

## Validation opinion

### Notification / Requesting approval of changes and revision of monitoring plan from the project activity as described in the approved revised project design document

Title of project activity: <b>Angkor Bio Cogen Rice Husk Power Project</b>		
CDM reference number:		PJRCS project No.:
0363		C-2-C-01-L-0421
Type of request:	<input checked="" type="checkbox"/> Notification of changes from project activity as described in the approved revised PDD (i.e. changes do <u>not</u> raise any concerns with regard to i) additionality, ii) the scale of CDM project activity and/or iii) the applicability and application of baseline methodology <input checked="" type="checkbox"/> Revision of monitoring plan to reflect current monitoring practice, from monitoring plan as described in the approved revised PDD <input checked="" type="checkbox"/> Request for approval of changes from project activity as described in the approved revised PDD	
Date	Work carried out by:	Work verified and approved by:
02 Sept. 2015	Zhang Xiaojun, Johnsen	Anjana Sharma

## 1. Notification of changes from project activity as described in the approved revised PDD

### 1.1. Description of the changes as compared to the description in the approved revised PDD

Second revised PDD: version 3.0, dated 11/08/2015

Approved first revised PDD: version 2.0 dated 01/11/2013, approved by UNFCCC on 23 January 2014

DNV: Validation Report of "Angkor Bio Cogen Rice Husk Power Project", Report No.2006-0559, version 01A dated 04/08/ 2006.

The assessment of the changes of second revised PDD: version 3.0, dated 11/08/2015, as compared with the approved first revised PDD: version 2.0 dated 01/11/2013 is as per VVS 09.0.

The changes requested to the approved first revised PDD: version 2.0 dated 01/11/2013 are two aspects:

- 1) Electricity supplied to Grid, and monitoring related to calculate baseline, project and/or leakage emission from electricity consumption

In the approved first revised PDD: version 2.0 dated 01/11/2013, the electricity generated from 2 MWe electricity generator using renewable source fuel (rice husk) supplies internally to AKR (Angkor Kasekam Roongroeung Rice Mill) and plans to supply small amount of surplus electricity to neighbouring factories and community. While for the second revised PDD: version 3.0, dated 11/08/2015, the electricity generate form this same 2 MWe electricity generator deliver electricity not only to AKR, but also additionally to the local grid through a power utility, namely Electricity Angsnoul Enterprise (EAE), due to lower consumption of electricity from AKR, unexpected from the original estimates.

Second revised PDD: version 3.0, dated 11/08/2015	Approved first revised PDD: version 2.0 dated 01/11/2013
<p>Section A. 3: <b>Electricity sales</b></p> <p>(1.1) Electricity supplied to AKR (Same with the content of right column)</p> <p>(1.2) <u>Electricity supplied to the grid</u></p> <p>Due to the low load environment of Angkor Kasekam Roongroeung Rice Mill (AKR), the Project supplies small amount of electricity generation to AKR, while the energy consumption for operating the power plant remains the same, which is not economic benefit to the project. As a result of this, the project proponent (ABC) plans to supply electricity to the grid through a power utility, namely Electricity Angsnoul Enterprise (EAE), which supplies electricity to the surrounding local areas in Angsnoul District in Cambodia.</p>	<p>Section A. 3: <b>Electricity sales</b></p> <p>The produced electricity will be sold in bulk to the rice mill under a power purchasing agreement. A sales licence is required for any electricity sales in Cambodia. Before the Project implementation, ABC will obtain the license from Electricity Authority of Cambodia (EAC). Angkor Rice Mill will sell excess electricity to the factories in the vicinity. It is expected that the power plant will internally consume about 15% of the electricity it produces. The total quantity of electricity sales will be 13,464 MWh/year:</p> $2 \text{ MW} \times 7,920 \text{ hours/year} = 15,840 \text{ MWh/year}^1$ $15,840 \text{ MWh/year} \times (1-0.15) = 13,464 \text{ MWh/year}$

- 2) Adoption of methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0 to calculate the emission reductions for the electricity delivered to Electricity Angsnoul Enterprise (EAE). The comparison of the two version of second revised PDD: version 3.0, dated 11/08/2015 and approved first revised PDD: version 2.0 dated 01/11/2013 is depicted in table below:

Second revised PDD: version 3.0, dated	Approved first revised
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<sup>1</sup> It is expected that the plant will be under operation for 330 days a year. The rest (35 days) is allotted for regular maintenance and other stoppages.

11/08/2015	PDD: version 2.0 dated 01/11/2013
Section B.1.: <b>AMS-I.D</b> Type I : Renewable energy projects Category D : Grid connected renewable electricity generation Reference : Version 18, Scope 1, valid from Reference 28/11/2014 onwards	/

## 1.2 Assessment of the changes

### 1.2.1 Assessment of when the changes occurred:

#### **Electricity supplied to Grid:**

During the 2<sup>nd</sup> verification site visit, it was observed by the DOE that PP has future planed to supply electricity to Grid through the same power plant installed under the project activity. FAR 01 was raised and closed out since the arrangement for supply of electricity to the grid is under the process but not implemented yet. It does not affect current monitoring period under the 2<sup>nd</sup> verification. After the second verification of the proposed project, PP has installed transformer and a two-way electricity meter to supply electricity generated from 2 MWe electricity generator using renewable source fuel (rice husk) to the grid.

**Adoption of methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0:** This is the result of the consequence of the first change.

### 1.2.2 Assessment of the reasons for these changes taking place

**Electricity supplied to Grid:** There are no actual physical changes, especially for the installing equipment (generators and meters), viewed during the physical site visits by PJRCES during the 1<sup>st</sup> verification and 2<sup>nd</sup> verification, after project implementation and during operation.

For Angkor Bio Cogen Rice Husk Power Project, only installing transformer (Model of Thai Maxwell with rated power of 1250 kVA) and reaching the grid facilities.

**Adoption of methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0:** It is the consequence of the first change.

### 1.2.3 Assessment of whether the changes would have been known to the project participants prior to registration of the project activity;

**Electricity supplied to Grid:** The changes would have not been known to the PP prior to registration of the project activity.

**Adoption of methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0:** N/A

#### **1.2.4 Assessment of how the changes may impact the overall operation/ability of the project activity to deliver emission reductions as stated in the PDD;**

**Electricity supplied to Grid:** There were not any changes of ex ante estimates of emission reduction.

**Adoption of methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0:**N/A

### **1.3 Assessment of the impact of the changes**

*Do the changes raise concerns with regard to any of the following aspects?*

- ☒ Additionality
- ☐ Scale of CDM project activity
- ☒ Applicability and application of baseline methodology
- ☐ Not applicable (the changes do not raise any concerns)

#### **1.3.1 Assessment of impacts of the changes on additionality;**

##### **Assessment of impacts of the changes on additionality**

The additionality argument presented in the approved first revised PDD is based on investment analysis and barrier analysis which consists of institutional, technological and investment barriers.

##### **Investment analysis of the Electricity supplied to Grid**

Only one physical change is the installing of transformer (Model of Thai Maxwell with rated power of 1250 kVA), which has minor impact on the investment analysis of the proposed project in opinion of verifiers.

Therefore, the changes of the project activity do not impact the additionality of the project. It is in PJRCES's opinion that the change to the project design has not changed the conclusion in the approved first revised PDD of the proposed project that the project is additional.

##### **Investment analysis of the Adoption of methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0**

N/A

#### **1.3.2 Assessment of impacts of the changes on the applicability and application of baseline methodology**

The project applied the the approved methodology 1, AMS-I.A. (Electricity generation by the user); 2, AMS-III.E. (Methane avoidance). *New circumstance is that due to part of electricity generated will be delivered to Grid*, another supporting methodology of AMS-I.D (Grid connected renewable electricity generation) Version 18.0 shall be adopted to support the main methodology of AMS-I.A. (Electricity generation by the user). The baseline of previous (in the approved first revised PDD) and upcoming (in the second revised PDD) scenario is totally same: Electricity delivered to Phnom Penh Grid by the project activity would have otherwise been generated by the operation of grid-connected

power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the 'Tool to calculate the emission factor for an electricity system (Version 04) and 'Tool to calculate baseline, project and/or leakage emissions from electricity consumption (Version 01).

Therefore, the applicability criteria of the applied methodology remain unaffected as there is no change in technology and the validated baseline scenario remains valid.

The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,y}$$

$EF_{grid,y}$  = Combined margin CO<sub>2</sub> emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO<sub>2</sub>/MWh) =  $EF_{grid,CM,y}$

### Calculation of $EF_{grid,y}$

PP has used six steps of Tool to calculate the emission factor for an electricity system (Version 04) to calculate the baseline emission factor of the grid. After the assessment of the calculation process, it was verified that  $EF_{grid,OM,y}$  (0.6257 tCO<sub>2</sub>e/MWh),  $EF_{grid,BM,y}$  (0.6867 tCO<sub>2</sub>e/MWh) and  $EF_{grid,CM,y}$  (0.6568 tCO<sub>2</sub>e/MWh) are correctly calculated.

### 1.3.3 Assessment of impacts of the changes on the scale of the CDM project activity

There is no change to the scale of the CDM project activity as the project does not change the capacity of the proposed project activity.

## 2. Revision of monitoring plan to reflect current monitoring practice

Following changes are applied to the monitoring plan:

- For fixed ex-ante:  $EF_{grid,om,y}$ ,  $EF_{grid,bm,y}$ ,  $EF_{grid,cm,y}$  and  $TDL_{j,y}$  in section B.6.2
- For monitored parameters; amount of electricity supplied to the grid (D.3-4) and amount of electricity imported from the grid (D.3-5) in section B.7.1

## Validation opinion

The proposed notification of the changes as stated in the section 1 and revision of the monitoring plan as stated in section 2 can ensure that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the notification change. And revision is in accordance with the approved monitoring methodology 1, AMS-I.A. (Electricity generation by the user); 2, AMS-III.E. (Methane avoidance) applicable to the proposed project.

We wish to seek permission on behalf of the project proponent for the changes requested above. Considering the assessment presented above, PJRCES was able to confirm that: 1) permanent change to include a small scale methodology {AMS.I-D (Grid connected renewable electricity generation)} in the project activity; and 2) monitoring plan optimization, would not impact the additionality of project activity negatively and would not change the scale of CDM project activity.

Perry Johnson Registrars Carbon emissions services, INC



A revision in the second revised PDD: version 3.0, dated 11/08/2015, to include the revision and additional information is herewith attached.

Yours faithfully  
for PJRCES

*Zhang Xiaojun*  
*Johnsen.*

*Zhang Xiaojun Johnsen*  
*Project Manager, PJRCES*

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