JCM Validation Report Form

A. Summary of validation

A.1. General Information

Title of the project	A HIGH EFFICIENCY AND LOW LOSS POWER TRANSMISSION AND DISTRIBUTION SYSTEM IN MONGOLIA
Reference number	MN005
Third-party entity (TPE)	Lloyd's Register Quality Assurance Limited (LRQA)
Project participant contracting the TPE	Hitachi, Ltd.
Date of completion of this report	02/08/2017

A.2 Conclusion of validation

Overall validation opinion	☒ Positive ☐ Negative

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.	☒
Project description	The description of the proposed JCM project in the PDD is accurate, complete, and provides comprehension of the proposed JCM project.	☒
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.	☒
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.	☒
	The values for project specific parameters to be fixed *ex ante* listed in the Monitoring Plan Sheet are appropriate, if applicable.	☒
Environmental impact assessment	The project participants conducted an environmental impact assessment, if required by Mongolia, in line with Mongolia's procedures.	☒
Local	The project participants have completed a local stakeholder	☒

Item	Validation requirements	No CAR or CL remaining
stakeholder consultation	consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed 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.	☒
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.	☒
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.	☒
	The MoC has been correctly completed and duly authorized.	☒
Avoidance of double registration	The proposed JCM project is not registered under other international climate mitigation mechanisms.	☒
Start of operation	The start of the operating date of the proposed JCM project does not predate January 1, 2013.	☒

Authorised signatory:	Mr. ☒	Ms. ☐
Last name: Chiba	First name: Michiaki	
Title: Climate Change Manager - Asia & Pacific		
Specimen signature [redacted]		Date: 02/08/2017

B. Validation team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. ☒ Ms. ☐	Michiaki Chiba	LRQA Ltd.	Team leader	☒	Technical competence authorised	☒
Mr. ☒ Ms. ☐	Stewart Niu	LRQA China	Internal reviewer	☒	N/A	☐
Mr. ☐ Ms. ☐				☐		☐
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 validation, findings, and conclusion based on reporting requirements

C.1. Project design document form

<Means of validation>

The PDD was checked and confirmed as complete against the JCM Guidelines for Developing Project Design Document (PDD) and Monitoring Report (MR) No. JCM_MN_GL_PDD_MR_ver03.0. A valid form of the JCM PDD Form No. JCM_MN_F_PDD_ver03.0 is used for the PDD Version 1.0 dated 31/05/2017. The completeness was also checked for the revised PDD Version 2.0 dated 20/07/2017.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the PDD was completed using the valid form of the JCM PDD Form and in accordance with the JCM Guidelines for Developing PDD and MR.

C.2. Project description

<Means of validation>

The project is to install a high efficiency and low-loss power transmission line made in Japan that can reduce transmission loss by 10-15% compared to a conventional transmission line, and contributes to reducing greenhouse gas (GHG) emissions. The project transmission line is a single-circuit transmission line spanning 159.4 km between New Oyu Tolgoi (NOT) Substation in Omnogovi Province and Tsagaan Suvarga (TS) Substation in Dornogovi Province in southern region of Mongolia.

The project is implemented by NATIONAL POWER TRANSMISSION GRID State Owned Stock Company (NPTG) from Mongolia and Hitachi, Ltd. from Japan. The start date of project operation will be on 01/10/2017 and the expected operational lifetime of the project is for 14 years. The project participants (PPs) referred to the Statutory useful life for the calculation of depreciation and amortization for machinery and equipment issued by Japan's Ministry of Finance for the basis of the expected operational lifetime. The operational lifetime is indicated as for 36 years for transmission line. According to Energy Regulation Commission (ERC) Resolution No. 53 of Mongolia, the period of depreciation is indicated for 40-45 years for 35 kV or higher voltage transmission line with steel cones. The project transmission line applying the state-of-art design of the Japanese leading manufacturer will have a longer operational lifetime with sound operation and maintenance activities, but the PPs selected shorter lifetime specified by the applicable regulations. That is conservative and considered acceptable as it fulfils the duration of the crediting period.

The project receives financial support for JCM demonstration projects from the New Energy and Industrial Technology Development Organization (NEDO), Japan. The PPs from Japan contribute in the project introducing the state-of-the-art low-loss transmission line technology of Japan and assist NPTG to implement proper monitoring.

The validation team assessed the PDD and the supporting documents, interviewed the PPs to validate the requirements concerning accuracy and completeness of the project description.

The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team assessed the project description provided in the PDD with the supporting documents to the requirements on the accuracy and completeness. The validation team confirmed that the proposed JCM project in the PDD is described in accurate and complete

manners that is understandable the nature of the proposed project activity.

C.3. Application of approved methodology(ies)

<Means of validation>

The project applied the approved methodology JCM_MN_AM001_ver01.0 "Installation of energy-saving transmission lines in the Mongolian Grid" Ver 01.0.

LRQA assessed if the selected methodology is applicable to the proposed project. The project applicability was checked against each eligibility criterion in the approved methodology selected. The steps taken to validate each eligibility criterion and the conclusions about its applicability to the proposed project are summarised as below.

Criterion 1: The transmission line constitutes of a single or double circuit(s) directly connecting a substation and another substation within the country with no branching in between, and does not constitute a part of a loop.

Justification in the PDD: This project involves the placement of low-loss transmission lines in between the new Oyu Tolgoi substation and Tsagaan Suvarga substation. There are no branch lines or loops present within the interval. Therefore, the project fulfils this criterion.

Steps taken for assessment: Document review was conducted on the project documentation, technical specification, and the on-site visit and interviews were conducted in the host country.

Conclusion: Based on the validation processes taken, the validation team confirmed that the project transmission line is a single circuit line directly connecting NOT and TS Substations in southern Mongolia. There is no branching between the 2 substations and it does not constitute a part of a loop. Therefore the criterion is met by the project.

Criterion 2: The type of conductor is LL-ACSR/SA, which meets the following technical criteria.

Type of energy-saving conductors	unit	Equivalent to LL-ACSR/SA 279/20mm2	Equivalent to LL-ACSR/SA 337/27mm2	Equivalent to LL-ACSR/SA 445/36mm2
Outer diameter of conductor	mm	≦ 21.6	≦ 24.0	≦ 27.5
Direct current resistance (@20degC)	Ω/km	≦ 0.1063	≦ 0.0862	≦ 0.0659
Tensile strength	N	≧ 75,050	≧ 90,574	≧ 120,481
Weight	kg/km	≦ 921	≦ 1,132	≦ 1,490

Corresponding conductors currently in use that forms the basis of calculating the reference emissions	ACSR 240/32mm2	ACSR 300/39mm2	ACSR 400/51mm2

Justification in the PDD: The specifications of the transmission line to be placed in this project are as follows, and meet those outlined in the eligibility criterion.

Specification of low-loss conductor;

- External diameter : 27.5 mm
- Direct-current resistance : 0.064 Ω/km
- Tensile strength : 120,600N
- Weight : 1,490 kg/km

Steps taken for assessment: Document review was conducted on the technical specification, test reports, and the on-site visit and interviews were conducted in the host country.

Conclusion: Based on the validation processes taken, the validation team confirmed that the project low loss transmission line of conductor equivalent to LL-ACSR/SA 445/36mm2 satisfies the specification. Therefore the criterion is met by the proposed project.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the project applied the valid version of the approved methodology and the applicability was demonstrated to the eligibility criteria as appropriate.

C.4. Emission sources and calculation of emission reductions

<Means of validation>

The project reduces transmission loss by introducing a high efficiency and low loss power transmission line in the power transmission and distribution system of Mongolia. The sources of GHG emissions are transmission loss and CO2 emissions in the reference scenario and the project scenario are considered in accordance with the applied methodology. The new transmission line between NOT Substation and TS Substation is constructed to connect NPTG grid system to Tsagaan Suvarga copper mine, the associated factories being newly developed and 2 nearby villages, that electricity demand will gradually increase according to the

development plan in several phases.

The conductor of the project transmission line is equivalent to LL-ACSR/SA 445/36mm2 and the direct current (D.C.) resistance of corresponding conductors currently in use for calculating the reference emissions (REs) is 0.0718 Ω/km in accordance with the applied methodology. The D.C. resistance of the LL-ACSR/SA conductors used for the project transmission line is determined ex-ante as 0.0640 Ω/km that is set in the test specification and satisfies the technical criteria of the eligibility criterion 2 of the applied methodology as equal or less than 0.0659 Ω/km. The D.C. resistance of the project transmission line was confirmed to be equal or less than 0.0640 Ω/km in the test records. Therefore use of 0.0640 Ω/km in the calculation for all the conductors of the project transmission line is conservative.

The CO2 emission factor (EF) for the grid electricity is monitored and determined ex-post using the most recent data published by the host country government. The ex-ante estimation uses the grid emission factor of 1.1054 t-CO2/MWh that is average of OM EF 1.1542 t-CO2/MWh and BM EF 1.0566 t-CO2/MWh as published for the Central Grid of Mongolia 2010-2013 in the JCM Mongolia website.

The project includes a single transmission line and the annual GHG emission reductions are calculated using the project transmission line loss based on the estimated electricity demand and the load flow analysis of each year as below:

Emission reductions (ERy) = Reference emissions (REy) – Project emissions (PEy) = LOSS_PJ,L,y x Rdc_RF,L / Rdc_PJ,L x EF_Grid,y - LOSS_PJ,L,y x EF_Grid,y

LOSS_PJ,L,y = E_L,send,y – E_L,receive,y

2017: 91.1 MWh x 0.0718 / 0.0640 Ω/km x 1.1054 t-CO2/MWh – 91.1 MWh x 1.1054 t-CO2/MWh = 113 – 101 = 12 t-CO2

2018: 191.0 MWh x 0.0718 / 0.0640 Ω/km x 1.1054 t-CO2/MWh – 191.0 MWh x 1.1054 t-CO2/MWh = 236 – 211 = 25 t-CO2

2019: 696.4 MWh x 0.0718 / 0.0640 Ω/km x 1.1054 t-CO2/MWh – 696.4 MWh x 1.1054 t-CO2/MWh = 863 – 770 = 93 t-CO2

2020-2024: 3,273.6 MWh x 0.0718 / 0.0640 Ω/km x 1.1054 t-CO2/MWh – 3,273.6 MWh x 1.1054 t-CO2/MWh = 4,059 – 3,618 = 441 t-CO2

2025-2029: 5,085.2 MWh x 0.0718 / 0.0640 Ω/km x 1.1054 t-CO2/MWh – 5,085.2 MWh x 1.1054 t-CO2/MWh = 6,306 – 5,621 = 685 t-CO2

2030: 5,782.5 MWh x 0.0718 / 0.0640 Ω/km x 1.1054 t-CO2/MWh – 5,782.5 MWh x 1.1054 t-CO2/MWh = 7,171 – 6,392 = 779 t-CO2

The MPS shows calculation of ERs in year 2018 but the calculations for the other years were separately provided for review by the validation team.

The validation team assessed the documented evidence and confirmed that all the relevant GHG emission sources covered in the applied methodology are addressed, and the steps taken and the

equations applied to calculate REs and PEs for the proposed project comply with the requirements of the approved methodology.

Through the processes taken, CAR 1, CL 1 and CL 2 were raised as the resolution detailed below.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

<Findings>

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

Grade / Ref: CAR 1

Nature of the issue raised:

The estimated values of the parameters E_L,send,y and E_L,receive,y needed to be revised in consideration of the up-to-date forecasted power consumption of the recipients including the load conditions and operating time in each year.

Nature of responses provided by the PPs:

Revised estimation was submitted based on the latest load data and operation time. The PDD and Monitoring Plan Sheet (MPS) were reflected with the updated data and information.

Assessment of the responses:

The validation team reviewed the revised estimation with the supporting documents and confirmed that the values used for estimation of the parameters were appropriately revised based on the updated forecast of the power consumption at the time of validation. The CAR was closed.

Grade / Ref: CL 1

Nature of the issue raised:

The PPs were requested to clarify how the value of the parameter Rdc_PJ,L was measured according to IEC 60468 (Method of measurement of resistivity of metallic materials) as requested by the approved methodology. The test plan of the manufacturer refers to IEC 62219, IEC 61232 and IEC 60889 but not IEC 60468.

Nature of responses provided by the PPs:

The tests for hard-drawn aluminium wire (inner layer & outer layer, aluminium-clad steel wire) were conducted in accordance with IEC 60889 and IEC 61232. IEC 60889 and IEC 61232 mention that DC resistance should be measured in accordance with IEC 60468.

DC resistance of conductor (LL-ACSR/AS) should be calculated based on measured resistance of each wire in accordance with IEC 62219.

Assessment of the responses:

The validation team reviewed the relevant international standards as well as the documentation of the manufacturer's tests. The project conductor composed of hard-drawn aluminium wire in

outer and inner layers and aluminium clad steel wire. The applied international standard for tests of hard-drawn aluminium wire is IEC 60889 and that for tests of aluminium-clad steel wire is IEC 61232 and both international standards apply the methods of resistivity test of IEC 60468. Thus D.C. resistance of the project conductor was confirmed as having been measured according to IEC 60468 in accordance with the requirement of the applied methodology. Therefore the CL was closed.

Grade / Ref: CL 2

Nature of the issue raised:

The PPs were requested to provide supporting information of estimated transmission line losses used in the ex-ante estimation of GHG emission reductions.

The ex-ante estimated value of the parameter E_L,send,y was based on the estimated electricity demand of the recipient industrial users and the parameter E_L,receive,y was calculated by deducting estimated transmission loss from the estimated value of E_L,send,y. However, E_L,receive,y should be based on the estimated electricity demand of the recipient industrial users and E_L,send,y is to be calculated by adding estimated transmission loss to the estimated value of E_L,receive,y instead.

Nature of responses provided by the PPs:

Revised calculation was submitted with the supporting documents including the load flow analysis. The load flow analysis was provided based on the updated information addressing above CAR 1.

Assessment of the responses:

The validation team confirmed that the estimated transmission line losses in the revised calculation are correctly sourced from the load flow analysis that was provided based on the updated information of the electricity consumption in each year at the time of validation. The ex-ante estimated values of the parameters E_L,send,y and E_L,receive,y were corrected so that the value of the parameter E_L,receive,y is based on the estimated electricity demand of the recipient industrial users and the value of the parameter E_L,send,y is calculated by adding estimated transmission loss to the estimated value of E_L,receive,y. The CL was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that:

- The methodology was applied correctly to calculate REs and PEs and no other significant emission source was identified that would be affected and reasonably attributed by implementation of the proposed project but not addressed by the applied methodology;
- The choice of whether an emission source or gas is to be included where the applied methodology allows was reasonably justified by the PPs;

- The MPS was not altered and the fields were filled in as required so that all estimates of the REs could be replicated using the data and parameter values provided in the PDD;
- The values for the project specific parameters fixed ex ante listed in the MPS were appropriate with all the data sources and assumptions and the calculations were correct to the proposed JCM project;
- All assumptions and data used by the PPs were listed in the PDD, including their references and sources; and
- All values used in the PDD were considered reasonable in the context of the proposed JCM project.

C.5. Environmental impact assessment

<Means of validation>

The project low loss power transmission line is applied to the new construction of power transmission and distribution system including the NOT Substation, TS Substation and 159.4 km power transmission line connecting the 2 substations. In accordance with the laws of the host country a detailed environmental impacts assessment has been conducted and approved with the general management plan. The environmental resource management plan and the measures implemented are required to be prepared and reported on an annual basis over the project operation period in accordance with the host country regulations. The validation team reviewed the report of the detailed environmental impacts assessment, the legal requirements of the host country, interviewed the PPs and the related parties, and confirmed that the environmental impacts assessment required by the host country has been conducted inclusive of the proposed JCM project.

The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed by assessing the relevant documents and using the local sources/expertise that an environmental impacts assessment has been conducted to meet the legal requirement of the host country and the PDD satisfies the requirements of the JCM.

C.6. Local stakeholder consultation

<Means of validation>

The PPs invited the local stakeholders and held a consultation meeting on 19/04/2017 that was

attended by the Ministry of Energy, the Ministry of Environment and Tourism, and Mongolyn Alt Corporation. No negative issue was raised through the process.
The details of the persons interviewed and documents reviewed are provided in the Section E of this report.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the PPs have invited comments to the proposed project from the relevant local stakeholders, the summary of the comments received is provided in the PDD in a complete manner and the PPs have taken due account of all the comments received from the local stakeholders as the processes described in the PDD.

C.7. Monitoring

<Means of validation>

The Monitoring Plan (MP) consisting of MPS and Monitoring Structure Sheet (MSS) is based on the approved methodology. Power sent from the point of origin/supply to the transmission line, power received at the point of receipt of the transmission line, and CO2 EF of the grid are the parameters to be monitored ex-post.
The power sent from the point of origin/supply to the transmission line and the power received at the point of receipt of the transmission line is directly and continuously measured by electrical power meters.
Value published by the host country government is used for the CO2 EF of the grid and the EF of the corresponding year is annually monitored and used for ex-post determination of the emission reductions. If such data is not available, the most recent data available at the time of submission of the MR is used in accordance with the applied methodology.
The roles and responsibilities of the persons are described in the MSS in accordance with the requirements of the applied methodology. The monitored data is automatically recorded and transferred. The Operators are responsible to maintain the records, the Project Engineer checks the data, and the Project Manager approves the monitoring results. For the initial period of the implementation, the team of Hitachi, Ltd. will support the monitoring management as covered by NEDO demonstration project and it will be succeeded by NPTG with instruction and training by Hitachi, Ltd. as relevant.
The validation team confirmed that the MP complied with the requirements in the approved methodology and that the PPs will be able to apply the MP following the monitoring arrangements described in it. CAR 2 and CL 3 were issued that the details of resolution are as

described below.

The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

<Findings>

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

Grade / Ref: CAR 2

Nature of the issue raised:

The Measurement methods and procedures of the MPS did not include detailed description of the measuring equipment on accuracy level and calibration information (date of calibration and validity).

Nature of responses provided by the PPs:

The revised MPS inclusive of the detailed description was submitted.

The accuracy level of the electricity meters is 0.5 (+/- 0.5%) and the meters are to be calibrated every year in accordance with the applied methodology.

Assessment of the responses:

The revised MPS includes the detailed description of the measuring equipment including the accuracy level and the calibration information. The accuracy level is 0.5 that was chosen from the Mongolian Standard MNS IEC 521:2001 specifying class 0.5, 1.0 and 2.0 A.C. watthour meters. The electricity meters were tested on 13/02/2017 satisfying the quality requirements and the calibration is valid for a year (next calibration is due by 12/02/2018).

The validation team reviewed the revised MPS and confirmed that the correct information is indicated based on the supporting documents including the technical specification and the calibration reports. The CAR was closed.

Grade / Ref: CL 3

Nature of the issue raised:

The PPs were requested to confirm how the PPs ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the final issuance of credits.

Nature of responses provided by the PPs:

The Project Engineer (person in charge of monitoring) will keep and archive data monitored and required for verification and issuance electronically for two years after the final issuance of credits. Revised Monitoring Procedures were submitted for review.

Assessment of the responses:

The validation team confirmed that the revised monitoring procedures address the requirement to keep and archive electronic data of the monitoring for two years after the final issuance of the credits as appropriate. Therefore the CL was closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the MP was described in compliance with the requirements of the approved methodology and the Guidelines for developing PDD and MR, and the PPs have demonstrated feasibility of the monitoring structure and their ability to implement the MP.

C.8. Modalities of Communication

<Means of validation>

The MoC was submitted to LRQA for review in the form JCM_MN_F_MoC_ver02.0 that nominates Hitachi, Ltd. as the focal point and was signed by the authorized representatives of all the PPs with the contact details. The form used is the latest one as of the time of validation.

The validation team assessed the personal identities including specimen signatures and employment status of the authorized signatories through directly checking the evidence for corporate and personal identity of the PPs and their authorised signatories. The validation team also confirmed through reviewing the corporate information of the PPs and by meeting the persons representing the PPs that the information provided in the MoC is correct.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the MoC was completed using the latest form after assessment conducted on relevance of the MoC in compliance with the requirements of the JCM Guidelines.

C.9. Avoidance of double registration

<Means of validation>

The validation team assessed and confirmed relevance of the written confirmation in the MoC from the PPs that the proposed JCM project was not registered under the other international climate mitigation mechanisms.

The team in addition to the interviews with the PPs checked publicly accessible information of Clean Development Mechanism (CDM), Joint Implementation (JI), Verified Carbon Standard (VCS) and Gold Standard (GS) and found no identical project as the proposed JCM project in terms of the name of entities, applied technology, scale and the location. The result of researches confirmed that the proposed project was not registered under the other international climate mitigation mechanisms than JCM and it will not result in a double counting of GHG emission reductions.

Particular attention was given to that there are approved CDM methodologies,
- Approved Large-scale CDM methodology AM0118 Introduction of low resistivity power transmission line Version 01.0
- Approved Small Scale CDM Methodology AMS II.A. Supply-side energy efficiency improvements – transmission and distribution Version 10

But no project registered under CDM and the other schemes was found applying the similar project technology of low loss transmission line and located in Mongolia.
The details of the persons interviewed and the documents reviewed are shown in the Section E of this report.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

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

C.10. Start of operation

<Means of validation>

The start date for the operation of the proposed JCM project is indicated in the PDD as 01/10/2017.
The validation team confirmed correctness/relevance of the information by reviewing the supporting evidence, including but not limited to assessing of the contracts and test reports, and that the date is not before 01/01/2013 as required to be eligible as a JCM project.

<Findings>

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

No issue was raised to the requirements of this section.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The validation team confirmed that the start date of operation of the proposed JCM project is 01/10/2017 and not before 01/01/2013 as required to be eligible as a JCM project.

C.11. Other issues

<Means of validation>

No issue was identified as relevant element not covered above.

<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, the PDD is to be made publicly available for 30 days to invite public comments. The PDD was made publicly available in line with the requirements of the procedure for the period of 07/06/2017 to 06/07/2017 as per https://www.jcm.go.jp/mn-jp/projects/27.

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

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

Thus no action was required to be taken by the PPs to satisfy the JCM requirement.

E. List of interviewees and documents received

E.1. List of interviewees

National Power Transmission Grid State Owned Stock Company

- Chinbat Davaasambuu, Senior Deputy Director and Chief engineer
- Enkhbat B., Head of Technical Policy Coordination Department
- Munkhtsog G., Head of Relay Protection Department
- Umerbai M., Head of Dispatching Department
- Baigalmaa M., Senior accountant

Hitachi Ltd. Power Business Unit

- Hiroshi Konno, Section Manager, Global T&D Engineering Group, System Engineering Department, Power Production Management Division
- Masanori Furuya, Engineer, Global T&D Engineering Dept. Business Management Div., Transmission & Distribution Systems Division

Mongolyn Alt Corporation (MAK)
- Battsengel Khuyagbaatar, Electric engineer
- D. Sarantuya, Manager, Corporate Social Responsibility

Environmental Resource Management (ERM) Japan Ltd.
- Tsuyoshi Nakao, Group Leader, Sustainability Management Team

E.2. List of documents received

Category A documents (documents prepared by the PPs)
- PDD Version 1.0 dated 31/05/2017 with the Monitoring Spreadsheet
- Revised PDD Version 2.0 dated 20/07/2017 with the Monitoring Spreadsheet
- MoC dated 05/06/2017
- Feasibility Study Report for promoting application of high efficiency technologies to power transmission and coal fired thermal power plant in Mongolia, March 2013
- Organisation chart of Hitachi, Ltd. as of 01/01/2017
- Corporate structure of Hitachi, Ltd. as of 02/04/2017
- Document signed by authorised persons
- Contract administration management chart for JCM demonstration project
- National Power Transmission Grid, Organization Chart
- National Power Transmission Grid, Company profile
- Appointment – Mr. Chinbat
- Appointment – Mr. Enkhbat
- Ministerial ordinance concerning the useful life etc. of depreciable assets
- Instruction Manual for measurement device (Ref. No. JTD52-14-256A)
- Transmission line development plan
- Power Grid Map, Mongolian Integrated Power System
- MNS 5870:2008 Electrical requirements for non-insulated wires and power lines
- Specification for Low electrical power loss type conductor
- DC resistance for LL transmission line
- Test plan for LL transmission line
- IEC 62219 Overhead electrical conductors – Formed wire, concentric lay, stranded conductors
- IEC 60889:1987 Hard-drawn aluminium wire for overhead line conductors
- IEC 61232:1993 Aluminium-clad steel wires for electrical purposes

- Test Report for low electrical power loss type conductor
- Load Map 2x75000 kVA Tsagaan Suvarga Power Substation 2017-2030
- Calculation data sheet
- Specification for manufacturing
- Specification for data process equipment
- System equipment structure drawing
- Measuring equipment system drawing
- Photos of measuring equipment
- Factory Test Plan for Measurement Devices
- Factory test report for Measurement Devices
- Witness test report for Measurement Devices
- Instrument Calibration Certificate for temperature meter, pyranometer, ultrasonic aerovane, and power meter
- JCM Mongolia website http://www.jcm-mongolia.com/?lang=en 2010-2013 Emission Factor in Central Grid of Mongolia
- Mongolian Law for Environmental Impact Assessment (2012)
- Environmental impact assessment report, 2014
- Report of Local Stakeholder Consultation
- Project schedule
- Energy Regulation Commission Resolution No. 53, Calculation of legal depreciation periods
- Mandatory Calibration, A Comprehensive List of Instruments, The regulations of calibration interval
- MNS IEC 60736:2007 15x Power Meter Test Equipment
- MNS 5660:2006 45x Active Static Watt AC Power
- MNS IEC 61036:2001 47x Active Power AC Static Watt-hour Meter
- Regulations of Environmental Resource Management Plan
- One-Line Diagram – Load Flow Analysis
- MNS IEC 521:2001 Metrology and measurement. Physical phenomena Class 0.5; 1.0, 2.0 alternating-current watt hour meter

Category B documents (other documents referenced)

- JCM_MN_AM001_ver01.0 Installation of energy-saving transmission lines in the Mongolian Grid
- JCM Project Cycle Procedure JCM_MN_PCP_ver04.0
- JCM Guidelines for Validation and Verification JCM_MN_GL_VV_ver01.0
- JCM Guidelines for Developing PDD and MR JCM_MN_GL_PDD_MR_ver03.0
- JCM Glossary of Terms JCM_MN_Glossary_ver01.0

- JCM PDD Form JCM_MN_F_PDD_ver03.0
- JCM MoC Statement Form JCM_MN_F_MoC_ver02.0
- Additional information to the Proposed Methodology MN_PM001 "Installation of energy-saving transmission lines in the Mongolian Grid"
- JCM Validation Report Form JCM_MN_F_Val_Rep_ver01.0
- Approved CDM baseline and monitoring methodology AM0097 Installation of high voltage direct current power transmission line Version 01.0.0
- Approved Large-scale CDM methodology AM0118 Introduction of low resistivity power transmission line Version 01.0
- Approved Small Scale CDM Methodology AMS II.A. Supply-side energy efficiency improvements – transmission and distribution Version 10
- IEC 61089 Round wire concentric lay overhead electrical stranded conductors
- GOST 839-80
- J-Power Systems Corporation, Company profile
- PDD, Validation Report of the registered JCM projects MN001, MN002, MN003 and MN004

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 Appointment is attached to this report.

Lloyd's Register
LRQA

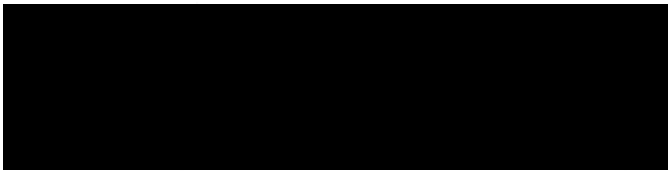
Joint Crediting Mechanism Certificate of Appointment

Title of Project: Validation of A HIGH EFFICIENCY AND LOW LOSS POWER TRANSMISSION AND DISTRIBUTION SYSTEM IN MONGOLIA

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the JCM project.

Name of Person	Assigned Roles
Michiaki Chiba	Team Leader
Stewart Niu	Technical Reviewer

Signed by



Michiaki Chiba
Climate Change Manager – Asia & Pacific
02/05/2017