The UNFCCC CDM Registration Team Germany

November 7, 2006

<u>Subject: Project No. 570 – 11.35 MW wind farm at Village Pohra, District Jaisalmer,</u> 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	Copies of the board resolution dated December 9,
	Limited	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	Copy of the board resolution dated July 25, 2004
	Limited	
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 gird of India (Northern Grid) are already registered with UNFCCC at a relatively higher baseline value namely:

Project Ref: 376 registered on 4th June 2006 with baseline emission factor of 0.95. Project Ref: 330 registered on 21st 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

Senergy Global Private Limited 9th Floor Eros Corporate Tower Nehru Place New Delhi – 110019



(A Government of India Recognised Star Trading House)

"Vishel House"

Opp Sales India, B/h. Oriental Sank of Commerce, Ashram Road, Ahmedabad - 380 009. INDIA

Tele 9091.79-7544591 Fax 0091-79-7541884 E-mail : vishelad1@sancharnet.in Website : www.vishelexports.com

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY AT THEIR MEETING HELD ON 9TH 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 coimbatore, the wind turbines may be procured form MIS Suzion 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 Kypto 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 gird 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 persone 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 Recognised Star Trading House)

"Vishal House"

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CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY AT THEIR MEETING HELD ON TUESDAY, 10^{1H} 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 Jaisaimer, 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 form M/S Suztlon 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 Kypto 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-triendly 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 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 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



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Tele 0091-79- 7543251, 7543321 7543019, 7543534 Fax 0091-79 - 7541894 E-Mail vishat@adt vsni net in

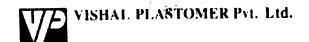
CERTIFIED/COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY AT THEIR MEETING HELD ON 23RD JULY, 2001 AT THE REGISTERED OFFICE OF THE COMPANY.

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 Rajasthari. 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 effection, 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 effection and installation of the same.

The Chairman also added that in the light of the Kypto 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.



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The Board passed the following resolution:

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"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 Jaiselmer 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 Suzion 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

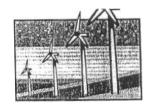
CERTIFIED TO BE TRUE FOR VISHAL PLASTOMER PRIVATE LIMITED

DIPAK S. MEHTA DIRECTOR

Mumbai Office 18 Niraj Ind Estate, Off Mahakali Caves Road Bih Paper Box Estate, Andheri (E), Mumbai - 400 083 ∠NDIA:
Tele 0091 - 22 - 8384337, 8386490 ● Fax: 0091 - 22 - 8386363

1 1

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 you 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 from 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



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

Luhodio

TIN: 08092706318 Ø 94141-29473

M/s. VIJAY BHAWNANI

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

Dated 10 3 2004

Ref. NoDated :-

Mr. Rohit Chauhan Susion energy Limited Jaipur (Rajasthan)

Thank you very much for the mosting explanining the benefits of installing Sussian wind turbines in comparison to the wind turbines already abaliable 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 Kyote Pretocol, wich you had briefed me the meetion. I would be glad if you can send me more details regarding the same.

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

Thanking You,

Yours faithfully, Vijay Bhewagani

TIN: 08972706319 93147-12755

M/s. PRAKASH BHAWNANI

Plot No. 868, 12th C Road, Sardarpura, JODEPUR

Dated 10 | 8 | 2004

Ref. No Dated :-

Mr. Rohit Chauhan Susion energey Limited Jaipur (Rajasthan)

Thank you very much for the meeting explanining the benefits of installing Suzolen wind turbines in comparison to the wind turbines already abaliable 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 Kyete Protocol, with you had briefed me the meetien. I would be gird if you can send me more details regarding the same.

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

Thanking You,

Yours faithfully, Prekast Bhawanani

TIN: 08882706320

M/s. DEEPAK BHAWNANI

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

Dated 10 8 200 4

Ref. No. Dated :-

Mr. Rohit Chanhan Susion energy Limited Japur (Rajasthan)

Thank you very much for the meeting explanining the benefits of installing Suzolon wind turbines in comparison to the wind turbines already abuliable 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 Kyete Protocol, wich you had briefed me the meetien. I would be gird if you can send me more details regarding the same.

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

Thanking You,

Yours faithfully, Doopak Bhawanani

TIN: 08792706321 © 0291-2430895

M/s. Rajni K. Bhawnani

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

Dated 10 8 200 4

Ref. No. Dated:-Mr. Rehit Chauhan Susion energy Limited

Jaipur (Rajasthan)

Thank you very much for the meeting explanining the benefits of installing Sussian wind turbines in comparison to the wind turbines already abaliable 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 Kyote Protocol, wick you had briefed me the meetion. I would be gird if you can send me more details regarding the same.

All those details would help me in making the decries to invest in wind energy.

Thanking You,

Yours falthfully, Raini Bhawanani

Dated: 25.07.2004

To,

Mr. Rohit ChauhanSuzlon 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 Woollen Yarn

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

TIN -08221353048 CST/RST No. 0712/03090 ■2545213, 2547172 (O), 2547722 (R) email- arorawool@sancharnet.in

email- arorawool@yahoo.com Fax: 0151-2204126

Ref.	No.					
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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 25th 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)

JAIPUR-302001, INDIA.

Tel: (0141)2 371128, 2371236

Fax: (0141)2 371186

E-mail:

klkm@kkjaipur.com

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.

haiyalal Kalyanmal

(O.P. Mittal) **Partner**



भारतीय अक्षय ऊर्जा विकास संस्था सीमित

(मास्त सरकार का प्रतिष्ठान)

Indian Renewable Energy Development Agency Limited (A Government of India Enterprise)



Speed Post

No.221/2228/WE/2003 - IREDA

15th 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)

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 Jaisaimer 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.

पंजीकृत एवं मुख्य कार्यालय : भारत पर्यावास केन्द्र, कोर-4-ए, ईस्ट कोर्ट, प्रथम तल, लोदी रोड, नई दिल्ली-110 003 दूरमाष : 24682214-21 फैक्स : 011-24682202 तार : आल्टरगेट-एनडी-3, ई-मेल : mdireda@rediffmail.com येव साईट : http://iredaltd.com

Regd. & Head Office: India Habitat Centre, Core-4 'A' East Court, 1st Floor, Lodhi Road, New Delhi-110003 Phones: 24682214-21 Fax: 011-24682202, Gram: ALTERNATE-ND-3, E-mail: mdireda@rediffmail.com Website: http://iredaltd.com

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- 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.
- In case the above terms and conditions are acceptable to you,
 - 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 drawls of loan indicating probable dates and amounts of drawls.
- 6. Please note that IREDA reserves the right to review/revoke the sanctioned loan and in case the loan has already been disbursed to withheld 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 submits 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 21⁵⁵ October, 2003. Meanwhile kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,

(K.S. Sridharan) Chief Ceneral 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 15th September. 2003 issued to M/s. Vishal Exports Overseas Ltd.

1.Rupee Loan:

i) <u>Amount</u>: 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 31st March, 30th June, 30th September and 31st 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	2.00%
date of disbursement of first interim loan. c) Above 6 months and upto 9 months from the	2/50%
date of disbursement of first interim loan.	

V) <u>Further interest</u>:

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 gurrent 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 31st March, 30th June, 30th September and 31st December, each year.

VIII) Last dates of Withdrawai 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:-

- ()) 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.

Project: Setting-up of 8.25 MW (5 Nos. of 1250 KW WEC) Wind Farm Project to be set up at Village Pohara, District Jaisalmer in the State of Rajasthan \cdot Under Project Financing Scheme.

(A) Details of Project Cost:

(X)

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
Total	2445.00
Cost per MW	391.20

(E) Means of Finance:

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

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 Ioan. 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. Suzion 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. Suzion Energy Limited shall abide by the decision of IREDA and shall not raise any objection thereto.
- 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 itemwise 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 <u>precedent to the execution of Loan Documents well before signing of Loan Agreement.</u>
- (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

- (15) The Sorrower 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)
 - calcilibration of the Borrower shall give an undertaking to IREDA and shall satisfy IREDA that the Manufacturers of Wind Turbines, M/s. Suzion 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 Nonconventional 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. Suzion 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.

- 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 Covernment 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.
- 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 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.
- 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 consider essential.
- 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.
- 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.
- 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.

- 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.
- 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 desclose 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.

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- 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 ioan of IREDA and that the Borrower shall abide by the decision of IREDA and that the Borrower shall not raise any objection thereto.
- 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 Jalsalmer 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

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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		IP Malana Powe	Hydro	43	133.04					
Malana Unit2		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 plai	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 plan	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
					35160.9591					20195.24615

 $EFBM = \Sigma(Fi*COEFi) / \Sigma(Gross Gen.)$ (tCO2/ 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

NORTHER	N GRID		Calculate	d Values-E	l/g colour				Data Collection	on from Differ	ent Sources-	arked with	lifferent col	ours				1			Formulae:
Baseline for	FY 2002-	-03, 2003-	2003-04, 2004-05 14, CEA, General Review 2005, www.cea.nic.in						Data Collection from Different Sources-marked with different colours NRLDC Annual Report 2002-03, 2003-04, 2004-05 Tariff (Tariff Orders/Orders 1 GWh=1 MU					Fuel Cons (Fi) '000 tons = (Gross Gen MU * OHR kcal/kWh)/(NCV kcal/kg)
tef: (1) Electricity) NRLDC Annual					vw.cea.nic.in					Review 2005 ance Review or	f Thermal Pow	er Station20	03-03, 2003	-04, 2004-0	5	NTPC Pr	esentation	1	1 MWh= 1 STEAM =	00 kWh	COEFi (tCO2/kg of fuel) = (NCV* EFCO2)*OXID OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas)- Ref: Revised 1996 IPCC Guidelines
Performance Re	view of Therm				-05; CEA				MNES Rept -	Baseline for RI	E proj under Cl	OM			one	CERC W	ebsite		Gas=NG		NCV (kcal/kg) /Rsf: Baseline for RE projects under CDM, MNES report/www.mnes.nic.iw/baselinerps Coal (default)=4021,Lignite=2800, Gas/NG/LNG=12428.57, Diesel=10316, Naptha=
		OXID valu	es (Ref:Revisa	a 1996 IPC C	Gross	Gross	Gross	Fuel	Fuel Cons.	Fuel Cons.		Oper. HR	Oper. HR	e Calculati	NCV x		COEFi	Fi*COE	Fi*COEF	Fi°COE	Coai (detauti)=4021;Lignite=2800; Gas/NG/LNG=12428.57; Diesei=10316; Napina=
ame of the Plant	Year- Commiss	Agency/ Owner	Fuel Type	Inst.Cap. (MW)	Gen. (MU)	Gen. (MU)	Gen. (MU)	Cons. (Fi) (000	(Fi) (000 Tonnes)	(Fi) (000 Tonnes)	Oper. HR (kcal/ kWh)	(keal/ kWh)	(kcal/ kWh)	NCV Keal/Kg	EFCO2 Kg of	OXID	(kg of CO2/kg	Fi (000	(000 tCO2)	Fi (000 tCO2)	
	ion	Owner	1,700	()	2002-03	2003-04	2004-05	Tonnes) 2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	remore	CO2/ Kg of fuel		of fuel)	2002-03	2003-04	2004-05	
						CHAN	DIGAR	Н													
HERMAL		Govt				1										1					1
iesel 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	
OTAL TH	ERMAL	(Chandig	arh)	2	0	0	0									1		0	0	0	
						DELH	ī														1
HERMAL																					-
draprastha P) TPS Unit-		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	
draprastha P) TPS Unit-		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	
draprastha P) TPS Unit-		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	398.9535	
draprastha		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	
ajghat Unit-1		IPGCL	Coal	67.5	429	332	342	383.848844	275.4931211	282.6326784	3597.8	3336.62	3323	4021	1.58	0.98	1.5484	594.3515	426.57355	437.6284	
ajghat Unit-2 agati Gas		IPGCL	Coal	67.5	419	441	360	374.901318	365.9411639	297.5080826	3597.8	3336.62	3323	4021	1.58	0.98	1.5484		566.6233	460.6615	
arbines (CGT)		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	
P.Gas urbines		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	
CCGT)					3510	5161.65	5713 38											2996.09	3771 071	4168.63	
OTAL TH	ERMAL	(DELHI)			3510	5161.65		,										2770.07	5771.071		
						HARY	ANA														1
HERMAL						HAKI	AIIA														<u>.</u>
ridabad extn nit-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	
ridabad extn nit-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	
ridabad extn		HGPCor	Coal	55	293	204	350	312.994098	216.835613	364.449142	4295.39	4274	4187	4021	1.58	0.98	1.5484	484.6401	335.74826	564.3131	
nit-3 aridabad		HGPCor	Diesel	2				0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0	
niesel anipat Unit-1		HGPCor	Coal	110	560	610	507	443.936135	482.0350162	400.9599602	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	687.3907	746.38302	620.8464	
anipat Unit-2 anipat Unit-3		HGPCor HGPCor	Coal	110 110	0 530	699 733	572 674	0 420.153842	552.3647152	452.3650833 533.0315842	3187.62 3187.62	3177.48 3177.48	3180 3180	4021 4021	1.58	0.98	1.5484	0 650.5662	855.28153 896.8832	700.4421 825.3461	
anipat Unit-4 anipat Unit-5		HGPCor HGPCor	Coal	110 210	626 1572	759 1648			599.777995: 1302.28476:		3187.62 3187.62	3177.48 3177.48	3180 3180	4021	1.58	0.98		768.4046 1929.604			
anipat Unit-€		HGPCor	Coal	210	1696	1501	1482	1344.4923	1186.122228	1172.036801	3187.62	3177.48	3180	4021	1.58	0.98	1.5484	2081.812	1836.5917	1814.782	
fagnum Diesel		Power	Diesel	25.2	81.74	27.45	92.55	16 330568	5.484145987	18.4902627	2061	2061	2061	10316	3.2	0.99	3.168	51.73524	17.373774	58.57715	
IPP)		Generation Ltd					,														
mbala (D.C)		HGPCor	Diesel	1.918				0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	7787.18	0 8604.452	7091 25	
estern amuna Canal		HGPCor	Hydro	48	243.31	252.55	283.89													1701123	
WYC)		Horeo	Tiyulo	40	245.51	232.33	283.89														
OTAL TH	ERMAL	(Haryana	1)			6771.45															
OTAL HY	DRO (Ha	aryana)		48	243.31	252.55	283.89	1	1												
						HIMA	CHAL I	PRADES	Н												1
HERMAL		unarn	m								1 2001			10017			2.100				-
eylong IYDRO		HPSEB	Diesel	0.13	·	1	1	0	0	0	2061	2061	2061	10316	3.2	0.99	3.168	0	0	0	J
iri bata assi		HPSEB HPSEB	Hydro Hydro	60	168.43 271.9	167.99 315.75	152.19 269.61														-
inwa onotono		HPSEB	Hydro	6	24.3	34.27	32														1
Nogli+Micro		HPSEB	Hydro	15.55	24.14	22.67	46.2														
ydel+Thirot ndhra		HPSEB	Hydro	16.95	70.31	69.55	56.31														1
habha Sanjay)		HPSEB	Hydro	120	536.98	580.09	581.48														
		HPSEB HPSEB	Hydro Hydro	12 10.5	32.91 39.91	40.21 48.09	42.62 50.47														-
aner aj		HPSEB HPSEB	Hydro Hydro	3	12.05	14.81	4.35														1
aner aj umma		ALL DEED	Hydro	86	329.51	363.76	266.08														1
aner aj umma hanvi		Malana HE	riyaro				1	i .	1	1	1	i .	1	-	-	 	†				1
aner aj umma hanvi lalana (IPP)		Project JaiPrakash	Hydro	300		2273.11	1196.82														
aner aj umma hanvi		Project JaiPrakash HP Ltd	Hydro	300		2273.11	1196.82														
aner aj umma hanvi alana (IPP) aspa (IPP) al - II HEP ation		Project JaiPrakash	***	300 2 1.5		2273.11	1196.82														
aner aj umma hanvi falana (IPP)		Project JaiPrakash HP Ltd HPSEB	Hydro Hydro	2		2273.11	1196.82														
mer ji		Project JaiPrakash HP Ltd HPSEB HPSEB HPSEB	Hydro Hydro	2	0	0	0														
mer ij mmma sanvi alana (IPP) spa (IPP) 1 - II HEP ation skti sarola		Project JaiPrakash HP Ltd HPSEB HPSEB HPSEB	Hydro Hydro	2			0														

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

NORTHER					B/g colour				Data Collection	n from Differ	ent Sources-m	arked with a	lifferent colo	urs							Formulae:
Baseline for	FY 2002	-03, 2003-	04, 2004	-05		IPP			NRLDC Annu	al Report 2002	2-03, 2003-04,	2004-05				Tariff Ore	ders/Orders		1 GWh=1 N	4U	Fuel Cons (Fi) '000 tons = (Gross Gen MU * OHR kcal/kWh)/(NCV kcal/kg)
(Ref. (1) Electricity	Data 2002-03	, 2003-04, CE	A, General Re	view 2005, w	ww.cea.nic.in				CEA General	Review 2005						NTPC Pro	esentation		1 MWh= 10	000 kWh	COEFi (tCO2/kg of fuel) = (NCV* EFCO2)*OXID
(2) NRLDC Annua	Report2002-	03, 2003-04, 2	004-05 www.	nrlde.org					CEA Performa	nce Review o	f Thermal Pow	er Station20	03-03, 2003	-04, 2004-0	5			1	STEAM =	COAL	OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas)- Ref: Revised 1996 IPCC Guidelines
(3) Performance Re	view of Therr	nal Power Stati	ons 2002-03.	2003-04, 200	4-05: CEA				MNES Rept -I	Baseline for RI	E proj under Cl	OM				CERC W	ebsite	-	Gas=NG		NCV (kcal/kg) (Ref: Baseline for RE projects under CDM, MNES report)www.mnes.nic.in/baselinerpt.htm
		OXID valu							Must Run and	Low Cost Pl	ants shall be e	liminated f	rom Baselin	e Calculati	ons						Coal (default)=4021, Lignite=2800, Gas/NG/LNG=12428.57, Diesel=10316, Naptha=10750
Name of the Plant	Year- Commiss ion	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	OXID	(kg of CO2/kg	Fi (000 tCO2)	Fi*COEFi (000 tCO2) 2003-04	Fi°COE Fi (000 tCO2) 2004-05	
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	
Diesel Gen Set (Bemina-5 MW+ Leh-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	
Kamah		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	
HYDRO																		39.849	19.92448	16.3106	
Lower Jhelum		J&K PDC	Hydro	105	9.88	512.87	427.03														
Upper Sindh		J&K PDC	Hydro	127.6	310.55	256.16	177.1														
Ganderbal		J&K PDC	Hydro	15	22.52	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														
Stakna		J&K PDC	Hydro	9.75	0	0	0														
Small Hyde			Hydro	3.54	0	1.37	5.7														

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

TOTAL THERMAL (J&K) 183.94 58 29 23.74 TOTAL HYDRO (J&K) 312.69 406.12 864.64 719.78

PUNJAB

THE PARTY OF THE																			
THERMAL																			
juru Nanak																			
Dev TPS.																			
Bhatinda)	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	704.4
Jnit-1																			
juru Nanak		+	1	1															-
Dev TPS.																			
Bhatinda)	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
Jnit-2 Juru Nanak																			-
Dev TPS,	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	776.9
Bhatinda)																110 10 1			
Jnit-3																			
iuru Nanak																			
Dev TPS,	PSEB	Coal	110	635	651	666	506 070692	503.2888933	480.1626461	3204.64	3108.64	2899	4021	1.58	0.98	1.5484	783.6138	779.29252	743.4
Bhatinda)	Lara	Coai	110	033	0.51	000	300.079082	303.2000933	480.1020401	3204.04	3100.04	2099	4021	1.56	0.78	1.3404	783.0138	119.29232	743.4
Jnit-4																			
GHTP (Lehra																			
Mohabbat) Unit	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
																110 10 1			100
GHTP (Lehra																			
Mohabbat) Unit	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
vionabbat) Unit	Lara	Coai	210	1400	1/11	1550	873.326430	1030.040038	923.9347370	2497.02	2422.11	2424	4021	1.56	0.78	1.3404	1332.202	1393.6333	1433
Guru Gobind			_	_															1
	PSEB	Coal	210	1214	1323	1600	#02 1000 to	839.3235713	1011.88759	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1228.177	1299.6086	1566
Singh TPS	PSEB	Coal	210	1214	1323	1600	/93.190948	839.3235/13	1011.88759	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1228.1//	1299.6086	1566
Ropar) Unit-1																			_
Guru Gobind																			
Singh TPS	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
Ropar) Unit-2																			
Guru Gobind																			
Singh TPS	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
Ropar) Unit-3																			
Guru Gobind																			
Singh TPS	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
Ropar) Unit-4													1						
Guru Gobind																			
Singh TPS	PSEB	Coal	210	1453	1457	1442	040 346332	924.3344243	911 9636906	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1469.968	1431.2394	1412
Ropar) Unit-5	, oll	Com	210	1455	1457	1-1-12	747.540552	724.3344243	711.7030700	2027.2	2330.70	2545	4021	1.50	0.50	1.5404	1407.700	1431.2374	1412
Guru Gobind		+	1	1															+
Singh TPS	PSEB	Coal	210	1533	1397	1545	1001.61592	886.2698632	977.1039542	2627.2	2550.96	2543	4021	1.58	0.98	1.5484	1550.902	1372.3003	1512
	PSEB	Coai	210	1555	1397	1343	1001.61392	880.2098032	977.1039342	2027.2	2330.96	2343	4021	1.58	0.98	1.3464	1550.902	1372.3003	1512
Ropar) Unit-6																			-
halkeri Rice	PSEB	Rice	10	0	23.63	93.24	0	34.518704	136.204992	3652	3652	3652	2500	1.58	0.98	1.5484	0	53.448761	210.8
Straw Fired		Straw																	
HYDRO																	14220.1	14577.94	144
ogindemagar/	PSEB	Hydro	110	456.81	564.21	510.13													
Shanan	PSEB	riyuro	110	430.81	304.21	510.13													
Jpper Behari																			
Doab Canal	PSEB	Hydro	90	394.27	427.45	376.99													
UBDC)		11,541.0		0.7 1.0.7	12.111														
Ranjit Sagar	PSEB	Hydro	600	1141.02	1547 50	1121 27													_
Aukerian	PSEB	Hydro	207	787.9	1020.24	706.52	-												-
					1027.29	190.33	 	l							 	_	-		+
mandpur Sahib	PSEB	Hydro	134	736.02	816.35	387.65					1	l						l	
	Domink	+	+	+			+	 	-						_	_	_		+-
	Punjab	L	1	0.00							1	l						l	
imall Hydel	Hydro P	Hydro	4.1	8.63	5.66	1.4	1	l			1				1	l	1		1
	Ltd																		_
Dandhar	PSEB	Hydro	1.5																
	PSEB	Hydro	0.8	1			1												1 -
Rohil	PSEB		0.8																

					RAJAS	THAN													
THERMAL					RAJAC	HIMIN													
Kota TPS Unit	RRVUNL	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	RRVUNL	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

NORTHER	N GRID		Calculate	d Values-I	3/g colour				Data Collectio	on from Differ	ent Sources-m	arked with a	lifferent col	ours							Formulae:
Baseline for	FY 2002	2-03, 2003	04, 2004	-05		IPP			NRLDC Annu	al Report 2002	2-03, 2003-04,	2004-05				Tariff Ord	ders/Orders		1 GWh=1 ?	4U	Fuel Cons (Fi) '000 tons = (Gross Gen MU * OHR kcal/kWh)/(NCV kcal/kg)
Ref. (1) Electricity					ww.cea.nic.in				CEA General							NTPC Pre	esentation		1 MWh= 1		COEFi (tCO2/kg of fuel) = (NCV* EFCO2)*OXID
2) NRLDC Annual									CEA Performa				03-03, 2003	-04, 2004-0	5				STEAM =	COAL	OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas)- Ref: Revised 1996 IPCC Guidelines
3) Performance Re	view of Therr								MNES Rept -I							CERC W	ebsite		Gas=NG		NCV (kcal/kg) [Ref: Baseline for RE projects under CDM, MNES report]www.mnes.nic.in/baselinerpt.ht
		OXID valu	ies (Ref:Revis	ed 1996 IPCC				Fuel	Must Run and		ants shall be			e Calculati	NCV x	_		_			Coal (default)=4021,Lignite=2800, Gas/NG/LNG=12428.57, Diesel=10316, Naptha=107
Name of the Plant	Year- Commiss ion	Agency/ Owner	Fuel Type	Inst.Cap. (MW)	Gross Gen. (MU) 2002-03	Gross Gen. (MU) 2003-04	Gross Gen. (MU) 2004-05	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 Keal/Kg	EFCO2 Kg of CO2/Kg of fuel	OXID	COEFi (kg of CO2 /kg of fuel)	Fi*COE Fi (000 tCO2) 2002-03	Fi*COEFi (000 tCO2) 2003-04	Fi°COE Fi (000 tCO2) 2004-05	
tota TPS Unit		RRVUNL	Coal	210	1701	1636	1671	1113.52257	1096.498383	1119.956478	2632.26	2695	2695	4021	1.58	0.98	1.5484	1724.178	1697.8181	1734.141	
Cota TPS Unit		RRVUNL	Coal	210	1681	1674	1662	1100.43001	1121.967172	1113.924397	2632.26	2695	2695	4021	1.58	0.98	1.5484	1703.906	1737.254	1724.801	
Cota TPS Unit		RRVUNL	Coal	210	1616	1624	1316	1057.87917	1088.455608	882.024372	2632.26	2695	2695	4021	1.58	0.98	1.5484	1638.02	1685.3647	1365.727	
Cota TPS Unit		RRVUNL	Coal	195	0	169	1470	0	113.2690873	985.2399901	2632.26	2695	2695	4021	1.58	0.98	1.5484	0	175.38585	1525.546	
uratgarh Unit		RRVUNL	Coal	250	1986	1430	1876	1204.74286	867.4633922	1138.014912	2439.21	2439.21	2439.21	4021	1.58	0.98	1.5484	1865.424	1343.1803	1762.102	
uratgarh Unit		RRVUNL	Coal	250	1867	1856	1704	1132.55535	1125.882557	1033.676658	2439.21	2439.21	2439.21	4021	1.58	0.98	1.5484	1753.649	1743.3166	1600.545	
uratgarh Unit		RRVUNL	Coal	250	1888	1765	1876	1145.29432	1070.680341	1138.014912	2439.21	2439.21	2439.21	4021	1.58	0.98	1.5484	1773.374	1657.8414	1762.102	
uratgarh Unit		RRVUNL	Coal	250	1221	1960	1951	740.680281	1188.970803	1183.511243	2439.21	2439.21	2439.21	4021	1.58	0.98	1.5484	1146.869	1841.0024	1832.549	
uratgarh Unit		RRVUNL	Coal	250	0	1133	1955	0	687.2979184	1185.937714	2439.21	2439.21	2439.21	4021	1.58	0.98	1.5484	0	1064.2121	1836.306	
tamgarh Gas PS (CCGT)		RRVUNL	Gas/HSD	113.8	161	241	359.93	39.5874988	59.25830566	88.50141891	3056	3056	3056	12428.57	2.93	0.995	2.91535	115.4114	172.7587	258.0126	
ragati CCGT tage-II GT-2		RRVUNL	Gas	37.5				0	0	0	2061	2061	2061	12428.57	2.93	0.995	2.91535	0	0	0	
IYDRO																		13298	14634.34	17092.4	
Aahi Bajaj agar		RRVUNL	Hydro	140	22.01	191.64	248.03														
tana Pratap lagar (RPS)		Chambal	Hydro	172	9.84	240.46	377.85														
awahar Sagar JS)		Chambal	Hydro	99	16.73	203.5	280.64														
Anoopgarh		RRVUNL	Hydro	9	5.02	8.54	9.95														
imall Hydro		RRVUNL	Hydro	14.85	7.18	11.67	10.36														

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

Deep Unit 6 UPPR Dear Limit 7 UPPR Dear Limit 7 UPPR Dear Limit 8 UPPR Dear Limit 8 UPPR Dear Limit 9 UPPR Dear Limit 9 UPPR Dear Limit 10 UPPR Dear Limit 11 UPPR Dear Limit 11 UPPR Dear Limit 12 UPPR Dear Limit 13 UPPR Dear Limit 13 UPPR Dear Limit 13 UPPR Dear Limit 14 UPPR Dear Limit 15 UPPR Dear Limit 16 UPPR Dear Limit 17 UPPR Dear Limit 17 UPPR Dear Limit 17 UPPR Dear Limit 18 UPPR Dear Limit 19	SVUN 6 SV	Coal	40 40 40 40 94 94 92 200 200 200 200 32 105 40 60	0 80 234 154 315 276 0 1059 1130 953 1114 1229 0 574 443 0 256	0 0 2222 196 274 90 0 845 1117 1074 1188 1241 0 513 565 0	0 0 171 108 138 0 123 1009 738 1169 1054 0 0 578 465 0	0 60.9382741 178.244452 117.306178 239.944452 210.237046 0 799.422534 853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827 157.513056	219.945476; 72.24486444 0 663.887142; 877.588092; 877.588092; 975.0105844 0 424.479751; 467.5069386 0 155.7821437	0 0 139.4876894 88.09748815 112.569012; 0 100.3332508 788.632181 766.599104; 560.70380; 888.169095; 800.7883611 0 90.00746083 149.7239493	3062.91 3062.91 3062.91 3062.91 3062.91 3062.91 3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39	3227.74 3227.74 3227.74 3227.74 3227.74 3227.74 3227.74 3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3327.16	3280 3280 3280 3280 3280 3280 3280 3055 3055 3055 3055 3055 3055 3055 30	4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	0 94.35682 275.9931 181.6365 371.53 325.531 0 1237.826 1302.113 1113.926 1302.113 0 759.1396 578.9405 0 343.0586	0 0 275.93107 243.61482 340.56358 111.86395 0 1027.9625 1358.8574 1306.5465 1445.2306 0 657.26445 723.88774 0 241.21307	868.1 1375 1239 0 735.2 591.
PROBLIST PROBLIST	SVUN 6 SV	Coal	40 40 40 94 94 94 200 200 200 200 200 32 105 105 40 60	80 234 315 276 0 1059 1130 953 1114 1229 0 574 443 0 256	0 222 196 274 90 0 845 1117 1074 1188 1241 0 513 565 0	0 171 108 138 0 123 1038 1009 738 1169 1054 0 578 465 0	60.9382741 178.244452 117.306178 239.944454 210.23704c 0 799.422534 853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827 157.513056	0 178 203995 157 333260 219 945476; 72 2448644 0 663 887142; 843 804486; 933 370325; 975 010584 467.506938; 0 155.7821437	0 139.4876890 88.09748811 112.5690121 0 100.3332504 788.632181 766.5991041 560.70380! 888.160905; 888.160905; 888.160905; 90.07845031 0 90.00746083	3062.91 3062.91 3062.91 3062.91 3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39	3227.74 3227.74 3227.74 3227.74 3227.74 3227.74 3227.74 3227.74 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16	3280 3280 3280 3280 3280 3280 3055 3055 3055 3055 3055 3054 304 3304 3	4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	94.35682 275.9931 181.6365 371.53 325.531 0 1237.826 1302.113 1436.533 0 750.1396 578.9405 0	0 275.93107 243.61482 340.66358 111.86395 0 1027.9625 1358.8574 1306.5465 1445.2306 0 657.26445 723.88774 0 241.21307	0 215.9 136.4 174.3 0 155. 1221 1187 868.1 1375 1239 0 735.3 591. 0
Potes Limit 4	EVUN (EVUN (Coal	40 40 94 94 94 92 200 200 200 200 32 105 105 60	234 154 315 276 0 1059 1130 953 1114 1229 0 574 443 0 256 182	222 196 274 90 0 845 1117 1074 1188 1241 0 513 565 0	171 108 138 0 123 1038 1009 738 1169 1054 0 578 465 0	178 244452 117 306178 239 944452 210 237046 0 79 42253, 853.019324 719,404792 840.941174 927.752875 0 484.461133 373.895966 0 221.556827 157.513056	178 20399; 157.333260; 219.945476; 72 2448644; 0 663.887142; 877.588092; 843.804486; 0 424.479751; 467.506938; 0 155.7821437 197.3240487	139.487689¢ 88.09748816 112.569012; 0 100.333250¢ 788.632181 766.599104; 560.70380; 888.160905; 888.160905; 800.7883611 0 474.9345934 382.0840587; 0 90.00746083	3062.91 3062.91 3062.91 3062.91 3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3393.76 3393.76 3480	3227.74 3227.74 3227.74 3227.74 3227.74 3257.74 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480	3280 3280 3280 3280 3280 3055 3055 3055 3055 3055 3304 3304 330	4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	275.9937 181.6365 371.53 325.531 0 1237.826 1320.815 1113.926 1302.113 1436.533 0 750.1396 578.9405 0	275.93107 243.61482 340.56358 111.86395 0 1027.9625 1358.8574 1305.5465 1445.2306 1509.7064 0 657.26445 723.88774 0 241.21307	215.9 136.4 174.1 155.1 1221 1187 868. 1375 1239 0 735.1 591.
	VUN 6	Coal	40 94 94 94 200 200 200 200 200 32 105 40 60	154 315 276 0 1059 1130 953 1114 1229 0 574 443 0 256	196 274 90 0 845 1117 1074 1188 1241 0 513 565 0	108 138 0 123 1038 1009 738 1169 1054 0 578 465 0	117.306178 239.944454 210.237046 0 799.42253 853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827	157.333260: 219.945476; 72.2448644; 0 663.887142; 877.588092; 843.804486; 933.370325; 975.010584; 0 467.506938; 0 155.7821437	88.09748815 112.5690127 0 100.3332504 788.632181 766.5991047, 560.703805 888.1609052 800.7883611 0 474.9345934 382.0840587 0 90.00746083	3062.91 3062.91 3062.91 3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39 3035.39	3227.74 3227.74 3227.74 3227.74 3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3480	3280 3280 3280 3280 3055 3055 3055 3055 3055 3304 3304 330	4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	181.6365 371.53 325.531 0 1237.826 1320.815 1113.926 1302.113 1436.533 0 750.1396 578.9405 0	243.61482 340.56358 111.86395 0 1027.9625 1358.8574 1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0 241.21307	136. 174. (155. 1221. 1187. 868. 1375. (2735. 591. (39.
West Daris 6 1989	EVUN (EVUN (Coal	94 94 94 94 200 200 200 200 200 32 105 40 60 60	315 276 0 1059 1130 953 1114 1229 0 574 443 0 256	274 90 0 845 1117 1074 1188 1241 0 513 565 0 180 228	138 0 123 1038 1009 738 1169 1054 0 578 465 0 104	239.944454 210.237046 799.422534 853.019324 719.404792 840.94174 927.752875 0 484.461135 373.895966 0 221.556827	219.945476; 72.24486444 0 663.887142; 877.588092; 933.370325; 975.0105844 0 424.479751; 467.5069386 0	112.5690127 0 100.3332504 788.632181 766.5991047 560.703805 888.1609052 800.7883611 0 474.9345934 382.0840587 0 90.00746083	3062.91 3062.91 3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3393.76 3393.76 3480	3227.74 3227.74 3227.74 3257.74 3159.16 3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480	3280 3280 3280 3055 3055 3055 3055 3055 3055 3304 3304	4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	371.53 325.531 0 1237.826 1320.815 1113.926 1302.113 0 750.1396 578.9405 0 343.0586	340.56358 111.86395 0 1027.9625 1358.8574 1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0	174. 155 122 118' 868. 137: 123: 735. 591
Pera Unit 7	EVUN (EVUN (Coal	94 94 94 200 200 200 200 32 105 105 40 60	276 0 1059 1130 953 1114 1229 0 574 443 0 256	90 0 845 1117 1074 1188 1241 0 513 565 0 180 228	0 123 1038 1009 738 1169 1054 0 578 465 0	210 237046 0 799.422534 853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827	72.24486446 0 663.887142; 877.588092; 843.804486; 933.370325; 975.010584; 0 424.479751; 467.506938; 0	0 100.3332504 788.632181 766.5991047 560.703802 888.1609057 800.7883611 0 474.9345934 382.0840587 0 90.00746083 149.7239493	3062.91 3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3393.76 3393.76 3480	3227.74 3227.74 3159.16 3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480	3280 3280 3055 3055 3055 3055 3055 3304 3304 330	4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	325.531 0 1237.826 1320.815 1310.815 1302.113 1436.533 0 750.1396 578.9405 0	111.86395 0 1027.9625 1358.8574 1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0	155 122 118' 868. 137: 123' 735. 591
Para Unit 8 Per Para Unit 8 Per Para Unit 9 Per Para Unit 10 Per Para Unit 11	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal	94 200 200 200 200 200 200 32 105 105 40 60	0 1059 1130 953 11114 1229 0 574 443 0 256 182	0 845 1117 1074 1188 1241 0 513 565 0 180 228	123 1038 1009 738 1169 1054 0 578 465 0	0 799.422534 853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827	0 663.887142: 877.588092: 843.804486i 933.370325: 975.010584i 0 424.479751: 467.506938i 0	100.3332504 788.632181 766.5991047 560.703802 888.1609052 800.7883611 0 474.9345934 382.0840587 0 90.00746083	3062.91 3035.39 3035.39 3035.39 3035.39 3035.39 3393.76 3393.76 3393.76 3480	3227.74 3159.16 3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480	3280 3055 3055 3055 3055 3055 3055 3304 3304	4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	0 1237.826 1320.815 1113.926 1302.113 1436.533 0 750.1396 578.9405 0	0 1027.9625 1358.8574 1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0	155 122 118 868 137: 123: 735. 591
New Limit 9	EVUN (EVUN (Coal	200 200 200 200 200 200 32 105 105 40 60	1059 1130 953 1114 1229 0 574 443 0 256 182	845 1117 1074 1188 1241 0 513 565 0 180 228	1038 1009 738 1169 1054 0 578 465 0	799.422534 853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827	663.887142: 877.588092: 843.804486; 933.370325: 975.010584: 0 424.479751: 467.506938: 0	788.632181 766.5991047 560.703809 888.1609052 800.7883611 0 474.9345934 382.0840587 0 90.00746083	3035.39 3035.39 3035.39 3035.39 3035.39 3393.76 3393.76 3393.76 3480	3159.16 3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480	3055 3055 3055 3055 3055 3055 3304 3304	4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	1237.826 1320.815 1113.926 1302.113 1436.533 0 750.1396 578.9405 0	1027.9625 1358.8574 1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0 241.21307	122 118 868 137 123 735 591
Imperiment Imp	EVUN (EVUN (Coal	200 200 200 200 32 105 105 40 60	1130 953 1114 1229 0 574 443 0 256 182	1117 1074 1188 1241 0 513 565 0 180 228	1009 738 1169 1054 0 578 465 0	853.019324 719.404792 840.941174 927.752875 0 484.461135 373.895966 0 221.556827	877.588092: 843.804486: 933.3703258 975.010584: 0 424.479751: 467.506938: 0	766.5991041 560.703802 888.1609051 800.7883611 0 474.9345934 382.0840581 0 90.00746083 149.7239493	3035.39 3035.39 3035.39 3035.39 3393.76 3393.76 3393.76 3480	3159.16 3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480	3055 3055 3055 3055 3055 3304 3304 3304	4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	1320.815 1113.926 1302.113 1436.533 0 750.1396 578.9405 0 343.0586	1358.8574 1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0 241.21307	118 868 137 123 735 59
New Limit 1	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal Coal Coal Coal Coal Coal Coal Coal	200 200 200 32 105 105 40 60	953 1114 1229 0 574 443 0 256 182	1074 1188 1241 0 513 565 0 180 228	738 1169 1054 0 578 465 0 104	719.404792 840.941174 927.752875 0 484.461139 373.895966 0 221.556827	843.804486i 933.370325i 975.010584i 0 424.479751: 467.506938i 0 155.7821437	560.70380! 888.160905; 800.7883611 0 474.9345934 382.084058; 0 90.00746083 149.7239493	3035.39 3035.39 3035.39 3393.76 3393.76 3393.76 3480	3159.16 3159.16 3159.16 3327.16 3327.16 3327.16 3480 3480	3055 3055 3055 3304 3304 3304 3480 3480	4021 4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	1113.926 1302.113 1436.533 0 750.1396 578.9405 0	1306.5465 1445.2306 1509.7064 0 657.26445 723.88774 0 241.21307	868 137 123 735 59
Nea Unit 12 UPR Nea Unit 12 UPR Nea Unit 13 UPR Nea Unit 13 UPR Nea Unit 13 UPR Nea Unit 14 UPR Nea UP	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal Coal Coal Coal Coal Coal Coal Coal	200 200 32 105 105 40 60	1114 1229 0 574 443 0 256 182	1188 1241 0 513 565 0 180 228	1169 1054 0 578 465 0 104	840.941174 927.752875 0 484.461139 373.895966 0 221.556827 157.513056	933.3703258 975.0105844 0 424.479751 <u>2</u> 467.5069386 0 155.7821437	888.160905; 800.7883611 0 474.9345934 382.084058; 0 90.00746083 149.7239493	3035.39 3035.39 3393.76 3393.76 3393.76 3480	3159.16 3159.16 3327.16 3327.16 3327.16 3480 3480	3055 3055 3304 3304 3304 3480 3480	4021 4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484 1.5484 1.5484	1302.113 1436.533 0 750.1396 578.9405 0 343.0586	1445 2306 1509.7064 0 657.26445 723.88774 0 241.21307	137 123 735 59
New Limit 3	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal Coal Coal Coal Coal Coal Coal Coal	200 32 105 105 40 60 60	1229 0 574 443 0 256 182	1241 0 513 565 0 180 228	1054 0 578 465 0 104	927.752875 0 484.461135 373.895966 0 221.556827 157.513056	975.0105844 0 424.4797513 467.5069386 0 155.7821437 197.3240487	800.7883611 0 474.9345934 382.0840587 0 90.00746083 149.7239493	3035.39 3393.76 3393.76 3393.76 3480 3480	3159.16 3327.16 3327.16 3327.16 3480 3480	3055 3304 3304 3304 3480 3480	4021 4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484 1.5484	1436.533 0 750.1396 578.9405 0 343.0586	1509.7064 0 657.26445 723.88774 0 241.21307	73.5 59
unki Unit 2	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal Coal Coal Coal Coal Coal Coal Coal	32 105 105 105 40 60 60	0 574 443 0 256 182	0 513 565 0 180 228	0 578 465 0 104	0 484.461139 373.895966 0 221.556827 157.513056	0 424.479751 <u>2</u> 467.5069386 0 155.7821437 197.3240487	0 474.9345934 382.0840587 0 90.00746083 149.7239493	3393.76 3393.76 3393.76 3480 3480	3327.16 3327.16 3327.16 3480 3480	3304 3304 3304 3480 3480	4021 4021 4021 4021 4021	1.58 1.58 1.58 1.58 1.58	0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484	0 750.1396 578.9405 0 343.0586	0 657.26445 723.88774 0 241.21307	735 591
anki Unit 3	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal Coal Coal Coal Coal Coal Coal Coal	105 105 40 60 60	574 443 0 256 182	513 565 0 180 228	578 465 0 104 173	484.461139 373.895966 0 221.556827 157.513056	424.479751: 467.5069386 0 155.7821437 197.3240487	474.9345934 382.0840581 0 90.00746083 149.7239493	3393.76 3393.76 3480 3480	3327.16 3327.16 3480 3480	3304 3304 3480 3480	4021 4021 4021 4021	1.58 1.58 1.58	0.98 0.98 0.98 0.98	1.5484 1.5484 1.5484 1.5484	750.1396 578.9405 0 343.0586	657.26445 723.88774 0 241.21307	735 591
anki Unit 4 ardusgany B unit-1 L ardusgany B UPRN init-1 L UPRN init-3 ardusgany B UPRN init-3 ardusgany B UPRN init-5 ardusgany B UPRN init-5 ardusgany B UPRN init-6 UPRN init-6 UPRN init-7 Ini	VUN (VUN (VUN (VUN (VUN (VUN (VUN (VUN (Coal Coal Coal Coal Coal Coal	105 40 60 60 60	443 0 256 182 0	565 0 180 228 0	465 0 104 173	373.895966 0 221.556827 157.513056	467.5069386 0 155.7821437 197.3240487	382.0840587 0 90.00746083 149.7239493	3393.76 3480 3480	3327.16 3480 3480	3304 3480 3480	4021 4021 4021	1.58 1.58 1.58	0.98 0.98 0.98	1.5484 1.5484 1.5484	578.9405 0 343.0586	723.88774 0 241.21307	139
Industry UPR Industry UPR Industry	VUN VUN VUN VUN	Coal Coal Coal Coal Coal	40 60 60	0 256 182 0	0 180 228 0	0 104 173	0 221.556827 157.513056	0 155.7821437 197.3240487	0 90.00746083 149.7239493	3480 3480	3480 3480	3480 3480	4021 4021	1.58	0.98	1.5484 1.5484	0 343.0586	0 241.21307	139
nit-1	VUN VUN VUN	Coal Coal Coal	60 60 60	256 182 0	180 228 0	104	221.556827 157.513056	155.7821437	90.00746083	3480	3480	3480	4021	1.58	0.98	1.5484	343.0586	241.21307	139
August August August	VUN VUN	Coal Coal	60	182	228	173	157.513056	197.3240487	149.7239493										100
arduaganj B	VUN (Coal	60	0	0					3480	3480	3480	4021	1.58	0.98	1.5484	242 9022	205 52656	_
ardunganj B UPRV intr-5 UPRV intr-5 UPRV intr-6 UPRV intr-6 UPRV intr-7 UPRV aricha Unit-1 UPRV aricha Unit-1 UPRV intr-1 UPRV intr-1 UPRV intr-1 UPRV inpara Unit 1 UPRV inpara Unit 2 UPRV inpara Unit 3 UPRV	VUN	Coal				0	0	0	0								243.8932	303.33030	23
arduaganj B UPRV nit-6 L arduaganj B UPRV nit-7 L richa Unit-1 UPRV npara Unit 1 UPRV npara Unit 1 UPRV npara Unit 3 UPRV	17131		60	0				U	U	3480	3480	3480	4021	1.58	0.98	1.5484	0	0	T
arduaganj B UPRV nit-7 L aricha Unit-1 UPRV aricha Unit-2 UPRV npara Unit 1 UPRV npara Unit 2 UPRV npara Unit 3 UPRV	VUN				0	0	0	0	0	3480	3480	3480	4021	1.58	0.98	1.5484	0	0	T
Paricha Unit-1 UPRV Paricha Unit-2 UPRV Ampara Unit 1 UPRV Ampara Unit 2 UPRV Ampara Unit 3 UPRV		Coal	105	328	325	354	283.869684	281.2733151	306.3715494	3480	3480	3480	4021	1.58	0.98	1.5484	439.5438	435.5236	474
Paricha Unit-2 UPRV Anpara Unit 1 UPRV Anpara Unit 2 UPRV Anpara Unit 3 UPRV UPRV	AZEDAT A	Coal	110	500	438	390	515.792092	451.8338722	399.796070€	4148	4148	4122	4021	1.58	0.98	1.5484	798.6525	699.61957	619
Inpara Unit 1 UPRV Inpara Unit 2 UPRV Inpara Unit 3 UPRV		Coal	110	448	145	577	462.149714	149.5797065	591.4931609	4148	4148	4122	4021	1.58	0.98	1.5484	715.5926	231.60922	91
npara Unit 2 UPRV npara Unit 3 UPRV		Coal	210	1455	1500	1407	922.356379	950.882865	891.9281273	2549	2549	2549	4021	1.58	0.98	1.5484	1428.177	1472.347	138
npara Unit 3 UPRV		Coal	210	1496	1579	1284	948.347177	1000.962696	813.9557324	2549	2549	2549	4021	1.58	0.98	1.5484	1468.421	1549.890€	126
		Coal	210	1327	1287	1474	841.214375		934.4008953	2549	2549	2549	4021	1.58	0.98	1.5484	1302.536	1263.2738	
npara Unit 4 UPRV		Coal	500	3691	3595	3828	2339.80577	2278.949266	2426.653071	2549	2549	2549	4021	1.58	0.98	1.5484	3622.955	3528.725	37
npara Unit 5 UPRV		Coal	500	3734	4021	3518	2367.06441	2549	2230.137279	2549	2549	2549	4021	1.58	0.98	1.5484	3665.163	3946.8716	
IYDRO	VOIV P	Coai	300	3734	4021	3310	2307.00441	2,349	2230.137275	2349	2,349	2,349	4021	1.30	0.70	1.3404	23017.3	22676.04	215
ihand LIPIV		Hydro	300			100.01							r		,	,	23017.3	220/0.04	21:
thand UPJV bra Hydro UPJV		Hydro Hydro	300 99	623.74	1112.16	477.04	-				-				-	-	-		+-
fatatila UPJV		Hydro	30	230.36	126.94	199.04	-				-				-	-	-		+-
latatila UPJV hara UPJV		Hydro Hydro	72	99.52 411.47	126.94	276.4	-	1	1										1-
		Hydro	0.8	911.47	269.9	276.4	-				-				-	-	-	-	+-
hamoli UPJV uringad UPJV		Hydro Hydro	0.8	-	-		-	1	1										+
iringad UPJV Irgaini UPJV		Hydro	5	-	_		-				-				-	-	-	-	+-
anital UPJV		Hydro	0.7	-	_		-				-				-	-	-	-	+-
		Hydro	2.7	-	_		-				-				-	-	-	-	+-
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hitanra UPJV alva UPJV		Hydro	3	-	-		-	1	1										1-
		Hydro		-	_		-				-				-	-	-	-	+
angori UPJV	VINL	Hydro	0.8	1									L	L	1	1	1	1	

					UTTAI	RANCH	AL						
HYDRO													
Khatima	UHPC	Hydro	41.4	163.08	173.41	182.63							
Ramganga	UHPC	Hydro	198	183.7	209.14	210.12							
Ganga Canal	UHPC	Hydro	32.7	138.31	131.04	208.86							

NORTHER			Calculate		B/g colour				Data Collection	on from Differ	ent Sources-m	arked with a	lifferent col	ours							Formulae:	NCV * EFCO2 [Ref:MNES Report
Baseline for (Ref. (1) Electricit					non osa nio in	IPP			NRLDC Annu	al Report 200: Review 2005	2-03, 2003-04,	2004-05				Tariff Ord NTPC Pre	lers/Orders	l	1 GWh=1 N 1 MWh= 10		Fuel Cons (Fi) '000 tons = (Gross Gen MU * OHR kcal/kWh)/(NCV kcal/kg) COEFi (tCO2/kg of fuel) = (NCV* EFCO2)*OXID	Coal (Default)=1.58 Lignite=1.19
(2) NRLDC Annua	l Report2002-	-03, 2003-04,	2004-05 www.i	nrlde.org							f Thermal Pow	er Station20	03-03, 2003	-04, 2004-0)5			1	STEAM = 0		OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas)- Ref: Revised 1996 IPCC Guidelines	Gas/NG/LNG=2.93
(3) Performance R	eview of Then	OXID va	ues (Ref:Revis	2003-04, 200 of 1996 IPC	4-05; CEA				MNES Rept -I Must Run an	Baseline for RI	E proj under Cl lants shall be	DM eliminated f	rom Raselir	e Calculati	ions	CERC W	ebsite		Gas=NG		NCV (kcal/kg) /Ref: Baseline for RE projects under CDM, MNES report/www.mnes.nic.in/baselinerpt.htm Coal (default)=4021.Lignite=2800. Gas/NG/LNG=12428.57. Diesel=10316. Naptha=10750	Diesel=3.2 Naptha=3.3
					Gross	Gross	Gross	Fuel	Fuel Cons.	Fuel Cons.		Oper. HR			NCV x		COEFi	Fi*COE	Fi*COEFi	Fi°COE	(and the second	
Name of the Plant	Year- Commiss ion	Agency/ Owner	Fuel Type	Inst.Cap. (MW)	(MU)	Gen. (MU)	Gen. (MU)	Cons. (Fi) (000 Tonnes)	(Fi) (000 Tonnes)	(Fi) (000 Tonnes)	Oper. HR (kcal/ kWh) 2002-03	(keal/ kWh)	(kcal/ kWh)	NCV Keal/Kg	EFCO2 Kg of CO2/ Kg	OXID	(kg of CO2/kg		(000 tCO2)	Fi (000 tCO2)		
					2002-03	2003-04	2004-05	2002-03	2003-04	2004-05		2003-04	2004-05		of fuel		of fuel)	2002-03	2003-04	2004-05		
Yamuna (I & IV)		UHPC	Hydro	114.75	596.59	574.15	829.84															
Chibre		UHPC	Hydro	240 120	871.29	824.39	633.89						ļ									
Chilla		UHPC	Hydro	144	607.32	689.97	744.83															
(Rishikesh) Maneri Bhali		UHPC	Hydro	90	457.38	459.99	0															
Sobla (Sibla		UHPC	Hydro	6																		
Small Hyde Galog		UHPC	Hydro	3	-	-																
TOTAL HYD	RO (Uttara	anchal)		1002.05	3426.31	3449.89	3111													•		
CENTRAL	GENE	RATIN	G STAT	ION																	1	
THERMAL																						
Badarpur Unit-	1973-74	NTPC	Coal	100	723	720	685	557.398657	555.0857996	528.1024621	3100	3100	3100	4021	1.58	0.98	1.5484	863.0761	859.49485	817.7139		
Badarpur Unit-	1974-75	NTPC	Coal	100	756	628	732	582.84009	484.1581696	564.3372295	3100	3100	3100	4021	1.58	0.98	1.5484	902.4696	749.67051	873.8198		
Badarpur Unit- 3 Badarpur Unit-	1974-75	NTPC	Coal	100	619	706	687	477.219597	544.2924646	529.6443671	3100	3100	3100	4021	1.58	0.98	1.5484		842.78245	820.1013		
4 Badarpur Unit-	1978-79	NTPC	Coal	210	1578	1711	1671	1047.81398		1109.567272	2670	2670	2670	4021	1.58	0.98	1.5484	1622.435		1718.054		
5 Singrauli STPS	1981-82	NTPC	Coal	210	1606	1667	1682	1066.40637	1106.911216		2670	2670	2670	4021	1.58	0.98	1.5484		1713.9413	1729.364		
Unit -1 Singrauli STPS	13.2.82	NTPC	Coal	200	1669	1754	1671	1108.23924			2670	2670	2670	4021	1.58	0.98	1.5484	1715.998		1718.054		
Unit -2 Singrauli STPS	25.11.82	NTPC	Coal	200	1697	1742	1511	1126.83163	1156.712261	1003.325044	2670	2670	2670	4021	1.58	0.98	1.5484	1744.786	1791.0533	1553.548		
Unit -3 Singrauli STPS	28.3.83	NTPC NTPC	Coal	200	1639	1705 1723	1568	1035.32952 1063.1236	1077.020642	990.4799801	2540 2540	2540 2540	2540 2540	4021	1.58	0.98	1.5484	1603.104 1646.141		1533.659 1624.622		
Unit -4 Singrauli STPS	26.02.84	NTPC	Coal	200	1562	1725	1625	986.689878	1089.654315	1049.226361	2540	2540	2540	4021	1.58	0.98	1.5484	1527.791	1687.2207	1589.411		
Unit -5 Singrauli STPS	23.12.86	NTPC	Coal	500	3717	3625	3745	2347.96817	2289.85327	2365.65531	2540	2540	2540	4021	1.58	0.98	1.5484	3635.594	3545.6088	3662.981		
Unit -6 Singrauli STPS	24.11.87	NTPC	Coal	500	4202	3369	4036	2654.33474		2549.475255	2540	2540	2540	4021	1.58	0.98	1.5484	4109.972		3947.607		
Unit -7 Rihand Unit-1	31.3.88		Coal	500	3951	3959	4067		2500.835613			2540	2540	4021	1.58				3872.2939			
Rihand Unit-2 Unchahar	5.7.89	NTPC	Coal	500	3800	3998	3921	2400.39791		2476.831634	2540	2540	2540	4021	1.58	0.98				3835.126		
Unit-1 Unchahar	21.11.88	NTPC	Coal	210	1513	1627	1624	955.737379	1027.749316	1025.854265	2540	2540	2540	4021	1.58	0.98	1.5484	1479.864	1591.367	1588.433		
Unit-2 Unchahar	22.3.89	NTPC	Coal	210	1528	1557	1719	965.212634	983.5314598	1085.864213	2540	2540	2540	4021	1.58	0.98	1.5484	1494.535	1522.9001	1681.352		
Unit-3 Unchahar	Jan-99	NTPC	Coal	210	1474	1675	1690	921.937329		1057.03805	2515	2515	2515	4021	1.58	0.98	1.5484	1427.528	1622.1906	1636.718		
Unit-4 Dadri National	Oct-99	NTPC	Coal	210	1635	1593	1748	1022.6374	996.367819	1093.315096	2515	2515	2515	4021	1.58	0.98	1.5484	1583.452	1542.7759	1692.889		
Capital TPP (NCTPP) Unit-1	21.12.91	NTPC	Coal	210	1592	1552	1748	1005.64039	980.3730415	1104.183039	2540	2540	2540	4021	1.58	0.98	1.5484	1557.134	1518.0096	1709.717		
Dadri National Capital TPP (NCTPP) Unit-2	18.12.92	NTPC	Coal	210	1486	1586	1680	938.68192	1001.850286	1061.22855	2540	2540	2540	4021	1.58	0.98	1.5484	1453.455	1551.265	1643.206		
Dadri National Capital TPP (NCTPP)	23.3.93	NTPC	Coal	210	1519	1548	1713	950.083313	968.2218354	1071.423775	2515	2515	2515	4021	1.58	0.98	1.5484	1471.109	1499.1947	1658.993		
Unit-3 Dadri National Capital TPP (NCTPP)	24.3.94	NTPC	Coal	210	1442	1496	1701	901.922407	935.6975877	1063.91818	2515	2515	2515	4021	1.58	0.98	1.5484	1396.537	1448.8341	1647.371		
Unit-4 Tanda Unit-1		NTPC	Coal	110	555	776	809		578.960457€		3000	3000	3000	4021	1.58	0.98			896.46237			
Tanda Unit-2 Tanda Unit-3	1	NTPC NTPC	Coal	110 110	555 555	779 568	841 836		581.1987068 423.7751803		3000 3000	3000	3000	4021 4021	1.58				899.92808 656.17349			
Tanda Unit-4		NTPC	Coal	110	555	789	832		588.6595374		3000	3000	3000	4021	1.58	0.98	1.5484	641.1554	911.48043	961.1555		
Anta GTPS (CCGT)		NTPC	Gas/Nept ha	413	2760	2777	2785	483.000056	485.9750559	487.375056	2175	2175	2175	12428.57	2.93	0.995	2.91535	1408.114	1416.7874	1420.869		
Faridabad		NTPC	Gas/Nept	430	2697	2792	2161.0	471 075054	488 6000562	552 2225626	2175	2175	2175	12429 57	2.03	0.005	2.01525	1275 072	1424 4402	1612 150		

12428.57 2.93

2175

Faridabad GTPS (CCGT) Auraiya GTPS (CCGT) Dadri GTPS (CCGT) HYDRO Bairasul Salal Tanakpur HPS Chamera HPS-

Chamera HPS

Uri HPS Naptha Jhakri Inits-1,2,3,4,5,6

NUCLEAR

NTPC

NTPC

NTPC

NHPC

JVNL

430 2697

652 4272

Gas/HSD 817 5212

300 480

1500

300

 NHPC
 Hydro
 180
 671.67

 NHPC
 Hydro
 690
 3142.07

 NHPC
 Hydro
 120
 421.56
 540

2792 3161.9 471.975054 488.6000562 553.3325636

4252 4119.7 747.600086 744.1000855 720.9475829

5062 5457.9 912.100105 885.8501018 955.1326098

2175 2175 2175 12428.57 2.93

2175

0.995 2.91535 1375.972 1424.4402 1613.158

0.995 2.91535 2179.516 2169.3122 2101.815

0.995 2.91535 2659.091 2582.5631 2784.546 51393.7 52436.9 54414.1

NORTHER	N GRID		Calculate	ed Values-	B/g colour				Data Collection	on from Differ	ent Sources-m	arked with a	lifferent cole	ours							Formulae:
Baseline for	FY 2002	-03, 2003-	-04, 2004	-05		IPP			NRLDC Anni	al Report 2002	2-03, 2003-04,	2004-05				Tariff Ore	ders/Orders		1 GWh=1 ?	ИU	Fuel Cons (Fi) '000 tons = (Gross Gen MU * OHR kcal/kWh)/(NCV kcal/kg)
(Ref. (1) Electricity	Data 2002-03	, 2003-04, CE	A, General Ri	eview 2005, v	www.cea.nic.ir				CEA General	Review 2005						NTPC Pro	esentation		1 MWh= 1	000 kWh	COEFi (tCO2/kg of fuel) = (NCV* EFCO2)*OXID
(2) NRLDC Annua	Report2002-	03, 2003-04, 2	004-05 www	nrlde.org					CEA Perform	ance Review o	f Thermal Pow	er Station20	03-03, 2003	-04, 2004-0	5			1	STEAM =	COAL	OXID = 0.98 (Coal), 0.99 (Oil), 0.995 (Gas)- Ref: Revised 1996 IPCC Guidelines
(3) Performance Re	eview of Therr	nal Power Stati	ions 2002-03,	2003-04, 200	4-05; CEA						E proj under Cl					CERC W	ebsite		Gas=NG		NCV (kcal/kg) [Ref: Baseline for RE projects under CDM, MNES report]www.mnes.nic.in/baselinerpt.htm
		OXID valu	ies (Ref:Revi	sed 1996 IPC	C Guidelines)				Must Run an	d Low Cost Pl	lants shall be e	eliminated f	rom Baselin	e Calculati	ons						Coal (default)=4021,Lignite=2800, Gas/NG/LNG=12428.57, Diesel=10316, Naptha=10750
Name of the Plant	Year- Commiss ion	Agency/ Owner	Fuel Type	Inst.Cap (MW)		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 Keal/Kg	NCV x EFCO2 Kg of CO2/Kg of fuel	OXID	(kg of CO2/kg	Fi (000 tCO2)	Fi*COEFi (000 tCO2) 2003-04	Fi°COE Fi (000 tCO2) 2004-05	
Rajasthan Atomic Power Station (RAPS) - B		NPC	Nuclear	440	3460.4	2971.35	2619.4														
Narora Atomic Power Station, UP, (NAPS)		NPC	Nuclear	440	3572.1	3041.34	2441.04														
BBMB (HY	DRO)																				
Bhakra Complex		BBMB	Hydro	1490.15	6531.01	7060.7	4517.12														
Dehar		BBMB	Hydro	990	3253.1	3337.27	3102.12														
Pong	<u> </u>	BBMB	Hydro	396	763.85	1112.28	874.71	<u> </u>	1	l	l			L		1	.			1	
TOTAL THEI TOTAL HYDI TOTAL NUCI TOTAL BBM	RO (CGS) LEAR (CG	S)		8137 3810 1180 2876.15	58552 8936.99 8571.92 10548	59461 11400.6 7324.27 11510.3	61727.5 15351 6255.93 8493.95														

Operating Margin Emission Factor (EF OM)

Simple OM Method: $EF \ OM \ simple = \Sigma(Fi^{\circ}COEFi) / \Sigma(Gross \ Gen.) \ (tCO2/MWh)$

	Year	Gross Gen (MUs)	Fi°COEFi (000 tCO2)								
	2002-03	116468.7	112752								
Total Thermal	2003-04	121417.7	116721								
	2004-05	125404.3	119676								
Total NR Generation 2003-04		167334.5 MUs									
Total NonTherm. Gen		45916.73 MUs	27.4401 %								
Non Thermal gen is less than 50% of total NR gen .So Simple OM Method use											

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

2002-03 2003-04 2004-05

	Year	Gross Gen (MUs)	Fi*COEFi (000 tCO2)
	2002-03	116468.74	112752.2531
Total Thermal	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 <u>less than 50%</u> 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

Imports from others	2002-03	2003-04	2004-05	2005-06	
Imports from WREB	186.39	282.02	1602.84	2153.23	
Imports from EREB	1019.53	2334.76	3600.58	4112.67	
EF (WREB), tCO2/GWh	910.00	910.00	906.00	884.00	http://mnes.nic.in/baselinepdf s/chapter2.pdf EF of Western Grid has been considered
EF (EREB), tCO2/GWh	1192.00	1186.00	1178.00	1158.00	http://mnes.nic.in/baselinepdf s/chapter2.pdf EF of Eastern Grid has been considered

As per ACM0002 the CO2 emission factor for the net Electricity imports from the connected Electricity system, there is an option to consider 0 t CO₂/ 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.