



WIND POWER PROJECT BY PATNAIK MINERALS PVT. LTD.



Document Prepared By Earthood Services Private Limited

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Summary:

Earthood Services Private Limited has been appointed by “Patnaik Minerals Pvt. Ltd. (PMPL)” to perform the 3rd periodic verification of the “Wind power project by Patnaik Minerals Pvt. Ltd”. The main purpose of this verification activity is to have an independent third party for the assessment of the project design, monitoring report to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements.

The project activity by Patnaik Minerals Pvt. Ltd. (PMPL) Private Limited involves operation of 35.2 MW wind power project consisting of 44 Wind Electric Generators (WTGs) of individual capacity 0.8 MW located at Samana Site in Gujarat, India. Out of the 44 WTGs, 38 WTGs are owned by PMPL and Banspani Iron Limited (BIL) owns 6 WTGs. PMPL holds 49.9% shareholding in BIL and is the promoter of the same. This is a greenfield project activity and supply the generated electricity to the National power grid i.e., Indian Grid. Thus, project activity has reduced the dependence on fossil fuel-powered power plants by substituting carbon-intensive energy with the clean renewable Wind energy. As per the baseline scenario, “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants that are fossil fuel fired power plants”. The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

During the Current Monitoring Period from 28-May-2011 to 30-April-2017 (First and last date included) 297,283 tCO₂e of emission reduction has been achieved.

There is a change in start date of crediting period on VERRA webpage and monitoring report as the project activity was commissioned on 21-March-2007 onwards, However, it took some more time to connect to the grid and approximately 15 days were also taken as trial period for checking that the

WEG is working fine and all the connections are working appropriately, hence the project proponent started claiming the credits from 01-May-2007 onwards and not 21-March-2007.

Further, VERRA has confirmed the above changes through mail to PP /24/ and made fixed crediting period 01-May-2007 to 30-April-2017 for the project activity.

Patnaik Minerals Pvt. Ltd. (PMPL) contracted **ESPL** to conduct the verification of the project. The scope of verification includes confirming the implementation of the monitoring plan in the registered VCS PD (Ver. 02 dated 09-November-2009) and the application of methodology ACM0002: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Version 09.0.

The verification consisted of three phases: a. Desk review of the project; b. Follow-up site audit; c. Resolution of outstanding issues and issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following ESPL's internal quality procedures.

A risk-based approach has been followed to perform this verification activity and No uncertainties associated with the verification. A total of 04 CARs have been raised during the verification process and one raised during validation of the project activity which were successfully closed.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

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1 INTRODUCTION

1.1 Objective

“Patnaik Minerals Pvt. Ltd. (PMPL)” has contracted ESPL (Hereinafter referred as Earthood) to conduct the verification of the project activity “Wind power project by Patnaik Minerals Pvt. Ltd” according to the requirements of the Verified Carbon Standard Version 4.2 /12/

The objective of this verification is to verify and certify emission reductions reported for the PA Wind power project by Patnaik Minerals Pvt. Ltd” for the period 28-May-2011 to 30-April-2017 (including both days).

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the appropriate VCS-MR form (and other templates) was used and correctly filled up; (As per <https://verra.org/wp-content/uploads/2019/09/VCS-V4-Summary-of-Effective-Dates.pdf/> the use of updated version of all VCS Program templates and representations is mandatory from 19 March 2020)
- The project activity is in accordance with all relevant host country criteria (India);
- The project activity is in accordance with all relevant VCS rules and requirements;
- The project activity is in accordance with conditions of the latest version of applied methodology ACM0002: Large Consolidated methodology- Version 0.9.0 /06/

The verification of the project activity is based on the VCS-PD/01/ and estimated GHG emission reduction calculations.

1.3 Level of Assurance

☒ Reasonable level of assurance

☐ Limited level of assurance

ESPL’s verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considers necessary to give reasonable assurance that reported estimated GHG emission reductions are fairly stated. All documentary evidences were checked, and onsite audit was conducted to arrive at a verification conclusion by the assessment team.

1.4 Summary Description of the Project

The project activity by Patnaik Minerals Pvt. Ltd. (PMPL) Private Limited is a 35.2 MW wind power project consisting of 44 Wind turbine Generators (WTGs) with individual capacity of 0.8 MW located at Samana Site in Gujarat, India. Out of the 44 WTGs, 38 WTGs are owned by PMPL and Banspani Iron Limited (BIL) owns 6 WTGs. The project activity is in line with the sustainable development priorities of the country. The electricity generated from the wind farm is exported to the regional electricity grid (now part of the Indian Grid) and sold to the state electricity utility, thereby marginally contributing to reducing the energy demand supply gap in the state of Gujarat. During the current monitoring period i.e., 28-May-2011 to 30-April-2017 (inclusive of both dates), 297,283 tCO_{2e} of emission reduction has been achieved.

The details of the project have been tabulated below: -

S. N.	Name of Owner	Capacity (MW)	Location	Connection with Grid	Usage
1.	Patnaik Minerals Pvt. Ltd. (PMPL)	30.4	Samana, Gujarat, India	Indian Grid	Sale to Utility
2.	Banspani Iron Limited (BIL)	4.8			

The project is a voluntary action being undertaken by each project owner of the project activity. EKI Energy Services Limited (hereafter referred as “EKIESL”) is acting as the other entity for this project activity.

Verification team confirmed the capacity by verifying commissioning certificates/08/ and also verified through interview during site visit those plants are operational in all the locations (Samana Site in Gujarat, India). The details of interconnection with grid of wind plants and commissioning details are given in Section 4.1 of this report.

The technical specifications of WTGs confirmed with technical specifications/16/ from technology supplier and details as confirmed during site audit provided in Sec. 4.1 of this report.

The electricity meters are of a accuracy class of 0.2s. The details of meters such as make, Sr, No., calibration frequency etc. are provided in Appendix 5 of this report/22/. The project is based on sectoral Scope 1: Energy Industries (renewable sources) with ACM0002: Large-scale Consolidated methodology: Grid-connected electricity generation from renewable sources, Version 09.0/06/.

During the current monitoring period i.e., 28-May-2011 to 30-April-2017 (inclusive of both dates), 297,283 tCO_{2e} of emission reduction has been achieved/3/.

2 VERIFICATION PROCESS

The registered VCS project is undergoing 3rd verification and the approach adopted to ensure the quality of emission reductions is described in the following sub-sections.

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using ESPL's internal procedures. The Project was verified against the latest requirements (Version 4.2) /12/ and guidance set out in VCS Standards as applicable.

- The verification process consists of the following three phases;
- A document review of the VCS PD/1/ and VCS MR/02/ (described in Section 2.2)
- Onsite visit and follow up interviews with project stakeholders (described in Section 2.3 and 2.4)
- The resolution of outstanding issues and issuance of the final report and opinion. (Described in Section 2.5)

DOE's Sampling Approach: No sampling approach was required for undertaking the current verification since all monitored data was verified by the assessment team.

2.2 Document Review

The verification is performed primarily as a document review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols. The assessment team cross checks the information provided in the documents (PDD, MR, validation report) and information from sources other than those used, if available, and also conducts independent background investigations. Earthood conducted a desk review as under;

- A review of the data and information presented to verify their completeness.
- A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

Name of Persons/Designation	Affiliation	Topics discussed	Team Member
Mr. Sanjit Panda	Site Incharge, Patnaik Minerals	Project Implementation, Monitoring practices, Calibration requirements, GHG calculations, MR and ER preparation	Dr. Atul Takarkhede
Ishani Sinha Consultant	EKI Energy	GHG calculations, MR and ER preparation	

Name of Persons/Designation	Affiliation	Topics discussed	Team Member
Jayesh Bhai Patel	Local Stakeholder (Villager)	Local Stakeholder Consultation, Grievance Mechanism	
Pinkesh Doshi			
Prabha Ben			

As referred above, the objective of the Site visit was to verify the following issues:

- Confirm the implementation and operation of the project in line with VCS JOINT PD & MR: the project activity is implemented as per the registered PD & MR and there is no change in capacity or design of the project activity since Commissioning. Same was confirmed from Commissioning certificates, technical specifications of the WTGs, PPA, interviews with PP/Site in charge and JMR as well as invoices raised by PP towards state utility;
- Review the data flow for generating, aggregating and reporting the monitoring parameters: JMR procedures are followed at the project site in line with the state utility practice and are in line with the registered PD & MR. JMR procedure is confirmed during the interviews with PP and assessment team also checked entire monthly JMRs issued by the state utility for the project activity with the values provided in the ER sheet for the calculations of the emission reductions;
- Confirm the correct implementation of procedures for operations and data collection: during interviews with PP, it was confirmed that implementation of procedures for operations and data collection is in line with registered PD & MR. Service provider is responsible for the operations, maintenance as well as maintaining other technical data of the project activity. Performance and operation data of each WTG is controlled and maintained by service provider through the dedicated software and made available to the PP as & when required;
- Cross-check the information provided in the MR documentation with other sources: the information provided in the MR was crosschecked with the Commissioning certificates, PPA, Calibration certificates and JMRs are issued by Statutory authority and invoices are used for cross-checking;
- Check the monitoring equipment against the requirements of the PD & MR and the approved Methodology, including Calibration, maintenance, etc.: monitoring meters are cross checked with the previous verification reports, interviews with PP, Calibration is checked with the Calibration certificates issued by State Utility authorized third parties;
- Review the calculations and assumptions used to obtain the GHG data and ER: calculation procedures and monthly generation data is checked with JMR and crosschecked with invoices;
- Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters: during interviews with PP, it was confirmed that quality control and quality assurance procedures are in place. Metering arrangements & JMR procedure is defined and controlled by state utility and PP do not

have control on it. Assessment team checked all the monthly JMR values as well as crosschecked with the invoices and found that emission reductions are calculated conservatively.

Thus, to verify the implementation of project activity, onsite operation & maintenance, monitoring & management practices; assessment team has conducted Skype call/telephonic interviews with onsite in-charge, O&M team and also had a detail discussion with the PP representative and reviewed third party statutory documents i.e. Commissioning certificates, Power Purchase Agreement, Complete set of JMRs covering monitoring period, Invoice (for cross check of Net electricity supplied to the grid as per registered PD & MR) ,breakdown log, O&M schedule, complaint/feedback register and other relevant records.

2.4 Site Inspections

Duration of on-site inspection: 25-November-2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	The verification team conducted site visit to confirm the information and to resolve issues identified in the document review. This involved: 1) An assessment of the implementation and operation of the CDM project activity as per the registered PDD. 2) A review of information flows for generating, aggregating and reporting of the monitoring parameters. 3) interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan. 4) A cross-check between information provided in the MR and data from other sources. 5) A check of the monitoring equipment including Calibration performance, and observations of monitoring practices against the requirements of the PDD and the applied Methodology. 6) A review of calculations and assumptions made in determining the GHG data and ERs. An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters	Kalavad Taluka, Jamnagar District and Upleta Taluka of Rajkot District, Gujarat., India	25-November-2021	Dr. Atul Takarkhede

2.5 Resolution of Findings

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues from validation which need to be clarified for ESPL's positive conclusion on the Monitoring report. The Corrective Action Requests and Clarification Requests raised by ESPL were resolved during communications between the Client and ESPL to guarantee the transparency of the verification process, the concerns raised and responses given are summarized below in the appendix 2.

The findings may be of the following types: CAR- Corrective Action Request, CL- Clarification Request and FAR- Forward Action Request.

The list of findings and their resolution are presented in Appendix 2 of this verification report. The section also includes the response, if provided, by the project participant and an assessment by the assessment team if it was closed or otherwise. It is to be noted that all the findings have been satisfactorily resolved by the assessment team.

A total of 04 CARs were raised in the current verification. All the findings that are raised and communicated to project participant during the verification are included under Appendix 2. The section also includes the response, if provided, by the project participant and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

This is 3rd periodic verification of the project activity and only one FAR was raised during validation of the project activity and Same has been closed successfully. Refer [appendix 2](#).

2.6 Eligibility for Validation Activities

As the project is already validated and this is 3rd verification of the project and ESPL already holds accreditation for validation & verification of VCS project under applicable scope. Hence, this section not applicable

3 VALIDATION FINDINGS

As project is already validated and this is 3rd verification of the project. Hence, this section not applicable.

3.1 Participation under Other GHG Programs

PP has submitted an undertaking regarding no participation in any other GHG mechanism i.e., Gold Standard, GCC etc. except CDM. Hence, VVB confirms that PP is also register under UNFCCC

CDM programme with ref. no. 4072¹. However, PP does not take any emission reduction benefits from CDM programme for the current monitoring period except VCS/14/. Furthermore, VVB has also checked the web site of other programs i.e., Gold Standard, GCC ,REC Registry of India etc and confirms that the project with same WTGs, installed capacity and locations are not listed except CDM and VERRA. VVB raised CAR 03 related to this which was closed successfully during verification.

3.2 Methodology Deviations

No methodology deviation is envisaged for present verification.

3.3 Project Description Deviations

The project activity has not sought any project description deviation during this verification.

3.4 Grouped Project

This is not a grouped project. Thus, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the onsite audit, it was concluded that the project is implemented as per the information of the registered VCS PD/1/, and this is verified from the commissioning certificates/08/. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Breakdown summary is submitted by PP for the WTGs. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

The Project activity comprises of 44 WTGs of E-48 Enercon make (800 kW WTGs)/16/. The WTGs generate 3-phase power at 400V, which is stepped up to 33 KV at Sadodar substation of the state utility, GETCO (Gujarat Energy Transmission Company Limited). The project can operate in the frequency range of 46–54 Hz and in the voltage range of 400 V $\pm$ 20%.

¹ <https://cdm.unfccc.int/Projects/DB/RWTUV1288029478.94/view>

The windfarm is connected by 33 kV grid line to 220 kV capacity Enercon site substation at Samana/Sadodar. The Samana/ Sadodar site substation is connected to 220 kV GETCO Motipaneli substation. The technical parameters/specification have been verified by the assessment team through interview with site personal during the site visit with the nameplates as well as the same is also verified with the details as provided by the manufacturer/16/.

The assessment team interviewed with the plant site personnel in order to verify the status of the project implementation of the monitoring plan provided in registered PD/01/. It has also been verified as per the guidelines in ACM0002: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Version 09.0 that the calculations for the GHG emission reductions are done in accordance with the aforesaid methodology/6/.

The assessment team also confirmed that the monitoring system for emission reduction calculation was in place and in accordance with the registered VCS PD/1/.

During the current monitoring duration, no events have been found that can change the design of project.

The Commissioning details of the WTGs has been tabulated below:

S.N.	Ownership	Name of Village	Taluka	District	Date of Commissioning	WTG ID No.
1	PMPL	Hakumati Sarvaniya	Kalavad	Jamnagar	11-June-2007	EIL/800/07-08/0557
2	PMPL	Hakumati Sarvaniya	Kalavad	Jamnagar	11-June-2007	EIL/800/07-08/0558
3	PMPL	Moti Vavdi	Kalavad	Jamnagar	27-August-2007	EIL/800/07-08/0559
4	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0560
5	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0561
6	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0562
7	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0563
8	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0564
9	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0565
10	PMPL	Moti Vavdi	Kalavad	Jamnagar	28-June-2007	EIL/800/07-08/0566
11	PMPL	Moti Vavdi	Kalavad	Jamnagar	28-June-2007	EIL/800/07-08/0567

S.N.	Ownership	Name of Village	Taluka	District	Date of Commissioning	WTG ID No.
12	PMPL	Moti Vavdi	Kalavad	Jamnagar	28-June-2007	EIL/800/07-08/0568
13	PMPL	Moti Vavdi	Kalavad	Jamnagar	28-June-2007	EIL/800/07-08/0569
14	PMPL	Moti Vavdi	Kalavad	Jamnagar	28-June-2007	EIL/800/07-08/0570
15	PMPL	Moti Vavdi	Kalavad	Jamnagar	28-June-2007	EIL/800/07-08/0571
16	PMPL	Moti Vavdi	Kalavad	Jamnagar	10-July-2007	EIL/800/07-08/0572
17	PMPL	Moti Vavdi	Kalavad	Jamnagar	10-July-2007	EIL/800/07-08/0573
18	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0574
19	PMPL	Moti Vavdi	Kalavad	Jamnagar	02-August-2007	EIL/800/07-08/0575
20	BIL	Khirsara	Upleta	Rajkot	24-March-2007	EIL/800/06-07/0240
21	BIL	Khirsara	Upleta	Rajkot	25-March-2007	EIL/800/06-07/0241
22	BIL	Khirsara	Upleta	Rajkot	26-March-2007	EIL/800/06-07/0242
23	BIL	Khirsara	Upleta	Rajkot	27-March-2007	EIL/800/06-07/0243
24	BIL	Khirsara	Upleta	Rajkot	28-March-2007	EIL/800/06-07/0244
25	BIL	Khirsara	Upleta	Rajkot	29-March-2007	EIL/800/06-07/0245
26	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0246
27	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0247
28	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0248
29	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0249
30	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0250

S.N.	Ownership	Name of Village	Taluka	District	Date of Commissioning	WTG ID No.
31	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0251
32	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0252
33	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0253
34	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0254
35	PMPL	Dhun Dhoraji	Kalavad	Jamnagar	27-March-2007	EIL/800/06-07/0255
36	PMPL	Hakumati Sarvaniya	Kalavad	Jamnagar	30-March-2007	EIL/800/06-07/0256
37	PMPL	Hakumati Sarvaniya	Kalavad	Jamnagar	30-March-2007	EIL/800/06-07/0257
38	PMPL	Hakumati Sarvaniya	Kalavad	Jamnagar	30-March-2007	EIL/800/06-07/0258
39	PMPL	Hakumati Sarvaniya	Kalavad	Jamnagar	30-March-2007	EIL/800/06-07/0259
40	PMPL	Vadali	Upleta	Rajkot	21-March-2007	EIL/800/06-07/0260
41	PMPL	Vadali	Upleta	Rajkot	21-March-2007	EIL/800/06-07/0261
42	PMPL	Vadali	Upleta	Rajkot	21-March-2007	EIL/800/06-07/0262
43	PMPL	Vadali	Upleta	Rajkot	21-March-2007	EIL/800/06-07/0263
44	PMPL	Vadali	Upleta	Rajkot	21-March-2007	EIL/800/06-07/0264

Capacity of the projects and date of commissioning verified with commissioning certificates/08/ and technical specifications provided by technology supplier/16/.

Geo coordinates checked on Google earth/15/ and verification team conclude geo coordinates of project locations are consistent with registered PD/1/.

Assessment team checked the technical details of the project activity from the manufactures specification and the detail are as follow:

The technical specifications of the WTGs installed is as below: -

E-48 TECHNICAL DATA

Rated capacity : 800 kW

Rotor diameter : 48 m

Hub height : 56 m

Rotor with Pitch Control

Type : Upwind rotor with active pitch control

Direction of rotation : Clockwise

Number of blades : 3

Swept area : 1810 m²

Blade material : Fibreglass (reinforced epoxy) with integral lightning protection

Rotor speed : Variable, 16-31.5 rpm

Tip speed : 41 - 78 m/s

Pitch control : Continuous variable pitching mechanism

Generator : Synchronous - Type

This is a multi-pole variable speed generator. Due to this and Power electronics the Gear Box, which steps up the speed to meet the speed of Induction Generator, is eliminated resulting in reduced transmission losses, and elimination of wear and tear of the Gear Box and oil leakage associated with it.

Hub : Casted Steel

Bearings : Tapered roller bearings

Grid Feeding : AC-DC-AC through Converter Invertor

Braking System : 3 independent Aero Brakes with power back up supply.

Yaw Control : Active through adjustment gears, friction damping

Cut-in Wind Speed : 3 m/s

Rated Wind Speed : 12 m/s

Tower : Steel Tubular, 56 m height

The technology employed in the project activity is environmentally safe and sound.

Assessment team concludes the following:

- a) The implementation status of project activity was found to be in compliance with registered PD/1/.
- b) DOE has conducted the onsite visit/23/ to confirm the implementation status of the project.
- c) The commissioning date of the project activity was found to be accurately and consistently recorded/08/.
- d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered PD/1/.
- e) The emission reductions achieved during the current monitoring period are 297,283 tCO₂e.

The project activity contributes to the sustainable development by utilising Wind energy for generating electricity which otherwise would have been generated through fossil fuels. Thereby reduction in usage of non-renewable sources used to generate energy.

Further the GHG emission reductions generated by the project activity has not been included by any other an emissions trading program or any other mechanism that includes GHG allowance trading. Also, the project has not received any other form of environmental credit and has not been participated/rejected under any other GHG programs.

Sustainable Development- The project will contribute to the sustainable development in the following ways:

1. Environmental: Since the project activity leads to cleaner production of energy, it is leading to displacement of fossil fuel-based energy.
2. Social: Setting up of the project activity has created new job openings hence is supporting employment of the local people around.
3. Cleaner Air: Since the project activity leads to lesser GHG emission it results in better air quality.
4. Economic well-being: The project activity leads to diversification of the national energy supply, which is dominated by conventional fuel based generating units. It provides new opportunities for industries and economic activities to be setup in the area, thereby resulting in greater local employment, ultimately leading to overall development.
5. Technological well being: The project activity is utilising the latest technology which is comparable with best practices in the renewable wind based energy sector anywhere in the world. Hence the project leads to technological well-being.

Further, inline with para 3.16.1, “The project proponent must demonstrate that a project contributes to at least three SDGs by the end of the first monitoring period, and in each subsequent monitoring period.” As per the provision of implementation deadline, “Projects registered before 20 January 2023 shall demonstrate contributions to at least three SDGs by 20 January 2025”/12/. However, PP have provided the information on the SDG contributions by the project activity for SDGs:

1. SDG 7.2.1: Renewable energy share in the total final energy consumption.
2. SDG 8: Employment of local men and women
3. SDG 13.0: tonnes of greenhouse gas emissions avoided or removed.

VVB has assessed mentioned contribution in table 1 of monitoring report against SDG 7.2.1, SDG 8 and SDG 13.0, and observed that project has contributing 513,884 tCO₂e emission reduction via generating 567,561.72 MWh of electricity from 01-May-2007 to 30-April-2017. During the same period, no new employees has been hired by project participants. However, PP has targeted to employ 10 persons by the year 2025 and minimum 1 person per annum after 2025. Same has been accepted as till 20-January-2025, PP has not submitted supporting documents for SDGF 8 and thus same has not been verified being not mandatory till 20 January 2025.

Further the project has been implemented as described in the Project Description/1/. CAR 01 & CAR 02 were raised on the editorial issue of description and same were resolved by revision in the MR.

The total emission reductions achieved in this monitoring period i.e., 28-May-2011 to 30-April-2017(inclusive of both dates), (including both days) are 297,283.

4.2 Safeguards

4.2.1 No Net Harm

As PP does not see and identify any potential negative environmental and socio-economic impacts, hence this section is not required.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration hence not applicable in the current monitoring period. However, PP has kept a dedicated visitor cum grievance register at the project site which is accessible to stakeholders to provide their feedback on the project as an ongoing communication with local stakeholders. This is in compliance with the requirement of para 3.16.4 of VCS standard, Version 4.2. Assessment team has checked the grievances register and confirms that there are no any grievances received during the current monitoring period/21/.

4.3 AFOLU-Specific Safeguards

This is non AFOLU projects, hence this section not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the MR.
Findings	CAR 04 was raised during the verification process and closed successfully. Refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	Baseline Emissions: The baseline Emissions for a given year is calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used: - $BE_y = EF_y * EG_y$ Where: BE_y = Baseline emissions in year y (tCO₂) EG_y = Net Electricity supplied to GUVNL facility.

	EF_y = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the version 01.1 of the “Tool to calculate the emission factor for an electricity system” Ex-ante Parameter: EF_y = Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9058 tCO₂/MWh. Verification team found same was used in the ER calculations. Ex-Post (Monitored) Parameter: - EG_y = Total Net generation for the project activity: 3,28,202.53 MWh This parameter is monitored and recorded monthly by GEDA officials in the presence of PP’s representative through bulk main meter connected to the incoming feeder of GETCO and the meters installed at the metering yard. The electricity metered at the GETCO meter is then proportionally divided among the customers connected to the meter on the basis of the pro-rata readings taken at the metering yard. The verification team has checked the entire Monthly Joint Meter Reading Sheets/05/ (Share Certificates issued by GETCO, Gujarat Energy Transmission Company) for net electricity generated & supplied to the grid and crosschecked same with the invoices/04/ raised by PP towards State Utilities for the monitoring period. All values are found correct. All the parameters are monitored and recorded as per the monitoring plan in the MR /02/. The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the JMR sheet and invoice and found that all the values are matching. Assessment team found it acceptable. Project Emission (PE_y) = As per ACM0002 - Version 09.0, all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. As the project activity involved wind power project emissions (PE_y) are taken as zero. BE_y = 3,28,202.53 x 0.9058 = 297,283 tCO₂ (Rounded down figure) ER = BE_y – PE_y = 297,283 – 0 =297,283 tCO₂ (Rounded down figure)
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log /19/ for the monitoring period. During the site visit, feeder wise location of the WTGs is also checked. The net electricity exported by WTGs installed at wind farm monitored through three meters each of accuracy class 0.2s at the metering yard and GETCO sub-station as mentioned in table below. The site wise location of meter and name of substations are given below. The same is verified with the onsite /23/ and commissioning certificates/08/. The electricity metered at the GETCO meter monitored by GETCO officials is proportionally divided among the customers connected to the meter on the basis of the pro-rata readings taken at the metering yard and same values are recorded in Monthly Joint Meter Reading Sheets (Share Certificates issued by GETCO, Gujarat Energy Transmission Company). These electricity meters are being used by state electricity board for JMR (Share Certificates)/5/. The net electricity exported to the grid is also cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for large scale project activity. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. Verification team confirms the metering process by interviewing the O&M personnel and PP representatives during onsite audit and found the monitoring process is in line with approved PD. Calibration of all the meters is done by state electricity board officials as per the industry standards. The calibration is done yearly as per calibration frequency in registered VCD PD/1/. The details of Calibration of the meters as confirmed during onsite verification audit and calibration certificates are mentioned in Appendix 5 of this report/22/. The assessment team checked the same and found correct. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly, O&M contractor is responsible for monitoring of the generation data at CMS. PP representatives confirmed that the CMS data as well as JMR sheets and invoices will be kept for 2 years following the end of the crediting period. During Onsite visit and discussion with PP, assessment team confirmed that the data will be kept for 2 years following the end of the crediting period. The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the Onsite visit/23/ by interviewing O&M personnel and checking of records/ log books/19/ maintained at site.
Findings	No Findings were raised
Conclusion	The assessment team confirms that the value of net electricity exported to the grid as used in emission reduction calculation is correct. The verification team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.

	Assessment team observed delay in calibration of energy meters installed under project activity, Calibration was not done for the below mentioned period as this is beyond the control of PP and under purview of state utility. 22-January-2011 to 16-January-2012 17-January-2013 to 05-September-2013 06-September-2014 to 27-June-2021 Hence, PP has applied maximum permissible error factor of 0.2% in the electricity export (error factor deducted) and import (error factor added) values for the delayed calibration period as observed error was less than permissible error. The calibration details of meters are provided in Appendix 5 of this report. Further, Assessment team confirms that all the meters are of same accuracy class i.e., 0.2s as per the requirement of the registered PD. On-site photographs and interview during Site visit with O&M personnel also confirms the same. The electricity generations are monitored continuously & cumulative readings are taken at the end of the month by joint meter reading procedure. These are sealed by State Utilities to avoid malfunctioning with meter readings. The calculation of net electricity supplied to grid is under purview of state electricity board and PP does not have control on it. For the delayed calibration maximum permissible error factor 0.2% have been applied. Interview with O&M personnel during site visit verification audit also confirms that the operational and organizational chart as mentioned in MR is as per the site practice and thus assessment team confirms that the details are correct. No unforeseen incident observed during the monitoring period which could alter the applicability of the methodology or change in project specification as mentioned in the registered PDD. The project undergone Continuous operation from the inception/commissioning and the same is confirmed from the JMR reports and invoices raised for the said period of verification. Comparison of actual and estimate emission reductions achieved: Assessment team checked the calculation of estimated VER vs. Actual VER. As per the registered VCS PD the amount of VERs annually is 64,864 tCO₂e. The days involved in present monitoring period are 2165. Therefore, on pro-rata basis, the estimated VERs for the monitoring period is 384,741 tCO₂e. Actual VERs obtained for the monitoring period is 297,283 tCO₂e and thus the actual VER is 22.73% lower than the estimated VER. This variation is majorly due to the unfavourable wind, climatic conditions, grid availability and other parameters which are not in the control of PP. Hence verification team confirms that decrease in VER by 22.73% in this monitoring period is acceptable.
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4.6 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

5 VERIFICATION CONCLUSION

Earthood Services Private Limited (Earthood), contracted by Patnaik Minerals Private Limited, has performed the independent verification of the emission reductions for the VCS project activity reference number 734² “Wind power project by Patnaik Minerals Pvt. Ltd ” in India for the monitoring period 28-May-2011 to 30-April-2017 reported in the Monitoring Report Version 04 dated 30-January-2023/02/

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

Earthood commenced the verification on the basis of the baseline and monitoring methodology “ACM0002 - Version 09.0»/06/ , the monitoring plan contained in the PD/01/ & MR, version 04/02/ and VCS standard Version 4.2/12/, Monitoring Report Version 04 dated 30-January-2023/02/ as per the process described under Section 2 of this report.

Earthood’s verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 28-May-2011 to 30-April-2017 are fairly stated in the Monitoring Report Version 04 dated 30-January-2023. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology “ACM0002 - Version 09.0”/06/ and the VCS standard, Version 4.2/12/.

Verification period: 28-May-2011 to 30-April-2017 (inclusive of both days).

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
28-May-2011 to 31-December 2011	27,182	0	0	27,182
01-January 2012 to 31-December-2012	57,557	0	0	57,557
01-January 2013 to 31-December-2013	50,392	0	0	50,392
01-January 2014 to 31-December-2014	47,851	0	0	47,851
01-January 2015 to 31-December-2015	53,814	0	0	53,814
01-January 2016 to 31-December-2016	45,930	0	0	45,930
01-January 2017 to 30-April-2017	14,557	0	0	14,557
Total	297,283	0	0	297,283

The achieved GHG emission is 22.73 % is lower than the estimated value. This is due to unfavourable wind during the monitoring period and is beyond the control of the Project Proponent.

Approved by



Dr. Kaviraj Singh
Managing Director

Earthood Services Privated Limited

Date: 28-02-2023

Place: Gurgaon, Haryana

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

S.No	Title of Document	Version	Date
1.	Registered VCS PD & MR	version 02	09-November-2009
2.	Final VCS Monitoring Report	version 04	30-January-2023
3.	ER spreadsheet (corresponding to the final monitoring report)	version 03	01-April-2022
4.	Invoice issued by PP for the duration of monitoring period (28-May-2011 to 30-April-2017)	-	-
5.	Joint Meter Readings for the duration of monitoring period (28-May-2011 to 30-April-2017)	-	-
6.	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002,	Version 09.0	-
7.	CO ₂ Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Govt.	version 4.0	October-2008
8.	Commissioning of the Wind based Power Plant of the project activity M/s Banspani Iron Ltd: - 1) 4.800 MW (GEDA/BIL/PWF/KHI/06-07/306 M/s Patnaik Minerals Pvt.Ltd: - 2) 15.200 MW (GEDA/PML/PWF/DHUDHORJI/06-07/300 M/s Patnaik Minerals Pvt.Ltd: - 3) 15.200 MW (GEDA/PWF/PMPL/MOTIVAVDI/07-08/2587	-	28-March-2007 13-April-2007 03-September-2007
9.	Power Purchase Agreement between PP and GUVNL , Ref. no. GUVNL/COM/WF/192/215	-	24-August-2007
10.	VCS webpage for the project, VCS ID 734; https://registry.verra.org/app/projectDetail/VCS/734	-	Last accessed on 05-March-2022

S.No	Title of Document	Version	Date
11.	O&M contract for all project sites 1. Between Wind World India Ltd (Formerly known as Enercon India Limited) and Banspani Iron Ltd. 2. Between Wind World India Ltd (Formerly known as Enercon India Limited) and Patnaik Minerals Pvt.Ltd/.	-	08-May-2017 08-May-2017
12.	VCS Standard	Version 4.2	Last accessed on 05-March-2022
13.	VCS Program Guide	Version 4.1	Last accessed on 05-March-2022
14.	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period and double counting	-	23-November-2021
15.	Google Earth desktop/Mobile application	-	Last accessed on 05-March-2022
16.	Technical specifications by technology supplier		
17.	Meter calibration guidelines: http://cea.nic.in/reports/regulation/CEA_metering_regulation_amendment_2019.pdf	-	-
18.	Validation report issued by TUV NORD CERT GmbH Verification report issued by TUV NORD CERT GmbH	Version 01 Version 01	16-November-2009 19-April-2012
19.	Break down log sheet of Plants	-	-
20.	Skill development training records	-	-
21.	Copies of the grievance registers maintained at sites	-	-
22.	Meter calibration records covering monitoring period for the project activity.	-	-
23.	Onsite Audit Plan	-	25-November-2021

S.No	Title of Document	Version	Date
24.	Clarification Mail regarding change in Crediting period	-	02-October-2021

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

Table 1. Remaining FAR from previous verification

FAR ID	01	Section no.	-	Date	02-February-2023
Description of FAR					
Please clarify about the double counting issue as the project is also under validation for other GHG program i.e. CDM					
Project participant response					Date : 04-February-2023
Declaration regarding "No double counting" has been submitted to VVB					
Documentation provided by project participant					
Declaration					
DOE assessment					Date : 05-February-2023
PP has submitted a declaration regarding "No double counting" of GHG credits. Same has been verified by VVB team through other GHG programs and found that No credits have been issued to the project for the monitoring period 28-May-2011 to 30-April-2017. Thus, accepted and FAR is closed.					

Table 2. CL from this verification

CL ID	01	Section no.	4.1	Date	DD/MM/YYYY
Description of CL					
-					
Project participant response					Date : DD/MM/YYYY
-					
Documentation provided by project participant					
-					
DOE assessment					Date : DD/MM/YYYY
-					

Table 3. CAR from this verification

CAR ID	01	Section no.	4.1	Date	13-December-2021
Description of CAR					
Following discrepancies observed during review of the MR:					
1. Content page observed as altered thus not found inline with the template to complete VCS MR. Corrective action sought.					

2. Information related to the relevant implementation dates (e.g., dates of construction, commissioning, and continued operation periods) is missing in the section 1.1 of MR. Thus, found not inline with the guidelines to complete VCS MR template version 4.0. Corrective action sought.	
3. In order to verify any WTG breakdown happened during the current monitoring period, PP is requested to provide breakdown details and evidence document for the same.	
Project participant response	Date : 08-February-2022
1. Any alteration to the standard template has been checked and corrected in MR version 02 now submitted for further assessment.	
2. The information related to the relevant implementation dates is now included in Section 1.1 inline with VCS MR template version 4.1 as well as Section 3 of MR version 02 now submitted for further assessment.	
3. The breakdown details pertaining to the current monitoring period have been included in Appendix #2 of MR version 02 along with the supporting documents now submitted for further assessment.	
Documentation provided by project participant	
1. MR version 02	
2. Breakdown details	
DOE assessment	Date: 09-March-2022
PP has rectified all above-mentioned correction request and found correct and appropriate. PP has revised the MR as per the applicable guidance provided in the version 4.1 of the MR template and found correct. Thus, accepted hence CAR is closed .	

CAR ID	02	Section no.	4.1	Date : 13-December-2021
Description of CAR				
PP is requested to submit all relevant supporting documents like technical specifications, O&M agreements, break down details, Grievance register etc. for review by assessment team.				
Project participant response				Date : 08-February-2022
The supporting documents such as technical specifications, O&M agreements, break down details, Grievance register etc. are now submitted for further assessment.				
Documentation provided by project participant				
1. Commissioning Certificates				
2. Technical Specifications				
3. O&M Agreement				
4. Break Down Details				
DOE assessment				Date: 09-March-2022
1. Commissioning dates of wind power plant are now included in Section 1.1 of revised MR. PP has also provided the commissioning certificates of all plants. Assessment team has checked the commissioning certificates and confirms that commissioning dates are correct.				
2. Technical specifications of all WTGs have been included now in Section 3.1 of revised MR.				
3. PP has provided the copies of O & M Agreement.				
4. Break down details of plants are included in Appendix-2 of the revised MR.				
CAR thus closed for all points.				

CAR ID	03	Section no.	4.1	Date : 13-December-2021
Description of CAR				
PP is requested to submit declaration in effect of avoiding double counting with regard to participation under other GHG Programs/Other forms credits, rejection under other GHG program etc.				
Project participant response				Date : 08-February-2022

The declaration in effect of avoiding double counting with regard to participation under other GHG Programs/Other forms credits, rejection under other GHG program etc. is now submitted for further assessment.	
Documentation provided by project participant	
VCS Declaration	
DOE assessment	Date: 09-March-2022
PP has submitted declaration in effect of avoiding double counting with regard to participation under other GHG Programs/Other forms credits, rejection under other GHG program. CAR closed.	

CAR ID	04	Section no.	4.4	Date : 13-December-2021
Description of CAR				
PP is requested to submit all supporting documents for calculation of net electricity generation supplied by the project activity along the copies of invoices for cross checking.				
Project participant response				Date : 08-February-2022
The supporting documents for calculation of net electricity generation supplied by the project activity along the copies of invoices for cross checking are now submitted for further assessment.				
Documentation provided by project participant				
JMRs and Invoices				
DOE assessment				Date: 09-March-2022
PP has submitted the copies of JMRs, Invoices and Calibration reports. Verification team has reviewed the supporting evidences and found consistent with ER sheet and revised MR. thus accepted and CAR is closed.				

Table 4. FAR from this verification

FAR ID	XX	Section No.		Date : DD/MM/YYYY
Description of FAR				
There is no FAR from this verification				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement	
Name	Atul Takarkhede

Education	Ph.D. Environmental Science		
Experience	12 years		
Field	Climate Change and environment		
Approved Roles			
Team Leader	YES		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.2)		
Reviewed by	Shreya Garg	Date	24/04/2019
Approved by	Anshika Gupta	Date	25/04/2019

Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	7 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Gautam	Date	01/03/2018

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
PP	Project Participant
GETCO	Gujarat Energy Transmission Corporation
GEDA	GUJARAT ENERGY DEVELOPMENT AGENCY

Abbreviations	Full texts
PMPL	Patnaik Minerals Pvt. Ltd.

APPENDIX 5: METER CALIBRATION DETAILS

Main Meter No.	Meter Type	Accuracy Class ³	Date of Calibration	Next Calibration Date	Calibration Compliance	Error Factor Applied
GJU04175	E3M021	Secure 0.2%	22-January-2010	21-January-2011	Delay from:-	As per Conservative approach, May-2011 to January-2012 January-2013 to September-2013 September-2014 to April-2017
			17-January-2012	16-January-2013	22-January-2011 to 16-January-2012 17-January-2013 to 05-September-2013	
			06-September-2013	05-September-2014	06-September-2014 to 27-June-2021	
			28-June-2021 ⁴	27-June-2022		
GJU04176	E3M022	Secure 0.2%	22-January-2010	21-January-2011	Delay from:-	As per Conservative approach, May-2011 to January-2012 January-2013 to September-2013 September-2014 to April-2017
			17-January-2012	16-January-2013	22-January-2011 to 16-January-2012 17-January-2013 to 05-September-2013	
			06-September-2013	05-September-2014	06-September-2014 to 27-June-2021	
			28-June-2021	27-June-2022		
GJB01470	E3M023	Secure 0.2%	22-January-2010	21-January-2011	Delay from:-	

³ The observed error for the monitoring meters found below the permissible error. Further, PP have only net export value available as per the approved monitoring which is available from credit report issued by state utility. PP do not have control on the JMR/Credit report process. Thus, PP have applied 0.4% error conservatively as separate export & import values not available. Same have been accepted by assessment team being conservative.

⁴ The latest meter calibration has been carried out in 2021, hence accordingly, error factor has been applied to the period Sep 2014 to end of MP that is April 2017.

Main Meter No.	Meter Type	Accuracy Class ³	Date of Calibration	Next Calibration Date	Calibration Compliance	Error Factor Applied
			17-January-2012	16-January-2013	22-January-2011 to 16-January-2012	As per Conservative approach, May-2011 to January-2012 January-2013 to September-2013 September-2014 to April-2017
			06-September-2013	05-September-2014	17-January-2013 to 05-September-2013	
			28-June-2021	27-June-2022	06-September-2014 to 27-June-2021	