



**Verified Carbon
Standard**

OUARZAZATE II CONCENTRATED SOLAR POWER PROJECT

Document Prepared by Numerco Limited

Project Title	Ouarzazate II Concentrated Solar Power Project
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Ouarzazate II Concentrated Solar Power Project (hereafter referred as “The Project” or NOORo II) consists installed capacity of 200MW of solar power plant. Ouarzazate II (hereafter referred as NOORo II) uses concentrated solar power (CSP) parabolic trough technology and includes 7 to 8 hours of thermal energy storage.

The start date of commercial operation is dated on 25/04/2018. All project equipment and facilities as described in the registered VCS PD have been correctly installed. Please refer to section 3.1 for details.

Construction and O & M stated in early 2014 for NOORo II project. The start date of commercial operation is dated on 25/04/2018. All project equipment and facilities as described in the registered VCS PD have been correctly installed. Please refer to section 3.1 for details. The total investment in this project is 9218 million MAD¹.

The Project is expected to supply around 699 GWhr per year to the Moroccan electricity grid, which is dominated by fossil fuels, thereby reducing greenhouse gas emissions through the provision of clean energy to the grid. It is expected to result in a reduction of an average of 406,293 tCO₂ per year and 4,062,929 tCO₂ over the crediting period.

This monitoring period covers the period from 25/04/2018 to 31/12/2019. The project operated in accordance with the registered VCS PD. Total GHG emission reduction achieved in this monitoring period is 556,707 tCO₂e.

The installed project is the second stage of a 580 MW solar power complex (the first stage, NOORo I is already registered as a CDM under the project number 8946), and represents the first step of the Solar Plan launched in 2009 by the Moroccan Government, which aims at installing at least 2,000 MW of solar generation capacity by 2020. Noting that renewable energy deployment has been accelerated with the objective to reach 52% of the energy mix by 2030. The Solar Plan promotes the use of solar energy in Morocco, along with the development of local skills in manufacturing, construction and operation of power plants, and it supports education, research and development activities in the solar sector.

The scenario existing prior to the implementation of the project activity and the baseline scenario are the same, which is that electricity delivered to the Moroccan grid by the project activity would

¹ (Louis Boisgibault, Fahad Al Kabbani (2020): Energy Transition in Metropolises, Rural Areas and Deserts. Wiley - ISTE. (Energy series) ISBN 9781786304995.)

have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

Contribution to sustainable development:

The project promotes local sustainable development through the following aspects:

- The project activity will displace the power generation of fossil fuel power plants, reducing CO₂, SO_x and NO_x emissions significantly, thus mitigating the air pollution and its adverse impacts on human health.
- Improvement of the fossil fuel dominated fuel mix of the electricity generation in the power grid by providing clean and renewable energy source, and help to energy supply security.
- Promote application and diffusion of the innovative/creative solar CSP technology in Morocco through the demonstrative practice of the project activity.

1.2 Sectoral Scope and Project Type

Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)

Project Type: Grid-connected renewable power generation

The project is not a grouped project.

1.3 Project Proponent

Organization name	Numerco Limited
Contact person	Mr Gareth Turner
Title	Director
Address	16 Great Chapel St, Soho, London W1F 8FL, United Kingdom
Telephone	+44 20 8004 3302
Email	gareth.turner@numerco.com

1.4 Other Entities Involved in the Project

Organization name	Moroccan Agency for Sustainable Energy (Masen)
Role in the Project	Project developer, operator and owner

Contact person	Mr. Tarik Hamane
Title	Head of Development, member of the Executive Board
Address	N° 50 Rocade Sud, Rabat - Casablanca A-B-C Buildings Zenith Rabat Souissi Rabat, Morocco
Telephone	+212 (0)5 37 57 45 50
Email	t.hamane@masen.ma

1.5 Project Start Date

25th April 2018. (Commissioning date of the project activity, i.e. ICOD -Initial Commercial Operation Date-)

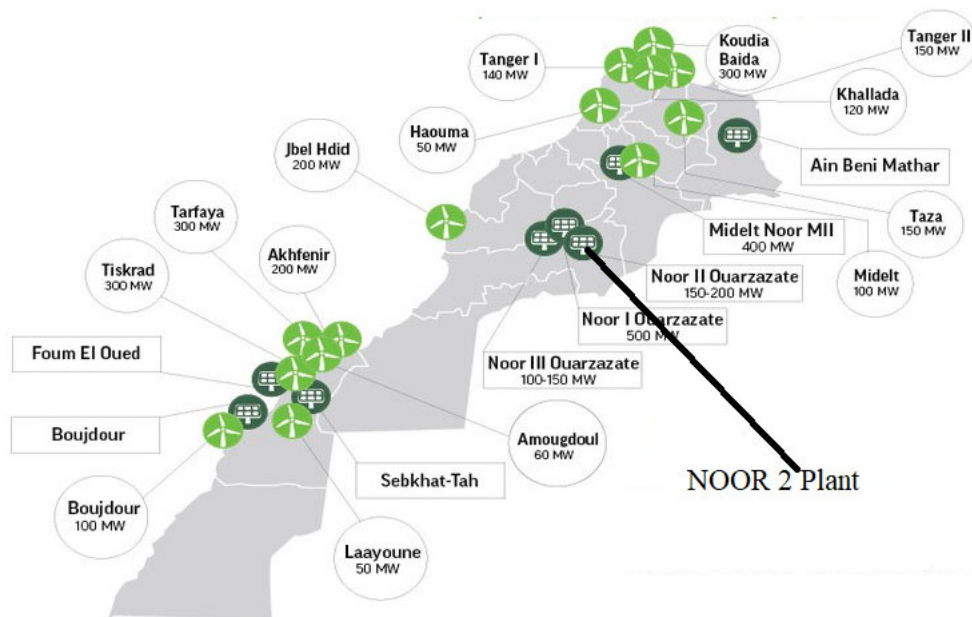
1.6 Project Crediting Period

The Project has started generating GHG emission reductions from 25/04/2018 i.e., from earliest date of commercial operations of the solar project. Hence, crediting period for VCS begins on 25/04/2018 and ends on 24/04/2025 i.e., 7 years crediting period which can be renewed for maximum 2 times.

1.7 Project Location

The project is located on a greenfield of the Ait Ougrou rural community, and falls within the administration of the Ghassate Commune. Lies between 31° 2'6.31"N Latitude and 6° 52'8.34"W Longitude (<https://www.google.com/maps/place/31%C2%B002'06.3%22N+6%C2%B052'08.3%22W/@31.0350861,-6.871172,17z/data=!3m1!4b1!4m5!3m4!1s0x0:0x4666c83c795692a2!8m2!3d31.0350861!4d-6.8689833>). The proposed project sits adjacent to the national highway connecting Ouarzazate and Errachidia, and is approximately 10Km north east of the city of Ouarzazate, 4Km north of National Road N10 and about 20Km north of Mansour Ed Dahbi Dam. The specific plot for the NOORo II CSP has a total area of 610 ha and is part of the 3,000 ha NOORo complex lot.

Figure 1: Location of the project



1.8 Title and Reference of Methodology

ACM0002: “Grid-connected electricity generation from renewable sources” (Version 20.0);

The methodology also refers to:

“Tool to calculate the emission factor for an electricity system” (Version 07.0);

More information concerning the above methodology and tools can be referred to: <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

1.9 Participation under other GHG Programs

The project has been registered as a VCS project with registration number 2004. The project does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading.

1.10 Other Forms of Credit

The project has been registered as a VCS project with registration number 2004. The project hasn't participated in any other form of emission trading programs.

The project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

1.11 Sustainable Development

The project will help to reduce GHG emissions versus the high-growth, coal dominated business-as-usual scenario. The proposed project promotes local sustainable development through the following aspects:

- The project activity will displace the power generation of fossil fuel power plants, reducing CO₂, SO_x and NO_x emissions significantly, thus mitigating the air pollution and its adverse impacts on human health.
- Improvement of the fossil fuel dominated fuel mix of the electricity generation in the power grid by providing clean and renewable energy source, and help to energy supply security.
- Promote application and diffusion of the innovative/creative solar CSP technology in Morocco through the demonstrative practice of the project activity.

2 SAFEGUARDS

2.1 No Net Harm

The development of the project has inevitably resulted in environmental and social impacts, both positive and negative. The potential impacts and appropriate mitigation measures implemented is presented in the below mentioned table;

Table 1: Impact mitigation measures

Impact	Impact receiver	Mitigation	Tools for monitoring (IOV)	Tools for reporting (MV)	Schedule
Natural Risk (fire due to lightning)	Site and surrounding area	Lightning rod	Lightning rod installation	Visual assessment	As on today

Fire risks related to short-circuit	Site and surrounding area	Fighting equipment against fire (fire extinguisher), Prevention and emergency plan	Number of fire extinguisher available, PPE	Visual assessment, System documentation of the security site management	As on today
Fire risk related to neighboring activities	Project site	Firewall around the plant	Existing firewall and conformity	Visual assessment	As on today
Risk of theft and vandalism and deterioration of facilities	Cattle, peoples within the area of the plant	Sign a contract with a security company	Contract with a security company	Visual assessment, System documentation of the security site management	As on today
Professional risk (work-related accident)	Employees	Training and awareness about professional risks, request using PPE, implement an urgent care procedure for accident	effectiveness and existing PPE, Management system and procedures in place for accident	Visual assessment, System documentation of the security site management	As on today
Obstruction of livestock corridors	Breeders for transhumance and neighboring farmers	Corridors implementation	Corridors	Visual assessment	As on today
Risks of social conflict	Local peoples	Priority to local hiring, Social actions	Number of local employment	Monitoring of the agreements signed among sponsors and peoples	As on today

2.2 Local Stakeholder Consultation

Several Community Consultation meetings have been held throughout the project scoping, planning and design phases of the NOORo Complex. A further community consultation meeting was undertaken in February 2015 to inform the stakeholders of the details of NOORo II & III and incorporate their concerns in the assessment undertaken in the SESIAs (Specific Environmental and Social Impact Assessment). Measures to compensate and/or mitigate the negative impacts that the community voiced in the consultation meeting have been incorporated in the design, operation and management of the proposed facility.

In Morocco, the public consultation process (“enquête publique”) is well defined under the national law 12-03 and is a pre-requisite to carrying out the EIA (Environmental Impact Assessment).

With regards to community consultation and stakeholder engagement, the Moroccan legislation had already been respected and fulfilled, since several rounds of public consultations were conducted during the preparation of the FESIA (Framework Environmental and Social Impact Assessment) for the NOORo complex. However, in order to ensure that international requirements are respected, a specific round of consultation has been undertaken for NOORo II & III.

Since it was a long gap between the VCS project commencement and the investment date decision of the project. Again, stakeholders comment process was conducted by using questionnaire method.

The local stakeholders are identified as the people living in the villages in vicinity of the solar project. The comments were received by the survey through following questionnaire during 06/07/2019 to 30/09/2019. The actual survey was conducted in local language i.e. Arabic.

The following people are considered as the stakeholders of this project:

- Residents of the nearby village;
- Staff of the project station;
- Relevant administrative staff of the local government.

The one-page questionnaire was designed with the following sections:

1. Is your environment affected by solar panels?
2. Has the employment increased due to solar project?
3. Has your livelihood affected by the solar project?
4. Is there any noise pollution at the residential places due to the solar power project?

5. Is there any vibration problem due to the solar power project?
6. Is there any water problem due to the solar power project?
7. Does the solar power project affect migration of birds?
8. Does the solar power project affect grazing of cattle?
9. Is your TV reception affected by solar power project?
10. What are the benefits from the solar power project?
11. Any other comments and suggestions?

The responses were categorized as positive and negative based on the comments. The positive responses indicate that respondent feels that the project activity will lead to overall good of their own and the society.

No negative comments were received, overall finding was that the participants expected that the local villagers would benefit from the project activity. The general queries raised during the stakeholder consultation meetings were settled by having Question and Answers session with each survey participant individually.

Project developer has effective grievance mechanism. Stakeholders can any time visit the site/contact the site in-charge and provide their grievances. The site in-charge is responsible for addressing the grievances received from stakeholders. During the present monitoring period there is no grievances received from any stakeholders.

2.3 AFOLU-Specific Safeguards

The project is a non-AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Total installed capacity of NOORo II CSP plant is 200 MW, electricity is generated through a multi-step process. The direct normal irradiance provided by the sun is concentrated onto a receiver tube using parabolic mirrors. A heat transfer fluid is circulated inside the receiver to collect the solar heat, which is then used to generate high pressure steam through a series of solar steam generation heat exchangers. The superheated steam is expanded through a steam turbine which in turn rotates the generator producing electricity. The steam turbine exhaust is condensed and then pressurized to complete the Rankine cycle.

The technical parameters of the main equipment for the project are shown in Table 1.

Table 1: Parameters of the equipment used in the proposed project

Generator Type: SGen5-100A-2P 118-46 M07										
Load Point						N				
Standard						IEC 60034				
Thermal Classification: Design / Using						F / B				F / B+5K
Apparent Power	Active Power			MVA	MW	250.00	200.00			
Cold Air Temp.	Cooling Water Temp.			°C	°C	41.0	38.0			
Voltage				kV		15.75				
Voltage Deviation			+	-	%		10.0	10.0		
Armature Current				kA		9.164				
Frequency	Speed			Hz	rpm	50	3000			
Power Factor				-		0.80				
Excitation Requirements	No load	I_{f0}	U_{f0}	A	V	495	132			
	4/4-load	I_{fN}	U_{fN}	A	V	1244	331			
	5/4-load	$I_{f5/4}$	$U_{f5/4}$	A	V	1470	391			
Cooling Air	Losses			kW		2771				
	Air flow	Temp. rise		m³/s	K	63.0	42.1			
Sudden-SCC at No-Load and Nominal Voltage	Is: 3-phase (peak)			kA		154				
	Ik3: 3-ph. (sustained at IfN)			kA		13.8				
	Ik2: 2-ph. (sustained at IfN)			kA		21.6				
Short Circuit Ratio				(tol. ± 4%)		0.60 (≥ 0.58)				
Reactances calculated values, tolerance +/-15% acc. IEC 60034-3	X''d	unsat.	sat.	%	%	20.3	15.2			
	X'd	unsat.	sat.	%	%	26.6	23.9			
	Xd	unsat.	sat.	%	%	180	166			
	X''q	unsat.	sat.	%	%	22.3	16.7			
	X'q	unsat.	sat.	%	%	51.5	46.6			
	Xq	unsat.	sat.	%	%	171	145			
	X2	unsat.	sat.	%	%	21.3	16.0			
	X0	unsat.		%		10.5				
	Xleak	unsat.		%		16.0				
Time constants at 95°C winding temperature	T''d	Tq''		s	s	0.029	0.067			
	T'd	Tq'		s	s	1.412	0.639			
	T'd0	Tq0'		s	s	10.180	2.500			
	T''d0	Tq0''		s	s	0.040	0.150			
	Ta			s		0.440				
Resistance at 20°C	Stator winding / phase			mΩ		0.89				
	Rotor winding			mΩ		203.47				
Voltage regulation	PF = rated P.F.			%		40.8				
	PF = 1,00			%		33.2				
Max. unbalanced load	Continuous			%		8				
	Short time i2² * t			s		8				
Power at PF = 0	Underexcited			Mvar		130.8				
	Overexcited			Mvar		202.4				
Winding temp. rise	Stator (RTD)			K	°C	67	108			
Winding temp.	Rotor (average)			K	°C	58	99			
Losses	Bearing losses			kW		135				
	Windage losses			kW		1105				
	Core losses			kW		421				
	Short circuit losses			kW		734				

Rotor I ² R losses		kW		427					
Total losses		kW		2822					
Efficiencies with tolerance at brushless excitation and rated P.F. (incl. bearing losses)	4/4-load	%		98.61					
	3/4-load	%		98.45					
	2/4-load	%		98.01					
	1/4-load	%		96.48					

During this monitoring period, the project is operated and implemented in accordance with the registered VCS PD version 2.0 dated 25th December 2019. Neither emergencies (including of overhaul times, downtimes of equipment, exchange of equipment, etc.) happened to the monitoring system in this monitoring period, nor did events or situations occur during the monitoring period which may impact the applicability of the methodology.

Since commissioning the project is running without any major breakdown. There is no major incident taken place during the monitoring period that impact GHG emission reduction or monitoring.

There is no change in project owner or any party involved in the project during the monitoring period.

[illegible]

3.2 Deviations

2.3.1 Methodology Deviations

There is no deviation applied to this monitoring period.

2.3.2 Project Description Deviations

As planned during the conceptualization of the project NOOR II, the monitoring plan of the project was as mentioned in the registered Project Design (PD). Due to some change in the implementation plan and power purchase agreements of the project, monitoring plan has to be revised in the process of monitoring of the project. Due to this, we had to change the monitoring to the present systems as mentioned in the current Monitoring Report (MR) submitted to VVB for verification. This is the post registration deviation and permanent till the project lifetime.

Flow meters are not installed in the monitoring system as mentioned in PD. Other parameters such as $FC_{i,NOOR\ II,y}$, $NCV_{i,y}$ and $EF_{CO2,i,y}$ are not monitored in the present and future verification periods.

3.3 Grouped Projects

The Project is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ /MWh
Description	Combined margin emission factor
Source of data	National power utility (ONEE), IPCC
Value applied	0.604
Justification of choice of data or description of measurement methods and procedures applied	Official statistics released by the national power utility (ONEE), reliable data source, latest data available (2016, 2017 & 2018) 2006 IPCC Guidelines on National GHG Inventories default values

	The combined margin is calculated as per the “Tool to calculate the emission factor for an electricity system” , version 7.0
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	EF _{grid,OM,y}
Data unit	tCO ₂ /MWh
Description	Operating margin emission factor
Source of data	National power utility (ONEE), IPCC
Value applied	0.634
Justification of choice of data or description of measurement methods and procedures applied	Official statistics released by the national power utility (ONEE), reliable data source, latest data available (2016, 2017 & 2018) 2006 IPCC Guidelines on National GHG Inventories default values The operating margin is calculated as per the “Tool to calculate the emission factor for an electricity system” , version 7.0
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	Build margin emission factor
Source of data	National power utility (ONEE), IPCC
Value applied	0.515
Justification of choice of data or description of measurement methods and procedures applied	Official statistics released by the national power utility (ONEE), reliable data source, latest data available (2018) 2006 IPCC Guidelines on National GHG Inventories default values The build margin is calculated as per the “Tool to calculate the emission factor for an electricity system” , version 7.0
Purpose of Data	Calculation of baseline emissions
Comments	

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{NOORo II, y}$	
Data unit	MWh	
Description	Quantity of net electricity generation supplied by NOORo II to the grid in year y	
Source of data	Electricity meter(s)	
Description of measurement methods and procedures to be applied	Bi-directional electricity meters, which will measure the quantity of electricity supplied by the project plant to the grid and the quantity of electricity delivered to the project plant from the grid.	
Frequency of monitoring/recording	Continuous measurement with monthly recording	
Value monitored	Month	Net Generation (MWhr)
	Apr-18	42573
	May-18	19796
	Jun-18	66061
	Jul-18	19641
	Aug-18	15678
	Sep-18	11606
	Oct-18	33972
	Nov-18	34915
	Dec-18	41305
	Jan-19	49929
	Feb-19	50500
	Mar-19	59061
	Apr-19	51383
	May-19	66508
	Jun-19	70402
	Jul-19	56141
	Aug-19	42298
	Sep-19	58828
	Oct-19	54741
	Nov-19	42566
	Dec-19	33795
	Total	921699

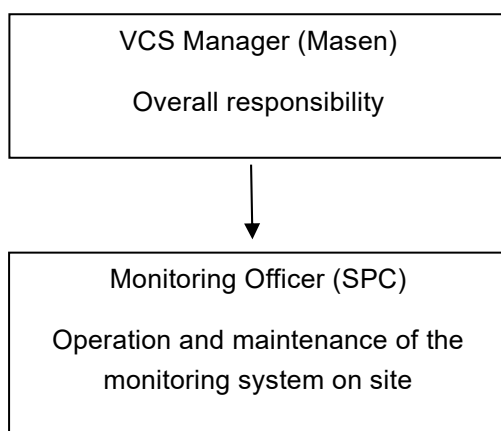
Monitoring equipment	Bi-directional electronic electricity meters measuring the net electrical energy Post and delivery point – ECSO Main Energy meter Number– (02833842, Elster make, 0.2s Accuracy class) Emergency Energy meter Number – (02833843, Elster make, 0.2s Accuracy class)																						
QA/QC procedures to be applied	Measurements from the main meters are cross checked with receipts and cross check meter readings. The accuracy of the meters is 0.2s. In case of failure of the main meter used for reporting and transaction purposes, back-up and cross check meters can be used. The electricity meter meets the standards specified by the International Electrotechnical Commission (IEC). The onsite calibration interval is hundred and eighty 180 days. ONEE the grid operator conducts the calibrations and is a qualified entity. <table><tr><th>Meter</th><th>Calibration date</th><th>Validity</th></tr><tr><td>Main meter – 2833838</td><td>10th January 2018</td><td rowspan="8">the validity is not mentioned in the certificate, according to the grid operator (ONEE) the validity of the calibration is more than 1 years up to 2 years</td></tr><tr><td>Emergency meter – 2833839</td><td>10th January 2018</td></tr><tr><td>Main meter – 2833838</td><td>5th June 2018</td></tr><tr><td>Emergency meter – 2833839</td><td>5th June 2018</td></tr><tr><td>Main meter – 2833838</td><td>12th February 2019</td></tr><tr><td>Emergency meter – 2833839</td><td>12th February 2019</td></tr><tr><td>Main meter – 2833838</td><td>27th November 2019</td></tr><tr><td>Emergency meter – 2833839</td><td>27th November 2019</td></tr></table>			Meter	Calibration date	Validity	Main meter – 2833838	10 th January 2018	the validity is not mentioned in the certificate, according to the grid operator (ONEE) the validity of the calibration is more than 1 years up to 2 years	Emergency meter – 2833839	10 th January 2018	Main meter – 2833838	5 th June 2018	Emergency meter – 2833839	5 th June 2018	Main meter – 2833838	12 th February 2019	Emergency meter – 2833839	12 th February 2019	Main meter – 2833838	27 th November 2019	Emergency meter – 2833839	27 th November 2019
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Emergency meter – 2833839	12 th February 2019																						
Main meter – 2833838	27 th November 2019																						
Emergency meter – 2833839	27 th November 2019																						
Purpose of the data	Calculation of baseline emissions																						
Calculation method	Electronic recording																						

Comments

4.3 Monitoring Plan

1) Operation and management structure

Overall responsibility for daily monitoring and reporting lies with the project owner. A monitoring group will be established within the project company to carry out the monitoring work. The structure of the monitoring group is as follows:



The responsibilities of each role in the team structure are:

- VCS manager has the overall management responsibility, especially supervising the implementation of the monitoring plan.
- Monitoring officer measures the electricity imported to and exported from the project and performs internal verification of the measurement, collects relevant receipts and calculates emission reductions

Finally, the monitoring reports will be reviewed by the General Manager.

2) Monitoring equipment and installation

Electricity meter(s) measure the quantity of net electricity generation supplied by the power plant to the grid.

The electricity meters' accuracy is within 0.2%. The maintenance and calibration regime will follow the relevant standards and/or the manufacturer's specifications.

The electricity meter corresponds to the one used for transaction purposes. In case of meter(s) failure, check meter(s) can be used to estimate the quantity of net electricity generation supplied by the power plant to the grid.

3) Data collection system

All data collected on-site by the SPC can be verified by Masen through a remote station connected to the plant. Masen will be responsible for the following:

- perform a check of all the relevant data received from the SPC,
- perform the ER calculations, and
- analyse emission reduction performance periodically.

4) Quality assurance and quality control (QA/QC)

QA/QC practice involves:

- The metering equipment will be calibrated each 6 months and checked for maintenance annually for accuracy;
- Calibration will be carried out by qualified parties with the records being supplied to the project owner, and the calibration shall ensure sufficient accuracy so that any error resulting from such equipment shall not exceed the allowable error of full-scale rating.
- All data collected as part of monitoring is archived electronically. All information should be stored by Masen and all the material has a physical copy for backup. In order to facilitate auditors' reference of relevant literature relating to the project, the project material and monitoring results are indexed. And all data including calibration records is kept until 2 years after the end of the crediting period, or the last issuance of VCUs, whichever is later.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

According to ACM0002 and the registered VCS PD of the Project, the baseline emission BEy during the monitoring period results from:

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

Where:

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

$EF_{grid,CM,y}$ Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the “Tool to calculate the emission factor for an electricity system” version 7.0.0 (tCO₂/MWh)

Calculation of $EG_{PJ,y}$

Since the project activity is the installation of a new grid-connected renewable power plant at a site where no renewable power plant was operated prior to the implementation of the project activity,

i.e. it is a greenfield power plant, $EG_{PJ,y}$ is calculated as follows:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

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

$EG_{facility,y}$ Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

The monthly electricity data and baseline emission are listed in the table 2:

Table 2: The monthly electricity data for $EG_{out,y}$ and $EG_{in,y}$ and the resulting $EG_{facility,y}$.

Month	Gross generation (MWH)	online consumption (MWH)	offline consumption (MWH)	Net generation (MWH)
Apr-18	46975	4402	1823	42573
May-18	24153	4357	2533	19796
Jun-18	72225	6165	1274	66061
Jul-18	21787	2146	2293	19641

Aug-18	17286	1608	2326	15678
Sep-18	12866	1260	2302	11606
Oct-18	37620	3648	1882	33972
Nov-18	38484	3569	1455	34915
Dec-18	45584	4279	1236	41305
Jan-19	54869	4941	1191	49929
Feb-19	55581	5081	1207	50500
Mar-19	65258	6197	1116	59061
Apr-19	56602	5219	1128	51383
May-19	73528	7019	875	66508
Jun-19	78005	7602	690	70402
Jul-19	62668	6527	960	56141
Aug-19	46390	4092	1375	42298
Sep-19	65239	6411	868	58828
Oct-19	60346	5605	1002	54741
Nov-19	46655	4090	1335	42566
Dec-19	37108	3312	1548	33795
Total	1019229	97529	30420	921699

Table 3: Calculation of the baseline emission

Monitoring period	EGfacility,y(MWh)	$EF_{grid,CM,y}$ (tCO ₂ e/MWh)	BEy (tCO ₂ e)
2018	285547	0.604	172,470
2019	636152	0.604	384,236
Total	921699	0.604	556,707

5.2 Project Emissions

As per the registered VCS PD, the Project emission (PE y) is 0 tCO₂ e.

5.3 Leakage

No leakage emissions are considered as per the applied methodology ACM0002 and the registered VCS PD.

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2018	172,470	0	0	172,470
2019	384,236	0	0	384,236
Total			0	556,707