



**Verified Carbon
Standard**

BUNDLED WIND POWER PROJECT IN RAJASTHAN BY ORANGE RENEWABLE POWER PRIVATE LIMITED



INFINITE
SOLUTIONS

Document Prepared by (Infinite Solutions)

Project Title	Bundled Wind Power Project in Rajasthan by Orange Renewable Power Private Limited
Version	02
Report ID	NA
Date of Issue	02-July-2020
Project ID	1465
Monitoring Period	01-May-2019 to 30-April-2020 (Inclusive of both the dates)
Prepared By	Infinite Solutions
Contact	Address: 611, Chetak Centre Main, 12/2 R.N.T. Marg, Indore, MP – 452001 Landline No.: 0731-4050174 Email: jimmy@infisolutions.org Website: www.infisolutions.org

CONTENTS

1	PROJECT DETAILS	3
1.1	Summary Description of the Implementation Status of the Project	3
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent	4
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	5
1.6	Project Crediting Period	5
1.7	Project Location	5
1.8	Title and Reference of Methodology	7
1.9	Participation under other GHG Programs	7
1.10	Other Forms of Credit	8
1.11	Sustainable Development	8
2	SAFEGUARDS	9
2.1	No Net Harm	9
2.2	Local Stakeholder Consultation	9
2.3	AFOLU-Specific Safeguards	10
3	IMPLEMENTATION STATUS	10
3.1	Implementation Status of the Project Activity	10
3.2	Deviations	10
3.3	Grouped Projects	11
4	DATA AND PARAMETERS	11
4.1	Data and Parameters Available at Validation	11
4.2	Data and Parameters Monitored	12
4.3	Monitoring Plan	14
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	17
5.1	Baseline Emissions	17
5.2	Project Emissions	19
5.3	Leakage	19
5.4	Net GHG Emission Reductions and Removals	19
	APPENDIX 1: < METER CALIBRATION DETAILS >	21

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity is a 59.4 MW (39.9 MW in Bhesada & 19.5 MW in Dalot) bundled wind power project consisting in of 32 Wind Turbine Generators (WTGs). The project is promoted by Orange Renewable Power Private Limited & Orange Jaisalmer Wind Energy Private Limited of which the “Orange Renewable Power Private Limited” is the representative of promoter of this bundled project. The purpose of the project activity is to generate clean electricity with utilization of wind energy.

The first project in the current bundle project is a 39.9 MW Wind power project near village Bhesada, close to the city of Jaisalmer in state of Rajasthan, hereafter call “Project 1”. It is developed by “Orange Jaisalmer Wind Energy Private Limited” (OJWEPL). It consists of 19 machines of 2.1 MW class Suzlon S88 make.

The other project in the bundle is 19.5 MW wind Power Project located near village Dalot, close to the city of Pratapgarh in state of Rajasthan, here after called “Project 2”. It is developed by “Orange Renewable Power Private Limited” (ORPPL). It consists of 13 machines of 1.5 MW class ReGen V82 make.

There was no activity at the site prior to implementation of the project activity (Greenfield). The electricity generated by the project is exported to the Indian electricity grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. Since wind power is Greenhouse Gas (GHG) emissions free, the power generated will prevent the anthropogenic gas emissions generated by fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas.

All the WTGs in the project activity were commissioned on 31-March-2013 and have been operational since then. The details of all the WTGs are provided under section 1.7 of this document. The details of the projects and the state of installation are mentioned in the table:

Project Site's Name	Capacity	Technology	State	Connection with Grid	Use of Electricity
Site 1 – Bhesada	19x2.1 39.9MW	Suzlon S88	Rajasthan	Indian	Sale to Grid

Site 2 – Dolat	13x1.5 19.5 MW	ReGen V82	Rajasthan	Indian	Sale to Grid
----------------	-------------------	-----------	-----------	--------	--------------

The timeline of the monitoring periods:

Commissioning	31-March-2013
1 st Monitoring Period	31-March-2013 to 31-March-2015
2 nd Monitoring Period	01-April-2015 to 31-March-2016
3 rd Monitoring Period	01-April-2016 to 31-March-2017
4 th Monitoring Period	01-April-2017 to 31-March-2018
5 th Monitoring Period	01-April-2018 to 30-April-2019
Current Monitoring period	01-May-2019 to 30-April-2020

This is the Sixth verification of the project and the GHG reductions by this project activity in the current monitoring period (01-May-2019 to 30-April-2020) is 100,491 tCO₂

1.2 Sectoral Scope and Project Type

Sectoral Scope: 1 Energy Industries (Renewable/Non-Renewable Sources)

Methodology applied is ACM 0002 of version 16.0

<http://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLAR6MJ6VEU83>

The Project is a bundled project activity.

1.3 Project Proponent

Organization name	Orange Renewable Power Private Limited
Contact person	Mr. Murali Krishnam Raju M.
Title	Senior Manager
Address	301B, 3rd Floor, D-21 Corporate Park, Sector-21, Dwarka, New Delhi-110077
Telephone	+91(40) 4030 1004
Email	muraliraju.m@greenkogroup.com

Organization name	Orange Jaisalmer Wind Energy Private Limited
Contact person	Mr. Murali Krishnam Raju M.
Title	Senior Manager
Address	301B, 3rd Floor, D-21 Corporate Park, Sector-21, Dwarka, New Delhi-110077
Telephone	+91(40) 4030 1004
Email	muraliraju.m@greenkogroup.com

1.4 Other Entities Involved in the Project

Organization name	Infinite Solutions
Role in the Project	Project Consultant
Contact person	Mr. Jimmy Sah
Title	Head – Sustainability
Address	611, Chetak Centre Main, 12/2 RNT Marg, Indore- 452001
Telephone	+91-9644130430
Email	jimmy@infisolutions.org

1.5 Project Start Date

The start date of the project activity is 31-March-2013. It is the date on which all the WTGs in the project activity were commissioned.

1.6 Project Crediting Period

The project activity has opted for 10 years crediting period which can be renewed for maximum twice. The current monitoring falls under the 1st crediting period which is from 31-March-2013 to 30-March-2022. The project activity started generating emission reduction from 31-March-2013.

1.7 Project Location

The project activity is located at Jaisalmer and Pratapgarh districts of Rajasthan State, India. The geo- coordinates of the project location is as follows:

1. “Project 1”: Geo-coordinates of 39.9 MW Wind power project in Jaisalmer

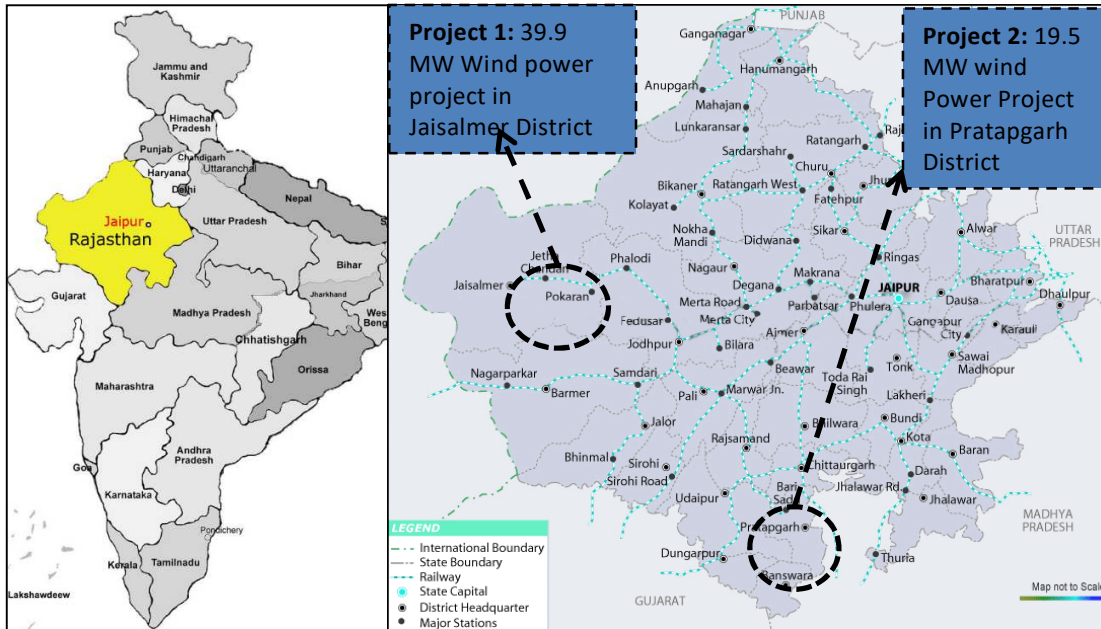
S.No	WTG No	PSS Feeder	Village	Taluk	District	Latitude	Longitude
1	RSA204	SEL 194	Luna Kala	Pokaran	Jaisalmer	26.6477	71.55631
2	RSA231	SEL 195	Luna Kala	Pokaran	Jaisalmer	26.65686	71.56304
3	RSA271	SEL 195	Luna Kala	Pokaran	Jaisalmer	26.65871	71.57321
4	RSA225	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.62153	71.58829
5	RSA226	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.62558	71.58246
6	RSA274	SEL 195	Naya Luna	Pokaran	Jaisalmer	26.64083	71.58605
7	RSA275	SEL 195	Naya Luna	Pokaran	Jaisalmer	26.63274	71.59008
8	RSA276	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.62773	71.59484
9	RSA277	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.62148	71.59838
10	RSA278	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.61782	71.60192
11	RSA289	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.61714	71.62101
12	RSA293	SEL 195	Motisar	Bhaniyana	Jaisalmer	26.63957	71.60723
13	RSA294	SEL 195	Motisar	Bhaniyana	Jaisalmer	26.64486	71.59981
14	RSA341	SEL 195	Motisar	Bhaniyana	Jaisalmer	26.65391	71.60882
15	RSA343	SEL 195	Motisar	Bhaniyana	Jaisalmer	26.64118	71.61789
16	RSA345	SEL 195	Motisar	Bhaniyana	Jaisalmer	26.62983	71.62431
17	RSA348	SEL 194	Motisar	Bhaniyana	Jaisalmer	26.61089	71.63743
18	RSA349	SEL 194	Motisar	Bhaniyana	Jaisalmer	26.60612	71.64224
19	RSA207	SEL 194	Naya Luna	Pokaran	Jaisalmer	26.62894	71.56688

2. "Project 2": Geo-coordinates of 19.5 MW Wind power project in Pratapgarh

S. No	WTG No	Village	Taluk	District	Latitude	Longitude
1	ORPDT_01	Ambirama	Arnod	Pratapgarh	23.5622	74.837
2	ORPDT_02	Ambirama	Arnod	Pratapgarh	23.5653	74.8353
3	ORPDT_03	Ambirama	Arnod	Pratapgarh	23.5674	74.8357
4	ORPDT_04	Ambirama	Arnod	Pratapgarh	23.5708	74.841
5	ORPDT_05	Ambirama	Arnod	Pratapgarh	23.5713	74.8352
6	ORPDT_06	Ambirama	Arnod	Pratapgarh	23.5747	74.8396
7	ORPDT_07	Ambirama	Arnod	Pratapgarh	23.5773	74.8426
8	ORPDT_08	Ambirama	Arnod	Pratapgarh	23.5602	74.8371
9	ORPDT_09	Ambirama	Arnod	Pratapgarh	23.5946	74.8387
10	ORPDT_10	Ambirama	Arnod	Pratapgarh	23.5843	74.8449
11	ORPDT_11	Ambirama	Arnod	Pratapgarh	23.5872	74.8486
12	ORPDT_12	Ambirama	Arnod	Pratapgarh	23.5884	74.8428
13	ORPDT_13	Ambirama	Arnod	Pratapgarh	23.5919	74.841

The WTGs from ORPDT_01 to ORPDT_07 are connected to Feeder 07 while rest of the WTGs are connected to Feeder 08.

The geographical location of the project site is as shown below:-



1.8 Title and Reference of Methodology

The methodology applied for the project is ACM0002 of version 16.0 titled “Grid-connected electricity generation from renewable sources” ACM0002 draws upon the following tools which have been used in the VCS PD:

- i) Tool to Calculate the Emission Factor for an Electricity System (Version 04.0)
<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf>
- ii) Tool for Demonstration and Assessment of Additionality (Version 7.0)
<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

1.9 Participation under other GHG Programs

The project activity is not registered/participated under any other GHG programs program and has not intended to pursue credits from other GHG program for the for the concerned monitoring period. The project is not registered under the REC mechanism of India and the same is cross-checked at <https://recregistryindia.nic.in>.

A declaration certificate for no other participation in any other GHG Programs for the monitoring period have been submitted for the assessment.

1.10 Other Forms of Credit

- Emission Trading Programs and Other Binding Limits: The project is not a part of any emission trading program.
- Other Forms of Environmental Credit: The project proponent hereby confirms that the project has not sought or received any other GHG related environmental credit.

1.11 Sustainable Development

Ministry of Environment & Forests, Government of India has stipulated following indicators for sustainable development in the interim approval guidelines¹ for GHG projects.

1. Social well-being
2. Economic well-being
3. Environmental well-being
4. Technological well-being

Social well-being

The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

Economic well-being

The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

Environmental well-being

Wind being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions and other specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

Technological well-being

¹ Ministry of Environment and Forest web site: http://envfor.nic.in:80/divisions/ccd/cdm_iac.html

The successful operation of project activity would lead to promotion of wind-based power generation and would encourage other entrepreneurs to participate in similar projects.

In view of the above, the PP has considered that the project activity profoundly contributes to the sustainable development.

2 SAFEGUARDS

2.1 No Net Harm

There are no negative environmental and/or socio-economic impacts due to the project

2.2 Local Stakeholder Consultation

Discussions with Local stakeholders are being carried out at periodic intervals. There are no negative comments received for the project. In line with VCS requirements the following process has been implemented to receive comments from local stakeholders as well as communicate with them at periodic intervals.

Methods	Details	Reason for Selection
Communication Book or Register	Communication Register is maintained at Admin office at project site office. Any comments/inputs/grievance received shall be processed in line with the procedure.	The administrative office is located at the site office. Thus, it is appropriate publicly accessible location at which local stakeholders can provide their feedback on the project.
Process Book	Any comments/inputs/grievance received shall be processed in line with the procedure	The local stakeholders are informed about the Communication Register. Further, a public notice has been posted at the site informing the stakeholders about the communication procedure.
Telephone access	+91 9959556707	Phone number of the contact person is circulated and discussed in the stakeholder meeting
Internet/email access	muraliraju.m@greenkogroup.com	Email ID of the contact person is circulated and discussed in the stakeholder meeting.

2.3 AFOLU-Specific Safeguards

This section is not applicable to the project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity envisages implementation of 59.4 MW wind power project consisting of 19 WTGs of individual capacity 2100 kW (project 1) & 13 WTGs of individual capacity 1500 kW (Project 2).

All the WTGs in the bundled project activity were commissioned on the same date; 31-March-2013. A comprehensive list of WEGs commissioning dates are provided under section 1.1 of the document.

The project has been under operation since commissioning without any major downs. Though normal breakdowns due to O&M measures are continuously being worked upon by a dedicated O&M contractor for the projects' WTGs. There has been no event that may have an impact on the GHG emissions or removals during the current monitoring period.

Further, there are no changes to the project participant for the project activity during the monitoring period

3.2 Deviations

2.3.1 Methodology Deviations

In the current monitoring period (01-May-2019 to 30-April-2020), there is no deviation from the applied methodology under which the project activity is registered.

2.3.2 Project Description Deviations

In the 1st monitoring period (31-March-2013 to 31-March-2015), there were three deviations observed from the project description as described in the registered PD.

1) In the registered PD, the monitoring method for Net Electricity ($EG_{\text{facility},y}$) was described in a very simplified manner. It described that, ($EG_{\text{facility},y}$) will be calculated based on the difference in "export", "import" and "transmission loss", however, the PD did not explain the exact method of calculations. In the current monitoring report the detailed method of calculating ($EG_{\text{facility},y}$) has been described under section 3.2 "Data and Parameters Monitored".

2) The registered PD also described the source of data to be "JMRs", which is correct. However, it has been clarified that the source of data is JMR along with "share certificate"

provided by the O&M contractor. The above change in no way impact the project's Additionality, Baseline and applicability of methodology

3) Apart from the above, the registered PD also describes the voltage of Substation to be 220kV. However, it is corrected in the MR as the voltage of OJWEPL PSS is 220kV, OJWEPL GSS is 400kV and ORPPL GSS is 132kV. This change in the description as well does not impact the project's Additionality, Baseline and applicability of methodology in any way. Grouped Projects

3.3 Grouped Projects

The project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,OM,simple,y}
Data unit	tCO ₂ /MWh
Description	Operating margin CO ₂ emission factor of NEWNE Grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 10
Value applied	0.9857
Justification of choice of data or description of measurement methods and procedures applied	The data has been considered in accordance to the Tool to calculate emission factor of an electricity system.
Purpose of Data	Baseline Emission calculation
Comments	The operating margin emission factor is a 3-year generation weighted average (2011-14) Data calculated to be 0.9857. The operating Margin is calculated ex ante and fixed during the crediting period.

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	Build margin CO ₂ emission factor of NEWNE grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 10
Value applied	0.9495

Justification of choice of data or description of measurement methods and procedures applied	The data has been considered in accordance to the Tool to calculate emission factor of an electricity system.
Purpose of Data	Baseline Emission calculation
Comments	The Build Margin would be calculated ex ante and fixed during the crediting period. For ex ante calculation the most recent data (2013-14) available has been used and the build margin thus calculated is 0.9495.

Data / Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor of NEWNE grid
Source of data	Central Electricity Authority: CO ₂ Emission Database CEA CO ₂ Baseline database Version 10
Value applied	0.9766
Justification of choice of data or description of measurement methods and procedures applied	The data has been considered in accordance to the Tool to calculate emission factor of an electricity system. The tool guides to take 75% weightage of EF _{grid,OMsimple} , & 25% weightage of EF _{grid,BM,y}
Purpose of Data	Baseline Emission calculation
Comments	The combined margin would be calculated ex-ante and fixed for the entire crediting period and the combined margin thus calculated is 0.9766.

4.2 Data and Parameters Monitored

Data / Parameter	EG _{facility, y}
Data unit	MWh
Description	Quantity of net electricity supplied to the grid during the year y.
Source of data	Monthly billing records issued by EB. These are called JMR (Joint Meter Reading) and electricity share certificate.
Description of measurement methods and procedures to be applied	Net electricity supplied is calculated based on the difference between calculated values of “export” (which already accounts for losses during transmission) and “import” on the EB energy meter at the Government substation. Transmission loss is accounted in Net export at substation based on the readings of Government substation & “primary metering Point”.

	Net Electricity = Net Export – Import
Frequency of monitoring/recording	Measurement: Continuous Recording: Monthly Monitoring Method: recording in Joint Meter Reading (GSS meter reading) and in Share certificate (PSS meter/controller reading). The JMR includes, monthly recording of electricity export & import of GSS meter and Share certificate includes apportioned export & import of each project owner.
Value monitored	102,900
Monitoring equipment	OJWEPL: GSS (Government Sub Station): Main Meter Number: RJB90214 Check Meter Number: RJB90215 Both Meter Type: Trivector, 3 Phases 4 wire Both Accuracy Class: 0.2s PSS (Pooling Sub Station): PSS Feeder 1 (SEL195): Main Meter Number: RJB78194 Check Meter Number: RJB78200 PSS Feeder 2 (SEL 194): Main Meter Number: RJB78201 Check Meter Number: RJB78203 All PSS Meter Type: Trivector, 3 Phases 4 wire All PSS Meters' Accuracy Class: 0.2s ORPPL: (GSS) (Government Sub Station) Main Meter Number: RJB79226 Check Meter Number: APMB3516 Both Meter Type: Trivector, 3 Phases 4 wire Both Accuracy Class: 0.2s
QA/QC procedures to be applied	Net electricity supplied to the grid by the project activity is cross checked with invoices submitted to EB. The meter(s) shall be calibrated and maintained by the state utility as per their own schedule, and this frequency of meter calibration is not within the control of the Project Proponent. Calibration of electricity meters is carried out in-line with the Nation standard which recommends at least once in 5-year calibration or whenever abnormal difference/inconsistency is observed between main meter and check meter. The calibration details of the meters included in the Annex 1 of this document.

Purpose of the data	Calculation of baseline emissions
Calculation method	OJWEPL: First the difference between the readings of PSS and GSS is derived: $\text{GSS Export} - \text{PSS Total Export} = \text{Export Difference}$ $\text{PSS Import} - \text{GSS Total Import} = \text{Import Difference}$ Then Net Export & Net Import by the project is derived by accounting losses by the project: $\text{Net Export by Project} = \text{PSS Project Export} - [(\text{Export Difference} / \text{PSS Total Export}) \times \text{PSS Project Export}]$ $\text{Net Import by Project} = \text{PSS Project Import} + [(\text{Import Difference} / \text{PSS Total Import}) \times \text{PSS Project Import}]$ <u>Net Electricity Supplied to the Grid by the Project (OJWEPL)</u> = Net Export by Project - Net Import by Project <u>ORPPL</u> Then Net Export & Net Import by the project is derived by accounting losses by the project: $\text{Net Export by Project} = (\text{GSS Export} / \text{All WTGs Total Controller Export}) \times \text{Project WTGs Controller Export}$ $\text{Net Import by Project} = (\text{GSS Import} / \text{All WTGs Total Controller Export}) \times \text{Project WTGs Controller Export}$ <u>Net Electricity Supplied to the Grid by the Project (ORPPL)</u> = Net Export by Project - Net Import by Project
Comments	

4.3 Monitoring Plan

The project proponent has entered into agreement with the WTG Suppliers (Suzlon Energy Limited & ReGen) for the operation and maintenance of WTGs. The WTG supplier has dedicated and technically well-equipped O&M team for day to day Operation and maintenance of each WTG. O&M contractor will provide a monthly report, which includes generation data, major breakdown events and machine availability. Project manager is responsible for recording of monthly meter readings of export and import. Monthly power export and import data will be sent regularly to site in charge of each project separately.

Monitoring Procedure:

In both OJWEPL and ORPPL, JMR reading at substation contains electricity generation from “project WTGs” and “non-project WTGs”. Hence, it is the responsibility of the Developer (Suzlon for OJWEPL and ReGen in case of ORPPL) to apportion and provide the exact share of electricity supplied by the “Project WTGs”. To arrive at the electricity share both the projects have adopted the following method as described below:

OJWEPL:

In OJWEPL, the electricity is monitored at two points, one being the 220kV Pooling Substation and other being the 400kV Government Substation (GSS). At the main meter of GSS there are both “Project WTGs” and “Non-Project WTGs” connected. Hence, the value at GSS meter consists of generation from “Non-Project WTGs” as well. The reading from the GSS meter is the considered to be the actual electricity fed to grid. The reading at the 220kV is out of interest for the DISCOM and is used solely by the O&M contractor for apportioning of the electricity share from the project activity.

The below parameters are monitored for apportioning JMR values:

PSS Project Export & PSS Total Export
PSS Project Import & PSS Total Import
GSS Export & GSS Import

ORPPL:

In ORPPL, the electricity is monitored at two points, one being the controller panel reading of individual WTGs and other being the 132kV Government Substation (GSS). At the main meter of GSS there are both “Project WTGs” and “Non-Project WTGs” connected. Hence, the value at GSS meter consists of generation from “Non-Project WTGs” as well. The reading from the GSS meter is the considered to be the actual electricity fed to grid. The reading at the controller panel of individual WTGs is not of any interest to the DISCOM and is used solely by the O&M contractor for apportioning of the electricity share from the project activity.

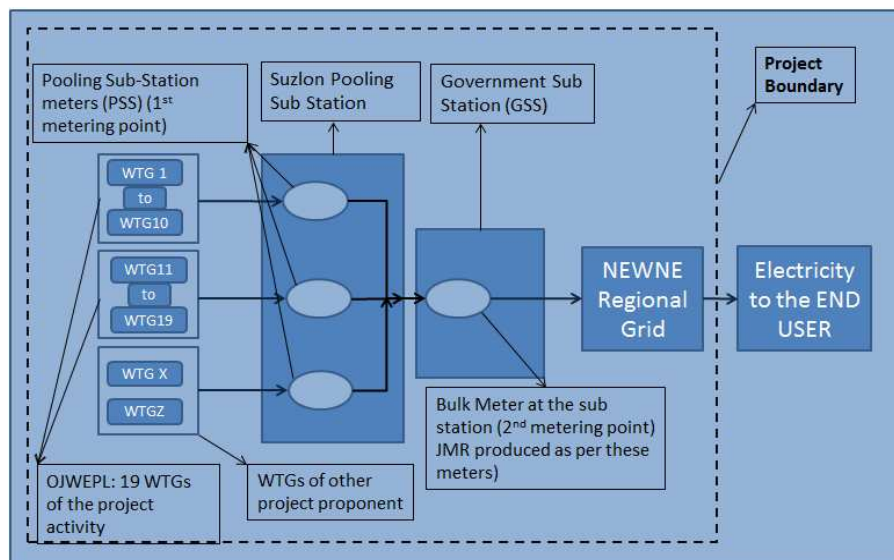
The below parameters are monitored for apportioning JMR values:

Project WTGs Controller Export & All WTGs Total Controller Export
GSS Export & GSS Import

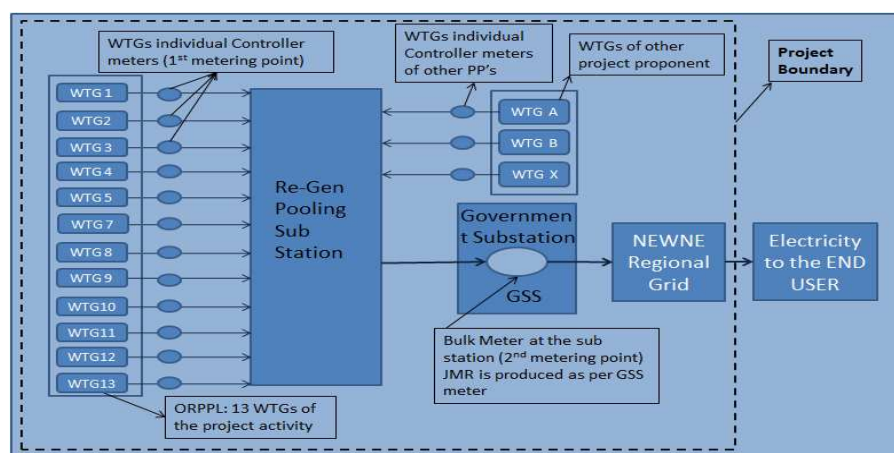
At the respective sub-station, the total export & import to this feeder is monitored using the main meter & the backup meter, which are electronic tri-vector meters. The total export at this meter is generally arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading. The period between these two readings is usually a period of one month which may vary. In a similar fashion, total import at this meter is also calculated. All the project investors raise the invoice for the electricity export to the grid. The allocation of electricity or apportionment procedure is executed as per the aforesaid procedure:

A schematic diagram indicating the metering system is provided below:

OJWEPL: Metering System



ORPPL Metering System:

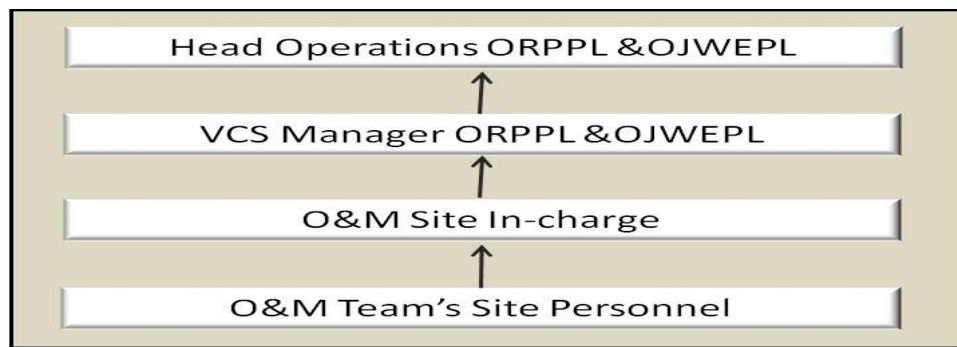


Methods:

Monitoring roles and responsibilities:

The operational and management structure implemented for data monitoring is as follows:

The Project activity is operated by the O&M contractor for the project activity and managed by the PP. Suppliers follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project. The data for the project is compiled by the O&M Contractor and subsequently stored by the PP, the data flows as per the below mentioned flow chart starting from Site O&M team which monitors day to day operational data and monthly recording. The roles and responsibilities for the project are described as below;



5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired 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:

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

Where:

BE_y = Baseline emissions in year y (tCO₂)

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

$EF_{grid, CM, y}$ = 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) (i.e, 0.9766 tCO_2/MWh).

Month	Net Electricity from OJWEPL (kWh)	Net Electricity from ORPPL (kWh)	Total Net Electricity from the Project (kWh)	Grid Emission Factor (tCO_2/MWh)	Baseline Emissions (tCO_2)
May-19	6,251,362	4,478,209	10,729,571	0.9766	10,478
Jun-19	6,695,742	4,927,800	11,623,542	0.9766	11,352
Jul-19	11,831,697	5,213,588	17,045,285	0.9766	16,646
Aug-19	4,991,584	3,141,663	8,133,247	0.9766	7,943
Sep-19	2,655,923	2,117,804	4,773,727	0.9766	4,662
Oct-19	2,024,771	2,124,134	4,148,905	0.9766	4,052
Nov-19	5,634,457	1,657,580	7,292,037	0.9766	7,121
Dec-19	5,260,696	3,935,102	9,195,798	0.9766	8,981
Jan-20	4,177,081	3,074,379	7,251,460	0.9766	7,082
Feb-20	4,184,843	2,947,895	7,132,738	0.9766	6,966
Mar-20	4,339,041	3,429,333	7,768,374	0.9766	7,587

Month	Net Electricity from OJWEPL (kWh)	Net Electricity from ORPPL (kWh)	Total Net Electricity from the Project (kWh)	Grid Emission Factor (tCO ₂ /MWh)	Baseline Emissions (tCO ₂)
Apr-20	5,057,894	2,747,083	7,804,977	0.9766	7,622
Total	63,105,091	37,794,570	102,899,661		100,491

Year	Total Net Electricity MWh	Baseline Emissions (tCO ₂)
2019	72,942	71,235
2020	29,958	29,256
Total	102,900	100,491

5.2 Project Emissions

The project activity involves in harnessing wind power. So, the emissions from the project are zero.

5.3 Leakage

No leakage emissions have been considered and hence the leakage emission is zero.

5.4 Net GHG Emission Reductions and Removals

As per the applied methodology, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y: Emission reductions in year y (tCO₂e/yr)

BE_y : Baseline emissions in year y (tCO₂e/yr)

PE_y: Project emissions in year y (tCO₂e/yr)

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2019	71,235	0	0	71,235

2020	29,256	0	0	29,256
Total	100,491	0	0	100,491

It is to be noted here that as per the estimated emission reduction estimated from the project activity for the current monitoring period is 103,152 tCO₂e, whereas actual emission reductions achieved are 100,491 tCO₂e, which is approximately 3 % lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, and not within the control of the project participant. The minor difference in the generation during the current verification period is hence due to certain natural conditions and hence acceptable.

APPENDIX 1: METER CALIBRATION DETAILS

Project	Meter	Meter number	Operation Period	meter location	Accuracy	Last Calibration Date*	Latest Calibration Date*	Calibration Validity
OJWEPL	GSS Main Meter	RJB90214	17-APR-2017 - Present	GSS	0.2s	NA	17-April-2017	16-April-2022
	GSS Check Meter	RJB90215	17-APR-2017 - Present	GSS	0.2s	NA	17-April-2017	16-April-2022
	PSS Main Meter 1	RJB78194	29-Mar-2013 - Present	PSS	0.2s	28-April-2016	19-August-2017	18-August-2022
	PSS Check Meter 1	RJB78200	29-Mar-2013 - Present	PSS	0.2s	28-April-2016	19-August-2017	18-August-2022
	PSS Main Meter 2	RJB78201	29-Mar-2013 - Present	PSS	0.2s	28-April-2016	19-August-2017	18-August-2022
	PSS Check Meter 2	RJB78203	29-Mar-2013 - Present	PSS	0.2s	28-April-2016	19-August-2017	18-August-2022
ORPPL	GSS Main Meter	ASH13815	03-July-2012 - 25-FEB-2020	GSS	0.2s	30-March-2016	20-August-2018	19-August-2023
	GSS Check Meter	ASH13816	03-July-2012 - 25-FEB-2020	GSS	0.2s	30-March-2016	20-August-2018	19-August-2023
	GSS Main Meter	RJB79226	26-FEB-2020 - Present	GSS	0.2s	26-February-2020	26-February-2020	25-February-2025
	GSS Check Meter	APMB3516	26-FEB-2020 - Present	GSS	0.2s	26-February-2020	26-February-2020	25-February-2025