



**Monitoring report form
(Version 05.1)**

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT

Title of the project activity	100 MW Wind Power Project at Anantapur, Andhra Pradesh	
GS reference number of the project activity	GS4557	
Version number of the monitoring report	4.0	
Completion date of the monitoring report	22/05/2018	
Monitoring period number and duration of this monitoring period	Monitoring Period: 01 Duration: 28/03/2016 to 31/03/2018 (Both days included)	
Project participant(s)	Orange Anantapur Wind Power Private Limited	
Host Party	India	
Sectoral scope(s)	Sectoral Scope 1: Energy Industries(renewable – /non-renewable sources)	
Selected methodology(ies)	ACM0002 "Grid-connected electricity generation from renewable sources" Version 17.0	
Selected standardized baseline(s)	NA	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	421,996 tCO ₂ e	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	NA	303,953 tCO ₂ e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Orange Anantapur Wind Power Private Limited (OAWPPL) has set up wind power project in the villages of Nimbagallu, Amidyala, Mopidi, Indravathi and Renumakulapalli in Uravakonda Mandal, Anantapur District, Andhra Pradesh with capacity of 100 MW (50 X 2 MW).

The project activity generates clean electricity with utilization of wind energy. The project consists of 50 Wind Turbine Generators (WTGs) of Gamesa G 97 turbines of 2 MW each.

The electricity generated by the project is exported to the Indian electricity grid. The project activity displaces an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid and thereby has resulted in reduction of the associated CO₂ emissions. The monitoring of emission reduction and sustainable development indicators has been carried out in accordance to respective registered PDD and Passport.

The present monitoring period is from 28/03/2016 to 31/03/2018 through which emission reduction claimed is 303,953 tCO₂e. All the project WTGs were commissioned on the same day i.e, 28/03/2016.

The project proponent has chosen to start the crediting period from 28/03/2016.

A.2. Location of project activity

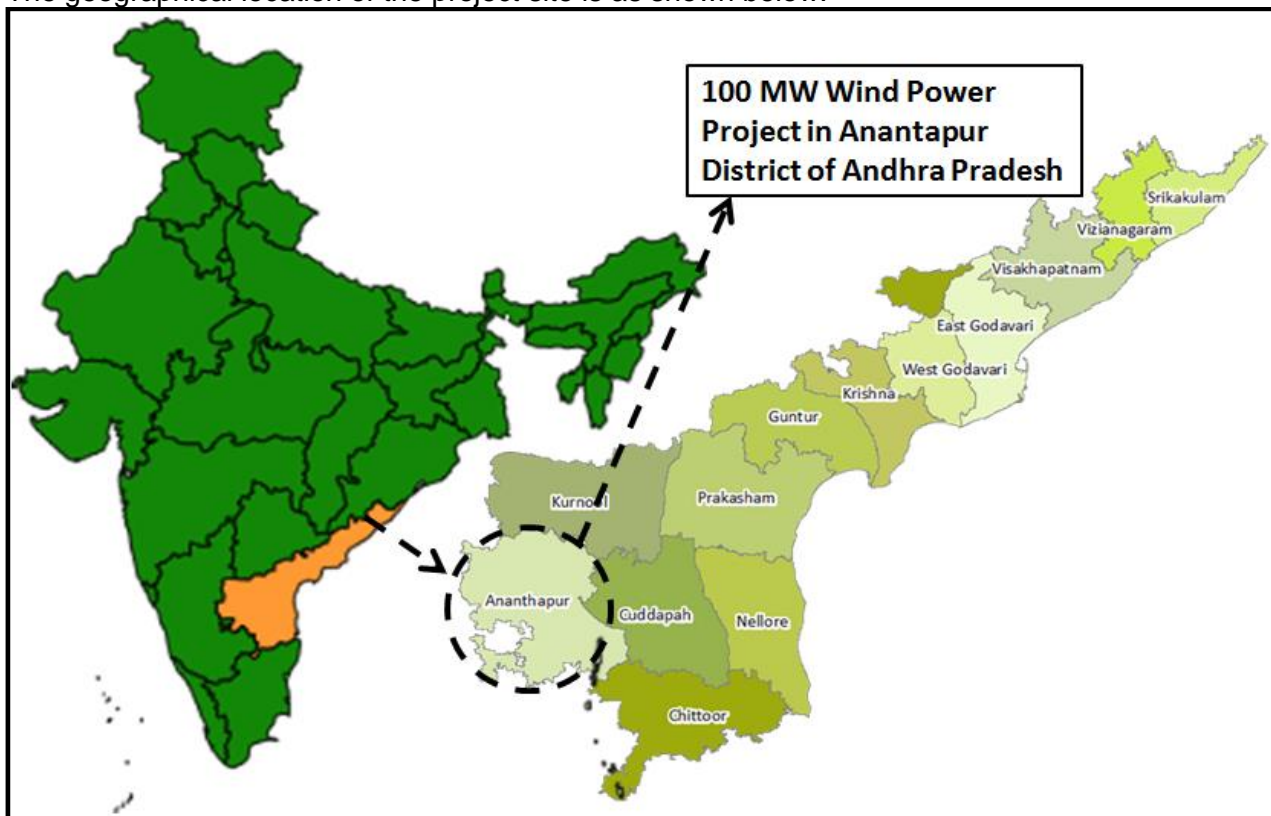
OAWPPL has installed WTGs at Nimbagallu, Amidyala, mopidi, Renumakulapalli, Indravathi villages of Uravakonda Mandal, Anantapur District, Andhra Pradesh, India .

Geographical coordinates of the all WTGs are given below:

S. No	WTG ID	Latitude	Longitude	Village	Mandal	District
1	G1-07	16.4197	73.5719	Amidyala	Uravakonda	Anantapur
2	G1-08	16.4225	73.5617	Amidyala	Uravakonda	Anantapur
3	G1-09	16.4257	73.5547	Amidyala	Uravakonda	Anantapur
4	G1-11	16.4324	73.5301	Amidyala	Uravakonda	Anantapur
5	G1-12	16.4349	73.5268	Amidyala	Uravakonda	Anantapur
6	G1-14	16.4397	73.5108	Amidyala	Uravakonda	Anantapur
7	G1-15	16.4231	73.7548	Amidyala	Uravakonda	Anantapur
8	G1-16	16.4256	73.7483	Amidyala	Uravakonda	Anantapur
9	G1-17	16.4284	73.7456	Amidyala	Uravakonda	Anantapur
10	G1-18	16.4309	73.7265	Amidyala	Uravakonda	Anantapur
11	G1-19	16.4341	73.7241	Amidyala	Uravakonda	Anantapur
12	G1-20	16.4202	73.7557	Amidyala	Uravakonda	Anantapur
13	G1-21	16.4257	73.5547	Indravathi	Uravakonda	Anantapur
14	G1-23	16.4509	73.7016	Amidyala	Uravakonda	Anantapur
15	G1-24	16.4349	73.5268	Renimakulapalli	Uravakonda	Anantapur
16	G1-25	16.4962	73.9643	Renimakulapalli	Uravakonda	Anantapur
17	G1-26	16.4901	74.0145	Renimakulapalli	Uravakonda	Anantapur
18	G1-27	16.4749	74.0365	Indravathi	Uravakonda	Anantapur
19	G1-28	16.4344	73.925	Amidyala	Uravakonda	Anantapur
20	G1-29	16.4385	73.9344	Amidyala	Uravakonda	Anantapur
21	G1-30	16.4406	73.9235	Amidyala	Uravakonda	Anantapur
22	G1-31	16.4431	73.9161	Amidyala	Uravakonda	Anantapur
23	G1-32	16.4454	73.9048	Amidyala	Uravakonda	Anantapur
24	G1-33	16.4291	74.0404	Amidyala	Uravakonda	Anantapur

25	G1-34	16.4493	73.8834	Nimbagallu	Uravakonda	Anantapur
26	G1-35	16.4517	73.8782	Nimbagallu	Uravakonda	Anantapur
27	G1-36	16.4542	73.8764	Nimbagallu	Uravakonda	Anantapur
28	G1-37	16.4372	73.725	Nimbagallu	Uravakonda	Anantapur
29	G1-38	16.4397	73.7282	Nimbagallu	Uravakonda	Anantapur
30	G1-39	16.4437	73.7203	Nimbagallu	Uravakonda	Anantapur
31	G1-40	16.4460	73.703	Nimbagallu	Uravakonda	Anantapur
32	G1-41	16.4484	73.7063	Nimbagallu	Uravakonda	Anantapur
33	G1-42	16.4509	73.7016	Nimbagallu	Uravakonda	Anantapur
34	G1-43	16.4346	74.0551	Amidyala	Uravakonda	Anantapur
35	G1-44	16.4370	74.0438	Amidyala	Uravakonda	Anantapur
36	G1-45	16.4404	74.1268	Amidyala	Uravakonda	Anantapur
37	G1-46	16.4430	74.1301	Amidyala	Uravakonda	Anantapur
38	G1-47	16.4455	74.1329	Amidyala	Uravakonda	Anantapur
39	G1-48	16.4484	74.1097	Mopidi	Uravakonda	Anantapur
40	G1-49	16.4509	74.108	Mopidi	Uravakonda	Anantapur
41	G1-50	16.4532	74.0995	Mopidi	Uravakonda	Anantapur
42	G1-51	16.4557	74.0918	Mopidi	Uravakonda	Anantapur
43	G1-52	16.4581	74.0885	Mopidi	Uravakonda	Anantapur
44	G1-53	16.4606	74.0833	Mopidi	Uravakonda	Anantapur
45	G1-54	16.4773	74.0302	Indravathi	Uravakonda	Anantapur
46	G1-55	16.4798	74.0254	Mopidi	Uravakonda	Anantapur
47	G1-56	16.4828	74.0343	Mopidi	Uravakonda	Anantapur
48	G1-57	16.4854	74.0305	Mopidi	Uravakonda	Anantapur
49	G1-58	16.4236	74.0439	Amidyala	Uravakonda	Anantapur
50	G1-59	16.4189	74.0189	Amidyala	Uravakonda	Anantapur

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



A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)
India	Orange Anantapur Wind Power Private Limited

A.4. Reference of applied methodology and standardized baseline

Title: Consolidated baseline and monitoring methodology for “Grid-connected electricity generation from renewable sources”

References: Approved consolidated baseline methodology ACM0002 “Grid-connected electricity generation from renewable sources” (Version 17.0¹)

A.5. Crediting period of project activity

Type of Crediting Period: Renewable

Start date of the crediting period: 28/03/2016 (Retroactive crediting start date)

Length of the current crediting period: 7 years

A.6. Contact information of responsible persons/entities

Monitoring report prepared by:
Kosher Climate India Private Limited (the party is not a project proponent)
First Floor, #945, 21st cross, 5th main,
Sector- 7, HSR Layout, Bangalore,
Karnataka-560 102, India

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

The project activity comprises of 50 WTGs of Gamesa’s G97model 2000kW.

All the WTGs have been commissioned. The technical details of the WTGs are given below:

Gamesa G-97	
Rated power	2000 kW
Average Annual Wind speed	7.5 m/s
Turbulence Intensity I15%	18 m/s
Reference 10 minute wind speed for 50 years	37.5 m/s

¹<https://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L>

Survival wind speed	52.5 m/s
POWER	
Rated power	2000 kW
Average Annual Wind speed	7.5 m/s
Turbulence Intensity I15%	18 m/s
Reference 10 minute wind speed for 50 years	37.5 m/s
Survival wind speed	52.5 m/s
GENERATOR	
Type	Doubly-fed with coil rotors and slip rings
Rated power	2.0 MW
Voltage	690 V AC
Frequency	50Hz/60Hz
Protection class	IP 54
Power Factor	0.95 CAP – 0.95 IND throughout the power range
ROTOR	
Diameter	97 m
Swept area	7390 sq.m
Speed range (variable)	9:19 rpm
TOWER AND FOUNDATION	
Hub height	104 m
Design	Tubular, Four sections
Foundation type	Floating foundation
GEAR BOX	
Type	1 Planetary stage & 2 Parallel stage
Ratio	1:106.8 (50 Hz), 1:127.2 (60 Hz)
TOWER AND FOUNDATION	
Hub height	104 m
Design	Tubular, Four sections
Foundation type	Floating foundation
GEAR BOX	
Type	1 Planetary stage & 2 Parallel stage
Ratio	1:106.8 (50 Hz), 1:127.2 (60 Hz)

SECTION C. Description of monitoring system

The project proponent has entered into agreement with the WTG Suppliers (Gamesa) 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.

Monthly Generation Data for the Monitoring Period:

	Export (kWh)	Import (kWh)	Net Generation (kWh)
Mar-16	34000	2600	31400
Apr-16	725300	27700	697600
May-16	1546500	25900	1520600
Jun-16	2866300	6900	2859400
Jul-16	3303261	7500	3295761
Aug-16	26153168	400	26152768
Sep-16	31053385	2600	31050785
Oct-16	11844500	31000	11813500
Nov-16	6078774	19900	6058874
Dec-16	8905351	14900	8890451
Jan-17	13677009	31200	13645809
Feb-17	12618965	43100	12575865
Mar-17	8968870	69000	8899870
Apr-17	13035053	76600	12958453
May-17	19829647	41800	19787847
Jun-17	33993684	200	33993484
Jul-17	40305368	700	40304668
Aug-17	21941225	21500	21919725
Sep-17	10822533	96200	10726333
Oct-17	5472657	130400	5342257
Nov-17	7238810	61200	7177610
Dec-17	8030773	45000	7985773
Jan-18	5638986	47900	5591086
Feb-18	7622433	33400	7589033
Mar-18	10080504	49500	10031004
Total	311787056	887100	310899956

Key Reasons for Downtime during the Current Monitoring Period:

Month-Year	WTG stoppage Hrs	Internal Grid (Hours)	External Grid (Hours)	Exclusion Event (Hours)	Customer Shutdown (Hours)
Apr-16	127.57	8.10	0.00	4049.90	0.00
May-16	233.12	26.70	0.00	983.88	0.00
Jun-16	73.80	35.90	5.90	473.35	0.00
Jul-16	178.65	11.80	0.00	641.63	0.00
Aug-16	355.02	5.33	0.00	360.42	0.00
Sep-16	101.97	78.90	0.00	1162.52	0.00
Oct-16	220.45	21.60	0.00	610.27	0.17
Nov-16	122.90	6.00	0.00	249.23	0.00
Dec-16	128.83	19.90	0.00	440.83	13.10
Jan-17	57.63	64.43	0.00	205.58	0.00
Feb-17	74.15	2.90	0.00	209.35	0.00
Mar-17	111.13	7.90	0.00	2163.54	294.00

Apr-17	244.32	3.83	0.00	506.75	126.55
May-17	103.68	31.00	1.00	1157.80	1.02
Jun-17	132.38	45.80	0.00	10.05	0.00
Jul-17	32	12	0	182	0
Aug-17	52	113	0	2474	0
Sep-17	73	12	13	58	0
Oct-17	50	7	0	3356	0
Nov-17	124	3	0	3545	0
Dec-17	169	3	0	457	0
Total	3439	556	115	38286	509

The project activity has entered a power purchase agreement for a period of 25 years with the Southern Power Distribution Company of A.P LIMITED (DISCOM). The electricity is fed in the Integrated Indian grid. Monitoring consists of metering the net electricity supplied to the grid ($EG_{\text{facility},y}$). This parameter is based on the monthly JMRs (share certificates) undertaken by DISCOM and Gamesa which is continuously through energy meter. The PP will then raise monthly electricity sales invoices to DISCOM based on the JMR reading. All the meters used in the project activity will be calibrated on an annual basis.

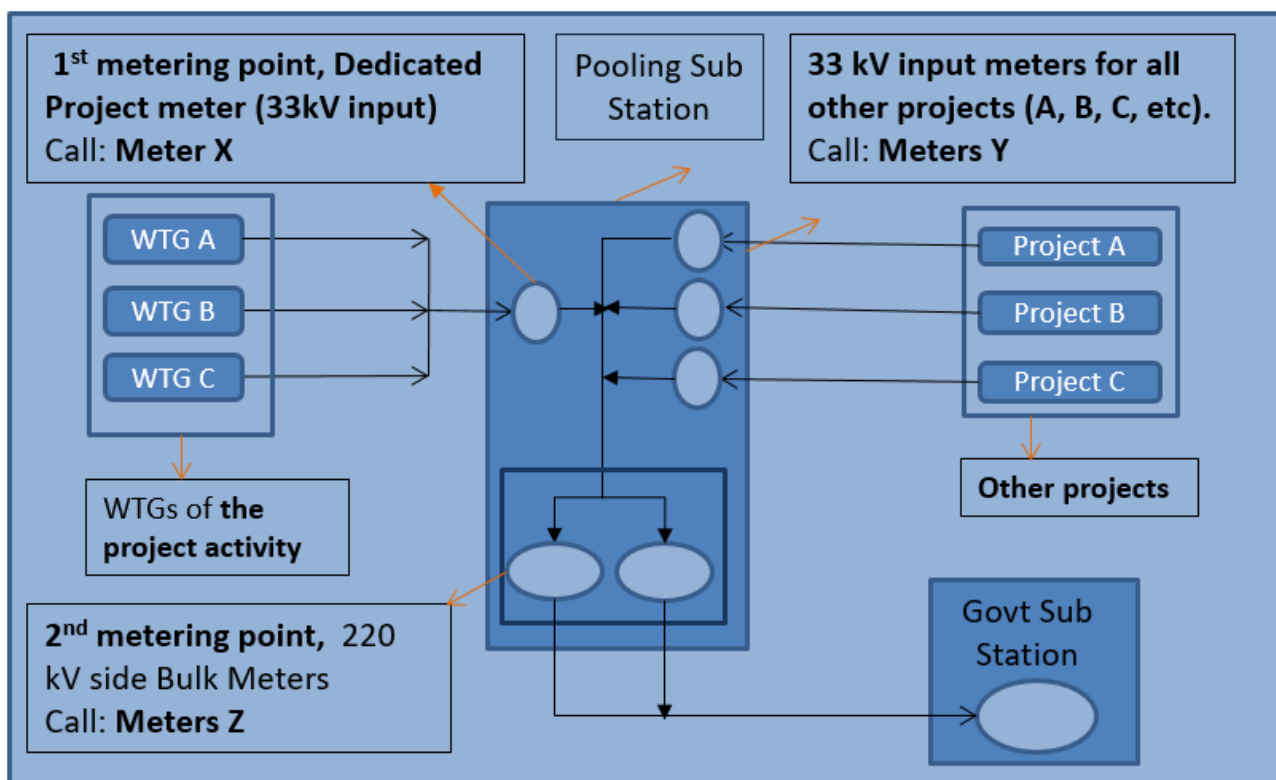
The monitored data will be reported by the PP to the GS consultant on a monthly basis for the calculation and estimation of emission reductions. This data will be checked against invoices raised.

Data storage and Archiving

In accordance with the methodology all the data collected during the crediting period will be archived electronically and kept for at least two years after the end of crediting period. 100% of the data is monitored and the meters owned by DISCOM/PP are calibrated at regular intervals to ensure low uncertainty in the monitored data.

Metering

The project activity includes metering at the substation managed by Orange & Gamesa. The electricity exported & imported are measured by Energy meter installed at substation. The reading is recorded and the difference from last month reading gives the number of units imported/exported. Below is the diagrammatic representation:



The project activity metering is done at the Pooling substation (PSS) input (33kV) and output (220kV) end. Hence, electricity at the PSS is recorded both at the input end and then at the GSS output end. Hence there is loss within the PSS as well. The Export, Import & Line Losses are as below:

Export = Export (Meter X) – Transmission Loss

Import = Import (Meter X)

Transmission Loss: $\text{Export (Meter X)} \times \frac{(\text{Export Meter X} + \text{Export Meters Y}) - \text{Exports Meters Z}}{(\text{Export Meter X} + \text{Export Meters Y})}$

Data and parameters

C.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter	$EF_{OM, y}$
Unit	tCO ₂ e/MWh
Description	Operating Margin Emission Factor of Indian Grid
Source of data	Central Electricity Authority: "CO ₂ Emission Database CEA CO ₂ Baseline database Version 11" published by Central Electricity Authority (CEA), Ministry of Power, Government of India.
Value(s) applied	0.9941
Choice of data or Measurement methods and procedures	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the Simple OM approach in accordance with the procedures prescribed in the approved "Tool to calculate the emission factor for an electricity system"
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	The operating margin emission factor is a 3-year generation-weighted average (2012-15). The operating Margin is calculated ex ante and fixed during the crediting period

Data / Parameter	$EF_{BM, y}$
Unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of INDIAN Grid
Source of data	Central Electricity Authority: "CO ₂ Emission Database CEA CO ₂ Baseline database Version 11" published by Central Electricity Authority (CEA), Ministry of Power, Government of India.
Value(s) applied	0.9285
Choice of data or Measurement methods and procedures	Build Margin Emission Factor has been calculated by the Central Electricity Authority with the approved "Tool to calculate the emission factor for an electricity system".
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comment	The Build Margin would be calculated ex ante and fixed during the crediting period. For ex ante calculation the most recent data (2014-15) available has been used and the build margin is calculated.

Data/parameter:	$EF_{CM, y}$
Unit	tCO ₂ e/MWh
Description	Combined Margin Emission Factor of INDIAN Grid
Source of data	Central Electricity Authority: "CO ₂ Emission Database CEA CO ₂ Baseline database Version 11" published by Central Electricity Authority (CEA), Ministry of Power, Government of India.
Value(s) applied)	0.9777
Choice of data or measurement methods and procedures	Combined Margin Emission Factor has been calculated with the approved "Tool to calculate the emission factor for an electricity system" as weighted average of 75% of OM (three years average) and 25% of BM for the latest year.
Purpose of data	The data is used to calculate baseline emission reductions.
Additional comments	-

C.2. Data and parameters monitored for Emission Reduction

(Copy this table for each piece of data and parameter)

Data/parameter:	$EG_{\text{facility}, y}$			
Unit	MWh			
Description	Quantity of net electricity supplied to the grid during the year y.			
Measured/calculated/default	Calculated (based on the measured values of electricity exported and imported)			
Source of data	Share Certificate Issued by Gamesa and JMR (Joint Meter Reading)			
Value(s) of monitored parameter	310,886 MWh			
	Vintage	Export (MWh)	Import (MWh)	Net Generation (MWh)
	Year 2016	92510539	139400	92365
	Year 2017	195934594	616900	195310
	Year 2018	23341923	130800	23211

Monitoring equipment	<p>Net electricity supplied will be calculated based on the difference between values of “export” and “import” on the EB energy meter at the Government sub-station (evacuation point). Net Electricity = (Export – Transmission Loss) – Import</p> <p>The net electricity will be calculated by State electricity board and provided in the monthly generation statement/JMR/B-form. Hence, the net electricity reading will be directly sourced from the monthly generation statement/JMR/B-form.</p> <p>Transmission Losses: This will be arrived at by the way of apportioning.</p> <p>As per the registered PDD, calibration of meters is under the control of State Utility and frequency of calibration is not within the control of PP. However, as the PDD the PP shall ensure at least once in five year calibration as per the national standard. During the monitoring period the meters have been calibrated and there has been no error or fault in the meters identified during the latest calibration as well.</p> <p>Below are the details of meter numbers and calibration dates, The meters are calibrated before commissioned and post commissioning during the monitoring period have been calibrated twice as detailed below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Energy Meter Serial No Details</th> <th>Calibration Date</th> <th>Latest Calibration</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center;">33 KV side Billing Meter</td> <td>Old Main</td> <td>APX00050</td> <td>28.03.2016</td> <td>-</td> </tr> <tr> <td>Old Check</td> <td>APX00049</td> <td>28.03.2016</td> <td>-</td> </tr> <tr> <td>Main Meter</td> <td>APX00642</td> <td>21.07.2016</td> <td>23.11.2017</td> </tr> <tr> <td>Check Meter</td> <td>APX00643</td> <td>21.07.2016</td> <td>23.11.2017</td> </tr> <tr> <td rowspan="2" style="text-align: center;">220 KV side Common Billing Meter Line 1</td> <td>Main Meter</td> <td>APX00638</td> <td>21.07.2016</td> <td>23.11.2017</td> </tr> <tr> <td>Check Meter</td> <td>APX00639</td> <td>21.07.2016</td> <td>23.11.2017</td> </tr> <tr> <td rowspan="2" style="text-align: center;">220 KV side common Billing Meter Line 2</td> <td>Main Meter</td> <td>APX00640</td> <td>21.07.2016</td> <td>23.11.2017</td> </tr> <tr> <td>Check Meter</td> <td>APX00641</td> <td>21.07.2016</td> <td>23.11.2017</td> </tr> </tbody> </table> <p><i>*All the meters are of “Secure Make: with 0.2s Accuracy class.</i></p> <p>Note: The Old main and check meter at the 33kV end of the sub-station were used till 21/07/2016. Post which the new meters were used for metering. Hence the calibration details of the Old meters are not presented post 28/03/2016.</p>	Energy Meter Serial No Details			Calibration Date	Latest Calibration	33 KV side Billing Meter	Old Main	APX00050	28.03.2016	-	Old Check	APX00049	28.03.2016	-	Main Meter	APX00642	21.07.2016	23.11.2017	Check Meter	APX00643	21.07.2016	23.11.2017	220 KV side Common Billing Meter Line 1	Main Meter	APX00638	21.07.2016	23.11.2017	Check Meter	APX00639	21.07.2016	23.11.2017	220 KV side common Billing Meter Line 2	Main Meter	APX00640	21.07.2016	23.11.2017	Check Meter	APX00641	21.07.2016	23.11.2017
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220 KV side Common Billing Meter Line 1	Main Meter	APX00638	21.07.2016	23.11.2017																																					
	Check Meter	APX00639	21.07.2016	23.11.2017																																					
220 KV side common Billing Meter Line 2	Main Meter	APX00640	21.07.2016	23.11.2017																																					
	Check Meter	APX00641	21.07.2016	23.11.2017																																					
Measuring/reading/recording frequency:	Measuring Frequency: Continuous Frequency of Recording: Monthly																																								
Calculation method (if applicable):	Net Electricity is calculated difference between export & import which is measured by energy meter.																																								
QA/QC procedures:	The net electricity is crosschecked with the invoice copies.																																								
Purpose of data:	Calculation of baseline emission																																								
Additional comments:	-																																								

Below are the details of WTGs connected to Feeders:

Feeder 1	OAWP-21, OAWP-24, OAWP-25, OAWP-26, OAWP-27, OAWP-54, OAWP-55, OAWP-56, OAWP-57
Feeder 2	OAWP-35, OAWP-36, OAWP-45, OAWP-46, OAWP-47, OAWP-48, OAWP-49, OAWP-50, OAWP-51, OAWP-52, OAWP-53
Feeder 3	OAWP-23, OAWP-28, OAWP-29, OAWP-30, OAWP-31, OAWP-32, OAWP-33, OAWP-34, OAWP-43, OAWP-44, OAWP-58, OAWP-59

Feeder 4	OAWP-15, OAWP-16, OAWP-17, OAWP-18, OAWP-19, OAWP-20, OAWP-37, OAWP-38, OAWP-39, OAWP-40, OAWP-41
Feeder 5	OAWP-07, OAWP-08, OAWP-09, OAWP-11, OAWP-12, OAWP-14, OAWP-42

C.3. Sustainable Development Parameters monitored

No	1	
Indicator	Air quality	
Mitigation measure	In order to reduce dust emissions during the construction phase, the following dust suppression measures stipulated and implemented: - Spraying water and covering material trucks' body to minimize dust; - Reuse of water for sprinkling of unpaved roads. - Imposition of speed controls for vehicles and unpaved site roads; - Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions; - Shut-down of diesel-powered mechanical equipment or trucks inside the worksites when they are not in operation. During the operational phase (monitoring period) the scope of dust emission is none to minimal. Vehicles are run under controlled speed to avoid any dust generation.	
Chosen parameter	CO ₂ emission reduction and reduction in dust generation	
Baseline situation of parameter	According to latest CEA official data CO ₂ emissions due to electricity generation in India is 9777 tCO ₂ /GWh. (This is calculated value and sources are available in the emission reduction spread sheet.) There was no project related activity and hence no resultant dust due to construction or project's vehicle movements.	
Value for the current monitoring period	303,953 tCO ₂ emission reductions achieved during the reported monitoring period. The applied OM & BM for the project are as following: Operating Margin: 0.9941 tCO ₂ /MWh Build Margin: 0.9285 tCO ₂ /MWh The applied Combined margin for the project activity is 0.9777 tCO ₂ /MWh. This high emission factor signifies the fact that the electricity being fed in the Indian grid is highly carbon intensive. Every MWh of electricity generated by the project activity prevents further emissions. Dust generation is controlled through strict practice of control measures at site, which includes no soil piles, open trucks, controlled vehicle speed. It also includes sprinkling of water if required. The project makes positive impact on this parameter. It results in emission reductions hence is helping in climate change mitigation	
Future target for parameter	Continuation of strict control measures for prevention of dust generation. Optimal operation of wind power project to generate clean energy and associated emission reductions.	
Way of monitoring	How	O&M policy and interview with O&M team. The interview with the O&M team revealed that the project operation has minimalistic ground activities which does not result in any dust emissions.
	When	Yearly once
	By who	Project/Plant Manager

No	2
Indicator	Quality of employment
Mitigation measure	None
Chosen parameter	Training provided to employees & O&M staffs
Baseline situation of parameter	No training & workshops conducted

Value for the current monitoring period	<p>Trainings & workshops where conducted to the O&M staffs by management of Gamesa.</p> <ol style="list-style-type: none"> 1) HSE Training Record 2) Regular Drill Record 3) Handling of Equipment Training 4) Soft Skill Training <p>The list of training programmes conducted during the monitoring period is included under this table.</p> <p>The training programmes help in making the workforce efficient and skilled at their job. This not only helps the company but adds to growth of individual employees. Thus the project has a positive impact on the parameter.</p>	
Future target for parameter	Continuation of regular trainings/workshops for employees & O&M staffs	
Way of monitoring	How	Training Records (HSE & HR) & Employee feedback forms
	When	Yearly once
	By who	O & M Contractor

S.No.	Name of Training	Training date	Trainer /Institute	No. of Participants
1	Auto Cadd 2D	18-05-15	CADD Center	6
2	Work at height - April 2017	First Week of Every Month	Karam Training Consultancy	20
3	Primavera	April 2015, 25th to 29th Feb 16	Internal Training	4
4	Quit Smoking Session	28-09-2015, 11-01-2016	Internal Training	7
5	Ride Safe Program	15-12-15	Hero Corp	15
6	Ergonomics Session	15-09-2015, 12-03-2016	Aakash HealthCare	16
7	Emergency Responder Training	15-12-2015, 22-01-2016, 19-02-2016, 29-07-2016, 02-09-2016	VIVO Health Care	14
8	Structured Query Language	14-10-2015 to 18-10-2015	Aurelius Corp. Solutions	10
9	Communication & Presentation Skills	10th -11th Nov 2015, 27th - 28th Jan 2016	Hero Mindmine	12
10	Basic First Aid Training	25-11-2015, 22-01-2016, 24-03-2016	Trove Skills	11
11	Leadership Training Program	25-11-15	The Foundation	18
12	MDP Training	09-12-15	TERI University	5
13	Gender Sensitization Workshop	14-12-16	Aspiring People	8
14	Advance Excel	2nd - 3rd March 2016	Prosper Consultancy	16

No	3
Indicator	Livelihood of the poor
Mitigation measure	None
Chosen parameter	Health Camps, Knowledge and information dissemination regarding natural disasters.
Baseline situation of parameter	No activity except Government facilities
Value for the current monitoring period	<p>PP conducted survey during construction phase of the project in the villages near project locations to check the requirement of facilities by the villages. From the survey, PP has identified several scope of developmental activities such as health camps, furniture, sports kits and toilet requirements in government schools, drinking water requirements etc.</p> <p>PP has started implementing the CSR activities. During the monitoring period</p>

	the CSR activities like: 1) Distribution of furniture to schools (Chairs, stools, benches and books) 2) Possibility of construction of Toilets at school for Girls if required. 3) Health camp at the village of Nimbagallu. 4) Establishment of water purifier with cooler in Nimbagalu The project will have positive impact on this parameter as there were no socially oriented CSR activities before the project activity. Thus the project has positive impact on the indicator.
Future target for parameter	Health Camps, Knowledge and information dissemination regarding natural disasters are done by PP based on the requirement in the project location.
Way of monitoring	How When By who
	CSR records and photographic evidence.
	Yearly once
	Project Coordinator

S. No.	Location	Area as per schedule VII of companies Act	Requirement	Details of Beneficiary
1	Nimbagallu	(iv) Promotion of healthy Environment	Tree plantation on world environment day	Surrounding community
3	Nimbagallu	(iv) Promotion of healthy Environment	Tree plantation on world environment day	Surrounding community
4	Nimbagallu	Target- Promotion of education	Target - Renumakalpalli, Mopidi, Amidyala and indravathi District Anantapur (AP)furniture, Science & Maths Kit, Black Boards, Mats, stationary, scholarships, Sports Kit, bicycles etc. Work In Progress	Target- Approx. 300 students of nearby villages
	Nimbagallu	Target- Promotion of healthcare, sanitation and drinking water facility.	Target - Organization of 2nos. health camp and 2 No of followup camp in Nimbagallu, Amidyala District Anantapur (AP)s-Work In Progress .	Target- Approx. prox 2000 Peoples nearby villages
	Nimbagallu	Target- Promotion of healthcare, sanitation and drinking water facility.	Target - Installation of RO Water Purifier along with Water cooler Work In Progress	Target- Approx. prox 250 Peoples nearby villages
	Nimbagallu	Target- Promotion of healthcare, sanitation and drinking water facility.	Target-Nimbagallu District Anantapur (AP): Construction of toilets (1 nos.) 1 water storage tank - Work In Progress	Target- Approx. 200 students of nearby villages

No	4
Indicator	Access to affordable and clean energy services
Mitigation measure	None
Chosen parameter	Net electricity supplied to grid
Baseline situation of parameter	No electricity is generated
Value for the current monitoring period	310,886 MWh of electricity supplied to grid by the project activity
Future target for parameter	Similar units of electricity supplied to grid by the project activity
Way of monitoring	How Monitored through energy meter. Net electricity will be calculated by DISCOM and O&M operator on monthly basis and provided in the share

		certificate.
	When	Continuously monitored & recorded monthly
	By who	DISCOM and O&M operator

No	5	
Indicator	Quantitative employment and income generation	
Mitigation measure	None	
Chosen parameter	1. Cost spent for O&M 2. Number of O&M staffs involved in the project	
Baseline situation of parameter	No employment generation	
Value for the current monitoring period	<p>The total number of O&M staffs employed by the Gamesa and Orange for the operation & maintenance of the project activity are around 50. This includes 9 number of O&M team of Gamesa, 10 number of third party contractors engaged by Gamesa, 1 personnel of Orange and 30 number of security staff employed at project site.</p> <p>The cost of O&M is over 20.5 lakhs per WTG which works at 1050 lakhs for the project per year, which helps in creating service based jobs in the project region.</p> <p>The parameter has a positive impact as the project results in direct employment and income generation.</p>	
Future target for parameter	Continued employment of O&M staff and security. Explore opportunity to engage more villagers. The project security staffs are local villagers and hence the project has also generated employment and income for local villagers.	
Way of monitoring	How	Plant employment records
	When	Yearly once
	By who	O & M Contractor

No	6	
Indicator	Soil Erosion	
Mitigation measure	<ul style="list-style-type: none"> • General soil erosion and sediment control measures would include: <ul style="list-style-type: none"> - Keep open areas of excavation to a minimum and construction activities restricted to dry months to avoid heavy rainfalls; - Using existing roads and lanes used by land owner. - Stockpiles of materials placed away from drainage lines and formed with sediment control structures placed immediately down slope; - Construction debris and excavated material were cleared up at regular intervals - Excavated material stock piled and used for backfilling of foundations, platforms etc. - Minimization of traffic in construction zones and use of a dedicated parking area, i.e. site compound; - Re-vegetation taken up as necessary after construction, in order to reduce the risk of soil erosion. <p>Specific mitigation measures followed in the operational phase of the project:</p> <p>Waste oil generated shall be stored separately in containers in a secured location in the maintenance room. The storage location and the containers are properly marked.</p> <p>The waste / used waste oil from the WTGs to be disposed off to a CPCB/SPCB authorized vendor.</p> <p>A hazardous waste inventory is maintained as per the provisions of the Hazardous Waste (Management, Handling and Trans-boundary Movement)</p>	

	Rules, 2008.	
Chosen parameter	Any change in top soil around the establishment of project.	
Baseline situation of parameter	No project related soil erosion in absences of no project activity.	
Value for the current monitoring period	The O&M log book records all the parameters as listed: 1) Hazardous waste generated, disposed, any spillages 2) Waste oil generated, disposed, any spillages 3) Leakage of any diesel or waste oil The same O&M HSE log book is submitted to DOE This parameter has a neutral (0) impact as there has been no incidences of oil leakage or inappropriate disposal of hazardous or waste oil during the monitoring period.	
Future target for parameter	Regular review of mitigation measures proposed under monitoring plan and revision as per grievance expressed (if any)	
Way of monitoring	How	Project O&M HSE logbook, or interview with maintenance staff.
	When	Yearly once
	By who	Project/Plant Manager , O & M Contractor

No	7	
Indicator	Maintenance of Landscape visual impact	
Mitigation measure	Detailed ESIA study conducted to understand if any of the location needs to be altered. Locals were consulted where ever a WTG location or access road was in vicinity to a settlement. The WTGs are painted with non-reflect paints and are not glary. Re-vegetation taken up as necessary after construction, in order to reduce the risk of soil erosion.	
Chosen parameter	Aesthetics	
Baseline situation of parameter	There was no project activity and hence no resultant visual or landscape impact of the same.	
Value for the current monitoring period	No significant visual impact observed and no grievances received. Vegetation has been grown where ever possible in the project's land. Apart from this the project proponent has planted a number of trees to improve the landscape visual impact. The parameter has a neutral (0) impact as there are no grievances received or registered. The WTGs are spread across the terrain and hence have minimalistic presence.	
Future target for parameter	Minimalistic visual impact/No stakeholders' complaints	
Way of monitoring	How	Project Grievance register, or interview with local villagers
	When	Yearly once
	By who	Project/Plant Manager, O & M Contractor

No	8
Indicator	Species Mortality & Bird Strikes (Bird & Bat Deaths)
Mitigation measure	<ol style="list-style-type: none"> 1. During the siting activity it was ensured that there are no water bodies beside WTGs. 2. Water pits are not allowed around the WTGs. 3. None of the area of WTGs erection or transmission lines are under sensitive or under areas of conservation importance 4. The transmission lines wherever required has reflectors 5. Storm water control around within 100m of every WTG
Chosen parameter	Bird carcass count
Baseline situation of parameter	No action taken
Value for the current monitoring period	The O&M team maintenances a Bird strike register. As per the record, there are no observed carcasses in vicinity of the WTGs. The death of birds by other reasons including prey and accidents has not been recorded as this is not caused by the project's WTGs and its ancillary. Such rare incidents are

	<p>known to the project proponent mostly through news. (Such as: http://www.indiatimes.com/news/india/parrots-in-madhya-pradesh-are-so-addicted-to-opium-they-re-stealing-it-straight-from-the-farms-274146.html)</p> <p>The project activity's micro-siting had been done considering possible impact on flora and fauna. The choice of sites has been carefully done considering the preliminary recommendation of the ESIA report. None of the WTGs are near to water bodies and PP takes deliberate steps to ensure there no water holes around the WTGs.</p> <p>The project proponent actively takes regular feedback from local villagers about project and has also set up a grievance mechanism in place. There has been no reported bird death in the project vicinity.</p> <p>The impact of parameter is neutral as there is no impact observed during the current monitoring period. The DoE has been provided with details of observations.</p>	
Future target for parameter	Strictly follow the control measures to prevent & control any bird strikes	
Way of monitoring	How	Bird Strike register, or interview with local villager
	When	Yearly once
	By who	Project/Plant Manager, O & M Contractor

C.4. Implementation of sampling plan

No sampling process is involved, hence not applicable. The details of sampling any of carried out during the course of verification will be included.

SECTION D. Calculation of emission reductions or GHG removals by sinks

As per the applied approved methodology ACM0002 (Version 17.0) Emission Reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \tag{11}$$

Where:

- ER_y =Emission reductions in year y (t CO₂e/yr)
- BE_y =Baseline emissions in year y (t CO₂/yr)
- PE_y =Project emissions in year y (t CO₂e/yr)
- LE_y =Leakage emission in year y (t CO₂e/yr)

However, LE_y has been neglected as per the guidelines of the methodology.

Hence as per PDD, emission reduction is calculated as below:

$$ER_y = BE_y - PE_y$$

D.1. Calculation of baseline emissions or baseline net GHG removals by sinks

Baseline Emissions for the amount of electricity supplied by project activity, BE_y is calculated as

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y} \tag{6}$$

Where,

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{PJ,y}$ = 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/yr).

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO₂/MWh)

For this monitoring period, the emission reduction is calculated as below:

= 310,886(MWh) * 0.9777 (tCO₂/MWh)

= 303,953 tCO₂ (rounded down)

D.2. Calculation of project emissions or actual net GHG removals by sinks

As mentioned in the PDD, the project activity involves the generation of electricity from the installation of wind turbines. Hence, as per ACM0002, Version 17.0 there is no project emission for windmill projects. Therefore, project emissions are zero.

D.3. Calculation of leakage

As per PDD, No leakage emissions are considered in the project activity. Hence leakage emission is considered as zero.

D.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	303,953	0	0	NA	303,953	303,953

D.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period (28/03/2016 to 31.03.2016)
Emission reductions or GHG removals by sinks (t CO ₂ e)	421,966	303,953
Year 2016	158,093	90,305
Year 2017	209,833	190,955
Year 2018	51,740	22,693

D.6. Remarks on difference from estimated value in registered PDD

The actual achieved emission reduction for this monitoring period is less than estimated value in the PDD. The PP would like to clarify that such variation is possible due to various factors such as annually varying capacity utilization factor of the machines (WTGs) and ancillary facilities. For the

year 2016 the generation is lesser by 42.88%. This is due to the reason that the project was just implemented and usually it takes time to operate the plant at full efficiency. Further, the year of 2016 can also be considered to be one with lean wind for the project resulting in lower generation.

For the year 2017 the generation is lesser by 9.00% which is not very far from expected generation. Variation in the wind availability is one of the reasons for such variation, the generation may go up as well depending on the peak season wind availability in the upcoming years of operation.

For the year 2018 the generation is lesser by 56.14%, this is due to the reason that the data covered in monitoring is only for the months of January to March which are non-peak seasons. Most of the generation for wind projects comes from the months of June to September.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Orange Anantapur Wind Power Private Limited
Street/P.O. Box	301B, 3rd Floor,
Building	D-21 Corporate Park, Sector 21
City	Dwaraka
State/region	New Delhi
Postcode	110077
Country	India
Telephone	011- 30501110
Fax	
E-mail	info@orangerenewable.net
Website	www.orangerenewable.net
Contact person	Pavan Kumar Gupta
Title	Senior Engineer
Salutation	Mr
Last name	Gupta
Middle name	Kumar
First name	Pavan
Department	Business Development
Mobile	9560540654
Direct fax	
Direct tel.	
Personal e-mail	pavangupta@orangerenewable.net

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	Kosher Climate India Private Limited
Street/P.O. Box	First Floor, #945, 21 st cross, 5 th main
Building	Sector- 7, HSR Layout
City	Bangalore
State/region	Karnataka
Postcode	560 102
Country	India
Telephone	+91 80 25720814
Fax	+91 80 25720814
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Contact person	Vamsi Krishna M
Title	Sr. Manager
Salutation	Mr.
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Middle name	Krishna
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
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