Component project activity design document form for CDM component project activities

(Version 03.0)

Complete this form in accordance with the Attachment "Instructions for filling out the component project activity design document form for CDM component project activities" at the end of this form.

COMPONENT PROJECT DESIGN DOCUMENT (CPA-DD)	
Title of the CPA	Vaspet-II and Vaspet III Wind Power Project, Maharashtra
Version number of the CPA-DD	03
Completion date of the CPA-DD	25/07/2014
Title of the PoA to which the CPA is included	Promotion of renewable energy generation in India - Programme of Activities
Host Party(ies)	India
Estimated amount of annual average GHG emission reductions	85,680 tCO_2e

SECTION A. General description of CPA

A.1. Title of the proposed or registered PoA

Promotion of renewable energy generation in India - Programme of Activities
Reference: 9416

A.2. Title of the CPA

Title: Vaspet-II and Vaspet III Wind Power Project, Maharashtra
Identification Number of CPA: CPA004
Version: 03
Date: 25/07/2014

A.3. Description of the CPA

The present CPA will commission and operate

☒ Wind energy project

☒ Sale to grid
☐ Captive consumption

The CPA has ☒ single sub- project
☐ multiple sub –projects as discussed below

The details of same are as below.
Total size of CPA: 49.50 MW
Location: Shedyal, Salekiri and Valsang village/s, Sangli District, Maharashtra State in India.

Technology: 1.5 MW x 33 number of individual units, ReGen Powertech Private Limited make, V82/1,5 MW model.

The electricity generated will be supplied to the
☒ NEWNE grid ☐ Southern grid
☒ through PPA ☐ contractual wheeling/ third party sale agreement

☐ For multiple sub- projects with multiple investors:

Sub –Bundle component	Project Implementer	Total Capacity (MW)	No. of WTGs	Location	Date of Commissioning
In case of more Bundles rows will be added					

Name of the CPA implementer acts as bundle co-ordinator (Focal Point)[1]: INSERT Name

This renewable electricity will avoid generation of equivalent electricity in the carbon intensive grid and reduce CO_2 emissions.

Pre-project Scenario:

[1] Focal point of the CPA has been decided by giving the power of attorney to INSERT Name by all the investors involved in this bundle. Power of Attorney dated INSERT Date is now submitted to the DOE.

The project under CPA is a
☒ Greenfield renewable energy power plant

Contribution of the project activity to sustainable development:
Ministry of Environment and Forests, Government of India has suggested social well-being, economic well-being, environmental well-being and technological well-being as the four indicators for sustainable development in the host country approval eligibility criteria for Clean Development Mechanism (CDM) projects[2].

The project contributes to the general well-being of the region and is in line with the sustainable development policies of Government of India, as described below:

Social well-being:
The project has resulted in the investment in the rural sector of India thereby creating employment opportunities to local population (skilled and unskilled manpower) available in and around project facility for building infrastructure, installation and maintenance and managing the wind farm thus enabling improvement in the quality of life of the people**.**

Economic well-being:
The land prices in the neighboring area have gone up thereby benefiting the villagers. It will help to improve the availability of electricity as the electricity generated will be fed into the grid thereby curtailing the supply demand gap. This will provide new opportunities for industries and economic activities to be setup in the area thereby increasing employment opportunities.

Environmental well-being:
The project activity is a cleaner means for power generation which avoids fossil fuel based thermal power generation. Therefore it positively contributes towards the reduction in demand for India's carbon intensive energy resources thereby conserving the non-renewable natural resources like coal, gas, oil. By substituting and hence decreasing the need for fossil fuel based power generation in the grid, the project activity will reduce GHG emissions from the country's electricity sector. Moreover wind power projects produce no end products in the form of solid and liquid wastes. Power generation from renewable energy sources in the project activity creates global as well as local environmental benefits.

Technological well-being:
The project activity is an energy diversification measure where renewable energy is harnessed for generation of power in order to meet the increasing energy demand of the state. The associated technology for power generation does not have any associated GHG emission. These turbines deploy the advanced technology for generation as well as for grid interaction. Hence, the project would utilize environmentally safe and sound technologies in wind power sector. Further the project demonstrates harnessing wind potential and encourages others for setting up more such projects in future.

Thus, from the above discussion it is evident that the CPA satisfies the Sustainable Development criteria of the host country.

A.4. Entity/individual responsible for the operation of CPA

ReNew Wind Energy (Shivpur) Private Limited is a SPV formed for the implementation of this project. The company has interest in development of renewable energy projects in India.

A.5. Technical description of the CPA

The CPA consists of grid connected renewable wind power generation unit using following technology

Wind turbine generators based power units

[2] http://www.cdmindia.gov.in/approval_process.php

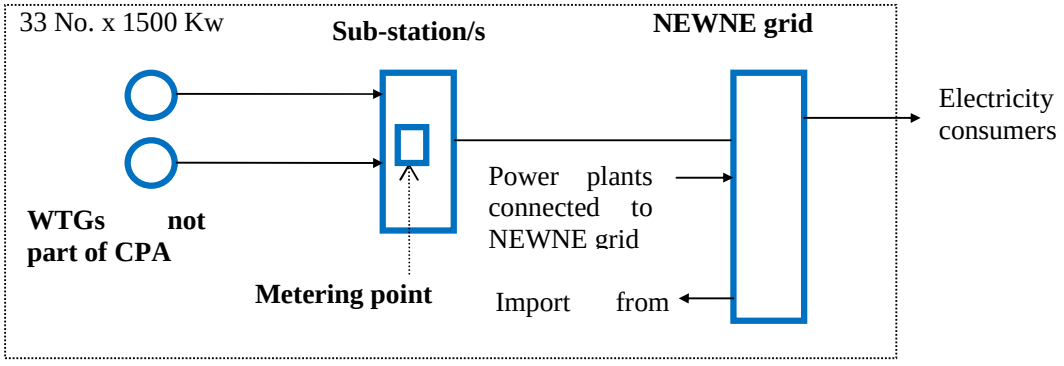
Table 1.1: Typical specifications of the wind turbine model/s used – ReGen Powertech Private Limited make, V82/1,5 MW model.

S.N.	Parameter	Specification/ Value with unit
1	Rated power	1500 kW
2	Rotor diameter	82 m
3	Hub height	85 m
4	Turbine type	Direct drive horizontal axis wind turbine with variable rotor speed
5	Power regulation	Independent electromechanical pitch system with for each blade
6	Cut in wind speed	3 m/s
7	Rated wind speed	~ 13 m/s
8	Cut out wind speed	22 m/s
9	Operational range of rot. speed	9 – 17.3 rpm
10	Orientation	Upwind
11	No. of blades	3
12	Blade material	Glass fibre reinforced plastic
13	Gear box type	Gearless
14	Generator type	Synchronous, variable speed
15	Braking	Aerodynamic
16	Output voltage	620 V
17	Tower	85 m
18	Useful life	20 years

Environmentally safe technology:

CPA has implemented Wind power plant which is a renewable energy source of energy and reduces greenhouse gas emissions by displacing fossil fuel based electricity generation. The technology used in the project, which has been used worldwide, is environmentally safe as it is free from any gas and liquid effluents like conventional power generation. The usage of this technology for power generation has no negative impacts on the ecosystem.

☒ **For CPAs with common metering point (at substation)**



☐ **For CPAs with metering at individual WTG**

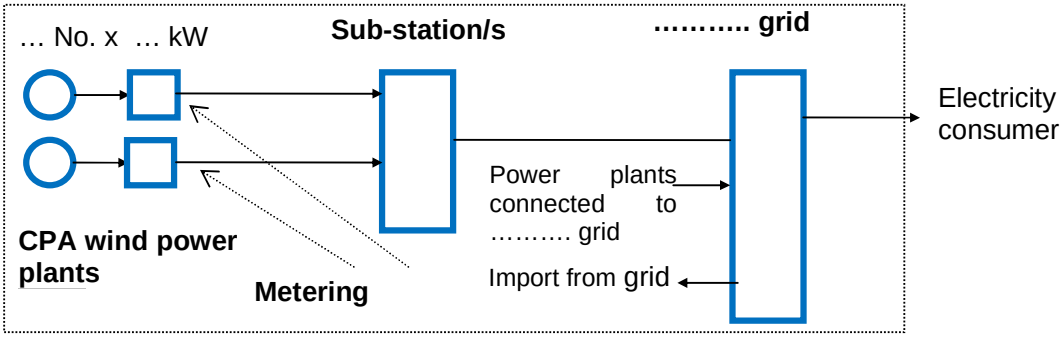


Figure: Flow diagram of generic wind CPA including NEWNE grid

List of metering points:
The CPA is implemented at a single wind farm and the individual WTGs will have controller meters and also connected to CMS. This data is monitored along with the bulk/ revenue meters at the connected substations and apportioning of import and losses is applied to get net export by the project activity WTGs.

The project activity is estimated to export annually 89,925 MWh to NEWNE grid.

c) Type and level of service provided outside the project boundary
The above estimated electricity will be supplied to the NEWNE grid and will avoid generation of equivalent electricity in the carbon intensive grid.

d) Technology transfer from Annex I countries

☒ The CPA does not involve technology transfer from Annex I countries to the host country

☐ The CPA involves technology transfer from Annex I countries to the host country as per discussion below

A.6. Party(ies)

Name of Party involved (host) indicates host Party	Private and/or public entity(ies) CPA implementer(s) (as applicable)	Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)
India (host)	ReNew Wind Energy (Shivpur) Private Limited (a private entity)	No

A.7. Geographic reference or other means of identification

The CPA is located in villages Shedyal, Salekiri and Valsang in Sangli district of Maharashtra state, India.
Nearest Airport: Pune, ~290 km;
Nearest Railway Station: Karad, 75 km;
Nearest Seaport: Mumbai, 440 km

The unique geographical coordinates of the individual power units in CPA are given in CPA-DD, Annex 1 - Geographical coordinates of the renewable power plants in CPA.

Figure 1: Location map of the project activity in India and Sangli district

A.8. Duration of the CPA

A.8.1. Start date of the CPA

26/11/2012

This is the date of supply agreement with ReGen Powertech Pvt. Ltd. for supply of WTGs under this CPA. (This date is selected as start date as real action on project activity started from this date only).

☒ Confirmation from CME that the start date is after the start date of the PoA.

A.8.2. Expected operational lifetime of the CPA

20 years and 00 months

A.9. Choice of the crediting period and related information

7 years and 0 months

☐ Fixed crediting period is chosen

☒ Renewable crediting period is chosen

The crediting period can be renewed twice (7 + 7 years) after the end of first crediting period. The crediting periods even after second renewal will not exceed the life of project WTGs and the end of duration of the PoA i.e. 22/05/2040.

A.9.1. Start date of the crediting period

01/08/2014[3] or date of inclusion of CPA whichever is later.

A.9.2. Length of the crediting period

7 years and 0 months

[3] Give a date based on estimated commissioning of all the power plants in the CPA

A.10. Estimated amount of GHG emission reductions

Emission reductions during the crediting period	
Years	**Annual GHG emission reductions (in tonnes of CO_2e) for each year**
2014	85,680
2015	85,680
2016	85,680
2017	85,680
2018	85,680
2019	85,680
2020	85,680
Total number of crediting years	7
Annual average GHG emission reductions over the crediting period	85,680
Total estimated reductions (tonnes of CO_2e)	599,760

A.11. Public funding of the CPA

CPA does not involve public funding, diversion of ODA from Annex 1 countries.

☒ Confirmation from CME that the CPA is implemented by CPA implementer by equity and debt funding and no public funding / ODA from Annex 1 countries is involved.

☐ Confirmation from CME that the CPA is implemented by CPA implementer by 100% equity and no public funding / ODA from Annex 1 countries is involved.

A.12. Confirmation for CPA

☒ The CPA implementer confirms that the CPA is neither registered as an individual CDM project activity nor is part of another registered PoA.

A.13. Contact information of responsible persons/ entities for completing the CDM-CPA-DD-FORM

Parag Sharma

COO

ReNew Wind Energy (Shivpur) Pvt. Ltd.

Contact details are provided in Appendix 1 below.

SECTION B. Environmental analysis

B.1. Analysis of the environmental impacts

The present CPA includes wind energy projects and these renewable power projects are excluded from conducting detailed EIA as per the EIA Notification 2006[4]. Thus, environmental impact assessment has not been required for the CPA.

B.2. Environmental impact assessment

This CPA is not envisaged to have environmental impacts as seen in section above.

[4] http://envfor.nic.in/legis/eia/so1533.pdf

SECTION C. Local stakeholder comments

C.1. Solicitation of comments from local stakeholders

The CPA implementer identified stakeholders like local population leaving near CPA power plants, employees, elected representatives of nearby areas etc. as potential stakeholders. A local stakeholders' meeting was held on 19/12/2013 and invitation was by a news paper ad (Punyanagari, Kolhapur) and few individual invitations in (local language). The meeting was held at

Venue – 507/1/2, 1st Floor, Algur, TV Nagar, Old Highschool Road, Jath, Tal. Jath, Dist. Sangli

The meeting was attended by total 25 people and started by welcome address from Mr. Dipak Nalavade (ReGen Powetech - WTG supplier and O&M contractor) and introductions. Mr. Kuber Turevale, a local representative was unanimously chosen as chairperson of the meeting. Mr. Rohit Joshi, representative of CPA implementer introduced objectives of project, its benefits and role in reducing GHG emissions. He also discussed issue of global warming and role of CDM of the Kyoto Protocol. The meeting Chairman discussed benefits of project to the local communities.

The Chairperson then summarised comments and gave his view, thanked CPA implementer for the social benefits. Then attendees were requested to give comments and raise concerns if any. These are summarised in following Section.

C.2. Summary of comments received

Sr. No.	Query / comments from stakeholders	Response from PP
1	Mr. Arun Shinde Is it true that wind mills move away rain clouds?	The clounds are mush higher than the height of wind mills and hence it is not likely to have any imapct on rain. Further reference was made to studies from Indian Institute of Tropical Meteorology and Center fo Wind Energy Technology on same conclusion.
2	Mr. Jagtap S.B. Why cant the electricity generation from this project be directly supplied to the local community?	The generated electriicty is suplied to the state electricty distribution company which distributes it as per the state policy. PP can not supply electricity directly to the local community.
3	Mr. Akash Whether wind projects harm local property value?	There would not be any negative impact on the property values due to the presence of wind farms. In fact, the development of wind farms will subsequently increase the property value owing to the overall development in the region.
4	Mr. Mahesh Jalake What are the direct and indirect benefits to local people from the project?	The project would generate local job oportunities, which will help in the overall socio-economic development of the region. Additionally, a number of social corporate responsibility initiaves would be undertaken, which would be identified based on the specific needs of local populace.

C.3. Report on consideration of comments received

The organisers gave vote of thanks to the stakeholders and requested to contact PP in case of any further queries.

SECTION D. Eligibility of CPA and estimation of emissions reductions

D.1. Reference of methodology(ies) and standardized baseline(s)

The CPA involves renewable electricity generation projects connected to grid. Thus, applicable methodology is

ACM0002, Version 13.0.0
Sectoral scope: 01
EB 67, Annex 13

'Consolidated baseline methodology for grid-connected electricity generation from renewable sources'

Reference: http://cdm.unfccc.int/methodologies/DB/MPY3HVJIMTKE5P0UNTYE827D6Q7EHB

The CPA does not involve application of multiple methodologies.

This methodology also refers to the latest approved versions of the following tools:

- "Tool to calculate the emission factor for an electricity system" (Ver. 04.0.0, EB 75, Annex 15)
- "Tool for the demonstration and assessment of additionality" (Ver. 07.0.0, EB 70, Annex 08)
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (Ver. 02, EB 41, Annex 11)
- "Combined tool to identify the baseline scenario and demonstrate additionality" (Ver. 05, EB 70, Annex 09)

These Tools can be referred from the link

https://cdm.unfccc.int/methodologies/PAmethodologies/approved

D.2. Applicability of methodology(ies) and standardized baseline(s)

Applicability conditions

Sr. No.	Applicability condition as per methodology	For a CPA involving wind energy plants
1	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s)	☒ CPA involves grid connected wind power generation projects that (select appropriate from below) ☒ install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant)
2	The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit	The CPA involves ☒ installation of a wind power plant
3	In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter $EG_{PJ,y}$):the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity	The CPA consists of only Greenfield projects. Hence, this condition is not applicable.
4	In case of hydro power plants: At least one of the following conditions must apply: o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of	This condition is not applicable as present CPA involves wind energy projects and not hydro power plants.

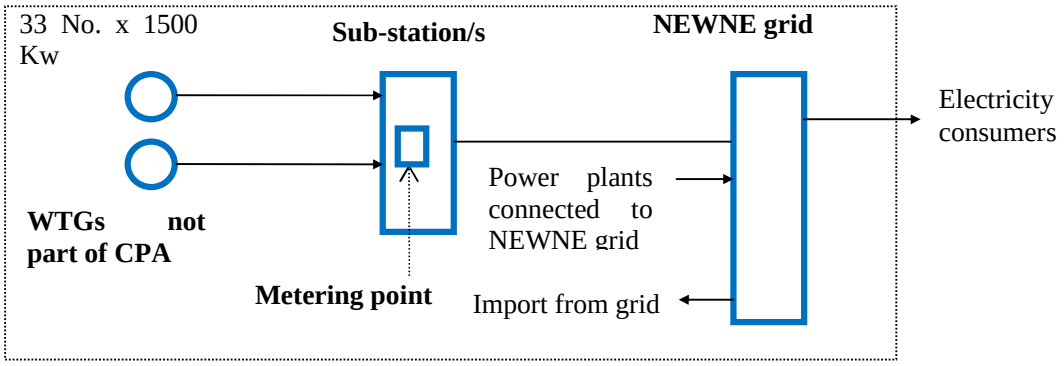
	any of the reservoirs; or o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2; or o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2.	
5	In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2 the project activity all of the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2; • Multiple reservoirs and hydro power plants are located at the same river and were designed together to function as an integrated project that collectively constitutes the generation capacity of the combined power plant; • Water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m^2, is lower than 15 MW; • Total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs	This condition is not applicable as present CPA involves wind energy projects and not hydro power plants.
6	The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants; • A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m^2.	This condition is not applicable as present CPA involves wind energy projects and not fuel switch from fossil fuel to renewable energy source; biomass fired power plants; hydro power plant.
7	In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The CPA consists of only Greenfield projects. Hence, this condition is not applicable.

Thus the application of ACM002 is followed for the CPA.

D.3. Sources and GHGs

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project scenario	Wind energy project	CO_2	No	Wind energy projects do not emit GHGs and need not consider project emissions[5].
		CH_4	No	Wind energy projects do not emit GHGs.
		N_2O	No	Wind energy projects do not emit GHGs.

☒ **For CPAs with common metering point (at substation)**



☐ **For CPAs with metering at individual WTG**

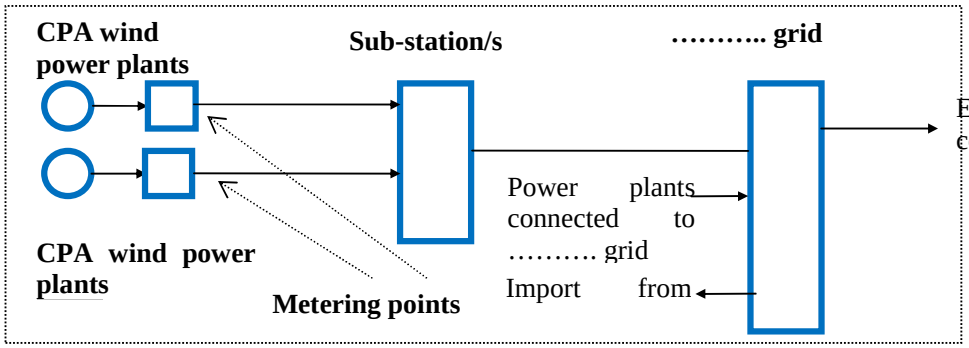


Figure: Schematic of the project boundary

D.4. Description of the baseline scenario

Identification of the baseline scenario

The identified baseline is in accordance with the section B.4 of PoA.

[5] as per ACM0002, Version 13.0.0, project emission section (pg. 6) 'For most renewable power generation project activities, PEy = 0.

☒ CPA involves new grid connected renewable power plant

(1) If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

- 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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

D.5. Demonstration of eligibility for a CPA

In line with the Criteria as per "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for PoA", Version 02.1, EB 70, Annex 5, the POA has set up few conditions. The section discusses how this CPA meets those criteria.

S. N.	Main requirement as per above guidance	Condition of PoA	Compliance of CPA
A	The geographical boundary of the CPA including any time-induced boundary3 consistent with the geographical boundary set in the PoA	Located within the geographical boundary of India evident from any of the following documents ☒ supply order/ purchase order/ MOU with supplier ☐ commissioning certificate/ land ownership/ lease OR regulatory clearance	The CPA is located within India. The condition is met.
B	Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)	Unique identification number based on locations will be allocated to each CPA to avoid double counting of emission reductions. ☒ wind energy project e.g. CPA00X	The CPA is identified under the PoA as CPA 004. Thus the condition is met.
c	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications.	Deploy technology/measures using wind power energy generation systems approved by Government/ Industry standards ☒ wind turbines approval documents by Centre for Wind Energy Technology (CWET) OR equivalent government approved agency	The CPA deploys wind energy generation systems approved by C-WET. Thus the condition is met.
D	Conditions to check the start date of the CPA through documentary evidence.	CPA has a project start date on or after start date of the PoA with documentary evidence. ☒ supply order/ purchase order/ with supplier ☐ start of construction of project plant ☐ any other commitment to implement project	The start date of CPA is 26/11/2012 which is after the start of PoA. Thus, the condition is met.

E	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs	Use methodology ACM0002 (Ver. 13.0.0) and meet all the applicability criteria	☒ The CPA is using methodology ACM002 (Ver. 13.0.0) as seen in section above. Thus the condition is met.
F	The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as specified in Section A above.	Demonstrate the additionality as per the "Tool for the demonstration and assessment of additionality" (Ver. 07.0.0, EB 70, Annex 8) at the time of inclusion of each CPA.	☒ The CPA has established additionality using available and applicable guidance now. Thus, the condition is met.
G	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis.	Undertake a local stakeholder consultation which comprises: i. Identification of local stakeholders ii. Explain about the CPA project activity iii. Inviting comments from stakeholders iv. Recording the comments ☒ all of these documents will be made available to the CME – (1) invitation notice in local language (2) minutes of meeting with attendance sheet (3) photo/ video evidence of meeting	☒ The CPA has identified local stakeholders, explained about CPA also invited and recorded comment. Thus the condition is met.
		Conduct EIA/Initial Environment Assessment if falling in same scope as per the applicable 'Environmental Impact Assessment Notification [6] ' and would address the identified environmental impacts.	Each CPA should conduct EIA/Initial Environment Assessment if falling in same scope as per the applicable 'Environmental Impact Assessment Notification' and would address the identified environmental impacts.
H	Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance.	Demonstrate that no Official Development Assistance (ODA) is being used. CME has checked source of funding from ☐ annual report of CPA implementer ☐ Chartered Accountant certificate ☒ loan approval of CPA project ☐ undertaking of the project funding	☒ The CPA does not include diversion of ODA. Thus, the condition is met.
I	Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid connected/	Supply electricity to grid (NEWNE or southern grid) or supplies electricity to an	The CPA supplies electricity to NEWNE grid. The condition is met.

[6] http://envfor.nic.in/legis/eia/eia-2006.htm

	off-grid) and distribution mechanisms (e.g. direct installation)	identified consumer facility via grid through a contractual arrangement such as wheeling ☒ NEWNE ☐ Southern grid	
J	Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys	The POA requires all CPAs to independently monitor all electricity generation sources and no sampling method is applicable.	☒ The CPA will monitor all the renewable power plants in it and no sampling method is used. Thus the condition is met.
K	-	Consist of one or more renewable energy power projects using wind power energy generation systems.	The CPA consists of 33 number of ☒ wind turbine generators
L	-	Have a contract of services and cessation of rights with the CME that governs the CPA's participation in the REG-PoA, and comply with the code of conduct of the CME.	☒ CME confirms that this CPA has contractual agreement and has signed to comply with the code of conduct of CME.
M	-	Be in line with laws and regulations available at the time of inclusion of the CPA into the PoA.w	☒ CPA implementer and ☒CME confirm that CPA will avail all laws and regulations applicable to it. Condition is met.

Thus, all the conditions of POA for eligibility of CPA are fulfilled.

Confirmation of additionality of CPA
The POA requires each CPA to demonstrate additionality using applicable CDM guidelines. The CPA has chosen to demonstrate additionality using 'Tool for the demonstration and assessment of additionality' (Ver. 07.0.0, EB 70, Annex 08). Accordingly step wise analysis is presented below.

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

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

(1) Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity.

(a) The proposed project activity undertaken without being registered as CDM project activity.

This alternative is in compliance with all applicable legal and regulatory requirements and may be a part of the baseline. However, in the absence of the CDM revenue it would have been difficult for the project proponent to implement the project activity on account financial unviability (please refer to Step 2: Investment Analysis in the following section for details).

(b) Continuation of existing situation
In this alternative, the project activity would not be implemented and an equivalent amount of energy (power) would have been produced by the project grid electricity system through its currently running power plants and by new capacity addition to the grid. i.e. continuation of current situation

Outcome of Sub-step 1a: The following are the possible alternatives for the project activity:

1) The proposed project activity undertaken without being registered as CDM project activity.
2) Continuation of existing situation

Sub-step 1b: Consistency with mandatory laws and regulations:

Both the alternatives are in compliance with all applicable legal and regulatory requirements as

- The implementation of the project activity is a voluntary initiative as taken by the project proponent and is not mandatory or a legal requirement;
- The Electricity Act, 2003, does not restrict or allow any authority to restrict the fuel choice for power generation; and
- The applicable Environmental Regulations do not restrict the use of wind energy and there is no legal requirement on the selection of a particular technology.

Outcome of Step 1b: The identified alternatives in sub step 1 a are in compliance with all applicable legal and regulatory requirements.

Step 2 Investment analysis OR Step 3 Barrier analysis

☒ Investment Analysis

☐ Barrier Analysis

☐ Investment barrier

☐ Technological barrier

CPA implementer has chosen Investment analysis to prove the Additionality.

Sub-step 2a Determine appropriate analysis method

☒ Option 1 Simple Cost Analysis would not be an appropriate analysis method as the project incurs revenue from sale of electricity (export of power to grid). As per guidance 19 of Annex 5 of EB 62,

Project is grid connected power plant and is selling electricity. Thus,
☒ Investment Comparison Analysis is not applicable as the investment in the alternative number 1 (identified in sub-step 1 b) is not in control of PP. As the project is supplied power to the grid, benchmark analysis is suitable to the project activity as per guidance 19 of Annex 5 of EB 62.

As the project is supplied power to the grid, benchmark analysis is suitable to the project activity as per guidance 19 of Annex 5 of EB 62.

Outcome of Sub-step 2a – The benchmark analysis option has been chosen.

Sub-step 2b: Option III. Apply benchmark analysis

Selection of financial indicator

The project activity involves considerable amount of capital investment. The project activity aims to supply electricity to NEWNE grid and thus generating revenue from sale of electricity. The Internal Rate of Return is a rate of return used in capital budgeting and compare the profitability statements and is found to be suitable indicator in capital intensive projects. PP had used equity IRR at the time of investment decision time. Thus in the context of the project activity, Equity IRR is deemed to be the suitable indicator for assessing the financial attractiveness of the project activity.

Now, here PP has evaluated post-tax equity IRR to assess the financial viability of the project activity.

Chosen financial indicator:
☐ Project IRR

☒ Equity IRR
☐ Levelised cost of electricity generation
☐ Any other - explain chosen fianncial indicator and justify appropriateness in the decision making context

Selection of benchmark
INSERT selection of benchmark and use following example if financial indicator chosen is equity IRR, delete if not applicable

Choice of Benchmark
☒ Expected/ required return on equity (as per EB 62, Annex 5, Appendix)
☐ Weighted average cost of capital (WACC)
☐ Return on equity using CAPM model
☐ Lending rate of commercial banks
☐ Any other - explain chosen benchmark and justify appropriateness in the decision making context

As per Para 12 of Annex 5 of EB 62,
Required/expected returns on equity are appropriate benchmarks for an equity IRR.

Thus, as per the above guidance CPA implementer has chosen required rate of return (ROE) as a benchmark.

As per guidance 13 of Annex 5 of EB 62,
*In the cases of projects which could be developed by an entity other than the project participant the **benchmark** should be based on parameters that are standard in the market.*
Since the project activity can be developed by any other entity, ROE is calculated based on the standard parameters in the market.

As per guidance 15 of Annex 5 of EB 62,
If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors.

As per the above guidance PP has used option (a) i.e. default values as provided in the Appendix A. The project 1 projects of India is 11.75%. As per guidance 7 of Appendix A, the nominal value can be converted to real term value by adding target inflation rate provided by central bank. Therefore, the real term value of ROE has been converted to the nominal term by adding inflation rate forecasted by RBI for year 2012-13 by taking activity belongs to sectoral scope 1 i.e. Energy Industries and thus falls under Group 1. The real term value of ROE for group average for 4 consecutive quarters which is 7.18%[7]. Thus, the benchmark ROE comes to 18.93%.

The key assumptions applied for the calculation of equity IRR are provided in the table below:

Table B.5.1: Assumptions made for the calculation

Parameter	Unit	Value	Reference / Remarks
No. of wind turbines	Nos.	33	Extracts of Project Appraisal Committee Meeting Dated 20th November 2012
Capacity of each wind turbine	MW	1.5	Extracts of Project Appraisal Committee Meeting Dated 20th November 2012
Plant load factor	%	20.74	Wind assessment study report by third party Pg:23
Total capacity of CPA	MW	49.50	Extracts of Project Appraisal Committee Meeting Dated 20th November 2012
Total project cost	₹ Million	3,118.50	Based on the cost of recent executed project

[7] http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/01SPA281013.pdf

			by same developer on same site for PP before signing of contract agreement for project dated 30 March 2012
Total estimated annual electricity generation	MWh	89,925	calculated from project capacity and PLF
O&M cost	%	0.768 million/MW	MERC RE tariff order March 2012
Tariff for sale to grid	₹/kWh	5.67	MERC RE tariff order March 2012
Income tax rate of depreciation on plant and machinery	%	7.69	Appendix IA of IT Rules
Income tax rate of depreciation on civil work	%	10	
Total income Tax	%	32.45[8]	Indian IT Act FY 2012-13
Income tax	%	30	Indian IT Act FY 2012-13
Surcharge	%	5	Indian IT Act FY 2012-13
Cess	%	3	Indian IT Act FY 2012-13
Debt-Equity ratio	%	70:30	MERC RE tariff order March 2012
Interest rate	%	14.49	Average BPLR for 5 Banks in the host country
Repayment	Years	10	MERC RE tariff order March 2012
Moratorium	Year	0	
Salvage Value	%	10[9]	Pg 64, MERC RE tariff order_March 2012
Tariff from 14th Year onwards	unit	Cost +16% return on equity	CERC Tariff Guideline
GBI benefits	Rs./kWh	0.5	GBI notification[10] with cap of Rs. 6.2 million/ MW

The equity IRR has been worked out for this project based on the above assumptions. The assumptions made to calculate equity IRR are conservative and were applicable at the time of investment decision. The equity IRR comes to 10.85% and is below the benchmark used. Therefore, it can be concluded that project is not viable without CDM revenue.

Sensitivity analysis:
As per Para 20 of Annex 5 of EB 62, the variables that constitute more than 20% of the total project cost as well as total project revenue are:

1. O & M
2. PLF
3. Project cost
4. Tariff

Hence, all these parameters are subjected to ±10% of variation to confirm the robustness of the equity IRR.

Outcome of sensitivity analysis:
The result of the sensitivity analysis carried out for the parameters O&M, PLF and project cost are provided in the table B.5.2 below.

Table B.5.2: Results of sensitivity analysis

Parameter	Variation	Without CDM revenues (%)	Required variation in parameter to breach the benchmark	Benchmark (%)

[8] http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/taxrates/COMPANIES_2013_14.htm

[9] http://www.marshall-stevens.com/pdf/pub_ValueCurves.pdf

[10] http://www.ireda.gov.in/forms/contentpage.aspx?lid=744

O&M	+10%	10.60	-	18.93%
	-10%	11.20	It is not possible to meet benchmark even with -100% reduction in O&M charges	
PLF	+10%	13.85	+26.1%	
	-10%	8.07		
Tariff rate	+10%	13.78	+26.80%	
	-10%	8.12		
Project Cost	+10%	8.25	-19.90%	
	-10%	14.36		

It is shown through the above analysis that the equity IRR without CDM revenue does not meet the benchmark.

Step 4: Common practice analysis

☒ Required

☐ Not Required

The 'Guidelines on common practice', version 02.0, EB 69, Annex 8 is used here.

Stepwise approach for common practice

Step 1: calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.
The CPA project activity is 49.50 MW and hence the applicable capacity for this analysis is 24.75 – 74.25 MW.

Step 2: identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

(a) The projects are located in the applicable geographical area;

The default applicable geographic area as per the guidelines on common practice is host country i.e. India. Within Host Country India different States have different policies for renewable energy projects and the tariff varies from state to state. The tariff calculation depends on generation estimates of different states and different project sites. The PLF varies significantly based on the location (state) and so is the variation in tariff which is governed by the state electricity regulatory commission. In case of Maharashtra the tariff is determined by 'Maharashtra Electricity Regulatory Commission'[11]. Different PLF and tariff rate can impact investment decision in each state, hence state as the applicable area will give equal weightage to comparable projects hence selected for further analysis. Hence, for further analysis the 'Applicable geographical area' chosen is Maharashtra state.

(b) The projects apply the same measure as the proposed project activity;

As discussed at the start of analysis, the measure applied by the CPA project is 'power generation based on renewable energy generation'. Thus, all renewable energy generation projects are studied.

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;

This is not applicable as CPA project does not involve a feedstock. Hence renewable energy technologies that use fuel/feed stock like biomass will not be considered for analysis.

[11] https://www.merc.gov.in/

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;

The CPA project is implemented to produce electricity and all project considered here are also electricity generation units.

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;

As seen above, the applicable capacity range for this analysis is 24.75 – 74.25 MW.

(f) The projects started commercial operation before the project design document (CPA-DD in this case) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Here, the real case CPA-DD is part of PoA and hence will not be published for global stakeholder consultation. Thus, projects commissioned before the start date of CPA i.e. 26/11/2012 will be considered.

Based on the above explanation we have three renewable technologies for analysis which are wind, solar and hydro.

For solar projects the database published by Maharashtra Energy Development Agency (MEDA) is studied. For all other grid connected hydro power plants, an authentic public database published by CEA[12] is used here.

Solar projects commissioned in Maharashtra:

A database published by Maharashtra Energy Development Agency (MEDA)[13] is used. Within this database, none of the projects are found to be in the range of 24.75 MW-74.25 MW.

Details of wind projects is provided in the separate excel sheet provided for validation.

By analysing these three databases, total projects observed were 21 (15 hydro, 0 solar and 6 wind)[14].

Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number Nall.

None of hydro projects in above analysis were in CDM. However, all the wind projects are under CDM. Thus,

Nall = 15 + 0 = 15

Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number Ndiff.

Here, since hydro power plant have different technology (including working principle), these are considered as different. Thus,

Ndiff = 15

[12] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm (Version 08, database, 'Data' worksheet)

[13] http://www.mahaurja.com/PDF/PG2_GridConnSPPCommissioned.pdf

[14] A separate worksheet with complete database and analysis as discussed here is submitted to the DOE

Step 5: calculate factor F=1-Ndiff/Nall representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

F = 1 – (15/15) = 0

Nall - Ndiff = 0

As per the guidance, the proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and Nall - Ndiff is greater than 3. However, here, both these conditions are not fulfilled and hence project is not a common practice.

Outcome of Step 4:
CPA wind power project is not a common practice.

As can be seen from above, the project activity without the CDM revenue is not a financially viable option and it is additional.

D.6. Estimation of emission reductions

D.6.1. Explanation of methodological choices

As per the methodology ACM0002, the baseline emissions are to be calculated as follows:

Baseline emissions

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y} \quad \textbf{(1)}$$

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)
$EF_{grid,CM,y}$	=	Combined margin CO_2 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" (tCO_2/MWh)

☒ This CPA is a Greenfield renewable energy project. Thus,

(a) Greenfield renewable energy power plants

If the project activity is the installation of a new grid-connected renewable wind power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{PJ,y} = EG_{facility,y} \quad \textbf{(2)}$$

Where:

$EG_{PJ,y}$	=	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)
$EG_{facility,y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh)

Project emissions

As per methodology ACM0002, for renewable energy projects

PEy = 0

Here, DG sets used as back units on site are neglected as per methodology.

Leakage

As per methodology ACM0002, no leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected.

Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Calculation of EF grid, CM, y

The methodology ACM 0002 requires that the combined margin for the grid to be calculated in accordance with the procedure provided in the *"Tool to calculate the emission factor for an electricity system"*. Here, following step wise calculation is done

Step 1: Identify the relevant electricity systems

For determining the electricity emission factors, identify the relevant a project electricity system. The host country DNA has considered delineation of the national grid[15] the project is connected to

☒ NEWNE grid
☐ southern grid

Thus the relevant electricity system is NEWNE grid of India.

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.

As per the CEA report referred above, pg. 10 - Captive power stations and Small decentralised generation sets are not accounted for in the database. Thus, PP chooses Option I - Only grid power plants are included in the calculation.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.

Further, the simple OM method (Option a) can only be used if low-cost/must-run resources 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.

As per the CEA report referred above, in India, hydro and nuclear stations qualify as low-cost / must run sources.

Share of Must-Run (Hydro/Nuclear) (% of Net Generation)					
	2006-07	2007-08	2008-09	2009-10	2010-11
NEWNE	18.5%	19.0%	17.4%	15.9%	17.6%

[15] Central Electricity Authority, CO_2 baseline database for the Indian Power Sector, latest Version 07 of the report is used. http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

Southern	28.3%	27.1%	22.8%	20.6%	21.0%

As can be seen above, the share of must run sources is always less than 50% in NEWNE grid. Thus, option (a) Simple OM is chosen here.

Here, PP chooses ex-ante emission factor calculation and hence this emission factor will be calculated at validation stage and will be fixed for the chosen fixed crediting period.

Step 4: Calculate the operating margin emission factor according to the selected method

In the step above, PP has chosen simple OM. The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

As per CEA report referred (pg. 14-15), individual power plant data is used and thus the following option is chosen
Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit

The recent three years generation weighted average OM is as below.

NEWNE grid

Year	2008-2009	2009-2010	2010-2011	Generation weighted Average
OM (tCO_2/MWh)	1.0066	0.9777	0.9707	0.9842

Step 5: Calculate the build margin (BM) emission factor

In terms of vintage of data, project participant has chosen Option 1 – ex-ante emission factor. As per the CEA report, the BM of NEWNE grid for the year 2010-11 is 0.8588 tCO_2/MWh.

Step 6: Calculate the combined margin emissions factor
The Option (a) Weighted average CM is chosen and calculated as below

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

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM} = Weighting of operating margin emissions factor (%)
w_{BM} = Weighting of build margin emissions factor (%)

As per the Tool, for wind projects, the weighted factors are
W_{OM} =0.75 and W_{BM} = 0.25.

For NEWNE grid

Thus,
$EF_{grid,CM,y}$ = 0.75 x 0.9842 + 0.25 x 0.8588
= 0.9528 tCO_2/MWh

D.6.2. Data and parameters fixed ex-ante

Data / Parameter	$EF_{grid\ BM\ ,\ y}$
Unit	tCO_2/MWh
Description	The Build Margin emission factor of NEWNE grid

Source of data	CEA CO_2 Baseline Database, version 07
Value(s) applied	☒ For NEWNE grid = 0.8588 ☐ For Southern grid = 0.7339
Choice of data or Measurement methods and procedures	The values are taken from the database developed by Central Electricity Authority (CO_2 Baseline database for the Indian power sector, Version 7.0). The database is Government of India's official publication based on the 'Tool to calculate the emission factor for an electricity system'.
Purpose of data	Calculation of baseline emissions
Additional comment	Parameter was determined ex-ante and would not be monitored during the crediting period.

Data / Parameter	$EF_{grid\ OM\ ,\ y}$
Unit	tCO_2/MWh
Description	The Operating Margin emission factor of NEWNE grid
Source of data	CEA CO_2 Baseline Database, version 07
Value(s) applied	☒ For NEWNE grid = 0.9842 ☐ For Southern grid = 0.9514
Choice of data or Measurement methods and procedures	The values are taken from the database developed by Central Electricity Authority (CO_2 Baseline database for the Indian power sector, Version 7.0). The database is Government of India's official publication based on the 'Tool to calculate the emission factor for an electricity system'.
Purpose of data	Calculation of baseline emissions
Additional comment	Parameter was determined ex-ante and would not be monitored during the crediting period.

Data / Parameter	$EF_{grid,CM,y}$
Unit	tCO_2/MWh
Description	Combined margin CO_2 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" for NEWNE
Source of data	Calculated as per the "Tool to calculate the emission factor for an electricity system"
Value(s) applied	☒ For NEWNE grid = 0.9528 ☐ For Southern grid = 0.8970
Measurement methods and procedures	As per the "Tool to calculate the emission factor for an electricity system"
Monitoring frequency	Once at the time of validation of PoA
QA/QC procedures	-
Purpose of data	Baseline emission calculation
Additional comments	Parameter was determined ex-ante and would not be monitored during the crediting period.

D.6.3. Ex-ante calculation of emission reductions

As seen in the Section D.6.1 above

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

$EG_{PJ,y}$ = 89,925 MWh

$EF_{grid,CM,y}$ = 0.9528 tCO_2/MWh
Thus,
BEy = 85,680 tCO_2

As seen in Section B.6.1, PEy and LEy = 0

ERy = BEy = 85,680 tCO_2

D.6.4. Summary of the ex-ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)
2014	85,680	0	0	85,680
2015	85,680	0	0	85,680
2016	85,680	0	0	85,680
2017	85,680	0	0	85,680
2018	85,680	0	0	85,680
2019	85,680	0	0	85,680
2020	85,680	0	0	85,680
Total	**599,760**	**0**	**0**	**599,760**
Total number of crediting years	**7**			
Annual average over the crediting period	**85,680**	**0**	**0**	**85,680**

D.7. Application of the monitoring methodology and description of the monitoring plan

D.7.1. Data and parameters to be monitored

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data	Joint meter reading OR Credit Note provided by Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL)
Value(s) applied	89,925
Measurement methods and procedures	The JMR is usually taken once in month for the bulk/ revenue meter at the common substation. Also with the individual WTG controller electricity meters (both import and export) or CMS data, the JMR also gives (where applicable – apportioned) electricity import of each WTG and losses till metering point. By using these data, net export by the WTGs in the CPA will be calculated (as in some case net export is not explicitly reported in JMR). Measurement by: electricity meters (bulk, WTG controller/ CMS) Recording: Electronic and paper Recording Frequency: Continuous monitoring and monthly recording Responsibility: The operators/ O&M team will be responsible for measurement Calibration Testing Frequency: Annually Accuracy class of meters: 0.2s/ 0.5s (as per state regulation) Archiving: Crediting Period + 2 years
Monitoring	Continuous measurement and at least monthly recording

frequency	
QA/QC procedures	Cross check measurement results with records for sold electricity – where electricity sale is applicable
Purpose of data	Baseline emissions calculation
Additional comments	Data will be archived for more than two years after end of crediting period or last issuance, whichever later

D.7.2. Description of the monitoring plan

The monitoring team will include PP's employees and O&M contractor's representatives.

Meter readings will be taken jointly at the appointed date by PP's representative, Regen Powertech Pvt. Ltd. official and Maharashtra State Electricity Distribution Company Limited (MSEDCL) official. The same is reported as Joint Meter Reports (JMR). The same will be reported to the O&M team and the complied reports will be generated in the form of Credit Notes.

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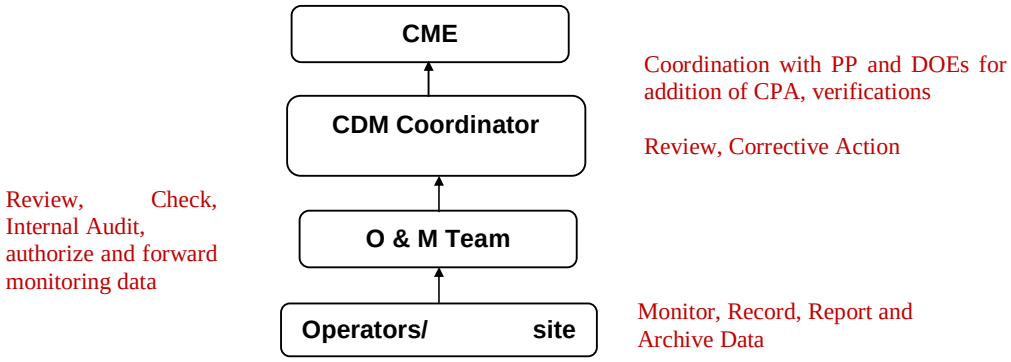
Net electricity supplied by the project activity to the grid shall be cross-checked with records for sold electricity by invoices raised for the payment purpose.

One metering system would be there at the substation and another at the WTG site. If the variation between the two meter readings is significant for the monthly recording of data, the meters would be reset and calibrated. The measurement will be taken from the MSEDCL energy meter which is located in the substation. Meter reading will be carried out in every calendar month.

The accuracy of monitoring parameter is ensured by adhering to the calibration and testing procedure as set in the power purchase agreement. The project will adhere to all mandatory regulatory and statutory requirements at the state as well as national level. The energy meters installed are tri-vector meters of 0.2% accuracy class.

The operational and management structure implemented by PP and O&M contractor is as follows:



In some cases, if a particular feeder/ substation has other WTGs not part of this CPA connected through same electricity meter, apportioning is used. Even otherwise, to get WTG/ project owner wise electricity supplied to grid, apportioning is required and is carried out as below.

Apportioning of net electricity supplied is done with reference to the electricity generated from individual WTGs. The MSEDCL will issue a monthly Joint Energy Meter Readings sheet for actual power exported from the wind farm to the grid. Apportioning of net electricity supplied, as per the Joint Energy Meter Readings sheet, by each project owner is done based on the individual meter readings of each wind turbine. The apportioning will be done by electricity purchaser (representative of MSEDCL) in cases jointly with the PP. The Credit Notes with electricity buyer will be used to calculate actual net electricity supplied to the grid and on the basis of that GHG emission reductions by the proposed project activity will be calculated.

The net electricity exported to the grid by project activity is referred from monthly credit note readings. The main billing meter at substation records total export, and total import by all the connected WTGs to the sub-station through a feeder. The electricity export and import by a WTG of the PP is then calculated by using the following formulae as given below. This is the billable reading against which the PP raises invoice to the state electricity board.

Formula:

$$\text{Net Generation of a WTG @ for credit:} \quad \frac{\text{kWh individual generation at WTG Controller X Total (Export kWh – Import kWh) @ EB at cumulative meter at feeder}}{\text{Total Controller Generation of WTGs connected on a feeder}}$$

Procedures for handling data uncertainty:

a. In case main meter is faulty: In the event that the main metering system is not in the service as result of maintenance, repairs or testing, then the back metering system shall be used during the period the main metering system is not in service and the provisions above shall apply to the reading of the backup metering system.
b. In case both the meters are faulty: When the Main Metering System and/or Backup Metering System and/or any component thereof is found to be outside the acceptable limit of accuracy or otherwise not functioning properly, it shall be repaired, recalibrated or replaced as soon as possible by the MSEDCL. The error observed during this calibration will be applied to all readings from last correct JMR / last meter calibration. MSEDCL will ensure that metering system is tested for accuracy at least once in year and report furnished along with joint meter reading.

Any meter seal(s) shall be broken only by the authorised officer of MSEDCL in the presence of representative of Power Producers/ Developers, whenever the Main Metering System or the backup metering system is to be inspected, tested, adjusted, repaired or replaced.

In case, the monitoring period starts mid- month, the reading for that month will be apportioned based on the daily electricity export data give by the O&M contractor. This will be also checked with the average daily export arrived from that month's JMR and the conservative of the two will be used for the emission reduction calculation.

For more details on apportioning kindly refer Appendix 5.

SECTION E. Approval and authorization

The letter of approval for the CPA:

☐ Required

☒ Not Required

The Host Country Approval has been obtained at PoA level. This in accordance with Paragraph 224 CDM Project Standard Version 7 (Paragraph 173 in Version 1), which states that: "The operators of individual CPAs are not required to be project participants. CDM project participation is only recorded at the PoA level."

The HCA letter for the PoA was received by the CME, General Carbon Advisory Services Pvt. Ltd. on the 12th December 2012.

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Appendix 1. Contact information of CPA implementer(s) and responsible person(s)/ entity(ies) for completing the CDM-CPA-DD-FORM

CPA implementer and/or responsible person/ entity	☒ CPA implementer(s) ☐ Responsible person/ entity for completing the CDM-CPA-DD-FORM
Organization	ReNew Wind Energy (Shivpur) Private Limited
Street/P.O. Box	MG Road
Building	Tower 4A, 6th Floor, DLF Corporate Park
City	Gurgaon (NCR Delhi)
State/Region	Delhi
Postcode	122002
Country	India
Telephone	+91 124 4489 6670/80
Fax	+91 124 4489 6670
E-mail	info@renewpower.in
Website	http://renewpower.in/
Contact person	Mr. Parag Sharma
Title	Chief Operating Officer
Salutation	Mr.
Last name	Sharma
Middle name	-
First name	Parag
Department	Chief Operating Officer
Mobile	+91 9810052210
Direct fax	+91 22 6191 9720
Direct tel.	+91 22 6191 9700
Personal e-mail	parag@renewpower.in

Appendix 2. Affirmation regarding public funding

The PoA does not involve diversion of ODA or public funding from Annex 1 countries.

Appendix 3. Applicability of methodology(ies) and standardized baseline(s)

Please refer Section D.2 above.

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

Please refer Section D.6 above

Appendix 5. Further background information on monitoring plan

APPORTIONING PROCEDURE

Procedure for apportioning of electricity:

1. In case the start/end dates of monitoring period do not match with the start/end dates of Joint Meter Reading Sheets / Generation reports issued by MSEDCL, following apportioning procedure will be applied for the first and the last monitoring period within a particular crediting period:

   Apportioning will be carried out based on ratio of generation data recorded using LCS installed at the each WTG. The emission reductions of that particular period (between the start/end date of monitoring period and the end/start of the billing period) will be calculated based on percentage generation of that particular period at WTG using LCS data multiplied with the total units generated in the month as per the Joint Meter Reading Sheets / Generation report issued by MSEDCL. The calculation formula has been furnished below:

   Generation from all project WTGs for the period y1= $EG_{WTGcontroller,i,y1}$
   Generation from all project WTGs for the period y2 = $EG_{WTGcontroller,i,y2}$

   Net energy supplied used for calculation of emission reduction for the monitoring period y1,
   i.e $EG_{facility,\ y1}$=

   $$\sum_{i=1}^{N} ((EG_{export,i,y2} - EG_{import,I,y2}) * (EG_{WTGcontroller,i,y1} / EG_{WTGcontroller,i,y2}))$$

   Where:
   y1 = No. of days within a billing period up to which generation is considered for emission reduction calculation
   y2 = No. of days in the billing period
   N = No. of feeders to which project WTGs are connected to.

2. In case if there are project and non-project WTGs connected to a particular feeder i, the quantity of net electricity supplied by project WTGs to the grid connected to that particular feeder will be calculated based on the formula specified below:

   Total generation from all project WTG(s) connected to the feeder i in period y = $EG_{WTG\_controller,i,y}$

   Total generation from all project and non-project WTGs connected to the feeder i in period y
   = $EG_{All\_controller,i,y}$

   Quantity of net electricity exported by all (project and non-project) WTGs connected to feeder i to the grid in period y= $EG_{export,i,y}$

Quantity of net electricity imported by all (project and non-project) WTGs connected to feeder i to the grid in period y= $EG_{import,i,y}$

Net electricity supplied by the project WTGs connected to feeder i to the grid in period y = $EG_{facility,y}$ = $\sum_{i=1}^{N} ((EG_{export,i,y} - EG_{import,I,y}) * (EG_{WTGcontroller,i,y} / EG_{All\_controller,i,y}))$

Where: N = No. of feeders to which project WTGs are connected to.

3. In cases where both scenarios mentioned above exist at the same time (i.e. both project and non- project WTGs connected to the same feeder(s) and the start/end date of the monitoring periods do not match with those of the JMR readings), firstly the apportioning as per point # 2 above will be applied for the billing period y2 to estimate the Net electricity supplied by the project WTGs connected to feeder Z to the grid in period y2. Then this value would replace (EG export,y2 – EG import,y2) in the formula specified under point # 1 above to arrive at the Net energy export used for calculation of emission reduction for the monitoring period y1.

Appendix 6. Summary of post registration changes

Not Applicable

Annex 1 - Geographical coordinates of the renewable power plants in CPA

Sr. No.	Location No.	Village	Geographical Coordinates	
			LONGITUDE	LATITUDE
1	VASP-237	Shedyal	75° 20' 56.4514" E	17° 01' 14.6452" N
2	VASP-15	Shedyal	75° 19' 31.3348" E	17° 02' 53.5497" N
3	VASP-72	Shedyal	75° 20' 8.6334" E	17° 03' 3.2863" N
4	VASP-142	Shedyal	75° 20' 4.2664" E	17° 02' 27.6631" N
5	VASP-29	Shedyal	75° 19' 8.0164" E	17° 02' 48.5783" N
6	VASP-64	Salekiri	75° 18' 35.0024" E	17° 02' 11.8565" N
7	VASP-35	Salekiri	75° 18' 39.8914" E	17° 02' 41.1351" N
8	VASP-394	Salekiri	75° 18' 18.6328" E	17° 03' 7.5916" N
9	VASP-09	Salekiri	75° 18' 44.8077" E	17° 03' 2.2838" N
10	VASP-49	Salekiri	75° 18' 11.8762" E	17° 02' 29.9222" N
11	VASP-450	Shedyal	75° 18' 54.6680" E	17° 02' 25.2324" N
12	VASP-564	Valsang	75° 20' 7.6447" E	17° 04' 7.0070" N
13	VASP-510	Valsang	75° 20' 15.7471" E	17° 03' 26.2202" N
14	VASP-637	Valsang	75° 20' 58.5114" E	17° 03' 43.2971" N
15	VASP-696	Valsang	75° 20' 46.8109" E	17° 03' 30.5873" N
16	VASP-92	Shedyal	75° 21' 41.3580" E	17° 03' 0.8830" N
17	VASP-21	Valsang	75° 18' 26.6254" E	17° 03' 31.1435" N
18	VAPS III 397	Shedyal	75° 18' 51.7841" E	17° 01' 44.2053" N
19	VAPS III 26	Valsang	75° 18' 23.3569" E	17° 03' 19.9168" N
20	VAPS III 58	Salekiri	75° 18' 16.6827" E	17° 02' 17.7754" N
21	VAPS III 525	Valsang	75° 20' 19.5374" E	17° 03' 58.2660" N
22	VAPS III 384V	Valsang	75° 19' 3.7317" E	17° 04' 24.4203" N
23	VAPS III 387	Valsang	75° 19' 5.1874" E	17° 04' 38.9978" N
24	VAPS III 388	Valsang	75° 19' 10.1862" E	17° 05' 2.7420" N
25	VAPS III 700/1	Valsang	75° 20' 37.6648" E	17° 03' 15.9618" N
26	VAPS III 689	Valsang	75° 21' 18.2867" E	17° 03' 37.0143" N

27	VAPS III 355	Shedyal	75° 19' 44.8206" E	17° 01' 0.4797" N
28	VAPS III 698	Valsang	75° 21' 0.9283" E	17° 03' 19.7314" N
29	VAPS III 108	Salekiri	75° 18' 14.7601" E	17° 01' 42.7977" N
30	VAPS III 440	Valsang	75° 19' 6.7255" E	17° 03' 46.8951" N
31	VAPS III 463	Valsang	75° 19' 16.5582" E	17° 03' 36.3689" N
32	VAPS III 105	Shedyal	75° 21' 22.1594" E	17° 02' 47.0197" N
33	VAPS III 424	Shedyal	75° 18' 45.6317" E	17° 01' 28.2339" N

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Document information

Version	*Date*	*Description*
03.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the component project activity design document form for CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a CPA implementer and/or responsible person/ entity for completing the CDM-CPA-DD-FORM in A.13. and **Error! Reference source not found.**; • Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and **Error! Reference source not found.**; • Change the reference number from *F-CDM-CPA-DD* to *CDM-CPA-DD-FORM*; • Editorial improvement.
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the component project activity design document form" (EB 66, Annex 16).
01.0	27 July 2007	EB33, Annex42 Initial adoption.

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