~~Bilateral Offset Credit~~Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report

CONTENTS

1. Scope and applicability

1. The "~~Bilateral Offset Credit~~Joint Crediting Mechanism Guidelines for Developing Project Design Document and Monitoring Report" (hereinafter referred to as "these Guidelines") are intended to assist project participants in developing ~~Bilateral Offset Credit~~Joint Crediting Mechanism (hereinafter referred to as "~~BOCM~~JCM") project design document (hereinafter referred to as "PDD") and monitoring report.

2. These Guidelines describe standards which are requirements to be met, except guidance indicated with terms "should" and "may" as defined in paragraph 7 below.

2. Terms and definitions

3. "Project design document (PDD)" is prepared by the project participant of a ~~BOCM~~JCM project and sets out in detail, in line with the ~~BOCM~~JCM rules and guidelines, the ~~BOCM~~JCM project which is to be realized.

4. "Monitoring" is collecting and archiving all relevant data necessary for estimating GHG emission that are significant and reasonably attributable to a registered ~~BOCM~~JCM project.

5. "Monitoring plan" sets out the methodology to be used by project participants for the monitoring of, and by third-party entities for verification of the amount of GHG emission reductions achieved by the ~~BOCM~~JCM project.

6. "Monitoring report" is prepared by a project participant and sets out the GHG emission reductions of an implemented registered ~~BOCM~~JCM project for a particular monitoring period.

7. The following terms apply in these Guidelines:

    (a) "Should" is used to indicate that among several possibilities, one course of action is recommended as particularly suitable;

    (b) "May" is used to indicate what is permitted.

8. Terms in these Guidelines are defined in "~~BOCM~~JCM Glossary of Terms" available on the ~~BOCM~~JCM website.

3. General guidelines

9. When designing a proposed ~~BOCM~~JCM project and developing a PDD and a monitoring report, project participants apply these Guidelines and the selected methodology(ies), which contain(s) approved methodology document(s) and Monitoring Spreadsheet(s).

10. The Monitoring Spreadsheet is provided as a part of each approved methodology and it consists of:

    (a) Monitoring Plan Sheet (input sheet and calculation process sheet) which is used

before validation for developing a monitoring plan and calculating emission reductions *ex ante*;

   (b)   Monitoring Structure Sheet which is used before validation for developing an operational and management structure to be implemented in order to conduct monitoring;

   (c)   Monitoring Report Sheet (input sheet and calculation process sheet) which is used before verification for developing a monitoring report and calculating emission reductions *ex post*.

11. A PDD consists of a completed PDD form and monitoring plan using Monitoring Plan Sheet and Monitoring Structure Sheet. A monitoring report is completed by using Monitoring Report Sheet.

12. The project participants provide a description of the project that provides a comprehension of the nature of the project and its implementation.

13. The project participants monitor the registered ~~BOCM~~JCM project and its emission reductions. The project participants establish and apply quality management procedures to manage data and information. The project participants should reduce, as far as is practical, uncertainties related to the quantification of emission reductions.

14. These Guidelines, the PDD form, and Monitoring Spreadsheet can be obtained electronically from the ~~BOCM~~JCM website.

15. The Joint Committee may revise the PDD form and the Monitoring Spreadsheet if necessary.

16. The Monitoring Spreadsheet may be revised when the corresponding approved methodology is revised.

17. The PDD form and the Monitoring Spreadsheet are completed in English language.

18. The PDD form and the Monitoring Spreadsheet are not to be altered, that is, are to be completed without modifying its format, font, headings, except for those referred in paragraph 19 below.

19. Rows may be added to the table in the Annex of the PDD form.

20. Where a PDD contains information that the project participants wish to be treated as confidential or proprietary, the project participants are required to submit documentation in two versions:

   (a)   One version where all parts containing confidential or proprietary information are made illegible (e.g. by covering those parts with black ink or overwrite those parts with letters such as "XXX") so that the version can be made publicly available without displaying confidential or proprietary information;

   (b)   Another version containing all information that is to be treated as strictly

confidential or proprietary by all parties handling this documentation (the third-party entities, the Joint Committee members, external experts).

21. Description related to application of the eligibility criteria and the environmental impact assessment is not considered confidential or proprietary.

22. The presentation of values in the PDD, including those used for the calculation of emission reductions, should be in international standard format e.g. 1,000 representing one thousand and 1.0 representing one. The units used should be accompanied by their equivalent S.I. units/norms (thousand/million) as part of the requirement to ensure transparency and clarity.

4. Developing a PDD

In the following section, a hypothetical project is described in red color as an example to show how to fill in the PDD form, Monitoring Plan Sheet, and Monitoring Structure Sheet.

4.1. Completing a PDD form

<Example of a completed PDD>

A. Project description

A.1. Title of the ~~BOCM~~JCM project

Energy Management System application for office buildings in the People's Republic of Bangladesh.

Please indicate technology(ies) applied as well as sector that the project is implemented.

A.2. General description of project and applied technologies and/or measures

The proposed ~~BOCM~~JCM project aims to improve electricity and fossil fuel consumption by introducing Energy Management System in existing buildings in the People's Republic of Bangladesh.

The key technology is to introduce optimum control and operation of buildings to achieve energy savings. Even without adopting facility investment measures such as replacement of existing facilities with more energy efficient ones, the optimum control and operation of building facilities can bring energy savings. Introducing Energy Management System will also lead to facility investment measures by analyzing facility energy consumptions.

The project covers 5 office buildings in "City X", the People's Republic of Bangladesh. Energy Management System will be introduced in all buildings. LED, high-efficient air conditioning and fan inverter control will be introduced as part of the project in particular buildings.

Please include in the description:

- The purpose of the project;

- Explanation of how the proposed project reduces greenhouse gas emissions (i.e. what type of technology is being employed, what measures are conducted as part of the project, etc).

A.3. Location of project, including coordinates

Country	The People's Republic of Bangladesh

Region/State/Province etc.:	N/A
City/Town/Community etc:	"City X"
Latitude, longitude	Building 1: N 10° 10' 00" and E 100° 10' 00" Building 2: N 10° 10' 10" and E 100°10' 10" Building 3: N 10° 10' 20" and E 100°10' 20" Building 4: N 10° 10' 30" and E 100° 10' 30" Building 5: N 10° 10' 40" and E 100°10' 40"

A.4. Name of project participants

The People's Republic of Bangladesh	Asia Pacific Buildings Holding Company Limited (Building 1, 2, 3) Pacific Real Estate Company Limited (Building 4, 5)
Japan	Energy Management System Japan Ltd.

Please name all project participants from the People's Republic of Bangladesh and Japan in corresponding cell.

A.5. Duration

Starting date of project operation	01/04/2013
Expected operational lifetime of project	10 years

Please provide starting date in DD/MM/YYYY and operational lifetime in years and months.

The starting date of a ~~BOCM~~JCM project is the date on which the operation of a project begins.

Expected operational lifetime may be explained with publicly available statistical data, reference data from similar projects, legal durable years, expert judgment, etc.

Note: The start of operating date of the proposed ~~BOCM~~JCM project does not predate January 1, 2013.

A.6. Contribution from Japan~~developed countries~~

The state-of-the-art technology of building energy management system which has been developed by the Japanese project participant is introduced in the proposed project. The Japanese project participant transfers the technology through training to the Bangladeshi project participants.

The Japanese side provides financial support to the project.

Please include explanation of how Japan~~developed countries~~ contributes to implementation of the project (i.e. finance, technology, training, support for O&M, etc).

B. Application of an approved methodology(ies)

B.1. Selection of methodology(ies)

Selected approved methodology No.	BOCMJCM_JP-BD_AM_0001
Version number	Ver. 01.0
Selected approved methodology No.	N/A
Version number	N/A
Selected approved methodology No.	N/A
Version number	N/A

Please name approved methodology(ies) number and its version number applied to the proposed BOCMJCM project.

B.2. Explanation of how the project meets eligibility criteria of the approved methodology

Eligibility criteria	Descriptions specified in the methodology	Project information
Criterion 1	Energy Management System is introduced in already existing buildings.	All buildings covered in this project are already existing ones in City X.
Criterion 2	The operation and control of equipment and facilities to reduce energy consumption for indoor environments is carried out by Energy Management System itself, not just upgrading equipments for energy consumption.	Optimum control and operation of energy consuming facilities will be introduced in all buildings, which will achieve energy savings. This is the key technology of Energy Management System that has been developed and good performances in Japan.
Criterion 3	Be able to identify all energy consumption in the building(s) having equipment controlled by Energy Management System.	Energy Management System is used to monitor total energy consumptions in each building.
Criterion 4	N/A	N/A
Criterion 5	N/A	N/A
Criterion 6	N/A	N/A
Criterion 7	N/A	N/A
Criterion 8	N/A	N/A
Criterion 9	N/A	N/A
Criterion 10	N/A	N/A

Please copy all descriptions specified in the applied methodology for each criterion.

Then explain how the project meets each eligibility criterion with project detailed information.

C. Calculation of emission reductions

C.1. All emission sources and their associated greenhouse gases relevant to the ~~BOCM~~JCM project

Reference emissions	
Emission sources	GHG type
Electricity consumption by lighting	CO_2
Electricity consumption by air conditioner	CO_2
Diesel fuel consumption by boiler	CO_2
Electricity consumption by fan	CO_2
Electricity consumption by ICT equipments	CO_2
N/A	N/A
N/A	N/A
Project emissions	
Emission sources	GHG type
Electricity consumption by lighting	CO_2
Electricity consumption by air conditioner	CO_2
Diesel fuel consumption by boiler	CO_2
Electricity consumption by fan	CO_2
Electricity consumption by ICT equipments	CO_2
N/A	N/A
N/A	N/A

Please list all emission sources and GHG types that are included in calculation of reference emissions and project emissions.

Please indicate in the description of "emission sources":

   - Energy consumption facilities;

   - Energy type;

For "GHG type" choose from CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3.

If the project involves more than one component, a separate table is to be provided in the Annex for each component or each approved methodology that is applied.

C.2. Figure of all emission sources and monitoring points relevant to the ~~BOCM~~JCM project
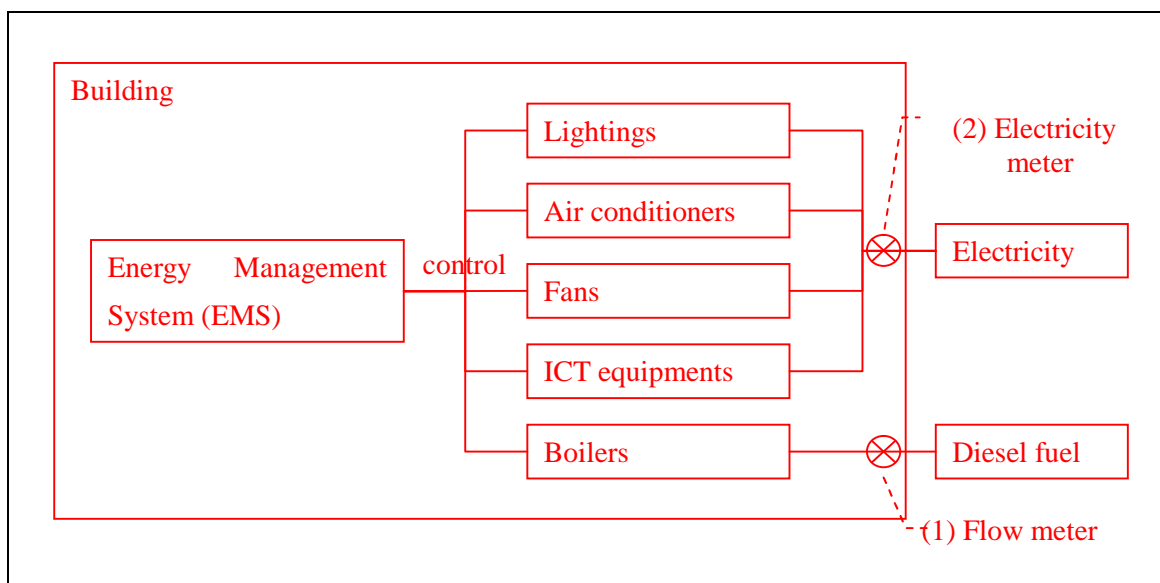
Please illustrate and describe all emission sources relevant to the project. Please also indicate all monitoring points for measurement* with types of equipments to be installed for the proposed project in the figure. Each monitoring point for measurement should be indicated with monitoring point number(s) corresponding to the number of parameter listed in the Monitoring Plan Sheet.

In selecting a monitoring point for measurement, the project participants should select the most suitable position in order to collect the accurate data. In many cases, the monitoring point for measurement corresponds to the position of the measuring equipment, however, when the amount of transaction is used to collect activity data, the receiving inlet of fuel at the factory/place of business operations such as a fuel tank serves as monitoring point. In addition, it is not always necessary for the emission source to correspond to the monitoring point in a one-to-one manner. It is possible to monitor the activity data of two or more sources at a point; it is also possible to monitor the activity data of one source at two or more points. In either case, monitoring points for measurements should be decided to increase the accuracy of measurement.

* If monitoring option B or C as referred to paragraph 25(b) is selected.

C.3. Estimated emissions reductions in each year

Year	Estimated Reference emissions (tCO$_{2e}$)	Estimated Project Emissions (tCO$_{2e}$)	Estimated Emission Reductions (tCO$_{2e}$)
2013	10,000	9,000	1,000
2014	11,000	9,500	1,500

2015	11,000	9,000	2,000
2016	11,000	9,000	2,000
2017	11,000	9,000	2,000
2018	11,000	9,000	2,000
2019	11,000	9,000	2,000
2020	11,000	9,000	2,000
Total (tCO$_{2e}$)	87,000	72,500	14,500

Please summarize the results of the ex-ante estimation of emission reductions for all years of the period, using the table above. If the project activity involves more than one component, only the table showing the aggregate emission reductions of the project is provided in this section. Separate tables for each component or each approved methodology that is applied are provided in Annex.

D. Environmental impact assessment

Legal requirement of environmental impact assessment for the proposed project	NO

Please select YES or NO depending on whether the proposed project is subject to an environmental impacts assessment according to national or local regulations.
If the project participant selects YES, the conclusions of environmental assessment are attached.

E. Local stakeholder consultation

E.1. Solicitation of comments from local stakeholders

…The project participants posted notices regarding the stakeholders' meeting two weeks prior to the meeting. To complimentcomplement the process, the project participants also sent out email invitations on XX/XX/2013 to tenants in the same office building as the project location. The stakeholders' meeting was held on YY/XX/2013 during 10:00-12:00 hours at the office building of the project site.

Please describe the process by which comments from local stakeholders have been invited for

the proposed project.

E.2. Summary of comments received and their consideration

Stakeholders	Comments received	Consideration of comments received
Tenant "A" in the project buildings "B"	Please inform how to engage in the energy saving project.	Energy saving measures on which tenants can work have been introduced at the stakeholder meeting. Brochure for energy saving measures has been distributed to all tenants in the project buildings.
Local authority	Such energy efficiency improvement measures comply with energy policies in the People's Republic of Bangladesh and are very much encouraged.	No action is needed.
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Please identify stakeholders that have made comments and provide a summary of these comments.

Please explain how due account have been taken of comments received.

F. References

Energy Statistics 2010

Energy Conservation and Promotion Act

Reference lists to support descriptions in the PDD, if any.

Annex

Please provide separate tables for section C.1 and C.3 and further information related to other sections, if necessary.

Revision history of PDD		
Version	Date	Contents revised
01.0	01/04/2013	First edition

4.2. Developing a Monitoring Plan

23. Project participants develop before validation a monitoring plan using Monitoring Plan Sheet and Monitoring Structure Sheet in the corresponding Monitoring Spreadsheet of the methodology applied.

24. Project participants input estimated values for each parameter in the Monitoring Plan Sheet including those fixed ex ante for parameters not to be monitored.

25. Project participants also describe the following items for each parameter specified in the Monitoring Plan Sheet in line with the applied methodology(ies). Project participants may add detailed information specific to the proposed project to the contents given in the applied methodology.

 (a) Estimated values: Provide the estimated values of the parameter for the purpose of calculating emission reductions *ex ante*;

 (b) Monitoring option: Select an option from below;

  (i) Option A: Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications);

  (ii) Option B: Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices);

  (iii) Option C: Based on the actual measurement using measuring equipments (Data used: measured values).

 (c) Source of data: Provide the source of data used or to be used. Clearly indicate the type of data source (e.g. logbooks, daily records, surveys, etc.) and spatial level of data (e.g. local, regional, national, international), if applicable;

 (d) Measurement methods and procedures: Describe how the parameters are to be measured/calculated including Quality Assurance/Quality Control (hereinafter referred to as "QA/QC") procedures applied. If the parameter will be measured, describe the equipments to be used to measure it, including details on accuracy level, and calibration information (frequency, date of calibration and validity) in line with section 4.3 below;

 (e) Monitoring frequency: Describe the monitoring frequency (e.g. continuously, annually).

26. The project participants ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the final issuance of credits.

27. In the Monitoring Structure Sheet, the project participants describe the operational and management structure to be implemented in order to conduct monitoring. The project

participants establish and clearly indicate the roles and responsibilities of personnel, institutional arrangements, and procedures for data collection, archiving and reporting.

28. The project participants appoint a person who is responsible for overall monitoring activity including preparation of the monitoring report, and managing and archiving of data. The responsible person for monitoring:

    (a) Ensures the quality of the monitoring report and the structure and procedure for producing such a document;

    (b) Appoints a person(s) responsible for managing monitoring points, when necessary, to collect data and maintain and control measuring instruments (including calibration/regular inspection) at monitoring points.

4.3. Preparing for actual measurement

29. For monitoring of parameters under Option C (i.e. parameters monitored through actual measurement), the project participants determine the frequency of calibration following the paragraphs 30, 31 and 32 below, unless otherwise stated in the applied methodology, and describe the frequency in the Monitoring Plan Sheet in line with paragraph 25(d).

30. The project participants confirm whether national laws and regulations on measurement exist for parameters under Option C.

31. Regarding parameters for which corresponding national laws and regulations on measurement exist, measuring equipments for those parameters are to be calibrated and/or qualified in accordance with the laws and regulations.

32. Regarding parameters for which national laws and regulations on measurement do not exist, measuring equipments are to be calibrated in line with international standards or manufacturers' specification.

<Example of a Monitoring Plan Sheet (Input Sheet)>

Monitoring Spreadsheet:JCM_BD_AM001_ver01.0

Monitoring Plan Sheet (input sheet) [Attachment to Project Design Document]

Table 1: Parameters to be monitored *ex post*

(a) Monitoring point No.	(b) Parameters	(c) Description of data	(d) Estimated Values	(e) Units	(f) Monitoring option	(g) Source of data	(h) Measurement methods and procedures	(i) Monitoring frequency	(j) Other comments
(1)	$PFC_{D,p}$	Project diesel fuel consumption during the period p	5,000	kl/p	Option B	purchase records	- Collecting purchase amount from retailer invoices and inputting to a spreadsheet manually - Project deputy managers double check the input data with invoices every 6 months	once a month	
(2)	PEC_p	Project electricity consumption during the period p	10,000	MWh/p	Option C	monitored data	- Collecting electricity consumption data with validated/calibrated electricity monitoring devices and inputting to a spreadsheet electrically - Verified monitoring devices are installed and they are calibrated once a year. - Verification and calibration shall meet international standard on corresponding monitoring devices.	continuous	
(3)	$PFC_{L,p}$	Project LPG consumption during the period p	0	t/p	N/A	N/A	N/A	N/A	N/A
(4)	$PFC_{N,p}$	Project natural gas consumption during the period p	0	$1000Nm^3$/p	N/A	N/A	N/A	N/A	N/A
(5)	$PFC_{K,p}$	Project kerosene consumption during the period p	0	kl/p	N/A	N/A	N/A	N/A	N/A

Table 2: Project-specific parameters to be fixed *ex ante*

(a) Parameters	(b) Description of data	(c) Estimated Values	(d) Units	(e) Source of data	(f) Other comments
EER_{office}	Percentage of improvement in energy consumption efficiency for [Office Building] using BEMS	22	%	Past records of 30 similar size office buildings for the period of 2008-2012 measured by the project participant, BEMS provider. Data set of each building has the data of before and after BEMS implementation at least for one year respectively.	

Table3: *Ex-ante* estimation of CO_2 emission reductions

CO_2 emission reductions	Units
1,945	tCO$_2$/p

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications)
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

Monitoring Plan Sheet (input sheet) [Attachment to Project Design Document]

Table 1: Parameters to be monitored *ex post*

(a) Monitoring point No.	(b) Parameters	(c) Description of data	(d) Estimated Values	(e) Units	(f) Monitoring option	(g) Source of data	(h) Measurement methods and procedures	(i) Monitoring frequency	(j) Other comments
(1)	$PFC_{D,y}$	Project diesel fuel consumption during the period of year y	5,000	kl/y	Option B	purchase records	- Collecting purchase amount from retailer invoices and inputting to a spreadsheet manually - Project deputy managers double check the input data with invoices every 6 months	once a month	
(2)	PEC_y	Project electricity consumption during the period of year y	10,000	MWh/y	Option C	monitored data	- Collecting electricity consumption data with validated/calibrated electricity monitoring devices and inputting to a spreadsheet electrically - Verified monitoring devices are installed and they are calibrated once a year. - Verification and calibration shall meet international standard on corresponding monitoring devices.	continuous	
(3)	$PFC_{L,y}$	Project LPG consumption during the period of year y	0	t/y	N/A	N/A	N/A	N/A	N/A
(4)	$PFC_{N,y}$	Project natural gas consumption during the period of year y	0	$1000Nm^3$/y	N/A	N/A	N/A	N/A	N/A
(5)	$PFC_{K,y}$	Project kerosene consumption during the period of year y	0	kl/y	N/A	N/A	N/A	N/A	N/A

Table 2: Project-specific parameters to be fixed *ex ante*

(a) Parameters	(b) Description of data	(c) Estimated Values	(d) Units	(e) Source of data	(f) Other comments
EER_{office}	Percentage of improvement in energy consumption efficiency for [Office Building] using BEMS	22	%	Past records of 30 similar size office buildings for the period of 2008-2012 measured by the project participant, BEMS provider. Data set of each building has the data of before and after BEMS implementation at least for one year respectively.	

Table3: *Ex-ante* estimation of CO_2 emission reductions

CO_2 emission reductions	Units
1,945	tCO_2/y

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications)
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

<Example of a Monitoring Structure Sheet>

Monitoring Spreadsheet: BOCM-JP-BD-001 Ver.1.0

Monitoring Structure Sheet [Attachment to Project Design Document]

Responsible personnel	Role
Project Manager	Responsible for project planning, implementation, monitoring results and reporting.
Project Deputy Managers	Appointed to be in charge of approving the archived data after being checked and corrected when necessary.
Facility Managers	Appointed to be in charge of monitoring procedure (data collection and storage), including monitoring equipments and calibrations, and training of monitoring personnel.
Operators	Appointed to be in charge of checking the archived data for irregularity and lack.
N/A	N/A
N/A	N/A
N/A	N/A

17

Monitoring Structure Sheet [Attachment to Project Design Document]

Responsible personnel	Role
Project Manager	Responsible for project planning, implementation, monitoring results and reporting.
Project Deputy Managers	Appointed to be in charge of approving the archived data after being checked and corrected when necessary.
Facility Managers	Appointed to be in charge of monitoring procedure (data collection and storage), including monitoring equipments and calibrations, and training of monitoring personnel.
Operators	Appointed to be in charge of checking the archived data for irregularity and lack.
N/A	N/A
N/A	N/A
N/A	N/A

5. Monitoring

5.1. Conducting monitoring

33. Project participants conduct monitoring in line with the monitoring plan of the registered PDD.

5.2. Data correction for actual measurement

34. For monitoring of parameters under Option C (i.e. parameters monitored through actual measurement), the project participants calibrate measuring equipments as per the monitoring plan.

35. The project participants determine the necessity for data correction in calculation of emission reductions following the decision tree shown in Figure 1 below.

36. Regarding parameters for which corresponding national laws and regulations on measurement exist, the project participants:

    (a) Apply measured values (uncorrected values) to those parameters in calculation of emission reductions, if measuring equipments are calibrated and/or qualified in accordance with the national laws and regulations on measurement;

    (b) Do not apply measured values in calculation of emission reductions for that monitoring period, if measuring equipments are not calibrated and/or qualified in accordance with the national laws and regulations on measurement.

37. Regarding parameters for which national laws and regulations on measurement do not exist, the project participants check whether the instrumental errors identified in the calibration test stay within the required level of accuracy (i.e. ±5%).

38. For parameters described in paragraph 37, if measuring equipments are calibrated in line with the monitoring plan, the project participants:

    (a) Apply measured values (uncorrected values) to those parameters in calculation of emission reductions, where the instrumental errors of the measuring equipments stay within ±5%;

    (b) Correct measured values by applying the difference resulted from the instrumental error and required level of accuracy to the measured values during the period between the date of the previous calibration and the concerned calibration, in line with the Appendix to these Guidelines, and apply the corrected values to those parameters in calculation of emission reductions, where the instrumental errors of the measuring equipments do not stay within ±5%.

39. For parameters described in paragraph 37, if measuring equipments are not calibrated in line with the monitoring plan, but calibration is implemented after the scheduled date, the project participants:

19

(a)   Apply measured values (uncorrected values) to those parameters in calculation of emission reductions, where the instrumental errors identified in the delayed calibration test stay within ±5%;

(b)   Correct measured values by applying the difference resulted from the instrumental error identified in the delayed calibration and required level of accuracy to the measured values during the period between the date of previous calibration and the actual date of calibration in line with the Appendix to these Guidelines, and apply the corrected values to those parameters in calculation of emission reductions, where the instrumental errors identified in the delayed calibration test do not stay within ±5%.

40. Correction of values in line with paragraph 38(b) and 39(b) are conducted in a manner which results in a conservative calculation of emission reductions, as shown in the Appendix.

41. For parameters described in paragraph 37, if measuring equipments are not calibrated in line with the monitoring plan and calibration is not implemented after the scheduled date, the project participants do not apply measured values in calculation of emission reductions for that monitoring period.
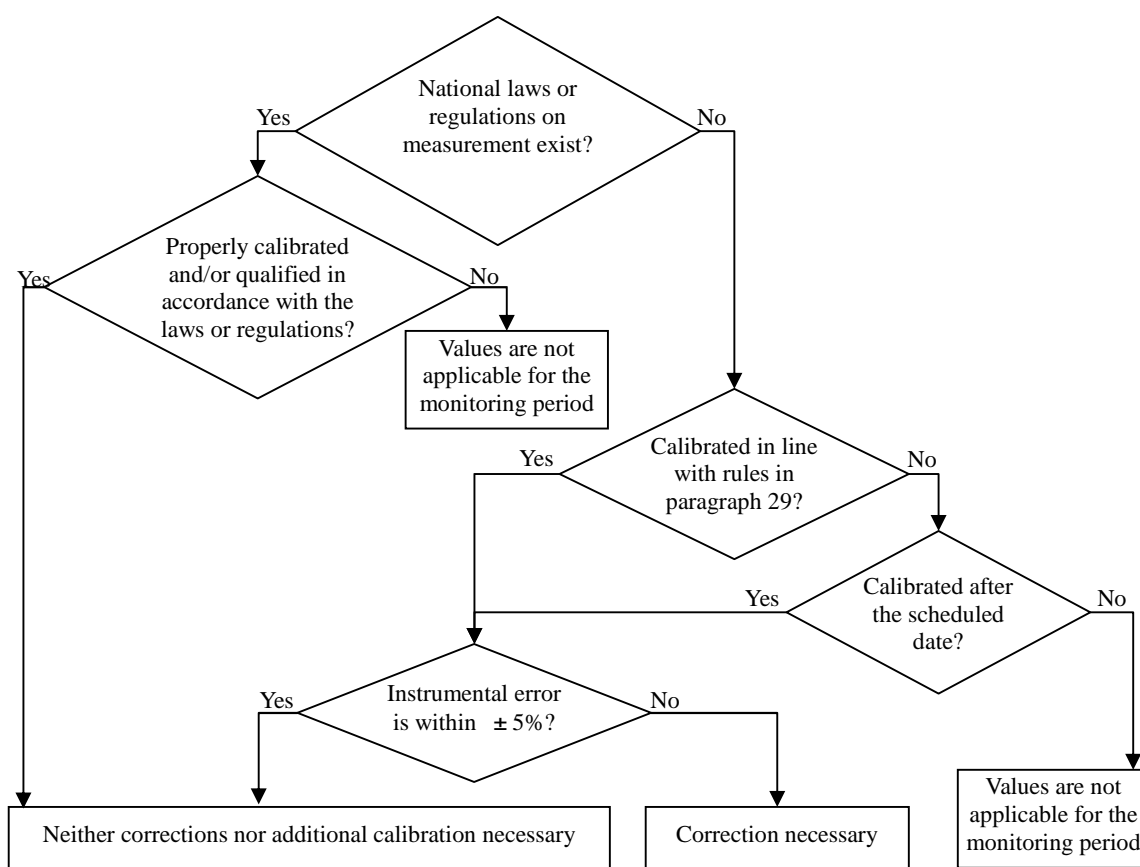
Figure 1 Decision tree for data correction

5.3. Recording and archiving data

42. The project participants record and archive the data as per the monitoring plan.

43. When conducting monitoring, the project participants archive the evidence and records that validate the figures to be stated in the monitoring report(s). It includes the source documents that form the basis for calculations and other information underlying the emission reductions.

6. Developing a Monitoring Report

44. The project participants develop a monitoring report using the Monitoring Report Sheet applied to the registered ~~BOCM~~JCM project.

45. For each parameter in the Monitoring Report Sheet, the project participants describe appropriate information corresponding to the following items:

   (a) Monitoring period: Describe the monitoring period;

   (b) Monitored values: Provide the values of the monitored parameter for the purpose of calculating emission reductions;

(c)   Monitoring option: Fill in the monitoring option used;

(d)   Source of data: Provide the source of data used. Clearly indicate the type of data source (e.g. logbooks, daily records, surveys, etc.) and spatial level of data (e.g. local, regional, national, international), if applicable;

(e)   Measurement methods and procedures: Describe how the parameters are measured/calculated including QA/QC procedures applied. If the parameter is measured, describe the equipments used to measure it, including details on accuracy level, and calibration information (frequency, date of calibration and validity);

(f)   Monitoring frequency: Describe the monitoring frequency.

<Example of a Monitoring Report Sheet>

Monitoring Spreadsheet: BOCM-JP-BD-001 Ver.1.0

Monitoring Report Sheet (input sheet) [For Verification]

Table 1: Parameters monitored *ex post*

(a) Monitoring period	(b) Monitoring point No.	(c) Parameters	(d) Description of data	(e) Monitored Values	(f) Units	(g) Monitoring option	(h) Source of data	(i) Measurement methods and procedures	(j) Monitoring frequency	(k) Other comments
//2013-**/**/2014	(1)	$PFC_{D,y}$	Project diesel fuel consumption during the period of year y	4,000	kl/y	Option B	purchase records	- Collecting purchase amount from retailer invoices and inputting to a spreadsheet manually - Project deputy managers have double checked the input data with invoices on **/**/2013 and **/**/2014. - An input error was found on the data of **/**/2013, then corrective action was instructed to a facility manager.	once a month	
//2013-**/**/2014	(2)	PEC_y	Project electricity consumption during the period of year y	8,000	MWh/y	Option C	monitored data	- Collecting electricity consumption data with verified/calibrated electricity monitoring devices and inputting to a spreadsheet electrically - Three verified monitoring devices fully compliant with the international standard IS00XX are installed on **/**/2013. - Electricity meter was calibrated on **/**/2013 and its accuracy (1.5%) was confirmed to be valid until **/**/2014.	continuous	
N/A	N/A	$PFC_{L,y}$	Project LPG consumption during the period of year y	0	t/y	N/A	N/A	N/A	N/A	N/A
N/A	N/A	$PFC_{N,y}$	Project natural gas consumption during the period of year y	0	1000Nm^3/y	N/A	N/A	N/A	N/A	N/A
N/A	N/A	$PFC_{K,y}$	Project kerosene consumption during the period of year y	0	kl/y	N/A	N/A	N/A	N/A	N/A

Table 2: Project-specific parameters fixed *ex ante*

(a) Parameters	(b) Description of data	(c) Estimated Values	(d) Units	(e) Source of data	(f) Other comments
EER_{office}	Percentage of improvement in energy consumption efficiency for [Office Building] using BEMS	22	%	Past records of 30 similar size office buildings for the period of 2008-2012 measured by the project participant, BEMS provider. Data set of each building has the data of before and after BEMS implementation at least for one year respectively.	

Table 3: *Ex-post* calculation of CO_2 emission reductions

Monitoring Period	CO_2 emission reductions	Units
//2013-**/**/2014	1,556	tCO$_2$/y

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications)
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

Monitoring Report Sheet (input sheet) [For Verification]

Table 1: Parameters monitored *ex post*

(a) Monitoring period	(b) Monitoring point No.	(c) Parameters	(d) Description of data	(e) Monitored Values	(f) Units	(g) Monitoring option	(h) Source of data	(i) Measurement methods and procedures	(j) Monitoring frequency	(k) Other comments
//2013-**/**/2014	(1)	$PFC_{D,p}$	Project diesel fuel consumption during the period *p*	4,000	kl/p	Option B	purchase records	- Collecting purchase amount from retailer invoices and inputting to a spreadsheet manually - Project deputy managers have double checked the input data with invoices on **/**/2013 and **/**/2014. - An input error was found on the data of **/**/2013, then corrective action was instructed to a facility manager.	once a month	
//2013-**/**/2014	(2)	PEC_p	Project electricity consumption during the period *p*	8,000	MWh/p	Option C	monitored data	- Collecting electricity consumption data with verified/calibrated electricity monitoring devices and inputting to a spreadsheet electrically - Three verified monitoring devices fully compliant with the international standard IS00XX are installed on **/**/2013. - Electricity meter was calibrated on **/**/2013 and its accuracy (1.5%) was confirmed to be valid until **/**/2014.	continuous	
N/A	N/A	$PFC_{L,p}$	Project LPG consumption during the period *p*	0	t/p	N/A	N/A	N/A	N/A	N/A
N/A	N/A	$PFC_{N,p}$	Project natural gas consumption during the period *p*	0	$1000Nm^3$/p	N/A	N/A	N/A	N/A	N/A
N/A	N/A	$PFC_{K,p}$	Project kerosene consumption during the period *p*	0	kl/p	N/A	N/A	N/A	N/A	N/A

Table 2: Project-specific parameters fixed *ex ante*

(a) Parameters	(b) Description of data	(c) Estimated Values	(d) Units	(e) Source of data	(f) Other comments
EER_{office}	Percentage of improvement in energy consumption efficiency for [Office Building] using BEMS	22	%	Past records of 30 similar size office buildings for the period of 2008-2012 measured by the project participant, BEMS provider. Data set of each building has the data of before and after BEMS implementation at least for one year respectively.	

Table 3: *Ex-post* calculation of CO_2 emission reductions

Monitoring Period	CO_2 emission reductions	Units
//2013-**/**/2014	1,556	tCO_2/p

[Monitoring option]

Option A	Based on public data which is measured by entities other than the project participants (Data used: publicly recognized data such as statistical data and specifications)
Option B	Based on the amount of transaction which is measured directly using measuring equipments (Data used: commercial evidence such as invoices)
Option C	Based on the actual measurement using measuring equipments (Data used: measured values)

Appendix: Accuracy Level and Calibration

1. The following provides an illustrative example for applying the provisions in paragraphs 38 and 39 on the treatment of monitored parameters for which national laws and regulations on measurement do not exist.

2. A hypothetical biomass power generation project is envisaged. The project generates electricity from biomass fuel and supplies it to the grid system. The project consumes diesel oil for a start-up and auxiliary fuel source to meet the required level of output. In this example, emission reductions are calculated as the difference between reference emissions calculated by multiplying electricity generated and emission factor of the grid, and project emissions calculated by multiplying diesel oil consumed and its emission factor.

3. If the instrumental errors identified in the calibration test do not exceed ±5%, then no correction is needed. An example is shown in example 1

4. If the instrumental errors identified in the calibration test exceeds ±5%, then a correction to the measured values is applied. The degree of correction is the identified errors minus 5%, in a way that results in a conservative calculation of emission reductions. An example is shown in example 2

Example 1: When the instrumental errors identified in the calibration test do not exceed ±5%

Measured value	Parameter	Error identified during (delayed) calibration	Applied values
100 MWh	Electricity supplied to the grid (required parameter for calculating reference emissions)	±0.2%	100MWh (uncorrected), since the error identified by calibration is less than or equal to the required accuracy level of ±5%, no correction needed
800 liters of diesel	Diesel flow to the power plant (required parameter for calculating project emissions)	±2%	800 liters (uncorrected), since the error identified by calibration is less than or equal to the required accuracy level of ±5%, no correction needed

Example 2: When the instrumental errors identified in the calibration test exceeds ±5%

Measured value	Parameter	Error identified during (delayed) calibration	Applied values
100 MWh	Electricity supplied to the grid (required parameter for calculating reference emissions)	±7%	100MWh*(1-(7%-5%))=98MWh, since the error identified by calibration is more than the required accuracy level of ±5%, and it is conservative to take the lower end of the corrected value..
800 liters of diesel	Diesel flow to the power plant (required parameter for calculating project emissions)	±10%	800 liters *(1+(10%-5%))=840 liters, since the error identified by calibration is more than the required accuracy level of ±5%, and it is conservative to take the higher end of the corrected value.