

JCM Verification Report Form

A. Summary of verification

A.1. General Information

Title of the project	Energy Saving for Air-Conditioning at Textile Factory by Introducing High-efficiency Centrifugal Chiller in Batang, Central Java (Phase 2)
Reference number	JCM ID005
Monitoring period	01/04/2015 – 31/05/2016
Date of completion of the monitoring report	31/05/2016
Third-party entity (TPE)	PT Mutuagung Lestari
Project participant contracting the TPE	Nippon Koei Co., Ltd.
Date of completion of this report	19/08/2016

A.2 Conclusion of verification and level of assurance

Overall verification opinion	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
<input checked="" type="checkbox"/> Unqualified opinion	<p>Based on the process and procedure conducted, <i>PT Mutuagung Lestari</i> (TPE's name) provides reasonable assurance that the emission reductions for <i>Energy Saving for Air-Conditioning at Textile Factory by Introducing High-efficiency Centrifugal Chiller (Phase 2) in Batang, Central Java</i> (project name)</p> <ul style="list-style-type: none"> ✓ 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
<p><i>(If overall verification opinion is negative, please check below and state its reasons.)</i></p> <input type="checkbox"/> Qualified Opinion <input type="checkbox"/> Adverse opinion <input type="checkbox"/> Disclaimer	<State the reasons>

A.3. Overview of the verification results

Item	Verification requirements	No CAR or CL remaining
The project implementation with the eligibility criteria of the applied methodology	The TPE determines the conformity of the actual project and its operation with the eligibility criteria of the applied methodology.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>
Avoidance of double registration	The TPE determines whether the project is not registered under other international climate mitigation mechanisms.	<input checked="" type="checkbox"/>
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.	<input checked="" type="checkbox"/>

Authorised signatory:	Mr. <input checked="" type="checkbox"/>	Ms. <input type="checkbox"/>
Last name: Sidauruk	First name: Ferry	
Title: GHG, Energy, & HSE Services Division Head		
Specimen signature		Date: 31/07/2018

B. Verification team and other experts

	Name	Company	Function*	Scheme competence*	Technical competence*	On-site visit
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Ferry Sidauruk	PT Mutuagung Lestari	Lead Verifier	<input checked="" type="checkbox"/>	Yes	<input checked="" type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Abdul Rahman	PT Mutuagung Lestari	Verification Member	<input checked="" type="checkbox"/>	Yes	<input checked="" type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Taiki Otono	PT Mutuagung Lestari	Technical Expert	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Mr. <input checked="" type="checkbox"/> Ms. <input type="checkbox"/>	Tony Arifiarachman	PT Mutuagung Lestari	Internal Reviewer	<input checked="" type="checkbox"/>		<input checked="" 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 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>

Based on the information obtained from the Project Participants, the JCM's verification activity in PT Primatexco Indonesia was conducted for the first time on this verification. It means, there was not any verification report previously produced for this JCM's project. According to the registered/validated PDD, the project chiller was operated since 01/04/2015. The validation of the project chiller was conducted by one of the JCM's TPEs, Lloyd's Register Quality Assurance Limited (LRQA) - Japan. The validation report for the JCM's project was completed on 22/02/2016. Verification Team assesses during the on-site visit, whether all physical features of the project were in place and that the project participants have operated the project as per the eligibility criteria of the applied methodology of JCM_ID_AM002_ver02.0.

Verification Team justifies their decision on this report, is based on the assessments through on-site visit and document review methods in accordance with JCM's guidelines.

Verification Team confirms that, the eligibility criteria of the applied methodology have complied to the project implementation and operation conducted by the Project Participants.

The project which applied the methodology has satisfied all of the following criteria:

Criterion 1. Project chiller is a centrifugal chiller with a capacity of less than 1,250 USRt.

* 1 USRt = 3.52 kW.

The Verification Team has verified that, project chiller (Ebara high efficiency centrifugal chiller: RTBF 050) is a centrifugal chiller with a capacity of 499 USRt.

Criterion 2. COP for project chiller i calculated under the standardizing temperature conditions* ($COP_{PJ,tc,i}$) is more than 6.0. $COP_{PJ,tc,i}$ is a recalculation of COP of project chiller i ($COP_{PJ,i}$) adjusting temperature conditions from the project specific condition to the standardizing conditions. $COP_{PJ,i}$ is derived in specifications prepared for the quotation or factory acceptance test data at the time of shipment by manufacturer.

The Verification Team has verified that, the COP for project chiller ($COP_{PJ,tc,i}$) which is introduced to the proposed project is 6.13.

Criterion 3. Periodical check is planned more than four (4) times annually.

The Verification Team has verified that, ERS and PT Ebara Indonesia (PTEI, subsidiary of the ERS which is a chiller manufacturer) conduct at least one direct periodical check per year by PTEI and remote periodical checks every month by the remote monitoring system by ERS.

This remote monitoring system automatically detects the potential error every hour and reports any abnormal condition of chiller to ERS immediately. This periodical check procedure both by direct and remote method is more frequent, effective and better than five times of periodical checks stipulated in the methodology (ID_AM002).

Criterion 4. Ozone Depletion Potential (ODP) of the refrigerant used for project chiller is zero.

The Verification Team has verified, based on document of specification of the refrigerant for the project chiller HFC 245fa, whose ODP is zero.

Criterion 5. Plan for not releasing refrigerant used for project chiller is prepared. In the case of replacing the existing chiller with the project chiller, refrigerant used for the existing chiller is not released to the air.

The Verification Team has verified letter of consent on not releasing refrigerant used for the project chiller issued by PT Primatexco Indonesia dated 10/03/2014. This project aims at replacement of absorption chillers, which does not use refrigerant.

<Findings>

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

No issue was identified to the requirement.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification Team concludes that the eligibility criteria which are stipulated in the applied methodology of implemented projects are satisfied.

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

<Means of verification>

Verification Team assesses, by means of on-site visit at the project site at PT Primatexco Indonesia, whether all physical features of the project in the registered/validated PDD are in place and that the project participants have operated the project as per the registered/validated PDD or any approved revised PDD.

The project implementation was checked whether has satisfied the approved revised PDD version 01.0 dated 19/02/2016. During assessing the verification trail, Verification Team addressed that there was lack of data and signature of responsible staffs in the data sheet of monitoring period.

<Findings>

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

CL 01

Nature of the issue raised:

In the form Monitoring Structure Sheet which is attachment to the Project Design Document, it is described the role of responsible personnel in the plant, such as follows:

- Plant Manager: Responsible for project planning, implementation, monitoring results and reporting
- Supervisor: Appointed to be in charge of confirming the archived data that are manually recorded / collected and provided by auto data collection system (the system) after being checked and corrected when necessary. Also, appointed to be in charge of monitoring procedure (data collection/storage and data sharing with manufacturer), including monitoring equipment and calibrations, and training of monitoring.

- Chiller Operator: Appointed to be in charge of manual data recording and direct checking of the archived data for irregularity and lack, in order for cross checking of data collected by the system.

Verification Team found there was no authorization implemented from responsible personnel (Chiller Operator, Supervisor, nor Plant Manager) in the utilization department for the plant's monthly report e.g. for consecutive three months of April to June 2016.

Verification Team also found during the onsite verification, in the Maintenance Form for the project chiller, there were some data in the report without signature of the responsible party (the chiller operator), e.g. on 9/4/2016, 8/6/2016, 20/6/2016, 22/6/2016, 8/7/2016, and 9/7/2016.

Nature of responses provided by the Project Participants:

The form of monthly report was updated so that operator, supervisor, manager will put signature on it, as in "Re_CAR01_Operation_Record_with_Signature". Since that time and onwards, the recording conducted with signature using the form.

Assessment of the responses:

Verification Team confirms, based on review of the document provided and supplied by Project Participants that, the issues on the plant's power consumption report already been modified accordingly, as follows:

- It is confirmed that authorization from responsible personnel (Chiller Operator, Supervisor, nor Plant Manager) has been implemented in the utilization department for the plant's monthly report on the revised form starting from August 2016 operation's performance.
- There has been an improvement implemented in the Maintenance Form for the project chiller, all record data in the report are authorized by responsible party accordingly.

Those forms of reporting and supporting information were sent and acknowledged to Verification Team are considered accepted as accurate and proper. Thus, CL 01 is closed.

CL 02

Nature of the issue raised:

In the PDD Section B Application of an approved methodology(ies) of Criterion 3 it is stated that, ERS and PT Ebara Indonesia (PTEI, subsidiary of the ERS which is a chiller

manufacturer) agreed to conduct at least one direct periodical check per year by PTEI and remote periodical checks every month by the remote monitoring system by ERS. This remote monitoring system automatically detects the potential error every hour and reports any abnormal condition of chiller to ERS immediately. This periodical check procedure both by direct and remote method is more frequent, effective and better than “more than four (4) times” of periodical checks stipulated in the methodology (ID_AM002_ver2.0).

The Verification Team found in the document “Procedure of Periodical Check and Remote Check for PT Primatexco Indonesia” provided by the Project Participants, there was no clear description of PTEI roles described in the flow chart nor in the procedure.

Nature of responses provided by the Project Participants:

The role of PTEI is that technical staff of PTEI is to be dispatched when Ebara remote monitoring centre judges that necessary service or repair at site is necessary. This is indicated in revised periodical check procedure, “Re_CL02_B-6 Periodical Check Procedure_v2”.

Assessment of the responses:

Verification Team confirmed, based on review of the document supplied by the Project Participants the document that was asked to change, already been modified accordingly. Project Participants have revised the periodical check procedure where role of PT Ebara Indonesia (PTEI) has been clear described on the document. Furthermore, the Project Participants also informed, that the revised procedure has been approved by Ebara Refrigeration System, Co. Ltd. in Japan to be implemented in the operation site of PT Primatexco Indonesia. The revised procedure and supporting information sent and acknowledged to Verification Team are considered to be accepted as accurate and proper. Thus, CL 02 is closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification Team concludes, based on the document review and on-site visit methods, that the monitoring period of the JCM project in PT Primatexco Indonesia as reported by the Project Participants, there are no changes from the registered or validated PDD or any approved revised PDD.

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

<Means of verification>

Verification Team assesses, whether monitoring of parameters related to the GHG emissions

reductions of a project has been conducted by measuring equipments (monitoring Option C defined in the PDD and Monitoring Guidelines). Then, Verification Team determined 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.

<Findings>

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

No issue was identified to the requirements.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Based on the document review and on-site interview to the Project Participants, Verification Team concludes that all parameters in the Monitoring Report Sheet (power consumption of project chiller, electricity imported from the grid to the project site) during the project period, have been monitored by measuring equipment. It is also concluded by Verification Team that the calibration of the measuring equipment is properly conducted in line with the monitoring plan and all the measured values are appropriately calculated, in line with the PDD and Monitoring Guidelines.

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

<Means of verification>

Verification Team assessed the data and calculations of GHG emission reductions achieved by/resulting from the project chiller by the application of the approved methodology of JCM_ID_AM_002_ver02.0, with title "Energy Saving by Introduction of High Efficiency Centrifugal Chiller, Version 2.0". The applied emission factor EF_elec was confirmed to be 0.843 tCO₂/MWh, as applied at the time of validation and PDD registration.

When verifying the reported emission reductions, Verification Team confirmed that there was an audit trail which contains the evidence and records that validate the stated values in the Monitoring Report Sheet. It included the source documents that form the basis for calculations and other information underlying the emission reductions.

Parameters	Monitored values	Method to check values in the monitoring report with sources
EC_PJ,i,p	1,630 MWh/p	Data is measured by measuring equipments in the factory. - Specification of measuring equipments :

		<p>1) Electrical power meter is applied for measurement of electrical power consumption of project chiller.</p> <p>2) Meter is certified in compliance with national/international standards on electrical power meter.</p> <p>- Measuring and recording :</p> <p>1) Measured data is automatically sent to a server where data is recorded and stored. Measured data is manually recorded by responsible staff for calculation of emission reduction.</p> <p>2) Recorded data is checked its integrity once a month by responsible staff.</p> <p>The accuracy level of electric meter is $\pm 0.5\%$.</p> <p>The data monitored and required for verification and issuance will be kept and archived electronically for two years after the final issuance of credits.</p> <p>- Calibration :</p> <p>Calibration was conducted by the Manufacturer at the time of Manufacturer's inspection. Next calibration is required after 10 years.</p>
El_grid,p	83,471 MWh/p	<p>[for Option B]</p> <p>Data is collected and recorded from invoices from the power company.</p>
h_gen,p	0 hours/p	Data is measured by meter equipped to a generator.

<Findings>

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

CAR 01

Nature of the issue raised:

In the registered Approved Methodology No. 002 ver.2.0 (Section G. Calculation of project emissions), the calculation of project emissions during the period p [tCO₂/p] is resulted from the power consumption of project chiller i during the period p [MWh/p] multiplied by CO₂ emission factor for consumed electricity [tCO₂/MWh]. Furthermore, on Section H it stated that the emissions reduction is resulted from reference emissions subtracted by project emissions. Based on these formulas, it is concluded that accuracy data record of power consumption of the project chiller is very crucial in order to ensure the calculation of project

emissions during the period p are valid and accurate.

In the plant's monthly report of PT Primatexco Indonesia, e.g. power consumption for the project chiller (coded Chiller #5), Verification Team found some typos and lack of data recording. For example, in the column of unit measurement for electricity consumption is stated in kW (kilo Watt), instead kWh (kilo Watt hour). Then, Verification Team found on the plant's monthly report of electricity consumption for April 2015, there were some dates e.g. on 01, 03, and 11 April, without electricity consumption data in the column. Moreover, there was not available of any information provided on the report which explain why did during those periods the electricity consumption data was not existed. On the plant's monthly report of power consumption for the project chiller (coded Chiller #5), there was no title and remark of the form, where it may be as reference for the information management within the Utility plant of PT Primatexco Indonesia.

Nature of responses provided by the Project Participants:

The unit of electricity consumption is modified from kW to kWh in the summary sheet "Re_CAR01_PR_J25_Prima_2nd_Chiller_and_PLN_consumption".

Since the chiller started operation on 1 April 2015 and first kWh measurement was done 2 April 2015, there is no record in 1 April. Since instruction to operator had not been conducted to the operator at the first month after started operation, 3 April and 11 April was not recorded. This was improved and instruction to operators was conducted after that. Also, if there is holiday, recording was not conducted. The operator will note the reason if there is any day without record, which was instructed to utility staff and operators as pointed in the verification. The log sheet was updated with title, form of signature of operator and utility manager, and remarks, as seen in "CAR01_Operation_Record_with_Signature".

Assessment of the responses:

Verification Team confirms, based on review of the document provided and supplied by the Project Participants that the recording error on the plant's reports already been modified accordingly, as follows:

- In the Operation and the power consumption report for the project chiller of PT Primatexco Indonesia, the column of unit measurement in the revised form of electricity consumption e.g. 01 to 05 August 2016 has been updated accordingly. Then, on the revised report of electricity consumption for August 2015, all data are filled in with electricity consumption with daily basis properly. Moreover, the Project Participants will state any information on the reports, whenever operation is stopped due to maintenance, repair, or other means to the project chiller.
- There is also an improvement to the plant's monthly report of power consumption for the project chiller, where the report has been updated with title and remark on the form.

Furthermore the Project Participants have provided evidence that revised operation record has been implemented in the operation line of the project chiller properly. Those reports sent and acknowledged to Verification Team are considered to be accepted as appropriate and accurate. Thus, CAR 01 is closed.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Based on verification result, Verification Teams concludes some points, as follows:

- (a) It can be concluded that Project Participants have used the appropriate Monitoring Report Sheet of the applied methodology;
- (b) It can be concluded that a set of data provided by the Project Participants for the monitoring period of 2015/4/1 - 2016/5/31 was complete, and data are available;
- (c) Verification Team assures reported data by Project Participants through document review and interview during the on-site visit at project site factory have been justified;
- (d) Verification Team assures all assumptions, emission factors, default values, and other reference values that were applied in the calculations have been justified.

C.5. Assessment of avoidance of double registration

<Means of verification>

The PPs state in the MoC section 7 of Declaration of avoidance of double registration that, the PPs ensure the proposed JCM project will not result double registration in other climate mitigation mechanisms, which then avoids double counting of GHG emission reductions by the project. In addition, it is declared by the PPs in the MoC if the proposed JCM project is registered under the JCM, the same project will not be registered under other international climate mitigation mechanisms, and vice versa.

The Verification Team received a written confirmation from the PPs on 19/07/2016, a document of Modalities of Communication (MoC). The MoC document was signed by authorised representative of the PPs on 09/03/2015.

In addition Verification Team has conducted a search on the website of the CDM and JI on 26/07/2016, to check whether the projects with similar technology and location in the Republic of Indonesia have been registered. Verification Team confirm that, projects with similar technology and location are not found. Verification Team ensures, through document review and/or interviews with the project participants on whether the project differs from projects registered under other international climate mitigation mechanisms.

<Findings>

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

No issue was identified to the requirement.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

The Verification Team concludes, based on the document review and information searching from CDM's and JI's websites, that the project "Energy Saving for Air-Conditioning at Textile Factory by Introducing High-efficiency Centrifugal Chiller (Phase 2) in Batang", is not registered under other international climate mitigation mechanisms.

C.6. Post registration changes

<Means of verification>

Verification Team confirms, through documents review, that there are no post registration changes from the registered/validated PDD and/or methodology which prevent the use of the applied methodology.

<Findings>

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

No issue was identified to the requirement.

<Conclusion based on reporting requirements>

Please state conclusion based on reporting requirements.

Verification Team concludes that the project "Energy Saving for Air-Conditioning at Textile Factory by Introducing High-efficiency Centrifugal Chiller (Phase 2) in Batang" has not been changed from the registered/validated PDD and/or methodology, meaning the project would not prevent the use of the applied methodology.

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

No remaining issues appropriate, including FARs from the validation and/or previous verification period.

E. Verified amount of emission reductions achieved

Year	Verified Emissions (tCO ₂ e)	Reference Emissions (tCO ₂ e)	Verified Project Emissions (tCO ₂ e)	Verified Emission Reductions (tCO ₂ e)
2013				
2014				
2015		889.3	811.0	78
2016		618.1	563.7	54
2017				
2018				
2019				
2020				
Total (tCO ₂ e)		1,507.4	1,374.7	132

F. List of interviewees and documents received

F.1. List of interviewees

1. Nippon Koei Co. Ltd., Japan
 - Ms. Yuka Nakagawa (Associate senior staff)
2. PT. Primatexco Indonesia
 - Mr. Yoshiaki Nishizawa (Director, Production)
 - Mr. Ahlis Imam (Asst. manager, Ulity)
 - Mr. Andi Rahman (Supervisor, Mechanical)
 - Mr. Ahmad Chaerudin (Supervisor, Electrical)
3. PT. Ebara Indonesia
 - Mr. Masahiko Kosho (Manager, Sales - Chiller, Cooling Tower & Pump)

F.2. List of documents received

1. JCM Project Design Document Form Version 2.0 dated 19/02/2016
2. JCM_ID_AM002_ver02.0 Energy Saving by Introduction of High Efficiency Centrifugal Chiller
3. Monitoring Plan Sheet and Monitoring Report Sheet: JCM_ID_AM002_ver02.0
4. JCM Validation Report of "Energy Saving for Air-Conditioning High Efficiency Centrifugal Chiller to a Textile Factory in Batang (Phase 2) (JCM ID-005)

5. JCM Modalities of Communication Statement Form of related project.
6. Emission factors of electric power interconnection systems in 2013 (2014 release, source: Indonesia JCM Secretariat website)
7. Set of documents of sample invoices from PT. Perusahaan Listrik Negara
8. Monitoring Procedure Ebara RTBF Centrifugal Chiller
9. Procedures for checking and maintenance of chillers prepared by ERS Co., Ltd.
10. Organizational structure of the Utility Department of Primatexco
11. Report of Job Completion Commissioning New Turbo Chiller Type RTBF 050 by PTEI
12. Operation and maintenance manual Ebara RTBF Centrifugal Chiller
13. Weekly report commissioning turbo chiller RTBF050
14. Electricity Energy Data Records of Primatexco
15. JCM Guidelines for Validation and Verification JCM_ID_GL_VV_ver01.0
16. Specification data sheet issued by ERS Co., Ltd.
17. Procedure of site thermal insulation for RTBF centrifugal chiller unit
18. Procedure of the 2nd site wiring construction
19. Operation chiller spinning 3 (economic analysis of chiller replacement)
20. Estimation of annual operation hours
21. Operation manual of refrigerant recovery equipment
22. NR_E8-1_Meter_Test_Certificate and PR_E8-1_Prima_Meter_Test_Certificate
23. PR_F12-1_Chiller_energy_consumption_record
24. Daily Log Book report of the electric energy meter of Utility Departement of Primatexco
25. Montly report of the electricity power consumption of Utility Departement of Primatexco
26. Maintenance report of the centrifugal chiller of Utility Department of Primatexco
27. Letter of Consent of Periodical Check and Use of Refrigerant by ERS.
28. Supporting information for calibration of the meter by Nippon Koei Co, Ltd.
29. Work Instruction for Electric Meter Record of JCM Turbo Chiller
30. Other supporting information related to the project.

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.