

### JCM Validation Report Form

#### A. Summary of validation

##### A.1. General Information

Title of the project	Small Scale Solar Power Plants for Schools in Island States
Reference number	PW002
Third-party entity (TPE)	Japan Management Association (JMA)
Project participant contracting the TPE	Pacific Consultants Co., Ltd. (PCKK)
Date of completion of this report	25 March 2016

##### A.2 Conclusion of validation

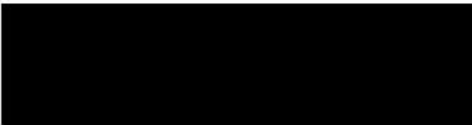
Overall validation opinion	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
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##### A.3. Overview of final validation conclusion

*Only when all of the checkboxes are checked, overall validation opinion is positive.*

Item	Validation requirements	No CAR or CL remaining
Project design document form	The TPE determines whether the PDD was completed using the latest version of the PDD forms appropriate to the type of project and drafted in line with the Guidelines for Developing the Joint Crediting Mechanism (JCM) Project Design Document, Monitoring Plan and Monitoring Report.	<input checked="" type="checkbox"/>
Project description	The description of the proposed JCM project in the PDD is accurate, complete, and provides comprehension of the proposed JCM project.	<input checked="" type="checkbox"/>
Application of approved JCM methodology (ies)	The project is eligible for applying applied methodology and that the applied version is valid at the time of submission of the proposed JCM project for validation.	<input checked="" type="checkbox"/>
Emission sources and calculation of emission reductions	All relevant GHG emission sources covered in the methodology are addressed for the purpose of calculating project emissions and reference emissions for the proposed JCM project.	<input checked="" type="checkbox"/>
	The values for project specific parameters to be fixed <i>ex ante</i> listed in the Monitoring Plan Sheet are appropriate, if applicable.	<input checked="" type="checkbox"/>
Environmental impact assessment	The project participants conducted an environmental impact assessment, if required by the Republic of Palau in line with Palauan procedures.	<input checked="" type="checkbox"/>
Local stakeholder consultation	The project participants have completed a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed	<input checked="" type="checkbox"/>

Item	Validation requirements	No CAR or CL remaining
	project.	
Monitoring	The description of the Monitoring Plan (Monitoring Plan Sheet and Monitoring Structure Sheet) is based on the approved methodology and/or Guidelines for Developing the Joint Crediting Mechanism (JCM) Project Design Document, Monitoring Plan, and Monitoring Report. The monitoring points for measurement are appropriate, as well as whether the types of equipment to be installed are appropriate if necessary.	<input checked="" type="checkbox"/>
Public inputs	All inputs on the PDD of the proposed JCM project submitted in line with the Project Cycle Procedure are taken into due account by the project participants.	<input checked="" type="checkbox"/>
Modalities of communications	The corporate identity of all project participants and a focal point, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories are included in the MoC.	<input checked="" type="checkbox"/>
	The MoC has been correctly completed and duly authorized.	<input checked="" type="checkbox"/>
Avoidance of double registration	The proposed JCM project is not registered under other international climate mitigation mechanisms.	<input checked="" type="checkbox"/>
Start of operation	The start of the operating date of the proposed JCM project does not predate January 13, 2014.	<input checked="" type="checkbox"/>

Authorised signatory:	Mr. <input checked="" type="checkbox"/>	Ms. <input type="checkbox"/>
Last name: Yasui	First name: Ryouichi	
Title: Senior Executive of GHG Certification Center, JMA		
Specimen signature:		Date: 25/03/2016

## B. Validation team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Motoyuki Matsumoto	JMA	Team Leader	<input checked="" type="checkbox"/>	Technical competence qualified	<input checked="" type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Kenji Suzuki	JMA	Team Member	<input checked="" type="checkbox"/>	Technical competence qualified	<input checked="" type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Masahiro Hirakawa	JMA	Internal Reviewer	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Toshiaki Takeda	JMA	Internal Reviewer	<input checked="" type="checkbox"/>	Technical competence qualified	<input type="checkbox"/>

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 validation, findings, and conclusion based on reporting requirements

### C.1. Project design document form

#### <Means of validation>

PDD (Ref.1) was checked using the "JCM Guidelines for Developing Project Design Document (PDD) and Monitoring Report (MR) (JCM\_PW\_GL\_PDD\_MR\_ver01.0) (Ref.14) ".

Review history of the PDD is as follows.

- PDD version 1: PDD was submitted to JMA on 8th Feb.2016.
- PDD version 2: PDD was revised on 7th Mar.2016 based on the document review and on-site assessment by validation team.
- PDD version 3: PDD was revised on 22nd Mar.2016 to resolve the remaining issues. PDD version 3 (Ref.1) is final version.

The latest version of the PDD form (JCM\_PW\_F\_PDD\_ver01.0) was checked at the website of New Mechanisms Information Platform for Palau. Validation team confirmed that the latest version of the PDD form was used for all version of PDD (Ref.1). Also, validation team confirmed that form of Monitoring Spreadsheet (JCM\_PW\_AM001\_ver01.0) which was approved as a methodology (Ref.2) by Joint Committee was used for the proposed project.

#### <Findings>

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

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

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the PDD was completed using the latest version of the PDD form and in accordance with the "JCM Guidelines for Developing PDD and MR (Ref.14)".

C.2. Project description

**<Means of validation>**

The proposed project is to install new solar PV systems in Republic of Palau. Solar PV system was installed at two sites (Site A and B). Site A is to install 51.675kW solar PV system on top of the gymnasium of Palau Seventh-Day Adventist Elementary School in Koror State, and Site B is to install 103.350kW solar PV system on top of the gymnasium of Palau Mission Academy in Airai State.

Validation team conducted the assessment with the step below by following "JCM Guidelines for Validation and Verification (JCM\_PW\_GL\_VV\_ver01.0) (Ref.13)".

- Document review was conducted using the checklist based on the "JCM Guidelines for Validation and Verification (Ref.13)". CLs were raised and informed to project participants (PPs).
- Follow-up interviews and on-site assessment were conducted.
- Remaining issues including the response of CLs were checked with reference.

Each section in the PDD was checked as follows during document review and on-site assessment to confirm the project description.

A.1, 2:

The proposed project is to reduce CO2 emissions by introducing solar PV system. The electrical power generated by the solar PV system displaces the electrical power from the grid. Validation team confirmed that explanation of how the proposed project reduces greenhouse gas emissions was described in the PDD.

CL1 was raised for checking solar PV system. As a result of raising CL1, validation team checked the solar PV system described in the PDD with "Specification of solar PV system (Ref. 3-1-2, 3-2-2)".

On-site assessment was conducted on 10-12 Feb.2016. Validation team confirmed that solar PV systems of all Sites had started the operation of power generation by the proposed project. Also, the solar PV system was confirmed by on-site inspection and interviews with PPs and local engineering company (project manager of engineering company which installed solar PV systems).

In addition, net-metering scheme in Palau was confirmed by checking "Approval of application

for Renewable Energy System (Ref. 3-1-1, 3-2-1)” and “Document of the Senate for Palau Net Metering Act (the Senate EIGHTH OLBIIL ERA KELULAU (RPPL No.8-39) (Ref.3-6)”.

A.3:

Location was confirmed by on-site visit to Site A and B, interviews with PPs and checking Google map.

A.4:

PPs of both countries were confirmed by interviews, on-site assessment and checking the Modalities of communications (MoC) (Ref.8-1).

A.5:

“Expected operational lifetime of project (20 years)” was checked and confirmed by raising CL2.

“Starting date of project operation” was checked in the section C.10.

A.6:

Financial support by the Ministry of the Environment, Japan was confirmed by checking “Financing programme for JCM model projects (Ref.4)”. Also, the role of Pacific Consultants Co., Ltd. (PCKK) described in the PDD was confirmed by interviews with PPs and local engineering company.

#### <Findings>

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

The following CLs were raised to check the project description of the PDD.

CL1:

It is necessary to confirm that the type of solar PV module described in the PDD is installed in the proposed project. Please submit the specification of solar PV system which includes the type of solar PV module.

⇒Summary of Response and Validation team Conclusion :

“Specification of solar PV system (Ref.3-1-2, 3-2-2)” including the type of solar PV module was submitted by PP.

Validation team confirmed that the solar PV system described in the PDD was installed at Sites. In addition, the solar PV system was confirmed by on-site inspection and interviews with PPs and local engineering company.

CL1 was closed.

CL2:

It is necessary to confirm the “Expected operational lifetime of project (20 years)” described in the PDD. Please submit the reference of expected operational lifetime 20 years for proposed project.

⇒Summary of Response and Validation team Conclusion :

“Reference of Expected operational lifetime of project (Ref.3-7)” was submitted by PP. The reference (Ref.3-7) includes the following information from manufacturer of proposed project.

- “Average of Expected operational lifetime for solar PV module” is more than or equals to 20 years.
- Limited power output warranty of solar PV module is 25 years.

Validation team confirmed the "Expected operational lifetime (20 years)" with manufacturers' information.

CL2 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team assessed the project description provided in the PDD with supporting documents and on-site visit. As a result of raising CL1 and CL2, supporting documents were submitted and the project description was revised appropriately.

Validation team confirmed that the description of the proposed project in the PDD was accurate and complete, and was understandable for the proposed project activity.

### C.3. Application of approved methodology(ies)

**<Means of validation>**

Approved methodology “Displacement of Grid and Captive Genset Electricity by a Small-scale Solar PV System, Ver. 01.0 (PW\_AM001 Ver. 1.0)” was applied to the proposed project. The methodology was approved by the Joint Committee on 20th Feb. 2015, and valid as of the time of the validation.

Validation team assessed if the project is eligible for applying selected methodology.

Validation team conducted the assessment for each criterion with the step below by following “JCM Guidelines for Validation and Verification (Ref.13)”.

- Document review was conducted using the checklist based on the “JCM Guidelines for Validation and Verification (Ref.13)”.
- Follow-up interviews and on-site assessment were conducted on 10-12 Feb.2016.
- Remaining issues including the response of CLs were checked with reference.

Each criterion in the PDD was checked as follows during document review and on-site assessment.

Criterion 1:

- Description specified in the methodology: “The project installs solar PV system(s).”
- Assessment for Criterion 1:

Specification of solar PV system described in the PDD was checked with “Specification of solar

PV system (Ref.3-1-2, 3-2-2)” and “Specification sheet of solar PV module / Inverter, Irradiance meter and Sunny WebBoxes (Ref.3-9 / 3-10)”. Also, installed solar PV system at each Site was checked by on-site inspection and interviews with PPs and local engineering company which installed solar PV systems.

Validation team confirmed that solar PV system described in the PDD was consistent with the actual equipment installed at each Site.

#### Criterion 2:

-Description specified in the methodology: “The solar PV system is connected to the internal power grid of the project site and/or to the grid for displacing grid electricity and/or captive electricity at the project site.”

-Assessment for Criterion 2:

The description of Criterion 2 in the PDD was checked by on-site inspection. Actual situation of electrical connection to the grid and the captive electricity at each Site were confirmed by on-site inspection and interviews with PPs.

CL3 was raised to confirm the documents for connection agreement to the grid. As a result of raising CL3, the description of Criterion 2 was checked and confirmed by validation team.

#### Criterion 3:

-Description specified in the methodology: “The PV modules have obtained a certification of design qualifications (IEC 61215, IEC 61646 or IEC 62108) and safety qualification (IEC 61730-1 and IEC 61730-2).”

-Assessment for Criterion 3:

Criterion 3 was checked with “Specification of solar PV system (Ref. 3-1-2, 3-2-2)”. CL4 was raised for checking certificates from manufacturer.

As a result of raising CL4, “Certificate for design qualifications (IEC 61215) and safety qualification (IEC 61730-1 and IEC 61730-2) (Ref.3-8)” were confirmed by validation team.

#### Criterion 4:

-Description specified in the methodology: “The equipment to monitor output power of the solar PV system and irradiance is installed at the project site.”

-Assessment for Criterion 4:

The equipment to monitor the output power of solar PV system and irradiance was checked during on-site assessment. Output power of solar PV system was checked by on-site inspection and “Specification of electrical power meter (Ref.3-11)”. Also, irradiance meter was checked by on-site inspection and “Specification sheet of Inverter, Irradiance meter (Sunny Sensor Boxes) and Sunny WebBoxes (Ref.3-10)”.

Validation team confirmed that the equipment to monitor output power of the solar PV system and irradiance was installed at the proposed project.

**<Findings>**

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

The following CLs were raised to check the application of approved methodology.

**CL3:**

In order to confirm the connection agreement to the grid, please submit the reference which was made between project site and grid corporation.

⇒ Summary of Response and Validation team Conclusion :

PPs submitted “Approval of application for Renewable Energy System (Ref. 3-1-1, 3-2-1)”. The application of installing solar PV system by the proposed project was approved by Palau Public Utilities Corporation (PPUC). (PPUC is a public corporation established to manage and operate the electrical power system of the Republic of Palau.) Also, PPUC inspected the completed solar PV system before the power line from the solar PV system to the grid was connected.

Validation team confirmed that PPs had applied to the PPUC appropriately for the connection to the grid.

CL3 was closed.

**CL4:**

In order to confirm the criterion 4, please submit the following certifications of Kyocera KU265-6MCA.

-Certification of design qualifications (IEC 61215, IEC 61646 or IEC 62108)

-Certification of safety qualification (IEC 61730-1 and IEC 61730-2)

⇒ Summary of Response and Validation team Conclusion :

“Certificate for design qualifications (IEC 61215) and safety qualification (IEC 61730-1 and IEC 61730-2) (Ref.3-8)” were submitted by PP. Validation team confirmed that the proposed project (Site A and B) satisfied the requirement of Criterion 4.

CL4 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team assessed the application of approved methodology of the proposed project with the supporting documents and on-site visit. As a result of raising CL3 and CL4, supporting documents were submitted.

Validation team confirmed that the proposed project was eligible for applying selected methodology “Displacement of Grid and Captive Genset Electricity by a Small-scale Solar PV System, Ver. 01.0”, and that the applied methodology was valid at the time of submission of the



proposed project for the validation.

#### C.4. Emission sources and calculation of emission reductions

##### <Means of validation>

The electricity generated by solar PV system is supplied to the power grid in Palau to replace existing electricity generation. Reference emissions are calculated using the quantity of the electricity generated by the project solar PV system. Emission sources of the reference emissions are consumption of grid electricity.

Validation team confirmed that relevant GHG emission sources and parameters to be fixed ex ante in the applied methodology were addressed in the PDD. Also, validation team checked the calculation of emission reductions with reference. Validation team conducted the assessment for GHG emission sources with the step below by following JCM Guidelines for Validation and Verification (Ref.13).

- Document review was conducted using the checklist based on the “JCM Guidelines for Validation and Verification (Ref.13)”.
- Follow-up interviews and on-site assessment were conducted on 10-12 Feb.2016.
- Remaining issues including the response of CL9 and CAR1 were checked with reference.

The description of the PDD including Monitoring spreadsheet was checked during document review and on-site assessment to confirm the emission sources and calculation of emission reductions.

The emission sources were confirmed by checking “Specification of solar PV system (Ref.3-1-2, 3-2-2)”, interviews with PPs and local engineering company, and on-site inspection by checking grid connection and captive electricity generation.

In addition, validation team checked the emission source that was not addressed by the applied methodology. Inverter for solar PV system consumes AC grid power when solar power is not available. Validation team confirms one inverter consumes 0.15W or less than 1W when solar power is not available. It is very few electrical consumption compared to the installed PV capacity (Site A: 5 inverters for 51.675kW solar PV capacity, Site B: 10 inverters for 103.35kW solar PV capacity), and it consumes for night time only. Validation team confirmed that it was identified no significant emission source that would be affected by implementation of the proposed project but not addressed by the applied methodology.

Validation team confirmed that the value of "Reference CO2 emission factor of grid and captive electricity" (0.533 tCO2/MWh) in the applied methodology was used in the PDD appropriately.

Also, the estimated quantity of electrical power generated was checked by validation team. The estimated electrical power was calculated by the multiplication of “daily generated power per kW of installed PV capacity (kWh/day/kW)”, “operation days of solar PV system” and installed

solar PV capacity. The values of “daily generated power per kW of installed PV capacity (kWh/day/kW)” was checked by “Reference regarding estimated solar PV output (The estimates were submitted by local engineering company) (Ref.11-1-1)” which was the historical data from other solar PV sites in Palau. “Operation days of solar PV system” was checked by “Reference for starting date of project operation (Document of Commissioning completion of Solar PV Power Plant) (Ref.3-1-3, 3-2-3)” . CL9 was raised to check “daily generated power per kilowatt of installed capacity” used for the calculation of estimated electrical power. As a result of raising CL9, validation team confirmed that the latest estimated value 3.7 (kWh/day/kW) was used as “daily generated power per kW of installed PV capacity”. Also, CAR1 was raised for checking the estimated value of emission reductions. As a result of raising CAR1, starting date of project operation described in the PDD was used for the calculation of estimated electrical power. Validation team confirmed that project emissions, reference emissions and emission reductions for the proposed project were calculated properly.

**<Findings>**

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

The following CL9 and CAR1 were raised to check the emission reductions of the PDD.

**CL9:**

“Reference regarding estimated solar PV output (The estimates were submitted by local engineering company) (Date:15 Sep.2015) (Ref.11-1-1)” was submitted by PP. In the “Reference regarding estimated solar PV output (Date:15 Sep.2015) (Ref.11-1-1)”, the value of “daily generated power per kilowatt of installed capacity” was revised from the previous reference (Date:15 Jan.2015). However, PPs did not use the latest “daily generated power per kilowatt of installed capacity” for the calculation of emission reductions. PPs need to clarify the data of “daily generated power per kilowatt of installed capacity” used for the calculation of emission reductions.

⇒Summary of response and validation team conclusion

PPs decided to use the latest data of “daily generated power per kilowatt of installed capacity” which was described in the “Reference regarding estimated solar PV output (Date:15 Sep.2015) (Ref.11-1-1)”.

Validation team confirmed that the value of “Estimated Emission Reductions” was calculated properly using the latest data of “daily generated power per kilowatt of installed capacity”.

CL9 was closed.

**CAR1:**

The value of “Estimated Emission Reductions” in 2016 was calculated from the first day of January 2016. However, the operation of solar PV system did not start power generation from

the first day of January 2016. PP needs to re-calculate the emission reductions by following the starting date of project operation.

⇒ Summary of Response and Validation team Conclusion :

The value of “Estimated Emission Reductions” in 2016 was re-calculated by PP. The starting date of project operation used for the calculation was same as the date from the “Reference for starting date of project operation (Document of Commissioning completion of Solar PV Power Plant) (Ref. 3-1-3, 3-2-3)”.

Validation team confirmed that the emission reductions were calculated properly using the starting date of project operation.

CAR1 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that:

- All relevant GHG emission sources covered in the approved methodology were addressed for the purpose of calculating project emissions and reference emissions for the proposed project ;
- The values for project specific parameters to be fixed ex ante listed in the Monitoring Plan Sheet were appropriate;
- The Monitoring Spreadsheet was not altered and its required fields were appropriately filled in;
- The emission sources and GHG types were confirmed through the on-site assessment and document review;
- Significant emission sources which were not addressed by the applied approved methodology and would be affected by implementation of the proposed project were not identified;
- The approved methodology was applied correctly to calculate project emissions and reference emissions.

C.5. Environmental impact assessment

**<Means of validation>**

PDD stated that an Environmental Impact Assessment (EIA) was not required by Palau’s laws and regulations. Palau’s regal requirements for EIA are issued by Environmental Quality Protection Board (EQPB). Validation team checked the requirements for EIA, which is “Guide to Environmental Impact Assessment, issued by Republic of Palau EQPB (Ref.5)”. Also, validation team had the interview with executive officer of EQPB in Palau to confirm the requirements of EIA. The proposed project is to install solar PV module on the top of the existing buildings. The applicability of the requirements of EIA described in the “Guide to Environmental Impact Assessment (Ref.5)” was confirmed by the interview. Validation team confirmed that EIA was not required for the proposed project (Site A and B) by the interview

with EQPB and the “Guide to Environmental Impact Assessment (Ref.5)”.

**<Findings>**

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

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

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the proposed project did not need EIA against the legal requirement of Republic of Palau.

C.6. Local stakeholder consultation

**<Means of validation>**

PPs conducted a stakeholder consultation meeting of this project activity to collect opinions from local stakeholders on 14th September 2015. CL 6 was raised to check the process of local stakeholder consultation and comments from local stakeholders. As a result of raising CL6, validation team checked “Local stakeholder consultation Meeting memo (Ref.6)”.

On-site assessment was conducted on 10-12 February 2016. As one of the on-site assessment processes, validation team interviewed two employees of Palau Adventist Schools. They are all supportive, and satisfied with the project activity which had an opportunity to reduce the usage of electricity.

**<Findings>**

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

The following CL6 was raised to check the process of local stakeholder consultation and comments from local stakeholders.

CL6:

How were the stakeholders selected for local stakeholder consultation? In addition, how were the interviewees selected? Also, please provide the minutes of local stakeholders consultation.

⇒Summary of Response and Validation team Conclusion :

The place of project activity is in the existing buildings. PPs identified the relevant stakeholders who are employees of Palau Adventist Schools (Site A and B) as local stakeholders for the project activity.

The stakeholder consultation meeting was informed to relative employees by direct contact to invite the employees to the meeting. PP has provided the copy of “Meeting memo (Ref.6)” to validation team. The comments from the meeting memo were checked and validation team found that there was no negative comment received from the local stakeholders.

CL6 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the PPs invited comments to the proposed project from the relevant local stakeholders, and the summary of the comments received was described in the PDD appropriately.

#### C.7. Monitoring

##### <Means of validation>

The description of the PDD including monitoring plan was checked as follows during document review and on-site assessment to confirm the Monitoring. Monitoring plan is consist of the Monitoring Plan Sheet and Monitoring Structure Sheet.

The description of Monitoring Plan Sheet was checked with the approved methodology. Monitoring points for measurement were checked by on-site inspection and “Specification of electrical power meter of the solar PV system (Ref.3-11)”. The proposed project has one monitoring point for each Site. Total quantity of the electrical power generated by the proposed project is measured by electricity meter. The description of chapter (h) in the table 1 of Monitoring Plan Sheet was checked as follows.

There is no national law or regulation for the measurement of electrical power in the proposed project. It was confirmed by interviews with PPs and local engineering company during on-site assessment.

PP submitted “Accuracy Calibration Self-Declaration (Ref.9-1)” which was made by electrical power meter manufacturer. In the “Accuracy Calibration Self-Declaration (Ref.9-1)”, it is described that “Accuenergy (CANADA) Inc, hereby declares that all Acuvim II series and Acuvim-L series power meters will maintain specified accuracy without recalibration in ten years after factory calibration.” PPs decided to replace the electricity meter within ten years after factory calibration in accordance with the “Accuracy Calibration Self-Declaration (Ref.9-1)”. Validation team confirmed that calibration method was decided appropriately based on the manufacturer's specification. Also, “Factory Test Report of electrical power meter (Ref. 9-2-1, 9-2-2)” was checked to confirm the date of factory calibration.

The accuracy described in the Monitoring Plan Sheet was checked by “Specification of electrical power meter of the solar PV system (Ref.3-11)”. CL5 was raised to check the description of the accuracy described in the Monitoring Plan Sheet.

Also, QA/QC procedure was checked with the description of the Monitoring Structure sheet and “Monitoring manual prepared by PCKK (Ref.12)”.

Monitoring structure was confirmed by interviews with the following people described in the Monitoring Structure sheet.

-Site A: Project manager (Deputy), Mechanic

-Site B: Mechanic

Validation team confirmed the role and responsibility for monitoring were assigned to the personnel in accordance with the Monitoring Structure sheet.

Also, validation team confirmed that PPs have the ability to implement the monitoring plan described in the Monitoring Plan Sheet and Monitoring Structure Sheet.

**<Findings>**

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

The following CL5 was raised to check the Monitoring Plan.

CL5:

The information of accuracy of monitoring point No. (1) described in the Monitoring plan sheet could not confirm by the reference (Specification of electrical power meter of the solar PV system (Ref.3-11)) submitted by PP. Please clarify the description of the accuracy described in the Monitoring plan sheet.

⇒Summary of Response and Validation team Conclusion :

PP revised the description of accuracy for electricity meter in the column (h) of the table 1 of Monitoring Plan Sheet. Validation team confirmed that the revised description was consistent with the “Specification of electrical power meter of the solar PV system (Ref.3-11)”.

CL5 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the Monitoring Plan was described in compliance with the approved methodology and “JCM Guidelines for developing PDD and MR (Ref.14)”.

Also, PPs have demonstrated the ability to implement the described monitoring plan including feasibility of monitoring structure.

C.8. Modalities of Communication

**<Means of validation>**

Modalities of communications (MoC) was developed using the form of "JCM\_PW\_F\_MoC\_ver01.0". Validation team confirmed that the latest form was used for MoC.

MoC was submitted by Pacific Consultants Co., Ltd. (PCKK). Validation team ensured that the “MoC (Ref.8-1)” was received from PCKK with whom JMA has a contractual relationship.

CL7 was raised to ask PPs to submit the “Written confirmation”. Validation team assessed the corporate identity of all project participants and a focal point, as well as the personal identities including specimen signatures and employment status of the authorised signatories through reviewing the “Written confirmation from PCKK (Ref.8-2)”.

Also, validation team confirmed the corporate information of PPs by interviews with all PPs.

**<Findings>**

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

The following CL7 was raised to confirm the description of the MoC.

CL7:

In order to confirm the followings, "Written confirmation" should be provided.

-all corporate and personal details, including specimen signatures, are valid and accurate in the MoC

⇒Summary of Response and Validation team Conclusion :

"Written confirmation (Ref.8-2)" was submitted by PP.

Validation team confirmed that "Written confirmation (Ref.8-2)" was issued by Mr. Masamichi Watanabe who is primary authorised by PCKK in the "MoC (Ref.8-1)". "Written confirmation (Ref.8-2)" indicates that all corporate and personal details of MoC of the proposed project, including specimen signatures, are valid and accurate. Information described in the "MoC (Ref.8-1)" was assessed with "Written confirmation (Ref.8-2)". Validation team confirmed that all corporate and personal details including specimen signatures were valid and accurate as requested in the "JCM Guidelines for Validation and Verification (Ref.13)".

CL7 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the "MoC (Ref.8-1)" was completed using the latest form. Also, validation team confirmed the "MoC (Ref.8-1)" had been completed correctly in compliance with the requirements of the "JCM Guidelines (Ref.13, 15)".

## C.9. Avoidance of double registration

**<Means of validation>**

"Written confirmation (Ref.8-2)" indicates that the proposed project is not registered under other international climate mitigation mechanisms. Also, "Written confirmation (Ref.8-2)" was issued by Mr. Masamichi Watanabe who is primary authorised by PCKK in the "MoC (Ref.8-1)". In addition, the following websites of CDM, JI and VCS were checked whether the projects with similar technology and location had been registered.

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

Validation team confirmed that there was no registered project with similar technology and location.

**<Findings>**

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

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

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the proposed JCM project was not registered under other international climate mitigation mechanisms.

C.10. Start of operation

**<Means of validation>**

"Start of operation date" described in the PDD was checked by raising CL8 and CAR2. On-site assessment was conducted on 10-12 Feb.2016. Validation team confirmed that all Sites had started power generation by the proposed project. The references submitted as the response of CL8 were checked during on-site assessment. Also, validation team had the interviews with project manager of installation vendor of solar PV systems to confirm the "Start of operation date".

Validation team confirmed the "Start of operation date" by on-site assessment and checking "Document of Commissioning completion of Solar PV Power Plant (Ref. 3-1-3, 3-2-3)".

**<Findings>**

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

The following CL8 and CAR2 were raised to check the "Starting date of project operation".

**CL8:**

It is necessary to confirm the "Start of operation date" for each Site.

Please submit the documents or records as the evidence of "Starting date of project operation" for each Site.

⇒Summary of Response and Validation team Conclusion :

The "Document of Commissioning completion of Solar PV Power Plant (Ref.3-1-3, 3-2-3)" was submitted by PP.

Validation team confirmed that the operation of solar PV system had started power generation on the date of commissioning completion. As power of inverters was "ON" on that day, each electrical power meter at Site was started measuring from indication zero. In addition, photographs of the electricity meter indication (kWh) before the start of operation (Ref.11-1-2, 11-2-2) were checked to confirm the value zero before the "Start of operation date".

CL8 was closed.

**CAR2:**

The starting date of project operation for Site B was confirmed during on-site assessment by



checking “Document of Commissioning completion of Solar PV Power Plant (Ref.3-2-3)”.  
 “Start of operation date” described in the PDD is inconsistent with the date described in the  
 “Document of Commissioning completion (Ref.3-2-3)”.

⇒Summary of Response and Validation team Conclusion :

The starting date of project operation for Site B described in the PDD was revised by PP.  
 Validation team confirmed that the starting date was consistent with the date of “Document of  
 Commissioning completion (Ref.3-2-3)”.

CAR2 was closed.

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Validation team confirmed that the "Start of operation date" of the proposed project was 8  
 Feb.2016 for Site A and 12 Feb.2016 for Site B as described in the PDD. "Start of operation  
 dates" for each Site is not before 13 January 2014. Hence, validation team confirmed that the  
 proposed project satisfied the requirement of the “JCM Guidelines (Ref.13, 14, 15)”.

C.11. Other issues

**<Means of validation>**

No other issue was identified.

**<Findings>**

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

Not applicable

**<Conclusion based on reporting requirements>**

*Please state conclusion based on reporting requirements.*

Not applicable

## D. Information on public inputs

### D.1. Summary of public inputs

In line with the JCM Project Cycle Procedure (JCM\_PW\_PCP\_ver01.0) (Ref.15), the PDD is to  
 be made publicly available for 30 days to invite public comments. The PDD was made publicly  
 available for the period of 18 Feb. 2016 to 18 Mar.2016 on the following URL.

<https://www.jcm.go.jp/pw-jp/projects/13>

### D.2. Summary of how inputs received have been taken into account by the project participants

No comment was received during the period to receive public inputs.

Hence, no action was required to be taken by the PPs to satisfy the requirement of JCM Project Cycle Procedure (Ref.15).

## E. List of interviewees and documents received

### E.1. List of interviewees

Pacific Consultants Co., Ltd. (PCKK):

Ms.Minako Sasaki

Mr.Hirofumi Ishizaka

Site A,B:

Palau Adventist Schools

Mr. Nelson Sisor

Mr.Marlon M. Tomas

Environmental Quality Protection Board (EQPB):

Ms.Roxanne Y. Blesam

Island Engineering and Design (local engineering company which installed solar PV systems):

Mr.Stephen Swords

### E.2. List of documents received

Ref.1: Project Design Document for JCM project "Small Scale Solar Power Plants for Schools in Island States"

- PDD version 1: PDD was submitted to JMA on 8th Feb.2016. Also, PDD was submitted to the secretariat of JCM for public inputs.

- PDD version 2: PDD was revised on 7th Mar.2016 based on the document review and on-site assessment by validation team.

- PDD version 3: PDD was revised on 22nd Mar.2016 to resolve the remaining issues.

Ref.2: Approved Methodology "Displacement of Grid and Captive Genset Electricity by a Small-scale Solar PV System, Ver. 01.0 "

Reference for Site A:

Ref.3-1-1: Approval of application for Renewable Energy System  
(Submitted by Renewable Energy Division, Palau Public Utilities Corporation on Jan.26, 2016)

Ref.3-1-2: Specification of solar PV system (Project documents):  
(Project Location: SDA elementary school GYM, Ngerbeched, Koror, Palau,  
Contractor: Island Engineering and Design, Meketii, Koror, Palau,  
Commissioned: 8 Feb. 2016, Submitted in Mar.2016)

Ref.3-1-3: Document of Commissioning completion of Solar PV Power Plant:  
(Commissioning of SDA Elementary School Solar PV Power Plant:  
System is now commissioned and operating as per design. Warranty is in effect as of 8 February 2016. (Submitted by Island Engineering and Design on 8 Feb. 2016))

Ref.9-2-1: Factory Test Report for Site A submitted by Accuenergy Technology Co., Ltd. (Test date: 2015/10/14)

Ref.11-1-2: Photograph of the power (kWH) indication before the start of operation

Reference for Site B:

Ref.3-2-1: Approval of application for Renewable Energy System  
(Submitted by Renewable Energy Division, Palau Public Utilities Corporation on Jan.26, 2016)

Ref.3-2-2: Specification of solar PV system (Project documents):  
(Project Location: SDA high school GYM, Ngerikiil, Airai, Palau,  
Contractor: Island Engineering and Design, Meketii, Koror, Palau,  
Commissioned: 12 Feb. 2016, Submitted in Mar.2016)

Ref.3-2-3: Document of Commissioning completion of Solar PV Power Plant" :  
(Commissioning of PMA High School Solar PV Power Plant:  
System is now commissioned and operating as per design. Warranty is in effect as of 12 February 2016. (Submitted by Island Engineering and Design on 12 Feb. 2016))

Ref.9-2-2: Factory Test Report for Site B submitted by Accuenergy Technology Co., Ltd. (Test date: 2015/10/14)

Ref.11-2-2: Photograph of the power (kWH) indication before the start of operation

Reference for Site A and B:

Ref.3-6: Reference regarding Net-metering scheme in Palau:  
The Senate EIGHTH OLBIIL ERA KELULAU (RPPL No.8-39)  
(Approved by Johnson Toribiong President Republic of Palau: 6 Jan.2012)

Ref.3-7: Reference for "Expected operational lifetime of project":  
-Average of Expected operational lifetime for solar PV module is more than or equals to 20 years (Homepage of KYOCERA)  
-Limited Warranty for Kyocera Photovoltaic Module(s) (KKM-SE-00001-07: 190713)

(Warranty period of Limited Power Output Warranty (25years))

Ref.3-8: Certificate for design qualifications (IEC 61215) and safety qualification (IEC 61730-1 and IEC 61730-2) (Date of issue: 2.April 2015, Japan Electrical Safety & Environment Technology Laboratories)

Ref.3-9: Specification sheet of solar PV module (KYOCERA KU-60 1000V Series, Submitted in Dec.2015)

Ref.3-10: Specification sheet of Inverter (Sunny Boy), Irradiance meter (Sunny Sensor Boxes) and Sunny WebBoxes (SMA America,LLC) (Contractor: Island Engineering and Design, Submitted in Jan.2016)

Ref.3-11: Specification of electrical power meter of the solar PV system  
(Acuvim II series high performance meter specification, made by ACCUENERGY)  
(Contractor: Island Engineering and Design, Submitted in Dec.2015)

Ref.4 : Financing programme for JCM model projects by the Ministry of the Environment, Japan

- Application for carbon dioxide emission control measures business subsidies 2014 fiscal year, Submitted to the Minister of the Environment, 27 Feb. 2015
- Grant decisions for carbon dioxide emission control measures business subsidies 2014 fiscal year, Issued by the Minister of the Environment, 2 Mar. 2015

Ref.5: Guide to Environmental Impact Assessment (Republic of Palau Environmental Quality Protection Board : Latest revision-August 2000)

Ref.6: Local stakeholder consultation (14 Sep.2015) Meeting memo

Ref.8-1: JCM Modalities of Communications Statement Form (Submitted on 8 Feb.2016)

Ref.8-2: Written confirmation from PCKK (Declaration from Mr. Masamichi Watanabe, PCKK on 9 Mar.2016)

Ref.9-1: Accuracy Calibration Self-Declaration

(Manager of Quality Assurance Dept. Accuenergy (CANADA) Inc signed on Mar.22. 2013)

Ref.11-1-1: Reference regarding estimated solar PV output:

The estimates were submitted by ISLAND ENGINEERING AND DESIGN (Date:15 Sep.2015)

Ref.12: Monitoring Manual (Prepared by Pacific Consultants Co., Ltd., Revised on 8.Feb. 2016)

Ref.13: Joint Crediting Mechanism Guidelines for Validation and Verification (JCM\_PW\_GL\_VV\_ver01.0)

Ref.14: Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report (JCM\_PW\_GL\_PDD\_MR\_ver01.0)

Ref.15: Joint Crediting Mechanism Project Cycle Procedure (JCM\_PW\_PCP\_ver02.0)

Ref.16: Joint Crediting Mechanism Glossary of Terms (JCM\_PW\_Glossary\_ver01.0)



**Annex Certificates or curricula vitae of TPE's validation 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 validation team and technical review team is attached to this report.

**Certificate of Competence  
for Validation/Verification team**

GHG Certification Center  
Japan Management Association



Scheme:

**The Joint Crediting Mechanism (JCM)**

Project Title:

Small scale solar power plants for schools in island states

Validation or Verification:

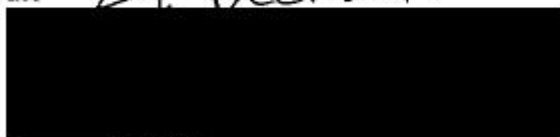
**Validation**

Name	Qualification <sup>*1</sup>	Leader/Member/ Technical expert/ Technical Reviewer(TR)	Qualification of Technical area (Renewables) <sup>*2</sup>	JCM scheme competence
Mr. Motoyuki Matsumoto	Lead Validator/ Verifier	Leader	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mr. Kenji Suzuki	Lead Validator/ Verifier	Member	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Competence of Validation Team</b>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

<sup>\*2</sup>Competence Requirement in accordance with Competence for Technical area sheet (GA-110-08)

Date 24 Dec. 2015



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:

**Small scale solar power plants for schools in island states**

Validation or Verification:


**Validation**

Name	Qualification *1	Leader/Member/ Technical expert/ Technical Reviewer(TR)	Qualification of Technical area (Renewables)*2	JCM scheme competence
Mr.Masahiro Hirakawa	Lead Validator/ Verifier	Technical Reviewer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mr. Toshiaki Takeda	Validator/ Verifier	Technical Reviewer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Competence of Technical Review Team</b>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\*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 7. Mar. 2016

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