



**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	Wind power project at Jaibhim by SIIL	
UNFCCC reference number of the project activity	6456	
Version number of the monitoring report	01	
Completion date of the monitoring report	30/01/2016	
Monitoring period number and duration of this monitoring period	Monitoring period number – 01 Duration - 01/01/2013 to 31/12/2015	
Project participant(s)	Serum Institute of India Limited	
Host Party	India	
Sectoral scope(s)	01 : Energy industries (renewable / non-renewable sources)	
Selected methodology(ies)	ACM0002 : "Grid-connected electricity generation from renewable sources", Version 12.3.0 EB 66	
Selected standardized baseline(s)	Not Applicable	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	158,694 tCO ₂ (52,898 tCO ₂ per annum)	
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
	0 tCO ₂	162,460 tCO ₂

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

Serum Institute of India (SIIIL) is a manufacturer of immune-biologicals, including vaccines in India. It was incorporated in the year 1984. The company is managed by the Poonawalla group. Today, Serum Institute of India Ltd. has established itself as the world's largest producer of Measles and DTP group of vaccines.

Purpose of the project activity:

With the growing concerns for the environment, Serum Institute of India Ltd. (SIIIL) has undertaken measures to reduce the GHG emissions by conceptualizing and installation wind power project in Maharashtra with efficient utilization of the available wind energy. 16 WTGs of 2.1 MW each have been commissioned as part of this project activity. The generated electricity is wheeled to substation through a 33 kV overhead line. The generated electricity will displace equivalent electricity that may have been produced majorly from conventional fuels (generally, fossil fuels).

The project will be utilizing wind energy for generating clean electricity for captive use/sale to third party/sale to grid which would have otherwise been generated through fossil fuel dominated power plants, contributing to reduction in specific emissions (emissions of pollutant) including GHG emissions and also reducing its dependence on fossil fuels for energy requirements. The project activity has reduced 162,460 tCO₂ during the given monitoring period.

The technical specifications of the WTGs are as follows:

Model	S88
Lifetime	20 years
Rated Power	2,100 kW
Rotor diameter	88 m
Swept area	6082 m ²
No. of blades	3
Cut in wind speed	4 m/s
Cut out wind Speed	25 m/s
Rotor Speed	15-17.6 rpm
Hub Height	80 m
Generator Type	Asynchronous
Insulation	Class H

Relevant dates for the project activity:

Start date of the project activity : 05/08/2010
 Registration of project activity under CDM : 28/11/2012
 Monitoring Period : 01/01/2013 to 31/12/2015
 Commissioning of WTGs : Please refer section A.2 for details

A.2. Location of project activity

The project site is located at Jaibhim in the Dhule district of Maharashtra, India. The nearest airport is Mumbai Aiport which is at a distance of 334 km and the nearest railway station is Dhule. The unique location information of the WTG is provided in the table below. The WTG numbers indicated in the table below are unique identification number provided by the state utility.

Location No.	Village	District	Latitude	Longitude	Gut no.	Commissioning Date
JAI-02	Runmali	Dhule	21° 7' 48"	74° 16' 3"	95/1	19/03/2011
JAI-03	Runmali	Dhule	21° 7' 36"	74° 16' 4"	79/3	19/03/2011
JAI-04	Vaskhedi	Dhule	21° 7' 20"	74° 15' 58"	87	06/09/2011
JAI-05	Jaitane	Dhule	21° 7' 41"	74° 18' 15"	129/2	15/03/2011
JAI-07	Runmali	Dhule	21° 8' 16"	74° 18' 24"	46	15/03/2011
JAI-08	Vajdare	Dhule	21° 8' 43"	74° 18' 31"	109	15/03/2011
JAI-09	Akhade	Dhule	21° 7' 54"	74° 20' 54"	122	31/03/2011
JAI-11	Jaitane	Dhule	21° 7' 24"	74° 20' 49"	582/3 & 582/4	31/03/2011
JAI-18	Shivajinagar	Dhule	21° 5' 42"	74° 20' 15"	124/1	11/03/2011
JAI-19	Shivajinagar	Dhule	21° 5' 26"	74° 20' 11"	116	19/03/2011
JAI-21	Shivajinagar	Dhule	21° 5' 20"	74° 19' 39"	124/3	11/03/2011
JAI-22	Shivajinagar	Dhule	21° 5' 29"	74° 18' 59"	386/3 & 386/4	19/03/2011
JAI-23	Bhamer	Dhule	21° 5' 41"	74° 19' 11"	391/1	19/03/2011
JAI-27	Bhamer	Dhule	21° 5' 10"	74° 18' 30"	370	12/03/2011
JAI-28	Bhamer	Dhule	21° 5' 0"	74° 17' 45"	113 & 313/1	11/03/2011
JAI-29	Bhamer	Dhule	21° 5' 17"	74° 17' 39"	315/2	12/03/2011

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
India (Host)	Serum Institute of India Limited - Private Entity	No

A.4. Reference of applied methodology and standardized baseline

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

Reference: ACM0002, Version 12.3.0, EB 66

The methodology also refers to the latest approved versions of:

“Tool to calculate the emission factor for an electricity system”, Version 02.2.1, EB 63

“Tool for the demonstration and assessment of additionality”, Version 06, EB 65

A.5. Crediting period of project activity

Type of crediting period : Fixed
 Crediting period from : 01/01/2013 to 31/12/2023
 Length of the Crediting Period : 10 Years

A.6. Contact information of responsible persons/entities

The contact information and responsible entities are mentioned in Appendix 1

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

The project activity has been commissioned & running successfully. As on 06/09/2011, the project participant has completed the commissioning of all the 16 WTGs. There have been no events which has affected the GHG emission reductions and monitoring. Overall the project is running successfully. The commissioning details of the project activity are provided in section A.2.

B.2. Post-registration changes**B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

Not Applicable

B.2.2. Corrections

Not Applicable

B.2.3. Changes to start date of crediting period

The start date of crediting period for the project activity has been changed from 28/11/2012 to 01/01/2013.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

Not Applicable

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

Not Applicable

B.2.6. Changes to project design of registered project activity

Not Applicable

B.2.7. Types of changes specific to afforestation or reforestation project activity

Not Applicable

SECTION C. Description of monitoring system

The project activity is in accordance with in accordance to the approved methodology ACM0002, Version 12.3.0, and therefore, can use the monitoring methodology for the same.

SIIL has outsourced the operations and monitoring the performances of the WTGs to Suzlon. The Operation & Maintenance (O&M) responsibility lies with Suzlon. The WTGs of Dhule are centrally connected & monitored by a Central Monitoring System (CMS) located at Dhule and maintained by Suzlon. The captured data from the CMS is then directly uploaded to the Customer Relationship Management (CRM) system, which is an Oracle based database. From the CRM, the daily generation reports are made available to SIIL on the customized website of the respective O&M service providers. The CRM manager is responsible for the monitoring of the WTGs and communicating results to SIIL. SIIL has the overall responsibility for collating the monitored data received from all the two locations. Two feeders of 22.5 MW each are dedicated for Suzlon -16 WTGs (10 nos on one feeder and 6 on the other) at the Sakri switchyard (33/132 KV). The WTGs are connected through a 33 KV overhead line up to Sakri Switchyard. At the MSEDCL sub-station, the total export & import to these feeders is monitored using main & the check meters, which are electronic tri-vector meters. The total export at this meter is arrived at by multiplying the monthly meter reading to the multiplying factor of the meter concerned. The monthly meter reading is arrived at as the difference between the current meter reading and the previous meter reading. The period between these two readings is usually a period of 30 days which may vary. In a similar fashion, total import at this meter is also calculated.

Hence, net electricity export is calculated as the difference between total export and total import at the meter.

Additionally, MSEDCL receives daily export & import figures for each WTG from the O&M service provider with the help of which it calculates the electricity export by each WTG at the WTG controller. The WTG controller is located within the WTG assembly itself. It then arrives at the export value of each WTG by apportioning the reading of the main/check meter in the same ratio at which each of the WTG had exported electricity. The formula applied on each WTG of a particular feeder is as follows:

Net export of electricity from WTG to Grid

= (% generation of individual WTG connected to feeder) x (Net Electricity Export @ MSEDCL meter for the feeder)

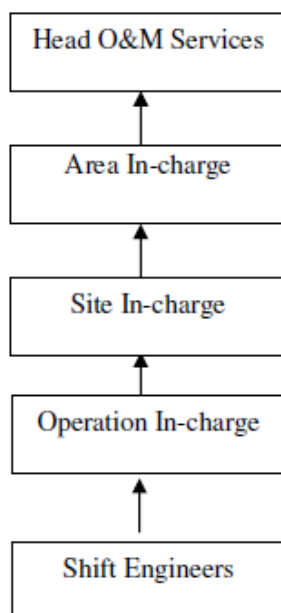
where, % generation of individual WTG connected to feeder

= (Controller reading @ Individual WTG)/(Sum of Controller reading of all WTGs connected on feeder)

The electricity export reports are generated by MSEDCL on credit notes and sent to SIIL through the O&M service provider on a monthly basis. Thus, to further elaborate, it may be said, that every month, SIIL receives credit notes from MSEDCL for each of its WTGs.

Based on these reports, the units billed at the consumption site (in case of captive consumption or sale to third party) are adjusted as per the units of electricity generated at the power generation site after discounting wheeling and transmission losses as contained in the MERC order. In case of sale to grid, the values can be directly used from the credit notes.

The structure of the O&M team is as follows:



The roles and responsibilities of the O&M personnel are as follows:

- **Head O&M Services:** He is in-charge of overall O&M activities of state/country. The responsibilities include formulation of procedures and decision-making for Operation & Maintenance team.
- **Area in-charge:** He is responsible for the defined areas with group of wind farms. He has to take timely corrective measures/action to ensure that overall performance of site is met and delivered.
- **Site In-charge:** He is responsible for daily monitoring of the performance of site operation and under any breakdown situation the WTG should be restored at earliest.
- **Operation In-charge:** He is responsible for attending the unscheduled breakdown of WTG and ensure that WTG should be restored at earliest. Daily monitoring of O & M team and performance of WTG.
- **Shift Engineers:** He is directly responsible for carrying out the O & M activity of WTG and to attend the breakdowns on immediate basis and report problem to Operation in charge.

Emergency Preparedness

In case of failure of monitoring meter(s), the grid officials would immediately replace the meter with a calibrated meter.

The O&M service provider would be responsible for maintenance of the necessary spare parts and consumables for the maintenance of the WTGs such as anemometers, wind vanes and sensors, oil filters, batteries, auxiliary motors and pumps, WTG controllers, slip rings, limit switches and sensors, detergents & solvents etc. The service provider will also ensure the availability of major components such as main gearbox, blades, generator, towers, hub, main shaft & bearings, ground and top controller, cooling and hydraulic systems in the event of a breakdown occurring during the tenure of the O&M. The service provider would also ensure that occupational health and safety procedures are adhered to during the operation & maintenance activities.

The main meter will primarily be used for recording generation. In case of its failure, the check meter will be used for the same purpose. However, in case of failure of both meters, the decision of MSEDCL regarding the generation will be final.

SECTION D. Data and parameters**D.1. Data and parameters fixed ex ante or at renewal of crediting period**

Data/parameter:	$EF_{grid,CM,y}$
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the project electricity system (NEWNE regional grid) for the year y
Source of data	CEA, CO ₂ Baseline Emission Factor for Indian Power Sector, Version 06(Valid from 1st March 2011)
Value(s) applied)	0.9487
Choice of data or measurement methods and procedures	The value applied is taken from the plant from CEA reviews. The weights used for calculating combined margin emission factor are 0.75 and 0.25 for operating margin and build margin respectively.
Purpose of data	Calculation of baseline emission
Additional comments	Calculated ex-ante, data will be kept for crediting year +2 years

Data/parameter:	$EF_{grid,OM,y}$
Unit	tCO ₂ /MWh
Description	Operating margin CO ₂ emission factor for the project electricity system (NEWNE regional grid) for the year y
Source of data	CEA, CO ₂ Baseline Emission Factor for Indian Power Sector, Version 06 (Valid from 1st March 2011)
Value(s) applied)	0.9942
Choice of data or measurement methods and procedures	Obtained from the CEA database on CO ₂ Baseline for Indian Power Sector, Version 06 as the weighted average of Operating Margin (incl. imports) for years 2007-08, 2008-09 and 2009-10
Purpose of data	Calculation of baseline emission
Additional comments	Calculated ex-ante, data will be kept for crediting year +2 years

Data/parameter:	$EF_{grid,BM,y}$
Unit	tCO ₂ /MWh
Description	Build margin CO ₂ emission factor for the project electricity system (NEWNE regional grid) for the year y
Source of data	CEA, CO ₂ Baseline Emission Factor for Indian Power Sector, Version 06 (Valid from 1st March 2011)
Value(s) applied)	0.8123
Choice of data or measurement methods and procedures	Obtained from the CEA database on CO ₂ Baseline for Indian Power Sector, Version 06 (not adjusted for imports)
Purpose of data	Calculation of baseline emission
Additional comments	Calculated ex-ante, data will be kept for crediting year +2 years

D.2. Data and parameters monitored

Data/parameter:	$EG_{facility,y}$
Unit	MWh

Description	Quantity of net electricity generation supplied to the grid by the project plant/unit to the grid in year y
Measured/calculated/default	Calculated
Source of data	Credit notes for generation by MSEDCL
Value(s) of monitored parameter	171,246.753
Monitoring equipment	Tri-vector meters
Measuring/reading/recording frequency:	<p><u>Monitoring</u>: These values are monitored through main and check meters having an accuracy class of 0.2 and located at the MSEDCL sub-station.</p> <p><u>Data type</u>: Measured & Calculated</p> <p><u>Archiving</u>: Electronic</p> <p><u>Recording Frequency</u>: Continuous monitoring and at least monthly recording</p> <p><u>Responsibility</u>: The plant management shall be responsible for the regular recording of data.</p> <p><u>Calibration Frequency</u>: The meters shall be calibrated by the MSEDCL's testing division annually.</p>
Calculation method (if applicable):	$EG_{\text{facility},y} = EG_{\text{facility},y \text{ export}} - EG_{\text{facility},y \text{ import}}$
QA/QC procedures:	The meters shall be calibrated by the MSEDCL's testing division annually. Generation values will be cross-checked with energy bill(s) at consumption centre by MSEDCL.
Purpose of data:	Calculation of baseline emissions
Additional comments:	<p>The data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.</p> <p>In the case of the crediting period start & end dates of the project activity falls in – between the billing cycles, then emission reduction will be claimed for only those billing cycles which fall entirely within the crediting period.</p>

D.3. Implementation of sampling plan

Not Applicable

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

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

According to the approved baseline methodology ACM0002, version 12.3.0, EB 66, the baseline emissions are calculated as follows:

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid,CM},y}$$

Where

BE_y = Baseline emissions in year y (t CO₂/yr)

$EG_{\text{facility},y}$ = 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)

$EF_{\text{grid,CM},y}$ = CO₂ emission factor of the grid in year y, tCO₂e/MWh

$$\begin{aligned}
 BE_y &= 171,246.753 \times 0.9487 \\
 &= \mathbf{162,460 \text{ tCO}_2}
 \end{aligned}$$

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

Since the project activity is a renewable energy project which generates electricity using wind power therefore there are no resulting project emissions.

E.3. Calculation of leakage

As per methodology, version 12.3.0, EB 66, there are no leakages from this project activity and hence leakage is considered as zero.

E.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	162,460	0	0	0	162,460	162,460

E.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
Emission reductions or GHG removals by sinks (t CO ₂ e)	$(52,898 * 1095 / 365) = 158,694$	162,460

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

From E.5 above, we can observe that actual emission reduction for the current monitoring is higher than estimated emission reductions by 2.37%. The values are marginally higher and do not impact the additionality of the project activity.

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	Serum Institute of India Limited
Street/P.O. Box	Dr. Ambedkar Road,
Building	Sarosh Bhavan
City	Pune
State/region	Maharashtra
Postcode	411 001
Country	India
Telephone	+91-20-26100324
Fax	+91-20-26993923
E-mail	-
Website	www.seruminstitute.com
Contact person	-
Title	Group Director (Accounts & Audit)
Salutation	Mr.
Last name	Deshpande
Middle name	-
First name	Satish
Department	Finance
Mobile	+91-9922940218
Direct fax	+91-20-26133228
Direct tel.	+91-20-26135311
Personal e-mail	shd@seruminstitute.com

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	M/s Infinite Solutions
Street/P.O. Box	RNT Marg,
Building	611, Chetak Centre Main,
City	Indore
State/region	Madhya Pradesh
Postcode	452002
Country	India
Telephone	+91 731 4050174
Fax	-
E-mail	jimmy@infisolutions.org
Website	www.infisolutions.org
Contact person	
Title	General Manager
Salutation	Mr.
Last name	Sah
Middle name	-
First name	Jimmy
Department	Sustainability
Mobile	+91 9644130430
Direct fax	-
Direct tel.	+91 731 4050174
Personal e-mail	jimmy@infisolutions.org

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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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