



EIE-06-256 REEPRO

Intelligent Energy  Europe

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

**Level 2 Course 5**

**Photovoltaic and Entrepreneur Training**

**15-16<sup>th</sup> May 2009**

**Khammuan Province, Laos**

**Community Development and Environment Association**

16 May 2009



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## List of Acronymes

SHS	Solar Home System
CDEA	Community Development and Environment Association
NUOL	National University of Laos
IEF	Individual Electricity Provider

Etc.



## 1 Summary Sheet

<b>Training:</b>	Training level 2 course 3
<b>Task number</b>	04.02.03
<b>Date, Location, Time:</b>	May 15 to 16, 2009, 8:00 - 16.30 Forestry Control Office, Parnam village, Mahaxai district, Khammuan province, Laos
<b>Theme:</b>	Training course focused on: Solar Photovoltaice, Entrepreneur and Biomass
<b>Target group:</b>	<input type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3
<b>Performance:</b>	16 hours speech (3 speakers), with the content of information session, discussion and practical session.
<b>Participants:</b>	15 participants, see attached list of participants
<b>Short Description:</b>	<p>The content of training: this training was the training for technician and its purpose to rising awareness on RE technical. There were 15 village electricians from 6 different villages surrounding Mahaxai district. These villages nearby them soon would install solar home system. The REEPRO project therefore selected Mahaxai as a pilot project, organized training for technician and stakeholders.</p> <p>Dr. Khamphon, trainer, had introduced about the reepro project purpose, partners to participants from 6 different villages. When participants introduced themselves, Dr. Khamphone had introduced session of training, consisting of three different parts theory, discussion and practise. Then introduction about energy sources, energy production such as wind, coal, water and sun. Moreover, this training had mainly focused on PV, working system, benefits, operation and maintenance.</p> <p>The last part of the training had also introduced about entrepreneur, operating business and management business that Mr. Bouangern introduced general concept and its considered factors. To ensuring their understanding about information taught, Mr. Bouagern had quiz for participants.</p>
<b>Download:</b>	The presentations can be downloaded under <a href="http://www.solpool.info">www.solpool.info</a>

Khammuan Province, 15-16 May 2009



## 2 Workshop Preparation

Due to this training was mainly under responsibility of Community Development and Environment Association (CDEA), two persons were assigned Mr. Bouangern and Mr. Bounphone to jointly conduct with Dr. Khamphone. Beside that CDEA had also cooperated with Individual Electricity Provider (IEP), Mr. Khamphat, who had experienced working in that area as a contract person. CDEA had prepared schedule and the number of participants, Mr. Khamphat then invited and organized the venue.

## 3 Workshop Performance

Day: 1 15 May 2009

- Dr. Khamphone, trainer, had introduced about reepro project, project partners and the purpose of this training to the participants who were from 6 different villages,
- Then, he raised questions with what are different amongst energy sources and energy production, the participants could give answers such wind, water as sources and electricity was energy production,
- Base on the renewable promotion, he had focused explanation on PV and solar home system. Comparing and demonstrating simply use, rain and sun light, roof and panels, electric wire and water pipes,
- Importantly addressed, he explained how the solar system work, its benefit given and operating system. Moreover, he also introduced about the general information about two different connections; series and parallel connections.
- An end of day, he reviewed lesson through opened discussion and had a quiz for participants

Day: 2 16 May 2009

- Before starting new session, Dr. Khamphone had reviewed the first day lesson and then gave a case for participants to resolve it. Basically, the question was about what were different energy given between series and parallel connections.
- Organized group work to do exercise, on calculation of amount energy consumption, light, battery and wire length,
- Then, he had also asked participants to practise on two different connect, using mini model

- The last session, Mr. Bouangern, trainer, had introduced the training about new topic. The entrepreneur and business management was the additional session, its aim to raise awareness and interest of participants to operate their own business. Therefore, he explained to what factors to make business succeeded, what people should consider when doing business basically.
- Then, he demonstrated on how to do analysis “SWOT” comparing internal and external factor influenced and how to reduce the risk.

### **3.1 Presentation**

Presentation basically used power presentation and clip chart. Trainers used combined theories and reality to create visual and sharing their experiences. Generally, presentation was almost illusion an example and then resolution. Due to the small number of participants, 15 persons, they had more chance to ask and share their understanding to the trainers.

### **3.2 Discussion**

During the training was conducting, the participants could raise the questions that they were interested. General discussion about PV, maintenance the system was most difficult, due to their experience the battery and lamp were most costly for this system. The battery could not keep or store energy and the lamp also was off easily. Therefore, trainers advised users as well as participants should use approximately 4 a day. Otherwise, user should not expand connection, due to limited energy given by the system.

On the other hand, the participants were also understanding about operating business. It did not always need to huge capital; however, they could start from small capital. As the definition of doing business was an exchanging good and service, adding some profits.

### **3.3 Conclusion**

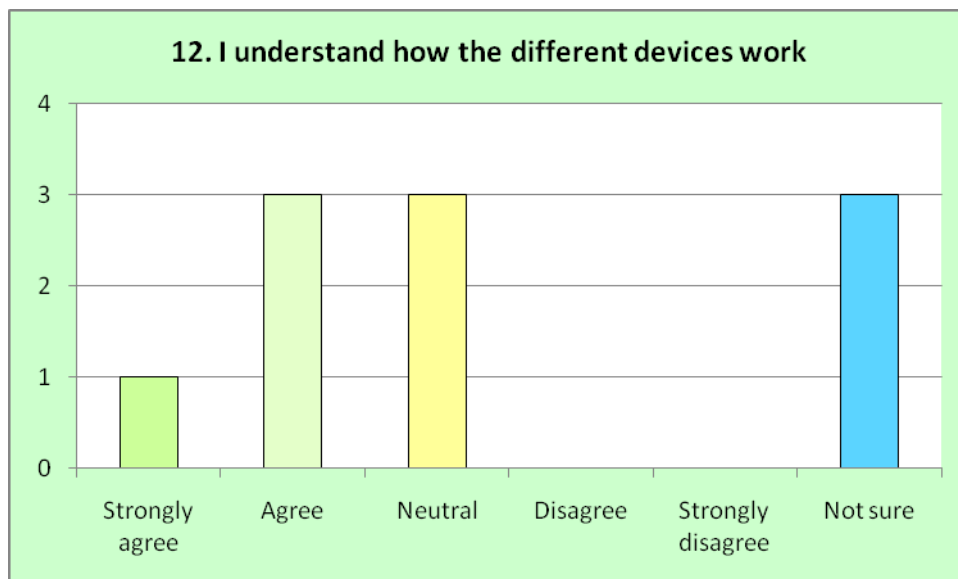
Generally, this training was quite accomplished, due to renewable energy was new for Lao, especially for people in rural areas. However, the participants could understand basic concepts of renewable energies, on PV, solar home system and business. On the other hand, the time constraint, we assumed that participants would learn and able to apply their knowledge and skill to SHS users. Herewith some figures resulting evaluation.

## Questionnaire evaluation

**Figure 1** this training meets my expectation

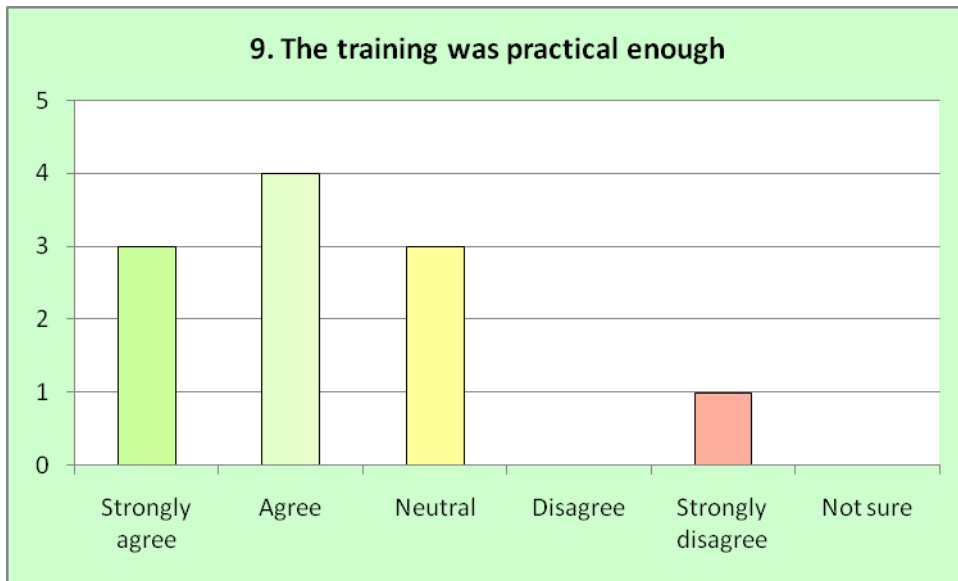


**Figure 2** I understand how different devices work

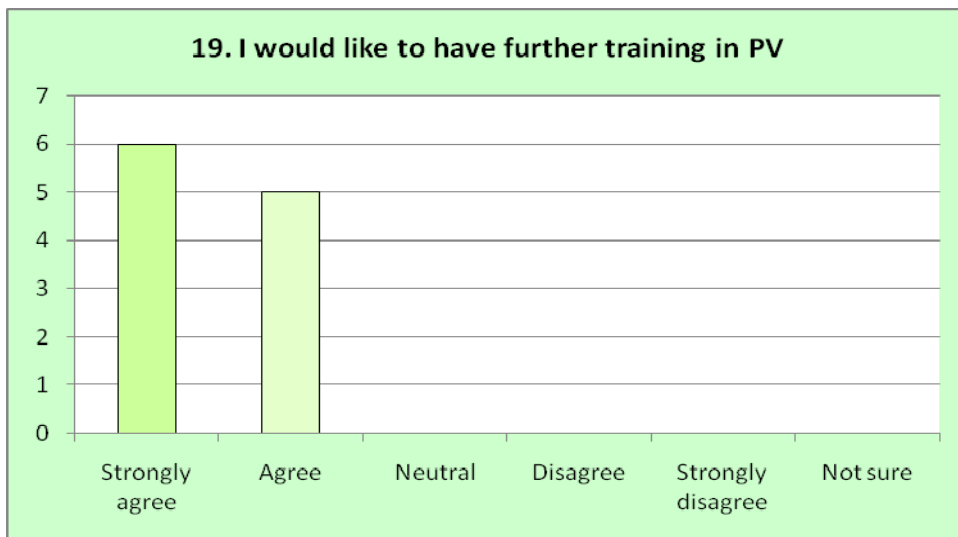


Due to the training was short and they were many theories rather than practise. They could not assume that they would fully understand. On the other hand, they so far had not installed solar home system yet, and only participated trainings. They therefore required more training and focused on PV and installation.

**Figure 3 The training was practical enough**



**Figure 4 I would like to have further training in PV**




(Further sources find attached or link) [Questionair of trianing in Khammouan Province.xls](#)

## Workshop Documentation

### 3.4 Invitation

Due to CDEA had contract person, Mr. Khamphat, who had worked in Khammuan to provide off-grid electricity for many years and had listing of village electrician that they had technical experiences and were interested to participate in this training. Therefore, we assigned him to contract and organized participants, through supporting from CDEA.

### 3.5 Programme



EIE-06-256 REEPRO  
Intelligent Energy Europe

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

**REEPRO training level 2 on  
SOLAR and Entrepreneur  
Laos-May 15-16 May 2009  
Tentative Schedule**

**Location:  
Parnam Village, Mahaxai district, Khammuan province**

16 May 2009

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Schedule for Training Level 2 in Khammuan Province On15-16 May 2009

Day 1	Description	In charge person
8:30-8:45	Welcome of participants	Dr. Khamphone
8:45-9:00	Introduction of REEPRO project	Dr. Khamphone
9:00-10:30	Introduction to PV	Dr. Khamphone
10:30-10:45	Coffee Break	
10:45-12:00	Continuing on PV	Dr. Khamphone
12:00-13:30	Lunch	
13:45-15:00	Continuing on PV	Dr. Khamphone
15:00-15:15	Coffee break	
15:15-14:30	Repeating all lesson and quiz for T-shirts and hats	Dr. Khamphone

Day 2	Description	In charge person
8:30-8:45	Review the lesson	Dr. Khamphone
8:45-9:00	Group exercise (calculation energy consumption)	Dr. Khamphone
9:00-10:30	Demonstration of connection	Mr. Bouangern, Dr. Khamphone
10:30-10:45	Coffee Break	
10:45-12:00	Introduction Entrepreneur	Mr. Bouangern
12:00-13:30	Lunch	
13:45-15:00	Cont. Entrepreneur	Mr. Bouangern
15:00-15:15	Coffee break	
15:15-14:30	Brief introduction about Rocket stove	Mr. Bouangern

## Registration Form

ລ/ດ	ຊື່ ແລະ າມສະກຸ	ຕຳແໜ່ງ	ບ່ອນປະຈຳກາ	5/15/2009	5/16/2009
No	Name and Surname	Position	organization	Signature	Signature
1					
2					
3					
4					
5					
6					
7					
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REEPRO

## ປັດໃຈທີ່ມີປະສິດທິພົນ ຕໍ່ຜູ້ປະກອບການຂະໜາດນ້ອຍ

REEPRO

## ປັດໃຈທີ່ມີປະສິດທິພົນຕໍ່ຜູ້ປະກອບການຂະໜາດນ້ອຍ

ຕາມການສຶກສາຄົ້ນຄ້ວາ ເລື່ອງປັດໃຈທີ່ ສົ່ງຜົນໃຫ້ ການດໍາເນີນທຸລະກິດນັ້ນໄປໄດ້ຄື, ພົບຄວາມຮູ້ອາກາ, ຫຼື ປະສົບ ຜົນສໍາເລັດ ແລະ ລົ້ມເຫຼວ ແມ່ນອັນອາກາດປັດໃຈ ເລື່ອງນີ້:

1. ປັດໃຈພາຍນອກ
2. ປັດໃຈພາຍໃນ

REEPRO

## 1 ປັດໃຈພາຍໃນ

ແມ່ນສະພາບ ແລະ ສິ່ງແວດລ້ອມທີ່ ສົ່ງຜົນພົວພັນໂດຍກົງໃສ່ການດໍາເນີນການຂອງບໍລິສັດ.

REEPRO

## 1 ປັດໃຈພາຍໃນ

### ການບໍລິຫານ

1. ການກຳນົດເປົ້າໝາຍ
2. ແຜນໂລຍະສັ້ນ-ອາວ
3. ການກຳນົດໜ້າທີ່
4. ວາລະປະຊຸມ
5. ການສຳຫຼວດກວດກາ

REEPRO

## 1 ປັດໃຈພາຍໃນ

### ການເງິນ:

1. ໃບດຸນດ່ຽງ
2. ສະຫຼຸບກຳໄລ ແລະ ຂາດຫຼືຫຼື
3. ສະແດງສະພາບໄຫຼວຽນກະແສເງິນສົດ
4. ວິເຄາະຈຸດກຸ່ມຫຼື

REEPRO

## 1 ປັດໃຈພາຍໃນ

### ການຕະຫຼາດ

1. ຮູ້ຄວາມຕ້ອງການຂອງລູກຄ້າ
2. ການວິເຄາະແນວໂນມໃນໄລຍະ 3 ປີຜ່ານມາ
3. ການວິເຄາະສະພາບແວດລ້ອມ
4. ການຂາຍ
5. ການຕະຫຼາດແບບຫຼາກຫຼາຍ

## List of Participants

List of Participants on level 2 in Khammuan province

No	Title	First Name	Last Name
1	Mr.	Khonsamai	
2	Mr.	Khamphat	
3	Mr.	Bounkhamsan	
4	Mr.	Sone	
5	Mr.	Vieng	
6	Mr.	Phouvan	Daosangvan
7	Mr.	Viengsamai	Thongsai
8	Mr.	Oudon	
9	Mr.	Khongma	
10	Mrs.	Houmpa	
11	Mr.	Thanongsak	
12	Mr.	Sieng	
13	Mr.	Mok	
14	Mr.	Kaikeo	
15	Mr.	Tisa	
16			
17			
18			
19			
20			
21			
22			

**Signed list**

ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມການຝຶກອົບຮົມກຸ່ມກັບແຫ່ງພະລັງງານທົດແທນລະດັບ 2 (ສຳລັບວິຊາການ) ທີ່ແຂວງຄຳມ່ວນ

List of participants of renewable energy sources training programmes level 2 in Khammouan Province

ລ/ດ	ຊື່ ຜສຍ ນາມສະກຸນ	ຕຳແໜ່ງ	ບອນປະຈຳການ	15/5/2009	16/5/2009
No	Name and Surname	Position	organization	Signature	Signature
1	ທ. ຊິງບຸນສິມ	ຫາສອນ	ແຂວງຄຳມ່ວນ		
2	ທ. ຊິງສາວິນ	ບຸກຄົນໄລ່/ໂຮງ	ທ່າສາວິນ		
3	ທ. ບຸນສິມ	ຊື່ວຽກ	ທ່າສາວິນ		
4	ທ. ສິມສອນ	ນາຍແມ່ນີ	ຫວຽດ ບຸນວຽດ		
5	ທ. ສິມສິມ	ຮອງແມ່ນີ	ຫວຽດ ບຸນວຽດ		
6	ທ. ສິມສິມ	ແມ່ນີ	ຫວຽດ ບຸນວຽດ		
7	ທ. ສິມສິມ	ຮອງແມ່ນີ	ຫວຽດ ບຸນວຽດ		
8	ທ. ສິມສິມ	ແມ່ນີ	ຫວຽດ ບຸນວຽດ		
9	ທ. ສິມສິມ	ຮອງແມ່ນີ	ຫວຽດ ບຸນວຽດ		
10	ທ. ສິມສິມ	ແມ່ນີ	ຫວຽດ ບຸນວຽດ		
11	ທ. ສິມສິມ	ຮອງແມ່ນີ	ຫວຽດ ບຸນວຽດ		
12	ທ. ສິມສິມ	ແມ່ນີ	ຫວຽດ ບຸນວຽດ		
13	ທ. ສິມສິມ	ຮອງແມ່ນີ	ຫວຽດ ບຸນວຽດ		
14	ທ. ສິມສິມ	ແມ່ນີ	ຫວຽດ ບຸນວຽດ		
15	ທ. ສິມສິມ	ຮອງແມ່ນີ	ຫວຽດ ບຸນວຽດ		
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ທີ່/Place Mahaxay District ວັນທີ/Date 16 / 05 / 2009

ຢັ້ງຢືນ/ Certified by:

ຮຽນ/Trainer:

### 3.7 List with complete contact data

List of contract on level 2 in Khammuan province

No	Title	First Name	Last Name	From Organization	Contract number
1	Mr.	Khonsamai		Tengtong vilage	
2	Mr.	Khamphat		Thakek	020 5924778
3	Mr.	Bounkhamsan		Parnam village	
4	Mr.	Sone		Khuanluang village	
5	Mr.	Vieng		Khuanluang village	
6	Mr.	Phouvan	Daosangvan	Phoxai village	
7	Mr.	Viengsamai	Thongsai	Phoxai village	
8	Mr.	Oudon		Dongmarkfeng vilage	
9	Mr.	Khongma		Dongmarkfeng vilage	
10	Mrs.	Houmpa		Champhet village	
11	Mr.	Thanongsak		Champhet village	
12	Mr.	Sieng		Manh village	
13	Mr.	Mok		Manh village	
14	Mr.	Kaikeo		Parnam village	
15	Mr.	Tisa		Parnam village	
16					
17					

### 3.8 Photos



Trainer were presenting about renewable energy, specifically on PV and SHS



Explanation and presentation had used both clip chart and power point presentation



Trainer was demonstrating two different connections (series and parallel)



There were 15 participants attending the training, they were village electricians