**Project design document form**
**(Version 12.0)**

| BASIC INFORMATION | |
|---|---|
| **Title of the project activity** | 2.2 MW hydropower plant in Birsinghpur, Madhya Pradesh of Ascent Hydro Projects Limited (AHPL). |
| **Scale of the project activity** | ☐ Large-scale<br>☒ Small-scale |
| **Version number of the PDD** | 07.0 |
| **Completion date of the PDD** | 01/11/2022 |
| **Project participants** | ▪ Ascent Hydro Projects Ltd (AHPL)<br>▪ WeAct Pty Ltd.<br>▪ Statkraft Markets GmbH |
| **Host Party** | India |
| **Applied methodologies and standardized baselines** | Methodology:<br>AMS-I.D. - Grid connected renewable electricity generation, version 18; Dated: 28/11/2014<br><br>Standardized Baseline: Not Applicable |
| **Sectoral scopes** | 01, Energy Industries (renewable/non-renewable sources) |
| **Estimated amount of annual average GHG emission reductions** | 12,980 tonnes CO2 equivalent. |

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

>>

The project activity has been registered with UNFCCC on 25/11/2007 and the project registration number under CDM is 1280. The project opted for the renewable crediting period valid and the duration of the first & second crediting periods are from 25/11/2007 – 24/11/2014 and 15/06/2015 – 24/11/2021.. The project participant intends to renew the crediting period which will be third and last crediting period for the project, which is considered in line with the procedure for renewal and the PDD has been updated accordingly.

AHPL is a subsidiary of Dodson–Lindblom International Inc. (DLI), an USA-based water resources company involved in developing and operation of hydroelectric plants. AHPL is operating a 2.2 MW small hydroelectric project at Birsinghpur in Madhya Pradesh on Build, Own, Operate and Maintain (BOOM) basis for thirty years.

The Unit 1 of the project activity has started commercial operation from 24/10/2006 whereas the Unit II of the project activity has started commercial operation from 06/02/2007. The plant has synchronized with the grid in July 2006.

The project activity, referred as “Birsinghpur hydroelectric project” is located within the premises of Sanjay Gandhi Thermal Power Station (SGTPS) owned and operated by Madhya Pradesh Power Generating Company Ltd (MPPGCL), formerly Madhya Pradesh State Electricity Board (MPSEB). SGTPS has four operating units of 210 MW each. SGTPS operates on the lake cooling system in which, the water is conveyed in a canal to the circulating water pump house. The water is then circulated through the cooling condensers of the steam generating units by the circulating water pumps. After cooling the steam in the condensers, the water is discharged to the seal pit. The water then flows back to the reservoir by gravity through the return canal. About 30,000 cubic metres per hour (m3/hr) of water is required for cooling the condensers. Three (3) pumps each having a discharging capacity of 10,000 m3 /hr at 25 metres head are employed to draw water from the lake.

The warmed circulating water is not discharged at atmospheric pressure to avoid vapour formation within the thermal unit’s condenser. A water seal is achieved by providing a concrete chamber at each pipe outlet to maintain the desired minimum pressure head of 2.5m water column (WC). The energy of the falling water is dissipated before it enters the return canal.

The difference of elevation between the water level in the seal pit and the water level in the return canal provides the head for the Birsinghpur mini hydro project. The quantity of water discharging from the seal pit provides the flow. The power potential offered by this head and flow will be harnessed by the mini hydro project. The available head and flow for the project activity are relatively constant, with the head being about 8.7 M and the available flow for each unit of about 8.3 cubic meters/sec for a total flow of about 33 cubic meters/sec. The project activity involves the construction of a Forebay consisting of concrete retaining walls connected to the seal pit structure. The water intake and power house are connected to the Forebay, with a by-pass structure involving a spillway that allows the release of water to the return canal in the event that the small hydropower plant is shut down for any reason. Water from the Forebay is led through Intake gates to 2 units of horizontal Kaplan turbines located in the adjacent power house building. This water rotates the Kaplan turbines, which in turn rotates the synchronous generator coupled to the turbine. A generator of 1.5 MVA (@0.8 pf) i.e 1.2 MW is coupled to each turbine to generate electricity. Electricity shall be generated at 3.3 KV and stepped up to 33 KV and connected to Madhya Pradesh Power Transmission Company Ltd (MPPTCL). The construction and erection of the plant is completed and the trial operations are in process. The plant has synchronised with the grid in June 2006. **This project is amongst the first of its kind in the country utilising condenser cooling water for power generation.**

PP has entered into the Power Purchase Agreement (PPA) with Madhya Pradesh Electricity Board for the sale of entire net electricity output, on 26th July 1999. However, section 3.3 of the PPA allows net electricity sale to either third party/ies (which are HT consumer of the board),on payment of wheeling charges or to the electricity board. Thus, PP signed short term PPAs for the sale of power with Nicholas Piramal India Ltd & IPCA Laboratories on 29th April 2006 and 4th August 2006 respectively, both the parties are HT consumers of the Board. However, the PPAs for the sale of power with respective third parties (Piramal Enterprises Limited & IPCA) have got amended on 26th April 2014 & 4th August 2011 valid as on date.

Contribution of the project activity to sustainable development

The Designated National Authority for India has identified the following attributes to measure the contribution of the project activity for sustainable development:

i) Social well being
ii) Economical well being
iii) Environmental well being
iv) Technological well being

i) Social well being

The social well-being is assessed by contribution to improvement in living standards of the local community. Birsinghpur is a remote village in an industrially backward area. The implementation of the project activity has provided job opportunities to the local community, contribute in poverty alleviation of the local community and development of basic amenities to community leading to improvement in living standards of the community. During construction of the project activity, job opportunities were given to several local people. Since the project activity is in a rural area, project activity caused the improvement of basic amenities. Thus the project activity has contributed to social well being.

ii) Economic well being

Economic well-being refers to additional investment consistent with the needs of the local community. The project activity has created direct and indirect job opportunities to the local community during construction and shall provide permanent job opportunities during operation. During operation of the project activity, persons would be employed directly, apart from indirect employment. These activities have contributed to the economic well being of the local community.

iii) Environmental well being

The project activity produces electricity without any greenhouse gas (GHG) emissions. Additionally, the project activity generates electricity from “renewable energy source”, a source of energy that gets replenished naturally and does not suffer permanent depletion due to use. The project activity is an environment friendly electricity generation project with no significant impact on the environment. This is a very important contribution of the project activity for environmental well-being. Electricity generation in the western grid is predominantly thermal where more than 70 % of installed capacity is thermal generation. Moreover, the project activity generates electricity from a renewable source of energy where the source gets replenished and is available for use. This is another important contribution of the project activity to the environmental well-being.

Therefore, the following environmental benefits are derived from the project activity:

- Produces electricity without GHG emissions.
- Hydro power plant with no increase in volume of reservoir and no land inundation
- Produces electricity from a renewable energy source.
- Rural development as the project activity location is in rural area.

Environmental impacts due to the project activity are discussed in the Section F of this document.

<u>iv) Technological well being</u>
The project activity uses a unique and creative mechanism to utilize water circulated in a thermal power plant to generate electricity. This project is one of its kind in the country and provides a sustainable means to maximize the utilization of scarce available resources in a region that typically sees severe water shortages on a routine basis.

The project activity improves the supply of electricity with clean, renewable hydroelectric power while contributing to the regional/local economic development. Small-scale hydropower run-of-river plants provide local distributed generation, these small-scale projects provide site-specific reliability and transmission and distribution benefits including:

- increased reliability, shorter and less extensive outages;
- lower reserve margin requirements;
- improved power quality;
- reduced lines losses;
- reactive power control;
- mitigation of transmission and distribution congestion, and;
- increased system capacity with reduced T&D investment.

In light of the above, the project participant believes that the project activity has contributed on all sustainable development attributes.

## A.2. Location of project activity

>>

### A.2.1. Host Party
>> India

### A.2.2. Region/State/Province etc.
>> Madhya Pradesh state

### A.2.3. City/Town/Community etc.
>> Mangthar near Birsinghpur, Pali Taluk, Umaria district.

### A.2.4. Physical/Geographical location
>>
Birsinghpur hydroelectric project is located within the premises of Sanjay Gandhi Thermal Power Station (SGTPS). The latitude and longitude coordinates of the plant are 23.36 and 81.03 respectively. The plant is located in the Khasra numbers 409, 410/1, 415/2 and 414/2 of the Mangthar village, Pali Taluk, Umaria District, Madhya Pradesh. The plant is about 8 kilometres from Birsinghpur railway station, which is on Bhopal –Bilaspur railway route. The district headquarters is at Umaria, which is about 40 kilometers from the plant. The location of project activity is shown in following figures – Fig 1:

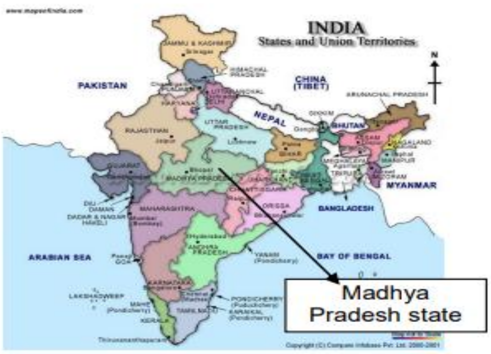
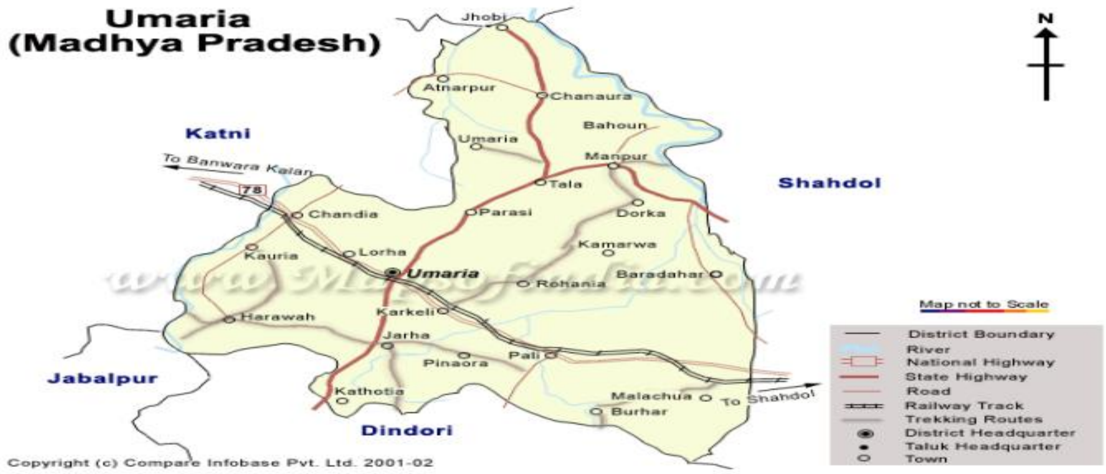



Fig - 1 Showing Madhya Pradesh state in Indian map


Fig- 2- showing Umaria district in Madhya Pradesh state



## A.3. Technologies/measures>>

**Technology**

2 units of Horizontal Kaplan turbines each of 1.179 MW are installed in Birsinghpur project.

**Specification of Kaplan turbines**

The Kaplan turbines are horizontal type with adjustable guide vanes and runner blades and tubular casing. The turbine runner blades are made of aluminium alloy since the water is drawn from the upper surface of the reservoir and is less erosive than canal or river water. The runner blades are fixed on a cast steel runner hub, which is rigidly fixed to the turbine shaft. The turbine shaft is forged carbon steel adequately designed to sustain the weight and withstand the run-away speed at its coupling with the runner hub. The guide vanes are of steel casting with integral body and stem. The guide vane profile shall be ground smooth so that leakage through it is negligible when fully closed. The casting of the draft tube shall be “S” type tubular, fabricated from steel plates.

**Salient features of turbine:**

| | |
|---|---|
| Type | Full horizontal Kaplan |
| Number | 2 |
| Rated output @ rated head of 8.1 m @ rated discharge of 16.5 m3/s@ best efficiency i.e 92.3% | 1208 kW |
| Rated output @ rated head of 8.1 m @ rated discharge of 16.075 m3/s @best efficiency i.e 92.3% | 1179 kW |
| Rated head | 8.1 m |
| Minimum operating head | 8.10 m |
| Maximum operating head[3] | 8.92 m |
| Rated discharge for each unit | 16.52 m3 /sec |
| Minimum discharge | 7.99 m3/sec |
| Maximum discharge | 16.50 m3/sec |
| Runner diameter | 1860mm |
| Specific Speed | 665.88RPM |
| Rated Speed | 265RPM |
| Turbine Setting | (-) 0.46 m |
| Make | Boving Fouress Limited |
| Minimum discharge | 7.99 m3/sec |
| Maximum discharge | 16.50 m3/sec |

In order to avoid flooding, the plant is designed in a manner that safety gates open when head of 8.1 m is reached. Thus, maximum head that can be achieved is 8.1 m

**Specification of generators at Birsingpur**

| | |
|---|---|
| Type | Synchronous |
| Number | 2 |
| Rated Output | 1.5 MVA, 3 phase, 50 Hz i.e 1.2 MW or 1200 kW |
| Net Output [4]<br>(termed as plant Output) | 1102KW |
| Voltage | 3.3 kV |
| Power Factor | 0.8 (lag) |
| Insulation | Class F |
| Excitation system less | Brush |
| Make | Crompton Greaves Limited |

**Specification of Transformer**

| | |
|---|---|
| Transformer capacity | 3.3/33 kV, 2.25 MVA Ynd11, 3 phase, ONAN |
| Connection on | 3.3kV side 6.6 kV grade 185 square mm<br>single core XLPE cable |
| Connection on | 33 kV side 33 kV bus bar |
| Connection point | Plant switchyard |
| Protection System | 50/51 (GT) over current and E/F relays and<br>Buchholz relay, WTI, OT |
| Control & monitoring | Computer based c/w interface for remote operation |
| Circuit Breakers | SF6 |

**Protection arrangements:**
This is the electrical power at generator terminals when turbine output is 1179 kW and applying 98% efficiency of gear box & 95.4% generator efficiency, as per the contract agreement.

- 64 G –restricted E/F relay
- 50 (ABC) over current relay
- 59 –over voltage relay
- 40G-loss of excitation relay
- Temperature monitoring system
- Speed monitoring system
- Master trip relay

The technology is well established and is available in the country and hence there is no transfer of technology.

The project activity produces electricity without any impact on the environment. There is no significant impact on air, water, and land due to the project activity. A brief impact on the environment due to project activity is discussed in section F. Thus, an environmentally safe technology is being employed in the project activity.

## A.4. Parties and project participants

| Parties involved | Project participants | Indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|---|---|---|
| India | Ascent Hydro Projects Ltd. (AHPL) (Private Entity) | No |
| Australia | WeAct Pty Ltd. (Private Entity) | No |
| Switzerland | Statkraft Markets GmbH (Private Entity) | No |

## A.5. Public funding of project activity>>

There is no public funding for the project activity from Annex 1 Parties.

## A.6. History of project activity >>

This is to confirm that:

(a) The CDM project activity is neither registered as a CDM project activity nor included as a component project activity (CPA) in a registered CDM programme of activities (PoA);
(b) The CDM project activity is not a project activity that has been deregistered.

This is to declare that:

(c) The CDM project activity was never a CPA that has been excluded from a registered CDM PoA;
(d) This is not a registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired (hereinafter referred to as former project) exists in the same geographical location as the proposed CDM project activity.

## A.7. Debundling >>

In line with the para 95 & 96 of Project Standard ver 7 “GUIDELINES ON ASSESSMENT OF DEBUNDLING FOR SSC PROJECT ACTIVITIES” has been followed – De-bundling is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale CDM project activities.

The full project activity or any component of the full project activity shall follow the regular CDM modalities and procedures. The following results into de-bundling of large CDM project: The small-scale project activity is not a de-bundled component of a large project activity since there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category or technology; and
- Registered within the previous two years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point

## SECTION B. Application of methodologies and standardized baselines

### B.1. References to methodologies and standardized baselines

>>

Title of approved baseline and monitoring methodology: Renewable electricity generation for a grid in accordance with approved small scale methodology AMS I.D.

| | |
|---|---|
| Type I | : Renewable energy project |
| Sectoral Scope | : 01, Energy Industries |
| Category I.D | : Grid connected renewable electricity generation,<br>Version 18; valid from 28th Nov 2014.<br>Reference: Reference has been taken from the list of the small-scale CDM project activity categories contained in Appendix B of the simplified M&P for small-scale CDM project activities.<br>https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK |

The following tools and guidelines are used in this document:

1. Tool to calculate the emission factor for an electricity system – Version 04.0.0
2. Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period." Ver 03.0.1
3. Tool to Calculate project or leakage CO2 emissions from fossil fuel combustion, Version 02".

Links to the Tools: https://cdm.unfccc.int/Reference/tools/index.html

### B.2. Applicability of methodologies and standardized baselines

>>

As per the approved small scale methodology AMS ID, version 18 this category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.

The identified project is a hydro power project of 2.2 MW (< 15 MW) capacity and there is no non-renewable components linked with it. The project will displace electricity in the western regional grid which is mostly thermal intensive (currently part of Unified Indian grid system).

### B.3. Project boundary, sources and greenhouse gases (GHGs)

>>

As per Paragraph 9 of the small-scale baseline methodology AMS-I.D., version 18: Grid connected renewable electricity generation "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to."

| | Source | GHG | Included? | Justification/Explanation |
|---|---|---|---|---|
| Baseline | Grid Electricity Generation | $CO_2$ | Yes | Main Emission Source |
| | | $CH_4$ | No | Excluded for simplification. This is Conservative |
| | | $N_2O$ | No | Excluded for simplification. This is Conservative |
| Project activity | On site fossil fuel consumption due to the project activity | $CO_2$ | No | Maybe an important emission source |
| | | $CH_4$ | No | Excluded for simplification. |
| | | $N_2O$ | No | Excluded for simplification. |
| | Combustion of waste gas for electricity generation | $CO_2$ | No | Not applicable |
| | | $CH_4$ | No | Excluded for simplification. |
| | | $N_2O$ | No | Excluded for simplification. |

## B.4. Establishment and description of baseline scenario

>>
Updated baseline for the second crediting period in line with the "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period." Version 03.0.1.

This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 292 of Project Standard & 49 (a) of the modalities and procedures of the clean development mechanism.

The tool stipulates the following steps to be carried out.

***Step 1: Assess the validity of the current baseline for the next crediting period***

***Step 1.1:*** *Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies The baseline scenario remains unchanged and is in compliance with all the relevant mandatory national and/or sectoral policies.*

***Step 1.2:*** *Assess the impact of circumstances*

The baseline scenario identified at the validation of the project activity was the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. Thus this project activity was a voluntary investment which intends to replace equivalent amount of electricity at grid from renewable source. PP was not bound to incur this investment; hence absence of project activity (i.e. the investment) does not lead to any continued baseline practice for PP within their scope whereas the continued operation of the project activity would continue to replace equivalent amount of electricity at grid. Hence, the same baseline as identified in the previous crediting period is still valid for the project. Therefore, the assessment of the changes in market characteristics is not required for the renewal of the project's crediting period under CDM.

Nevertheless, there is an impressive growth attained by the Indian Power Sector within the recent years, the installed capacity has grown from mere 1,713 MW in 1950 to 223,343.60 MW as on 31.03.2013, consisting of 151,530.49 MW Thermal, 39,491.40 MW Hydro and 4,780 MW Nuclear. Sector-wise details of installed capacity are shown in Table 1. However, It is evident from Table 1 that the installed capacity is predominantly coal based and therefore, is a major source of carbon dioxide emissions in India. Hence, there exists scope for reducing the CO2 emissions in the country by increased use of renewable energy sources.

Furthermore, project participant has considered the latest available CO2 Baseline Database (CEA database, version 17, October 2021) at the time of requesting renewal of the crediting period for establishing the baseline emission factor, which itself considered all the new circumstances. Hence, the new circumstances do not have an impact on the baseline emission.

*Step 1.3: Assess whether the continuation of the use of current baseline equipment(s)* ***or an investment is the most likely scenario for the crediting period for which renewal is requested***

As explained in step 1.2, the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. Therefore this condition is not applicable to the project activity.

*Step 1.4: Assessment of the validity of the data and parameters*
This step stipulates that *"Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity."*

In the context of the present project activity the emission factor has been updated along with the approach used to calculate the emission factor.

*Step 2: Update the current baseline and the data and parameters*
As evident from the explanation provided above the baseline scenario remains unchanged. Only the approach used to calculate the baseline emission factor is updated as per the latest version available at the time of PDD submission for renewal.

In line with the paragraph 13.9.1 of the project standard version 7, the impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period; and the correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

**Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity**

The Government of India enacted the Electricity Act in the year 20037 to harmonize and rationalize the provisions in the then existing laws. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the Enactment of the act, the then existing laws viz, The Indian Electricity Act 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory Commissions Act, 1998 were repealed. The Electricity Act 2003 was in force at the time of the completion of the baseline study for the registered PDD.

Section 3 of the said act required the Central Government to prepare the national electricity policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy. In accordance with the section 3 of the Electricity Act 2003, the Central Government notified the National Electricity Policy8 on 12th February 2005 which was in force at the time of completion of the baseline study as stated in the registered PDD of the project activity. This policy has not been revised since then and is currently in force as well.

In addition to the above policies, State Electricity Regulatory Commissions (SERCs) have announced preferential tariffs and Indian Renewable Energy Development Agency (IREDA) provides term loan assistance towards establishing biomass power projects. All these fiscal and financial incentives were in force at the time of completion of the baseline study for the registered PDD of the project activity and still continue to exist.

However, in spite of the financial incentives given by the government to renewable power projects in India the generation from the low cost must run resources connected to the NEWNE Regional Grid has not increased to such an extent that this would lead to more than 50% contribution from the low cost must run resources towards the total generation from the Regional Grid.

The approved consolidated baseline methodology, AMS-I.D., (Version 18), has been used to determine the baseline and the estimation of emission reductions for the applicable crediting period. As referred in the methodology "Tool to calculate the emission factor for an electricity system" (version 04.0) has been used to determine continued validity of the baseline based on combined margin (CM) calculations.

In light of the above discussion it is to be concluded that in accordance with relevant guidelines stipulated in the Project Standard para 13.9.1, national and/or sectoral policies and circumstances had been considered towards formulating the OM & BM baseline scenario .Hence the baseline scenario as applied for the present project activity remains justified.

As per AMS-I.D., (Version 18), paragraph 22, Baseline emissions include only CO2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$BEy = EG_{PJ,\,y} * EF_{grid,\,y}$

Where:

$BE_y$: Baseline Emissions in year y; $tCO_2$

$EG_{PJ,\,y}$: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,y}$: Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO2/MWh) .

The Emission Factor can be calculated in a transparent and conservative manner as follows:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the „Tool to calculate the emission factor for an electricity system".

OR

(b) The weighted average emissions (in tCO2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used."

The approach proposed in the "Option (a)" i.e. "Combined Margin" has been used for ascertaining Baseline Emission Reductions. The operating margin and the build margin emission factor have been considered from the information (Baseline Carbon Dioxide Emission Database -Version 17, October 2021) published by the Central Electricity Authority (CEA), Ministry of Power, Govt. of India which have been computed according to the procedures prescribed in "Tool to calculate the emission factor for an electricity system".

The baseline scenario has been identified as per the combined margin (CM) approaches which consists of operating margin (OM) and build margin (BM) factors as described in this section.

**STEP 1. Identify the relevant electricity System:**

The Indian power system is currently Integrated as unified Indian Grid System. In the proposed baseline, Indian Grid has been used as the reference grid system for estimating the baseline emission.

**STEP 2. Choose Whether to Include Off-Grid Power Plants in the Project Electricity System (Optional):**

Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

**Option I:** Only grid power plants are included in the calculation.
**Option II:** Both grid power plants and off-grid power plants are included in the calculation.

Project participant has chosen option I to include only grid power plants in the calculation.

**STEP 3. Select a method to Determine the Operating Margin (OM)**

As per the "tool to calculate the emission factor for an electricity system", "the operating margin refers to a cohort of power plants that reflect the existing power plants whose electricity generation would be affected by the proposed CDM project activity."

Further, the OM is to be determined based upon the following methods
(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch data analysis OM, or
(d) Average OM.

The simple OM method (option a) can only be used if low cost/must run resources[1] constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long term averages for hydroelectricity production.

In the context of the present project activity simple OM has been considered since the contribution of low cost must run resources in the southern regional grid mix amongst the five most recent years generation of the southern regional grid mix is less than 50% of total grid generation[2].

Hence, the statistics provided in the table above quite evidently demonstrate the fact that power generation from the low cost must run resources within the southern regional grid is less than 50 % of the total generation. Hence, the use of simple operating margin method towards formulation the baseline scenario remains justified.

[1] Low-cost/must-run resources are defined as power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the grid. They typically include hydro, geothermal, wind, low cost biomass, nuclear and solar generation. If coal is obviously used as must-run, it should also be included in this list, i.e. excluded from the set of plants.

[2] Central Electricity Authority : CO2 Baseline Database Version 17.

Further as per Step 3, the emission factor can be calculated using either of the two data vintages:

- ***Ex-ante option:*** If the ex ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation. For off-grid power plants, use a single calendar year within the five most recent calendar years prior to the time of submission of the CDM-PDD for validation.

- ***Ex post option:*** If the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required to calculate the emission factor for year y is usually only available later than six months after the end of year y, alternatively the emission factor of the previous year y-1 may be used. If the data is usually only available 18 months after the end of year y, the emission factor of the year proceeding the previous year y-2 may be used. The same data vintage (y, y-1 or y-2) should be used throughout all crediting periods.

For the project activity, the Ex-ante option is chosen for emission factor estimation.

The Simple OM factor is calculated as under in Step 4.

**Step 4: Calculate the Operating Margin Emission Factor According to the Selected Method**

As per Step 3 of the „tool to determine the emission factor of an electricity system‟, the simple OM emission factor can be calculated using the ex-ante option which states that for calculation of OM „A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period'.

In this regard, the simple OM emission factor has been sourced from the most recent data available at the time of submission of the PDD for renewal and has **therefore been fixed for this third crediting period**.

**Step 5: Calculate the Build Margin (BM) Emission Factor**

In terms of vintage of data, project participants can choose between one of the following two options:

**Option 1:** For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

**Option 2:** For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

The project participant has chosen Option 1 for vintage of the data.

Therefore, in line with the requirement for the 3rd crediting period, the BM (build margin) emission factor calculated for the second crediting period has been used to be $EF_{grid,BM,y}$.

**Step 6: Calculate the Combined Margin Emissions Factor**

Combined Margin has been used for ascertaining Baseline Emission Reductions. The combined margin emission factor consists of two components i.e. the operating margin and the build margin. The Central Electricity Authority (CEA) under the Ministry of Power, Government of India, has estimated the simple operating margin and build margin emission factor for the southern regional grid. According to „Tool to calculate the emission factor an electricity system", the combined margin emission factor is calculated as follows:

The weighted average CM method (option A) is preferred for calculation of combined margin emission factor.

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

Where:

$EF_{grid,OM,y}$ : Operating Margin CO2 emission factor in the year y (tCO2/MWh)
$W_{OM}$ : Weighting of operating margin emission factor (%)
$EF_{grid,BM,y}$ : Build Margin CO2 emission factor in the year y (tCO2/MWh)
$W_{BM}$ : Weighting of build margin emission factor (%)

The combined margin emission factor has been derived from the simple operating margin and build margin emission factors after considering/ factoring the weights of 0.25 and 0.75 for operating margin (OM) and build margin (BM) emission factors respectively relevant to the hydro power generation project activities as per the Tool to calculate the emission factor for an electricity system.

The values as per the CEA database, version 17 as explained above are:

$EF_{grid,OM,y}$ = 0.9522 $tCO_2$/MWh
$EF_{grid,BM,y}$ = 0.9673 $tCO_2$/MWh

ER calculation sheet is referred for detailed calculation of EFs.

**Thus, the Combined Margin (CM) in tCO2/MWh for the Indian grid system is**
$EF_{grid,CM,y}$ = 0.9635 tCO2/MWh

## B.5. Demonstration of additionality

>>
This is renewal of crediting period for the project, hence additionality demonstration has been referred in line with the registered CDM PDD, as follows.

As per the decision 17/cp.7 Para 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.

As per the attachment A to Appendix B of the simplified M&P for small-scale CDM project activities of the UNFCCC CDM website, to prove that the project is an additional, explanation regarding the project activity would not have occurred anyway due to at least one of the following barriers is required:

(a) Investment barrier
(b) Technological barrier
(c) Barrier due to prevailing practice
(d) Other barriers

The barriers are discussed in detail below:

***Barrier analysis:***

The implementation of the hydel power based project activity is a voluntary step undertaken by AHPL with no direct or indirect mandate by law. The main driving forces to this „Climate change initiative‟ have been:

- GHG reduction and subsequent carbon financing against sale consideration of carbon credits.
- Rural Development of the region by creating job opportunities for the local people.
- Demonstration of developing such projects to the other entrepreneurs.

However, the project participant was aware of the various barriers associated to project implementation. But it was felt that the availability of carbon financing against a sale consideration of carbon credits generated due to project activity would help to overcome these barriers. The barriers faced by the project activity are discussed below:

***Sectoral and national policies for hydropower project***

Hydropower is recognized as a renewable source of energy, which is non-polluting and environmentally benign. The history of hydropower generation in India is more than 100 years old. The first hydropower station in India was a small hydro power station of 130 KW commissioned in 1897 at Sidrapong near Darjeeling in West Bengal. With the advancement in technologies and increasing requirement of electricity, emphasise was shifted to large sized hydro power stations. In 1963, the hydropower had attained a share of 50.62% in the total installed capacity of power generation in India.

While there has been a continuous increase in the installed capacity of hydropower stations, which now stands at 25,963.05 MW14 as against the total installed capacity of 123,667.81 MW as on 31.12.2005. The share of hydropower has been reduced to 21% currently as focus had been development of thermal fossil fuel based power plants. Ministry of Power in the Government of India is responsible for the development of large hydro power projects in India. In order to maintain the balance between hydro power and thermal power, Ministry of Power has announced a Policy for accelerated development of hydro power in the country. Ministry of Non-conventional Energy Sources (MNES) is responsible for development of small and mini hydro projects of 3-25 MW station capacity. Ministry of Non-conventional Energy Sources has created a database of potential sites of small hydro based on information from various States and on studies conducted by Central

Electricity Authority. An estimated potential of about 15,000 MW of small hydropower projects exists in India. Small and mini hydro projects have the potential to provide energy in remote and hilly areas where extension of grid system is un-economical. These projects although are not economically very attractive like large power plants, they are environmentally friendly and still are viable. 4,096 potential sites with an aggregate capacity of 10,071 MW for projects up to 25 MW capacity have been identified. India has 420 small hydro power projects up to 25 MW station capacity with an aggregate capacity of over 142315 MW out of total national installed capacity of generation mix of 123,667.81MW. Many projects for a total installed capacity of about 521 MW are under construction.

The small hydropower projects are developed in the potential regions identified by the State Electricity Boards/ State Agencies responsible for SHP development. Most of the SHP projects are grid connected. However, there are some projects, which are decentralized and are managed by local community/NGOs. Many states in India have announced policies for development of small hydropower projects with various incentives like wheeling of power produced, banking, attractive buy-back rate, facility for third party sale, etc. But still the capacity additions have not been very high. Still the share of small hydro power projects upto 25 MW is only 1.5% including the projects under construction.

In Madhya Pradesh, hydropower projects are implemented by MPSEB and now MPPGCL. There are 8 hydro power stations in Madhya Pradesh with an installed capacity of 835MW. Madhya Pradesh government had formed a separate department MP Urja Vikas Nigam to develop and harness renewable energy projects.

While each of these states including Madhya Pradesh have established specific agencies to promote the development of renewable small hydropower projects, the results have been dismal. There is a significant gap between policy formation and policy implementation. Often the policy formulation is based on assessments that do not adequately account for or are tailored to the financing, technical, hydrological and overall viability of such projects in the regions where there are meant to be promoted. Small hydropower projects in the state of Madhya Pradesh, including the Birsinghpur hydroelectric project have been impacted, by these factors

The Birsinghpur hydroelectric project has faced numerous barriers, several of which are detailed in the discussion that follows. It should be noted that while an attempt has been made to describe the barriers by category, many of the barriers universally apply across several categories.

***Technological barriers***

As mentioned earlier, the project activity is amongst the first of its kind in the country utilizing condenser-cooling water for power generation. The project activity utilises the return cooling water discharged by the SGTPS. Generally thermal power stations use huge quantities of water for cooling the condenser lines. After cooling the condensers, the water is sent to a cooling tower where it is cooled and re-circulated. In SGTPS, the system operates on lake storage cooling system. A huge reservoir is available near the thermal power station.

Cooling water for condensers is drawn from the reservoir on River Johilla through the intake canal to the cooling water pump house. Three (3) pumps are provided in the pump house to meet the cooling system requirement of each thermal unit of 210 MW. Each pump has a pumping capacity of 10,000 Cum/hr.

Thus, the total quantity of circulating cooling water for each thermal unit is of the order of 30,000 Cum/hr. After cooling of the condensers this water is returned back to the reservoir by a return canal through the seal pit. Water pumped for cooling of auxiliaries is also discharged through the same seal pit. This discharge is of the order of 3,000 Cum/hr for each thermal unit. The total quantity of water available at the seal pit after considering losses of about 10% will be about 29,700 Cum/hr (8.25 Cumecs). The crest level of seal pit is about 9 metres high from the canal bed. This „head" is being harnessed to produce electricity in the project activity. A forebay is provided near the seal pit by constructing side walls to the top of the seal pit to have a constant head for the generating units. The turbines are so placed that a head of at least 8.1 metres is available.

As the project is located within the thermal power plant complex, the construction of the project activity had to be carried out within significant space limitations associated with the thermal complex. The project activity is constructed between the intake channel and the return canal of the thermal power plant. Technical requirements mandated by equipment characteristics were difficult to accommodate within the available construction space. In addition, delays caused by actions imposed by MPEB at various times resulting inordinate delays to the implementation of the project forced the company to make significant changes to the project implementation methodology. During the early development stages of the project, shortly after the initial memorandum of understanding was signed in 1996 with MPEB, AHPL completed a unique design concept using imported submersible turbine generator units ideally suited to the severely restricted environment at the project location.

Delays caused by MPEB in executing agreements, project withdrawal and re-instatement and transfer of land resulted in the technology no longer being available for use at the Birsinghpur hydroelectric project. Engineering modifications were required to the technical arrangement finally adopted for the project, which resulted in significantly increased cost, not initially envisioned for the project. In addition, consideration had to be provided to working within an existing facility where there could be no activity undertaken that could disrupt the operations of the thermal plant. This barrier has resulted in adjustments to project design and construction methodologies and incorporation of alternative measures requiring significant time and additional costs. In addition, the project activity represents a unique system with very limited experience available in implementation of similar projects, resulting in extended schedules and increased costs.

***Investment barriers***

Investment barriers are typically faced prior to start of construction and result from a climate that is not conducive to investment. Enormous delays in the allotment of the land by the government of MP, executing the PPA and other project approvals did not provide confidence to investors and financiers. MPEB also cancelled the allotment of the project after its award and after significant development effort involving investment of funds had already taken place and the project activity had progressed to an advanced stage including completion basic designs, availability of construction drawings, identification of equipment suppliers with unique submersible turbine generator technology. These issues were resolved after many deliberations, which took significant, time resulting in increased cost of the project. The project financing structure had to be significantly modified, as the investors and lenders, who had initially expressed significant interest in financial participation in the project activity, withdrew their interest.

*Capital cost increase*

The project was awarded by MPSEB to AHPL and subsequently the allotment of the project was withdrawn. However, after a prolonged debate, the project was again awarded to AHPL. The land for the project was part of SGTPS and owned by MPSEB. Post AHPL‟s request of transferring the land, it took MPSEB more than 30 Months to allot the land to AHPL. The delay in allotment resulted in a huge increase in capital cost. Designs previously completed had to be redone, with the incorporation of more readily available technology. Due to the various delays associated with the project outside of AHPL‟s control resulting in a cascading adverse financial impact to the project, the capital cost has risen from INR 114.4 Million (US $ 2.54 Million) to INR 170.4 Million (US $ 3.78 Million), which is about 33%. This has resulted in a huge financial burden to AHPL, which could be offset with the CDM funds, if made available.

*Construction cost increase*

Debt financing for the project activity was finally obtained from IREDA under a World Bank line of funding for renewable energy projects. This required compliance with World Bank procedures for the preparation of tender documents, bidding, bid evaluation, selection of bidders and final award for all construction and equipment supply contacts for the project upon approval by IREDA on behalf of World Bank. Bids were invited, after receiving the debt commitment letter from IREDA, from the approved list of vendors of IREDA on Limited International Competitive Bidding basis for Electro-mechanical package and through press notification for the civil works on domestic competitive basis by keeping suitable time cushion for the bidding and approval process as per the World Bank procedures.

In order to avoid any delays in the project execution, the bidding process was initiated early i.e. in Q-4 2001 to ensure that it would be completed by the time the loan documentation and security creation process was completed. Based on the bids and various queries raised by IREDA, the bid evaluation report recommending award of Electro-mechanical equipment package to Alstom (Lowest Bidder) was resubmitted to IREDA for approval in July 2002. Simultaneously, the civil works contract was approved by IREDA and the contract was awarded in August 2002 and the civil works were initiated in October 2002. However, after prolonged discussions with AHPL, IREDA rejected the contract award of Electromechanical package to the lowest Bidder i.e. Alstom, as it did not meet IREDA‟s requirements. This situation necessitated a re-bidding of the Electro-mechanical equipment package, which was reinitiated in November 2002 after obtaining World Bank/ IREDA approval and the contract was finally awarded to Boving Fouress Limited in March 2003. The total process of bidding and supplier selection for the E& M package thus got delayed by over 12 months resulting in significant delays to the commencement of the project work which had further cascading effect on the construction process.

Based on the information obtained from Alstom, the plant layout was established and major excavation had commenced in the October 2002. However, in addition to the delays the new E&M contractor modified the project layout, which resulted in major modifications and further delays in the detailed engineering and thereby the commencement of the civil construction activity. This necessitated a premature de-mobilization by the civil contractor. By the time the construction activity got reorganised, the steel prices increased by 55% and the cement prices increased by about 20%. These price increases placed significant pressures on the contractor to meet the scheduled obligations.

The civil works contractor expressed inability to complete the project at the agreed cost and abandoned the project requiring the project participants to find another experienced contractor to complete the works at an increased price than agreed with the earlier contractor. The civil contractor also requested for an escalation of the contract value and the project promoters had to agree for the escalation due to steep increase in basic inputs of the projects. The cost of civil works during planning stage was about INR 43 Million (US$0.955 Million), which has finally escalated to INR 65 Million (US$1.44 Million), which is about 51% and similarly the cost of electromechanical and hydro mechanical works increased by INR 10 Million (US$0.222 Million). This had a negative effect on the bottom line reducing the return on investment. The project promoters had to arrange for extra investment, which was a big barrier for the project activity.

*Institutional barriers*

MPEB had advertised for setting up Mini Hydel Power plants and allotted projects based on the incentive policy as per Government of MP Notification dated 26/09/1994. The project was allotted by MPEB to AHPL and then was abruptly withdrawn as MPEB unilaterally decided to implement the project activity by itself, without regard to agreements signed. However, the project was re allotted after prolonged discussions and deliberations. The Government of MP declared vide its notification dated 26/09/1994, scheme of incentives for power generation through non-conventional energy source which included provision of buy back by MPEB in respect of electricity generated through non-conventional sources at a rate of INR 2.25 per kWh and also provision of sales tax exemption on the eligible investment. AHPL had carried out their financial analysis of the project with the tariff of INR 2.25 per kWh and the benefit of sales tax exemption of INR 1.25 per unit. However, in June 2000, the Government of MP issued another notification whereby they notified that the projects, which do not get commissioned before December 2001, will not be eligible for this benefit. It is noteworthy that the delays in implementation of the project were primarily related to delays and ad hoc actions by the MP government actions, however, the project activity suffered, because, the provisions that established its early financial viability were no longer fully available to the project. This inconsistent implementation of government policies, which are a significant barrier for the private sector investments in the power sector in the MP state, constituted a significant institutional barrier for the project activity.

***Hydrological risks***

*Water discharge*

The project activity is dependent totally on the discharge from the thermal power plant. Any shutdown in the thermal power plant generating units would also result in the shut down/curtailment of generation of the Mini Hydel plant. The project hydrology is thus linked to the operation of the thermal plant and is affected by all the risks that could impact the operation of the thermal plant. This is a huge barrier for AHPL as its operations are linked to the smooth operation of the old thermal power plant generating units.

***Prevailing practice***

The common prevailing practice in Indian power investment scene is investing in only medium or large scale conventional power projects, as several projects that are coming up are mostly large scale fossil fuel based power generation stations. This is mainly due to the assured return on investment, economies of scale and easy availability of finances.

The total installed capacity of small hydropower plants in India is 1423 MW16 and another 187 small hydropower plants are under construction with an installed capacity of 521 MW totaling 1944 MW. The total installed capacity of power generation in India is 123,671.81MW as on 31 December, 2005 excluding small hydro, biomass and wind energy; the share of small hydropower projects is only 1.57 %. This shows that investing in small hydropower plants is not a common prevailing practice in India.

Prevailing practice in Madhya Pradesh

The total installed capacity of small hydro project in Madhya Pradesh is 5.455 MW17 as against installed capacity of 3112.955 MW constituting a share of 0.17 % only, which is very minimal. Although few projects have been allotted for private investment, no project has come up so far in the state. This shows that investment in small hydropower project is not a common prevailing practice in Madhya Pradesh.

In the light of above barriers, the project activity is additional and not a baseline scenario

## B.6. Estimation of emission reductions

### B.6.1. Explanation of methodological choices

>>
According to the para 23 of AMS-I.D. (version 18), the Emission Reductions for the project activity will be calculated using the following formula:

$$ER_y = BE_y - PE_y - LE_y \text{..................................................} \quad (2)$$

Where,
ERy = Emission Reductions during the year y in tCO2e
BEy = Baseline Emissions during the year y in tCO2e
PEy = Project Emissions during the year y in tCO2e
LEy = Leakage Emissions during the year y in tCO2e

**Calculation of Baseline Emissions:**
As per para 22 of AMS-I.D. (version 18), baseline emissions (BEy in tCO2e) are the product of electrical energy baseline EGBL, y expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor (EFCO2,grid, y ).

$$BE_y = EG_{PJ,y} * EF_{grid,y} \text{..................................................} \quad (3)$$

Where,

$BE_y$ = Baseline Emissions in year y (tCO2)

**As per para 26 of AMS-I D ver 18,** $EG_{PJ,y} = EG_{PJ,facility,y}$ = Quantity of net electricity supplied by the project plant/unit to the grid in year y (MWh).

(The net electricity export to the grid is the difference between the quantities of the grid electricity export and the import.)

$EF_{grid,y}$ = CO2 emission factor of the grid in year y (t CO2/MWh)

(Baseline emission factor for the grid (considering Combined Margin approach); Indian Grid system has been considered for this project activity.)

**Calculation of Project Emissions**
According to para 39 of AMS-I.D. (version 18), for most renewable energy project activities, PEy = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of ACM0002.

- Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption)

- Emissions from water reservoirs of hydro power plants"

The project activity is not a biomass project, neither a geothermal application and nor it is a water reservoir based hydro power project. This is a first of its kind small hydro project; therefore no project emissions are applicable to the proposed project activity.

However, as per paragraph 40 of AMS-I.D. (version 18), CO2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion18”.

As there is a small capacity DG set available at the site as backup arrangement during start up or as a failsafe option. Therefore, the emission due to on-site consumption of fossil fuel shall be calculated as per the "Tool to Calculate project or leakage CO2 emissions from fossil fuel combustion, Version 02" a project emission; (calculated in the section B.6.3 of the PDD),

**Thus,**

$$PE_{FC,j,y} = \sum_{i} FC_{i,j,y} \times COEF_{i,y}$$

Where:

$PE_{FC,j,y}$ - Are the CO2 emissions from fossil fuel combustion in process j during the year y (tCO2/yr);

$FC_{i,j,y}$ - Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr);

$COEF_{i,y}$ - Is the CO2 emission coefficient of fuel type i in year y (tCO2/mass or volume unit) I - Are the fuel types combusted in process j during the year y

The CO2 emission coefficient COEFi,,y will be calculated based on net calorific value and CO2 emission factor of fuel type i, as mentioned in option B (equation 4) of „Tool to calculate project or leakage CO2 emissions from fossil fuel combustion‟ (version 2).

**Leakage**

According to the AMS-I.D, para 42, guidance on leakage is provided for biomass project only but the project activity is first of its kind small hydro project. Hence, no leakage emission from this project activity has been considered.

**Emission Reductions:**

According to equation no 2, the Emission Reduction is calculated by subtracting the project emissions from the baseline emissions

**Thus ERy = BEy – PEy - LEy**

According to the methodology, leakage emissions have not been considered for the project activity.
**Therefore, ERy = BEy – PEy**

### B.6.2. Data and parameters fixed ex ante

| Data/Parameter | EF |
|---|---|
| Unit | $tCO_2/MWh$ |
| Description | Combined Margin $CO_2$ Emission Factor of the Indian grid system |
| Source of data | $CO_2$ baseline database for the Indian Power Sector, Version 17, October 2021 – published by Central Electricity Authority (CEA), Ministry of Power |
| Value(s) applied | 0.9635 |
| Choice of data or measurement methods and procedures | CEA has estimated the simple operating margin and build margin emission factor for the unified Indian Grid system. For calculating the $CO_2$ emission factor as per combined margin method for the renewable power generation project activities in the first and subsequent crediting periods, the weights of 0.25 for operating margin and 0.75 for build margin have been considered as - “Tool to calculate the emission factor for an electricity system” |
| Purpose of data/parameter | Calculation of baseline emission. |
| Additional comments | The emission factor has been fixed for the Second crediting period. |

| Data/Parameter | $EF_{grid,OM,y}$ |
|---|---|
| Unit | $tCO_2/MWh$ |
| Description | Operating Margin CO2 emission factor in the year y (tCO2/MWh) |
| Source of data | $CO_2$ baseline database for the Indian Power Sector, Version 17, October 2021 – published by Central Electricity Authority (CEA), Ministry of Power |
| Value(s) applied | 0.9522 |
| Choice of data or measurement methods and procedures | CEA has estimated the simple operating margin and build margin emission factor for the unified Indian Grid system. For calculating the $CO_2$ emission factor as per combined margin method for the renewable power generation project activities in the first and subsequent crediting periods, the weights of 0.25 for operating margin and 0.75 for build margin have been considered as - “Tool to calculate the emission factor for an electricity system” |
| Purpose of data/parameter | Calculation of baseline emission. |
| Additional comments | The emission factor has been fixed for the Second crediting period. |

| Data/Parameter | $EF_{grid,BM,y}$ |
|---|---|
| Unit | $tCO_2/MWh$ |
| Description | Build Margin CO2 emission factor in the year y (tCO2/MWh) |
| Source of data | $CO_2$ baseline database for the Indian Power Sector, Version 17, October 2021 – published by Central Electricity Authority (CEA), Ministry of Power |
| Value(s) applied | 0.9673 |
| Choice of data or measurement methods and procedures | CEA has estimated the simple operating margin and build margin emission factor for the unified Indian Grid system. For calculating the $CO_2$ emission factor as per combined margin method for the renewable power generation project activities in the first and subsequent crediting periods, the weights of 0.25 for operating margin and 0.75 for build margin have been considered as - “Tool to calculate the emission factor for an electricity system” |

| | |
|---|---|
| Purpose of data/parameter | Calculation of baseline emission. |
| Additional comments | The emission factor has been fixed for the Second crediting period. |

### B.6.3. Ex ante calculation of emission reductions

>>

***Formula used to determine Emission Reduction***

**CO2 emission reduction due to project activity = $BE_y - PE_y - LE_y$**

**Calculation of Baseline Emissions**

**$BE_y = EG_{PJ,y} * EF_{grid,y}$**

For the second crediting period, the total net electricity delivered to the grid would be monitored & calculated as per the monitoring plan provided in section B.7.3. However, for the estimation of total net electricity delivered by the project activity per annum, verified data from the 1st crediting & 2nd crediting period for the issued emission reduction period has been considered below:

Quantity of net electricity to be supplied to the grid ($EG_{BL,y}$): 13,471 MWh

Thus, the Baseline Emissions are

$$BEy = EG_{PJ,y} * EF_{grid,y}$$
$$= 13,471 * 0.9635$$
$$= 12,980\ tCO_2e/annum$$

Hence, the expected baseline emissions for the project activity will be 12,980 $tCO_2e$/annum.

**Calculation of Project Emissions:**

| | | |
|---|---|---|
| Average Diesel Consumption per year | = 45 | Lit/annum |
| EF $CO_{2\_diesel}$ | = 0.0726 | $tCO_{2e}$/GJ |
| $NCV_{diesel}$ | = 41.76 | GJ/Ton |
| Density of diesel (IPCC 2006 default value) | = 0.00086 | ton/liter |
| Project Emission (Less than 1% of total ER. Hence, considered zero for ex-ante estimation. However, will be considered as per actuals during the 3rd crediting period on actuals. | = (45*0.0726*41.76*0.00086) = 0.12 | 0 $tCO_2$/annum |

**Leakage:**
According to the AMS-I.D, para 42, guidance on leakage is provided for biomass project only but the project activity is first of its kind small hydro project. Hence, no leakage emission from this project activity has been considered. Hence, LEy = 0

**Emission Reductions:**
The Emission Reduction is calculated by subtracting the project emissions from the baseline emissions
**Thus,**
**ERy = BEy – PEy - LEy**
= 12,980 – 0 – 0 tCO2
= 12,980 tCO2

### B.6.4. Summary of ex ante estimates of emission reductions

| Year | Baseline emissions (t $CO_2$e) | Project emissions (t $CO_2$e) | Leakage (t $CO_2$e) | Emission reductions (t $CO_2$e) |
|---|---|---|---|---|
| Year 1 | 12,980 | 0 | 0 | 12,980 |
| Year 2 | 12,980 | 0 | 0 | 12,980 |
| Year 3 | 12,980 | 0 | 0 | 12,980 |
| Year 4 | 12,980 | 0 | 0 | 12,980 |
| Year 5 | 12,980 | 0 | 0 | 12,980 |
| Year 6 | 12,980 | 0 | 0 | 12,980 |
| Year 7 | 12,980 | 0 | 0 | 12,980 |
| **Total** | 90,860 | 0 | 0 | 90,860 |
| **Total number of crediting years** | 7 | | | |
| **Annual average over the crediting period** | 12,980 | 0 | 0 | 12,980 |

## B.7. Monitoring plan

### B.7.1. Data and parameters to be monitored

| **Data/Parameter** | $EG_{BL,y}$ |
|---|---|
| Data unit | MWh |
| Description | Quantity of net electricity supplied to the grid in year y |
| Source of data | Monthly Joint Visual Meter Reading |
| Value(s) applied | 13,471 |
| Measurement methods and procedures | 1) The total electricity generated at two generators is supplied to the grid through bay 1 and bay 2<br>2) There is main meter and check meter, at the interconnection point, at each bay.<br>3) The accuracy class of each meter is 0.2.<br>4) The export and import readings are recorded at main and check meters at both the bays by the representative appointed by MPPKVVCL20 in the presence of representative of AHPL.<br>5) All the meters are owned by AHPL and controlled by MPPKVVCL.<br>6) The calculated value of total net electricity exported to the grid will be used for emission reduction calculation. |
| Monitoring frequency | Continuous monitoring, hourly measurement and at least monthly recording |
| QA/QC procedures | Main and check meters are tested once in a year by the representative appointed by MPPKVVCL or third party authorised by the grid authority. The data will be cross checked with the invoice and bank statement. |
| Purpose of data | Calculation of baseline emission |
| Additional comment | The data would be archived upto two years after the end of crediting period. |

| **Data/Parameter** | $NCV_{diesel}$ |
|---|---|
| Data unit | GJ/Ton |
| Description | Net calorific value of diesel used on standby DG set |
| Source of data | $CO_2$ baseline database for the Indian Power Sector, version 17, October 2021 – Central Electricity Authority (CEA), Ministry of Power (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm) |
| Value(s) applied | 41.76 |
| Measurement methods and procedures | Regional or National default values |
| Monitoring frequency | Annually |
| QA/QC procedures | Calorific value will be sourced from the central electricity database once in a year |
| Purpose of data | Calculation of project emission |
| Additional comment | CO2 baseline database gives Gross Calorific Value (GCV) which is converted to NCV by deducting 5% on account of latent heat of vaporisation of water, as per IPCC guidelines 2006. |

| **Data/Parameter** | $EF_{CO2\ diesel}$ |
|---|---|
| Unit | $tCO_2e/GJ$ |
| Description | $CO_2$ emission factor of diesel |
| Measured/calculated/ Default | Default |
| Source of data | CO2 baseline database for the Indian Power Sector, Version 17, October 2021<br>Central Electricity Authority (CEA), Ministry of Power<br>https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver9.pdf |
| Value(s) of monitored parameter | 0.0726 |
| Monitoring equipment | Not applicable |
| Measuring/reading/recording frequency | Review appropriateness of the values annually |
| Calculation method (if applicable) | Not Applicable as it is default value |
| QA/QC procedures | Emission factor will be sourced from the database once in a year |
| Purpose of data/parameter | Calculation of project emission |
| Additional comments | The emission factor in CO2 baseline database by CEA is sourced from IPCC guidelines 2006. |

| **Data/Parameter** | $DC_y$ |
|---|---|
| Unit | Litres |
| Description | Diesel consumption by the standby DG set |
| Measured/calculated/ Default | Measured |
| Source of data | Logbook |
| Value(s) of monitored parameter | 45 |
| Monitoring equipment | NA |
| Measuring/reading/recording frequency | Daily Recording |
| Calculation method (if applicable) | 1) The diesel quantity available in diesel storage tank is measured using a scale and recorded on daily basis in logbook by AHPL.<br>2) The diesel consumption would be recorded in the logbook in liters. The values will be converted to tons using a factor 0.86 kg/liters (density of diesel), IPCC 2006 default values, for the purpose of calculation.<br>3) The diesel will be consumed only in the rare situation only when the power plant is not operational.<br>4) This value is used for project emission calculation. |
| QA/QC procedures | The measured data will be cross checked with diesel procurement. |
| Purpose of data/parameter | Calculation of project emission. |
| Additional comments | Project emissions due to diesel consumption will be calculated as below:<br>$PE_{DC,y} = DC_y \times NCV_{diesel} \times EF_{CO2\_diesel}$<br><br>Currently, an expected value has been derived based on previous crediting period, however during the monitoring periods actual recorded data shall be considered for project emission calculations. The data would be archived up to two years after the end of crediting period. |

### B.7.2. Sampling plan

>>
Not Applicable.

### B.7.3. Other elements of monitoring plan

>>

***Metering system***

As per the PPA, the electricity generated is to be evacuated at the 33kV Grid sub-station. However, as per the provisional permission granted by MPEB, the electricity generated is currently evacuated at interconnection point of MPPKVVCL's existing 33 kV line which delivers the electricity to the substation. The metering system in current scenario[3] is described below:

***Current Scenario:***

The electricity is generated at 3.3 kV which is stepped up to 33 kV and further the electricity is supplied to the grid through two bays i.e., bay 1 and bay 2. For measuring the net energy supplied to the grid, one main meter and one check meter is connected at interconnection point at each bay.

Joint Meter Reading (JMR) of main and check meters are recorded and signed by authorised officials of AHPL and MPPKVVCL once in every month. The JMR indicates readings recorded at meters connected to each bay and further it also indicates the calculated total net electricity supplied to the grid by the project activity.

The total net electricity exported to the grid, as per the JMR, will form the basis of emission reduction calculation.

Also, the main and check meters are capable of recording daily readings which is retrieved by AHPL staff in the presence of MPPKVVCL on the monthly basis and archived in electronic form. The readings will be used in case of apportioning of data when the JMR dates are not coinciding with the verification date.

***Billing and Cross-checking:***

The electricity generated from the project activity is sold to third parties through a wheeling arrangement with the MPPKVVCL. Further the Project Participant has retained the option of selling the electricity generated from the project activity to the MPSEB. The billing and cross-checking in either case is as below:

<u>Sale to third party:</u>

Based on the total net electricity supplied to the grid indicated in JMR, "statement of net energy delivered in the grid system" is raised by MPPKVVCL which indicates the value of net electricity delivered in the grid system. The value of net energy delivered in the grid system is calculated as total net electricity supplied to the grid minus wheeling charges. Accordingly, the electricity is distributed to the third party. The same is indicated in the monthly electricity bill issued by the concerned grid authority. Based on the electricity bill, AHPL raises an invoice to the third party subsequent to which third party releases the payment. The bank statement will form the basis of crosscheck of receipt of payment. There will be difference between total net electricity supplied to the grid indicated in the JMR and electricity consumption against which the payment is released due to deduction of wheeling charges.

[3] Project has been permitted to retain the existing metering arrangement (as per the approval received from the competent authority, ED-MPPTCL-Jabalpur). As such PP will not require to shift their Billing Meters (check and main) from the present position. Hence, existing scenario remains valid.

Sale to Madhya Pradesh Electricity Board (MPEB):

Based on the total net electricity supplied to the grid indicated in JMR, AHPL will raise an invoice to MPPKVVCL, subsequent to which payment will be released. The bank statement will form the basis of crosscheck of receipt of payment.

***Testing/ Calibration:***

The main and check meters are tested for accuracy once in a year by the representative appointed by MPPKVVCL or third party authorised by the grid authority.

The meters are jointly inspected, tested and sealed and are not be interfered with, by either AHPL or MPPKVVCL, except in presence of the other party.

Differentiation between testing and calibration:

All the meters are tested for accuracy once in a year[4] by the representative appointed by MPPKVVCL or third party authorised by the grid authority at the site itself. The portable calibrated standard meters are used for the purpose of testing whether the meters are within the permissible limits. Calibration is conducted by the MPPKVVCL only if during the testing the meter is found to be exceeding the permissible limit of error. The meter exceeding the permissible limit is removed from the site and replaced with the calibrated meter. The removed meter is then taken to the laboratory for calibration.

***Procedure for handling data uncertainty:***

The main and check meters would be tested once in every year and sealed by the MPPKVVCL in presence of PP. Both main and check meters have separate set of CT/PT units to avoid chances of both going out of order simultaneously.

**a)** If during yearly testing, main meter is found to be beyond permissible limits of error, the error identified would be applied to all the measured data recorded on the main meter and used for the purpose of billing, from the date of previous testing/calibration. The MPPKVVCL will be informed for further action.

In case the check meter readings have been used for few of the months for the purpose of billing, the error would not be applied to those months as long as check meter readings are within the permissible limit of error.

**b)** If during yearly testing, the check meter is found to be beyond permissible limits of error, the identified error would be applied all the measure data recorded, only if the check meter readings have been used for the purpose billing during the period from previous testing/calibration. However, the MPPKVVCL authority will be informed for their action.

**c)** If during yearly testing, the main meter and check meter are both found to be beyond permissible limits of error, the identified error would be applied to all the measured data, from the previous date of testing/calibration, and corrected values would be used for the purpose of emission reduction calculation.

**d)** If both, main and check meters fail to display or record the reading which is very unlikely, the MPPKVVCL authority will be informed for their further immediate action. The emission reduction will be based on the JMR raised during that month.

**Procedure for data apportioning: In the event when verification period dates and billing cycle dates in the project activity, do not coincide:**

In the event when the verification period dates and billing cycle dates (JMR dates) do not coincide, daily export and import reading from main and check meter would form the source of emission reduction calculation for that period. The daily export and import readings are retrieved from the

[4] Details of Energy Meter calibration has been provided under Appendix 2 of MR.

main and check meter on monthly basis in the presence of representative of MPPKVVCL. The method of calculation is as explained below:

For example, if the JMR date is 30$^{th}$ of a month whereas the crediting period starts on 25$^{th}$ of that month. The net energy supplied to the grid will be calculated as below:

| | |
|---|---|
| Export reading on 30$^{th}$ | X |
| Export reading on 25$^{th}$ | Y |
| Total export between 25$^{th}$ to 30$^{th}$ | Z = X –Y |
| Import reading on 30$^{th}$ | A |
| Import reading on 25$^{th}$ | B |
| Total import between 25$^{th}$ to 30$^{th}$ | C =A – B |
| Net electricity supplied between 25$^{th}$ to 30$^{th}$ | E= Z – C |

All the monitored data will be archived for at least two years after end of the crediting period. The monitoring period starts from 01 Apr 2019 whereas billing cycle starts from 31$^{st}$ of one month to 31$^{st}$ of every next month. Thus, procedure for data apportioning is not required for this monitoring period.

***Interruption***:

Numbers of interruptions hours (tripping/shutdowns) in generation during the shifts are recorded in the logbooks at the plant. Such interruptions records will be submitted during each periodic monitoring and verification.

# SECTION C. Start date, crediting period type and duration

## C.1. Start date of project activity

>>
01/09/2002

## C.2. Expected operational lifetime of project activity

>>
30 y-0m

## C.3. Crediting period of project activity

### C.3.1. Type of crediting period

>>
The project activity has been considered with Renewable Crediting Period.

### C.3.2. Start date of crediting period

>>
Starting date of third crediting period: 25/11/2021 or the date of acceptance of the renewal crediting period by UNFCCC, whichever is later.

### C.3.3. Duration of crediting period

>>
7 y-0 m

# SECTION D. Environmental impacts

## D.1. Analysis of environmental impacts

>>
Ministry of Environment and Forests (MoEF), Government of India (MoEF) has exempted small hydro power projects with project cost less than Rs.1000 million (US$22.22 Million)) from environmental clearance and carrying out environmental impact assessment (EIA) studies. However, AHPL has carried out an Environmental Review Summary (ERS) of the project activity. A brief of the same applicable for the project activity is discussed below;

The following potential environment, health and safety and social aspects of the project were analyzed:

- land acquisition, compensation and physical and/or economic resettlement;
- national and local government permitting requirements;
- potential impacts on downstream users; and
- provision of housing, hygiene facilities, water, and power (including fuel storage) during construction and operation;
- Impact on air, water and ecology due to project activity
- Social and economy issues

*Land acquisition, compensation and physical and/or economic resettlement.*

There has been no separate land acquisition due to the project activity. Birsinghpur project is located within the premises of SGTPS. Hence, there is no physical and/or economic resettlement. Since the project activity does not increase the reservoir size and does not cause any land inundation, there are no land submerging issues and hence no resettlement and rehabilitation was involved.

*National and local government permitting requirements*
All required clearances have been obtained for Birsinghpur project by AHPL.

*Potential impacts on downstream users*
The water discharged from Birsinghpur plant flows to the lake from where the water is recycled back to the SGTPS. Hence, there are no downstream users of this water.

*Impact on Air, water and ecology*
There is no impact on the air quality due to the project activity. No effluents are produced from the project activity and hence no impact on water. Hence, there are no significant impacts on the ecology due to the project activity.
*Social and economy issues*
The installation of the project activity has given job opportunities to the local community during construction and operation of the project activity. The project activity has contributed for improving the standard of living of the local community.

The environmental impacts of the project are not significant. The fact that the host Party (Government of India’s Ministry of Environment and Forests) had exempted the project activity from an environment impact assessment studies is an evidence of insignificant impacts on the environment due to the project activity.

## D.2. Environmental impact assessment

>>
Not applicable.

# SECTION E. Local stakeholder consultation

## E.1. Modalities for local stakeholder consultation

>>

The stakeholders consultation was conducted at project level before the project registration achieved, which were part of the registered CDM PD, details are discussed below.

As part of CDM project, an environmental review summary (ERS) was prepared by AHPL and by its consultants and this ERS was given for public scrutiny.

An advertisement was given in local newspapers in vernacular languages as follows; - in Navbharath, Shadol edition in Hindi language on 20/06/2005; and

The advertisements informed about the project activity and about the availability of ERS report and inviting public and local stakeholders to avail a copy of the document and offer their comments. ERS was kept for public inspection at the project sites

A register was maintained to make the entries of the issue of ERS. The English translation of the newspaper advertisements and a scanned version of the same is attached herewith.

**Translation of the newspaper advertisement**

Ascent Hydro Projects Ltd proposes to complete construction of its plant in Madhya Pradesh.
An Environmental Review Summary (ERS) has been prepared which discusses possible environmental impacts of the project as well as environmental mitigations and management measures.

The ERS is available for public inspection from 21st June 2005 to 20th July 2005 at the following address :

**Mr. Anil Ranade (Engineering Manager)**
Ascent Hydro Projects Limited,
Near SGTPS, Village Mangthar,
P.O.Birsinghpur, District: Umaria
Madhya Pradesh – 484552
Phone : 07655 262860 / 262424

लघु जल विद्युत गृह, बिरसिंहपुर

सूचना

एसेन्ट हाइड्रो प्रोजेक्टस् लिमिटेड, बिरसिंहपुर जिला-उमरिया मध्यप्रदेश में स्थित अपने संयंत्र (लघु जल विद्युत गृह) का निर्माण पूर्ण करने जा रहा है

पर्यावरण संबंधी संक्षिप्त समालोचन (ERS-Environmental Review Summary) तैयार किया गया है, जिसमें संयंत्र से पर्यावरण पर पड़ने वाले संभावित प्रभाव एवं संभावित निराकरण तथा प्रबंधन के उपाय का उल्लेख है.

पर्यावरण संबंधी समालोचन (ERS) सार्वजनिक पुनर्निरीक्षण के लिए **21 जून 2005 से 20 जुलाई 2005 तक** निम्नांकित स्थान पर उपलब्ध है.

**श्री अनिल रानाडे, इंजिनियरिंग मैनेजर,**
**एसेन्ट हाइड्रो प्रोजेक्टस् लिमिटेड,**
संजय गांधी ताप विद्युत गृह के पास ग्राम- मंगठार,
पो.- बिरसिंहपुर, जिला- उमरिया मध्यप्रदेश, पिन कोड - 484552
दूरभाष क्रमांक 07655-262860, 262424

### E.2. Summary of comments received

>>

There was no request from the stakeholders to review the environmental social review till the prescribed period of availability (20 July 2005) and there was no comment from anybody and nobody visited to collect the document.

### E.3. Consideration of comments received

>>

Since there were no comments, no action taken report is available.

## SECTION F. Approval and authorization

>>

The letter of approval from the host country for the project activity has already available at UNFCCC website.

# Appendix 1. Contact information of project participants

| | |
|---|---|
| **Organization name** | Ascent Hydro Projects Limited |
| **Country** | India |
| **Address** | Street/P.O. Box -Tejpal Scheme Road 5, Vile Parle ,Building - 6, Shiv Vastu, City - Mumbai, State/Region- Maharashtra, Postcode - 400 057 |
| **Telephone** | +91 Ph: 022 26826819 |
| **Fax** | +91 20 25885234 |
| **E-mail**<br>**Website** | ptherade@dlz.com |
| **Contact person** | Prakash Therade |

# Appendix 2. Affirmation regarding public funding

There is no public funding of the project activity from annex 1 parties.

# Appendix 3. Applicability of methodologies and standardized baselines

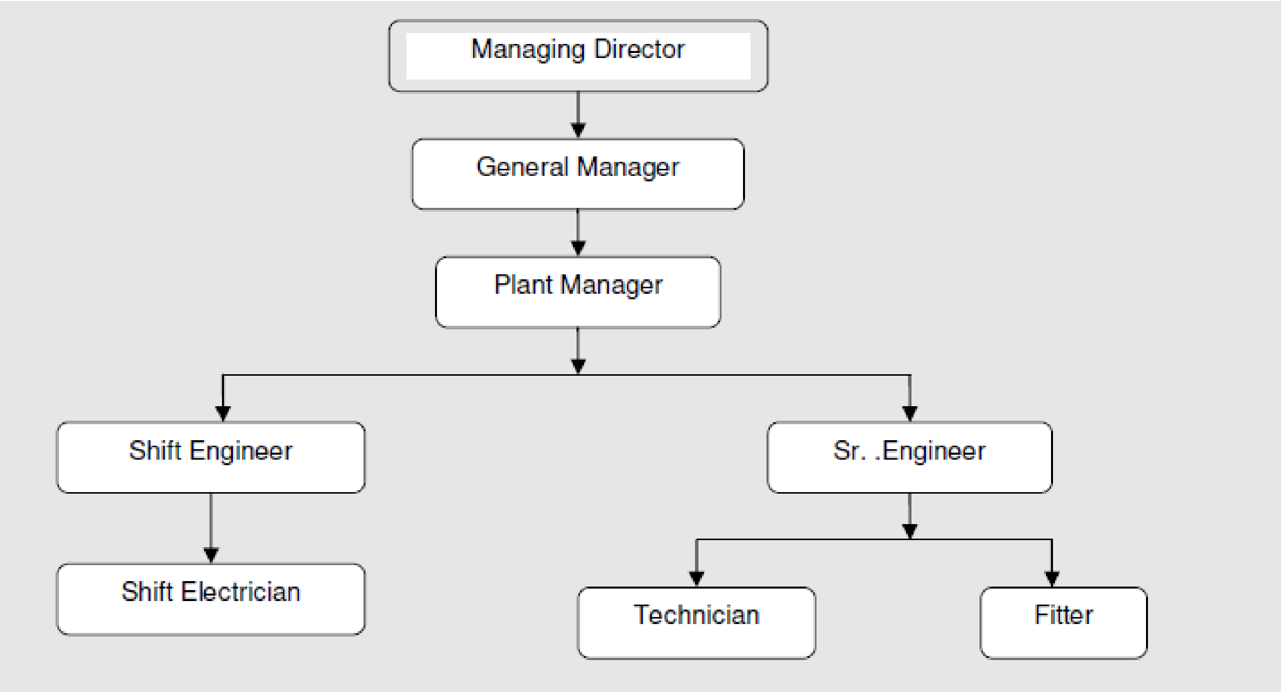
Refer Section B.2.

# Appendix 4. Further background information on ex ante calculation of emission reductions

Refer Section B.6.3

# Appendix 5. Further background information on monitoring plan

The operational and management structure and procedure to monitor the project activity is discussed below:




Managing Director of AHPL is based in head office in Pune and with a regional head office in Mumbai. The project team is dedicatedly deployed at the plant site. The concerned team of the company makes a periodical visit to the Birsinghpur plant. The Plant Manager is in charge of day to day operations of the plant. Shift Engineers, assisted by a fitter and a technician would be responsible for on-site maintenance of the equipment, preventive maintenance etc.

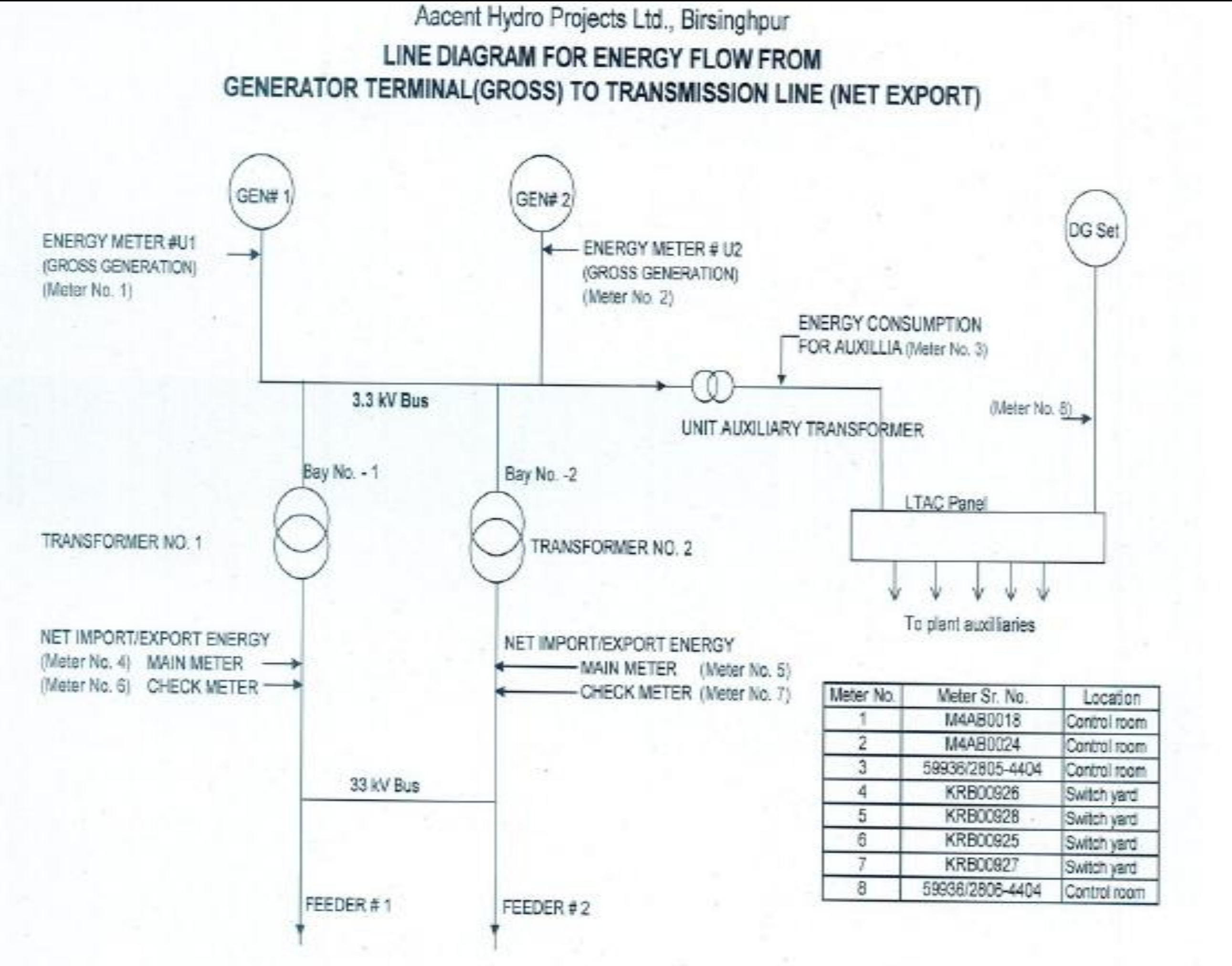
The technicians will record the readings from main and check meters daily and these readings will be counter checked by the Plant Manager. Daily records at the storage tanks are maintained in the log book to derive the quantity of diesel consumed. Daily reports are sent to head office electronically and Monthly reports are generated and maintained at the plant and head office. Plant managers would maintain records of joint meter reading.

In house training will also be provided on need basis. The Plant Manager will be responsible for identifying the training needs and maintaining the undergone training records. The records of training undergone are kept at the site.

Calibration /testing records will be maintained by Plant Manager.

In order to ensure that the project emissions are being regularly monitored and to ensure the function of the monitoring system, the Managing Director or his representative would carry out an audit every six months and maintain necessary records of the same. Necessary corrective and preventive action based on the audit findings would be carried out. All the internal audit records would be kept at the corporate office and a copy of the same would be maintained at the site

Monitoring system diagram of the existing scenario:




| Meter No. | Meter Sr. No. | Location |
|---|---|---|
| 1 | M4AB0018 | Control room |
| 2 | M4AB0024 | Control room |
| 3 | 59936/2805-4404 | Control room |
| 4 | KRB00926 | Switch yard |
| 5 | KRB00928 | Switch yard |
| 6 | KRB00925 | Switch yard |
| 7 | KRB00927 | Switch yard |
| 8 | 59936/2806-4404 | Control room |

This current scenario will remain valid for the project throughout the time as project has been permitted to retain the existing Metering arrangement. A copy of approval received from the competent authority (ED -MPPTCL-Jabalpur) is attached for reference.

## Appendix 6. Summary report of comments received from local stakeholders

Refer Section E.2.

# Appendix 7. Summary of post-registration changes

There are no post-registration change related activities during the last monitoring period and also during the current renewal of crediting phase. However, there were some post registration change related activities happened during the first verification period, which are reported here.

Following are the reasons identified during the first verification period due to which post registration changes has happened:

1. There was change in implementation of project activity description in the registered PDD, as AHPL exercised its power to enter into a PPA with third parties i.e Nicholas Piramal Ltd and IPCA.

2. The technical specifications of the project activity equipment in the registered PDD were not in line with the specifications observed at site and through document review. However the project activity equipment has not been replaced or changed since their installation at site,

3. The verification team observed that the description of monitoring plan in the registered PDD was not in compliance with the actual monitoring practice at the project site.

Hence the verification team raised CARs based on which the Project Participant has revised the PDD and monitoring plan. The changes to the registered PDD and revision in the monitoring plan were submitted to the CDM EB as a single submission which was approved by CDM – EB on 31/05/2011.

# Appendix - 8

Details of Energy Meters & their calibration status:

| Calibrated Energy Meter Serial No, | Make | Energy Meter Type | Accuracy Class | Last Meter Calibration Date |
|---|---|---|---|---|
| D1175013<br>Main Meter Bay-1 | Secure | E3M024 | 0.2s | 09-Sep-21 |
| D1175012<br>Check Meter Bay-1 | Secure | E3M024 | 0.2s | 09-Sep-21 |
| D1175015<br>Main Meter Bay-2 | Secure | E3M024 | 0.2s | 09-Sep-21 |
| D1175014<br>Check Meter Bay-2 | Secure | E3M024 | 0.2s | 09-Sep-21 |

Please note that meter calibration & its replacement etc. is solely under purview of MPPKVVCL, PP has no control over it.

- - - - -

## Document information

| *Version* | *Date* | *Description* |
|---|---|---|
| 12.0 | 8 October 2021 | Revision to:<br>Improve consistency with version 03.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN). |
| 11.0 | 31 May 2019 | Revision to:<br>• Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);<br>• Make editorial improvements. |
| 10.1 | 28 June 2017 | Revision to make editorial improvement. |
| 10.0 | 7 June 2017 | Revision to:<br>• Improve consistency with the “CDM project standard for project activities” and with the PoA-DD and CPA-DD forms;<br>• Make editorial improvement. |
| 09.0 | 24 May 2017 | Revision to:<br>• Ensure consistency with the “CDM project standard for project activities” (CDM-EB93-A04-STAN) (version 01.0);<br>• Incorporate the “Project design document form for small-scale CDM project activities” (CDM-SSC-PDD-FORM);<br>• Make editorial improvement. |
| 08.0 | 22 July 2016 | EB 90, Annex 1<br>Revision to include provisions related to automatically additional project activities. |
| 07.0 | 15 April 2016 | Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0). |
| 06.0 | 9 March 2015 | Revision to:<br>• Include provisions related to statement on erroneous inclusion of a CPA;<br>• Include provisions related to delayed submission of a monitoring plan;<br>• Provisions related to local stakeholder consultation;<br>• Provisions related to the Host Party;<br>• Make editorial improvement. |

| *Version* | *Date* | *Description* |
|---|---|---|
| 05.0 | 25 June 2014 | Revision to:<br>• Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0));<br>• Include provisions related to standardized baselines;<br>• Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1;<br>• Change the reference number from F-CDM-PDD to CDM-PDD-FORM;<br>• Make editorial improvement. |
| 04.1 | 11 April 2012 | Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b. |
| 04.0 | 13 March 2012 | Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8). |
| 03.0 | 26 July 2006 | EB 25, Annex 15 |
| 02.0 | 14 June 2004 | EB 14, Annex 06b |
| 01.0 | 03 August 2002 | EB 05, Paragraph 12<br>Initial adoption. |

Decision Class: Regulatory
Document Type: Form
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