

JCM/BOCM Feasibility Study

“Small-scale Biomass Power Generation with Stirling Engine”

By Pro-Material Co, Ltd.

URL: http://gce.jp/main.nsf/en/Activities-Climate_Change_Mitigation-FS2012jcmfs01

1. Description of Project/Activity

The purpose of the Project is to reduce Green-house gas (GHG) emissions by displacing diesel fired power generation at small rice mills through the dissemination of low-cost and easy-to-operate stirling engines using biomass as fuel in Cambodia.

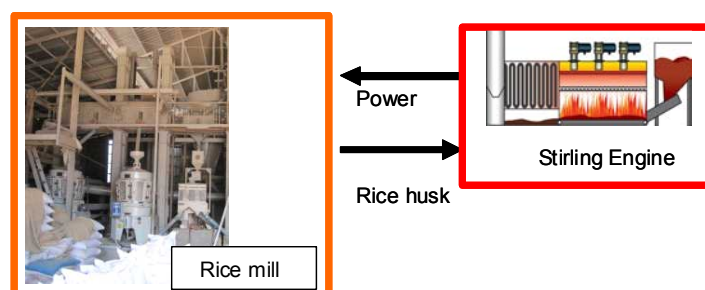


Figure 1. Project concept

2. Results of the study

(1) Eligibility Criteria for MRV Methodology Application

Case 1	The technology introduced involves installation of a biomass electricity generation technology in rice mills, where there was no such technology installed prior to the implementation of the project activity.
Case 2	The project activity shall replace fossil fuel used in a captive power plant not connected to grid.
Case 3	The fuel used in the project activity consists solely of renewable biomass.
Case 4	The technology installed under the project activity does not generate toxic substance as byproduct through processes, such as reforming of gas.
Case 5	Project participants are able to monitor the amount of net electricity generated by the project activity.

(2) Reference Scenario and Project/Activity Boundary

The reference scenario is continuous use of fossil fuel based fuel by existing electricity generation for the duration of the proposed project. The project boundary includes industrial and commercial facilities consuming energy generated by the system.

(3) Calculation Method Options

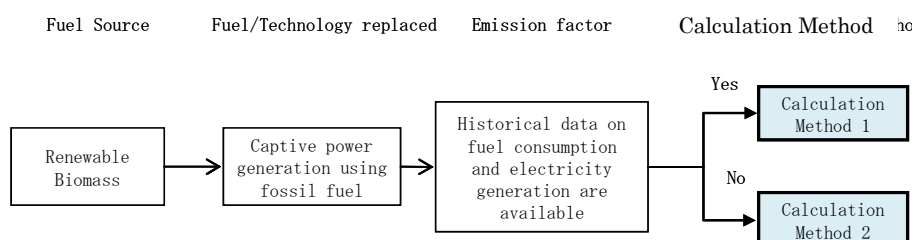


Figure 2. Calculation Method options



(4) Default Value(s) Set in MRV Methodology

For Calculation Method 2, the default value for CO₂/ emission per unit of electricity generated by diesel engine is conservatively set at 0.8 kgCO₂/kWh.

(5) Monitoring Methods

Table 1: Monitoring parameters

Parameter	Description	Measurement Method (e.g.)
EG _{PJ,y}	Quantity of net electricity generated by the renewable energy unit installed under the project activity (MWh)	Measurements are undertaken using a metering device that can operate continuously. The net electricity displaced is the gross energy generation by the project activity power plant, minus the auxiliary electricity consumption. Data may be compiled remotely.

(6) Quantification of GHG Emissions and its Reductions

Table 1: Estimated emission reductions

Case	Annual average GHG emission reduction
Per installation site (50kW)	175.2 tCO ₂
Potential in 3 Study provinces (135kW) (Kampong Speu, Kandal, Kampong Cham)	613.2 tCO ₂

(7) Verification of GHG Emission Reductions

The net electricity generated by the project activity will be verified by a third party. The accuracy level of the monitoring equipment used will be confirmed to determine whether calibration is required.

(8) Ensuring Environmental Integrity

Stirling engines have greater environmental benefits compared to conventional biomass power generation systems such as lower noise, NO_x and SO_x emission levels, and no harmful substances emitted into the surroundings.

(9) Contribution to Sustainable Development in Host Country

The Study found that the proposed Project using renewable biomass as energy source conforms with the mitigation actions in the energy sector stipulated in the Cambodia Climate Change Strategic Plan, as well as to the energy policy objectives including rural electrification.

3. Toward Implementation/Future prospects and issues

Project implementation schedule is planned as follows.

	Content
FY 2012	1 unit for demonstration
FY 2013	5 units per system for 10 sites... 175kWh/50 units for F/S and Promotion
FY 2014	Sales phase; 10 units per system for 100 sites...3500kWh/1000 units

Issues to be tackled include confirmation of the monitoring technology, selection of project sites, minimizing technology cost and establishing a sales channel.