Pilot cases on standardized Baseline

Biomass Gasification in Cambodia

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Low electricity access rate
High carbon intensity energy source

Electrification rate in Cambodia: 24% (IEA)
80.5% of population live in rural area, where electrification rate is much lower

Most of industrial plants including rice millers have an in-house generation system using diesel

Electricity source in grid system

Source: Electricity Authority of Cambodia

Potential of rice husk utilization as biomass fuel

- Gasification with rice husk reduces 60-75% of diesel consumption
- 6 kg of rice husk is equivalent to 1L of diesel
- Some portion of rice husk is used as fuel for heating, other is decayed.
- Government promotes to increase milled rice for export.

Source: Ministry of Agriculture, Floristries and Fishery
Source: The Supreme National Economic Council
Steps for establishing standardized baseline

Step 1: Identify host countries, sectors, outputs and measures

Host Country: Cambodia
(Potential level of aggregation: countries in same conditions)

Sector: Rice milling factory
(garment factory, and ice factory, etc.)

Measure: Switch of technology with change of energy source

Technology: Generating power by gasification of biomass (e.g. rice husk) replaced with diesel

Step 2: Establish additionality criteria for the identified measures

Step 3: Identify the baseline for the measures

Power source in rice milling factory (Assumption)

Rice millers in Cambodia: about 27,000
Rice millers applying gasification with rice husk: 48

Source: Ministry of Environment of Cambodia, NEDO and SME renewable energy Ltd.

<table>
<thead>
<tr>
<th>Source of Power</th>
<th>T1 Supply from mini-grid</th>
<th>T2 Captive plant with diesel</th>
<th>T3 Supply from Phnom penh grid</th>
<th>T4 Gasification with biomass</th>
<th>T5 Other renewable energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission factors</td>
<td></td>
<td>x</td>
<td>0.66</td>
<td>y</td>
<td>0</td>
</tr>
<tr>
<td>(t-CO2/MWh)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>% of rice milled</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

A % | B % | C % | D % | E %
0%  |     |     |     | 100%
Additionality demonstration

- No regulation: mandating use of the activities

- Financial barrier: Large initial equipment cost

- Technology barrier: Lack of experts & service providers

- Common practice: Low prevailing rate of the technology

Exemption from demonstrating additionality
- Projects up to 5 MW that employ renewable energy technology
- The geographic location of the project in one of LDCs/SIDs

Step 4: Determine the baseline emission factor

\[
\text{Emission Reductions} = \text{Baseline Emissions} - \text{Project Emissions} - \text{Leakage}
\]

0 t-CO2

0 t-CO2

**Option 1.**

\[
\text{BE}_y = \text{EG}_{BL,y} \times \text{EF}_{EG,y}
\]

Quantity of net electricity displaced

**Option 2.**

\[
\text{BE}_y = \text{FC}_{BL,y} \times \text{EF}_{FC,y}
\]

Quantity of diesel consumption for displaced electricity generation

**Option 3.**

\[
\text{BE}_y = \text{MR}_y \times \text{EF}_{MR,y}
\]

Quantity of milled rice production
**Benefit**

- Standardized baseline can be applied for other type of small scale factories (e.g. garment, ice making, etc) as well as in other country having similar conditions

**Issues**

- How much accurate data is required?
  - Survey is based on hearing plant owners who are SME and don’t have their record.
  - How many sample is required to determine baseline / additional level