



“51 MW WIND POWER PROJECT AT CHITRADURGA”

Document Prepared by
“M/s. NSL Renewable Power Private Limited”

Project Title	51 MW Wind Power Project at Chitradurga
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CONTENTS

1	PROJECT DETAILS.....	3
1.1	Summary Description of the Implementation Status of the Project	3
1.2	Sectoral Scope and Project Type	3
1.3	Project Proponent	4
1.4	Other Entities Involved in the Project	4
1.5	Project Start Date	4
1.6	Project Crediting Period	4
1.7	Project Location	5
1.8	Title and Reference of Methodology	6
1.9	Participation under other GHG Programs.....	6
1.10	Other Forms of Credit.....	6
1.11	Sustainable Development.....	6
2	SAFEGUARDS.....	7
2.3	AFOLU-Specific Safeguards	8
3	IMPLEMENTATION STATUS	8
3.1	Implementation Status of the Project Activity	8
3.2	Deviations.....	9
3.3	Grouped Projects	10
4	DATA AND PARAMETERS.....	10
4.1	Data and Parameters Available at Validation	10
4.2	Data and Parameters Monitored.....	11
4.3	Monitoring Plan.....	14
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	17
5.1	Baseline Emissions	17
5.2	Project Emissions	17
5.3	Leakage.....	17
5.4	Net GHG Emission Reductions and Removals.....	17
	APPENDIX 1: METER CALIBRATION DETAILS.....	19

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity is a Wind Power Generation project of total capacity 50.4 MW, installed and currently operational at Bhimasamudra site in Chikkandavadi and Kallavanagathihalli village, Chitradurga District of Karnataka in India. The project activity has been connected to Indian Grid (previously it was as Southern Grid) through sub-stations owned and maintained by the state electricity utility.

Nuziveedu Seeds Limited had made an application for conversion to private company under section 31(1) of the companies act and received approval from central government for name change as “Nuziveedu Seeds Private Limited” on 26/06/2008. In continuation to that, on 16/06/2010, the central government approved for the name change as “NSL Renewable Power Private Limited” (hereafter referred as NSL) in line with section 21 of the companies act. "On 10/12/2007, NSL had released purchase order to Regen Power Private Limited (RPPL) for 34 nos. of Wind Turbine Generators (WTGs) (1.5 MW each) for a capacity of 51 MW. RPPL had supplied 9 WTGs on time out of the 34 WTGs. From the balance 25 nos. of WTGs, RPPL supplied only 19 WTGs and informed NSL on 12/09/2009 that the balance 6 WTGs could be supplied only later (after June 2010). So, considering the delay in supply of WTGs from RPPL, NSL decided to replace Regen make of 6 nos. WTGs with 4 nos. of WTGs of Suzlon make each having capacity of 2.1 MW. Based on this, NSL released new purchase order to Suzlon Energy Limited (SEL) for 4 no WTGs. Hence the current capacity amounts to 50.4 MW which is lower than the capacity mentioned in the title. PP is also developing the project under CDM and received HCA with the same title. PP is using the same title for consistency between their CDM and VCS project.

The Project WTGs are currently operational and had successfully completed 10 years of first crediting period under VCS (end date of first crediting period was 05/06/2018). The first machine under the project activity was commissioned on 06/06/2008 and last machine under the project activity was commissioned on 30 September 2011. The expected operational lifetime of the project is minimum of 20 years.

The monitoring period covered under this document is from **01/11/2020** to **31/08/2021**, which falls under the 2nd Crediting Period of the project. The electricity generated from the project activity in this current monitoring period corresponds to emission reductions of **54,397 tCO₂e** in this monitoring period.

1.2 Sectoral Scope and Project Type

Sectoral scope	: 01, Energy Industries (renewable- /non-renewable sources)
Project Type	: I, Renewable energy projects

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	M/s. NSL Renewable Power Private Limited
Contact person	Mr. A. Rajnikant
Title	Head – Wind Projects & Operations
Address	NSL ICON, 4th Floor, Road No.12, Banjara Hills, Hyderabad - 500034, Andhra Pradesh
Telephone	+91 - 40 - 3051 4444
Email	rajnikant.a@nslpower.com

1.4 Other Entities Involved in the Project

Organization name	Emergent Ventures India Pvt. Ltd.
Role in the Project	Project Consultant
Contact person	Atul Sanghal
Title	Business Head
Address	Magnum Tower 1, 8th Floor, Sector 58, Gurgaon, Haryana, India
Telephone	+91-97173 96309
Email	contact@emergent-ventures.com

1.5 Project Start Date

06-June-2008 – The date of commissioning of the first WTG (HK 3).

1.6 Project Crediting Period

This is the second renewal crediting period for the project activity.

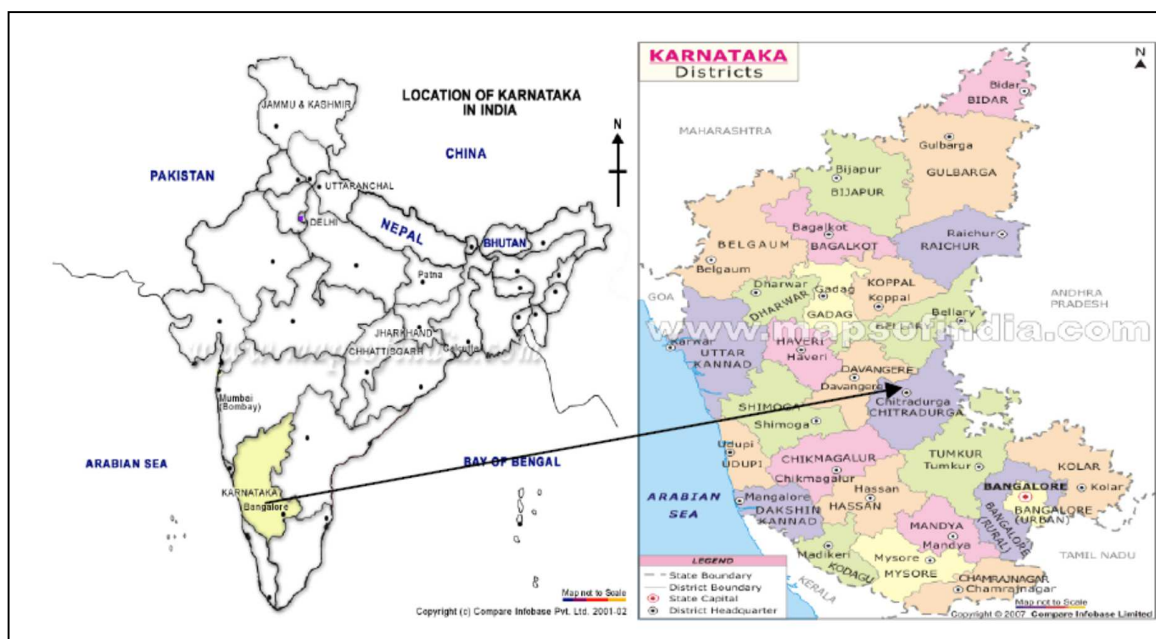
Type of crediting period	:	Renewal
Start date of 2 nd crediting period	:	06/06/2018
End date of 2 nd crediting period	:	05/06/2028
2 nd crediting period total number of years	:	10 years

The first crediting period of the project activity was considered from 06-June-2008 to 05-June-2018.

1.7 Project Location

The project site is located at Bhimasamudra site, Chikkandavadi and Kallavanagathihalli village, Chitradurga District of Karnataka in India. Chitradurga is approximately around 200 KM from Bangalore, capital of Karnataka state.

The physical location is provided below:



Geographical location map of project activity

WTG HT SC No	Location No	Village	District	State	Latitude	Longitude
1	HK 1	Chikkandavadi	Chitradurga	Karnataka	N14 11 02.7	E76 12 32.2
2	HK 2	Chikkandavadi	Chitradurga	Karnataka	N14 10 49.7	E76 12 25.7
3	HK 3	Chikkandavadi	Chitradurga	Karnataka	N14 10 42.1	E76 12 26.8
4	HK 4	Chikkandavadi	Chitradurga	Karnataka	N14 10 33.7	E76 12 26.6
5	HK 5	Chikkandavadi	Chitradurga	Karnataka	N14 10 23.2	E76 12 26.0
6	HK 6	Chikkandavadi	Chitradurga	Karnataka	N14 10 08.8	E76 12 25.6
7	HK 7	Chikkandavadi	Chitradurga	Karnataka	N14 10 00.7	E76 12 25.0
8	HK 8	Chikkandavadi	Chitradurga	Karnataka	N14 09 53.1	E76 12 23.3
9	HK 9	Chikkandavadi	Chitradurga	Karnataka	N14 09 45.3	E76 12 22.1
10	HK 10	Kallavanagathihalli	Chitradurga	Karnataka	N14 13 10.6	E76 08 43.7
11	HK 11	Kallavanagathihalli	Chitradurga	Karnataka	N14 12 43.4	E76 08 39.2
12	HK 12	Kallavanagathihalli	Chitradurga	Karnataka	N14 12 23.7	E76 08 57.4
13	HK 13	Kallavanagathihalli	Chitradurga	Karnataka	N14 12 18.9	E76 09 02.5
14	HK 14	Kallavanagathihalli	Chitradurga	Karnataka	N14 12 12.5	E76 09 07.5
15	HK 15	Kallavanagathihalli	Chitradurga	Karnataka	N14 12 06.4	E76 09 11.9
16	HK 16	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 59.5	E76 09 16.8
17	HK 17	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 37.0	E76 09 38.3

18	HK 18	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 30.3	E76 09 43.3
19	HK 19	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 24.4	E76 09 48.0
20	HK 20	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 16.6	E76 09 50.9
21	HK 21	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 10.9	E76 09 56.4
22	HK 22	Kallavanagathihalli	Chitradurga	Karnataka	N14 11 04.4	E76 09 59.9
23	HK 23	Kallavanagathihalli	Chitradurga	Karnataka	N14 10 57.8	E76 10 03.4
24	HK 24	Kallavanagathihalli	Chitradurga	Karnataka	N14 10 41.1	E76 10 39.9
25	HK 25	Kallavanagathihalli	Chitradurga	Karnataka	N14 10 34.0	E76 10 44.3
26	HK 26	Kallavanagathihalli	Chitradurga	Karnataka	N14 10 26.9	E76 10 47.8
27	HK 27	Kallavanagathihalli	Chitradurga	Karnataka	N14 10 19.8	E76 10 51.3
28	HK 29	Kallavanagathihalli	Chitradurga	Karnataka	N14 10 02.1	E76 11 14.3
29	HK 30	Kallavanagathihalli	Chitradurga	Karnataka	N14 09 55.0	E76 11 18.0
30	HK 31	Kallavanagathihalli	Chitradurga	Karnataka	N14 09 48.9	E76 11 23.0
31	HK 32	Kallavanagathihalli	Chitradurga	Karnataka	N14 09 42.0	E76 11 26.8
32	HK 33	Kallavanagathihalli	Chitradurga	Karnataka	N14 09 35.0	E76 11 30.4

1.8 Title and Reference of Methodology

Type	:	I – Renewable Energy Projects
Category	:	ACM0002. Consolidated baseline methodology for grid connected electricity generation from renewable sources”.
Version	:	19, EB 62.
Reference	:	https://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYG_D
Tools	:	Tool to calculate the emission factor for an electricity system --- Version 07.0,
	:	Tool for the demonstration and assessment of additionality --- Version 07.0.0

1.9 Participation under other GHG Programs

The project is not registered under any other GHG programs.

1.10 Other Forms of Credit

Project has not been applied under any other GHG or any related programs. Also, the project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period. PP has submitted the declaration confirming the same to the verifying DOE.

1.11 Sustainable Development

Contribution to sustainable development:

Ministry of Environment and Forests, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

- **Social well-being:** The project helped in generating employment opportunities during the construction and operation phases. The project activity leads 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 generates power using zero emissions wind-based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.
- **Technological well-being:** The successful operation of project activity led to promotion of wind-based power generation and would encourage other entrepreneurs to participate in similar projects
- **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.

2 SAFEGUARDS

2.1 No Net Harm

Being renewable wind power generation project there is no negative environmental and socio-economic impacts in fact project activity contributes positively by providing environment friendly power generation leading to sustainable development of the region. Also, the generation of employment supports uplift of socio-economic status of region.

2.2 Local Stakeholder Consultation

The Project is already registered with VCS. No comment has been received during regular communication with local stakeholders.

As a part of continuous feedback from stakeholders, there were no other major comments or protest raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region.

For ongoing communication, the PP has also placed a grievance register onsite where in the stakeholder can put down his/her complain and the same if found genuine will be addressed immediately. However, being renewable wind power generation project there is no feedback/grievance has been reported within this monitoring period. Therefore, no action has been undertaken.

2.3 AFOLU-Specific Safeguards

Not applicable to the project activity.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity has been in operation since its date of commissioning. There are no changes related to the project. Project is implemented and operational as per the VCS Project description submitted.

There have been outages during the current monitoring as provided below.

WTG	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Remarks
NSL HK-01	39.85	175.14	19.50	63.87	8.10	21.60	5.42	18.07	0.88	9.51	
NSL HK-02	39.68	26.91	20.70	62.19	551.25	27.40	9.80	27.66	17.60	8.45	
NSL HK-03	51.28	34.04	17.90	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-04	73.11	76.61	40.93	25.80	1.80	1.50	725.00	720.00	744.00	744.00	Generator Failure
NSL HK-05	33.38	27.02	9.90	106.80	12.69	4.50	81.22	15.16	31.36	10.48	
NSL HK-06	44.30	31.30	15.59	16.90	11.70	29.50	21.53	0.00	1.20	9.44	
NSL HK-07	30.57	17.71	18.80	10.20	28.19	12.60	8.66	0.00	2.85	13.30	
NSL HK-08	33.34	18.26	8.00	17.19	9.40	2.90	3.54	0.00	7.52	5.34	
NSL HK-09	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-10	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-11	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-12	54.33	34.64	50.00	35.29	2.30	3.70	2.53	13.03	0.18	9.29	
NSL HK-13	65.48	26.69	12.30	24.58	51.67	52.10	5.50	11.54	2.69	15.31	
NSL HK-14	84.9	38.64	19.00	11.49	22.40	15.30	10.19	4.82	1.27	6.19	
NSL HK-15	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure

NSL HK-16	32.22	23.61	10.60	15.39	21.79	12.90	3.93	27.55	16.84	532.62	Generator Failure
NSL HK-17	38.44	25.66	24.49	48.39	37.79	13.50	8.89	8.12	13.32	8.39	
NSL HK-18	42.44	30.66	1.70	26.60	17.39	14.80	30.07	13.61	402.54	744.00	Generator Failure
NSL HK-22	39.82	24.37	5.30	21.19	12.40	15.50	38.00	24.48	11.35	7.53	
NSL HK-23	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-24	80.93	80.92	65.09	23.20	14.80	49.00	220.19	4.66	6.45	7.88	
NSL HK-25	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-27	42.35	29.55	32.24	29.90	2.60	15.80	12.96	11.63	5.78	6.59	
NSL HK-29	720	744	672.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	
NSL HK-30	720.00	744.00	0.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-31	39.38	19.40	11.40	16.00	22.19	8.40	0.17	0.89	5.87	6.60	Generator Failure
NSL HK-32	58.1	30.82	0.60	17.50	41.79	8.00	4.70	2.82	26.91	72.35	
NSL HK-33	720.00	744	744.00	672.00	744.00	720.00	744.00	720.00	744.00	744.00	Generator Failure
NSL HK-19	26.28	10.19	26.86	32.59	86.68	29.09	7.37	45.94	50.29	3.79	
NSL HK-20	33.19	6.55	18.30	79.23	49.33	9.22	53.57	17.50	4.46	2.16	
NSL HK-21	8.14	37.80	56.40	25.67	42.04	36.07	209.29	8.93	4.46	10.04	
NSL HK-26	32.26	24.78	40.8456	53.6256	73.5072	32.112	82.36	112.54	73.58	148.65	

*The outages are in number of hours lost.

3.2 Deviations

3.2.1 Methodology Deviations

No methodological deviation applied to the project activity.

3.2.2 Project Description Deviations

No project description deviation applied to the project activity during the current monitoring period.

Also, during the previous monitoring periods no project description related deviation was occurred. The same can be referred from the previous approved monitoring reports.

3.3 Grouped Projects

Not Applicable (as the project is not a grouped project)

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{OM,y}
Data unit	tCO ₂ e/MWh
Description	Operating Margin Emission Factor of Indian Grid
Source of data	"CO₂ Baseline Database for Indian Power Sector" version 13 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO₂ Baseline Database for Indian Power Sector" is available at http://www.cea.nic.in/tpeandce.html
Value applied	0.9726
Justification of choice of data or description of measurement methods and procedures applied	Calculated by using 3 years vintage (2014-2015, 2015-2016 and 2016-17) data obtained from "CO ₂ Baseline Database for Indian Power Sector" version 13.0, published by the Central Electricity Authority, Ministry of Power, Government of India, which is based on the tool "Tool to calculate the emission factors for an electricity system".
Purpose of Data	Baseline emission calculations
Comments	Value is fixed ex-ante for entire crediting period.

Data / Parameter	EF _{BM,y}
Data unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data	"CO₂ Baseline Database for Indian Power Sector" version 13 published by the Central Electricity Authority, Ministry of Power, Government of India. The "CO₂ Baseline Database for Indian Power Sector" is available at http://www.cea.nic.in/tpeandce.html
Value applied	0.8723
Justification of choice of data or description of measurement methods and procedures applied	2016-17 data obtained from "CO ₂ Baseline Database for Indian Power Sector" version 13.0, published by the Central Electricity Authority, Ministry of Power, Government of India, which is based on the tool "Tool to calculate the emission factors for an electricity system".
Purpose of Data	Baseline emission calculations

Comments	Value is fixed ex-ante for entire crediting period.		
Data / Parameter	EF _{CO₂,grid,y}		
Data unit	tCO ₂ e/MWh		
Description	Combined Margin Emission Factor of Southern Regional Electricity Grid		
Source of data	Combined Margin Emission Factor (EF_{CM,y}) is calculated as the weighted average of Operating Margin Emission Factor (EF_{OM,y}) and Build Margin Emission Factor (EF_{BM,y}). The “CO₂ Baseline Database for Indian Power Sector” Version 13 published by the Central Electricity Authority, Ministry of Power, Government of India. The “CO₂ Baseline Database for Indian Power Sector” is available at http://www.cea.nic.in/tpeandce.html		
Value applied	In case of wind power projects default weights of 0.75 for EF_{OM} and 0.25 for EF_{BM} are applicable as per ACM0002. <table border="1"> <tr> <td>Combined Margin Emission Factor (EF_y or EF_{CM,y})</td><td>0.9475</td></tr> </table> Refer ER calculation sheet for detailed calculation sheet	Combined Margin Emission Factor (EF _y or EF _{CM,y})	0.9475
Combined Margin Emission Factor (EF _y or EF _{CM,y})	0.9475		
Justification of choice of data or description of measurement methods and procedures applied	Combined Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with CDM methodologies: ACM0002, and Tool to Calculate the emission Factor for an Electricity System.		
Purpose of Data	Baseline emission calculations		
Comments	Value is fixed ex-ante for entire crediting period.		

4.2 Data and Parameters Monitored

For the project activity, the following parameters are being monitored on continuous basis:

Data / Parameter	EG _y
Data unit	kWh
Description	Electricity supplied by the plant to the grid
Source of data	Tariff invoices submitted to KPTCL for the electricity supplied to the grid
Description of measurement methods and procedures to be applied	The metering points NSLC III, NSLC IV, NSLC V are connected to bulk metering point NSLC I and NSLC II till 30th Sep 2011. From 30th Sep 2011 onwards, the metering points NSLC III, NSLC IV are connected to bulk metering point NSLC I and metering point NSLC V, NSLC VI are connected to bulk metering point NSLC II. The WTGs of capacity load 13.5 MW (9X1.5 MW) are connected to metering point NSLC III, and WTGs of capacity load 12 MW (8X1.5 MW)

	are connected to metering point NSCL IV and WTGs of capacity load 12.6 MW (7X1.5 MW, 1X2.1 MW) are connected to the metering point NSLC V and WTGs of capacity load 12.3 MW (4X1.5 MW, 3X2.1 MW) are connected to metering point at NSLC VI located at group controller station, Hirekandavadi. Energy is fed to grid from NSLC III, NSLC IV, NSLC V, NSLC VI through bulk metering points NSLC I, NSLC II located at 66 kV substation, KN Halli. Actual power generated by WTGs of project activity is measured using energy meters (Main & Check) located at group controller station, Hirekandavadi. The main meter and check meter are installed at group controller station, Hirekandavadi. The energy meters are 0.2s accuracy class and regularly calibrated. The details of calibration along with respective energy meter are provided in Appendix-I of this monitoring report. Net electricity exported to grid by the wind farm is measured using KPTCL meters installed at HT end of the 33/66 KV substation at KN Halli. The main meter and check meter are installed at the substation. Both of these are joint meter readings and are taken on monthly basis in the presence of KPTCL/BESCOM and representative of the project proponent. KPTCL & BESCOM is issued a certificate for the share of electricity generated every month. Monthly share of electricity certificate is prorated by KPTCL/BESCOM based on actual generation of WTGs and the net total electricity supplied by the Wind Farm. Reading recorded in this certificate for the WTGs in the project activity is used for actual estimations.				
Frequency of monitoring/recording	Measuring frequency – Continuous Recording frequency – Monthly				
Value monitored	57,411,957				
Monitoring equipment	<table border="1"> <thead> <tr> <th>Energy Meter</th><th>Accuracy Class</th></tr> </thead> <tbody> <tr> <td>Trivector energy meter</td><td>0.2s</td></tr> </tbody> </table> The details of calibration along with respective energy meter are provided in Appendix-I of this monitoring report.	Energy Meter	Accuracy Class	Trivector energy meter	0.2s
Energy Meter	Accuracy Class				
Trivector energy meter	0.2s				
QA/QC procedures to be applied	The main and check energy meters are of 0.2s accuracy class. Calibration of energy meters at group controller end and substation end are carried out by BESCOM/KPTCL annually. The invoices raised to BESCOM/ KPTCL by NSL can be used for cross checking the electricity readings.				
Purpose of the data	Calculation of baseline emission				
Calculation method	Not applicable				
Comments	The data will be archived for the crediting period plus two years in electronic format.				

Data / Parameter

TEG_y

Data unit	kWh				
Description	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y				
Source of data	Form B certificate issued by KPTCL/BESCOM.				
Description of measurement methods and procedures to be applied	The metering points NSLC III, NSLC IV, NSLC V are connected to bulk metering point NSLC I and NSLC II till 30th Sep 2011. From 30th Sep 2011 onwards, the metering points NSLC III, NSLC IV are connected to bulk metering point NSLC I and metering point NSLC V, NSLC VI are connected to bulk metering point NSLC II. The WTGs of capacity load 13.5 MW (9X1.5 MW) are connected to metering point NSLC III, and WTGs of capacity load 12 MW (8X1.5 MW) are connected to metering point NSCL IV and WTGs of capacity load 12.6 MW (7X1.5 MW, 1X2.1 MW) are connected to the metering point NSLC V and WTGs of capacity load 12.3 MW (4X1.5 MW, 3X2.1 MW) are connected to metering point at NSLC VI located at group controller station, Hirekandavadi. Energy is fed to grid from NSLC III, NSLC IV, NSLC V, NSLC VI through bulk metering points NSLC I, NSLC II located at 66 KV substation, KN Halli. Actual power generated by WTGs of project activity is measured using energy meters (Main & Check) located at group controller station, Hirekandavadi. The main meter and check meter are installed at group controller station, Hirekandavai. Net electricity exported to grid by the wind farm is measured using KPTCL meters installed at HT end of the 33/66 KV substation at KN Halli. The main meter and check meter are installed at the substation. Both of these are joint meter readings and are taken on monthly basis in the presence of KPTCL/BESCOM and representative of the project proponent. KPTCL & BESCOM is issued a certificate for the share of electricity generated every month. Monthly share of electricity certificate is prorated by KPTCL/BESCOM based on actual generation of WTGs and the net total electricity supplied by the Wind Farm. Reading recorded in this certificate for the WTGs in the project activity is used for actual estimations.				
Frequency of monitoring/recording	Measuring frequency – Continuous Recording frequency – Monthly				
Value monitored	58,062,600				
Monitoring equipment	<table border="1"> <thead> <tr> <th>Energy Meter</th><th>Accuracy Class</th></tr> </thead> <tbody> <tr> <td>Trivector meter</td><td>0.2s</td></tr> </tbody> </table> The details of calibration along with respective energy meter are provided in Appendix-I of this monitoring report.	Energy Meter	Accuracy Class	Trivector meter	0.2s
Energy Meter	Accuracy Class				
Trivector meter	0.2s				
QA/QC procedures to be applied	The main and check energy meters are of 0.2s accuracy class. Calibration of energy meters at group controller end and substation end are carried out by BESCOM/KPTCL annually. The invoices raised to BSECOM/ KPTCL by NSL can be used for cross checking the electricity				

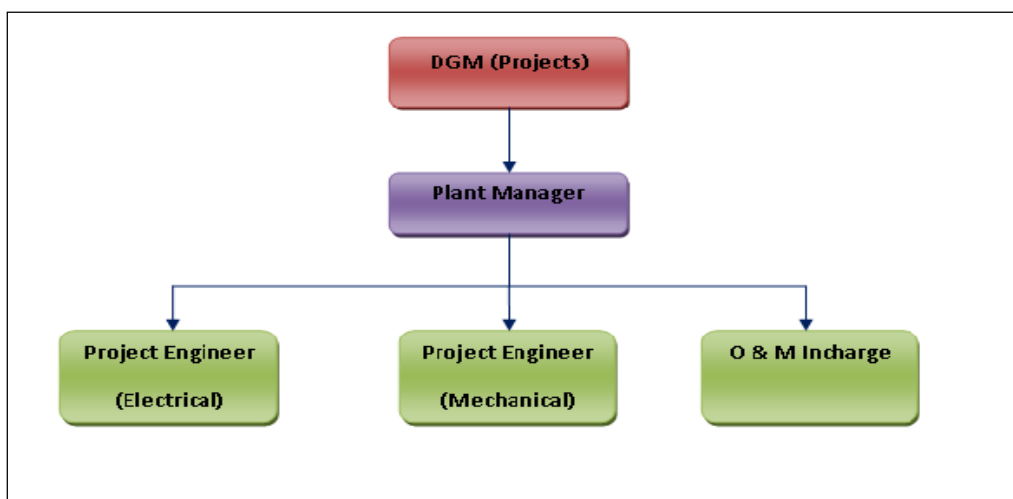
	readings.
Purpose of the data	Calculation of baseline emission
Calculation method	Not applicable
Comments	The data will be archived for the crediting period plus two years in electronic format.

4.3 Monitoring Plan

Monitoring Plan has been proposed as prescribed under the registered PD. Also, as the renewal crediting period applies the latest version of the Methodology (i.e. ACM0002 Version 19), hence monitoring of emission reductions are also comply with the requirements of the methodology.

The operational and management structure implemented by NSL at the project site is as follows:

Organizational chart for data collection of Bhimasamudra Wind farm:



Roles and Responsibilities:

Designation	Responsibilities
DGM (Projects)	Certifying official (Authorized for signing invoice)
Plant Manager	Verification of correctness of data
Project Engineer / O & M In-charge	Staff who present during collection of data by BESCOM/KPTCL

Metering arrangements:

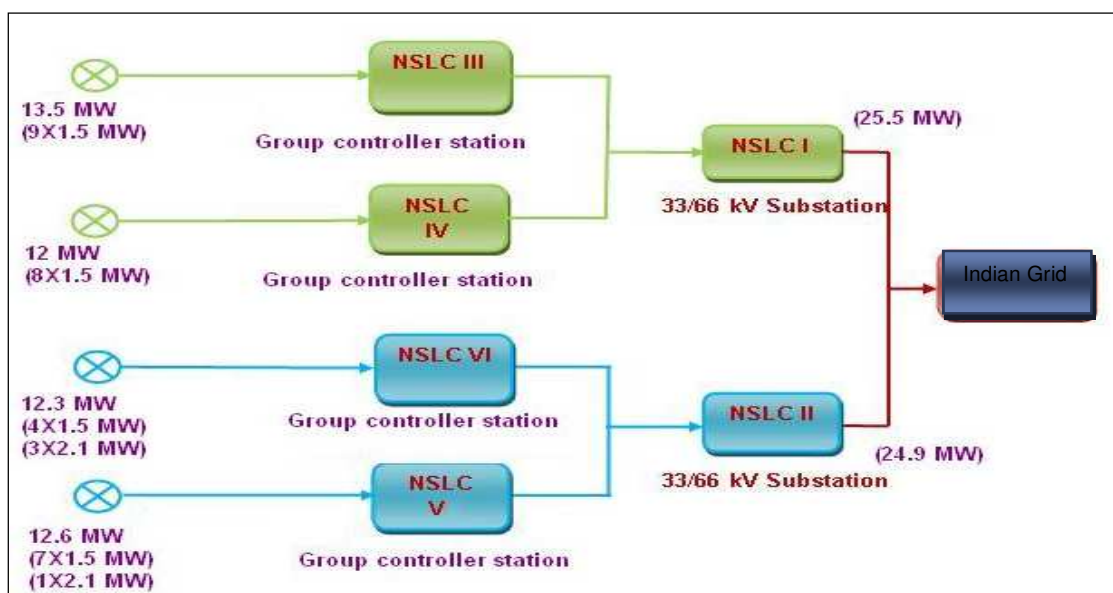
The metering points NSLC III, NSLC IV, NSLC V are connected to bulk metering point NSLC I and NSLC II till 30th Sep 2011. From 30th Sep 2011 onwards, the metering points NSLC III, NSLC IV are connected to bulk metering point NSLC I and metering point NSLC V, NSLC VI are connected to bulk metering point NSLC II.

The WTGs of capacity load 13.5 MW (9X1.5 MW) are connected to metering point NSLC III, and WTGs of capacity load 12 MW (8X1.5 MW) are connected to metering point NSCL IV and WTGs of capacity load 12.6 MW (7X1.5 MW, 1X2.1 MW) are connected to the metering point NSLC V and WTGs of capacity load 12.3 MW (4X1.5 MW, 3X2.1 MW) are connected to metering point at NSLC VI located at Group Control Station, Hirekandavadi. Energy is fed to grid from NSLC III, NSLC IV, NSLC V, NSLC VI through bulk metering points NSLC I, NSLC II located at 66 KV substation, KN Halli.

Metering points	WTGs No	Capacity of WTGs (MW)	Commissioning date
NSLC III	HK 1	1.5	29/09/2008
	HK 2	1.5	01/07/2008
	HK 3	1.5	06/06/2008
	HK 4	1.5	09/09/2008
	HK 5	1.5	09/09/2008
	HK 6	1.5	29/09/2008
	HK 7	1.5	08/12/2009
	HK 8	1.5	08/12/2009
	HK 9	1.5	08/12/2009
NSLC IV	HK 10	1.5	15/12/2009
	HK 11	1.5	15/12/2009
	HK 12	1.5	21/01/2010
	HK 13	1.5	15/12/2009
	HK 14	1.5	21/01/2010
	HK 15	1.5	15/12/2009
	HK 22	1.5	21/01/2010
	HK 23	1.5	21/01/2010
NSLC V	HK 25	1.5	30/09/2011
	HK 27	1.5	30/09/2011
	HK 29	1.5	30/09/2011
	HK 30	1.5	30/09/2011

NSLC VI	HK 31	1.5	30/09/2011
	HK 32	1.5	30/09/2011
	HK 33	1.5	30/09/2011
	HK 26	2.1	30/09/2011
	HK 16	1.5	30/09/2011
	HK 17	1.5	30/09/2011
	HK 18	1.5	30/09/2011
	HK 24	1.5	30/09/2011
	HK 19	2.1	30/09/2011
	HK 20	2.1	30/09/2011
	HK 21	2.1	30/09/2011

Current Metering arrangements:



Actual power generated by WTGs of project activity is measured using energy meters located at Group Control Station, Hirekandavadi. The main and check meter of the WTGs are installed at Group Control Station, Hirekandavadi.

Net electricity exported to grid by the wind farm is measured using KPTCL meters installed at HT end of the 33/66 KV substation at KN Halli. The main meter and check meter of the net electricity exported to the grid is installed at the substation. Both of these are joint meter readings and are taken on monthly basis in the presence of KPTCL/BESCOM and representative of the project proponent.

KPTCL & BESCOM is issued a certificate for the share of electricity generated every month. Monthly share of electricity certificate is prorated by KPTCL/BESCOM based on actual generation of WTGs and the net total electricity supplied by the Wind Farm. Reading recorded in this certificate for the WTGs in the project activity is used for actual estimations. The calibration details of the energy meter are given in the Appendix-I of the report

QA/QC procedures & Data collection and archiving:

The reading can be cross verified with the actual invoices presented to BESCOM/KTPCL by NSL. The daily data at the site is collected in electronic form. Monthly data is also collected and maintained in plant log books. The project proponent shall keep complete and accurate records of all the data as a part of monitoring for at least a period of 2 years after the end of the crediting period or the last issuance of ERs for the project activity, whichever occurs later.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are calculated as:

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

Where,

$EG_{PJ,y}$ is considered as EG_y in the registered VCS PD.

$EF_{grid,CM,y}$ is the emission factor (0.9475 tCO₂e/MWh fixed ex-ante).

$$\begin{aligned} BE_y &= 57,411.957 \times 0.9475 \text{ tCO}_2\text{e} \\ &= 54,397 \text{ tCO}_2\text{e} \end{aligned}$$

5.2 Project Emissions

As per methodology, for wind power projects $PE_y = 0 \text{ tCO}_2\text{e}$.

5.3 Leakage

As per the methodology, no leakage is considered from the project activity. $Ly = 0$.

5.4 Net GHG Emission Reductions and Removals

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)
Year 2020 (1 st Nov 2019 to 31 st Dec 2020)	13,146	0	0	13,146
Year 2021 (1 st Jan 2021 to 31 st Aug 2021)	41,251	0	0	41,251
Total	54,397	0	0	54,397

Comparison of actual emission reductions with ex-ante estimates:

MP Start Date	01-11-2020
MP End Date	31-08-2021
Total days count	304
Annual ER as per revised VCS-PD (CPII)	127,993
Estimated VER in VCS PD for the equivalent period of the current MP	106,602
Actual values achieved during this monitoring period	54,397
% change in actual VERs with estimates in revised PDD	-48.97%

There is no increase in ER, but 48.97% lower ER is achieved during the current monitoring period which was caused due to decrease in generation during the current MP because of lower wind availability.

APPENDIX 1: METER CALIBRATION DETAILS

The meter calibration is under the direct purview of Discom. However, as per registered PD, all the energy meters including pooling station meters should be calibrated at least once in a year i.e. calibration frequency is “Annual”. As can be referred in the table below, there were meter calibrations occurred during the current monitoring period and the frequency of calibration has been achieved within one year period from previous and successive calibrations. Hence, there is no delay in calibration of energy meter during this monitoring period.

Metering Points	Meter Details				Calibration covering current MP			Test Result
	Serial no	Make	Type	Accuracy class				
NSLC I	Main meter – 11071857	L & T	3P4W	0.2s	15-07-2020	20-02-2021	04-08-2021	Satisfactory
	Check meter – 15195281							
NSLC II	Main meter – 11071861	L & T	3P4W	0.2s	15-07-2020	20-02-2021	04-08-2021	Satisfactory
	Check meter – 11071863							
NSLC III	Main meter – 07022896	L & T	3P4W	0.2s	15-07-2020	20-02-2021	04-08-2021	Satisfactory
	Check meter – 07022921							
NSLC IV	Main meter – 07022985	L & T	3P4W	0.2s	15-07-2020	20-02-2021	04-08-2021	Satisfactory
	Check meter – 07022986							
NSLC V	Main meter – 09142342	L & T	3P4W	0.2s	15-07-2020	20-02-2021	04-08-2021	Satisfactory
	Check meter - 13191365							
NSLC VI	Main meter – 11071865	L & T	3P4W	0.2 S	15-07-2020	20-02-2021	04-08-2021	Satisfactory
	Check meter - 13191363							