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Date : 01 April 2013
Ref. No. : JCI-CDM-C-13-001

CDM Executive Board
c/o Secretary to the CDM Executive Board

Subject : DOE's Response to the Request for registration incomplete for the programme of activities "Power generation using biogas from state-owned palm oil mills in the Republic of Indonesia" - Ref No. 00008389

Dear Sirs,

Please find the attached document which shows JCI's response to the request for registration incomplete for the above PoA / Reference No.8389.
It has been reflected to the revised PoA-DD, CPA-DD and Validation Report.

In case you have any further question or request, please let us know by phone call or Email.

Yours sincerely,

Hideyuki Sato

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DOE's Response to Request for Registration Incomplete

Project title:	Power generation using biogas from state-owned palm oil mills in the Republic of Indonesia
Reference No.:	No. 8389
Project Participants:	1. PT. Perkebunan Nusantara 6 -Indonesia 2. Centre for Application and Assessment of Energy Resources Technology, Agency for the Assessment and Application of Technology (BPPT) - Indonesia 3. Shimizu Corporation - Japan
DOE:	Japan Consulting Institute, JCI

[Request for Registration Incomplete]

Scope : The DOE is requested to describe the steps taken to assess the equations applied to calculate the baseline/ project emissions, leakage and emission reductions as per the chosen methodology as per VVM v1.2 paragraph 92.
Issue: The CPA-DD, page 59 states that the CODout values for 02-03-04/08/2010 are regarded as the outlier which was subject to the disturbance caused by extraordinary rainfall, it is excepted from calculation of average value. •However, the values of CODin for the same dates have been taken into account. The DOE is requested to provide information on how it has validated the ex-ante measurement campaign to be in line with the applied methodology AMS-III.H version 16, paragraph 27 (b), in particular, how the exclusion of these values impacts on the COD removal efficiency of the baseline treatment system.

Scope: The PP/DOE are requested to include the details of each monitoring parameter listed, such as unit, source, measurement methods, QA/QC procedures, etc, as per EB 48 Annex 60 paragraph 10 (a).
Issue: The PoA-DD and CPA-DD do not contain information on how the measurements of the quantity of net electricity supplied to the grid will be cross checked with records for sold/purchased electricity (e.g. invoices/receipts), as required by the applied methodology AMS-I.D version 17.

Scope: The PP/DOE are requested to indicate the reference and the versions of the applied methodologies in the PDD as per EB 48 Annex 60 paragraph 10 (a).
Issue 1: The eligibility criteria for inclusion of a CPA in the PoA, point 5 states: each CPA shall apply the applicability of both AMS-III.H and AMS-I.D・ However, the PoA-DD does not specify the versions of the methodologies to be applied by each CPA.
Issue 2: The eligibility criteria for inclusion of a CPA in the PoA, point 6 states: The additionality of each CPA shall be demonstrated in accordance with guidelines on the demonstration of additionality of small- -scale project activities・ However, the PoA-DD does not specify the version of the Guidelines to be applied.

Issue: The CPA-DD, page 59 states that the CODout values for 02-03-04/08/2010 are regarded as the outlier which was subject to the disturbance caused by extraordinary rainfall, it is excepted from calculation of average value. • However, the values of CODin for the same dates have been taken into account. The DOE is

requested to provide information on how it has validated the ex-ante measurement campaign to be in line with the applied methodology AMS-III.H version 16, paragraph 27 (b), in particular, how the exclusion of these values impacts on the COD removal efficiency of the baseline treatment system.

Response of JCI

JCI validated the suitability of exclusion of the CODout values for 02-03-04/08/2010 in the CPA-DD as the outlier in following consideration;

1. 10 days average of CODin is 41,416 mg/l calculated based on the 10 days sampling as shown in the Table 14 in the CPA-DD.
2. 10 days average of CODout is obtained 2,021 mg/l based on the samplings in the 7 days and 3 samplings are excluded as outlier because of those extremely higher volumes of data. In reality, it can be deemed that the 7 days average would be equivalent to 10 days average on the assumption that excluded three data are substituted respectively with 7 days average value instead.
3. Obviously, the values of last three days CODout are extremely higher than values in former 7 days and it seemed reasonable to take them as outlier and substitute those three days data with the average of preceding seven days because it is a usual measure taken under this kind of situation.
4. As a result, JCI accepted PO's decision as shown in the Table 14 in the CPA-DD at the validation stage.

However, JCI reconsidered in this occasion whether it is, in principle, really fitting to take values in the last three days for outlier because such extremeness in value could occur under certain weather condition.

After considering all possible situations, JCI judged that it should be more appropriate to use any sampled data in 10-days average calculation no matter how much deviated from other values rather than to just ignore.

Accordingly, the conclusion is that the data obtained through sampling and analysis is all to be adopted for average calculation without exception.

Meanwhile, the change of adopted data as mentioned above does directly affect the calculation of the baseline emissions (BEs) and the project emissions (PEs), and, as a result, it affects the values of emission reductions (ERs) because of considerable impact on the COD removal efficiency and COD of treated wastewater discharged.

JCI examined the degree of impact on the ex-ante emission reductions in both cases of applying outlier and substitute as values in the last three days as follows;
[Case 1]

The case in which 7 days average is applied to last three day (Current version)

(a) Under conditions shown in the Table 14 in the CPA-DD, COD removal efficiency of the baseline treatment system (= $\eta_{COD,BL,B1}$) and the chemical oxygen demand of treated wastewater discharged into sea/river/lake (=$COD_{ww, discharge, BL,y}$) are given as follows;

$\eta_{COD,BL,B1}$ = (CODin – CODout)/CODin x 0.89
= (41,416 – 2,021)/41,416 x 0.89
= 0.951 x 0.89
= 0.8464 (Refer to paragraph 20 and 27, AMS-III.H ver.16)

$COD_{ww, discharge, BL,y}$= CODout x 0.89 = 0.00202t/m^3 x 0.89
= 0.00180 t/m^3

(b) Accordingly, "Baseline emissions of the wastewater treatment system affected by the project activity in year y ($BE_{ww,treatment,y}$) and Baseline methane emissions from degradable organic carbon in treated discharged into sea/river/lake ($BE_{ww, discharge,y}$)" become as follows;

$BE_{ww,treatment,y}=\Sigma i(Q_{ww,i,y}\times COD_{inflow,i,y}\times \boldsymbol{\eta_{COD,BL,i}}\times MCF_{ww,treatment,BL,i})\times B_{o,ww}\times UF_{BL}\times GWP_{CH4}$
= 181,567 × 0.04142 × ***0.8464*** × 0.8× 0.25× 0.89 × 21
= 23,794 tCO2/y

$BE_{ww,discharge,y} = Q_{ww,y} \times COD_{ww,discharge,BL,y} \times MCF_{ww,discharge,BL} \times B_{o,ww} \times UF_{BL} \times GWP_{CH4}$
= 181,567×***0.00180***×0.1×0.25×0.89×21
= 153 tCO2/y

(c) Next, under conditions shown in the Table 14 in the CPA-DD, COD removal efficiency of the project wastewater treatment system 3 (P3) in year y (=$\eta_{COD,PJ,P3}$) and the chemical oxygen demand of treated wastewater discharged into sea/river/lake in the project scenario in year y (=$COD_{ww, discharge, PJ,y}$) are given as follows;

$\eta_{COD,PJ,P3}$ = (CODin,P3 – CODout,P3)/CODin,P3
= (7,206 – ***2,021***)/7,206
= 0.7200 (Ref. paragraph 30 and ER excelsheet Table for P3)

$COD_{ww, discharge, PJ,y}$ = CODout,P3 = 0.00202 t/m^3

Accordingly, "Project emissions of the wastewater treatment system affected by the project activity in year y ($PE_{ww,treatment,y}$) and Baseline methane emissions from degradable organic carbon in treated discharged into sea/river/lake (BEww, discharge,y)" become as follows;

$PE_{ww,treatment,y} = \Sigma_k(Q_{ww,k,y} \times COD_{inflow,k,y} \times \eta_{COD,PJ,k} \times MCF_{ww,treatment,PJ,k}) \times B_{o,ww} \times UF_{PJ} \times GWP_{CH4}$

= 181,567 x 0.04142 x 0.130 x 0.8 + 181,567 x 0.00721 x 0.7200 x 0.8 x 0.25 x 1.12 x25

= 4,599 + 4,434

= 9,033 tCO2/y

$PE_{ww,discharge,y} = Q_{ww,y} \times COD_{ww,discharge,PJ,y} \times MC_{Fww,discharge,PJ} \times Bo,ww \times UF_{PJ} \times GWP_{CH4}$

=181,567×0.00202×0.1×0.25×1.12×21

=216 tCO2/y

[Case 2]

The case in which sampled data is applied for each last three days respectively

(d) All of actual samplings would have been taken into consideration (without exclusion as outliers) for CODout 10 days average calculation, CODout average becomes 5,082 mg/l and it leads to $\eta_{COD,BL,B1}$ to 0.7805 and $COD_{ww, discharge, BL,y}$ to 0.00452, which can be obtained as below;

$\eta_{COD,BL,B1}$ = (CODin – CODout)/CODin x 0.89

= (41,416 – 5,082)/41,416 x 0.89

= 0.877 x 0.89

= ***0.7805***

$COD_{ww, discharge, BL,y}$= CODout x 0.89 = 0.00508t/m^3 x 0.89

= ***0.00452*** t/m^3

Therefore,

$BE_{ww,treatment,y} = Q_{ww,B1,y} \times COD_{inflow,B1,y} \times \boldsymbol{\eta_{COD,BL,B1}} \times MCF_{ww,treatment,BL,B1}) \times B_{o,ww} \times UF_{BL} \times GWP_{CH4}$

= 181,567×0.04142× ***0.7805***×0.8×0.25×0.89×21

= 21,941 tCO2/y

$BE_{ww,discharge,y} = Q_{ww,y} \times COD_{ww,discharge,BL,y} \times MCF_{ww,discharge,BL} \times B_{o,ww} \times UF_{BL} \times GWP_{CH4}$

= 181,567×0.00452×0.1×0.25×0.89×21

= 383 tCO2/y

(e) Next, under conditions shown in the Table 14 in the CPA-DD, COD removal efficiency of the project wastewater treatment system 3 (P3) in year y (=$\eta_{COD,PJ,P3}$) and the chemical oxygen demand of treated wastewater discharged into sea/river/lake in the project scenario in year y (=$COD_{ww, discharge, PJ,y}$) are given as follows;

$\eta_{COD,PJ,P3}$ = (CODin,P3 – CODout,P3)/CODin,P3

= (7,206 – ***5,082***)/7,206

= ***0.295***

$COD_{ww, discharge, PJ,y}$ = CODout.P3

= ***0.00508*** t/m^3

Therefore,

$PE_{ww,treatment,y} = \Sigma_k(Q_{ww,k,y} \times COD_{inflow,k,y} \times \eta_{COD,PJ,k} \times MCF_{ww,treatment,PJ,k})$
$\times Bo,ww \times UFPJ \times GWPCH4$
$= (181,567 \times 0.04142 \times 0.1300 \text{ x } 0.8 + 181,567 \text{x} 0.00721 \text{x } \boldsymbol{0.295} \times 0.8)$
$\times 0.25 \times 1.12 \times 21$
$= 4,599 + 1,817$
$= 6,416$

$PE_{ww,discharge,y} = Q_{ww,y} \times COD_{ww,discharge,PJ,y} \times MCF_{ww,discharge,PJL} \times B_{o,ww} \times UF_{BL} \times GWP_{CH4}$
$= 181,567 \times 0.00508 \times 0.1 \times 0.25 \times 0.89 \times 21$
$= 542$

From above calculation results, the total baseline emissions and project emissions in [Case 1] and [Case 2] under wastewater treatment become as follows in comparison;

[Case 1]

$BE_{ww,y} = \{BE_{power,y} + BE_{ww,treatment,y} + BE_{s,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}\}$
$= 0 + BE_{ww,\ treatment,y} + 0 + BE_{ww,\ discharge,y} + 0$
$= 23,794 + 153 = 23,947$ tCO2e/y
(Refer to D.6.3. d) in the uploaded CPA-DD)

$PE_{wastewater,y} = \{PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge\ ,\ y}$
$+ PE_{s,final,y} + PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y}\}$
$= 86 + 9,033 + 0 + 216 + 2,461 + 0 + 316$
$= 12,112$

Accordingly,
$ER_{Case1} = 23,947 - 12,112 = 11,835$ tCO2/y

[Case 2]

$BE_{ww,y} = \{BE_{power,y} + BE_{ww,treatment,y} + BE_{s,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}\}$
$= 0 + BE_{ww,\ treatment,y} + 0 + BE_{ww,\ discharge,y} + 0$
$= 21,941 + 383 = 22,324$ tCO2e/y
(Refer to D.6.3. d) in the uploaded CPA-DD)

$PE_{wastewater,y} = \{PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge\ ,\ y}$
$+ PE_{s,final,y} + PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y}\}$
$= 86 + 6,416 + 0 + 542 + 2,461 + 0 + 316$
$= 9,821$

Accordingly,
$ER_{Case2} = 22,324 - 9,821 = 12,503$ tCO2/y

As a result,
$ER_{diff} = ER_{Case2} - ER_{Case1} = 12,503 - 11,835 = 668$ tCO2/y

In consideration that factors other than referred ones in the total baseline emissions and total project emissions above are not affected by the difference of CODout average calculation, the conclusion for the above comparison ([Case

1] and [Case 2]) can be said as below;
In the comparison, the emission reductions will increase by ER_{diff} (= 668 tCO2/y) in the Case 2 as an impact, which is the case that all sampled CODout are utilized in the 10 days average calculation (no substitution is considered) in the COD Analysis implemented according to AMS-III.H version 16.
JCI thinks that the above calculation process is strictly based on the applied methodology (AMS-III.H version 16) and the result is credible, although the consequence of examination is against the intuition.

Please note that, as explained in below, GWP_{CH4} has been revised from 21 to 25 in the resubmitted PoA-DD and CPA-DD, accordingly the above calculation result is only reflected on the previous version of PoA-DD and CPA-DD.

[JCI's additional exposition]
As for the relevant figures in the above JCI's response, all of them are referred to those used in the uploaded PoA-DD and CPA-DD at the previous requesting registration, some of which are subject to the revision of value of "Global Warming Potential for methane (GWP_{CH4}) from 21 to 25 in the revised DDs.
JCI judged that the revision of GWP_{CH4} to 25 is appropriate in view of EB69 Annex3, decision 4/CMP.7 and IPCC2006 (AR4).

Issue: The PoA-DD and CPA-DD do not contain information on how the measurements of the quantity of net electricity supplied to the grid will be cross checked with records for sold/purchased electricity (e.g. invoices/receipts), as required by the applied methodology AMS-I.D version 17.

Response of JCI
During the validation of the PoA-DD and CPA-DD about information on how the measurements of the quantity of net electricity supplied to the grid, JCI confirmed that it stipulates only that "***Measuring equipment will be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least three years"*** as QA/QC procedures for $EG_{BL,y}$ in the PoA-DD and CPA-DD.
However, as for the monitoring of the net quantity of the supplied electricity to the grid, it is described in the applied methodology (AMS-I.D version 17) as "***If applicable, measurement results shall be cross checked with records for sold/purchased electricity (e.g. invoices/receipts).***"

As it is applicable in the case of the proposed PoA, the relevant parts of PoA-DD and CPA-D have been appropriately revised as below;

"Measurement results shall be cross checked with records for sold electricity (e.g. invoices/receipts).

Measuring equipment will be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least three years." (underlined part is added)

JCI considers the above revision on the PoA-DD and CPA-DD complies with the requirement of the applied methodology (AMS-I.D version 17)

Issue 1: The eligibility criteria for inclusion of a CPA in the PoA, point 5 states: each CPA shall apply the applicability of both AMS-III.H and AMS-I.D・ However, the PoA-DD does not specify the versions of the methodologies to be applied by each CPA.

Response of JCI

As stated in the VVS version 03.0 (paragraph 204), it is required to specify the version of applied methodology in the latest version of the PoA-DD in order to determine whether the CPA meets the requirement of the PoA, especially in the case of future inclusion of CPAs.

Version numbers of applied methodologies are clearly stated in the PoA-DD and CPA-DD, however it is not clearly described in the eligibility criteria table in the PoA-DD and CPA-DD.

From view point stated in the VVS, JCI considers that it is needed to revise the eligibility criteria as specifying the version number for both of AMS-III.H and AMS-I.D which are applied in the PoA-DD and CPA-DD so that it is easy to determine whether the CPA meets the requirement of the PoA, especially in the case of future inclusion of CPAs.

JCI requested the project owner to revise the point 5 in the eligibility criteria to add the versions for both of AMS-III.H and AMS-I.D in the PoA-DD and CPA-DD.

Issue 2: The eligibility criteria for inclusion of a CPA in the PoA, point 6 states: The additionality of each CPA shall be demonstrated in accordance with guidelines on the demonstration of additionality of small- scale project activities・ However, the PoA-DD does not specify the version of the Guidelines to be applied.

Response of JCI

JCI confirmed that he PoA-DD does not specify the version of the additionality tool

“Guidelines on the demonstration of additionality of small-scale project activities” which is to be applied by to each CPA in the eligibility criteria whereas it is described in the other part of the PoA-DD and CPA-DD.

On the same consideration in the JCI’s response to the above “***Issue 1***”, JCI reckons that it is needed to revise the eligibility criteria as specifying the version number for the applied additionality tool “Guidelines on the demonstration of additionality of small-scale project activities” which is applied in the PoA-DD.

Accordingly, JCI requested the project owner to revise the point 6 in the eligibility criteria to add the version for the relevant tool in the PoA-DD and CPA-DD.