JCM Verification Report Form

A. Summary of verification

A.1. General Information

Title of the project	Installation of 12.7MW Solar Power Plant for Power Supply In Ulaanbaatar Suburb
Reference number	MN003
Monitoring period	01/06/2018 – 31/12/2020
Date of completion of the monitoring report	03/02/2021
Third-party entity (TPE)	Japan Management Association (JMA
Project participant contracting the TPE	FARMDO CORPORATION
Date of completion of this report	16/03/2021

A.2 Conclusion of verification and level of assurance

Overall verification opinion	☒ Positive ☐ Negative
☒ Unqualified opinion	Based on the process and procedure conducted, *Japan Management Association* (TPE's name) provides reasonable assurance that the emission reductions for *Installation of 12.7MW Solar Power Plant for Power Supply In Ulaanbaatar Suburb* (project name) ✓ Are free of material errors and are a fair representation of the GHG data and information, and ✓ Are prepared in line with the related JCM rules, procedure, guidelines, forms and other relevant documents
(If overall verification opinion is negative, please check below and state its reasons.) ☐ Qualified Opinion ☐ Adverse opinion ☐ Disclaimer	<State the reasons> Not Applicable

A.3. Overview of the verification results

Item	Verification requirements	No CAR or CL remaining
The project implementation with	The TPE determines the conformity of the actual project and its operation with the eligibility criteria of	☒

Item	Verification requirements	No CAR or CL remaining
the eligibility criteria of the applied methodology	the applied methodology.	
The project implementation against the registered PDD or any approved revised PDD	The TPE assesses the status of the actual project and its operation with the registered/validated PDD or any approved revised PDD.	☒
Calibration frequency and correction of measured values with related requirements	If monitoring Option C is selected, the TPE determines whether the measuring equipments have been properly calibrated in line with the monitoring plan and whether measured values are properly corrected, where necessary, to calculate emission reductions in line with the PDD and Monitoring Guidelines.	☒
Data and calculation of GHG emission reductions	The TPE assesses the data and calculations of GHG emission reductions achieved by/resulting from the project by the application of the selected approved methodology.	☒
Avoidance of double registration	The TPE determines whether the project is not registered under other international climate mitigation mechanisms.	☒
Post registration changes	The TPE determines whether there are post registration changes from the registered PDD and/or methodology which prevent the use of the applied methodology.	☒

Authorised signatory:	Mr. ☒	Ms. ☐
Last name: Nemoto	First name: Wako	
Title: Senior Executive of GHG Certification Center, JMA		
Specimen signature: [redacted]		Date: 16/03/2021

B. Verification team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Motoyuki Matsumoto	JMA	Team Leader	☒	Technical competence qualified	☐
Mr. ☒ Ms. ☐	Satoshi Kodakari	JMA	Team Member	☒	Technical competence qualified	☐
Mr. ☒ Ms. ☐	Kenji Suzuki	JMA	Internal Reviewer	☒	Technical competence qualified	☐
Mr. ☐ Ms. ☐				☐		☐

Please specify the following for each item.

* *Function: Indicate the role of the personnel in the validation activity such as team leader, team member, technical expert, or internal reviewer.*

* *Scheme competence: Check the boxes if the personnel have sufficient knowledge on the JCM.*

* *Technical competence: Indicate if the personnel have sufficient technical competence related to the project under validation.*

C. Means of verification, findings and conclusions based on reporting requirements

C.1. Compliance of the project implementation and operation with the eligibility criteria of the applied methodology

<Means of verification>

Approved methodology “Installation of Solar PV System, Ver. 02.0 (Ref.2)” was applied to the JCM project. Verification team assessed the compliance of the project implementation and operation with the eligibility criteria of the applied methodology.

Verification team conducted the assessment of the project implementation and operation for the monitoring period (from 1 June.2018 to 31 Dec.2020) to confirm the compliance with the eligibility criteria of the applied methodology (Ref.2).

- Document review was conducted using the checklist based on the “JCM Guidelines for Validation and Verification (Ref.13)”.
- Interviews with all project participants through the internet were conducted on 25 Feb.2021.

The verification was conducted without on-site visit by the following reasons.

- Due to the COVID-19 pandemic.

(refer to the URL/ https://www.jcm.go.jp/jc_decisions/1751/Decision_on_interim_special_measure_for_on-

site_assessment_by_TPEs.pdf)
- The information required for verification, which would normally be verified during on-site assessment, was verified by alternative methods such as document and photo/on-site video reviews, interviews via internet, and e-mail.
Each criterion of the applied methodology was confirmed as follows by document review and interviews.

Criterion 1:
The equipment for solar PV system described in the revised PDD (Ref.1-2) was confirmed by checking "Specification of equipment (Ref.3-1-1)" and on-site video, also interviews with project participants (PPs). Verification team confirmed that the solar PV system was kept installing at the project site during the monitoring period without any change since the previous verification and the proposed project satisfied the eligibility criterion 1.

Criterion 2:
Criterion 2 was checked with "Specification of solar PV system (Ref. 3-1-1)" and "Certificate for design qualifications (IEC 61215) and safety qualification (IEC 61730-1 and IEC 61730-2) (Ref.3-5)". Verification team confirmed that the solar PV modules installed have obtained design qualifications (IEC 61215) and safety qualification (IEC 61730-1 and IEC 61730-2), and the proposed project satisfied the eligibility criterion 2.

Criterion 3:
The equipment to monitor the output power of solar PV system and irradiance was confirmed by the photos, on-site video and interviews with PPs. An electrical power meter of solar PV system was checked by "Specification of electrical power meter (Ref.3-1-2)". Also, a pyranometer was checked by "Specification of pyranometer (Ref.3-1-3)",and "Specification of remote monitoring service for solar PV system (Ref.3-2-1)".
Verification team confirmed that the equipment to monitor output power of the solar PV system and irradiance were installed at the proposed project site during the monitoring period without any change since the previous verification. The proposed project satisfied the eligibility criterion 3.

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No CAR, CL, or FAR was raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team assessed the application of approved methodology of the JCM project with

the supporting documents and alternative means to on-site visit such as interviews. Verification team confirmed the compliance of the project implementation and operation with the eligibility criteria of the applied methodology.

C.2. Assessment of the project implementation against the registered PDD or any approved revised PDD

<Means of verification> Verification team assessed the project implementation against the approved revised PDD (Ref.1-2) by means of document review and interviews with PPs for this 2nd verification. The verification team confirmed that FARMLAND CO., LTD. was newly added to the PPs in this verification (Ref.8-2), and also the company is a group company of Focal Point entity. Verification team checked that physical features of the project in the revised PDD were in place and that PPs operated the project for the monitoring period as per the revised PDD. During desk review, Monitoring Report (Ref.7) provided by the PP with following references were checked: - The revised PDD including Monitoring Plan Sheet and Monitoring Structure Sheet, - Previous verification report (Ref.9) and, - Approved methodology. The physical features of the project in the revised PDD were checked by the documents review and interviews with following references of the previous verification report: -Specification of solar PV system (Ref.3-1-1), - Specification of electrical power meter (Ref.3-1-2), -Specification of pyranometer (Ref.3-1-3), -Reference of "Expected operational lifetime of project" (Ref.3-3-1), -Reference of "Starting date of project operation" (Ref.3-3-2), Also, project operation as per the revised PDD was checked by interviews with following references: - Monitoring Structure Sheet of the revised PDD, - Electric Power Purchase Agreement (Ref.3-1-4), - Specification of remote monitoring service (Ref.3-2-1), - Reference of "EIA" (Ref.4), - Local stakeholder consultation (Ref.5), - Modalities of communications (Ref.8),

Monitoring structure was checked by interviews of the following people described in the Monitoring Structure Sheet of the revised PDD.
-Project Manager / Facility Manager / Operators

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

CL1
As EIAs need to be renewed every five years, please provide documentation to confirm that a new approval process has been carried out in 2020.
⇒Summary of Response and Verification team Conclusion:
PPs explained that the EIA is normally renewed promptly, but due to COVID-19 lockdown and the general resignation of the government, the administrative process has been delayed.
The verification team confirmed that the PPs had processed the renewal with the government in November 2020 (Ref.4-3).
CL1 was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The verification team confirmed that there was no change from the previous verification during the monitoring period, except for the addition of a group company to the PPs and the EIA renewal process. In addition, it was confirmed that operational and management structure described in the Monitoring Structure Sheet of the revised PDD was conducted during the monitoring period. The monitoring has been carried out in accordance with the monitoring plan contained in the revised PDD.
Verification team confirmed that the project was operated during the monitoring period in accordance with the revised PDD.

C.3. Compliance of calibration frequency and correction of measured values with related requirements

<Means of verification>

Compliance of calibration frequency of the electrical power meter was checked against the applied methodology and the revised PDD.

The verification team confirmed with the test report (Ref.6) that the electricity meter was certified and valid for 8years, and fully covers this monitoring period.

Verification team confirmed that electrical power meter was not changed and the calibration or replacement of electricity meter was not required during this monitoring period, in accordance with the monitoring plan of the revised PDD.

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No CAR, CL, or FAR was raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that the electricity meter for monitoring point No.(1) was valid and calibration or replacement was not required during this monitoring period in accordance with the monitoring plan of the revised PDD.

C.4. Assessment of data and calculation of GHG emission reductions

<Means of verification>

Monitoring Report was checked as follows through document review to confirm the data and calculation of GHG emission reductions. Monitoring Report was checked against the description of Monitoring Plan Sheet, the revised PDD and the applied methodology.

Parameters used for calculations were checked with the following table.

・Parameters monitored ex post (Table 1 of Monitoring Report Sheet) :

Monitored values of electrical power meter (Monitoring point No. (1)) were checked with the following table.

・Project specific parameters fixed ex ante (Table 2 of Monitoring Report Sheet) :

CO2 emission factor used for the calculation was checked with the revised PDD and the approved methodology.

Verification team verified the reported emission reductions of "Monitoring Report (Ref.7) by comparing the source data (Ref.11-2-1, 11-2-2) and CO2 emission factor of the approved methodology. It was checked through CL2.

The comparison of actual CO2 emission reduction with estimates (Ref.11-1-1) was checked by verification team.

First, we confirmed that the total amount of emission reduction in 2019 was 26% higher than estimated, but that the reason for this difference was due to actual solar radiation being higher than assumed, as discussed in our previous verification report (Ref. 9).

On the other hand, although 2020 had roughly the same amount of solar radiation as 2019, it resulted in only 5% more emission reductions than expected. In this regard, the verification team confirmed through documentation of power generation and interviews with PPs that there were frequent instructions from the Mongolian NDC (National Dispatching Center) to restrict or completely stop power generation, partly due to COVID-19. This resulted in 39 days of no

power generation in 2020, compared to 6 days in 2019, according to the power generation records.

For 2018, verification team reviewed that the ratio of solar radiation to power generation is generally consistent with 2019, which is closest to normal operation, and that there are no concerns.

Parameters	Monitored values	Method to check values in the monitoring report with sources
ΣEGi,p	44,442 MWh	The data used was taken from the electrical power meter, which was installed at the project site. CL2 was raised to check the source data of this monitoring period. As a result of raising CL2, the source data (Ref.11-2-1, 11-2-2) of monitored value (44,442MWh) was checked during desk review assessment.

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

CL2

Please submit the source data of Monitoring point No. (1) (measured record of electricity meter) for the monitoring period (Ref.7).

⇒Summary of Response and Verification team Conclusion：

PPs submitted the measuring records of electricity meter (Ref.11-2-1) as the source data, double check records (Ref.11-2-2) and invoices issued by the power company (Ref.11-2-3). Verification team checked the measuring records and double check data, and confirmed those records are consistent and used as the data for monitored values. Invoices are issued by means of reading the electrical power meter installed at the substation. Amount of the electricity written in the invoices were agreed with the PPs and the power company based on the power purchase agreement. Verification team also confirmed the consistency between the measuring records and invoices.

CL2 was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that the appropriate Monitoring Report Sheet of the applied methodology was used for Monitoring Report.

A complete set of source data of Monitoring point No. (1) (measured data of electrical power meter) for the monitoring period was prepared by PPs and checked by verification team. Also, it was confirmed that the appropriate emission factor (0.797 for the reference CO2 emission factor) was used in accordance with the approved methodology.
Verification team confirmed that the calculation of CO2 emission reductions was conducted appropriately in accordance with the approved methodology.

C.5. Assessment of avoidance of double registration

<Means of verification>

The following websites of CDM,and VCS were checked whether the projects with similar technology and location had been registered.

1) Website of UNFCCC (Project Search for CDM Projects)
2) Website of IGES (IGES CDM Project Database, IGES JI Project Database)
3) Website of Verified Carbon Standard

Also, the written confirmation (Ref.8-3) that the project was not registered under other international climate mitigation mechanisms was submitted at the previous verification. Verification team confirmed in the interview that the registration status has not changed since then.

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No CAR, CL, or FAR was raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that the project was not registered under other international climate mitigation mechanisms.

C.6. Post registration changes

<Means of verification>

There was no post registration change from the revised PDD and/or methodology which prevented the use of the applied methodology.

<Findings>

Please state if CARs, CLs, or FARs are raised, and how they are resolved.

No CAR, CL, or FAR was raised for this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification team confirmed that there was no post registration change during the monitoring period.

D. Assessment of response to remaining issues

An assessment of response to the remaining issues including FARs from the validation and/or previous verification period, if appropriate

There is no remaining issue.

E. Verified amount of emission reductions achieved

Year	Verified Reference Emissions (tCO_2e)	Verified Project Emissions (tCO_2e)	Verified Emission Reductions (tCO_2e)
2013			
2014			
2015			
2016			
2017			
2018	7,688.5	0	7,688
2019	15,176.4	0	15,176
2020	12,555.3	0	12,555
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			
Total (tCO_2e)			35,419

F. List of interviewees and documents received

F.1. List of interviewees

Farmland Co., Ltd.
Mr.Yusuke Murota
Ms.Andrades Fernández Laura

Everyday Farm LLC:
Mr. Enkhtuvshin Munkhbayasgalan
Mr. Bat-Ochir Gantulga
Mr. Enebish Bum-Erdene
Mr. Purevchuluun Bilguun

Mr. Gansukh Sanjmyatav Mr. Oyundelger Tsolmon

F.2. List of documents received

1-1 Project Design Document for JCM project " " (Registration date: 26/05/2017)
1-2 Revised Project Design Document for JCM project (Ver10.0 30/10/2018)
2 Approved Methodology "Installation of Solar PV System, Ver. 02.0 "
3 Reference relating to PDD chapter A, B, C
3-1-1 Specification of solar PV system:
1) Specification of solar PV module (27 Nov.2015, 27 Jinko Solar Japan K.K.) and Delivery completion report (28 Sep.2016, Hitachi Systems, Ltd.)
2) Specification of solar PV module (08 July 2016, Jinko Solar Japan K.K.) and Delivery completion report (10 Mar.2017,31 Mar 2018, Hitachi Systems, Ltd.)
3) Specification of solar PV module (27 Jan 2016, Jinko Solar Japan K.K.) and Delivery completion report (31 Mar 2018, Hitachi Systems, Ltd.)
4) Specification of solar PV module (23 Sep 2016, Jinko Solar Japan K.K.) and Delivery completion report (31 Mar 2018, Hitachi Systems, Ltd.)
5) Specification of solar PV module (13 Sep 2016, Jinko Solar Japan K.K.) and Delivery completion report (31 May 2018, Hitachi Systems, Ltd.)
6) Single line diagram (18 Aug.2016)
7) Single line diagram (3 Oct.2018)
8) Specification of power conditioner (MV Power Station 2000SC, SMA Solar Technology (www.SMA-Solar.com))
3-1-2 Specification of electrical power meter for monitoring point No.1 :
A1800 ALPHA® meter style numbers (elster (www.elster.com))
3-1-3 Specification of pyranometer of the solar PV system:
(Delta OHM)
3-1-4 This Electric Power Purchase Agreement
(8 Jun.2016, National Dispatching Center limited liability company and Everyday farm LLC)
3-1-6 Organization structure of PPs
1)Organization structure of Everyday Farm LLC (5 Jan.2017)
2)Organization structure of Bridge LLC (Sep.2016)
3-2-1 1)Specification of remote monitoring service for solar PV system (12 Dec 2016, Hitachi Systems, Ltd.)
2)Captured image of the 3-2-1 1) system screen (10 Dec 2020)

3-3-1 Reference of "Expected operational lifetime of project":
1)Limited Warranty for Solar PV module (Warranty period of Limited Power Output Warranty (25years)) (27 Sep 2016, 7 Feb 2017, 22 Mar 2017, 12 Feb 2018 28 Jul 2017, 5 Aug 2017, Jinko Solar Japan K.K.)
2)SMA manufacturer's Warranty (SMA Solar Technology)

3-3-2 Reference of "Starting date of project operation"
1) Certification issued by National Dispatching Center
2) Application for the electricity supply to the to the National Dispatching Center.
3) Permission issued by National Commission of Ministry of Energy
3-4-1 Grant decisions for carbon dioxide emission control measures business subsidies 2015-2017 fiscal year, Issued by Global Environment Centre Foundation, 1 Apr. 2016
3-4-2 Grant decisions for carbon dioxide emission control measures business subsidies 2015-2017 fiscal year, Issued by Global Environment Centre Foundation, 11 Oct. 2016
3-5 Certificate for design qualifications (IEC 61215) and safety qualification (IEC 61730-1 and IEC 61730-2):
Test Report (12/11/2015,1/7/2016, 7/7/2016, 12/10/2016, 7/12/2016, 24/4/2017, TÜ V)
4 Reference of "EIA"
4-1 Evaluation result of Environmental impact assessment report (17 Nov.2015, Ministry of Environmental, Green Development and Tourism of Mongolia)
4-2 Environmental impact assessment report (2015, Everyday Farm LLC)
4-3 Official request for ENVIRONMENTAL TOUR, Evaluation of Ministry of Tourism Audit Department (2 Nov 2020, No.11)
5 Local stakeholder consultation (3-4 Oct.2016) Meeting memo
6 Certification of test report of Electricity meter (11Nov.2015, Mongolian Agency for Standardisation and Metrology)
7 Monitoring report (JCM_MN003_MP_2018_06-12.xlsx / JCM_MN003_MP_2019_01-12.xlsx / JCM_MN003_MP_2020_01-12.xlsx)
8 Modalities of communications
8-1 JCM Modalities of Communications Statement Form (Submitted on 7 Feb.2017)
8-2 JCM Modalities of Communications Statement Form ANNEX 1 (Date of Submission :10/03/2021)
8-3 Written confirmation from Farmdo Co.,Ltd (Declaration from Mr.Masayuki Iwai on 22 Oct. 2018)
9 Verification Report (27 June.2018, Japan Management Association)
11 Reference relating to Monitoring Plan Sheet
11-1-1 Reference regarding estimated solar PV output:

11-1-2 Records of irradiance measured by PPs 11-2-1 Records of measured data of electricity meter 11-2-2 Double check records implemented by PPs 11-2-3 Agreed Power Sale Data : Generated Power Sales Agreement per every month between the National Dispatching Center and PPs 12 Monitoring Flow (Prepared by Farmdo Co.,Ltd, Revised on 3 Mar.2017) 13 Joint Crediting Mechanism Guidelines for Validation and Verification (JCM_MN_GL_VV_ver01.0)

Annex Certificates or curricula vitae of TPE's verification team members, technical experts and internal technical reviewers

Please attach certificates or curricula vitae of TPE's validation team members, technical experts and internal technical reviewers.

Certificate of Competence
for Validation/Verification team

GHG Certification Center
Japan Management Association

Scheme:

The Joint Crediting Mechanism (JCM)

Project Title:

Installation of 12.7 MW Solar Power Plant for Power Supply In Ulaanbaatar Suburb

Validation or Verification:

Verification

Name	Qualification *1	Leader/Member/ Technical expert/ Technical Reviewer(TR)	Qualification of Technical area *2	JCM scheme competence
Mr. Motoyuki Matsumoto	Lead Validator/ Verifier	Leader	☑	☑
Mr. Satoshi Kodakari	Lead Validator/ Verifier	Member	☑	☑
Competence of Validation Team	-	-	☑	☑

*1 Qualification in accordance with "JMACC's Procedures for Contract and Evaluation of Validators/Verifiers and Technical Experts (GA-110)"

*2 Competence Requirement in accordance with Competence for Technical area sheet (GA-110-08)

Date 1. Dec, 2020

[redacted]

Kenji Suzuki
Director of Validation & Verification Dept.
GHG Certification Center
Japan Management Association

Certificate of Competence for Technical Review team

GHG Certification Center
Japan Management Association

Scheme:

The Joint Crediting Mechanism (JCM)

Project Title:

Installation of 12.7 MW Solar Power Plant for Power Supply In Ulaanbaatar Suburb

Validation or Verification:

Verification

Name	Qualification*1	Leader/Member/ Technical expert/ Technical Reviewer(TR)	Qualification of Technical area *2	JCM scheme competence
Mr. Kenji Suzuki	Lead Validator/ Verifier	Technical Reviewer	☑	☑
Competence of Technical Review Team	-	-	☑	☑

*1Qualification in accordance with "JMACC's Procedures for Contract and Evaluation of Validators/Verifiers and Technical Experts (GA-110)"

*2Competence Requirement in accordance with Competence for Technical area sheet (GA-110-08)

Date 1. Dec. 2020

[redacted]

Kenji Suzuki
Director of Validation & Verification Dept.
GHG Certification Center
Japan Management Association