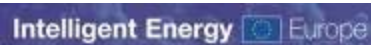




EIE-06-256 REEPRO



# Promotion of the Efficient Use of Renewable Energies in Developing Countries

**Show Case documentation**

**Show Case No.: 8  
Svay Rieng Province**

## **Authors**

name, organisation  
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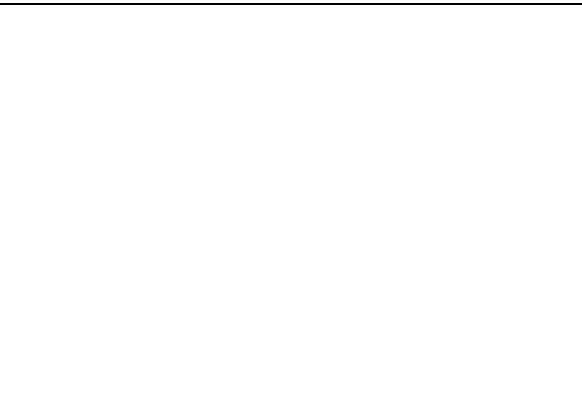
December 2009

## 1 Show case documentation

<b>Type of Equipment:</b> (tick off the type)	PV	Solar Thermal	Biomass to Energy	
			✓	
<b>Name:</b>	Farmer's biodigester plant			
<b>Location of the equipment:</b>	Sromor village, Svay Rompea commune, Svay Teab district, Svay Rieng province			
<b>Year of purchasing:</b>	2006			
<b>Operator:</b> (Name and address)	Pa Sarat Sromor village, Svay Rompea commune, Svay Teab district, Svay Rieng province			
<b>Planner:</b> (Name and address)	Ngoun Sam Ann, NBP construction company with the supervision of Pa Sophy, Svay Rieng province			
<b>Detailed description of the installation:</b> (technology, function, benefit for training, etc. max 150 words)	<p>It is 4m<sup>3</sup> NBP biodigester plant, which has detail as below:</p> <ul style="list-style-type: none"> <li>• Storage capacity of modified plant 50%, the original model only 30% per day. Farmer will have enough gas for cooking.</li> <li>• Hydraulic retention times is up to 40 days depend on climate in Cambodia,</li> <li>• Location and size of outlet are modified to simplified the flow out of digester by gas pressure and gravity,</li> <li>• Simplified the manhole for enter during maintenance,</li> <li>• Intern of dome (gas storage) will be spread with cement-acrylic emulsion,</li> <li>• Inlet is modified in order to reduce construction cost,</li> <li>• Dick of wall is modified according construction material offered at the market in Cambodia and</li> <li>• The outside wall plaster is thin necessary for reduce also the construction cost.</li> </ul>			
<b>Generated Energy service:</b> (tick off the energy type)	electricity	heat	gas	light
			✓	✓
<b>Power output of installation: (kWel, m<sup>3</sup> biogas, kW th, etc.)</b>	1.2 m <sup>3</sup> /day			
<b>Financing*</b> (tick off the financing type)	private investment	loan	donation	grant
	✓	✓		
<b>Investment costs in US\$*</b>	USD 400			

<b>Maintanance costs in US\$*</b>	0
<b>Savings US\$ per month</b>	<ul style="list-style-type: none"> <li>• Fuelwood: 6Kg/day costs USD 9/month</li> <li>• Charcoal: 2Kg/day costs USD 4.5/month</li> <li>• Kerosen: 0.7l/day costs USD 13.8/month</li> </ul>
<b>Energy sale income in US\$*</b>	No
<b>Comments</b>	<p>After the result of the training in July 2009, there were more biodigester plants constructed in the community area. The increase is counted up to Jan 2010.</p> <ul style="list-style-type: none"> <li>- Svay Teap district: 18 biodigester</li> <li>- Romeas Hek district: 85 biodigester</li> <li>- Chantrea district: 34 biodigester</li> </ul>

**Pictures**



## **2 Show case development and operation**

### **2.1 Project side survey**

During the project survey, it found that within Svay Rumpea commune, Svay Tiep district, Svay Rieng province, there are 15 biodigester plants dispersing in the area. One prominent farmer, who has the biodigester plant of 4m<sup>3</sup> was selected as a case study in Srma village, Svay Rumpea commune, Svay Tiep district, Svay Rieng province because the householder has mixed farming system and multiple cropping.

### **2.2 Show case definition workshop**

A show case within Svay Rumpea commune, Svay Tiep district, Svay Rieng province was selected because it should be an existing model for the others in order to promote more biodigester construction by showing many benefits given by biogas plant solving with the constrains the farmers are facing at the moment. As the mater of fact, it is due to:

- Firewood which is the only energy source in the area is becoming a scare resource; and
- Harmful environmental awareness about the chemical fertilizer and farm soil quality is becoming infertile

Most important points are:

- Because micro-financing channel is already existing in the area and it is under the coverage province of NBP, which is leading in the construction of biogas plant in Cambodia;
- Good management, responsibility and personal characteristics of the operators of the biogas plant;
- NBP masons are locally available for the construction; and last but not least,
- Accessible infrastructure to the case study site

These all points mentioned above are contributing REEPRO and NBP cooperate smoothly in case of providing training and practice by making use of the showcase promoting and extension of biogas application.

The case study was selected in the frame of REEPRO project in line with NBP cooperation. A workshop was given for the villagers, biogas owners, teachers and authorities on the background of REEPRO project in Cambodia and Lao and the training content focussing on Biogas Plant Technique, Slurry Extension. Since most of the villagers are farmers, so they are happy in having the biogas plants not only serving for energy supply but also for fertiliser, feeding animals, earth worms and fishes.

### **2.3 Showcase planning**

Below is the biogas plant component and construction:

- (1) Mixing tank
- (2) Inlet pipe
- (3) Digester tank
- (4) Gas storage /dome



**MEMORANDUM of UNDERSTANDING**  
**Cooperation in Biodigester Dissemination**

Between

National Biodigester Programme Cambodia (hereinafter "NBP"),  
Legally represented by **Mrs. Lam Saoleng**, Programme Coordinator, being the first party.

and

Cambodian Education and Waste Management Organization (hereinafter "COMPED" as  
REEPRO local project manager in Cambodia),  
Legally represented by **Mr. Chau Kim Heng**, Director, being the Second party

**WHEREAS**

Both parties are dedicated to a sustainable rural development including access of the rural people to permanent and clean energy sources provided on a commercial, market oriented basis as well as the promotion of organic fertiliser use;

**AND**

The COMPED is a non-governmental organization established in 2000 and officially registered at the Ministry of Interior in April 2003. Its purposes and goals are:

1. To cooperate with the authorities in dealing with the waste crisis in Phnom Penh, saving the environment and exchanging experiences with farmers, and promoting the quality of agricultural soil by using compost.
  2. To cooperate with the royal government of Cambodia in developing the educational field by providing more educational opportunities for children and adults and by building more schools.
  3. To cooperate with the German association called "Thüringisch Kambodschanische Gesellschaft" (TKG) in seeking for sponsorships for some disadvantaged children by finding them German Godparents, building schools, and operating the composting plant.
- and

Since 2007 COMPED is implementing three years project called Promotion of the Efficient Use of Renewable Energies in Developing Countries –REEPRO.

The project is motivated by the fact that poor household in developing countries often lack access to basic energy services. The proposed of the project shall lead to the provision of energy services to those currently un-served and underserved by higher quality energy services on the basic of an introduction of renewable energies and energy efficiency.

**AND**

The NBP which is the National Programme of the Ministry of Agriculture, Forestry and Fisheries was established since 2005. The programme's overall objective is the dissemination of domestic biodigesters as an indigenous, sustainable energy source through the development of a commercial, market oriented, biodigester sector in selected provinces of Cambodia. Over the period 2006 till December 2012, 22 000 biodigesters are to be constructed under NBP. The programme supports biodigesters farmers financially by the provision of a US\$ 150 subsidy per plant, provides training in effective plant operation and on bio slurry (fertiliser) use.

**THEREFORE**

COMPED and the NBP shall cooperate in doing promotion of bio-digesters and the extension on bio-fertiliser use and commit themselves to the following:

1. COMPED accommodates approximately 0.5 hectare of land with a very nice training center in Cheung EK. In the training center compound there are an operating biodigester, a cross-cut sample of biodigester and fruit trees as well as some crops..
2. COMPED will use a part of the available land for developing a demonstration farm (Home garden) for students, trainees and other visitors who are interested in biogas technology or farming system or do more research on bio-slurry and compost use at least until the end of 2010.
3. COMPED will cooperate with the Slurry and Extension officer of NBP to design home garden demonstration and other necessary integrated farming at the training center.
4. NBP will support COMPED with resource person for necessary training, promotion and extension materials, and other publications available.
5. NBP will provide technical support and necessary input (seeds and necessary materials) for developing this home garden around 300 USD per year while COMPED will fill the land and make drainage system and provide sufficient staff to manage demonstration farming. All products from this demonstration farm will be managed by COMPED. The detailed demonstration activities will be annexed.
6. COMPED will provide financial support (catering, accommodations, and training facilities) to NBP to organize two training courses for PBPO technicians (Mason or supervisors) while travel cost and logistic as well as resource persons will be the burden of NBP.
7. COMPED will provide additional financial support for NBP trainees (travelling, food, admin, and accommodation) to organize five propagation campaigns for local communities or user training courses in some provinces of NBP targeted provinces. The detailed trainings will be annexed.
8. The validity of this Memorandum of Understanding will be until the end of the 2010.
9. Any disputes relating to this MoU will be settled in mutual consideration.

Signed in three copies (1 copy for COMPED, 1 copy for NBP and 1 copy to REEPRO).

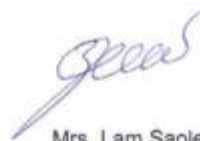
Phnom Penh, date: 17 June 2009

For COMPED



Mr. Chau Kim Heng  
Director

For NBP



Mrs. Lam Saoleng  
Programme Coordinator



## 2.5 Show case implementation

Thanks to the NBP programme that now there are more than 5,000 biodigester plants in Cambodia. There were one for level 2 (technician level) and three training courses for level 3 (community level) in which one training is in the case study area.

The material was wholly supervised by NBP and installed by NBP construction company trained by NBP.

The show case was to promote and disseminate about the function and benefit of biogas plant in the province economically, environmentally and socially.



## 2.6 Show case operation

The biodigester plant provide many benefits for the farmer such as

- Energy for cooking three times per day
- Lighting for children to study at night time for about 4 hours per day
- Slurry for his whole farming system such as cropping, fishery and earth worm raising for ducks
- The area around the house is clean from cow dung
- The farmer can have more time for earning from other business

## **2.7 Show case supervision**

As the result of Level 2 training in Svay Ring on September 29<sup>th</sup>, 30<sup>th</sup>, 2009, the mason companies were trained to provide more knowledge on construction technique, rule and review progress and problem and QC and CR and discussion; highlighted the critical point on the construction manual, principle of biogas plant construction.