4021	1.58	0.98	1.5484	147.6706	330.45483	398.9355
Indraprastha (IP) TPS Unit-4		IPGCL	Coal	60	37	179	249	32.0789356	154.6624994	225.9020144	3486.2	3474.29	3648	4021	1.58	0.98	1.5484	49.67102	239.47941	349.7867
Rajghat Unit-1		IPGCL	Coal	67.5	429	332	342	383.848844	275.4931211	282.6326783	3597.8	3336.62	3323	4021	1.58	0.98	1.5484	594.3511	426.57351	437.6284
Rajghat Unit-2		IPGCL	Coal	67.5	419	441	360	374.901311	365.9411633	297.5080827	3597.8	3336.62	3323	4021	1.58	0.98	1.5484	580.4977	566.6231	460.6615
Wajpa Gas Turbine (CCGT)		Pr PCL	Gas	330.4	825	2406.1	2550.7	136.807774	398.997801	422.9764728	2061	2061	2061	12428.57	2.93	0.995	2.91535	398.8425	1163.2182	1233.124
Wajpa Gas Turbine (CCGT)		Pr PCL	Gas/HSD	282	1215	1214.55	1540.68	201.48054	201.405918	255.4872749	2061	2061	2061	12428.57	2.93	0.995	2.91535	587.3863	587.16874	744.8348
<b>TOTAL THERMAL (DELHI)</b>				<b>3510</b>	<b>5161.65</b>	<b>5713.38</b>	<b>3510</b>	<b>5161.65</b>	<b>5713.38</b>									<b>2996.09</b>	<b>3771.071</b>	<b>4168.63</b>

HARYANA																					
<b>THERMAL</b>																					
Faridabad extn Unit-1		HGPCor	Coal	55	320	252	286	341.836558	267.8557573	297.8070132	4295.39	4274	4187	4021	1.58	0.98	1.5484	529.2997	414.74785	461.1244	
Faridabad extn Unit-2		HGPCor	Coal	55	365	338	232	389.907324	359.266849	241.577717	4295.39	4274	4187	4021	1.58	0.98	1.5484	603.7325	556.28879	374.0589	
Faridabad extn Unit-3		HGPCor	Coal	55	293	204	350	312.994908	216.835613	364.449142	4295.39	4274	4187	4021	1.58	0.98	1.5484	484.6401	335.74826	564.3131	
Faridabad Diesel		HGPCor	Diesel	2	0	0	0	0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0	
Panipat Unit-1		HGPCor	Coal	110	560	610	507	443.936131	482.035016	400.959960	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	687.3907	746.3830	620.8464	
Panipat Unit-2		HGPCor	Coal	110	0	699	572	0	352.364715	452.365083	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	0	855.28157	700.4421	
Panipat Unit-3		HGPCor	Coal	110	530	733	624	420.153841	529.232200	333.031344	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	650.5661	806.5831	825.5461	
Panipat Unit-4		HGPCor	Coal	110	626	759	625	496.257118	599.779951	494.280029	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	768.4044	928.6621	765.3432	
Panipat Unit-5		HGPCor	Coal	210	1572	1648	1467	1246.19211	1302.284765	1160.174089	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	1929.604	2016.4577	1796.414	
Panipat Unit-6		HGPCor	Coal	210	1696	1501	1482	1344.4921	1186.122229	1172.036807	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	2081.812	1836.5917	1814.782	
Wajpa Gas Turbine (CCGT)		Magnum Power Generation Ltd.	Diesel	25.2	81.74	37.45	92.55	16.330568	5.484145987	18.4902627	2061	2061	2061	10316	3.2	0.99	3.168	51.73524	17.373774	58.57715	
Ambala (D.C.)		HGPCor	Diesel	1.918				0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0	
<b>TOTAL THERMAL (Haryana)</b>																	<b>7787.18</b>	<b>8604.452</b>	<b>7981.25</b>		
<b>HYDRO</b>																					
Western Yamuna Canal (WYC)		HGPCor	Hydro	48	243.31	252.55	283.89														
<b>TOTAL THERMAL (Haryana)</b>				<b>6043.74</b>	<b>6771.45</b>	<b>6287.55</b>															
<b>TOTAL HYDRO (Haryana)</b>				<b>48</b>	<b>243.31</b>	<b>252.55</b>	<b>283.89</b>														

HIMACHAL PRADESH																				
<b>THERMAL</b>																				
Keystone		HPSEB	Diesel	0.13				0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0
<b>HYDRO</b>																				
Giri bati		HPSEB	Hydro	60	168.43	167.90	152.15													
Bansa		HPSEB	Hydro	60	271.9	317.78	269.61													
Bansa		HPSEB	Hydro	6	28.3	31.23	32													
Ronglong +Nogli+Micro Hydro-Thini		HPSEB	Hydro	15.55	24.14	22.67	46.2													
Andhra		HPSEB	Hydro	16.95	70.31	69.55	56.31													
Bhabha (Samay)		HPSEB	Hydro	120	336.98	580.09	581.48													
Bansi		HPSEB	Hydro	12	33.91	40.21	42.62													
Gai		HPSEB	Hydro	10.5	39.61	45.09	50.41													
Gramma		HPSEB	Hydro	3	13.05	14.81	4.35													
Ghosi		HPSEB	Hydro	22.5	90.2	86.26	74.06													
Malana (IPP)		HPSEB	Hydro	86	109.31	363.76	268.08													
Baqua (IPP)		HPSEB	Hydro	300	2273.11	1196.82														
Sal - II HEP Station		HPSEB	Hydro	2																
Kaun		HPSEB	Hydro	1.5																
Gharola		HPSEB	Hydro	0.05																
<b>TOTAL THERMAL (HP)</b>				<b>0</b>	<b>0</b>	<b>0</b>														
<b>TOTAL HYDRO (HP)</b>				<b>1590.64</b>	<b>3996.69</b>	<b>2772.19</b>														

JAMMU & KASHMIR																			
<b>THERMAL</b>																			

**NORTHERN GRID** Calculated Values-Big colour  
**Baseline for FY 2002-03, 2003-04, 2004-05**

(Ref 1) Electricity Data 2002-03, 2003-04, CEA, General Review 2005, www.cem.nic.in  
 (2) NLDL Annual Report 2002-03, 2003-04, 2004-05, www.nldl.co.in  
 (3) Performance Review of Thermal Power Station 2002-03, 2003-04, 2004-05, CEA

**Data Collection from Different Sources-marked with different colours**

NLDL Annual Report 2002-03, 2003-04, 2004-05  
 Tariff Orders/Circulars  
 CEA General Review 2005  
 NTPC Presentation  
 CEA Performance Review of Thermal Power Station 2002-03, 2003-04, 2004-05  
 MNES Reg- Baseline for RE, not under CDM  
 CERC Website

**Formulas:**

Fuel Cons (Fi) '000 tons = (Gross Gen MU \* OHR kcal/kWh)/(NCV kcal/kg)  
 COEFFI (tCO2/kg of fuel) = (NCV\* EFCO2)\*OXID  
 OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas) - Ref. Revised 1996 IPCC Guidelines  
 NCV (kcal/kg) /Ref. Baseline for RE, project under CDM, MNES report/www.mnec.nic.in/baseline.htm  
 Coal (default)=4021, Lignite=2800, Gas/NG/LNG=12428.57, Diesel=10316, Naptha=10750

NCV + EFCO2/Ref. MNES Report  
 Coal (Default)=1.58  
 Lignite=1.19  
 Gas/NG/LNG=2.93  
 Diesel=3.2  
 Naptha=3.3

Name of the Plant	Year-Commission	Agency/Owner	Fuel Type	Inst.Cap. (MW)	Gross Gen. (MU) 2002-03	Gross Gen. (MU) 2003-04	Gross Gen. (MU) 2004-05	Fuel Cons. (Fi) (000 Tonnes) 2002-03	Fuel Cons. (Fi) (000 Tonnes) 2003-04	Fuel Cons. (Fi) (000 Tonnes) 2004-05	Oper. HR (kcal/ kWh) 2002-03	Oper. HR (kcal/ kWh) 2003-04	Oper. HR (kcal/ kWh) 2004-05	NCV kcal/kg	NCV x EFCO2 Kg of CO2/ Kg of fuel	COEFFI (kg of CO2/kg of fuel)	F1*COE 2002-03	F1*COE 2003-04	F1*COE 2004-05	F1(000 tCO2)	F1(000 tCO2)	F1(000 tCO2)	
																							OXID
Pampore (OCGT)		J&K PDC	Gas (Oil based-HSD)	175	58	29	23.74	13.6686682	6.834334119	5.59472731	2929	2929	2929	12428.57	2.93	0.995	2.91535	39.84895	19.924476	16.31059			
Berminia-5 (MW+Leb-2.18 MW)		J&K PDC	Diesel	7.18	0	0	0	0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0			
Kanab		J&K PDC	Diesel	0.06	0	0	0	0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0			
Upper Sindh		J&K PDC	Diesel	1.7	0	0	0	0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0			
<b>HYDRO</b>																							
Lower Jhelum		J&K PDC	Hydro	105	9.88	312.87	427.03																
Upper Sindh		J&K PDC	Hydro	127.6	310.55	266.36	121.7																
Gandohri		J&K PDC	Hydro	15	22.53	23.39	26.44																
Mohra		J&K PDC	Hydro	9	0	0	0																
Chenani		J&K PDC	Hydro	32.8	63.17	70.85	83.51																
Sakran		J&K PDC	Hydro	9.78	0	0	0																
Small Hydel		J&K PDC	Hydro	3.54	0	1.37	5.7																
Sewah-III		J&K PDC	Hydro	9																			
Jammu Canal		J&K PDC	Hydro	1																			
<b>TOTAL THERMAL (J&amp;K)</b>					183.94	58	29	23.74															
<b>TOTAL HYDRO (J&amp;K)</b>					312.69	406.12	864.64	719.78															

**PUNJAB**

<b>THERMAL</b>																						
Guru Nanak Dev TPS (Bhatinda) Unit-1		PSEB	Coal	110	571	632	631	455.073226	488.5999702	454.9288734	3204.64	3108.64	2899	4021	1.58	0.98	1.5484	704.6354	756.54819	704.4119		
Guru Nanak Dev TPS (Bhatinda) Unit-2		PSEB	Coal	110	612	654	0	487.749237	505.608197	0	3204.64	3108.64	2899	4021	1.58	0.98	1.5484	755.2309	782.88373	0		
Guru Nanak Dev TPS (Bhatinda) Unit-3		PSEB	Coal	110	681	614	696	542.740572	474.6841482	501.7915941	3204.64	3108.64	2899	4021	1.58	0.98	1.5484	840.3795	735.00094	776.9741		
Guru Nanak Dev TPS (Bhatinda) Unit-4		PSEB	Coal	110	635	651	666	506.079682	503.288933	480.1626461	3204.64	3108.64	2899	4021	1.58	0.98	1.5484	783.6138	779.29252	743.4838		
GHTP (Lehra Mohabbat) Unit 1		PSEB	Coal	210	1500	1670	1773	931.715991	1005.949689	1068.82666	2497.62	2422.11	2424	4021	1.58	0.98	1.5484	1442.669	1557.6125	1654.971		
GHTP (Lehra Mohabbat) Unit 2		PSEB	Coal	210	1406	1711	1536	873.328456	1030.646658	925.9547376	2497.62	2422.11	2424	4021	1.58	0.98	1.5484	1352.262	1595.8533	1433.748		
Guru Gobind Singh TPS (Ropar) Unit-1		PSEB	Coal	210	1214	1323	1600	793.190948	839.325713	1011.88759	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1228.177	1299.6086	1566.807		
Guru Gobind Singh TPS (Ropar) Unit-2		PSEB	Coal	210	1305	1515	1390	852.6476	961.1301666	879.0773439	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1320.24	1488.214	1361.163		
Guru Gobind Singh TPS (Ropar) Unit-3		PSEB	Coal	210	1459	1609	1502	953.266551	1020.764646	949.9094753	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1476.038	1580.552	1470.84		
Guru Gobind Singh TPS (Ropar) Unit-4		PSEB	Coal	210	1281	1166	1608	836.966725	739.7213032	1016.947028	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1295.959	1145.3845	1574.641		
Guru Gobind Singh TPS (Ropar) Unit-5		PSEB	Coal	210	1453	1457	1442	949.346332	924.3344243	911.964606	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1469.968	1431.2394	1412.085		
Guru Gobind Singh TPS (Ropar) Unit-6		PSEB	Coal	210	1533	1397	1545	1001.61592	886.2698632	977.1039542	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1550.962	1372.3003	1512.948		
Bhalkeri Rice Straw Fired		PSEB	Rice Straw	10	0	23.63	93.24	0	34.518704	136.204992	3652	3652	3652	2500	1.58	0.98	1.5484	0	53.448761	210.8998		
<b>HYDRO</b>																						
Jogindernagar Sharan		PSEB	Hydro	110	456.81	564.21	510.13															
Upper Behan Doab Canal (UBDC)		PSEB	Hydro	90	394.27	427.45	376.99															
Kanag Sagan		PSEB	Hydro	600	1441.93	1547.53	1131.35															
Makseran		PSEB	Hydro	207	787.3	1029.24	796.53															
Anandpur Sahib		PSEB	Hydro	134	236.02	816.32	387.65															
Small Hydel		Punjab Hydro P.L.	Hydro	4.1	8.63	5.66	1.4															
Dandhar		PSEB	Hydro	1.5																		
Rohli		PSEB	Hydro	0.8																		
Dhali		PSEB	Hydro	0.8																		
<b>TOTAL THERMAL (Punjab)</b>					13650	14422.6	14482.2															
<b>TOTAL HYDRO (Punjab)</b>					3525.56	4390.5	3294.07															

**RAJASTHAN**

<b>THERMAL</b>																						
Kota TPS Unit 1		BRVUNL	Coal	110	691	740	783	452.348088	495.9711515	524.7910967	2632.26	2695	2695	4021	1.58	0.98	1.5484	700.4158	767.96173	812.5865		
Kota TPS Unit 2		BRVUNL	Coal	110	865	721	846	566.253395	483.236757	567.0156677	2632.26	2695	2695	4021	1.58	0.98	1.5484	876.7868	748.24379	877.9671		







**NORTHERN GRID** Calculated Values-Big colour  
**Baseline for FY 2002-03, 2003-04, 2004-05**

(Ref 1) Electricity Data 2002-03, 2003-04, CEA, General Review 2005, www.cem.nic.in  
 (2) NRDC Annual Report 2002-03, 2003-04, 2004-05 www.nrdc.org  
 (3) Performance Review of Thermal Power Station 2002-03, 2003-04, 2004-05, CEA

**Data Collection from Different Sources-marked with different colours**

NRDC - Annual Report 2002-03, 2003-04, 2004-05  
 Tariff Orders/Circulars  
 CEA General Review 2005  
 NTPC Presentation  
 CEA Performance Review of Thermal Power Station 2003-03, 2003-04, 2004-05  
 MNES Regt - Baseline for RE proj under CDM  
 CERC Website

**Formulas:**

Fuel Cons (Fi) '000 tons = (Gross Gen MU \* OHR kcal/kWh)/(NCV kcal/kg)  
 COEfi (tCO2/kg of fuel) = (NCV\* EFCO2)\*OXID  
 OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas) - Ref. Revised 1996 IPCC Guidelines  
 NCV (kcal/kg)/Ref. Baseline for RE project under CDM, MNES report/www.mnec.nic.in/baseline/rep.htm  
 Gas=NG

**NCV \* EFCO2/Ref. MNES Report]**  
 Coal (Default)=1.58  
 Lignite=1.19  
 Gas/NG/LNG=2.93  
 Diesel=3.2  
 Naptha=3.3

**OXID values (Ref. Revised 1996 IPCC Guidelines)**

**Must Run and Low Cost Plants shall be eliminated from Baseline Calculations**

Name of the Plant	Year-Commission	Agency/Owner	Fuel Type	Inst.Cap. (MW)	Gross Gen. (MU) 2002-03	Gross Gen. (MU) 2003-04	Gross Gen. (MU) 2004-05	Fuel Cons. (Fi) (000 Tonnes) 2002-03	Fuel Cons. (Fi) (000 Tonnes) 2003-04	Fuel Cons. (Fi) (000 Tonnes) 2004-05	Oper. HR (kcal/ kWh) 2002-03	Oper. HR (kcal/ kWh) 2003-04	Oper. HR (kcal/ kWh) 2004-05	NCV Kcal/Kg	NCV x EFCO2 Kg of CO2/ Kg of fuel	OXID	COEfi (kg of CO2/kg of fuel)	F1*COE (tCO2) 2002-03	F1*COE (tCO2) 2003-04	F1*COE (tCO2) 2004-05
Asipathan Atomic Power Station (RAPS)		NPC	Nuclear	440	3460.4	2971.35	2619.4													
Narora Atomic Power Station (NAPS)		NPC	Nuclear	440	3572.1	3041.34	2441.04													
<b>BBMB (HYDRO)</b>																				
Complex		BBMB	Hydro	1490.15	6531.01	7060.7	4517.12													
Dekhar		BBMB	Hydro	900	3253.1	3337.27	3102.12													
Pune		BBMB	Hydro	396	763.85	1172.20	874.31													
<b>TOTAL THERMAL (CGS)</b>					8137	58852	59461	61727.5												
<b>TOTAL HYDRO (CGS)</b>					3810	8936.99	11400.6	15351												
<b>TOTAL NUCLEAR (CGS)</b>					1180	8571.92	7324.27	6255.93												
<b>TOTAL BBMB HYDRO (CGS)</b>					2876.15	10548	11510.3	8493.95												

**Operating Margin Emission Factor (EF OM)**

Simple OM Method:  
**EF OM simple = 2\*(F1\*COEfi) / (2\*Gross Gen.) (tCO2/MWh)**

**Build Margin Emission Factor (EF BM)**  
**EF BM = 2\*(F1\*COEfi) / (2\*Gross Gen.) (tCO2/MWh)**

Calculation of Build Margin shall include either of  
 (a) the 5 power plants that have been built most recently, or  
 (b) the power plants capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.  
 The large value of (a) or (b) should be used for calculating EF BM  
 Baseline Emission Factor (EF)  
**EF = WQM \* EF OM + WRM + WFBM (tCO2/MWh)**

Year	Gross Gen (MU's)	F1*COEfi (tCO2)	
			2002-03
2003-04	121417.7	116721	
2004-05	125404.3	119676	
<b>Total NR Generation 2003-04</b>			
Total NonTherm. Gen		167334.5 MU's	
Total Thermal Gen		459162.3 MU's	
Non-Thermal gen is less than 50% of total NR gen. So Simple OM Method use.			
2002-03	2003-04	2004-05	
EF OM Simple	0.96809	0.961315	0.954317
EF OM Simple Average of Three years	0.961241		tCO2/MWh

	Year	Gross Gen (MUs)	Fi*COEFi (000 tCO2)
Total Thermal	2002-03	116468.74	112752.2531
	2003-04	121417.73	116720.6657
	2004-05	125404.34	119675.5035
Total NR Generation 2003-04		167334.46 MUs	
Total NonTherm. Gen		45916.73 MUs	27.440092 %

Non Thermal gen is less than 50% of total NR gen .So **Simple OM Method** use

	2002-03	2003-04	2004-05	
EF OM Simple	0.96809026	0.9613148	0.95431708	tCO2/ MWh
EF OM Simple Average of Three years		0.9612407		tCO2/ MWh
EF BM		0.5743656		tCO2/ MWh

According to ACM 0002 for wind power projects the Combined margin is calculated as follows:

**Combined Margin Emission Factor EF = 75% EF OM + 25% EF BM**

Hence,

**EF 0.864522**

<b>Imports from others</b>	<b>2002-03</b>		<b>2003-04</b>		<b>2004-05</b>		<b>2005-06</b>	
Imports from WREB	186.39		282.02		1602.84		2153.23	
Imports from EREB	1019.53		2334.76		3600.58		4112.67	
EF (WREB), tCO <sub>2</sub> /GWh	910.00		910.00		906.00		884.00	<a href="http://mnes.nic.in/baselinepdfs/chapter2.pdf">http://mnes.nic.in/baselinepdfs/chapter2.pdf</a> EF of Western Grid has been considered
EF (EREB), tCO <sub>2</sub> /GWh	1192.00		1186.00		1178.00		1158.00	<a href="http://mnes.nic.in/baselinepdfs/chapter2.pdf">http://mnes.nic.in/baselinepdfs/chapter2.pdf</a> EF of Eastern Grid has been considered

As per ACM0002 the CO<sub>2</sub> emission factor for the net Electricity imports from the connected Electricity system, there is an option to consider 0 t CO<sub>2</sub>/ MWh as net electricity import. As the source of the plant importing to the grid is not known and the percentage of import is very less, this option has been used for net electricity imported.