# WIND BASED POWER GENERATION BY MYTRAH ENERGY (INDIA) LIMITED (EKIESL- VCS-JANUARY-16-01)

Document Prepared by Infinite Solutions

| | |
|---|---|
| Project Title | Wind Based Power Generation by Mytrah Energy (India) Limited (EKIESL-VCS-January-16-01) |
| Version | 03 |
| Report ID | VVER1521 |
| Date of Issue | 15-December-2023 |
| Project ID | 1521 |
| Monitoring Period | 01-April-2022 to 30-June-2023 (Inclusive of both days) |
| Prepared By | Infinite Solutions |
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## CONTENTS

# 1 PROJECT DETAILS

## 1.1 Summary Description of the Implementation Status of the Project

The purpose of the project activity is to generate electrical energy using renewable energy source (wind) for the purpose of captive and state utility. The project activity generates electricity using wind potential and converts it into kinetic energy using Wind turbines, which drives the alternators to generate energy. The generated electricity is exported to the regional grid system which is under the purview of the Southern grid of India (Now INDIAN Grid).

This project activity involves the installation of Wind Power Projects. The total installed capacity of the project is 233.1 MW AC; which involves operation of 223 Wind Turbine Generators (WTGs) with capacity of 0.85 MW each located at Karnataka (112 WTGs) Andhra Pradesh (44 WTGs) implemented by Mytrah Vayu Krishna Private Limited and 67 Wind Turbine Generator (WTGs) of 1.5 MW implemented by Mytrah Vayu (Manjira) Private Limited Tamil Nadu state in India. These are the subsidiary companies of Mytrah Energy (India) Limited. However, the project is promoted by Mytrah Energy (India) Limited, which is also the project proponent in the project activity. The commissioning dates of the project activity is mentioned in APPENDIX 1: Date of Commissioning. The first WTG was commissioned on 21-February-2014 and last WTG was commissioned on 26-February-2015.

| Name of Investor | State utility | State | Usage |
|---|---|---|---|
| Mytrah Vayu Krishna Private Limited(Karnataka) | Banglore Electricity Supply company Limited | Karnataka | Supply to grid |
| Mytrah Vayu Krishna Private Limited(Andhra Pradesh) | Central Power Distribution compamy of Andhra Pra | (Andhra Pradesh | Supply to grid |
| Mytrah Vayu (Manjira) Private Limited (Tamil Nadu) | TNEB | Tamil Nadu | Captive use (Through TNEB Grid) |

The power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, as per VCS PD, it results in total electricity generation of 488,388.4 MWh/year and of GHG emission reductions of 479,448 tonnes of $CO_2$/year. The current monitoring period is from 01-April-2022 to 30-June-2023.(Including both the dates). The

methodology applied is ACM0002: Grid-connected electricity generation from renewable sources -Version 16.0[1]

The Project activity is a new facility (Greenfield) and the purpose of the project activity is to generate electricity by the utilization of wind velocity, and selling the generated electrical energy from 132.6 MW project implemented by Mytrah Vayu Krishna Private Limited to respective state utilizes under the Indian Grid. Further energy generation from 100.5 MW wind mill project implemented by Mytrah Vayu (Manjira) Private Limited is for captive utilization through state grid, under Tamil Nadu state. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

In the Pre- project scenario, the equivalent amount of electricity delivered to the grid by the project activity, would have otherwise been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new generation sources. The Pre-project scenario for the facility where the electricity is wheeled (in case of TN WTGs), the electricity was sourced from southern grid.

The current monitoring period is 8$^{th}$ Verification from 01-April-2022 to 30-June-2023 (Including both the dates). The electricity generated during current monitoring period is 375,917.13 MWh and total emission reductions achieved is 369,034 t $CO_2e$.

The audit history are as follows-

| Audit Type | Period | Program | VVB Name | Number of years |
|---|---|---|---|---|
| Validation | 21-February-2014 to 20-February-2024 | VCS | EPIC Sustainability Services Private Limited | 10 years |
| Verification | 21-February-2014 to 1-April-2016(including both days) | VCS | EPIC Sustainability Services Private Limited | 2 years, 1 month, 12 days |
| Verification | 02-April-2016 to 01-May-2018(including both days) | VCS | LGAI Technological Center S.A. | 2 years, 1 month,00 days |
| Verification | 02-May-2018 to 01-August 2019(including both days) | VCS | LGAI Technological Center S.A. | 1 year, 3 months,00 days |

[1] https://cdm.unfccc.int/UserManagement/FileStorage/0X6IERWMG92J7V3B8OTKFSL1QZH5PA

| | | | | |
|---|---|---|---|---|
| Verification | 02-August-2019 to 31-March-2020 (including both days) | VCS | LGAI Technological Center S.A. | 7 months, 30 days,00 days |
| Verification | 01-April -2020 to 31-May-2021(including both days) | VCS | KBS Certification Services Pvt Ltd | 1 year, 2 months,00 days |
| Verification | 01-June-2021 to 28-February-2022 (including both days) | VCS | LGAI Technological Center S.A. | 9 months,00 days |
| Verification | 01-March-2022 to 31-March-2022(including both days) | VCS | LGAI Technological Center S.A. | 1 month,00 days |
| **Verification (Current Verification)** | 01-April-2022 to 30-June-2023 (Inclusive of both days) | VCS | VKU certifications Pvt.Ltd | 1 year, 3 months,00 days |
| Total | 21-February-2014 to 30-June-2023 (Inclusive of both days) | VCS | | 9 years, 4 months, 10 days |

## 1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Project Type:

Sectoral Scope: 01 – Energy industries (renewable / nonrenewable sources)

Project Type: I - Renewable Energy Projects

Methodology: ACM0002: Grid-connected electricity generation from renewable sources - Version 16.0[2]

The project is not a grouped nor and AFLOU project activity.

## 1.3 Project Proponent

| | |
|---|---|
| **Organization name** | JSW Neo Energy Limited |
| **Contact person** | Mr. Ramesh Kure |

[2] https://cdm.unfccc.int/UserManagement/FileStorage/0X6IERWMG92J7V3B8OTKFSL1QZH5PA

| | |
|---|---|
| Title | Assistant Manager |
| Address | JSWEnergy<br>8001,QCity,Nanakramguda,Gachibwli,Hyderabad,Telangans<br>500032 |
| Telephone | +91 72888 75975 |
| Email | ramesh.kurre@jsw.in |

## 1.4 Other Entities Involved in the Project

| | |
|---|---|
| Organization name | Infinite Solutions |
| Role in the Project | Carbon Consultant |
| Contact person | Jimmy Sah |
| Title | Project Manger |
| Address | 214-215 Milinda Manor, Opp. Next Treasure Island, 2 RNT Marg, Indore- 452001 |
| Telephone | +91-731-4050174 |
| Email | Jimmy@infisolutions.org |

## 1.5 Project Start Date

Project Start Date: 21-February-2014

The project start date is the date on which first WTG was commissioned under the Project activity.The first WTG was commissioned inAndhra Pradesh (Burgula site)).The location no. of WTGs commissioned on 21-February-2014 are as follows -

| | | | |
|---|---|---|---|
| Location No. 508, Location No. 509,Location No. 510,Location No. 511,Location No. 512,Location No. 513,Location No. 514,Location No. 515,Location No. 516,Location No. 517,Location No. 518,Location No. 519,Location No. 520,Location No. 521,Location No. 522,Location No. 523,Location No. 524,Location No. 525,Location No. 526,Location No. 527,Location No. 528,Location No. 529,Location No. 530,Location No. 531,location No. 550,Location No. 551 | 21-February-2014 | Burgula | Andhra Pradesh |

## 1.6 Project Crediting Period

First Crediting Period Start date: 21-February -2014

First Crediting Period End date: 20-February-2024 (Including both the dates)

The project activity adopts renewable crediting period of 10 years' period which can be renewed for maximum 2 times

## 1.7 Project Location

The project location are as follows-

| S. No | Project site | Address |
|---|---|---|
| 1. | Vagrai | Appanuthu, Dindigul,Tamil Nadu India |
| 2. | Burgula | Kurnool, Andhra Pradesh India |
| 3. | Savalsung | Vijaypura,KarnatakaIndia |

The geo coordinates of the project are mentioned in Appendix-3

## 1.8 Title and Reference of Methodology

Methodology: ACM0002: Grid-connected electricity generation from renewable sources - Version 16.0, Sectoral Scope: 01, EB 81, Annex 9 https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLAR6MJ6VEU83

The project activity also takes reference from following Tools from the tools prescribed by applied methodology:

- TOOL 01- Tool for the demonstration and assessment of additionality --- Version 07.0.0, EB 70, Annex 8[3],
- TOOL 07-Tool to calculate the emission factor for an electricity system --- Version 05.0, EB 87, Annex 09[4]

## 1.9 Participation under other GHG Programs

The Project is not registered under any other GHG programs and neither has participated in any other GHG programs other than for Tamil Nadu 45 MW WTGs. The electricity generated from 45 MW REC component of Tamil Nadu are not included for VCU calculations to avoid any double accounting. The HTSC numbers DRA 01,03,04,05,06,07,08,09,12,13,15,17,18,21,22,23,24,25,26,27,31,32,33,43,44,46,47,48,49 ,54 (TOTAL 30 WTGs of 1.5 MW from Tamil Nadu site) are availing REC. Thus electricity generated from these WTGs having REC component are not considered for VCU calculations for current

[3] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf

complete monitoring period. The undertaking from PP has been submitted for no any double accounting for current monitoring period and project activity is not participated any other GHG program other than VCS

## 1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

Emission Trading Programs and Other Binding Limits: The PP has not applied this project in any Emission Trading Programs and other Binding Limits.

- Other Forms of Environmental Credit: The PP has not applied this project in any other form of environmental credits other than Tamil Nadu 45 MW WTGs. The electricity generated from 45 MW REC component of Tamil Nadu are not included for VCU calculations to avoid any double accounting. The HTSC numbers DRA 01,03,04,05,06,07,08,09,12,13,15,17,18,21,22,23,24,25,26,27,31,32,33,43,44,46,47,48,49,54 (TOTAL 30 WTGs of 1.5 MW from Tamil Nadu site) are availing REC. Thus electricity generated from these WTGs having REC component are not considered for VCU calculations for current complete monitoring period. Furthermore, the project activity is not availing any benefits from CDM/GS/GCC/UCR/RECs (except from mentioned above) mechanism which can be confirmed from the links below:

  https://www.recregistryindia.nic.in/index.php/publics/accredited_regens

  CDM: CDM-Home (unfccc.int)

  https://www.goldstandard.org/

  https://projects.globalcarboncouncil.com/

  https://www.ucarbonregistry.io/

  Registries | I-REC Standard (irecstandard.org)

- The project Activity is a wind power project and does not involve any supply chain in the project such as manufacturers, wholesalers, distributers and retailers. So, no indirect upstream and downstream GHG emissions are involved in the project activity. Thus, the Scope 3 emissions are not applicable in this project activity.

## 1.11 Sustainable Development Contributions

The wind Project is located at Karnataka, Andhra Pradesh and Tamil Nadu. The Wind power or wind energy describes the process by which the wind is used to electricity. Wind turbines convert the kinetic energy in the wind into mechanical power and further converted to electrical energy.

The project is contributing in sustainable development by generating electricity and reduction of $CO_2$ emissions due to implementation of project activity and generates employment to the local stakeholders. Through Project activity economic development has been achieved in the project location by creating opportunities of employment during the project lifetime. Project owner monitors the carbon emission with help of the record of electricity generated.

**Table 1: Sustainable Development Contributions**

<table>
<tr><th>Row number</th><th>SDG Target</th><th>SDG Indicator</th><th>Net Impact on SDG Indicator</th><th>Current Project Contributions</th><th>Contributions Over Project Lifetime</th></tr>
<tr><td>1)</td><td>7.2</td><td>7.2.1: Renewable energy share in the total final energy consumption</td><td>Implemented activities to increase the Renewable energy share in the total final energy consumption</td><td>About 375,917.13 MWh, renewable electricity has supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.</td><td>Since Commissioning, about 2,896,866.13 MWh renewable electricity has supplied to Indian grid that helps to increase the renewable energy share in the energy mix
<table>
<tr><th>Monitoring period</th><th>Contribution</th></tr>
<tr><td>21-February-2014 to 01-April- 2016</td><td>566,713 MWh</td></tr>
<tr><td>02-April-2016 to 01-May-2018</td><td>714,121 MWh</td></tr>
<tr><td>02-May-2018 to 01-August 2019</td><td>496,789 MWh</td></tr>
<tr><td>02-August-2019 to 31-March-2020</td><td>171,511 MWh</td></tr>
<tr><td>01-April -2020 to 31-May-2021</td><td>312,899 MWh</td></tr>
<tr><td>01-June-2021 to 28-February-2022</td><td>245,786 MWh</td></tr>
<tr><td>01-March-2022 to 31-March-2022</td><td>13,130 MWh</td></tr>
<tr><td>01-April-2022 to 30-June-2023</td><td>375,917.13 MWh</td></tr>
</table></td></tr>
</table>

<table>
<tr>
<td>2)</td>
<td>8.6</td>
<td>8.6.1 Proportion of youth (aged 15-24) not in education,employment or training</td>
<td>Implemented activities to increase the employment and number of trainings</td>
<td>Total- 94 peoples are employed during this reporting period.<br>Declaration for the same is provided to auditor<br>Total 3 training was provided to employed people during the current monitoring period. The training details are given in Appendix 4</td>
<td>Employment to 94 peoples and 3 training is provided.</td>
</tr>
<tr>
<td>3)</td>
<td>13.0</td>
<td>Tonnes of greenhouse gas emissions avoided or removed</td>
<td>Implemented activities to increase tonnes of greenhouse gas emissions avoided</td>
<td>By supplying 375,917.13 MWh clean electricity to Indian grid, the project avoided release of 369,034 $tCO_2$ in to the atmosphere during the reporting period.</td>
<td>Prevented the release of 2,843,823 tonnes of carbon in the atmosphere
<table>
<tr><th>Monitoring period</th><th>contributions</th></tr>
<tr><td>21-February-2014 to 1-April-2016</td><td>556,341 $tCO_2$</td></tr>
<tr><td>02-April-2016 to 01-May-2018</td><td>701,051 $tCO_2$</td></tr>
<tr><td>02-May-2018 to 01-August 2019</td><td>487,697 $tCO_2$</td></tr>
<tr><td>02-August-2019 to 31-March-2020</td><td>168,371 $tCO_2$</td></tr>
<tr><td>01-April -2020 to 31-May-2021</td><td>307,153 $tCO_2$</td></tr>
<tr><td>01-June-2021 to 28-February-2022</td><td>241,287 $tCO_2$</td></tr>
<tr><td>01-March-2022 to 31-March-2022</td><td>12,889 $tCO_2$</td></tr>
<tr><td>01-April-2022 to 30-June-2023</td><td>369,034 $tCO_2$</td></tr>
</table>
</td>
</tr>
</table>

# 2 SAFEGUARDS

## 2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the WTGs, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories. The report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013[5] . This report clearly mentioned that wind project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same. During the current monitoring period there is no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity and project is implemented as per VCS approved PD, hence is no negative environmental and socio-economic impacts

## 2.2 Local Stakeholder Consultation

The stakeholders identified for the project were: the usual occupants of the villages around and the local communities, NGOs, governmental agencies, employees, contractors. Local population is considered to be a major stakeholder with respect to the project activity. The stakeholders of the project activity were invited to attend the stakeholder meeting. Personal invitations were also sent to the prominent members (villagers, local community people) of the regions in the vicinity.

A discussion was held in which the views of the local stakeholders were addressed. The stakeholder meeting was organised at all of the three locations i.e Burgula, Salvasang and Vagarai on the dates given below at the time of validation of this project activity.

| Tamil Nadu | |
|---|---|
| Date of Invitation | Meeting date |
| 10-October-2012 | 23-October-2012 |
| | 24-October-2012 |
| | 25-October-2012 |
| Andhra Pradesh | |
| Date of Invitation | Meeting date |
| 12-April-2013 | 22-April-2013 |
| Karnataka | |
| Date of Invitation | Meeting date |

[55] https://odishainnovationcell.nic.in/Content/SIC/Articles/RE_Development_Impacts_in_India.pdf

| | |
|---|---|
| 11-April-2013 | 21-April-2013 |

Representative of the project proponent explained the purpose of the meeting and detailed ach questions in the questionnaire. He further explained about the advantages of the wind energy generation and explained how the project would help in reducing demand supply gap in environment friendly manner.

According to the feedback received from the stakeholders, due to the erection of wind farms the socioeconomic situation in the area and the village people's living standard has been improved. It has not only provided employment but also significantly contributed to the infrastructure development likes roads. Local Stakeholder consultation had been carried out during VCS registration of this project activity. There were no comments that required follow up action from PP.

Nevertheless, PP is open for the continuous stakeholder interaction and formed a grievance/suggestion register and a grievance box placed at each project site for the comments at any point of time during the project crediting period. PP has explained this mechanism to the local stakeholders and transparently kept the notice mentioning the grievance register and box at the project site.

For ongoing grievance mechanism, PP has maintained grievance register onsite (at each site ) and no major issues and grievance for the project activity has been identified during the current monitoring period.

## 2.3 AFOLU-Specific Safeguards

Not required as this is a non-AFOLU project activity.

# 3 IMPLEMENTATION STATUS

## 3.1 Implementation Status of the Project Activity

The Project Activity envisages implementation of a 233.1 MW wind power project consisting of 223 Wind Turbine Generators (WTGs).In which 44 WTGs of individual capacity 0.85 MW of Gamesa 58 in Andhra Pradesh and 112 WTGs in Karnataka state of India by Mytrah Vayu Krishna Private Limited.and another 67 Wind Electric Generators of individual capacity 1.5 MW VENSYS 87 in Tamil Nadu state of India by Mytrah Vayu (Majira) Private Limited. All the 223 Wind Turbine Generators (WTGs) which are part of the project activity are commissioned and the commissioning details are provided in Appendix-1. The Project activity is a new facility (Greenfield) and the electricity generated by the project is exported to the Indian electricity grid. The project therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent avails the VCS benefits for the project. The plant was commissioned on 21-February-2014 and it running smoothly with specific schedule

maintenance works. In the Pre- project scenario, the entire electricity, delivered to the grid by the project activity, would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. No any changes occurred during the current monitoring activity which can alter the design of the project activity. No change in project proponent or other entity. The details are same as the registered PD.

The technical specifications are as follows-

For Vagrai Site

| VENSYS 87 (Regen Powertech) | |
|---|---|
| POWER | |
| Rated power | 1500 kW |
| Cut-in wind speed | 3 m/s |
| Rated Wind Speed | 13 m/s |
| Cut-out wind speed | 22 m/s |
| Survival wind speed | 52.5 m/s |
| Generator | Variable Speed, Multi-pole Synchronous with Permanent Magnet Excitation |
| ROTOR | |
| Diameter | 87 |
| Swept area | 5942 sq. m |
| Speed range (variable) | 9 to 17.3 rpm |
| TOWER AND FOUNDATION | |
| Hub height | 85 m |
| Design | Tubular, Four sections |
| Foundation type | Floating foundation |
| CONTROL AND SAFETY SYSTEMS | |
| Control of output | Pitch Regulation |
| Speed control | Variable, Micro-controller based |
| Low Voltage Ride Through (LVRT) | 3 seconds |
| Primary brake system | Aerodynamic Brake, Single Pitch Control/triple redundant |
| Pitch System | Electromechanical, Maintenance Free Toothed Belt Drive (Patented) |
| Remote Monitoring | VPN, Visualization via web-browser |
| TYPE CLASSES | |
| Wind turbine type class | GL III B |
| Blade | |
| Blade model | LM 42.1 P2 |
| Make | LM |
| Length | 42.1 Mtr. |
| Generator | |

| | |
|---|---|
| Capacity | 1.5MW |
| Rated Voltage | 690V |
| Generator type | Direct Drive synchronous PM Excited |
| Number of pole | 88 |
| Winding type | LAP winding |
| Rated RPM | 17.3 |
| No. of phases | 2x3 phases AC Y |
| Insulation class | F |
| Protection Class | IP 23 |
| Cooling system | Passive Air cooling |
| **Converter/Grid output** | |
| Rated output Voltage | 620V |
| Rated output frequency | 50Hz |
| Rated current | 1450A |

For Burgula and Savalsung site

| **Model: Gamesa G58** | |
|---|---|
| Rated power | 0.85 MW |
| Startup WS (Wind speed) | 3.0 m/s |
| Rated wind speed | 12 m/s |
| Cut-out wind speed | 21.0 m/s |
| **Rotor** | |
| Diameter | 58 m |
| Swept area: | 2,642m² |
| Number of blades | 3 |
| Rotor speed, max | 30.8 U/min |
| Tipspeed | 94 m/s |
| Power density | 321.7 W/m² |
| Power density | 3.1 m²/kW |

The project has been under operation since commissioning without any major breakdowns. The break down hours are 3% of total operating hours Though normal breakdowns due to O&M measures are continuously being worked upon by the dedicated O&M contractor for the projects WTGs. There has been no event that may have an impact on the GHG emissions or removals during the current monitoring period.

The O and M entity are as follows-

| S.No | Project entity | Site | O and M entity |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | Mytrah Vayu (Krishna Pvt Ltd | Savalsung | Siemens Gamesa Renewable Power Private Limited |
| 2 | Mytrah Vayu (Manjira) Private Limited | Vagrai | Regen Powertech Private Limited |
| 3 | Mytrah Vayu (Krishna Pvt Ltd | Burgula | Suzlon Global services Pvt ltd |

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

The project has undergone continuous operation and there is no major incident observed for the monitoring period except some maintenance and some breakdowns. The actual emission reductions are 38.39% lower as compared to the estimated emission reductions.

The WTGs are under operation including scheduled shutdowns during the current monitoring period. The breakdown occurred is for a total of 2.30% of total hours of all WTGs and is beyond the control of PP. Therefore, due to this percentage variations of breakdown identified in the current monitoring period also it has no impact in the GHG emissions reductions. The summary of breakdown details in the current monitoring period has been described in the below table

| | | |
|---|---|---|
| Total no of WTG | 223 | |
| Number of WTGs considered for ER calculation | 193 | As 30 are claiming REC |
| Total days in monitoring period | 456 | |
| Total operating hours | 2,112,192 | |
| Total breakdown hours | 48,649 | |
| Break down hours in % | 2.30% | |
| Actual operational hours | 2,061,543 | |
| Operational hours in % | 97.70% | |

## 3.2 Deviations

### 3.2.1 Methodology Deviations

There has not been any methodology deviation during current or previous monitoring period.

### 3.2.2 Project Description Deviations

Deviation applied in current monitoring period-

**Deviation 1**

The geo-cordinates were mentioned incorrect due to typo-error for Vagrai and Savalsung site which are corrected and requested as deviation in current monitoring period. This deviation is applied in Appendix-3. The above change does not have any impact on emission reductions, applicability of the methodology, additionality or the appropriateness of baseline scenario. And, therefore deviation is sought for the same from the registered PD. This deviation is a permanent.

**Deviation -2**

The machine ID for the WTGs were mentioned incorrect for Savalsung site. Same is corrected in Appendix-1 and requested as deviation. The deviation is applied in Appendix-1 The above change does not have any impact on emission reductions, applicability of the methodology, additionality or the appropriateness of baseline scenario. And, therefore deviation is sought for the same from the registered PD. This deviation is a permanent.

**Deviations approved during previous verifications**

Deviation 1 for Mytrah Energy India Limited

This project Tamilnadu site WTGs are under group captive since commissioning. To meet group captive consumers annual energy requirement, banking is done during high wind season ((i.e., from June to October) and then those units will get utilize in low wind season (ie. from Nov to Mar). Due to this process electricity in invoice is different than JMR and cannot be consistent and not appropriate to compare or to take lower values as conservative approach. Also Tamil Nadu Generation and Distribution Corporation deducts Transmission & Distribution loss in generating end while doing the energy allocation. This T&D loss will vary based on consumer drawal voltage (3.06%, 4.24%. Due to above reason, the comparison of JMR and invoices value for Tamilnadu Site (Vagarai) is not appropriate as there is adjustment of electricity due to banking as explained above. Thus PP is considering the JMR value for net electricity supplied to grid and for emission reduction calculations. There is no cross check possible due to difference in JMR and invoice values due to banking for Tamilnadu site, hence only JMR value is considered for ER calculations. State electricity board is doing adjustment in invoice based on JMR value. Hence month wise JMR and invoice is not matching. Since JMRs are issued by state electricity board and authentic, JMR values are considered for ER calculations. There is no material impact on ER calculations as primary source of data are correctly applied for ER calculations.

This was approved in verification for monitoring period of 01-June-2021 to 28-February-2022(including both the dates)

**Deviation-2**

For Burgula site of Andhra Pradesh, there is no individual meter which shows the generation from this site. The combined generation is shown in meter located at 132/33 KV, Racharla and JMR issued for 39.7 MW. This was approved during monitoring period of 01-June-2021 to 28-February-2022. Further section 4.2 and 4.3 can be referred for calculation.

**Deviation-3**

For Burgula site of Andhra Pradesh, export value for 37.4 MW is given and can be used for calculation but the import values need to be apportioned to obtain import for 37.4 MW. This was

approved during monitoring period of 01-June-2021 to 28-February-2022.Further section 4.2 and 4.3 can be referred for calculation.

**Deviation-4**

The invoices for Burgula site is generated on export value. The total generation cannot be cross-checked with invoice. Hence, as conservative approach the minimum of JMR and Invoice is considered for emission reduction. This was approved during 01-June-2021 to 28-February-2022

## 3.3 Grouped Projects

The project is not a grouped project. Hence, this section is not applicable.

# 4 DATA AND PARAMETERS

## 4.1 Data and Parameters Available at Validation

| Data / Parameter | $EF_{grid,OM,y}$ |
|---|---|
| Data unit | $tCO_2/MWh$ |
| Description | Operating Margin $CO_2$ emission factor in year y |
| Source of data | Calculated from CEA database, Version 10, December 2014 |
| Value applied | 0.9887 |
| Justification of choice of data or description of measurement methods and procedures applied | Calculated as per TOOL 07"Tool to calculate the emission factor for an data or description of electricity system, version 05.0[6]" as 3-year generation weighted measurement methods average using data for the years 2011-2012, 2012-2013 & and procedures applied 2013- 2014. The data are obtained from "$CO_2$ Baseline Database for Indian Power Sector" version 10.0[7], published by the Central Electricity Authority, Ministry of Power, Government of India |
| Purpose of Data | For the calculation of the Baseline Emission |
| Comments | This parameter is fixed ex-ante for the entire crediting period. |

| Data / Parameter | $EF_{grid,BM,y}$ |
|---|---|
| Data unit | tCO2/MWh |
| Description | Build Margin $CO_2$ emission factor in year y |
| Source of data | Calculated from CEA database, Version 10, December 2014 |

[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf

[7] https://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver10.pdf

| | |
|---|---|
| Value applied | 0.9609 |
| Justification of choice of data or description of measurement methods and procedures applied | Calculated as per TOOL 07 "Tool to calculate the emission factor for an electricity system, version 05.0" [8]for the year 2013-2014. The data is obtained from "CO2 Baseline Database for Indian Power Sector" version 10.0[9], published by the Central Electricity Authority, Ministry of Power, Government of India. |
| Purpose of Data | For the calculation of the Baseline Emission |
| Comments | This parameter is fixed ex-ante for the entire crediting period. |

| | |
|---|---|
| Data / Parameter | $EF_{grid,CM,y}$ |
| Data unit | $tCO_2/MWh$ |
| Description | Combines Margin $CO_2$ emission factor in year y |
| Source of data | Calculated from CEA database, Version 10, December 2014 |
| Value applied | 0.9817 |
| Justification of choice of data or description of measurement methods and procedures applied | The combined margin emissions factor is calculated as follows:<br>$EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$<br>$EF_{grid,CM,y}$ -= Build margin $CO_2$ emission factor in year y($tCO_2/MWh$)<br>$EF_{grid,OM,y}$ = Operating margin $CO_2$ emission factor in year *y* ($tCO_2/MWh$)<br>$W_{OM}$ = Weighting of operating margin emissions factor (%) = 75%<br>$W_{BM}$= Weighting of build margin emissions factor (%) = 25% |
| Purpose of Data | For the calculation of the Baseline Emission |
| Comments | This parameter is fixed ex-ante for the entire crediting period. |

## 4.2 Data and Parameters Monitored

| | |
|---|---|
| Data / Parameter | $EG_{PJ,Y}$ |
| Data unit | MWh |
| Description | Quantity of net electricity generation supplied by the project (Wind) plant/unit to the grid in year y |

[8] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf

[9] https://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver10.pdf

| | |
|---|---|
| Source of data | Credit note/ JMR/Form B reports from respective state electricity board |
| Description of measurement methods and procedures to be applied | Quantity of net electricity generation supplied by the project (Wind) plant/unit to the grid in year y<br><br>Credit note/ JMR/Form B reports from respective state electricity board<br>Quantity of net electricity generation supplied by the project (Wind) plant/unit to the grid in year y<br>$EG_{PJ,y} = EG_{BLKNy} + EG_{BLTNy} + EG_{BLAPy}$<br>Where,<br>$EG_{BLKNy}$ = $EG_{Export,KN}$ – 115%*$EG_{Import}$ – Transmission Loss ($TE_{,KN}$) $EG_{BLTNy} = EG_{Export} - EG_{Import}$<br>$EG_{BLAPy} = EG_{Export} - EG_{Import} * 37.4/39.7$<br>For Karnataka and Tamil Nadu- The value of net electricity generation supplied to the grid as per Monthly electricity form B /Credit Note or Joint Meter Reading Report forms the basis for calculation of the emission reductions; which can be cross checked from the invoice raised to DISCOM & Adjustment reports (in case of captive utility).<br>For Tamil Nadu site- Net electricity supplied to is calculated as the difference of the measured values of "export" and "import" of electricity through the dedicated SEB energy meter installed at the WTG end.<br>For Karnataka site-<br>Net electricity supplied to is calculated as the difference of the measured values of "export" and "import" of electricity through the dedicated SEB energy meter installed at the 33 KV delivery point.<br>**For Andhra Pradesh**- The value of export can be cross checked with the invoice raised to DISCOM,<br>Net electricity supplied to is calculated as the difference of the measured values of "export" and "import" of electricity through the dedicated SEB energy meter installed at the 220 kv delivery point.<br><br>Monthly meter readings are taken from the main and check meter installed at metering point and certified by the representatives of SEB Officials and the representatives of the project proponent for apportioning procedure refer section 3.3 |
| Frequency of monitoring/recording | Continuous monitoring hourly measurement and at least monthly recording. |
| Value monitored | 375,917.13 |

| | |
|---|---|
| Monitoring equipment | Monitoring: Tri vector meter is used Data type: Measured<br>Type of meter: Static type meter (Main & Check). Both are Bidirectional meters. Class of meter:0.2s for Karnataka and Andhra Pradesh whereas 0.5s for Tamil Nadu. |
| QA/QC procedures to be applied | The calibration of all the meters is undertaken at required intervals and faulty meters are duly replaced immediately. The meters are of accuracy class 0.2s for Karnataka and Andhra Pradesh whereas 0.5s for Tamil Nadu. The meter accuracy class and calibration interval is under purview of state electricity board and PP does not have any control on it. It is also noted that apportioning procedure is under control of state electricity board and PP do not have any control on it. The available parameter to PP is the net electricity supplied to grid and same parameter is mentioned as monitoring parameter The Net electricity exported to the grid is cross checked against the invoice raised by the PP towards the DISCOM and Adjustment Reports in case of captive consumption. For Tamil Nadu site, being group captive consumption banking of electricity is done, hence JMR value is considered for VCU calculations as per deviation request mentioned in section 2.3.2 of VCS PD. |
| Purpose of the data | Calculation of Baseline emissions |
| Calculation method | - |
| Comments | The data would be archived electronically and maintained for the entire crediting period plus two years. |

## 4.3 Monitoring Plan

**Aim of monitoring:**

The monitoring procedure sets guidelines for the project investor to monitor the parameters regularly and to ensure quality and accuracy in monitoring. It elaborates on the functions of the monitoring team and procedures to be followed in monitoring of the VCS parameters.

The monitoring includes all the equipment's that contribute towards reduction in GHG emissions. Since the project activity focuses mainly on the generation of renewable power from the WTGs, it is important to monitor all the equipment's involved in the metering of all the necessary instruments.

The monitoring plan has been prepared in accordance with the applied methodology, ACM0002 Version 16.0. The project investor has a well-defined management structure for monitoring the project activity.

**Monitoring Plan at Karnataka**

The voltage is generated at 690V and stepped up to 33 KV and further connected. The voltage is stepped up to 220 KV by transformer of 33KV/220KV 100 MVA transformer and supplied to grid. The main parameter to be monitored for a wind project is the Quantity of net electricity supplied to the grid as a result of the implementation of the VCS project activity in year y. The parameter is measured as electricity export, import and transmission loss, which was issued by BESCOM officials and recorded in the B-Form and issued monthly to the project proponent. These monthly reports for the entire monitoring period form the basis to report the emission reductions achieved due to the project activity. The project proponent in turn raises the invoices to the BESCOM for the electricity supplied to the grid. The electricity is measured by two-way energy meters of an accuracy class of 0.2s which are calibrated periodically by officials from the BESCOM/KPTCL for billing purpose the value of energy meter installed at 33 kV metering point is used whereas for calculation of transmission loss, energy export Reading at bulk meter installed at high voltage side of transformer of the receiving station 220kV is used.

The procedure for calculation of transmission loss as given in the PPA is set-out below:

Z = ((X1+X2+X3...+Xn)-Y)/((X1+X2+X3...+Xn) ) x 100

Z = Percentage transmission loss for export incurred in transmission line between the meter located at 33 kV metering point and the meters located at bulk 220 metering point (bulk meter: main and check) high voltage side of receiving sub-station.

Xi = Energy Export Reading of energy meter installed at 33 kV metering point

Y = Energy Export Reading at bulk meter installed at high voltage side of transformer of the receiving station 220kV.

X1, X2, X3, Xn are the meters that are installed at 33kV metering point and are connected to the receiving substation by internally connected lines to the receiving station.

The Export Reading Xi is adjusted for transmission loss that is determined by the state utility and is applied directly to the JMR (Form B) taken at 33 kV metering point. This can be checked from the JMR signed jointly by the representatives of PP and the state utility.

Transmission Loss in Export (TE) = Percentage Transmission Loss (Z) * Energy Export at 33kV metering point ($EG_{Export,KN}$)

Empirical Formula for Energy Export after adjustment of transmission loss (Equation 1)

Net Energy Export after adjustment of transmission loss = $EG_{Export,}$ – TE

The transmission loss in export is generally less than 5%. However, in case of Energy Import, the state utility conservatively applies adjustment of 15% to the import values noted at 33 kV metering point

Transmission Loss in Import (TI) = 15% * Energy Import at 33kV metering point ($EG_{Import, KN}$)

Empirical Formula for Energy Import after adjustment of transmission loss (Equation 2)

Net Energy Import after adjustment of transmission loss = $EG_{Import}$+15%*$EG_{Import}$
= 115%* $EG_{import}$

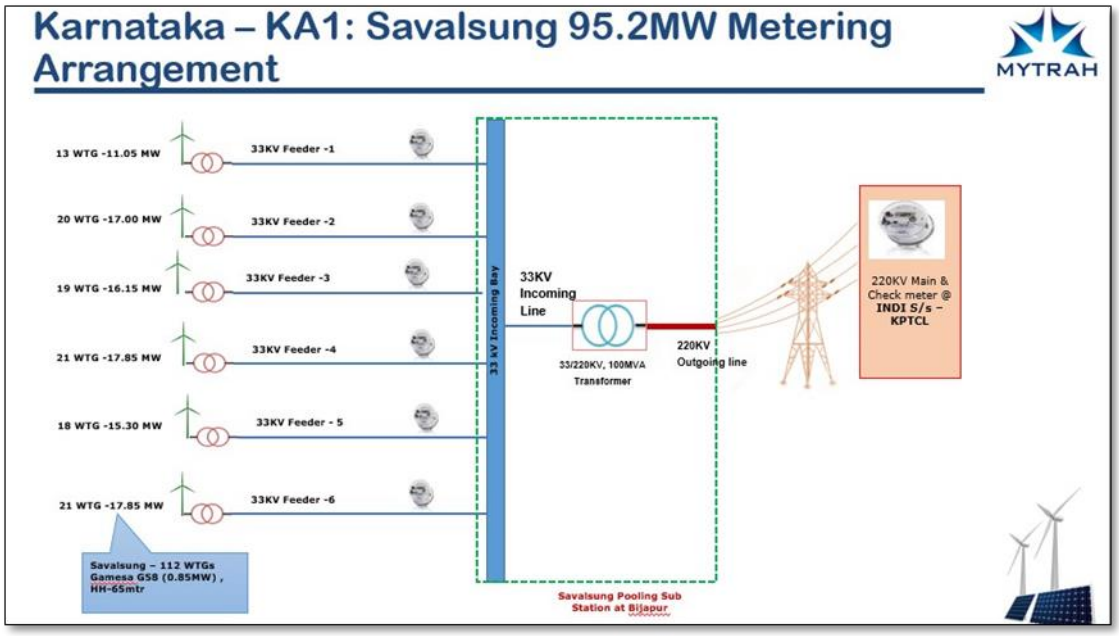
Therefore, Energy Supplied to Grid after adjustment of transmission loss is difference of equation 1 and 2 as given in the Form B signed jointly by representatives of PP and the state utility.

$EG_{BL,KN,y}$ = EG– 115%*EG– Transmission Loss ($T_{E,KN}$)

The Joint meter reading noted at 33 KV metering location contains the following data:-

1. Electricity Export ($EG_{Export,KN}$)
2. Electricity Import ($EG_{Import,KN}$)
3. Transmission Loss ($T_{E,KN}$) between 33 kV metering point and 220 Kv metering point
4. Net Electricity supplied to the Grid [ $EG_{BL,KN,y}$= $EG_{Export,KN}$-115%* $EG_{Import,KN}$–$TE_{,KN}$]

Form B is signed by the representatives of PP and the state utility. The net electricity supplied to the grid can be cross checked from the invoices raised on the state utility for supply of net electricity supplied to the grid.




## Monitoring Plan at Tamil Nadu

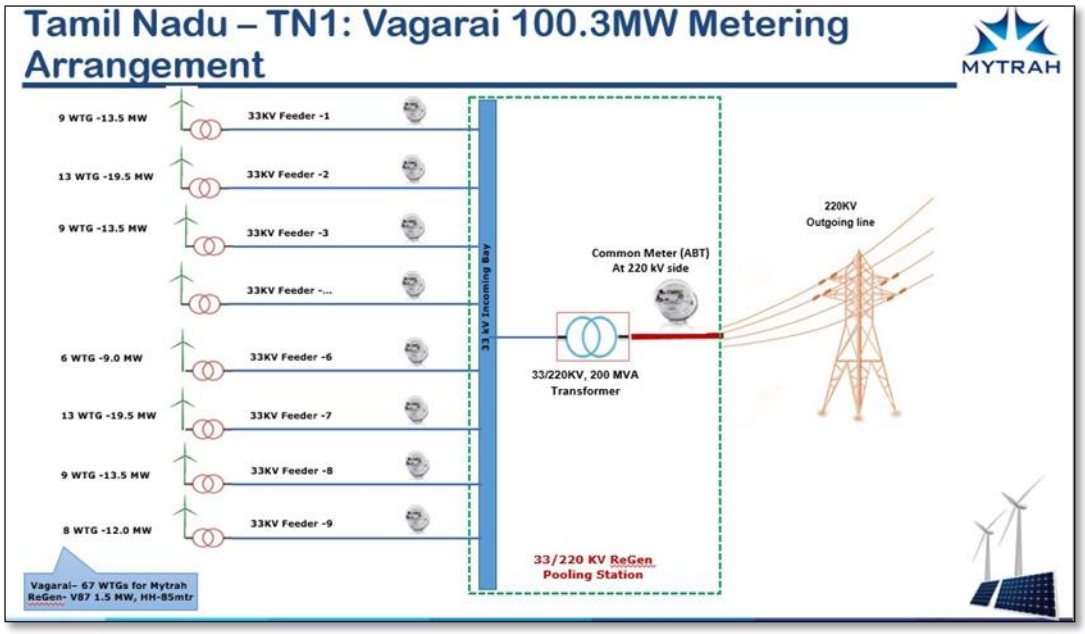
The voltage is generated at 690V and stepped up to 33 KV and further connected.The voltage is stepped up to 220 KV by transformer of 33KV/220KV 200 MVA transformer and supplied to grid.

Reading of net electricity imports & export is taken at the metering point of TNEB, located at yard approximately 5 to 7 meters from the WTG. Each WTG has its individual EB meter, installed by the SEB.The AMR is used to record the readings and same is issued on TNEB Portal every month. The power generated at WTG is sent to TNEB through substation and TNEB sells the power generated to Captive users

The import & export figure at WTG controller is recorded in the excel logbook of Investors representative on a daily basis. This data is preserved both in paper & electronic form. The summary of the generation is submitted by the O&M contractor / Investors representative to the investor on the monthly basis.

The TNEB meter is the main source for monitoring net export to the grid. On mutually decided / SEB official availability date of each month, the reading from the TNEB meter is recorded by the engineers of the SEB in presence of the O & M contractor/ Investors representative. Subsequently the Tamil Nadu Electricity Board statements is prepared.

A monthly statement is issued by the State Utility every month to the Project investor against sale of power. Based on the monthly sale of power, invoice is raised to TNEB.




QA/QC procedures:

Energy meters are calibrated once in a five year and faulty meters are duly replaced immediately. The entire responsibility of this task lies with the state utility. The meters have an accuracy class of at least 0.5s. TNEB has an on-site testing & calibration arrangement; hence there is no need to dismantle the meter for calibration. In case the meters are found faulty and hard to calibrate against the prescribed accuracy class the meter is replaced by the state utility.In very rare occasion, when both meter fails simultaneously, one of the meter will be replaced immediately as per CEA guidelines

If during any of monthly measurement, main meter is found to be beyond permissible limit of error, then meter is calibrated immediately. For the period thereafter the measurement is continued in accordance with the calibrated main meter.

**Data Management and Data Archiving:**

Copies of the break-up sheet, invoices raised on Discom and sales receipts are retained and archived for the entire crediting period plus two years by the project investor.

Procedures for Data Adjustments / Uncertainties:

Data uncertainties are likely under following conditions:

- In case of error in TNEB meter
- When records are lost

If during any of monthly measurement, main meter is found to be beyond permissible limit of error, then meter shall be calibrated immediately & the correction factor applicable for the main meter shall be used for energy computation at time of such test checks. For the period thereafter the measurement shall be continued in accordance with the calibrated main meter. When records are lost, the Tamil Nadu Electricity Board Statements are used as reference.

Meter calibration: The meters are tested for accuracy and calibration of the meters is taken care of, following the applicable guidance. As per the national guidelines given by CEA[10], electricity meters have to be calibrated once in every 5 years,

Hence the meters are scheduled to be calibrated at least once in every five years[11][12]

**Calculation method**

The generated electricity is exported to TNEB grid and the exported electricity is measured by the TNEB energy meter. Representative Officer from Tamil Nadu Electricity Board (TNEB) prepares and provides the TNEB Statement. Once in a month, the designated person takes the TNEB energy meter readings and records the initial and final readings for Export and Import. The difference between the initial and final readings gives net export and net import. The difference between the net export and net import is recorded as Net Generation.

Net exports for Tamil Nadu $EG_{BL, TN,y} = EG_{Export} - EG_{Import}$

**Monitoring Plan at Andhra Pradesh**

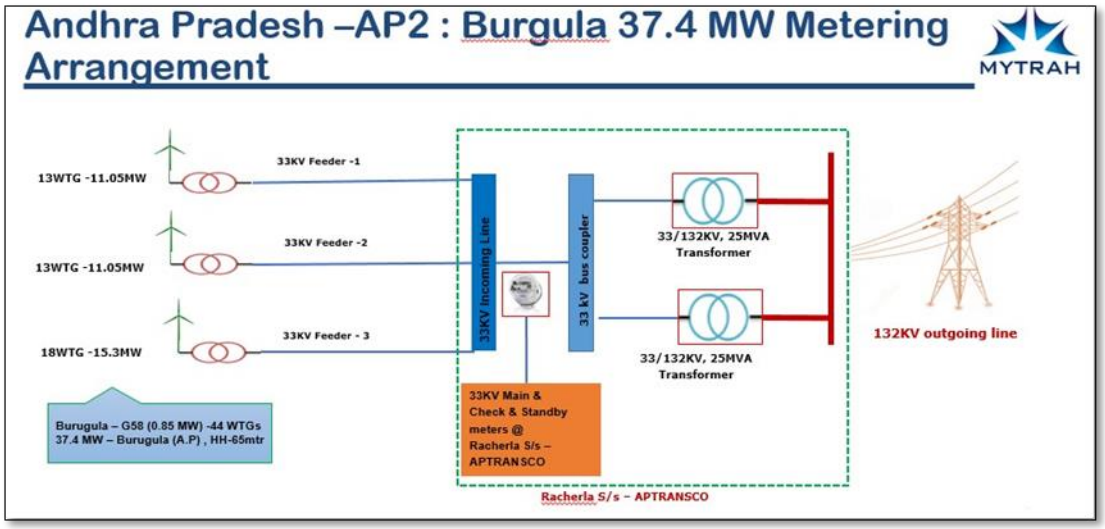
[10] https://www.cbip.org/MIR/1%20DATA/CEA%201.pdf

[12] As per VCS approved PD

The voltage is generated at 690V and stepped up to 33 KV and further connected to feeder. The voltage is stepped up to 132 KV by transformer of 33KV/132KV 25 MVA transformers and supplied to grid.

Metering system and monitoring plan:

- A Joint Meter Reading combined for 39.7 MW is taken at GSS by the representatives of PP and APTRANSCO at the high voltage side of the step up transformer installed at the substation at a particular date.
- In case the main metering system is not in service, then the check metering system is be used until the main system is back to service.
- Meter reading is jointly signed by both the representatives.
- The main and the check metering systems are sealed in presence of representatives of Power producers, and APTRANSCO.
- When any of these metering systems is found to be outside acceptable limits of accuracy or otherwise not functioning properly, it is repaired, recalibrated or replaced.
- PP raises a monthly energy bill/statement based on the JMR at the end of each calendar month and the payment by State Electricity Board is done on this basis. The billing and payment records are maintained by the PP.
- Calibration and Testing of Meters are done once in 5 years.The metering arrangement is mentioned below




**Calculation of data:**

Net exports for Andhra Pradesh $EG_{BL,\ AP,y}$= $EG_{Export}$ – $EG_{Import}$ *(37.4/39.7)

In the event when the individual verification period dates and billing cycle dates of the various WTGs in the project activity do not coincide, then the apportioning procedure is followed as mentioned belowThe deviation was approved in monitoring period o

**QA and QC Procedures**

The electricity meter with accuracy class 0.2s at substation end (i.e. one main and one check meter) are installed.

Data Storage and Archiving All the data items monitored under the monitoring plan will be kept for 2 years after the end of crediting period or till the last issuance of VCUs for this project activity, whichever occurs later. The data will be archived both electronically and manually, and kept in safe storage by PP.

**Apportioning procedure**

In the event when the individual verification period dates and billing cycle dates of the various WTGs in the project activity do not coincide, then the monitoring procedure is-

| | | |
|---|---|---|
| X | : | Sum of generation during partial days of the month recorded at controller meter (kwh) source – Electronic / Manual Log Book |
| Y | : | Total generation during the month recorded at controller meter (kwh/month) |
| Z = X/ Y | : | Ratio |
| B | : | Net Energy export by the WTG as per Monthly Report on Generation and Consumption |
| Z*B | : | Generation of partial days for calculating emission reduction (kwh) |

*Metering Arrangements at respective project sites:*

# 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

## 5.1 Baseline Emissions

As per para 46 of ACM0002 version 16.0, Baseline emissions include only $CO_2$ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

$BE_y$= Baseline emissions in year y ($tCO_2$)

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

$EF_{grid,CM,y}$ = Combined margin $CO_2$ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" ($tCO_2$/MWh)

**Baseline Emissions**

As per the equation 7 of the methodology ACM 0002 (Version 16.0),

$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$ (1)

Where:

$BE_y$ : Baseline emissions in year y ($tCO_2e$/yr)

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

$EF_{grid,CM,y}$ : Combined margin $CO_2$ emission factor for grid connected power generation in year y calculated using the latest version of the TOOL 07"Tool to calculate the emission factor for an electricity system" ($tCO_2e$/MWh) Version 05.0

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

| | | |
|---|---|---|
| $EG_{PJ,y}$ | = | 375,917.13 MWh |
| $EF_{grid,CM,y}$ | = | 0.9817 tCO2e |
| $BE_y$ | = | 375,917.13* 0.9817 |
| | = | 369,034 $tCO_2e$ (Round down value) |

## 5.2 Project Emissions

As per para 37 of ACM0002 version 16, "For all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected

Therefore $PE_y$=0

## 5.3 Leakage

. As per para 60 of ACM0002 version 16, No leakage emissions need to considered for the wind project activity.

Therefore $LE_y=0$

## 5.4 Net GHG Emission Reductions and Removals

As per equation number (13) of the applied methodology, emission reductions are calculated as follows:

$ER_y = BE_y - PE_y$ (7)

Where:

$ER_y$ : Emission reductions in year y ($tCO_2e/yr$)

$BE_y$ : Baseline emissions in year y ($tCO_2e/yr$)

$PE_y$ : Project emissions in year y ($tCO_2e/yr$)

| Year | Baseline emissions or removals ($tCO_2e$) | Project emissions or removals ($tCO_2e$) | Leakage emissions ($tCO_2e$) | Net GHG emission reductions or removals ($tCO_2e$) |
|---|---|---|---|---|
| Year 2022 | 245,914 | 0 | 0 | 245,914 |
| Year 2023 | 123,120 | 0 | 0 | 123,120 |
| Total | 369,034 | 0 | 0 | 369,034 |

| Ex-ante emissions reductions /removals | Achieved emissions reductions /removals | Percent difference | Justification for the difference |
|---|---|---|---|
| 598,982 tCO2 for current monitoring period | 369,034 | -38.39% | This difference is majorily due to the exclusion of 45 MW REC Component not considered for emission reduction calculation to avoid double counting. Also, during current monitoring period, the plant underwent breakdowns which is 2.30% of operating hours of 193 (operational during current monitoring period) WTGs. The generation is also less due to variation in climate conditions such as wind pattern and flow rate throughout the year which are beyond the control of the Project Proponent . Hence the actual emission reductions are 38.39% lower as compared to the estimated emission reductions. The PLF achieved during current monitoring period is 19.12% |

| | | | |
|---|---|---|---|
| | | | whereas registered PLF is 19.90% which is is within sensitivity range of 10%. |

# APPENDIX 1: DATE OF COMMISSIONING

Date of Commissioning of WTGs for Tamil Nadu

| Vagarai@ Tamil Nadu - 100.5 MW(1.5 * 67) | | | |
|---|---|---|---|
| ReGen make Vensys - 87 1.5 MW WTG of model | | | |
| S. No. | Machine ID | HTSC No. | DOC[3] |
| 1. | KOO - 518 | DRA 001 | 1-June-2014 |
| 2. | KOO - 1359 | DRA 003 | 1-June-2014 |
| 3. | APY - 241 | DRA 004 | 1-June-2014 |
| 4. | APY - 416 | DRA 005 | 1-June-2014 |
| 5. | PAR - 9 | DRA 006 | 1-June-2014 |
| 6. | PON - 534 | DRA 008 | 1-June-2014 |
| 7. | PON - 1043 | DRA 009 | 1-June-2014 |
| 8. | NAL-119 | DRA 012 | 1-June-2014 |
| 9. | NAL - 81 | DRA 013 | 1-June-2014 |
| 10. | NAL - 57 | DRA 015 | 1-June-2014 |
| 11. | MAN - 210 | DRA 017 | 1-June-2014 |
| 12. | MAN - 898 | DRA 018 | 1-June-2014 |
| 13. | MAN - 802 | DRA 021 | 1-June-2014 |
| 14. | KON - 556 | DRA 022 | 1-June-2014 |
| 15. | KON - 563 | DRA 023 | 1-June-2014 |
| 16. | KON - 590 | DRA 024 | 1-June-2014 |
| 17. | KON - 640 | DRA 025 | 1-June-2014 |
| 18. | KON - 658 | DRA 026 | 1-June-2014 |
| 19. | KON - 621 | DRA 027 | 1-June-2014 |
| 20. | KON - 501 | DRA 031 | 1-June-2014 |
| 21. | ALA - 1639 | DRA 043 | 23-June-2014 |
| 22. | ALA - 1946 | DRA 044 | 23-June-2014 |
| 23. | NAL - 434 | DRA 049 | 23-June-2014 |
| 24. | KON - 234 | DRA 054 | 14-July-2014 |
| 25. | PAR - 50 | DRA 007 | 1-June-2014 |
| 26. | MAN - 625 | DRA 032 | 1-June-2014 |
| 27. | MAN - 604 | DRA 033 | 1-June-2014 |
| 28. | ALA-2301/2304 | DRA 046 | 23-June-2014 |
| 29. | ALA - 1569 | DRA 047 | 23-June-2014 |
| 30. | ALA-2352 | DRA 048 | 23-June-2014 |
| 31. | KOO - 1157 | DRA 002 | 1-June-2014 |
| 32. | PON - 1081 | DRA 010 | 1-June-2014 |
| 33. | MAN - 940 | DRA 019 | 1-June-2014 |

| | | | |
|---|---|---|---|
| 34. | PON - 1565 | DRA 037 | 23-June-2014 |
| 35. | PON - 1568 | DRA 038 | 23-June-2014 |
| 36. | VEL - 1936 | DRA 039 | 23-June-2014 |
| 37. | ALA - 1618 | DRA 042 | 23-June-2014 |
| 38. | PON - 908 | DRA 050 | 23-June-2014 |
| 39. | PON - 1203 | DRA 052 | 23-June-2014 |
| 40. | MAN - 963 | DRA 055 | 16-July-2014 |
| 41. | PON - 1021 | DRA 011 | 1-June-2014 |
| 42. | KUL - 652 | DRA 014 | 1-June-2014 |
| 43. | PON - 4 | DRA 016 | 1-June-2014 |
| 44. | MAN-828 | DRA 020 | 1-June-2014 |
| 45. | KON - 618 | DRA 028 | 1-June-2014 |
| 46. | KON-395 | DRA 029 | 1-June-2014 |
| 47. | KON-451 | DRA 030 | 1-June-2014 |
| 48. | APA-84 | DRA 034 | 1-June-2014 |
| 49. | PUN-270 | DRA 035 | 1-June-2014 |
| 50. | PUN - 34 | DRA 036 | 4-June-2014 |
| 51. | VEL-1702 | DRA 040 | 23-June-2014 |
| 52. | KAL-93 | DRA 041 | 23-June-2014 |
| 53. | ALA-2290 | DRA 045 | 23-June-2014 |
| 54. | PON - 775 | DRA 051 | 23-June-2014 |
| 55. | ALA - 2260 | DRA 053 | 23-June-2014 |
| 56. | MET 1664 | DRA 065 | 09-January-2015 |
| 57. | NAL - 445 | DRA 061 | 03-December-2014 |
| 58. | KOO-1036 | DRA 056 | 31-October-2014 |
| 59. | VEL-1540 | DRA 060 | 03-December-2014 |
| 60. | KOO-1174 | DRA 058 | 31-October-2014 |
| 61. | KOO-1000 | DRA 057 | 31-October-2014 |
| 62. | PON-1304 | DRA 059 | 31-October-2014 |
| 63. | APY-247 | DRA 064 | 06-January-2015 |
| 64. | KON-411 | DRA 67 | 26-February-2015 |
| 65. | KOO - 581 | DRA 062 | 18-December-2014 |
| 66. | VEL - 2119 | DRA 063 | 24-December-2014 |
| 67. | ALA 1385 | DRA 066 | 04-February-2015 |

Date of commissioning of WTG at Karnataka

| Savalsang@ Karnataka - 95.20 MW (0.85*112) | | |
|---|---|---|
| Gamesa Make WTG model G53/850 kW | | |
| S. No. | Machine ID | DOC |
| 1 | SVG15 | 02-June-2014 |
| 2 | SVG16 | 02-June-2014 |
| 3 | SVG17 | 03-May-2014 |
| 4 | SVG18 | 03-May-2014 |
| 5 | SVG19 | 03-May-2014 |
| 6 | SVG20 | 03-May-2014 |
| 7 | SVG22 | 30-April-2014 |
| 8 | SVG23 | 29-April-2014 |
| 9 | SVG25 | 29-April-2014 |
| 10 | SVG26 | 01-May-2014 |
| 11 | SVG27 | 29-April-2014 |
| 12 | SVG28 | 30-April-2014 |
| 13 | SVG29 | 30-April-2014 |
| 14 | SVG30 | 01-May-2014 |
| 15 | SVG31 | 01-May-2014 |
| 16 | SVG32 | 10-May-2014 |
| 17 | SVG33 | 02-May-2014 |
| 18 | SVG34 | 01-May-2014 |
| 19 | SVG35 | 01-May-2014 |
| 20 | SVG37 | 04-May-2014 |
| 21 | SVG39 | 01-May-2014 |
| 22 | SVG40 | 01-May-2014 |
| 23 | SVG41 | 01-May-2014 |
| 24 | SVG42 | 01-May-2014 |
| 25 | SVG43 | 02-January-2015 |
| 26 | SVG47 | 01-May-2014 |
| 27 | SVG48 | 30-April-2014 |
| 28 | SVG49 | 04-May-2014 |
| 29 | SVG50 | 01-May-2014 |
| 30 | SVG51 | 29-April-2014 |
| 31 | SVG52 | 30-April-2014 |
| 32 | SVG53 | 30-April-2014 |
| 33 | SVG54 | 06-August-2014 |
| 34 | SVG57 | 03-May-2014 |
| 35 | SVG58 | 03-May-2014 |
| 36 | SVG60 | 01-May-2014 |
| 37 | SVG62 | 01-May-2014 |

| | | |
|---|---|---|
| 38 | SVG63 | 01-May-2014 |
| 39 | SVG64 | 01-May-2014 |
| 40 | SVG65 | 01-May-2014 |
| 41 | SVG66 | 01-May-2014 |
| 42 | SVG68 | 02-June-2014 |
| 43 | SVG74 | 02-June-2014 |
| 44 | SVG75 | 03-May-2014 |
| 45 | SVG76 | 03-May-2014 |
| 46 | SVG83 | 06-August-2014 |
| 47 | SVG84 | 05-June-2014 |
| 48 | SVG85 | 01-May-2014 |
| 49 | SVG88 | 05-May-2014 |
| 50 | SVG90 | 06-May-2014 |
| 51 | SVG91 | 06-May-2014 |
| 52 | SVG94 | 31-December-2014 |
| 53 | SVG96 | 01-May-2014 |
| 54 | SVG97 | 02-June-2014 |
| 55 | SVG101 | 10-May-2014 |
| 56 | SVG103 | 03-May-2014 |
| 57 | SVG105 | 10-May-2014 |
| 58 | SVG106 | 30-April-2014 |
| 59 | SVG107 | 30-April-2014 |
| 60 | SVG108 | 29-April-2014 |
| 61 | SVG109 | 29-April-2014 |
| 62 | SVG110 | 29-April-2014 |
| 63 | SVG111 | 03-May-2014 |
| 64 | SVG112 | 02-May-2014 |
| 65 | SVG118 | 11-May-2014 |
| 66 | SVG119 | 03-May-2014 |
| 67 | SVG120 | 29-April-2014 |
| 68 | SVG122 | 02-May-2014 |
| 69 | SVG123 | 03-May-2014 |
| 70 | SVG125 | 23-August-2014 |
| 71 | SVG126 | 05-May-2014 |
| 72 | SVG128 | 02-June-2014 |
| 73 | SVG129 | 02-June-2014 |
| 74 | SVG131 | 02-June-2014 |
| 75 | SVG132 | 02-June-2014 |
| 76 | SVG134 | 02-June-2014 |
| 77 | SVG135 | 02-June-2014 |

| | | |
|---|---|---|
| 78 | SVG136 | 02-June-2014 |
| 79 | SVG137 | 02-June-2014 |
| 80 | SVG138 | 21-May-2014 |
| 81 | SVG139 | 11-August-2014 |
| 82 | SVG140 | 07-August-2014 |
| 83 | SVG141 | 06-August-2014 |
| 84 | SVG143 | 06-August-2014 |
| 85 | SVG144 | 06-August-2014 |
| 86 | SVG145 | 06-August-2014 |
| 87 | SVG147 | 06-August-2014 |
| 88 | SVG148 | 06-August-2014 |
| 89 | SVG150 | 02-June-2014 |
| 90 | SVG153 | 06-August-2014 |
| 91 | SVG154 | 29-April-2014 |
| 92 | SVG155 | 29-April-2014 |
| 93 | SVG156 | 29-April-2014 |
| 94 | SVG157 | 03-May-2014 |
| 95 | SVG165 | 03-May-2014 |
| 96 | SVG166 | 02-June-2014 |
| 97 | SVG168 | 02-June-2014 |
| 98 | SVG170 | 01-May-2014 |
| 99 | SVG172 | 31-December-2014 |
| 100 | SVG173 | 11-December-2014 |
| 101 | SVG174 | 03-January-2015 |
| 102 | SVG175 | 31-December-2014 |
| 103 | SVG176 | 31-December-2014 |
| 104 | SVG177 | 31-December-2014 |
| 105 | SVG178 | 06-August-2014 |
| 106 | SVG179 | 02-January-2015 |
| 107 | SVG180 | 31-December-2014 |
| 108 | SVG193 | 10-August-2014 |
| 109 | SVG194 | 12-August-2014 |
| 110 | SVG195 | 06-August-2014 |
| 111 | SVG196 | 06-August-2014 |
| 112 | SVG197 | 31-December-2014 |

Date of Commissioning at Andhra Pradesh

| Burugula @ Andhra Pradesh - 37.40MW (0.85* 44) | | |
|---|---|---|
| Gamesa Make WTG model G53/850 kW | | |
| S. No. | Machine ID | DOC |
| 1 | Location No. 508 | 21-February-2014 |
| 2 | Location No. 509 | 21-February-2014 |
| 3 | Location No. 510 | 21-February-2014 |
| 4 | Location No. 511 | 21-February-2014 |
| 5 | Location No. 512 | 21-February-2014 |
| 6 | Location No. 513 | 21-February-2014 |
| 7 | Location No. 514 | 21-February-2014 |
| 8 | Location No. 515 | 21-February-2014 |
| 9 | Location No. 516 | 21-February-2014 |
| 10 | Location No. 517 | 21-February-2014 |
| 11 | Location No. 518 | 21-February-2014 |
| 12 | Location No. 519 | 21-February-2014 |
| 13 | Location No. 520 | 21-February-2014 |
| 14 | Location No. 521 | 21-February-2014 |
| 15 | Location No. 522 | 21-February-2014 |
| 16 | Location No. 523 | 21-February-2014 |
| 17 | Location No. 524 | 21-February-2014 |
| 18 | Location No. 525 | 21-February-2014 |
| 19 | Location No. 526 | 21-February-2014 |
| 20 | Location No. 527 | 21-February-2014 |
| 21 | Location No. 528 | 21-February-2014 |
| 22 | Location No. 529 | 21-February-2014 |
| 23 | Location No. 530 | 21-February-2014 |
| 24 | Location No. 531 | 21-February-2014 |
| 25 | Location No. 550 | 21-February-2014 |

| | | |
|---|---|---|
| 26 | Location No. 551 | 21-February-2014 |
| 27 | Location No. 532 | 15-March-2014 |
| 28 | Location No. 533 | 15-March-2014 |
| 29 | Location No. 534 | 15-March-2014 |
| 30 | Location No. 535 | 15-March-2014 |
| 31 | Location No. 536 | 15-March-2014 |
| 32 | Location No. 537 | 15-March-2014 |
| 33 | Location No. 538 | 15-March-2014 |
| 34 | Location No. 539 | 15-March-2014 |
| 35 | Location No. 540 | 15-March-2014 |
| 36 | Location No. 541 | 15-March-2014 |
| 37 | Location No. 542 | 15-March-2014 |
| 38 | Location No. 543 | 15-March-2014 |
| 39 | Location No. 544 | 15-March-2014 |
| 40 | Location No. 545 | 15-March-2014 |
| 41 | Location No. 546 | 15-March-2014 |
| 42 | Location No. 547 | 15-March-2014 |
| 43 | Location No. 548 | 15-March-2014 |
| 44 | Location No. 549 | 15-March-2014 |

# APPENDIX II: CALIBRATION DETAILS

Vagarai Tamil Nadu state 55.5 MW (37*1.5 MW WTGs)[13] 33 KV Substation

| S. No. | HTSC No. | Meter S. No. | Substation | Calibration date | Due date of calibration[14] |
|---|---|---|---|---|---|
| 1. | DRA 002 | 4321945 | 33 Kv | 25-May-2017 | 24-May-2022 |
| 2. | DRA 010 | 4322515 | 33 Kv | 23-May-2017 | 22-May-2022 |
| 3. | DRA 019 | 4322252 | 33 Kv | 22-May-2017 | 21-May-2022 |
| 4. | DRA 037 | 4322069 | 33 Kv | 20-May-2017 | 19-May-2022 |
| 5. | DRA 038 | 4321884 | 33 Kv | 20-May-2017 | 19-May-2022 |
| 6. | DRA 039 | 4322063 | 33 Kv | 05-May-2017 | 04-May-2022 |
| 7. | DRA 042 | 4321949 | 33 Kv | 20-May-2017 | 19-May-2022 |
| 8. | DRA 050 | 4322064 | 33 Kv | 20-May-2017 | 19-May-2022 |
| 9. | DRA 052 | 4321888 | 33 Kv | 20-May-2017 | 19-May-2022 |
| 10. | DRA 055 | 4322067 | 33 Kv | 22-May-2017 | 21-May-2022 |
| 11. | DRA 011 | 4322519 | 33 Kv | 23-May-2017 | 22-May-2022 |
| 12. | DRA 014 | 4322517 | 33 Kv | 23-May-2017 | 22-May-2022 |
| 13. | DRA 016 | 4322521 | 33 Kv | 23-May-2017 | 22-May-2022 |
| 14. | DRA 020 | 4322433 | 33 Kv | 23-May-2017 | 22-May-2022 |
| 15. | DRA 028 | 4322566 | 33 Kv | 22-May-2017 | 21-May-2022 |
| 16. | DRA 029 | 4322574 | 33 Kv | 22-May-2017 | 21-May-2022 |
| 17. | DRA 030 | 4322374 | 33 Kv | 22-May-2017 | 21-May-2022 |
| 18. | DRA 034 | 4321977 | 33 Kv | 23-May-2017 | 22-May-2022 |
| 19. | DRA 035 | 4322581 | 33 Kv | 22- May- 2017 | 21-May-2022 |
| 20. | DRA 036 | 4322582 | 33 Kv | 22- May- 2017 | 21- May -2022 |
| 21. | DRA 040 | 4322160 | 33 Kv | 25- May- 2017 | 24- May -2022 |
| 22. | DRA 041 | 4321952 | 33 Kv | 25- May -2017 | 24- May -2022 |
| 23. | DRA 045 | 4321943 | 33 Kv | 20- May -2017 | 19- May -2022 |
| 24. | DRA 051 | 4322065 | 33 Kv | 20- May -2017 | 19- May -2022 |
| 25. | DRA 053 | 4321944 | 33 Kv | 20- May -2017 | 19- May -2022 |

[13] PP is claiming VCS benefits for only 37 WTGs out of 67 WTGs. Rest 30 WTGs are availing Renewable Energy Certificate (REC) benefits. Meter calibration of the 37 WTGs claiming VCS benefits was done at the date of commissioning. Later on these meters were changed in the year 2017 (respective dates are mentioned in the table above). The calibration records of newly installed meters have been submitted to the DOE and the due date of calibration for the respective meters are mentioned in the above table

[14] As ,meters were not calibrated during current monitoring period, hence error factor is applied in month of may and June due to delay in calibration,

| | | | | | |
|---|---|---|---|---|---|
| 26. | DRA 065 | 4322579 | 33 Kv | 22- May -2017 | 21- May -2022 |
| 27. | DRA 061 | 4322154 | 33 Kv | 20- May -2017 | 19- May -2022 |
| 28. | DRA 056 | 4321973 | 33 Kv | 25- May -2017 | 24- May -2022 |
| 29. | DRA 060 | 4321948 | 33 Kv | 20- May -2017 | 19- May -2022 |
| 30. | DRA 058 | 4322514 | 33 Kv | 23- May -2017 | 22- May -2022 |
| 31. | DRA 057 | 4322513 | 33 Kv | 23- May -2017 | 22- May -2022 |
| 32. | DRA 059 | 4322068 | 33 Kv | 20- May -2017 | 19- May -2022 |
| 33. | DRA 064 | 4322066 | 33 Kv | 20- May -2017 | 19- May -2022 |
| 34. | DRA 067 | 4322573 | 33 Kv | 22- May -2017 | 21- May -2022 |
| 35. | DRA 062 | 4321892 | 33 Kv | 25-May-2017 | 24-May-2022 |
| 36. | DRA 063 | 4322158 | 33 Kv | 20.May-2017 | 19-May-2022 |
| 37 | DRA 066 | 4321947 | 33 Kv | 20.May-2017 | 19-May-2022 |

Calibration details for Karnataka site WTGs 95.2 MW (112*0.85 MW WTGs) 33 KV Substation

| Location | Meter Type | Meter Serial Number | Make | Substation | Accuracy Class | Calibration Date | Due date of Calibration |
|---|---|---|---|---|---|---|---|
| Feeder 1 | Main Meter | 13191120 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| | Check Meter | 13191121 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| Feeder 2 | Main Meter | 13191094 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| | Check Meter | 13191095 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| Feeder 3 | Main Meter | 13191100 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| | Check Meter | 13191104 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| Feeder 4 | Main Meter | 13191096 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| | Check meter | 13191097 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| Feeder 5 | Main Meter | 13191114 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| | Check Meter | 13191122 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |
| Feeder 6 | Main Meter | 13191159 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Check Meter | 13191380 | L & T | 33Kv | 0.2s | 23-September-2020 | 22-September-2025 |

Calibration details for Andhra Pradesh site WTGs 37.4 MW (44*0.85 MW WTGs) 33K Kv wind metering

| Meter Type | Meter meter Serial | Calibration Date | Substation | Due Date | New calibration | Due date |
|---|---|---|---|---|---|---|
| Main Meter | APX01701 | 28-July-2017 | 33 Kv | 27-July-2022 | 14-Feb-2022 | 13-Feb-2027 |
| Check Meter | APX01702 | 28-July-2017 | 33 Kv | 27-July-2022 | 14-Feb-2022 | 13-Feb-2027 |
| Standby Meter | APX01703 | 28-July-2017 | 33 Kv | 27-July-2022 | 14-Feb-2022 | 13-Feb-2027 |

# APPENDIX III: WTG LOCATIONS

For Tamil Nadu

| S.No. | Machine ID | Feeder Nos. | Latitude | Longitude |
|---|---|---|---|---|
| 1 | KOO-518 | Feeder 9 | 10.69948341 N | 77.6882558 E |
| 2 | KOO-1359 | | 10.66563968 N | 77.65962324 E |
| 3 | APY-241 | Feeder 5 | 10.65021639 N | 77.64901256 E |
| 4 | APY-416 | | 10.67020783 N | 77.62907088 E |
| 5 | PAR-09 | | 10.66760795 N | 77.6115463 E |
| 6 | PON-534 | | 10.68803933 N | 77.59283778 E |
| 7 | PON-1043 | | 10.68473981 N | 77.60821209 E |
| 8 | NAL-119 | Feeder 2 | 10.7208402 N | 77.58716885 E |
| 9 | NAL-81 | Feeder 5 | 10.72735208 N | 77.58532376 E |
| 10 | NAL-57 | | 10.72995488 N | 77.57654703 E |
| 11 | MAN-210 | Feeder 9 | 10.69502488 N | 77.57087056 E |
| 12 | MAN-898 | | 10.67605028 N | 77.57193498 E |
| 13 | MAN-802 | | 10.67881165 N | 77.55364153 E |
| 14 | KON-556 | Feeder 4 | 10.6625153 N | 77.55755231 E |
| 15 | KON-563 | | 10.65892169 N | 77.56165127 E |
| 16 | KON-590 | | 10.65451458 N | 77.55915715 E |
| 17 | KON-640 | | 10.65735343 N | 77.55342588 E |
| 18 | KON-658 | | 10.65283678 N | 77.54550489 E |
| 19 | KON-621 | | 10.64871125 N | 77.55058605 E |
| 20 | KON-501 | Feeder 3 | 10.66499329 N | 77.52838599 E |
| 21 | ALA-1639 | Feeder 8 | 10.76318948 N | 77.61626788 E |
| 22 | ALA-1946 | | 10.76326328 N | 77.62570771 E |
| 23 | NAL-434 | Feeder 6 | 10.73760525 N | 77.62759636 E |
| 24 | KON-234 | | 10.64497336 N | 77.52904287 E |
| 25 | PAR-50 | Feeder 5 | 10.67281499 N | 77.60039121 E |
| 26 | MAN-625 | Feeder 3 | 10.67788177 N | 77.53579195 E |
| 27 | MAN-604 | Feeder 2 | 10.68348459 N | 77.53683425 E |
| 28 | ALA-2301 | Feeder 8 | 10.75886068 N | 77.63132567 E |
| 29 | ALA-1569 | | 10.75463624 N | 77.6265833 E |
| 30 | ALA-2352 | | 10.74110802 N | 77.63007535 E |
| 31 | KOO-1157 | Feeder 2 | 10.68178844 N | 77.68985383 E |
| 32 | PON-1081 | | 10.68348435 N | 77.61787566 E |
| 33 | MAN-940 | Feeder 9 | 10.66893415 N | 77.56925334 E |
| 34 | PON-1565 | | 10.69642995 N | 77.65552456 E |
| 35 | PON-1568 | Feeder 6 | 10.69303118 N | 77.6535857 E |
| 36 | VEL-1936 | Feeder 8 | 10.73813524 N | 77.68816772 E |

| | | | | |
|---|---|---|---|---|
| 37 | ALA-1618 | Feeder 9 | 10.75944434 N | 77.6049963 E |
| 38 | PON-908 | Feeder 8 | 10.71374814 N | 77.62914446 E |
| 39 | PON-1203 | Feeder 6 | 10.69438029 N | 77.63405677 E |
| 40 | MAN-963 | Feeder 7 | 10.66329726 N | 77.56688572 E |
| 41 | PON-1021 | Feeder 2 | 10.68974267 N | 77.61070314 E |
| 42 | KOL-652 | Feeder 5 | 10.7374949 N | 77.57384237 E |
| 43 | PON-4 | | 10.71893637 N | 77.58140577 E |
| 44 | MAN-828 | Feeder 9 | 10.67012558 N | 77.55507631 E |
| 45 | KON-618 | Feeder 3 | 10.6446245 N | 77.54867946 E |
| 46 | KON-395 | | 10.64247133 N | 77.52219864 E |
| 47 | KON-451 | Feeder 2 | 10.65236689 N | 77.52989861 E |
| 48 | APA-84 | Feeder 3 | 10.64182591 N | 77.56167279 E |
| 49 | PUN-270 | | 10.60746419 N | 77.54929363 E |
| 50 | PUN-34 | | 10.63256556 N | 77.56924986 E |
| 51 | VEL-1702 | Feeder 9 | 10.75513671 N | 77.69153445 E |
| 52 | KAL-093 | Feeder 8 | 10.76334694 N | 77.69804901 E |
| 53 | ALA-2290 | | 10.76527764 N | 77.63428714 E |
| 54 | PON-775 | Feeder 6 | 10.71842551 N | 77.61554436 E |
| 55 | ALA-2260 | | 10.75628612 N | 77.6376538 E |
| 56 | MET-164 | Feeder 7 | 10.61592339 N | 77.56684556 E |
| 57 | NAL-445 | | 10.73391078 N | 77.63495601 E |
| 58 | KOO-1036 | Feeder 6 | 10.68513012 N | 77.6699966 E |
| 59 | VEL-1540 | | 10.75739179 N | 77.66053403 E |
| 60 | KOO-1174 | Feeder 7 | 10.67220444 N | 77.68962334 E |
| 61 | KOO-1000 | | 10.67217045 N | 77.67146366 E |
| 62 | PON-1304 | | 10.70991951 N | 77.63314951 E |
| 63 | APY-247 | | 10.65429232 N | 77.65102078 E |
| 64 | KON-411 | | 10.64434508 N | 77.51504326 E |
| 65 | KOO-581 | | 10.69196175 N | 77.68144785 E |
| 66 | VEL-2119 | | 10.72574112 N | 77.64794111 E |
| 67 | ALA-1385 | | 10.71111522 N | 77.64877317 E |

For Andhra Pradesh

| S. No. | Feeder Nos. | Location No. | Latitude | Longitude |
|---|---|---|---|---|
| 1 | Feeder 1 | 508 | 15.154461 N | 77.922135 E |
| 2 | | 510 | 15.157268 N | 77.921522 E |
| 3 | | 511 | 15.158979 N | 77.923322 E |
| 4 | | 513 | 15.161872 N | 77.923761 E |
| 5 | | 514 | 15.163549 N | 77.923292 E |
| 6 | | 515 | 15.165388 N | 77.922815 E |

| | | | | |
|---|---|---|---|---|
| 7 | | 516 | 15.166574 N | 77.921892 E |
| 8 | | 517 | 15.167997 N | 77.920787 E |
| 9 | | 518 | 15.16929 N | 77.919977 E |
| 10 | | 519 | 15.170968 N | 77.918066 E |
| 11 | | 520 | 15.172449 N | 77.918783 E |
| 12 | Feeder 2 | 528 | 15.185218 N | 77.923655 E |
| 13 | | 529 | 15.186921 N | 77.923976 E |
| 14 | | 530 | 15.189489 N | 77.925118 E |
| 15 | | 531 | 15.190881 N | 77.925026 E |
| 16 | Feeder 3 | 532 | 15.206692 N | 77.937622 E |
| 17 | | 533 | 15.208101 N | 77.938972 E |
| 18 | | 534 | 15.209818 N | 77.940958 E |
| 19 | | 535 | 15.211871 N | 77.942781 E |
| 20 | | 536 | 15.215178 N | 77.947515 E |
| 21 | | 537 | 15.216917 N | 77.949166 E |
| 22 | | 538 | 15.218416 N | 77.950564 E |
| 23 | | 539 | 15.221591 N | 77.953603 E |
| 24 | | 540 | 15.225099 N | 77.957372 E |
| 25 | | 541 | 15.226569 N | 77.958248 E |
| 26 | | 542 | 15.228387 N | 77.959399 E |
| 27 | | 543 | 15.229998 N | 77.960501 E |
| 28 | | 545 | 15.223820 N | 77.956471 E |
| 29 | Feeder 3 | 546 | 15.213598 N | 77.946804 E |
| 30 | | 547 | 15.204944 N | 77.93730 E |
| 31 | Feeder 2 | 551 | 15.188055 N | 77.924987 E |
| 32 | Feeder 1 | 509 | 15.155886 N | 77.920862 E |
| 33 | | 512 | 15.160386 N | 77.923416 E |
| 34 | Feeder 2 | 521 | 15.174326 N | 77.91959 E |
| 35 | | 522 | 15.175897 N | 77.92030 E |
| 36 | | 523 | 15.177475 N | 77.921177 E |
| 37 | | 524 | 15.179081 N | 77.921943 E |
| 38 | | 525 | 15.180875 N | 77.922916 E |
| 39 | | 526 | 15.182457 N | 77.923515 E |
| 40 | | 527 | 15.183845 N | 77.923022 E |
| 41 | Feeder 3 | 544 | 15.231485 N | 77.961368 E |
| 42 | | 548 | 15.202938 N | 77.936743 E |
| 43 | | 549 | 15.201556 N | 77.936035 E |
| 44 | Feeder 2 | 550 | 15.192441 N | 77.927995 E |

**For Karnataka**

| S.No | Machine ID | Feeder Nos. | Latitude (N) | Longitude (E) |
|---|---|---|---|---|
| 1. | SVG15 | Feeder-01 | 17.1604 N | 75.717 E |
| 2. | SVG16 | | 17.1588 N | 75.7173 E |
| 3. | SVG17 | | 17.1582 N | 75.7219 E |
| 4. | SVG18 | | 17.1568 N | 75.7226 E |
| 5. | SVG19 | | 17.1546 N | 75.7241 E |
| 6. | SVG20 | | 17.1531 N | 75.7245 E |
| 7. | SVG22 | | 17.151 N | 75.7408 E |
| 8. | SVG23 | | 17.1477 N | 75.7429 E |
| 9. | SVG25 | | 17.1441 N | 75.7392 E |
| 10. | SVG26 | | 17.1429 N | 75.7406 E |
| 11. | SVG27 | | 17.1406 N | 75.7408 E |
| 12. | SVG28 | | 17.1332 N | 75.7316 E |
| 13. | SVG29 | | 17.1316 N | 75.7308 E |
| 14. | SVG30 | Feeder-02 | 17.1507 N | 75.7137 E |
| 15. | SVG31 | | 17.1493 N | 75.7122 E |
| 16. | SVG32 | | 17.1475 N | 75.7111 E |
| 17. | SVG33 | | 17.146 N | 75.7116 E |
| 18. | SVG34 | | 17.1434 N | 75.7105 E |
| 19. | SVG35 | | 17.1421 N | 75.7089 E |
| 20. | SVG37 | | 17.139 N | 75.713 E |
| 21. | SVG39 | | 17.1448 N | 75.715 E |
| 22. | SVG40 | | 17.1432 N | 75.7164 E |
| 23. | SVG41 | | 17.1415 N | 75.7166 E |
| 24. | SVG42 | | 17.1395 N | 75.7167 E |
| 25. | SVG43 | | 17.1368 N | 75.7175 E |
| 26. | SVG47 | | 17.1304 N | 75.7266 E |
| 27. | SVG48 | | 17.1497 N | 75.742 E |
| 28. | SVG49 | | 17.1479 N | 75.7089 E |
| 29. | SVG50 | | 17.1233 N | 75.734 E |
| 30. | SVG51 | | 17.1217 N | 75.7234 E |
| 31. | SVG52 | | 17.12 N | 75.7237 E |
| 32. | SVG53 | | 17.1184 N | 75.7267 E |
| 33. | SVG54 | | 17.1395 N | 75.7064 E |
| 34. | SVG57 | | 17.1086 N | 75.7305 E |
| 35. | SVG58 | | 17.1066 N | 75.7298 E |
| 36. | SVG60 | | 17.1007 N | 75.7422 E |
| 37. | SVG62 | | 17.0982 N | 75.7389 E |
| 38. | SVG63 | | 17.0949 N | 75.7388 E |
| 39. | SVG64 | | 17.0968 N | 75.7364 E |

| | | | | |
|---|---|---|---|---|
| 40. | SVG65 | | 17.1013 N | 75.7321 E |
| 41. | SVG66 | | 17.0997 N | 75.7317 E |
| 42. | SVG68 | Feeder-03 | 17.1176 N | 75.6977 E |
| 43. | SVG74 | | 17.1105 N | 75.7321 E |
| 44. | SVG75 | | 17.1099 N | 75.7232 E |
| 45. | SVG76 | | 17.108 N | 75.7233 E |
| 46. | SVG83 | | 17.1248 N | 75.7104 E |
| 47. | SVG84 | | 17.1231 N | 75.7107 E |
| 48. | SVG85 | | 17.1179 N | 75.7158 E |
| 49. | SVG88 | | 17.0999 N | 75.7254 E |
| 50. | SVG90 | | 17.1005 N | 75.7082 E |
| 51. | SVG91 | | 17.0986 N | 75.7059 E |
| 52. | SVG94 | | 17.0945 N | 75.7117 E |
| 53. | SVG96 | Feeder-04 | 17.0976 N | 75.7314 E |
| 54. | SVG97 | | 17.0918 N | 75.7302 E |
| 55. | SVG101 | | 17.1176 N | 75.706 E |
| 56. | SVG103 | | 17.0897 N | 75.697 E |
| 57. | SVG105 | | 17.1145 N | 75.7027 E |
| 58. | SVG106 | | 17.0986 N | 75.6774 E |
| 59. | SVG107 | | 17.097 N | 75.678 E |
| 60. | SVG108 | | 17.0953 N | 75.6778 E |
| 61. | SVG109 | | 17.0937 N | 75.6776 E |
| 62. | SVG110 | | 17.0921 N | 75.6772 E |
| 63. | SVG111 | | 17.0906 N | 75.6761 E |
| 64. | SVG112 | | 17.089 N | 75.6753 E |
| 65. | SVG118 | | 17.0872 N | 75.6758 E |
| 66. | SVG119 | | 17.0814 N | 75.6768 E |
| 67. | SVG120 | | 17.0798 N | 75.678 E |
| 68. | SVG122 | | 17.0903 N | 75.6907 E |
| 69. | SVG123 | | 17.0879 N | 75.6967 E |
| 70. | SVG125 | | 17.1163 N | 75.7161 E |
| 71. | SVG126 | | 17.0909 N | 75.7251 E |
| 72. | SVG128 | | 17.0795 N | 75.6956 E |
| 73. | SVG129 | | 17.0766 N | 75.6981 E |
| 74. | SVG131 | Feeder-05 | 17.0736 N | 75.7047 E |
| 75. | SVG132 | | 17.0716 N | 75.7049 E |
| 76. | SVG134 | | 17.081 N | 75.7148 E |
| 77. | SVG135 | | 17.0787 N | 75.7162 E |
| 78. | SVG136 | | 17.0755 N | 75.717 E |
| 79. | SVG137 | | 17.0737 N | 75.7168 E |
| 80. | SVG138 | | 17.0859 N | 75.7285 E |

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|---|---|---|---|---|
| 81. | SVG139 | | 17.085 N | 75.7305 E |
| 82. | SVG140 | | 17.0814 N | 75.7319 E |
| 83. | SVG141 | | 17.0793 N | 75.7336 E |
| 84. | SVG143 | | 17.0744 N | 75.7359 E |
| 85. | SVG144 | | 17.0722 N | 75.7368 E |
| 86. | SVG145 | | 17.0701 N | 75.7373 E |
| 87. | SVG147 | | 17.0636 N | 75.74 E |
| 88. | SVG148 | | 17.0654 N | 75.7397 E |
| 89. | SVG150 | | 17.0827 N | 75.7137 E |
| 90. | SVG153 | | 17.0691 N | 75.7396 E |
| 91. | SVG154 | | 17.1383 N | 75.7416 E |
| 92. | SVG155 | Feeder-06 | 17.1144 N | 75.7334 E |
| 93. | SVG156 | | 17.1128 N | 75.7333 E |
| 94. | SVG157 | | 17.1044 N | 75.7275 E |
| 95. | SVG165 | | 17.0963 N | 75.7114 E |
| 96. | SVG166 | | 17.094 N | 75.7293 E |
| 97. | SVG168 | | 17.0753 N | 75.692 E |
| 98. | SVG170 | | 17.1415 N | 75.7129 E |
| 99. | SVG172 | | 17.0956 N | 75.7194 E |
| 100. | SVG173 | | 17.0681 N | 75.7294 E |
| 101. | SVG174 | | 17.0792 N | 75.7598 E |
| 102. | SVG175 | | 17.0763 N | 75.76 E |
| 103. | SVG176 | | 17.0777 N | 75.7537 E |
| 104. | SVG177 | | 17.0747 N | 75.7526 E |
| 105. | SVG178 | | 17.0669 N | 75.7516 E |
| 106. | SVG179 | | 17.0635 N | 75.7549 E |
| 107. | SVG180 | | 17.0616 N | 75.7544 E |
| 108. | SVG193 | | 17.0623 N | 75.7469 E |
| 109. | SVG194 | | 17.064 N | 75.7469 E |
| 110. | SVG195 | | 17.0707 N | 75.762 E |
| 111. | SVG196 | | 17.0725 N | 75.7623 E |
| 112. | SVG197 | | 17.1227 N | 75.7171 E |

# APPENDIX IV: TRAINING DETAILS

| S.NO | TOPIC | ATTENDEES | DATE |
|---|---|---|---|
| 1 | Effective document management | 7 | 11-January-2023 |
| 2 | Quality Assurance | 8 | 08-February-2023 |
| 3 | Basic and First Aid awareness program | 15 | 08-March-2023 |

# APPENDIX V: BREAKDOWN DETAILS

| BURGULA SITE | |
|---|---|
| WTG ID | Breakdown Hours |
| BRG 508 | 1 |
| BRG 508 | 39 |
| BRG 509 | 15 |
| BRG 510 | 33 |
| BRG 511 | 21 |
| BRG 512 | 21 |
| BRG 513 | 24 |
| BRG 514 | 39 |
| BRG 515 | 31 |
| BRG 516 | 22 |
| BRG 517 | 29 |
| BRG 518 | 22 |
| BRG 519 | 39 |
| BRG 520 | 12 |
| BRG 521 | 20 |
| BRG 522 | 20 |
| BRG 523 | 19 |
| BRG 524 | 22 |
| BRG 525 | 20 |
| BRG 526 | 20 |
| BRG 527 | 27 |
| BRG 528 | 28 |
| BRG 528 | 1 |
| BRG 529 | 25 |

| | |
|---|---|
| BRG 530 | 32 |
| BRG 531 | 26 |
| BRG 532 | 19 |
| BRG 533 | 28 |
| BRG 534 | 27 |
| BRG 535 | 17 |
| BRG 536 | 16 |
| BRG 537 | 41 |
| BRG 538 | 26 |
| BRG 539 | 20 |
| BRG 540 | 33 |
| BRG 541 | 31 |
| BRG 542 | 27 |
| BRG 543 | 24 |
| BRG 544 | 30 |
| BRG 545 | 28 |
| BRG 546 | 20 |
| BRG 547 | 20 |
| BRG 548 | 12 |
| BRG 549 | 15 |
| BRG 550 | 14 |
| BRG 551 | 17 |
| **Grand Total** | **1073** |

| SAVALSUNG SITE | |
|---|---|
| WTG ID | Breakdown Hours |
| F-2 | 55 |
| F-3 | 57 |
| F-4 | 63 |
| SV123 | 1 |
| SVG101 | 55 |
| SVG103 | 61 |
| SVG105 | 62 |
| SVG106 | 691 |
| SVG107 | 231 |
| SVG108 | 38 |
| SVG109 | 302 |
| SVG110 | 43 |
| SVG111 | 71 |
| SVG112 | 44 |
| SVG118 | 40 |
| SVG119 | 693 |
| SVG120 | 48 |
| SVG122 | 45 |
| SVG123 | 66 |
| SVG125 | 85 |
| SVG126 | 77 |
| SVG128 | 558 |
| SVG129 | 76 |
| SVG131 | 49 |

| | |
|---|---|
| SVG132 | 48 |
| SVG134 | 200 |
| SVG135 | 48 |
| SVG136 | 54 |
| SVG137 | 82 |
| SVG138 | 40 |
| SVG139 | 63 |
| SVG140 | 53 |
| SVG141 | 64 |
| SVG143 | 67 |
| SVG144 | 78 |
| SVG145 | 67 |
| SVG147 | 57 |
| SVG148 | 58 |
| SVG15 | 586 |
| SVG150 | 36 |
| SVG153 | 116 |
| SVG154 | 45 |
| SVG155 | 65 |
| SVG156 | 41 |
| SVG157 | 547 |
| SVG16 | 81 |
| SVG165 | 66 |
| SVG166 | 56 |
| SVG168 | 71 |
| SVG17 | 41 |
| SVG170 | 45 |

| | |
|---|---|
| SVG172 | 71 |
| SVG173 | 59 |
| SVG174 | 133 |
| SVG175 | 84 |
| SVG176 | 59 |
| SVG177 | 57 |
| SVG178 | 57 |
| SVG179 | 303 |
| SVG18 | 230 |
| SVG180 | 593 |
| SVG19 | 47 |
| SVG193 | 98 |
| SVG194 | 76 |
| SVG195 | 101 |
| SVG196 | 78 |
| SVG197 | 3992 |
| SVG20 | 53 |
| SVG22 | 219 |
| SVG23 | 37 |
| SVG25 | 55 |
| SVG26 | 264 |
| SVG27 | 41 |
| SVG28 | 73 |
| SVG29 | 43 |
| SVG30 | 29 |
| SVG31 | 42 |
| SVG32 | 43 |

| | |
|---|---|
| SVG33 | 38 |
| SVG34 | 53 |
| SVG35 | 537 |
| SVG37 | 53 |
| SVG39 | 40 |
| SVG40 | 65 |
| SVG41 | 48 |
| SVG42 | 50 |
| SVG43 | 70 |
| SVG47 | 36 |
| SVG48 | 139 |
| SVG49 | 43 |
| SVG50 | 314 |
| SVG51 | 287 |
| SVG52 | 1324 |
| SVG53 | 694 |
| SVG54 | 58 |
| SVG57 | 48 |
| SVG58 | 39 |
| SVG60 | 69 |
| SVG62 | 453 |
| SVG63 | 38 |
| SVG64 | 81 |
| SVG65 | 52 |
| SVG66 | 262 |
| SVG68 | 39 |
| SVG74 | 64 |

| | |
|---|---|
| SVG75 | 62 |
| SVG76 | 70 |
| SVG83 | 32 |
| SVG84 | 42 |
| SVG85 | 44 |
| SVG88 | 67 |
| SVG90 | 39 |
| SVG91 | 51 |
| SVG94 | 167 |
| SVG96 | 486 |
| SVG97 | 77 |
| SVV165 | 1 |
| **Grand Total** | 19355 |

| Vagrai Site | |
|---|---|
| **WTG ID** | **Breakdown Hours** |
| MVMPR-01 | 152 |
| MVMPR-02 | 229 |
| MVMPR-03 | 1899 |
| MVMPR-04 | 286 |
| MVMPR-05 | 245 |
| MVMPR-06 | 288 |
| MVMPR-07 | 96 |
| MVMPR-08 | 154 |
| MVMPR-09 | 1228 |
| MVMPR-10 | 402 |

| | |
|---|---|
| MVMPR-11 | 484 |
| MVMPR-12 | 408 |
| MVMPR-13 | 820 |
| MVMPR-14 | 200 |
| MVMPR-15 | 218 |
| MVMPR-16 | 4467 |
| MVMPR-17 | 358 |
| MVMPR-18 | 180 |
| MVMPR-19 | 208 |
| MVMPR-20 | 230 |
| MVMPR-21 | 172 |
| MVMPR-22 | 148 |
| MVMPR-23 | 189 |
| MVMPR-24 | 1622 |
| MVMPR-25 | 1016 |
| MVMPR-26 | 241 |
| MVMPR-27 | 986 |
| MVMPR-28 | 174 |
| MVMPR-29 | 68 |
| MVMPR-30 | 82 |
| MVMPR-31 | 129 |
| MVMPR-32 | 330 |
| MVMPR-33 | 267 |
| MVMPR-34 | 279 |
| MVMPR-35 | 110 |
| MVMPR-36 | 224 |
| MVMPR-37 | 153 |

| | |
|---|---|
| MVMPR-38 | 424 |
| MVMPR-39 | 298 |
| MVMPR-40 | 260 |
| MVMPR-41 | 226 |
| MVMPR-42 | 363 |
| MVMPR-43 | 98 |
| MVMPR-44 | 137 |
| MVMPR-45 | 353 |
| MVMPR-46 | 296 |
| MVMPR-47 | 315 |
| MVMPR-48 | 135 |
| MVMPR-49 | 618 |
| MVMPR-50 | 172 |
| MVMPR-51 | 512 |
| MVMPR-52 | 172 |
| MVMPR-53 | 253 |
| MVMPR-54 | 742 |
| MVMPR-55 | 162 |
| MVMPR-56 | 221 |
| MVMPR-57 | 190 |
| MVMPR-58 | 297 |
| MVMPR-59 | 343 |
| MVMPR-60 | 279 |
| MVMPR-61 | 312 |
| MVMPR-62 | 598 |
| MVMPR-63 | 190 |
| MVMPR-64 | 194 |

| | |
|---|---|
| MVMPR-65 | 854 |
| MVMPR-66 | 158 |
| MVMPR-67 | 307 |
| **Grand Total** | **28221** |