CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 02 - in effect as of: 1 July 2004)

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

Budhil Hydro Electric Project, India (BHEP)
Aug 25th, 2006

A.2. Description of the project activity:

Purpose of project activity

The Budhil Hydro Electric Project (BHEP) is proposed for development on the Budhil stream, a major tributary of the Ravi River, in the Chamba District of the state of Himachal Pradesh in India. The Project will have an installed capacity of 70MW, and generate approximately 313.33 GWh of electricity (net) per annum. The project is being developed by LANCO Green Power Pvt. Ltd. (LANCO), one of the LANCO Group of companies which are based in India.

The broad objective of the Project is to utilise the hydrological resources of the Budhil stream to generate zero emission electricity. Electricity generated will be exported to the northern regional grid through the North Regional Load Dispatch Centre (NRLDC), where it will provide much needed power to the northern states of India (which comprise of Delhi, Haryana, Himachal Pradesh, Jammu Kashmir, Punjab, Rajasthan, Uttar Pradesh and Uttaranchal). The northern states currently face power supply shortages, particularly during peak periods. Central Electricity Authority studies predict that there will be a supply deficit in the region of 16.6% during peak demand periods by the end of 2006-2007[1]. LANCO signed a Power Purchase Agreement with the Power Trading Corporation of India in November 2004 for the sale and transmission of the power generated to the northern regional grid via the Haryana state network.

Contribution to Sustainable Development

The Project will contribute strongly to the environmental, social and economic well being of the region. A Local Area Development Authority (LADA) has been formed by the Himachal Pradesh Government to oversee the environmental management of the project and the implementation of the Environmental Management and Local Area Development (EMLAD) Plan. The activities of the LADA will be financed by setting aside 1.5% of the total capital cost of the Project.

The BHEP will contribute to the sustainable development of the region in the following ways:

- The electricity to be generated displaces grid-sourced electricity that is dominated by non-renewable fossil fuel resources.
- The generation of electricity by the project will not result in the emission of greenhouse gases to the atmosphere.
- The project will result in a reduction in air borne pollutants, such as oxides of nitrogen, oxides of sulphur, carbon monoxide and particulates, through the reduction in the combustion of fossil fuels.
- The project will not compromise access to the river resources for downstream users, or impact upon local fish populations, as the Sup stream and Bharmani stream flow into the Budhil stream

[1] http://www.cea.nic.in/planning/Power%20Supply%20Position%20at%20the%20end%20of%2010th%20Plan.htm

immediately downstream of the proposed dam. In addition 15% of the lean season natural flow of the Budhil stream will be released throughout the year.

- LANCO will undertake plantation forestry in the area to enhance the area's environmental, social and economic development.
- The development of the project will improve access to the area through the construction of new roads and communication infrastructure.
- The project will create local employment, intensively in the construction phase and on a continuing basis during the operation of the plant.
- The project will encourage the demand for materials, equipment, spare parts and consumables for maintenance.
- Funds allocated to the LADA will be used for local development purposes and for scholarships for local children to pursue higher professional education.
- Twelve percent of the total electricity generated will be provided free to the Himachal State Government as a royalty, which will result in improved reliable power supply in the state.

The Project has been developed in line with India's National Electricity Policy. Section 5.2.5 of the policy outlines the Government's emphasis on the full development of feasible hydro potential in the country. The Ministry of Power has outlined several policy measures to accelerate the capacity addition from hydro-electric projects[2]. In addition, the Project is consistent with the future plans of the Ministry of Non-Conventional Energy Sources (MNES) of the Government of India to establish 10,000 MW from Renewable Energy by the year 2012.

A.3. Project participants:

Please refer to the Table A.1 below:

Table A1 Parties Involved in the Project

Name of Party Involved (*) ((host) indicates a host Party)	Private and/or Public Entity(ies) Project Participants (*) (as applicable)	Kindly Indicate if the Party involved wishes to be Considered as Project Participant (Yes/No)
India (host)	M/s. LANCO Green Power Pvt. Ltd. (private entity)	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

>>
India

A.4.1.2. Region/State/Province etc.:

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Region : Northern Region of India (Lesser Himalayas)

[2] http://powermin.nic.in/JSP_SERVLETS/internal.jsp

State : Himachal Pradesh
Province (District) : Chamba

A.4.1.3.	City/Town/Community etc:

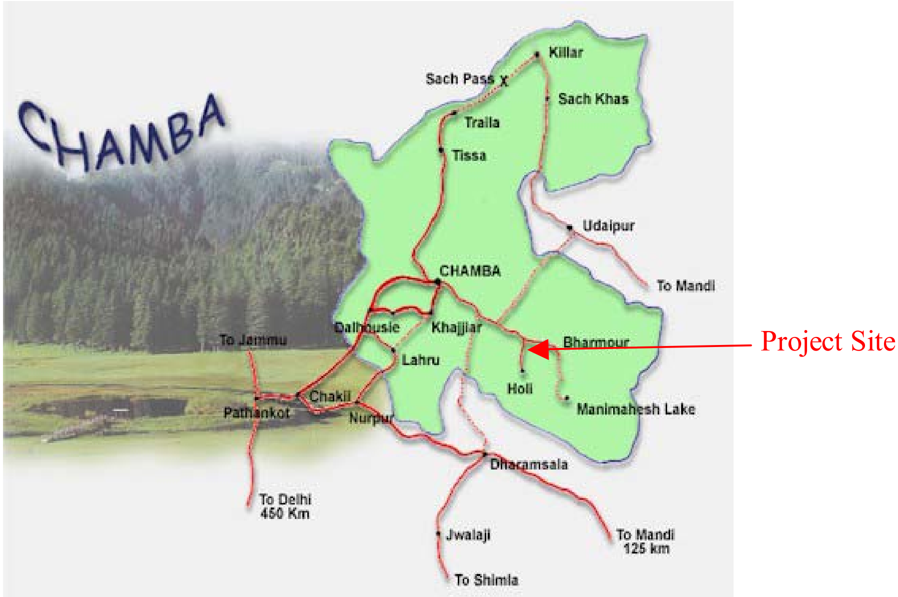
>>
City/District : Chamba
Community(Village) : Thalla

A.4.1.4.	Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

>>
The Project is to be developed on the Budhil Stream, a major tributary of River Ravi in the Chamba District, Himachal Pradesh, India. The project catchment is in Chamba District.

The Project dam site is nearly 500 metres from the Thalla Bridge section of the Chamba – Chobia Road, which is approximately 63km from Chamba. The project power house is 3 km upstream of village Kharamukh on Chamba – Chobia Road, about 51 km from Chamba (Figure A1).

Figure A1 Location of the Project



Chamba district co-ordinates:

Latitude:	North latitude 32° 11′ 30″ and 33° 13′ 6″
Longitude	East longitude 75°49 and 77° 3′ 30″

A.4.2. Category(ies) of project activity:

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Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)

A.4.3. Technology to be employed by the project activity:

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The project involves the construction of a concrete diversion dam over the Budhil stream approximately 64 metres long, with a maximum height above the deepest foundation of 58 metres. The dam will create a small in stream impoundment of approximately 4.5 hectares.

The dam will incorporate 3 radial gate spillways. Water will be released through a feeder tunnel into a desilting chamber, before being conveyed through a head race tunnel of approximately 6km, surge shaft and pen stock, into a power house containing 2 x 35MW vertical shaft Francis turbines connected to synchronous generators. Water will be discharged back into Ravi River via a tail race approximately 1000 metres upstream of the confluence of the Budhil stream and Ravi River. All components of the project, aside from the dam, will be underground.

The voltage of the electricity generated at the generator terminals will be 11kV which will be stepped up to 220kV at the switchyard of the powerhouse. The electricity will be exported to the grid via an 18km transmission line from the switchyard to National Hydro Power Corporation Limited's Chamera-III substation.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:

The BHEP will generate electrical power without the emission of greenhouse gases. The power generated will be exported to the northern regional grid where it will displace the electricity generated from a fossil fuel dominated generation mix, thereby reducing the carbon intensity of the grid and the quantity of greenhouse gases emitted.

By the end of 2007, the Central Electricity Authority predicts a supply deficit of 16.67% during peak demand periods for the northern regional grid. There is thus an urgent need to provide additional generation capacity in the northern states. In the absence of the project activity, it is most likely that the required capacity additions to the grid will be met through the development of large thermal power stations, due largely to relatively high returns on investment, economies of scale and the availability of project finance. Furthermore, there are a limited number of feasible opportunities to develop hydroelectric power in India. This is further limited when potential project sites are screened for environmental or social reasons.

In total, the Project is estimated to result in a reduction in emissions of greenhouse gases of 1,929,347 tonnes of CO_2 over a crediting period of 7 years.

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

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Estimated emission reductions over the chosen crediting period are shown in Table A2.

Table A2 Estimated Emission Reductions Over the Crediting Period

Year	Annual Estimate of Emission Reductions (tonnes of CO_2)
2009	275,621
2010	275,621
2011	275,621
2012	275,621
2013	275,621
2014	275,621
2015	275,621
Total estimated reductions (tonnes of CO_2)	1,929,347
Total number of crediting years	7 years
Annual average over the crediting period of estimated reductions (tonnes of CO_2)	275,621

In the above table, the year 2009 represents one full year period from the project activity start date, i.e. 01 April 2009 to 31 March 2010. Subsequent years represent full year periods between April and March.

A.4.5. Public funding of the project activity:

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The project will be financed through private sources and as such no public funding will be required.

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

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Approved consolidated baseline methodology ACM0002, "Consolidated baseline methodology for zero-emissions grid-connected electricity generation from renewable sources" (Version 6, 19 May 2006).

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

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The choice of baseline methodology ACM0002 is justified for the BHEP as it satisfies the required applicability criteria, namely:

- The project is a new grid connected hydro project.
- The BHEP has an installed capacity of 70MW and will result in an impoundment of 4.5 hectares. This equates to a power density of 1555 W/ m^2 which is greater than the minimum requirement, of 4 W/m^2, specified by the methodology.
- The geographic and system boundaries of the northern regional grid are clearly identified and information on the characteristics of the grid are available.

As a renewable energy project it is appropriate to follow Paragraph 48 of Marrakech Accords and use existing actual or historical emissions, since the project activity will serve to reduce actual emissions. On this basis the conditions of applying ACM0002 are met.

B.2. Description of how the methodology is applied in the context of the project activity:

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Applying the methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", the implementation of the BHEP will reduce on average 275,621 tCO_2 per annum. The values used for the calculation of calorific values for fuel types and fuel oxidization factors come from local agencies (NRLDC and the Central Electricity Agency) or the IPCC GHG Gas Inventory Reference Manual (IPCC 1996) were this data was not available.

Emissions reductions for the project are based on the baseline scenario, calculated as a combined margin (CM) consisting of operating margin (OM) and build margin (BM) factors as provided for in ACM0002. The data used for the calculation of the Build Margin and Operating Margin is shown in Annex 3 of this document.

Step 1 – Calculate the Operating Margin Emission Factor

The ACM0002 consolidated methodology provides four options to calculate the Operating Margin. For the proposed project activity the information required to compute a dispatch data analysis is not available to the public. Therefore, option (a), simple Operating Margin, has been selected.

The simple Operating Margin can only be used where low-cost/must run resources constitute less than 50% of total generation in the northern regional grid in either the average of the five most recent years or based on long-term normals for hydroelectricity production.

The composition of the Northern Regional Grid over the last five years is shown in Table B1. As the data indicates, low cost/must run resources constitute an average of 30% of total generation and thus the simple Operating Margin method can be used.

Table B1 Composition of the Northern regional Grid 2000 - 2005 (GWh)

	2000-01	2001-02	2002-03	2003-04	2004-05
Hydro	8533.72	8698.72	30139.99	38592	36222
Thermal (Coal Fired)	14635.5	15135.5	99307.95	103142	105758
Thermal (Gas/Diesel Fired)	2834.95	2834.95	17270	18775	20157
Nuclear	1180	1180	8571.92	7324	7070
Non-Conventional	42.75	52.5	42	122	383
Total	**27226.92**	**27901.67**	**155331.86**	**167955**	**169590**
Low Cost/Must Run	36%	36%	25%	27%	26%
5 Year Average	30%				

Source: *North Regional Load Dispatch Centre - Annual Reports (2001-02 to 2004-05)*
http://www.nrldc.org/nrldc/grid-reports.asp

The simple OM emission factor is therefore calculated as the generation-weighted average emissions per electricity unit (tCO_2/MWh) of all generating sources serving the grid, not including low-operating cost and must-run power plants using the following formula:

$$EF_{OM,\,y} = \frac{\sum_{i,j} F_{i,\,j,\,y}\, COEF_{i,\,j}}{\sum_{j} GEN_{j,\,y}}$$

Where:

$F_{i,j,y}$ is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in year(s) y;
j refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants, and including imports to the grid;
$COEF_{i,j}$ is the CO_2 emission coefficient of fuel i (tCO_2 / mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources j and the percent oxidation of the fuel in year(s) y; and
$GEN_{j,y}$ is the electricity (MWh) delivered to the grid by source j.

The CO_2 emission coefficient $COEF_i$ is obtained as:

$$COEF_i = NCV_i * EF_{CO2,\,i} * OXID_i$$

Where:

NCV_i is the net calorific value (energy content) per mass or volume unit of a fuel i;
$OXID_i$ is the oxidation factor of the fuel (default values from page 1.29 in the 1996 Revised IPCC Guidelines are used); and
$EF_{CO2,i}$ is the CO_2 emission factor per unit of energy of the fuel.

The Simple Operating Margin emission factor was calculated as a three year average, using power generation statistics from the northern regional grid, as contained in the annual and monthly reports of NRLDC for 2002-2003, 2003-2004 and 2004-2005.

Step 2 – Calculate the Build Margin Emission Factor

According to ACM0002, project participants can choose between two given options for calculating the Build Margin for the project. In this case, option 1 has been chosen (i.e. calculate the Build Margin emission factor *ex-ante* based on the most recent information available on plants already built for the sample group (m) at the time of PDD submission).

Under option 1 there are two alternatives for selecting the sample group (m). Project proponents should utilize the larger sample of either the five power plants that have been built most recently or the power plant capacity additions that comprise of 20% of the system generation and that have been built most recently. These two samples for the Northern Regional Grid are compared in Table B2 (detailed data is provided in Annex 3).

Table B2 Build Margin Sample Group

Option for sample group (m)	Annual Generation (Ex-Bus) GWh
Power plant additions comprising 20% system generation	32,346
Five Power Plants that have been built most recently	9,430

As the data indicates, the power plant capacity additions most recently built that comprise 20% of the system generation is the larger sample and thus it has been used as the basis of the Build Margin calculations.

Thus the Build Margin is calculated as:

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} COEF_{i,m}}{\sum_{m} GEN_{m,y}}$$

Where:

$F_{i,m,y}$ is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources m in year(s) y;
m refers to the power plant additions that comprise 20% of the system generation and that have been built most recently;
$COEF_{i,m}$ is the CO_2 emission coefficient of fuel i (tCO_2 / mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources m and the percent oxidation of the fuel in year(s) y; and
$GEN_{m,y}$ is the electricity (MWh) delivered to the grid by source m.

The CO_2 emission coefficient $COEF_i$ is obtained as:

$$COEF_i = NCV_i * EF_{CO2,i} * OXID_i$$

Where:

NCV_i is the net calorific value per mass or volume of fuel;
$OXID_i$ is the oxidation factor of the fuel; and
EF_{CO2} is the CO_2 emission factor per unit of energy of fuel i.

Step 3 – Calculate the Baseline Emission Factor

The baseline emission factor (EF_y) was calculated as the weighted average of the OM emission factor ($EF_{OM,y}$) and the BM emission factor ($EF_{BM,y}$), according to the following formulae:

$$EFy = w_{OM} .EF_{OM,y} + w_{BM} .EF_{BM,y}$$

Where:

ω_{OM}: is the operating margin weight, which is 0.5 by default;
$EF_{OM,y}$ is the operating margin emission factor (tCO_2 / MWh) as calculated in Step1;
ω_{BM} is the build margin weight, which is 0.5 by default;
$EF_{BM,y}$ is the build margin emission factor (tCO_2 / MWh as calculated in Step3; and
Y represents a given year.

Step 4 – Calculate the Project Emissions

The BHEP has an installed capacity of 70MW and a reservoir area of 4.5 hectares.

The power density is obtained as:

$$\text{Power Density} = \frac{\text{Installed Capacity}}{\text{Reservoir Area}}$$

which equates to a power density of 1555 W/ m^2.

As per methodology ACM0002:

if the power of the project is greater than 10 W/m^2 then

$PE_y = 0$

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity:

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To demonstrate the additionality of the project the steps prescribed in "Tool for the demonstration and assessment of additionality" (Version 2; 28th November 2005) have been followed.

Step 0. Preliminary screening based on the starting date of the project activity

The crediting period starts at the date of registration.

Step 1. Identification of alternatives to the project activity consistent with laws and regulations

Sub-step 1a. Define alternatives to the project activity:

The LANCO Group of companies own and are currently developing a diverse range of thermal and renewable power projects. As such, the following alternatives to the project have been considered:

- Alternative 1 - the proposed 70MW BHEP not undertaken as a CDM project.
- Alternative 2 – development of a coal fired power station.
- Alternative 3 – development of a natural gas-fired power station.

Sub-step 1b. Enforcement of applicable laws and regulations:

All the alternatives to the project activity comply with the applicable laws and regulatory requirements for electricity generation in India.

Step 2. Investment analysis

Sub-step 2a. Determine appropriate analysis method:

The option chosen to prove additionality is Option II – "Investment Comparison Analysis" as LANCO may choose to invest in the development of a number of different power generation projects.

Sub-step 2b. Option II. Apply investment comparison analysis:

The financial indicator chosen as most suitable for the project type and decision context is the equity Internal Rate of Return (IRR). The equity (IRR) of the project activity has been compared to the equity IRR of the other project alternatives.

Sub-step 2c. Calculation and comparison of financial indicators:

LANCO's expected equity IRR from natural gas fired generation plants, based on the performance of commissioned facilities, is 19% to 22%. The company's expected equity IRR from coal fired generation plants that are under construction is 16% to 19%. Data supporting these values will be provided to the DOE during validation.

The equity IRR of the BHEP without additional revenue from the sale of CERs is 11.90%, which is lower than LANCO's expected return from coal and gas fired power projects. The financial model used to calculate the equity IRR of the BHEP consists of confidential information and therefore full details will only be made available to the DOE during validation.

Key assumptions made in calculating the equity IRR of the BHEP includes:

- A plant load factor of 0.511
- Commissioning date of April 1st 2009
- Annual net generation of 310,510 MWh's.
- Annual electricity sold to PTC of 273,249 MWh's.

Sub-step 2d. Sensitivity analysis

A sensitivity analysis was conducted on the financial model by altering the following parameters:

- annual electricity generation sold to PTC (plus and minus 10%);
- the electricity tariff paid by PTC (plus and minus 10%); and
- project capital and operational costs (plus and minus 10%).

The results of the sensitivity analysis are presented in Table B3, which shows that the equity IRR of the BHEP remains below Lanco's expected equity IRR from the development of a gas fired power station even in the case where these parameters change in favour of the project.

Table B3 IRR Using Alternative Project Parameters

Scenario	Parameter change	Equity IRR
Base case		11.90%
Annual electricity generation sold to PTC	Plus 10%	17.14%
	Minus 10%	6.50%
Electricity tariff paid by PTC	Plus 10%	17.14%
	Min 10%	6.50%
Project capital and operational costs	Plus 10%	10.08%
	Minus 10%	13.95%

The investment comparison analysis clearly demonstrates that the proposed CDM project activity is unlikely to be considered the most financially attractive course of action by LANCO. As such, Step 3 – Barrier Analysis is not required.

Step 4. Common practice analysis

The majority of investment in the Indian power sector is focused on medium to large-scale thermal power projects due largely to relatively high returns on investment, economies of scale and the availability of project finance. The favoured development of thermal power projects is illustrated through a consideration of five-year plans over the last 50 years (Table B4). Five-year plans are developed by the Planning Commission to identify the planned capacity additions to the national and regional grid. As Table B1 indicates, thermal power has dominated the planned development of the national and regional grid, with the contribution of the hydro sector steadily falling over the last 35 years.

Table B4 National and Regional Electricity Grid Composition Over the last 50 Years

Plan and Year	Hydro (%)	Thermal (%)	Other (Nuclear and Wind) (%)
1st Plan 1956	35	65	0
3rd Plan 1966	46	54	0
5th Plan 1979	41	57	2
7th Plan 1990	29	69	2
9th Plan 2002	25	71	4

Source: http://powermin.nic.in (see *Plans to augment power generation; Accelerating the Development of Hydro Projects)*

This lack of development of hydropower has occurred despite the existence of substantial undeveloped hydro resources in many states. In Himachal Pradesh, just 20% of the potential hydro resources have been developed[3]. In an effort to encourage further development of hydro potential in the state, the Government of Himachal Pradesh has allocated a number of projects for private sector development. However, to date just three hydro power projects with a capacity in excess of 25MW have been developed or are in the process of being developed by the private sector, which are described in Table B5. As the table indicates, the high installed cost of the BHEP clearly indicates its non-viability without the additional revenue from the sale of CERs.

[3] http://planningcommission.nic.in/plans/stateplan/sdr_hp/sdr_hpch17.pdf

Table B5 Private Sector Hydro Power Projects (above 10MW) in Himachal Pradesh

Project Name	Installed Capacity	Year Commissioned	Project Developer	Comment
Malana Hydro Power Project	86MW	2001	Malana Power Company Ltd	The Malana Hydro Project was one of the first IPP's to be developed in India. The installed cost of the project was Rs.3.66 crores/MW (US $ 0.814 million)[4], compared to Rs. 5.98 crores/MW (US $ 1.36 million) for the BHEP. This cost differential is due to the time gap between the two projects; additional social and environmental management measures undertaken by LANCO; and different project layouts due to differences in the geography of the two sites resulting in a more expensive project configuration and construction requirements for the BHEP.
Baspa Stage II Project	300MW	2003	Jaiprakash Hydro-Power Limited	The installed cost of the Baspa Stage II project Rs. 3.16 crores/MW (US $ 0.72 million)[5] which is considerably less than the BHEP. The project indicates the difficulties of developing large hydro assets in India, with the implementation agreement and power purchase agreement signed in 1992 and 1997 respectively. This cost differential between the project and the BHEP is due to the time gap between the two projects; and the additional social and environmental management measures undertaken by LANCO.
Allain Duhangan hydropower project	192MW	2008 (expected)	Malana Power Company Ltd	Construction of this project commenced in 2005. The installed cost of the project is expected to be Rs. 4.56 crores/MW (US $ 1.04 million)[6], which is considerably less than BHEP due to Allain Duhangan being "a project with favourable construction costs"[7].

Step 5. Impact of CDM registration

As shown in Step 2 and 4 above, the BHEP project is not a financially attractive project. If LANCO was able to sell certified emission reduction (CERs) from the project activity, the additional revenue generated by carbon sales would increase the equity IRR of the project to 17.67% (assuming a price of $US8/CER), which is consistent with the return the company expects from the development of a coal fired power project. The additional revenue from the sale of the CERs would also assist in mitigating some of the risk associated with developing a hydro power project in India, such as hydrological and geological risk, and the lack of key supporting infrastructure around remote hydro sites.

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[4] http://www.snpowerinvest.com/Our_business/Malana

[5] http://www.jhpl.com/au-jhplatglance.htm

[6] http://www.snpowerinvest.com/Our_business/Malana/info/573/casecard_Allain_Duuhangan.pdf

[7] http://www.snpowerinvest.com/Our_business/Malana/

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

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Project emissions associated with the inundation of the reservoir have been considered in calculating the project emissions associated with the BHEP. Only CO_2 emissions associated with displaced fossil fuel fired electricity have been accounted for in determining the baseline.

The spatial extent of the project boundary includes the immediate BHEP project site, incorporating the diversion dam, reservoir, power canal, penstock, powerhouse and tailrace canal, the export of the generated power to the grid, and the auxiliary power consumed by the plant, and all power plants connected physically to the northern regional grid of India to which the project is connected. The dispatch of power throughout the northern regional grid is controlled by the NRDLC.

B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

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Date of completion of the Baseline Development: 26/06/2006

Details of the person/entity determining the baseline:

Contact Person	:	Mr. Srinath N. Anekal
Company Name	:	SMEC India (Pvt.) Ltd.,
Mobile Number:		+91-98801 94404
E-mail Address	:	srinath@smecindia.com
Contact Address		
Head Office	:	A1, First Floor, Chirag Enclave, New Delhi – 110048 India
Telephone Number	:	011 26421513/26421514
Fax Number	:	011 26421515

SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

Project construction commenced April 1st 2006. The project is expected to be operational April 1st 2009.

C.1.2. Expected operational lifetime of the project activity:

>>
35 years

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>
April 1st 2009

C.2.1.2. Length of the first crediting period:

>>
7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not applicable

C.2.2.2. Length:

>>
Not applicable

SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

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Approved consolidated monitoring methodology ACM0002, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources" (Version 6, 19 May 2006).

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The Project activity is a grid-connected hydropower project with a power density greater than 4W/ m^2, where the grid's geography and system boundaries are explicit and information on characteristics of the grid are available. On this basis the conditions for applying ACM0002 are met.

D.2. 1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Not applicable.

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

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As the Project is a new hydropower project with a power density of greater than 10W/ m^2, project emissions are zero.

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1. EGy	Electricity supplied to the grid by the project	Meters	MWh	m	Hourly measurement and monthly recording	100%	Electronic and paper	Electricity supplied by the project activity to the grid. Double check by receipt of sales.

2. EFy	CO_2 emission factor of the grid	Northern Regional Load Dispatch Centre	tCO_2/MWh	c	Yearly	100%	Electronic	Calculated as a weighted sum of the OM and BM emission factors
3. $EF_{OM,y}$	CO_2 Operating Margin emission factor of the grid	Northern Regional Load Dispatch Centre	tCO_2/MWh	c	Yearly	100%	Electronic	Calculated as indicated in the relevant OM baseline method above
4. $EF_{BM,y}$	CO_2 Build Margin emission factor of the grid	Northern Regional Load Dispatch Centre	tCO_2/MWh	c	Yearly	100%	Electronic	Calculated as [$\sum_i F_{i,y}$*COEFi] / [$\sum_m GEN_{m,y}$] over recently built power plants defined in the baseline methodology
5. Fi,y	Amount of fossil fuel consumed by each power plant	Central Electricity Agency and individual power stations (where available)	Mass or volume	m	Yearly	100%	Electronic	Obtained from Central Energy Agency and individual power stations (where available)
6. COEFi	CO_2 emission coefficient of each fuel type i	Various sources	tCO_2/ mass or volume unit	m	Yearly	100%	Electronic	Obtained from various sources as noted in Section E.
7. $GEN_{j/k/n,y}$	Electricity generation of each power plant j, k or n	Northern Regional Load Dispatch Centre	MWh/a	m	Yearly	100%	Electronic	Obtained from Northern Regional Load Dispatch Centre
8.	Surface area at full reservoir level	Project developer	m^2	m	At start of the project	100%	Electronic	Calculated by LANCO
9.	Identification of power plant for the OM	Northern Regional Load Dispatch Centre	Text	e	Yearly	100% of set of plants	Electronic	Identification of plants (j, k or n) to calculate Operating Margin emission factors
10.	Identification of power plant for the BM	Northern Regional Load Dispatch Centre	Text	e	Yearly	100% of set of plants	Electronic	Identification of plants (j, k or n) to calculate Build Margin emission factors

11. $GEN_{j/k/n,y}$ *IMPORTS*	Electricity imports to the project electricity system	Northern Regional Load Dispatch Centre	kWh	c	Yearly	100%	Electronic	Obtained from the latest local statistics. If local statistics are not available, IEA statistics are used to determine imports.
12. $COEF_{i,j,y}$ *IMPORTS*	CO_2 emission coefficient of fuels used in connected electricity systems(if imports occur)	Various sources	tCO_2/ mass or volume unit	c	Yearly	100%	Electronic	Obtained from the latest local statistics. If local statistics are not available, IEA statistics are used to determine imports.

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>

Formulae used to calculate the baseline emissions are as outlined in Section B2.

D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

Not applicable.

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

>>
Not applicable.

D.2.3. Treatment of leakage in the monitoring plan

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Not applicable.

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>
Not applicable - no leakage is expected.

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

>>
As described in section B.

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data *(Indicate table and*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.

ID number e.g. 3.-1.; 3.2.)		
D.2.1.3:1	Low	EGy will be monitored continuously by sealed and tested meters. This data will be used for the calculation of emission reductions. The metering system will comprise of two sets of meters – meters on the generator cables recording gross electricity generation and meters in the sub substation recording net electricity generation. The net metered electricity generation data will be used to calculate and monitor the greenhouse gas emission reductions from the project. Both the meters at the generator and the sub station will include a main meter and a back-up meter. All meter data will be stored in electronic and paper formats. Calibration certificates of the meters will be stored. Invoices for the quantity of electricity exported and sold to PTC will also be stored and will allow cross checking of the net metered generated electricity. The gross metered electricity generation data (minus estimates for auxiliary loads and losses) can also be used as a further cross check of the net metered generated electricity.
D.2.1.3: others	Low	Default data (for emission factors) and IEA statistics are used to check the local data.

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

>>

LANCO Green Power Pvt. Ltd proposes to appoint a senior executive as a CDM Monitoring Officer with the direct responsibility of overseeing the collection, recording and storage of the data required to calculate and monitor the greenhouse gas emission reductions from the project activity. The CDM Monitoring Officer would be supported by the company's Quality Assurance Officer who will undertake regular internal audits of the project. Both the CDM Monitoring Officer and Quality Assurance Officer will report directly to the General Manager (Projects).

All archived data will be kept until two years after the last issuance of CERs for this project. Data will be archived in LANCO's existing information storage system on a monthly basis.

As identified previously no significant sources of leakage are expected.

D.5 Name of person/entity determining the monitoring methodology:

>>

The contact information for the entity that has determined the monitoring methodology is given below. The entity is not a project participant.

Company Name: SMEC India (Pvt.) Ltd.,
Mobile Number: +91-98801 94404
E-mail Address: srinath@smecindia.com

Contact Address
Head Office; A1, First Floor,
Chirag Enclave,
New Delhi – 110048
India
Telephone Number: 011 26421513/26421514
Fax Number: 011 26421515

Contact Person: Srinath N. Anekal

SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

>>

The BHEP is a hydropower project and as such does not result in the combustion of fossil fuels.

As the power density of the project is 1555 W/ m^2, which is greater than 10 W/ m^2, the emissions associated with the inundation of land are not required to be quantified.

On this basis, project emissions $PE_y = 0$.

E.2. Estimated leakage:

>>

The main sources of emissions which could potentially give rise to leakage are associated with construction of the power plant and land inundation. However, ACM0002 states that project participants do not need to consider these sources of emissions as leakage in applying this methodology.

Thus $L_{y\,=}\,0$

E.3. The sum of E.1 and E.2 representing the project activity emissions:

>>

The sum of PE_y and L_y is expected to be zero.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

>>

As per methodology ACM0002, the estimated baseline anthropogenic emissions are calculated using the following formula:

$$BE_y = EG_y * EF_y$$

Where the baseline emissions (BEy in tCO_2) are the product of the baseline emissions factor (EFy) in tCO_2/MWh) times the electricity supplied by the project activity to the grid (EGy in MWh).

Using the above formula the baseline emissions of the Project during the crediting period are 1,929,347 tonnes of CO_2, as outlined in Table E1 below (see Annex 3 for further detailed calculations).

Table E1 Baseline Emissions Factors and Baseline Emissions during the first crediting period

Electricity Generated Emissions Reductions	Per Year	Crediting Period (7 years)
Simple Operating Margin Emission Factor ($EF_{OM,y}$ in tCO_2/MWh)	1.121	-
Build Margin Emissions Factor ($EF_{BM,y}$ in tCO_2/MWh)	0.655	-
Baseline Emissions Factor (EF_y in tCO_2/MWh)	0.888	-
Electricity generated by Project (EG_y MWh)	313,330	2,193,310
Baseline Emissions (*BEy* tCO_2)	**275,621**	**1,929,347**

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

>>

The Project emission reductions are calculated using the formula:

$ER_y = BE_y - PE_y - L_y$

As PE_y and L_y equal zero, the total emission reductions during the crediting period are 1,929,347 tonnes of CO_2

E.6. Table providing values obtained when applying formulae above:

>>

The emission reductions resulting from the project activity during the first crediting period are shown in Table E1 below.

Table E2 Project Activity Emission Reductions During the First Crediting Period

Year	Estimation of project activity emission reductions (tonnes of CO_2)	Estimation of baseline emission reductions (tonnes of CO_2)	Estimation of leakage (tonnes of CO_2)	Estimation of emission reductions (tonnes of CO_2)
2009	**0**	275,621	**0**	275,621
2010	**0**	275,621	**0**	275,621
2011	**0**	275,621	**0**	275,621
2012	**0**	275,621	**0**	275,621
2013	**0**	275,621	**0**	275,621
2014	**0**	275,621	**0**	275,621
2015	**0**	275,621	**0**	275,621
Total	**0**	**1,929,347**	**0**	**1,929,347**

In the above table, the year 2009 represents one full year period from the project activity start date, i.e. 01 April 2009 to 31 March 2010. Subsequent years represent full year periods between April and March.

The data used to calculate the baseline is contained in Annex 3.

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>
The project required approval from the Ministry of Environment and Forests (MoEF), under the *Environmental (Protection) Act 1986.* As part of the approval process, a comprehensive environmental assessment of the Project was prepared in accordance with the requirements of MoEF.

Relevant documents submitted to MoEF include:

- EIA Study Report
- Addendum to EIA
- Catchment Area Treatment Plan

Copies of each document are available upon request.

Approval for the project was obtained from Himachal Pradesh state level Environmental Impact Assessment Committee in January 2006 and from MoEF on February 28 2006.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>
The EIA Study Report identifies a range of environmental impacts associated with the project. Each of these impacts is addressed in the EMLAD Plan for the Project. This EMLAD Plan was developed in consultation with the LADA that was formed by the Himachal Pradesh Government specifically to oversee the environmental management of the project. It is comprised of representatives from state and local government agencies such as the District Administration, Himachal Pradesh State Electricity Board, Public Works Department, Irrigation and Public Health, Forest Department, Sub Divisional Magistrate and LANCO. A Catchment Area Treatment (CAT) Plan has also been developed.

The activities of the LADA will be financed by funds set aside by LANCO, representing 1.5% of the total capital cost of the Project. These funds are additional to Project expenditure on the CAT Plan.

The environment management measures overseen by the LADA include:

(i) Environmental management during the construction phase

Provisions will be made for adequate latrines, sewage treatment, garbage treatment facilities, a community kitchen and water storage facilities for the worker colony. Suitable dust control equipment will be used to maintain the air quality at the site during construction.

(ii) Compensatory Afforestation

Compensatory afforestation will be carried out by the Project Developer in line with the guidelines issued by the MoEF. The compensatory afforestation will cover an area of land equal to twice the area of land which will be used for the project.

(iii) Waste Handling

Provisions will be made for handling waste which will be generated during construction. This includes the excavation, construction and subsequent reclamation of specific dumping sites for muck generated by the project. The sites will be fitted with crate wire toe walls and retaining walls for protection.

(iv) Road side stabilization

Road side stabilization will be carried, including provisions for the prevention of potential landslides associated with the construction of approach roads, particularly in hilly terrain (e.g. surface drainage, sub-surface drainage, toe protection and rock bolting); control of deforestation and water drainage during road construction; and collection and disposal of the muck generated due to road construction.

(v) Health delivery system

The project developer has allocated funds to upgrade public medical facilities at the Community Health Centre in Bharmour. In addition, each major civil construction contractor will operate a 24 hour dispensary (which will be available to locals during an emergency); a temporary hospital will be erected during the construction phase; and an ambulance will be available 24 hours.

(vi) Rural development

The project will contribute to the improvement of the local area by constructing public toilet facilities at Bharmaur, Hadsar and Manimahesh and an annual pilgrimage centre. In addition, repairs and maintenance to village paths and water resources will be carried out in the village of Panchayats

(vii) Education

Funding has been allocated to the Department of Education for the upgrade and provision of equipment and facilities at schools in the local area.

(viii) Fish Development

An agreement has been signed with the Fisheries Department for the provision of funds for the development and protection of aquatic life in the local area.

(ix) Agriculture

Funding has been allocated to the Department of Agriculture to assist agricultural development through the provision of tank irrigation facilities which harvest snow and rain water; and assistance for growing vegetables and floriculture.

(x) Horticulture

Funding has been allocated to assist in the conversion of unproductive kharif land into fruit orchards which are suited to local conditions. Seedlings, fertiliser and pit excavation will be funded by the Project Developer.

(xi) Fuel saving devices for labourers

Kerosene fuel subsidies will be funded by the Project Developer to alleviate the demand on local firewood. Pressure cookers and kerosene stoves will be provided to project workers.

(xii) Funding of other environmental protection and development activities as required

Additional funding has been kept in reserve to be used for environmental protection measures which may arise due to unforeseen circumstances.

(xiii) Disaster Management

A detailed disaster management plan has been formulated which includes preventative actions, disaster mitigation, public awareness, and evacuation plans.

(xiv) Environment Monitoring.

A third party Environmental Consultant (with detailed knowledge of the local area) will be engaged to oversee all environmental management aspects of project construction.

These environmental management measures will mitigate the environmental impacts associated with the project. It is important to note that the reservoir that will be created by the Project is small (maximum 4.5 ha surface area) and that, aside from the dam, the Project will be entirely underground. The Project will not displace any persons or impact upon any endangered species or habitat.

The EIA Study Report also identifies several positive environmental impacts associated with the project. These range from environmental benefits in the form of mitigation of climate change, to a number of socio-economic benefits for the District of Chamba (see Section A2).

SECTION G. Stakeholders' comments

>>

G.1. Brief description how comments by local stakeholders have been invited and compiled:

>>

LANCO conducted public meetings in the two villages adjacent to the Project site, Thala and Kharamukh, on 21st December 2005. At each public meeting the proposed Project was presented and comments invited.

Participants in the public meetings included local villagers and representatives from:

- District Administration, Chamba
- Himachal Pradesh State Electricity Board.
- Science Technology (Shimla), Bharmour.
- Irrigation and Public Health Department, Sub Division, Bharmour.
- Forest Department, Bharmour Office.
- Fisheries Department , Chamba.
- Himachal Pradesh Power and Water Works Department.
- Agriculture Department, Chamba.
- Block Medical Officer, Bharmour.
- Village Gram Panchayat.

G.2. Summary of the comments received:

>>
A summary of the comments received at the meeting held at Thalla and Kharamukh Villages are outlined below:

1. Employment should be given to local people of Bharmour on priority basis.
2. Care should be taken for muck dumping.
3. Beautification of Bharmour temple and financial aid for Manimahesh temple should be borne by LANCO.
4. Concern was expressed regarding damage of pasture and forest due to construction of project/roads.
5. Concern was expressed regarding impact on local water sources.
6. Scientific studies should be conducted to assess the cumulative effects of hydro power projects on River Ravi.
7. People who are rendered homeless should be rehabilitated.
8. LANCO should make provision for providing more funds for local development such as schools, hospitals and roads.
9. Provision of funds made for local area development should be spent through local Panchayats.
10. One sarian, a devotional place, should be constructed at Kharamukh Village.
11. Concern was expressed that the water used by the Project will impact the running of the Gharat (watermills).

G.3. Report on how due account was taken of any comments received:

>>
Due account has been taken of the comments received at Thalla Village as follows:

1. Employment should be given to local people of Bharmour on priority basis.

Employment will be provided as per provisions of law enforced by the State Government with preference given to project-affected families. In addition, scholarships will be provided to school children of Bharmour for pursuing higher professional education. After completing technical education, jobs will be given to local persons preferentially, as per the project requirement.

2. Care should be taken for muck dumping.
   Adequate protection works will be provided in all the dumping sites and dumping shall be done in such a way that no spillage takes place. The location of the stone crusher will be according to the guidelines approved by the State Government and Pollution Control Board. Pollution control devices shall be provided as prescribed in the *Environmental (Protection) Act 1986*. The Pollution Control Board will continuously monitor muck dumping to ensure compliance with requirements.

3. Beautification of Bharmour temple and financial aid for Manimahesh temple should be borne by LANCO.
   Funds set aside for the LADA, which will be made available to Gram Panchayats through the Deputy Commissioner of the district, can be used for developmental purposes.

4. Damage of pasture and forest due to construction of project/roads.
   The route of the proposed road has been changed to avoid destruction of forest areas. All excavated material from tunnel/roads shall be dumped in designated dumping sites with adequate protection so that no spillage of muck occurs in the forest area and river.

5. Impact on local water sources.
   All the sources of water utilised by the villages in the vicinity of the project site have been inventoried and properly documented by LANCO and the Irrigation and Public Health Department. If any damage is observed due to project activities, the water source will be restored or an alternative source provided.

6. Scientific studies should be conducted to assess the cumulative effects of hydro power projects on River Ravi.
   Hydropower project developers in the area may pool together to conduct a strategic environment assessment. The State Level Environmental Impact Assessment and Monitoring Committee (SLEIA&MC) may also take a view in the matter.

7. People who are rendered homeless should be rehabilitated.
   No persons will be displaced or rendered homeless by the Project. In the event that any displacement does occur, a Relief and Rehabilitation Plan will be developed and implemented as required by the Himachal Pradesh Government.

8. Project proponents should make provision for providing more funds for local development such as school, hospital and roads.
   Funds set aside for the LADA, which will be made available to Gram Panchayats through the Deputy Commissioner of the district, can be used for developmental purposes.

9. Provision of funds made for local area development should be spent through local Panchayats.
   The Environmental Management and Local Area Development Plan has been allocated significant funds, which will be made available to Gram Panchayats through the Deputy Commissioner and can be used for developmental purposes.

10. One Sarian, a devotional place should be constructed at Kharamukh Village.

Construction of the Sarian shall be carried out by LANCO

11. Water used by the Project will impact the running of the Gharat (water mill)
    The Project will not affect the running of Gharat. All the sources of water utilised by the villages in the Project area have been inventoried and properly documented by LANCO and the Irrigation and Public Health Department. If any damage is observed due to the Project, the water source will be restored or an alternative source provided.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	M/s. LANCO Green Power Pvt. Ltd
Street/P.O.Box:	22, K.G. Marg
Building:	Antanksh Bhavan, UGF
City:	New Delhi
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Telephone:	+91-11-2331 1991
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E-Mail:	hydro@lancogroup.com
URL:	http://www.lancogroup.com
Represented by:	
Title:	Vice President
Salutation:	Mr.
Last Name:	Subramanian
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Direct tel:	+91-11-2331 1990
Personal E-Mail:	murali@lancogroup.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding, either national or international, was sourced in order to undertake any aspect of this Project Activity. The project will be funded solely by private entities.

Annex 3

BASELINE INFORMATION

Tables A3-1 to A3-11 contain the data used to calculate the Baseline for the Northern Regional Grid.

CO_2 Emissions Coefficients of Fuel ($COEF_i$)

The CO_2 emission coefficients for coal, gas and diesel in tonnes of CO_2 per kilotonne of fuel are provided in Table A3-1. These values are used for both the simple Operating Margin, and Build Margin calculations.

Table A3-1 CO_2 Emission Coefficients of Fuel ($COEF_i$)

Fuel	NCV_i[1]	$EF_{CO2,i}$[2]	$OXID_i$[2]	$COEF_i$
	$TJ/10^3$ tonnes	$tC0_2/TJ$		$tC0_2/ 10^3$ tonnes
Coal	19.63	94.60	0.98	1819.86
Gas	52.3	56.10	0.995	2919.36
Diesel	43.33	74.07	0.99	3177.22

1. Net Calorific Values obtained from Indian National Communication to the UNFCCC (Natcom) (2004) GHG Inventory Information
2. Values for Emission Factors and Oxidation Factors obtained from IPCC (1996) Guidelines for National Greenhouse Gas Inventories (Revised)

Simple Operating Margin

Generating Capacity of Individual Plants

Individual plant generation data used to calculate the simple operating margin for each of the three nominated years (2002-03, 2003-04 and 2004-05) is contained in Tables A3-3, A3-4 and A3-5.

Table A3-2 Generating Capacity of Individual Plants in the Northern Regional Grid 2002-03

State/Sector[1]	Plants[2]	Fuel Type[2]	Installed Capacity[2]	Effective Capacity[2]	Generated Units[2]	Qty of Fuel Used[3]
			MW	MW	(Ex-bus) GWh p.a.	10^3 tonnes p.a
Thermal (Coal Fired)						
Central Sector NTPC	a. Badarpur TPS	Coal	720	705	4801.20	3216.80
	b. Singrali STPS	Coal	2000	2000	15087.69	9505.24
	c. Rihand STPS	Coal	1000	1000	7124.15	4345.73
	d. Dadri NCTPS	Coal	840	840	5568.71	3675.35
	e. Unchahar -I TPS	Coal[4]	420	420	2791.83	1870.53
	f. Unchahar - II TPS	Coal[4]	420	420	2832.00	1897.44

	g. Tanda TPS	Coal	440	440	1944.64	1730.73
Delhi	a. Indra Prashta	Coal	247.5	247.5	549.00	439.20
	b. Raighat	Coal	150	149	753.55	625.45
Haryana	b. Faridabad	Coal	180	165	841.79	757.61
	c. Panipat	Coal	860	860	4389.66	3248.35
Punjab	g. Guru Nanak Dev TPS (Bhatinda)	Coal	440	440	2290.83	1603.58
	h. Guru Gobind Singh TPS (Ropar)	Coal	1260	1260	7578.01	4698.37
	i. Lehra Mohabbat TPS (Bhatinda ext)	Coal	420	420	2593.90	1608.22
	j. Jhalkeri rice Straw Fired	Coal	10	10	0.00	0.00
Rajasthan	f. Kota TPS	Coal	850	850	5914.00	3784.96
	g. Suratgarh TPS	Coal	1000	1000	6619.00	3971.40
Uttar Pradesh	g. Obra Thermal	Coal[4]	250	160	0.00	0.00
	h. Obra Extn I	Coal[4]	300	282	0.00	0.00
	i. Obra Ext II	Coal[4]	1000	1000	5726.44	4867.47
	j. Panki	Coal[4]	32	32		0.00
	k. Panki Extn	Coal[4]	220	210	886.65	860.05
	l. Harduaganj - A	Coal[4]	90	0		0.00
	m. Harduaganj - B	Coal[4]	220	150		0.00
	n. Harduaganj - C	Coal[4]	230	225	672.30	699.19
	o. Paricha	Coal[4]	220	220	783.66	760.15
	p. Anpara - A	Coal[4]	630	630		0.00
	q. Anpara - B	Coal[4]	1000	1000	10170.99	7017.98
		Total	**15449.5**	**15135.5**	**89920.00**	**61183.81**
Thermal (Gas Fired)						
Central Sector NTPC	h. Anta GPS	Gas	419.33	419.33	2691.31	381.41
	i. Auraiya GPS	Gas	663.36	663.36	4198.8	704.27
	j. Dadri GPS	Gas	829.78	829.78	5075.77	811.18
	K Faridabad GPS	Gas	431.57	431.57	2634.4	405.19
Delhi	c. I.P. Gas Turbine	Gas	282	282	1181.96	252.46
	d. Pragati Gas Turbine	Gas	330.4	330.4	809.87	116.73
Jammu Kashmir	i. Pampore GT St -I	Gas	75	75	0	0.00
	j. Pampore GT St-II	Gas	100	100	19.64	3.24
Rajasthan	h. Ramgarh GT	Gas	3	3	0	0.00
	i. Ramgarh GT Ext	Gas	35.5	35.5	215	35.45
		Total	**3169.94**	**3169.94**	**16826.75**	**2709.92**
Diesel						
Chandigarh[5]	a. Diesel Gen Set	Diesel	2	1.4	0	0.00

Haryana	d. Magnum Diesel IPP	Diesel	25.2	25.2	80.99	16.57
Jammu Kashmir[5]	k. Diesel gen. Set	Diesel	8.94	7.18	0	0.00
		Total	**36.14**	**33.78**	**80.99**	**16.57**

1. States/Sectors with only hydro or nuclear power are excluded from the list
2. Source: *Northern Regional Load Dispatch Centre (NRLDC) Annual Report 2002-2003* [http://www.nrldc.org/docs/Annual2002-03.pdf]
3. The quantity of fuel consumed is calculated as follows:

   Coal: Using specific fuel consumption values obtained from CEA (2003-04) *Annual Performance Review of Thermal Power Stations*; [http://www.cea.nic.in/god/opm/Thermal_Performance_Review/index_Thermal_Performance_Review.html]

   Gas: Using plant heat rates. Data for 2002-03 is not available. The heat rates were obtained from *Data on Petroleum Fuels used by various Gas Turbine & Diesel Engine Power Plants in the Country during 2003-04*, which is a document supplied by the Central Electricity Authority. Net Heat Rate used. Heat rates for Pampore GT I&II and Ramgarh GT & Ext were unavailable. Heat rate used is the CEA norm for combined cycle plant, which is a conservative assumption: [http://mnes.nic.in/baselinepdfs/chapter2.pdf]. Net Calorific Values obtained from *Indian National Communication to the UNFCCC* (Natcom), 2004, GHG inventory information

   Diesel: Using plant heat rates. Plant specific data for 2002-03 not available. Heat Rate value for Diesel is the average of diesel heat rate values for 2003-04 from *Data on Petroleum Fuels used by various Gas Turbine & Diesel Engine Power Plants in the Country during 2003-04*, which is a document supplied by the Central Electricity Authority. Net Heat Rates used.
4. Fuel Consumption is reported as a total value for combined plants (e.g. Unchar I + II TPS Coal Consumption = 4,152,000 tonnes)
5. Generation at small diesel plants has been neglected - *Northern Regional Load Dispatch Centre (NRLDC) Annual Report 2002-2003* [http://www.nrldc.org/docs/Annual2002-03.pdf];

Table A3-3 Generating Capacity of Individual Plants in the Northern Regional Grid 2003-04

State/Sector[1]	Plants[2]	Fuel Type[2]	Installed Capacity[2]	Effective Capacity[2]	Generated Units[2]	Qty of Fuel Used[3]
			MW	MW	(Ex-bus) GWh p.a.	10^3 tonnes p.a
Thermal (Coal Fired)						
Central Sector – Ntpc	a. Badarpur TPS	Coal	720	705	4940.36	3260.64
	b. Singrali STPS	Coal	2000	2000	14557.85	9025.87
	c. Rihand STPS	Coal	1000	1000	7320.19	4392.11
	d. Dadri NCTPS	Coal	840	840	5683.23	3807.76
	e. Unchahar -I TPS	Coal	420	420	2918.30	1984.44
	f. Unchahar - II TPS	Coal	420	420	2956.71	2010.56
	g. Tanda TPS	Coal	440	440	2542.94	2034.35
Delhi	a. Indra Prashta	Coal	247.5	247.5	668.09	554.51
	b. Raighat	Coal	150	135	688.34	557.56
Haryana	b. Faridabad	Coal	180	165	688.80	640.58
	c. Panipat	Coal	860	860	5349.46	4012.10

Punjab	g. Guru Nanak Dev TPS (Bhatinda)	Coal	440	440	2307.88	1661.67
	h. Guru Gobind Singh TPS (Ropar)	Coal	1260	1260	7611.52	5099.72
	i. Lehra Mohabbat TPS (Bhatinda ext)	Coal	420	420	3079.32	1847.59
	j. Jhalkeri rice Straw Fired	Coal	10	10	0.00	0.00
Rajasthan	f. Kota TPS	Coal	1045	1045	6283.81	4147.31
	g. Suratgarh TPS	Coal	1250	1250	7524.32	4514.59
Uttar Pradesh	g. Obra Thermal	Coal[4]	250	160		0.00
	h. Obra Extn I	Coal[4]	300	282		0.00
	i. Obra Ext II	Coal[4]	1000	1000	5550.44	4773.38
	j. Panki	Coal[4]	32	32		0.00
	k. Panki Extn	Coal[4]	220	210	931.94	829.43
	l. Harduaganj - A	Coal[4]	90	0		0.00
	m. Harduaganj - B	Coal[4]	220	150		0.00
	n. Harduaganj - C	Coal[4]	230	225	639.30	684.05
	o. Paricha	Coal[4]	220	220	572.02	514.82
	p. Anpara - A	Coal[4]	630	630		0.00
	q. Anpara - B	Coal[4]	1000	1000	10482.10	7337.47
		Total	**15894.5**	**15566.5**	**93296.92**	**63690.53**
Thermal (Gas Fired)						
Central Sector – Ntpc	h. Anta GPS	Gas	419.33	419.33	2691.31	381.41
	i. Auraiya GPS	Gas	663.36	663.36	4198.8	704.27
	j. Dadri GPS	Gas	829.78	829.78	5075.77	811.18
	k Faridabad GPS	Gas	431.57	431.57	2634.4	405.19
Delhi	c. I.P. Gas Turbine	Gas	282	282	1181.96	252.46
	d. Pragati Gas Turbine	Gas	330.4	330.4	809.87	116.73
Jammu Kashmir	i. Pampore GT St -I	Gas	75	75	0	0.00
	j. Pampore GT St-II	Gas	100	100	19.64	3.24
Rajasthan	h. Ramgarh GT	Gas	3	3	0	0.00
	i. Ramgarh GT Ext	Gas	35.5	35.5	215	35.45
		Total	**3169.94**	**3169.94**	**16826.75**	**2709.92**
Diesel						
Chandigarh[5]	a. Diesel Gen Set	Diesel	2	1.4	0	0.00
Haryana	d. Magnum Diesel IPP	Diesel	25.2	25.2	80.99	16.57
Jammu Kashmir[5]	k. Diesel gen. Set	Diesel	8.94	7.18	0	0.00
		Total	**36.14**	**33.78**	**80.99**	**16.57**

1. States/Sectors with only hydro or nuclear power are excluded from list
2. Source: *Northern Regional Load Dispatch Centre (NRLDC) Annual Report 2003-2004* [http://www.nrldc.org/docs/An03-04.pdf]
3. The quantity of fuel consumed is calculated as follows:
   Coal: Using specific fuel consumption values obtained from CEA (2003-04) *Annual Performance Review of Thermal Power Stations*; [http://www.cea.nic.in/god/opm/Thermal_Performance_Review/index_Thermal_Performance_Review.html]
   Gas: Using plant heat rates. The heat rates were obtained from *Data on Petroleum Fuels used by various Gas Turbine & Diesel Engine Power Plants in the Country during 2003-04*, which is a document supplied by the Central Electricity Authority. Net Heat Rate used. Heat rates for Pampore GT I&II and Ramgarh GT & Ext were unavailable. Heat rate used is the CEA norm for combined cycle plant, which is a conservative assumption: [http://mnes.nic.in/baselinepdfs/chapter2.pdf]. Net Calorific Values obtained from *Indian National Communication to the UNFCCC* (Natcom), 2004, GHG inventory information
   Diesel: Using plant heat rates. Heat Rate value for Diesel is the average of diesel heat rate values for 2003-04 given in *Data on Petroleum Fuels used by various Gas Turbine & Diesel Engine Power Plants in the Country during 2003-04*, which is a document supplied by the Central Electricity Authority. Net Heat Rate used..
4. Fuel Consumption is reported as a total value for combined plants
5. Generation at small diesel plants has been neglected - *Northern Regional Load Dispatch Centre (NRLDC) Annual Report 2003-2004* [http://www.nrldc.org/docs/An03-04.pdf];

Table A3-4 Generating Capacity of Individual Plants in the Northern Regional Grid 2004-05

State/Sector[1]	Plants[2]	Fuel Type[2]	Installed Capacity[2]	Effective Capacity[2]	Generated Units[2]	Qty of Fuel Used[3]
			MW	MW	(Ex-bus) GWh p.a.	10^3 tonnes p.a
Thermal (Gas Fired)						
Central Sector - Ntpc	a. Badarpur TPS	Coal	720	705	4971.87	3380.87
	b. Singrali STPS	Coal	2000	2000	14633.12	9511.53
	c. Rihand STPS	Coal	1500	1500	7308.58	4385.15
	d. Dadri NCTPS	Coal	840	840	6235.54	4053.10
	e. Unchahar -I TPS[5]	Coal	420	420	3052.36	2075.60
	f. Unchahar - II TPS[5]	Coal	420	420	3119.50	2121.26
	g. Tanda TPS	Coal	440	440	2926.14	2282.39
Delhi	a. Indra Prashta	Coal	247.5	247.5	805.41	692.65
	b. Raighat	Coal	150	135	607.20	473.62
Haryana	b. Faridabad	Coal	180	165	755.28	717.52
	c. Panipat	Coal	1360	1360	5198.14	3846.62
Punjab	g. Guru Nanak Dev TPS (Bhatinda)	Coal	440	440	1751.12	1295.83
	h. Guru Gobind Singh TPS (Ropar)	Coal	1260	1260	8320.32	5574.61
	i. Lehra Mohabbat TPS (Bhatinda ext)	Coal	420	420	2906.46	1743.88
	j. Jhalkeri rice Straw	Coal	10	10	30.69	0.00

	Fired					
Rajasthan	f. Kota TPS	Coal	1045	1045	6980.01	4676.61
	g. Suratgarh TPS	Coal	1250	1250	8491.85	5349.87
Uttar Pradesh	g. Obra Thermal[6]	Coal[4]	250	160		0.00
	h. Obra Extn I[6]	Coal[4]	300	282		0.00
	i. Obra Ext II[6]	Coal[4]	1000	1000	4824.25	4148.86
	j. Panki[6]	Coal[4]	32	32		0.00
	k. Panki Extn[6]	Coal[4]	220	210	914.98	805.18
	l. Harduaganj - A[6]	Coal[4]	90	0		0.00
	m. Harduaganj - B[6]	Coal[4]	220	150		0.00
	n. Harduaganj - C[6]	Coal[4]	230	225	558.11	591.60
	o. Paricha[6]	Coal[4]	220	220	833.18	758.19
	p. Anpara - A[6]	Coal[4]	630	630		0.00
	q. Anpara - B[6]	Coal[4]	1000	1000	10114.75	7282.62
		Total	**16894.5**	**16566.5**	**95338.86**	**65767.55**
Thermal (Gas Fired)						
Central Sector - Ntpc	h. Anta GPS	Gas	419.33	419.33	2702.31	382.96
	i. Auraiya GPS	Gas	663.36	663.36	4008.3	672.31
	j. Dadri GPS	Gas	829.78	829.78	5359.92	856.59
	k Faridabad GPS	Gas	431.57	431.57	3088.69	475.07
Delhi	c. I.P. Gas Turbine	Gas	282	282	1502.29	320.88
	d. Pragati Gas Turbine	Gas	330.4	330.4	2493.01	359.33
Jammu Kashmir	i. Pampore GT St -I	Gas	75	75	7.48	1.23
	j. Pampore GT St-II	Gas	100	100	15.88	2.62
Rajasthan	h. Ramgarh GT	Gas	3	0	0	0.00
	i. Ramgarh GT Ext	Gas	110.5	110.5	336.49	55.48
		Total	**3244.94**	**3241.94**	**19514.37**	**3126.47**
Diesel						
Chandigarh[5]	a. Diesel Gen Set	Diesel	2	1.4	0	0.00
Haryana	d. Magnum Diesel IPP	Diesel	25.2	25.2	92.55	18.94
Jammu Kashmir[5]	k. Diesel gen. Set	Diesel	8.94	7.18	0	0.00
		Total	**36.14**	**33.78**	**92.55**	**18.94**

1. States/Sectors with only hydro or nuclear power are excluded from list
2. Source: *Northern Regional Load Dispatch Centre (NRLDC) Annual Report 2004-2005* [http://www.nrldc.org/docs/AN04-05.pdf]
3. The quantity of fuel consumed is calculated as follows:

Coal: Using specific fuel consumption values obtained from CEA (2004-05) *Annual Performance Review of Thermal Power Stations*; [http://www.cea.nic.in/god/opm/Thermal_Performance_Review/index_Thermal_Performance_Review.html]
Gas: Using plant heat rates. Data for 2004-05 not available. The heat rates were obtained from *Data on Petroleum Fuels used by various Gas Turbine & Diesel Engine Power Plants in the Country during 2003-04*, which is a document supplied by the Central Electricity Authority. Net Heat Rate used. Heat rates for Pampore GT I&II and Ramgarh GT & Ext were unavailable. Heat rate used is the CEA norm for combined cycle plant, which is a conservative assumption: [http://mnes.nic.in/baselinepdfs/chapter2.pdf]. Net Calorific Values obtained from *Indian National Communication to the UNFCCC* (Natcom), 2004, GHG inventory information,
Diesel: Using plant heat rates. Plant specific data for 2004-05 not available. Heat Rate value for Diesel is the average of diesel heat rate values for 2003-04 given in *Data on Petroleum Fuels used by various Gas Turbine & Diesel Engine Power Plants in the Country during 2003-04*, which is a document supplied by the Central Electricity Authority. Net Heat Rate used..

4. Fuel Consumption is reported as a total value for combined plants
5. Generation at small diesel plants has been neglected - *Northern Regional Load Dispatch Centre (NRLDC) Annual Report 2004-2005* [http://www.nrldc.org/docs/AN04-05.pdf];

Simple Operating Margin Emission Factor ($EF_{OM,y}$)

The simple operating margin emission factors for each of the three nominated years (2002-03, 2003-04 and 2004-05) are contained in Tables A3-5, A3-6 and A3-7. The three year average is contained in table A3-8.

Table A3-5 Simple Operating Margin Emission Factor ($EF_{OM,y}$) 2002-03

	Fi,j,y	**COEFi,j**	**GENj,y**	
	10^3 tonnes	**t $C0_2$/ 10^3 tonnes**	**MWh**	
Coal	61183.81	1819.86	89920000	
Gas	2709.92	2919.36	16826750	
Diesel	16.57	3177.22	80990	
		EFom,y	**1.117**	**$tC0_2$/MWh**

Table A3-6 Simple Operating Margin Emission Factor ($EF_{OM,y}$) 2003-04

	Fi,j,y	**COEFi,j**	**GENj,y**	
	10^3 tonnes	**t $C0_2$/ 10^3 tonnes**	**MWh**	
Coal	63690.53	1819.86	93296920	
Gas	2709.92	2919.36	16826750	
Dies el	16.57	3177.22	80990	
		EFom,y	**1.124**	**$tC0_2$/MWh**

Table A3-7 Simple Operating Margin Emission Factor ($EF_{OM,y}$) 2004-05

	Fi,j,y	**COEFi,j**	**GENj,y**
	10^3 tonnes	**t $C0_2$/ 10^3 tonnes**	**MWh**
Coal	65767.55	1819.86	95338860
Gas	3126.47	2919.36	19514370

Diesel	18.94	3177.22	92550
		EFom,y	**1.121**

$tC0_2$/Mwh

Table A3-8 Three Year Average of the Simple Operating Margin

Year	EFom,y
2002-03	1.117
2003-04	1.124
2004-05	1.121
Average	1.121

$tC0_2$/Mwh

Build Margin

Table A3-9 Power Plants Considered for Calculating the Build Margin

Power plant additions comprising 20% system generation					
Northern Region Total Generation Ex-Bus (2004-2005) GWh: 157623.9					
20% Total Generation Ex-Bus GWh: 31524.78					
Station	**Fuel Type**	**Date Comissioned[1]**	**Capacity Addition[1]**	**Effective Capacity (Plant)[2] 2004-2005**	**Generated Units[2] (Ex-bus)**
			MW	**MW**	**GWh p.a.**
Rihand TPS II Unit I	Coal	31-01-2005	500	1500	2436.19
Panipat TPP (#7&#8)	Coal	28-09-2004/28-1-2005	500	1360	1911.08
Suratgarh TPS III 5	Coal	19-08-2003	250	1250	1698.37
Kota TPS _IV (Unit6)	Coal	30-07-2003	195	1045	1302.49
Suratgarh TPS II 4	Coal	15-01-2002	250	1250	1698.37
Suratgarh TPS II 3	Coal	31-7-2002	250	1250	1698.37
Panipat TPP (#6)	Coal	2000-2001	210	1360	802.65
Suratgarh TPS II 2	Coal	28-3-2000	250	1250	1698.37
Unchar TPS II #2	Coal	22-10-1999	210	420	1559.75
Unchar TPS II #1	Coal	1998-1999	210	420	1559.75
Ramgarh GT	Gas	2004-2005	75	110.5	228.39
Pragati GT	Gas	04-02-2003	121.2	330.4	914.51
Pragati GT	Gas	14-11-2002	104.6	330.4	789.25
Pragati GT	Gas	25-05-2002	104.6	330.4	789.25
Faridabad	Gas	31-07-2000	144	431.57	1030.59
Chamera HPS II	Hydro	3x100MW in 2003-2004	300	300	1344.07
SJVNL	Hydro	03-01-2004	1000	1500	3405.85
SJVNL	Hydro	18-5-2004	500	1500	1702.92

Baspa U-1,2,3	Hydro	27-5-2003	300	300	1196.82
Ganhvi 2	Hydro	01-10-2001	22.5	22.5	74.06
Malana HEP	Hydro	07-08-2001	86	86	266.08
Upper Sindh II	Hydro	15-1-2000	70	127.6	97.16
Ranjit Sagar HPS	Hydro	02-01-2001	600	600	1131.37
Chennai Stage III	Hydro	2000-2001	7.5	32.8	19.10
Gumma HPS	Hydro	2000-2001	3	3	4.35
RAPS B	Nuclear	03-11-2000	220	440	1309.70
RAPS B	Nuclear	17-11-2000	220	440	1309.70
Rajasthan Wind Farm[3]	Renewable	2004-2005	289	303	332.53
KPTL-Biomass	Renewable	2004-2005	7.8	7.8	34.78
		Total (Ex-Bus) GWh		GWh	**32345.87**
Five Power Plants that have been built most recently.					
Station	**Fuel Type**	**Date Comissioned[1]**	**Capacity Addition[1]**	**Effective Capacity (Plant)[2] 2004-2005**	**Generated Units[2] (Ex-bus)**
			MW	**MW**	**GWh p.a.**
Rihand TPS[1]	Coal	31-01-2005	500	1500	2436.19
Panipat TPP[1]	Coal	28-1-2005	500	1360	1911.08
Chamera HPS (#3)[1]	Hydro	31-03-2004	300	300	1344.07
SJVPNL HPS(#1)[1]	Hydro	18-5-2004	1000	1500	3405.85
Rajasthan WindFarm[1]	Wind	2004-2005	289	303	332.53
		Total (Ex-Bus) GWh		GWh	**9429.72**

1. Source: *Northern Regional Load Dispatch Centre (NRLDC) Annual Report and Monthly Reports* [http://www.nrldc.org/nrldc/grid-reports.asp]
2. Wind farms were added incrementally between 1998 and 2001 and exact commissioning dates are not available. However according to NRLDC Annual Reports of 289 MW was added during 2004-2005.

As outlined in Section B2, the selected sample group comprises the power plant additions comprising 20% of system generation, and that have been most recently built. Based on this data set the calculated Build Margin is contained in Table A3-10.

Table A3-10 Build Margin Emission Factor $EF_{BM,y}$

	$F_{i,j,y}$	**$COEF_{i,j}$**	**GENj,y**
	10^3 tonnes p.a		**MWh p.a**
Coal	10743.70	1819.86	16365398.09
Gas	555.50	2919.36	3751986.03
Hydro	0.00		9241770.45
Nuclear	0.00		2619400.00
Renewable	0.00		367311.22
		EFBM,y	**0.655**

tCO_2/Mwh

Baseline Emission Factor

The baseline emission factor is contained in table A3-11.

Table A3-11 Baseline Emission Factor

Operating Margin EF (tCO_2/MWh)	1.121
Build Margin EF (tCO_2/MWh)	0.655
Baseline Emission Factor(tCO_2/MWh)	0.888

Annex 4

MONITORING PLAN

BHEP proposes to appoint a senior executive with the direct responsibility of overseeing the collection, recording and storage of the data required to calculate and monitor the greenhouse gas emission reductions from the project activity. The appointed senior executive would be assisted by a team of experienced operators involved in the operation and maintenance of the hydro power plant. All personnel involved would be trained and provided with a manual with clear details of their duties and responsibilities.

The appointed senior executive and support staff will be responsible for the collection of data and the preparation of reports as outlined below:

1. **Calibration of Meters**. The appointed senior executive will ensure that a manufacturer's test certificate accompanies all purchased meters. Meters will be recalibrated in accordance with local standards. A report summarising metering calibration requirements will be prepared on project commissioning, which will be updated as required.

2. **Power Generation and Greenhouse Gas Emissions**. Net metered electricity generation data from paper and electronic sources will be recorded and cross checked against the invoices for the quantity of electricity exported and sold to TPC and the gross metered electricity generation data (minus auxiliary loads and losses), with any conflict resolved as per the guidelines of the PPA signed with TPC. The net metered electricity generation data will be used to calculate and monitor the baseline emissions associated with the project on a daily basis. This data will be summarized in a quarterly report.

3. **Emission Reductions**. Emission reductions will be calculated on a daily basis using the project and baseline emission data. Emission reductions occurring as a result of the project activity will be summarized in a quarterly report.

4. **Re-calculation of the Operating Margin and Build Margin**. Data required to re-calculate the Operating Margin and Build Margin for subsequent crediting periods will be collected in accordance with the requirements of ACM002. A report summarizing this data will be prepared annually.

All repots outlined above will be sent to LANCO's General Manager (Projects) for review. Each report will list any anomalies identified by the appointed senior executive in preparing the report and how these issues have been rectified.

The company's Quality Assurance Officer will undertake an internal audit of the project every three months to ensure the operational and maintenance regime of the project and data collection and recording practices are compliant with the content of this Project Design Document. The results of the audit will be summarised in a report, which will be sent to the General Manager (Projects) of the company for review. The report will also list any corrective actions required to ensure project compliance.