

**ASB0004**

## Standardized baseline

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# Technology switch in the rice mill sector of Cambodia

Version 01.0



**United Nations**  
Framework Convention on  
Climate Change

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## 1. Introduction

### 1.1. Background

1. The following table describes the key elements of the standardized baseline:

**Table 1** Key elements

Typical projects	Installation of new equipment and/or retrofitting of existing equipment to generate mechanical or electrical power to drive rice mill machines (e.g. transporters, shakers, threshers, polishers and sewing machines for packing bags)
Type of greenhouse gas emission mitigation action	Switch to less carbon-intensive technology with change of energy source

## 2. Scope, applicability, entry into force and validity

### 2.1. Scope

2. This standardized baseline is applicable to project activities that install new equipment, replace existing equipment and/or retrofit existing equipment to generate mechanical or electrical power to drive rice mill machines (e.g. transporters, shakers, threshers, polishers and sewing machines for packing bags) and possibly to power appliances and lighting in the rice mill facilities.
3. This standardized baseline includes applicability conditions, a positive list of technologies that are considered to be automatically additional, the approach for determining the baseline emissions, and a parameter to be monitored for the estimation of the baseline emissions. The appendix provides the information on the background and rationale for the development of this standardized baseline based on the submission from the designated national authority (DNA).
4. The standardized baseline can only be used in conjunction with the latest approved version of the small-scale methodology AMS-I.B “Mechanical energy for the user with or without electrical energy”, as follows:
  - (a) The applicability conditions contained in this standardized baseline supersede the applicability conditions in AMS-I.B;
  - (b) The project emissions and the leakage emissions shall be determined according to AMS-I.B;
  - (c) The following parameter (if diesel is consumed by the project activity) shall be monitored according to the provisions in AMS-I.B, and the other parameters in the methodology do not apply:
    - (i) Quantity of diesel consumption in year  $y$ ;
  - (d) AMS-I.B is applicable to all the technologies identified in Table 2.

## 2.2. Applicability

5. This standardized baseline is applicable under the following conditions:

- (a) The host country is Cambodia;
- (b) Replacement or retrofitting of existing facilities are eligible under this standardized baseline, only if the existing equipment used prior to the implementation of the project activity to generate the mechanical energy or electrical energy is operated based on fossil fuel without renewable component, such as co-firing of renewable biomass;
- (c) The total rated output capacity of the new or retrofitted energy-generating equipment implemented at the project rice mill shall not be more than 5 MW;
- (d) The rice production at the project rice mill shall not be more than 3,000 tonnes per year. This condition shall be checked ex ante against the estimated daily rice production and operating days per year by the project participant. If the actual rice production exceeds 3,000 tonnes in any year of the crediting period, the quantity that can be considered for the baseline emissions is capped at 3,000 tonnes of rice per year while the project emissions shall be determined based on the total amount of diesel consumed and the grid electricity consumed during that year;
- (e) The project participants shall demonstrate that the project activity corresponds to one of the technologies specified in Table 2 below and thereby the project activity is automatically additional:

**Table 2. Positive list of technologies**

<b>Name of technology</b>	<b>Description</b>
Rice husk gasification and engine	A mill driven by an engine, for which the main fuel is combustible gases (mixture of CO, CH <sub>4</sub> and H <sub>2</sub> ) generated from a rice husk gasification system. The mill may be driven by a dual fuel mode engine that consumes diesel as a subsidiary fuel.
Steam turbine with rice husk combustion	A mill driven by electricity generated from steam turbines firing rice husks.
Stirling engine with rice husk combustion	A mill driven by electricity generated from stirling engines firing rice husks.

- (f) Rice husks used by the project activity shall not be stored for more than one year. No storage of the rice husk shall be done in anaerobic conditions.
- (g) Under the project activity, no other fuels than rice husk and diesel (where applicable) are used;
- (h) The project proponents may use diesel driven back up electrical or mechanical power source, in addition to above technologies listed in Table 2.

### **2.3. Entry into force**

6. This standardized baseline shall enter into force immediately upon its adoption by the Executive Board of the clean development mechanism (the Board) (on 08/11/2013).

### **2.4. Validity**

7. The standardized baseline is valid for three years from the date of its adoption by the Board.

## **3. Normative references**

8. This standardized baseline is based on the following proposed new standardized baseline:
  - (a) "PSB0004: Standardized baseline of energy use in rice mill sector of Cambodia" submitted by the DNA of Cambodia.
9. For further information regarding the proposed new standardized baseline as well as the consideration of proposed new standardized baselines by the Board, please refer to <[http://cdm.unfccc.int/methodologies/standard\\_base/index.html](http://cdm.unfccc.int/methodologies/standard_base/index.html)>.
10. The proposed standardized baseline is developed according to version 02 of the "Guidelines for the establishment of sector specific standardized baseline". It applies to the following measure: switch of technology with or without change of energy source (including energy efficiency improvement).
11. Project participants shall apply the "General guidelines for SSC CDM methodologies" and "General guidance on leakage in biomass project activities" (Attachment C to Appendix B of decision 4/CMP.1 Annex II) available at <<http://cdm.unfccc.int/Reference/Guidclarif/index.html>>.
12. This standardized baseline also refers to the latest approved version of the small-scale methodology AMS-I.B "Mechanical energy for the user with or without electrical energy".

## **4. Definitions**

13. The definitions contained in the Glossary of CDM terms shall apply.

## **5. Baseline methodology**

### **5.1. Project boundary**

14. The project boundary includes the physical, geographical site(s) of the rice mill where the project activity is implemented.

### **5.2. Baseline emissions**

15. In the absence of the project activity, the rice would be milled using machines driven by diesel engine(s). The baseline emissions are calculated as follows:

$$BE_y = \min(3000, Q_{rice,y}, Q_{cap,daily} \times 200) \times EF_{baseline} \quad \text{Equation (1)}$$

Where:

$BE_y$	=	Baseline emissions in year $y$ (t CO <sub>2</sub> )
$Q_{rice,y}$	=	Quantity of rice produced in year $y$ (t rice)
$Q_{cap,daily}$	=	Maximum quantity of rice produced per day, determined ex ante according to design specification of the rice mill machines (t rice/day)
200	=	Typical number of days for processing per year (days); with justification an alternative number may be used
$EF_{baseline}$	=	Baseline emission factor (t CO <sub>2</sub> /t rice), 0.0506 t CO <sub>2</sub> /t rice for small/medium mills ( $\leq 1,000$ t rice /yr) and 0.033 t CO <sub>2</sub> /t rice for semi-large mills ( $>1,000$ t rice /yr and $\leq 3,000$ t rice /yr)

## 6. Monitoring methodology

### 6.1. Data and parameters monitored

16. The parameter below shall be monitored.

**Data/parameter table 1.**

<b>Data/parameter:</b>	$Q_{rice,y}$
Data unit:	Tonnes
Description:	Quantity of rice produced in year $y$
Source of data:	On-site measurement
Measurement procedures (if any):	The parameter can be monitored using direct measurement (e.g. by use of a scale) of the weight of rice milled.
Monitoring frequency:	Continuously or in batches.
QA/QC procedures:	-
Any comment:	-

## Appendix. Background information

1. The standardized baseline was developed using version 2.0 of the “Guidelines for the establishment of sector specific standardized baseline”.
  - (a) Output of the sector: milled rice;
  - (b) Applicable measure: Measure 2: Switch of technology with or without change of energy sources (including energy efficiency improvement);
    - (i) The standardized baseline did not include the measure of methane avoidance, which may occur through the decay of rice husks under anaerobic conditions. The availability of biomass residue will be assessed at the project level;
  - (c) Level of aggregation: Cambodia;
    - (i) Data were collected from the entire country;
    - (ii) Disaggregation according to annual rice production is proposed by the DNA:
      - a. There are only a small number of mills with more than 3,000 tonnes of annual rice production in Cambodia, and most of those that do exceed 3,000 tonnes of annual rice production have a gasification system installed. This group is considered to be different from other smaller mills because they may have some capability for installing advanced technologies;
      - b. According to Mansvelt,<sup>1</sup> the average production is about 800 tonnes, which is rounded up to 1,000 tonnes. The number of collected samples is also taken into account;
      - c. No standardized baselines are proposed for rice mills with more than 3,000 tonnes of annual rice production;
  - (d) Additionality demonstration:
    - (i) According to the guidelines on “Demonstrating additionality of microscale project activities”, microscale renewable projects (5 MW) implemented in a least developed country are automatically additional. The positive list therefore includes the renewable/biomass technologies under this threshold;
  - (e) Baseline identification:
    - (i) A sampling survey was implemented to identify the technologies and the output fraction of each technology for mills with annual production below 3,000 tonnes;

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<sup>1</sup> Mansvelt. 2011. IFC Gasifier Study (draft report).

- (ii) Only one technology was identified: diesel engine (mostly second-hand vehicle engines);
- (iii) The baseline was determined to be a mill powered by a diesel engine;
- (f) Baseline emission factor:
  - (i) To calculate the emission factor of the diesel-engine-driven rice mills, the methodological approach contained in AMS-I.B. is used;
  - (ii) Fuel consumption and rice production at 30 mills were sampled from each group: small/medium mills ( $\leq 1,000$  t) and semi-large mills (1,000 t ~ 3,000 t).
  - (iii) The baseline emission factor (t CO<sub>2</sub>/t rice) is determined for small/medium mills ( $\leq 1,000$  t) and semi-large mills (1,000 t ~ 3,000 t) separately at the 80<sup>th</sup> percentile.

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### Document information

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