



EIE-06-256 REEPRO

Intelligent Energy  Europe

Promotion of the Efficient Use of Renewable Energies in Developing Countries

Show Case documentation

Show Case No.: 3

Houn District, Oudomxay

Authors

Khampha Keomanichanh, CDEA

February 2010

1 Show case documentation

Type of Equipment: (tick off the type)	PV	Solar Thermal	Biomass to Energy		
	✓				✓
Name:	Installation of Photo Voltage (PV) System Unit for Khongmuang Health Post, Phousea zone, Houn District – Oudomxay Province				
Location of the equipment:	Various Villages, Houn District, Oudomxay (or Oudomxai) is coordinate with approximately 20° 42' 0" N, 101° 59' 0" E				
GPS position (for Google Earth): ພາກພື້ນ	South Asian geographic coordinates of 18°00'N latitude and 105°00'E longitude				
Year of purchasing:	2009				
Operator: (Name and address)	Villagers in the Houn district				
Planner: (Name and address)	CDEA office, Bane phoxay, Group number 11, House number 171 P.O.Box: 3413 Vientiane Capital. Tel / Fax: (865) 21 415105; Mobile (856) 20 2222187				
Detailed description of the installation: (technology, function, benefit for training, etc. max 150 words)	<p>CDEA provided training for households in Houn District to promote renewable energy activities. Specifically, two technologies were promoted in the training sessions which were the maintenance of PV equipment and the local production of rocket stoves. 275 Solar home systems were installed previously by various other NGOs. However, it was found that equipment was not maintained properly to make full use of the available solar potential. CDEA explained how a solar PV panel works, how much energy could be produced in a given day and the proper maintenance practices to achieve this including the upkeep of system, batteries and solar panels. Further, CDEA explained the benefits of using a rocket stove and the types of fuel that can be used in it.</p> <p>Furthermore, the REEPRO team supported the Phousea zone, one of the 10 villages in the Houn district, to development an electrification concept for their post health centre. It was planed to equip the centre with a 100 Wp Solar home system for lighting and a 150 SHS for the operation of a solar fridge for vaccine cooling. A detailed design was prepared but the installation is not yet implemented.</p>				
Generated Energy service: (tick off the energy type)	Electricity	Heat	Gas	Light	Training
	✓				✓
Power output of installation: (kWel, m³ biogas, kW th, etc.)	Encouraged PV installations: 8110 Wp, 84 x 50Wp, 9 x 30Wp and 182 x 20 Wp Power Output of those systems: Before the trainings: about 8.000 kWh After the training: about 10.500 kWh				

	Increase: about 2.500 kWh			
Financing* (tick off the financing type)	private investment	Loan	donation	grant
			✓	
Investment costs in US\$*	N/A			
Maintenance costs in US\$*	N/A			
Savings US\$ per month	Exact value not calculated. Saving from fire wood: 10m ³ /year /family x 12\$/m ³ = 120\$/year or 10\$/month /family or 80\$/8h/h Saving from time instead of collection fire wood in a year: 50 days collection fire wood in a year x 4\$ as labor cost/day = 200\$/year or 16.67\$/month/family.			
Energy sale income	N/A			
Comments	CDEA's involvement was for the sole purpose of training. No hardware was installed. But the performance of the existing systems could be increased by training the villagers in operation and maintenance.			
Natural Resources available:	Available resources: animal dung from cattle, water buffaloes, and pig, corn husk.			
Current electricity access:	100% no electricity access, almost 98% they use diesel lamp and other 2% use small engine which there are 9 engines for 9 households generated electricity only at night.			
Current fuel consumption (kind and prices of fuels):	Solar home systems, Diesel lamp (lamp tern) for lighting, fuel consumption is 2L/household/month, and for 30L/month engine generated electricity. Normally, charging battery spend 5,000LAK/time, with 2 time/month. Diesel cost: 15.000LAK/l (1.2EUR/l) Gasoline: 12.000LAK/l (1 EUR/l)			
Current economic basis of the village:	They almost 100% are agriculturists, mainly mixed farming such as crop planting and animal raising based on traditional methods			
Heights of income in the village (estimate):	Height income averaged 1.000.000LAK/month (82.6EUR) a household and lowest about 120.000 LAK/month (10EUR). With these income are from selling corn, animals raised			
Future plans for economic development:	Regarding to government's goal to stop slash burning and turn to stable farming, they so occupies on crops planting			
Level of community support to such a project (political, financial, labour):	Village committees will contribute as a labor and some financial to the project and there will be available in school for any training or meeting			
Amount of power needed (in Watt):	These only estimates roughly of electricity use monthly, the highest electricity need is 1,500 watt/month or 1,5kWh (one light bulb) spent 2 hours lighting only, not plus CDs and TV.			
Time frame in which power is to be provided (daily, project timeline):	Depending on daily spent 2 hours for lighting which start at 6:30PM to 9.00 PM – only dinner time.			

Pictures



Phouse village in Houn district



Access village can go by car or motorbike



Mountainous land use for crop plantation



Rice mill engine use for sawing, lighting and entertaining



“Takein” most use at night



Wood collect for cooking



SHS in Phousea



Post Health centre and present vaccine storage

2 Show case development and operation

2.1 Project side survey

Based on the REEPRO's plan several pilot an project communities have to been identified with in Laos and Cambodia. In the selection of the communities, possible villages were listed which do not have access to electricity but do have high potential in the development of renewable energy in near future. To meet the criteria of the project, CDEA was responsible to visit and study the potential communities to work with as pilot projects in Oudomxay and Khammuan provinces.

Initially, in Khammuan province, only 2 villages in Mahaxay district were visited. However, it had been decided that the project sites would be selected in Oudomxay province and not in Khammuan province. Therefore in Oudomxay province, the survey was carried out in two districts, Xay and Houn districts of which a total of 12 villages had been visited. The reason being that Oudomxay is rated as one of the poorest provinces and the villages visited do not have access to electricity but do have the potential for renewable energy development including community development as a whole. On the other hand, the Oudomxay authorities had advised CDEA to visit villages in La District and give priority to it than Xay district.

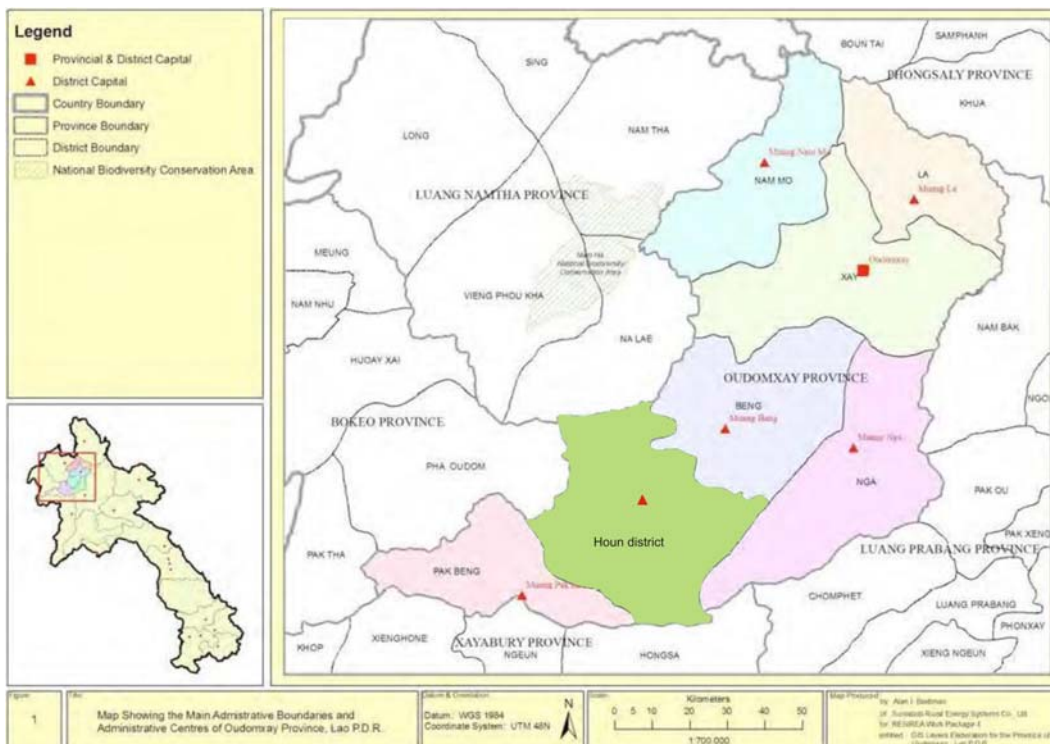


Figure 1: Map of the Oudomxay province (Source: /www.oudomxay.info)

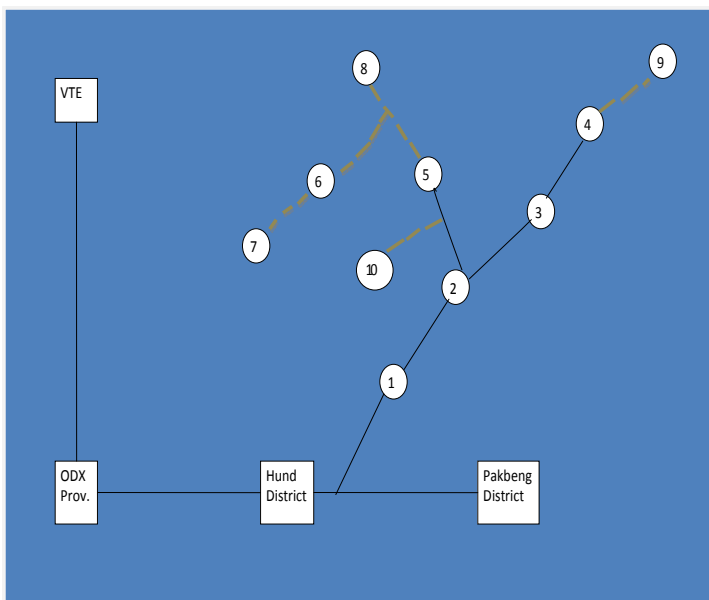
Oudomxay is located in Northern Laos with 200 42' N and 101059" East. Oudomxay province is one of the poorest in Laos. It comprises of 7 districts, which includes La, Xai, Parkbeng, Houn, Nam, Nga and Beng districts. There are 505 villages (including 333 villages which are considered being poor) and 42,740 households (statistic of Oudomxay Province). The total population is 274,667 persons including 136,445 female. The main occupation of the population is mostly agriculture which is 100% based on traditional methods of farming.

Oudomxay Province has got a moderate monsoon climate. Due to high altitudes there are more variations in temperature during the year. The yearly amount of rain is about 1,900mm–2,600mm. Temperatures in February and March average between 18 and 19 °C, from April to May temperatures climb over 31 °C. During the cold month from the temperature in the night goes down to about 10°C, which is really cold in the simple huts without any heating system, besides open fire.

The total number of poor households is 152.227. The Government has plans to extend electricity lines along the main roads to districts. There are many villages in remote areas that do not have access to electricity. The main source of energy is firewood especially for daily cooking in the household with the quantity of firewood used per year about 3 to 10 m³. For lighting and rice milling they use diesel which is 10 to 20 litres per month. The cost of diesel was nearly 1,5 US\$ per litre in 2009. However, there are only some villages and households that have access to solar energy and Pico hydro power. Corn is the second crop after rice with the total area of its production equalling to 25000 ha (Ministry of Agriculture) and is the biggest after Sayaboury Province.

Houn District is one of the 7 Districts in the province mentioned above and is located at about 95 km from Oudomxay capital on the way to Pakbeng District. It consists of 14 zones and comprises of 10.515 households of which 3.413 households are in poor condition. The total population is 65.579 persons of which 33.003 are females (statistic of Oudomxay Province).

The selected area in Houn District is the Phousea sub district which includes 10 villages namely Phoutum, Khonmuag, Tanglod, Tanglunh, Tangya, Phousea, Longkhou, Nampark, Phoukhoy villages. This area has no electricity accessed yet and it is a developing area for Lao government.



- Villages:
1. Phoutum
 2. Kongmuang
 3. Phoulod
 4. Tanglunh
 5. Tangya
 6. Phouse
 7. Longkhou
 8. Nampark
 9. Phoukhoy
 10. Ban Dou

Figure 2: The 10 villages of the Houn district


For the collection of firewood, women and children in the Houn district have to walk long distances and thus spent about 55 days per year only for wood collection. The traditional style of cooking uses a lot of firewood, one family in the Xay district uses about uses 10m³

wood/year /family. 1 m³ of firewood costs about 12 USD, thus the families spent about 120\$/year or 10\$/month.

For lighting: Almost all household in Houn district use homemade lamps using diesel as source energy about 3 -5 liters per month, except Bane Kongmung all household use home solar system. In addition some household in the area have engine for rice milling and watching television about two hours per day; in this case they use approximately 20 liters/month (1 liter of diesel cost 1.5 USD).

The Phousea sub-district is one of the 15 sub-districts of Houn District, it has been selected as **REEPRO pilot area** by Community Development and Environment Association, it is consisting of 10 villages not far from each other in which already a community development project, the Oudomxay Community Initiatives Support Project (OCISP) exists. The Pilot community will be based in Bane Kongmuang village, one of the 10 villages in the Phousea zone, located about 29 km from Houn District.

Table 1: Administrative structure of the Houn district

Houn District	15 zones/sub districts:	1. Phouvieng (health post)	7 to 10 Villages		
		2. Phousea (health post)*			1. Phoutum village has PV system 2. Kongmuang village* has PV system 3. Longkhou village 4. Tang-Ya village has PV system 5. Namphak village has PV system 6. Phoukhoy village 7. Dou village 8. Phoulod village 9. Tangloan village has PV system 10 Phousea village has PV system
					
		3. Phadam (health post)			
		4. Namphoune (health post)			
		5. Namphouan (health post)			
		6. Naxiengdee (health post)			
		7. Phonxay (health post)			
		8. Navang (health post)			
		9. Sibouneheung (health post)			
		10. Dong Ngone			
		11. Namtam			
		12. Chanhtay			
		13. Donedam			
		14. Municipality-1			
15. Municipality-2					

*REEPRO pilot community

The main income of the villager in the Houn district is maize selling and the main energy sources are fire wood, diesel lamps and diesel motors to operate rice mills. Furthermore, Solar energy is available in Houn District in several households. Anyway, the REEPRO team found that most of the households were not maintaining the equipment properly, and thus not using the available solar energy to its full potential. In this regard, the idea of renewable energies was not completely new to local villagers. However, it was decided that training would help expand and improve the use of renewable energies in these areas.

Table 2: Installed SHS in the Phousea zone

Name of village	Total PV/village	SHS System size		
		50 W	30 W	20 W
Ban Phoutoum	34	16	0	18
Ban Kongmeuang	38	12	9	17
Ban Tangya	51	24	0	27
Ban Tangloan	37	15	0	22
Ban Nampak	51	4	0	47
Ban Phouxae	64	13	0	51
Total Installation	275	84	9	182
Total Electrical power	8110	4200	270	3640

Detailed information on the side survey performed in July 2008 and the discussion of the results of the survey within the Lao REEPRO team are presented in reports attached as

Appendix 1.

2.2 Show case definition workshop

In the frame of the Lao REEPRO team meeting on 12th September 2008 it was agreed to select the Houn district as REEPRO show case and to focus the work their on the encouraging of the existing Solar Home Systems and the promotion of the use of Rocket stoves, simple efficient wood gasification stoves. Subsequently 8 level 3 trainings on solar energy and biomass energy were performed in March 2009 in the different villages of the Houn district. See the report of this meeting in Appendix 2

2.3 Showcase planning

2.3.1 Trainings

The main goal for the training was to educate villagers on more efficient ways of generating energy. The problem with existing solar home systems was the lack of proper maintenance for individual households. CDEA believes that the focus should be placed on individual households for their own system rather than rely on the village technician to service all solar home systems. It is also hoped that villagers will use other renewable energy technologies beginning with the construction and dissemination of rocket stoves.

The REEPRO trainings in the Houn district tool place from March 15 – 22, 2009. CDEA travelled to 8 villages in total and provided training in each of the villages. The exact number of households with existing solar home systems is unknown. A total of 295 participants attended the 8 training sessions, where each was conducted in a separate village.

CDEA provided training in cooperation with the Faculty of Engineering at the National University of Laos. Training included a brief introduction to various renewable energies such as biomass-to-energy and wind power. More in-depth education was provided for the use of PV solar energy and the construction of rocket stoves. The importance of maintaining solar PV systems was the focus of this particular training which included choosing an appropriate location to store the battery, operating the system, and regularly cleaning the solar panels. Further training was given for the construction and operation of rocket stoves to provide a safe and effective means of creating a fire. Trainers showed participants where to obtain raw materials – bricks and a mixture of components – which was naturally abundant in the area. Further knowledge was provided about how to construct moulds and which fuels could be used. CDEA found that this area was ideally suited for the use of rocket stoves since costs to construct are low, and construction materials are abundant.

2.3.2 Electrification of the Post Health center

In the frame of the trainings and the different side visits and individual consultings, the stakeholders in the Houn district discussed the problems they have with the operation of their post health centres, meeting halls and schools.

In the Houn district, the main health centre supports 9 health posts in the 9 of the 15 Houn sub-disticts of which each zone respectively responds to about 7 to 10 villages, see Table 1. The 9 zones are Phouvieng, Phousea , Phadam, Namphoune , Namphouan , Naxiengdee,

Phonxay, Navang and Sibouneheung. Each zone operates a health post, which is a community building which houses a small health care centre and a post office. The post health centre in the Pousea zone is located in the Khonmuan village. The distance from the main Houn Health centre to Khongmuang is about 32 km. The health post and primary school in Khongmuang provide service to the 9 villages of the Phousea zone nearby, see Table 1. The total population in these 10 villages is about 3,250 people.

The REEPRO team developed a concept note on the electrification of the health post, meeting hall and primary school in the Khongmuang village, Phousea zone in order to look for financial sources as e.g. potential donors. The REEPRO team developed a general English concept note and a German concept note addressed to the Swiss Schmitz-Hille Foundation. Based on the concept notes, which are attached in Appendix 3, the REEPRO team decided to focus its efforts on seeking support for the electrification of the Phousea post health centre in Khongmuang. It was planned to equip the centre with a 100 Wp Solar home system for lighting and a 150 SHS for the operation of a solar fridge for vaccine cooling. The Lao company Sunlabob was requested to provide a quotation, which is also attached in Appendix 3. The REEPRO team discussed the quotation with Sunlabob, see the comments in the quotation in Appendix 3. The installation was not contracted to Sunlabob in the frame of the REEPRO project as the team could not identify financial sources for the installation. Thus, also the quotation was not discussed further. The Schmitz-Hille Foundation which at the beginning was very interested to support the project had to take back its commitment as they suffered substantial financial losses due to the financial crises.

2.4 MOU on showcase project

CDEA and the **KHONGMUANG VILLAGE** signed two MOUs, which are attached as Appendix 4. One is focussing on the electrification of the post health centre, school and meeting room and one on the general cooperation of both parties within REEPRO.

2.5 Show case implementation

No hardware installations were made.

2.6 Show case operation

Villagers were very receptive to the training, which included developing a schedule for cleaning solar panels and properly operating the solar system. CDEA is confident that participants of the training are now better prepared to maintain their solar home systems. Instructions were also given to participants to spread knowledge within their local communities as well as surrounding villages since the exact number of households with solar home systems was not determined in Houn District and CDEA was unable to reach every household with solar technology.

Encouraged PV installations:

The 275 SHSs installed in the Phousea zone have an electrical power of 8110 Wp. There are 84 x 50Wp, 9 x 30Wp and 182 x 20 Wp SHS installed. The performance of the SHSs before the REEPRO trainings was influenced by improper maintenance and often wrong

installations, thus about 25% less electricity was generated by the systems. Due to the REEPRO trainings, the SHSs in the Phousea zone now are operated better and the systems produce about 100% of the expected electricity.

Power Output of those systems:

Before the trainings: about 8.000 kWh

After the training: about 10.500 kWh

Increase: about 2.500 kWh

Appendix 1: Project Side Survey

EIE-06-256 REEPRO

Intelligent Energy  Europe

Promotion of the Efficient Use of Renewable Energies in Developing Countries

Visit Community Report

Authors

Bouagern XAYALATH,
CDEA

July 2008

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List of Acronymes

CDEA	Community Development and Environment Association
DGS	Deutsche Gesellschaft für Solarenergie
NUOL	National University of Laos
SHS	Solar Home System
VOPS	Village off grid Promotion and Support

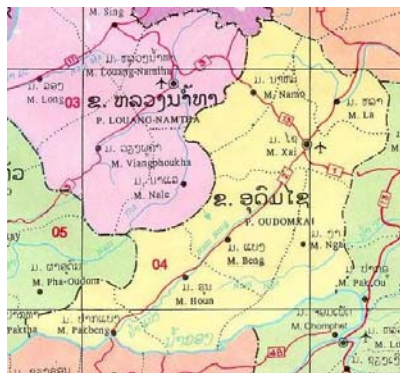
Etc.

1 Introduction

Based on the REEPRO's plan, two pilot communities have to been identified with one in Laos and one in Cambodia. In the selection of the communities, 10 possible villages were listed which do not have access to electricity but do have high potential in the development of renewable energy in near future. To meet the criteria of the project, CDEA is responsible to visit and study the potential communities to work with as pilot projects in Oudomxay and Khammuan provinces.

Initially, in Khammuan province, only 2 villages in Mahaxay district were visited. However, it had been decided that the project sites would be selected in Oudomxay province and not in Khammuan province. Therefore in Oudomxay province, the survey was carried out in two districts, Xay and Houn districts of which a total of 12 villages had been visited. The reason being that Oudomxay is rated as one of the poorest provinces and the villages visited do not have access to electricity but do have the potential for renewable energy development including community development as a whole. On the other hand, the Oudomxay authorities had advised CDEA to visit villages in La District and give priority to it than Xay district.

Figure 1 Oudomxai province



Oudomxay is located in Northern Laos with $20^{\circ} 42' N$ and $101^{\circ} 59'$ East. Oudomxay province is one of the poorest in Laos. It comprises of 7 districts, which includes La, Xai, Parkbeng, Hund, Namong, Nga and Beng districts. There are 505 villages (including 333 villages which are considered being poor) and 42,740 households (statistic of Oudomxay Province). The total population is 274,667 persons including 136,445 female. The main occupation of the population is mostly agriculture which is 100% based on traditional methods of farming.

The total number of poor households is 15, 2227. The Government has plans to extend electricity lines along the main roads to districts. There are many villages in remote areas that do not have access to electricity. The main source of energy is firewood especially for daily cooking in the household with the quantity of firewood used per year is about 3 to 5 m³. For lighting and rice milling they use diesel which is 10 to 20 litres per month. The cost of diesel is nearly 1.5 US\$ per litre. However, there are only some villages and households that have access to solar energy and Pico hydro power. Corn is the second crop after rice with the total area of its production equalling to 25000 ha (Ministry of Agriculture) and is the biggest after Sayaboury Province.

Figure 2 Target area in Hund district

Hund District is one of the 7 Districts in the province mentioned above and is located at about 95 km from Oudomxay capital on the way to Pakbeng District. It consists of 14 zones and comprises of 10,515 households of which 3,413 households are in poor condition. The total population is 63,985 persons including 31,407 females (statistic of Oudomxay Province).



2 Objective of Visiting Community:

- To visit and study the most potential community in the development of renewable energy as well as community development,
- To determine the final selection of the pilot communities
- To plan for the actual implementation of the project in the selected communities

2.1 Project team

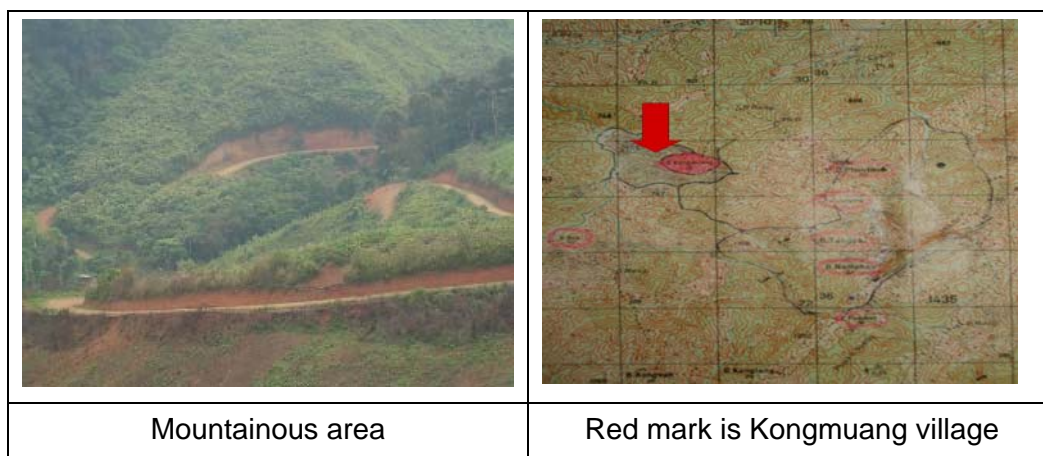
- Mr. Khampha and Mr. Bounphone, Community Development and Environmental Association (CDEA)

3 Description of Kongmuang village

3.1 Location

The Pilot community will be based on Ban Kongmuang, located at 29 km from Hund District centre. The detailed information about communities is specified below. Road accessibility do exist but it is not in a good condition and gets even worse during the raining season. (See figure3).

Figure 3 Road accessibility and location of Kongmuang village









3.2 Social and economic

There are 34 households which comprise of 248 persons (126 female) with an ethnicity of 100% Lao theung. The main occupation of the people is totally based on agricultural practices. These practices include shifting cultivation, uncontrolled burning, and improper forest management practices. Their main income from selling maize is between an average of 200-700 US\$ per year. In the northern region, where the road network is poor with rough terrains, logging activities are much lesser compared to other parts of the country. However, shifting cultivation remains the main cause of deforestation.

3.2.1 Energy use

Concerning the use of energy, there are similar remote areas in Oudomxay using fire wood as the energy source. The quality of firewood per family per year is approximately 3- 5m³. One Cubic meter would cost between 10 to 12USD. In addition to that, diesel also plays an important role in lighting, rice milling and watching CD/DVD. The quantity of diesel normally used is approximately 5 to 20 liter/month, with the cost of diesel reaching nearly 1, 5 USD/liter. In the target villages, only Ban Kongmuang has all of its houses having established home solar system. However, it had been selected as a pilot community due to the fact that; it is in the centre surrounded by the selected pilot communities and set as a good venue for conducting training sessions and can also be used as a practical model for other pilot communities to learn during the training. Corn waste can also be used as an energy source but had not been used properly due to limited knowledge on its usage. Furthermore, the target villages do not have Pico hydro power systems in place.

Figure 4 Energy use in village

		
Engine is used for TV/DVD	Kerosene lamp light	Firewood for cooking
		
One provide battery charge service	Light use 3-4 hours	SHS installed in household

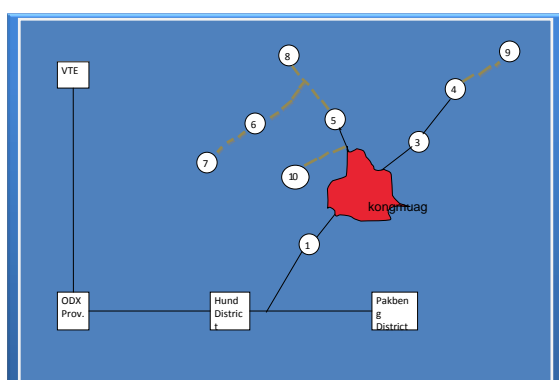
3.3 Plan of development pilot project

The project objective is to raise awareness and conduct training on the efficient use of renewable energy at 2 different levels, namely; the District and the community levels. Therefore, Hund district will serve as the central venue for selected district personnel to attend training sessions while Kongmuang village will be for other selected villages to attend both the awareness and training sessions. The survey had also done amongst the nearby villages and it would be better to invite them to participate in our project training to extend further the development of renewable energy.

Table 1 The distances between nearby villages to Ban Kongmuag

No.	Name of village	Household	Population	Female	Distance to Kongmuang
1	Phoutum	33	267	138	4km
2	Phoulod	75	624	314	6km
3	Tanglunh	33	273	137	18km
4	Tangya	46	352	178	5.5km
5	Phouse	60	411	192	8km

Figure 5 Map of villages nearby pilot community



3.4 Other potentiality


Therefore, it had been decided to work in Houn district only if International Food and Agriculture Development (IFAD), with their office located in these areas would offer their support for our project work to commence there. On the whole, a decision on the project site had not been done as yet with the initial report on the meeting has yet to receive response from Mrs. Antje. In the meantime, concentration had been placed on the level one training to determine trainers with the limited time available.

4 Recommendation

As per the recommendation by the Lao teams, two training levels need to be organized as follows:

1. The first training will be conducted at the district level and the second level of training will be conducted at the village level.
2. Ban Kongmuang had installed solar systems in all its households but lack the knowledge to maintain the systems
3. They are willing to undergo the training on rocket stove to assist in the preservation of trees as is the issue with the environment.

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Intelligent Energy  Europe

Promotion of the Efficient Use of Renewable Energies in Developing Countries

Lao Partner project meeting

Minutes

July 11th 2008

Authors

Khampha KEOMANCHANH, CDEA

July 2008

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1. List of participants

Name	Organisation
Mr. Khampha Keomanichanh	CDEA
Dr. Khamphone Nanthavong	NUOL
Mr. Phouthanouthong Xaysombath	STRI
Mrs.Keophayvanh	STRI
Mr. Soukanh Vannapho	STRI

2. WP 6: Pilot Community

2.1 General information

Since 2007 CDEA has been extended the branches to Oudomxay province which is one of the poorest in Laos. They are comprising 7 districts, 505 villages (*included 333 villages are poor*), 42,740 households (statistic of Oudomxay Province). The total population is 274,667 persons included 136,445 female. The main job of population is almost agriculturist which is 100% base on nature. The total number of poor households are 15,2227.

The Government have plan to extend electricity line on the long of the main road to districts. There are many villages in remote area can not access to electricity. The main source of energy is firewood especially for daily cooking in household, the quantity of firewood used per year is about 3 to 5 m3. For lighting and rice milling they use diesel which is 10 to 20 litres per month, the cost of diesel is nearly 1.5 \$. There are only some villages and households can access to solar energy and Pico hydro power. Corn is second crop after rice, the total area of corn production is 25000 ha (Ministry of Agriculture) it is the biggest after Sayaboury Province.

Hund District is one of the 7 Districts in the province mentioned above, it is located at about 95 km from Oudomxay capital on the way to Pakbeng District, consisting of 14 zones and comprising 10,515 households included 3,413 households are in poor condition. The total population is 63,985 persons included 31,407 of female (statistic of Oudomxay Province). Corn is the second crop after rice. The total area is 17500 ha (Ministry of Agriculture).

Phouse is one of the 14 zones of Hund District, it has been selected as pilot area by Community Development and Environment Association, it is consisting of 10 villages not far from each other where Oudomxay Community Initiatives Support Project (OCISP) existed. The Pilot community will be based on Bane Kongmung where located at 29 km from Hund District. The detail about communities is below:

2.2 Detail of the target villages.

Name of village	Number of household	Number of family	Number of female	Total population	Distance From Hund to target village
Bane. Phoutum	33	39	138	267	25 km
Bane kongmung <i>(Pilot community)</i>	34	35	126	248	29 km
Bane Phoulod	75	80	314	624	35 km
Bane TangLunh	33	35	137	273	35 km
Bane Tangya	47	48	178	352	34.5 km
Bane Phouse	60	68	192	411	37km
Total	282	305	1,085	1,148	

It is available up to 10 villages the name of villages are below:

Bane Longkhon	Access road is in poor condition, the car can access only in dry season
Bane Namphark	No access road, walk only
Bane Phoukhoy	No access road, walk only
Bane Dou	No access road, walk only

2.3 Distance from Pilot Community to bordering villages

CDEA has selected bane Kongmung as pilot community center because there is an established central office to manage the villages. The distance from Kongmung to the villages in the zone is as below:

Bane Kongmung	to	Bane Phoutum	4 km
Bane Kongmung	to	Bane Phoulod	6 km
Bane Kongmung	to	Bane TangLung	18 km
Bane Kongmung	to	Bane Tangya	5.5 km
Bane Kongmung	to	Bane Bane Phouse	8 km
Bane Kongmung	to	Bane Longkhon	7.5 km
Bane Kongmung	to	Bane Namphark	6.5 km
Bane Kongmung	to	Bane Phoukhoy	17.5 km
Bane Kongmung	to	Bane Dou	23.5 km

- The activity proposed is to train the villagers about how to make and use the rocket stove therefore to minimize the quantity of firewood use and also how to do maintenance on the solar energy already in place properly.

2.4 Criteria for community selection

Regarding to the government strategy in community development for poverty reduction, CDEA has set up:

- Poor community,
- In the remote area
- Ethnic group: minority

2.5 Economic conditions of target communities

- Corn is the second crop after rice. Villagers produce rice for house consumption, corn for trade, furthermore villagers raise pigs, cows and poultry. The average income is approximately 800–1,200 \$.

2.6 Requirements for target area

- From the personal and group interview conducted it made fully understood that villagers need electricity, good access road and income activities.

2.7 Accessibility to target area

- Access road exist but it is not in good condition especially during the raining season.(see picture show). There are 4 villages in the zone no have access road as mentioned above.

2.8 Existing facilities in target area.

- In the target area there is some activity has been started by Oudomxay Community Initiatives Support Project (OCISP) such as central office for the target village management, gravity water flow system and some community development fund for initiative the income generation.

2.9 Energy

The main source of energy used for cooking in the target area at the present is firewood. The quantity

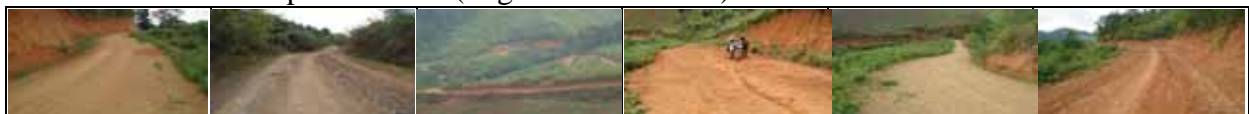
of firewood per family per year is approximately 3- 5m³. One Cubic meter cost 10 to 12USD. In addition the diesel also play an important role in lighting, rice milling and watching CD/DVD. The quantity of diesel used is approximately 5 to 20 litres/month. The cost of diesel is nearly 1,5 USD/litre. In the target villages only Bane Kongmung was completely established home solar system. Corn waste also can be used as energy source but it was not used properly. In the target village we could not find Pico hydro power system.

2.10 Future village plan

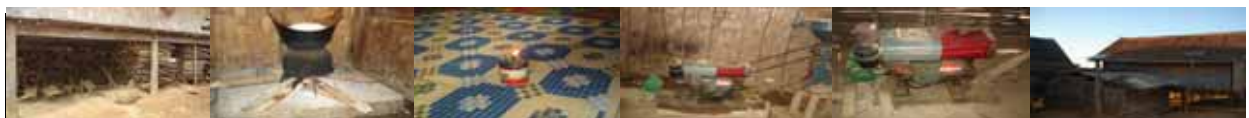
The government planned to establish home solar energy system but villagers do not know when it will be done.

3. Pictures

11.1 Access road to phouse zone (in general condition)



11.2 Energy



11.3 Target village



4. Summarization

The survey has been conducted smoothly in Phouse zone, Hund District due to the kind cooperation of local authority. Concerning energy use, there are similar situations in the target area. Shifting cultivation is still practiced in the area. Therefore, in the case of collecting firewood, women and children has to walk distances from the village to fulfill that purpose. Furthermore, the traditional style of cooking uses a lot of firewood, one family use fire wood about 3m³ to 5m³ per year (1m³ cost 100,000 kip to 120,000 kip or 10 to 12 USD).

For lighting: Almost all household use homemade lamps using diesel as source energy about 3 -5 liters per month, except Bane Kongmung all household use home solar system. In addition some household in the area have engine for rice milling and watching television about two hours per day; in this case they use approximately 20 liters/month (1liter of diesel cost 1.5 USD).

Access road: During the dry season can access easily by car and off road motorcycle to Phouse zone but during the wait season some distances is very difficult to access.

Appendix 2: Project definition workshop



EIE-06-256 REEPRO

Intelligent Energy  Europe

Promotion of the Efficient Use of Renewable Energies in Developing Countries

Lao Partners Project Meeting

Minutes

12th September 2008

Authors

Bouagern XAYALATH, CDEA

September 2008

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List of Acronymes

VOPS	Village Off-grid Promotion and Support
OCISP	Oudomxai Community Initiatives Support Project
NUOL	National University of Lao
CDEA	Community Development and Environment Association
STRI	Sceince Technology and Research Institute
IED	International Energy Development
IFAD	Internation Forest and Agricultural Development

List of Participant

Name	Organization
Mr. Khampha Keomanichanh	CDEA
Mr. Bouangern Xayalath	CDEA
Mr. Albert Marligan	CDEA
Mr. Khammalounla Lexayavong	CDEA
Dr. Khamphone Nanthavong	NUOL
Mr. Humpheng Theumbounmy	STRI

1 WP 6: Show Case Implementation

1.1 Show case definition workshop 6.2.1

After selecting the pilot communities the trainers (RES experts from the project partners and third organisation) and the community decision makers start planning of show case activities supervised by DGS, EFEC and TSE. In the frame of the show case definition workshop the general direction of the show case will be discussed and responsibilities assigned

As project plan, show case implementation will be conducted during December 2008. It is therefore necessary to have a discussion amongst project team, to study feasible organizations to be involved, and to decide activities planning generally and responsibilities assigned. After finding organization to show case, the next step preparing Memorandum of Understanding will be drafted by CDEA, through recommended of project partners.

1.1.1 Time duration:

ID	Task	Start dated	Deadline
6.2.1	Show case definition workshop	01.08.08	31.08.08
6.2.2	Show case planning & documentation	01.10.08	31.12.08
6.2.3	MOU on show case project with communities	01.12.08	31.12.08
6.2.4	Show case community project implementation	01.12.08	31.12.08

2 Minute of Meeting in General

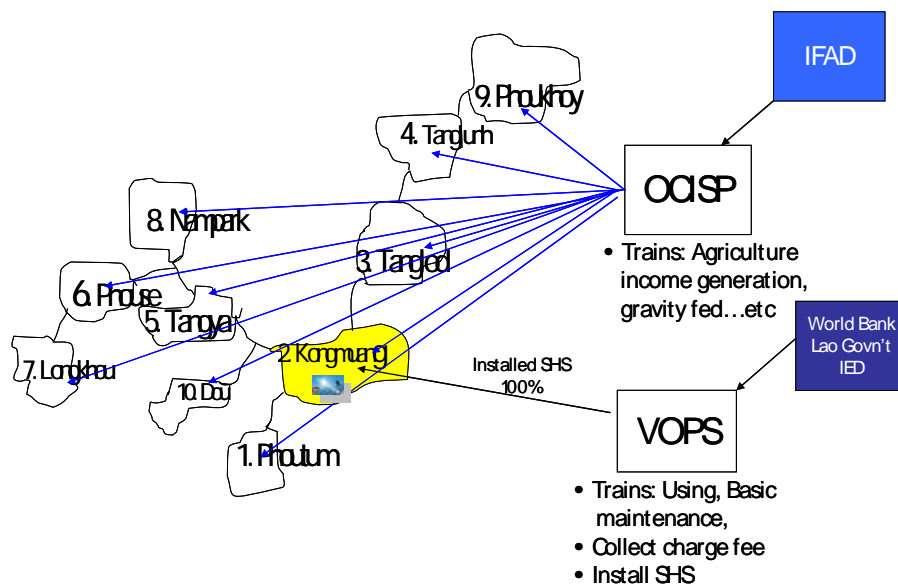
As CDEA has taken the responsibility for task selecting pilot project, with involving of NUOL and STRI to jointly perform and follow-up this task, to report the progress this task, on 12 September 2008, CDEA hold minute of meeting in CDEA's office, by inviting NUOL and STRI involved (see appendix 1). The main objective of this meeting is to discuss about organization to perform of show case definition workshop- training level 2 and 3.

In the meeting has reviewed the result of project site survey, as Lao partners finally agreed to select most appropriate areas, in Phouse zone which include with 10 villages namely Phoutum, Khonmuag, Tanglod, Tanglunh, Tangya, Phouse, Longkhon, Nampark, Phoukhoy villages. This area has not electricity accessed yet and it is developing areas for Lao government.

2.1 Project areas

People in these villages are mostly low income, as main occupation 100% agriculture. Lao government therefore is urgent to develop, and improve people's living conditions. Oudomxai Community Initiative Support Project (OCISP), supported by International Forest and Agriculture Development (IFAD), is one project that has implemented agricultural activities to further develop income generation. Furthermore, there also is the Village Off-grid Promotion & Support (VOPS), which employed by International Energy Development what won bidding Lao government's off-grid project.

Figure 1 Areas with two projects implement

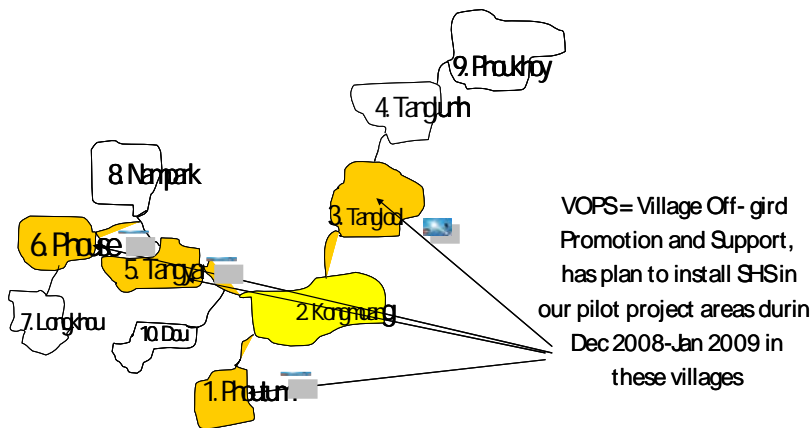


2.2 Energy use

Almost these areas energy use is mainly fired wood, diesel lamps, and rice miller which use for generating light and electricity for TV/VCD. Therefore, the estimated energy consumption approximately 15 liters per month, which cost of diesel is 9.750 LAK/l (0.8EUR/l), and gasoline is 10.890LAK/l (0.9EUR/l).

However, there is only Khongmuang village, which has already 100% installed Solar Home System. Base on the demand on Solar Home System in these areas increasing, VOPVS will nearly plan to install more SHS in four villages, includes with Photum, Tangya, Tanglod and Phouse village which will be installed during December to January 2009 (see figure of areas VOPS plan)

Figure 2 Areas to installed SHS of VOPS



2.3 Participant

Mr. Khampha Keomanichanh	Community Development & Environment Association
Mr. Bouagern Xayalath	CDEA
Mr. Albert Marligan	CDEA
Mr. Khammalounla Lexayavong	CDEA
Mr. Khamphon Nanthavong	NUOL
Mr. Humpheng Theumbounmy	STRI

2.4 Methodology

- Team discussion on the progresses of pilot communities in Hound district, Oudomxai province, Lao PDR and finding an organization to show case workshop

3 Main issues

- Based on the project plan, training level 2 and 3 will be conducted in pilot project and project communities. Dr. Khamphone suggested that the next level training would possibly be implementing in district and village level. Simultaneously, within our target areas there are two organizations, VOPS and OCISP which already conducted activities in whole areas in Oudomxai. As the result, Mr. Khampha discussed with Mr. Phonekhan Manithong, manager North Branch of VOPS. He generally agreed with idea of the training on solar home system.

Comment: Therefore, Mr. Khampha and Dr. Khamphone should discuss more detail to the VOPS headquarter in Vientiane capital and OCISP manager, on further supporting our training and sign MOU jointly implementing these activities.

- Initiatively, meeting decided daftly the contribution as followed as;

REEPRO	OCISP	VOPS
Trainers fee (travel, hotel, food)	Resource for making rocket stove	Food for participants all level (district and local levels)
Coffee break	Venue for training rocket stove all level (district and local level)	Travel and food cost for participant (for training at district level)
Handouts of trainings		Training materials (if possible)
		Venue for training
		Study tour (if possible)

- Training at district level would hold two times, as first training would focus on SHS, PV and visit areas that VOPS already implemented Solar Home System. Second training would focus on rocket stoves and entrepreneur (for level 2 training)
- For training level 3, we would conduct in pilot project. It means the technicians from level2 would implement this training which will focus on SHS and rocket stove through theory and practices.

It therefore the meeting agreed CDEA to draft the concept to VOPS in Vientiane capital on the contribution. When they agree on the concept and then we will draft MOU to jointly implement.

References

03.09.2008, Mr. Phonekham Manithong, Manager North Branch of VOPS, Tel: 283 9675

Appendix 1: Show case definition workshop programme

12 September 2008

Time	Description	In charged
9:00-10:15	Introduction purpose Project site results Present potential in areas selected	CDEA
Break		
10:25-11:15	- All discussion about Workshop Planning activities and responsibility assigned in general	CDEA, STRI, NUOL
Lunch		
13:30-14:30	- Continue discussion	CDEA, STRI, NUOL

Appendix 2: Show case presentation

EIE-06-256 REEPRO
Sustainable Energy


Show Case Definitions Workshop

Task: 6.2.1

Main Description 6.2.1

- After select pilot communities, the trainers, RES experts from partners and third parties and the community decision makers start planning show case activities
- General direction of show case will discussed and responsibilities be assigned

Project site survey




Selected villages:

1. Phatum
2. Kangmuang
3. Langkhou
4. Tanglunh
5. Tanglone
6. Tangya
7. Phausea

Location of target villages

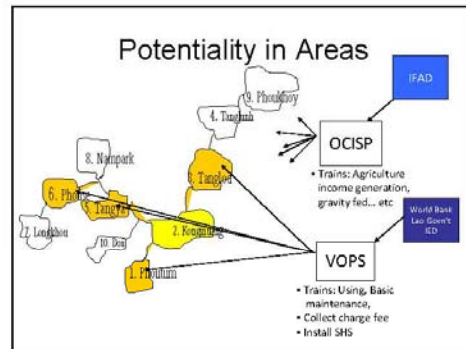
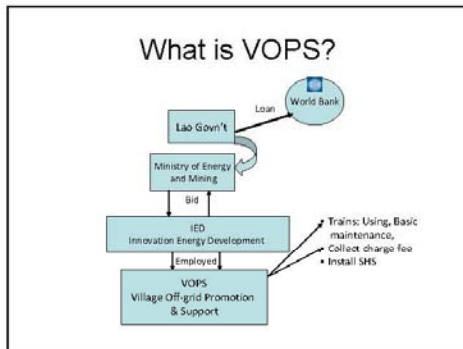
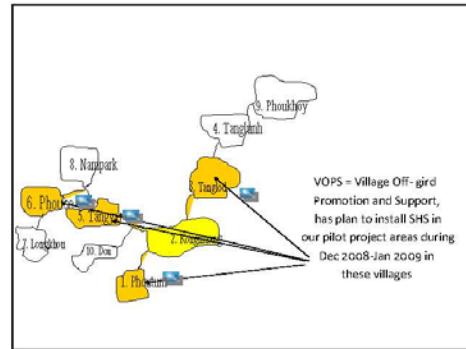
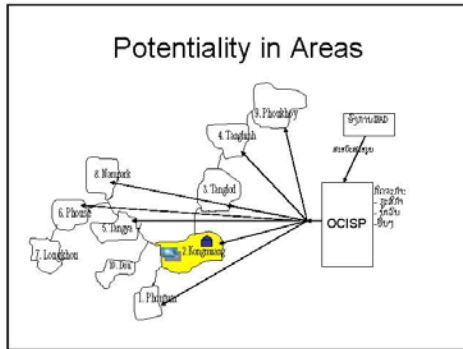
Hound District

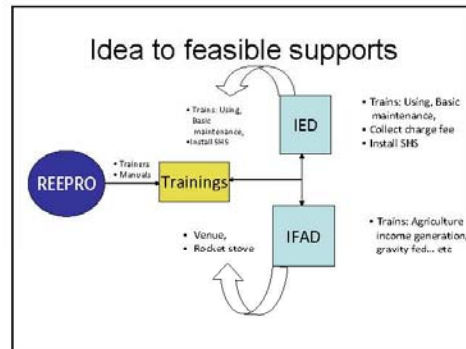
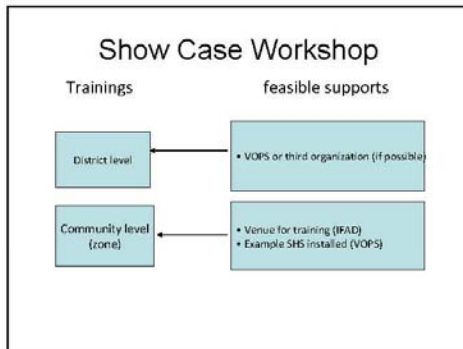
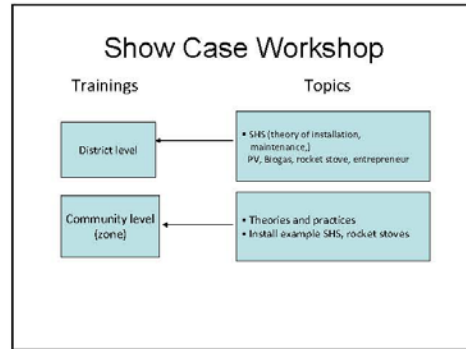
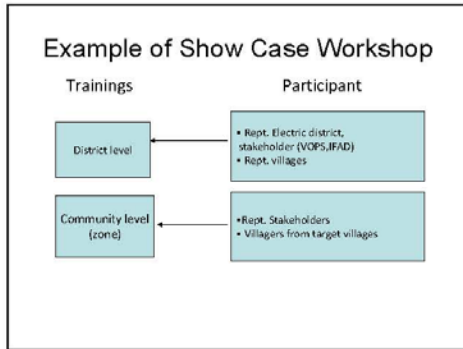


1. Phatum
2. Kangmuang
3. Tanglunh
4. Tanglone
5. Tangya
6. Phausea
7. Langkhou
8. Kangkai

Phouthay

Kangmuang already has 100% installed SRE





Appendix 3: Show case planning

Concept note on the electrification project for the post health centre, meeting hall and school



ສະມາຄົມພັດທະນາຊຸມຊົນ ແລະສິ່ງແວດລ້ອມ (ສ.ພ.ຊ.ສ)
Community Development and Environment Association
P.O. Box 4438, Vientiane, Lao PDR. Tel: (856-021) 213366, Fax: (856-021) 243312, (856 020) 5 022759;
e-mail: cdealaos@yahoo.com; keomanichanh@yahoo.com

Concept paper to _____

Proposed project title: Installation of Photo Voltage (PV) System Unit for Khongmuang Health Post, Phousea zone, Hound District – Oudomxay Province

1. Project Background and Rationale

Hound district in Oudomxay province has a total population of 65,579 persons of which 33,003 are females and are mostly the Kamu ethnic group. In the district, the main health centre supports 9 other health posts in 9 zones of which each zone respectively responds to about 7 to 10 villages. The 9 zones are namely; Ngew, Xiengdee, Nampaun, Namphoon, Phakham, Sibounhueng, Phouviengxai, Navang, and **Phousea**. Each zone comprises a health post. This concept note concentrates on the health post, meeting hall and primary school in Phousea zone, is located in Khongmuang village. The distance from Hound Health centre district to Khongmuang is about 32 km. The health post and primary school in Khongmuang provide service to 10 villages nearby, including with Phoutum, Longkhood, Nampak, Tangya, Duo, Tanglon, Tadtale, Phousea, Phoulod and Khongmuang. The total population in these 10 villages is about 3,250 people. The students actually are from nearby of khongmuang, including with Phoutum, Longkhood, Tangya and Nampark villages. The distance from each villages are 6 to 9 km, students have to walk more than 2 hours to the school. Each year there are 100 students from those 4 villages, excluding with students in Khongmuang.

This health post is very much in need of electricity for lightings at night. Actually, for lighting at night in the health post really requires for treating patients especially women in the labor and also for the cooling system to keep the vaccines. There is no electricity being generated and no proper cooling systems in place for these areas. Even though they do not have diesel generators to fulfill the purposes, the capacity of these generators to support the centers in a more convenient manner is yet to be desired with the increasing fuel cost. Fuel consumption is about 20L/month with the actual cost at 11,000 kip/litre for diesel (0.9 Euro) and 12000 kip/litre (1.07 Euro) for petrol. Additionally, the meeting hall also really needs one PV system for generating lighting and loud speaker. The lighting and generating loud speaker is for meeting at night and also helping they access regularly of the information, along with enhancing parents' contribution to their children learning.

The health posts tend to rationalize the fuel usage by minimizing the usage of lighting to vaccination conservation. However, there were frequent problems relating to fuel shortage of which the generator could not fully support the conservation of vaccines to the required storage temperatures of -8°C thus resulting in their disposal. Hence, an alternative means of improved electrification source would greatly minimize such problems. Hence, this concept note is prepared purposely to install the PV systems (consists of solar panels

and batteries) which will minimize the costs of fuel and importantly avoid the loss of vaccines efficiency which cost a lot to purchase and also provide lightings.

The elementary school in Khongmuag village was built in 1992 by supporting from ADB 1 and there are including of 3 classrooms, consist of 198 to 200 students. Unfortunately, in 1996 this school was affected by natural disaster and almost damaged whole building. Presently the element school is really poor constructed; however, the villagers did the best they can to reconstruct the damaging building- with extremely limited budget and resources. Otherwise, in the rainy season the school could not continue the education, based on torn roofs and wall. Additionally, the stream of many younger students entering the school has grown fastly; however, some students spend up to two hours walking over the mountain to the nearly school. In the mean time, because of the large number of students, so they can not fit into the existing number of tables and chairs.

This project should promote the goal of the government of Lao PDR to increase the electrification ratio for the whole country from the current level of about 43% in 2004 to 90% by 2020, with intermediate Targets of 45% in 2005, 70% in 2010. Other, this project also helps to promote the government policy implications, the human resource development

As per the main project plan, the project activities do not response to the basic needs of education, electrification and information; the organization is motivated to assist the said Khongmuang village as a pilot project to equip them to fully serve the population to have access to better health care, education and public information. It is better to address such issue now rather than waiting for a major issue to arise and then to act.

2. Objectives:

The program will have 4 main objectives:

1. To provide PV System cooling unit to Khongmuang health post in Phousea zone.
2. To provide the training on management and maintaining of the established PV systems
3. To provide better lighting systems to the health centers
4. To provide PV system for meeting hall
5. To reconstruct of element school

3. Target Groups and final beneficiaries

The main target groups would be the 10 villages comprising of 3250 persons The villages in the Phousea zone are namely; Phoutum, Longkhon, Nampak, Tangya, Duo, Tanglon, Tadtale, Phousea, Phoulod and Khongmuang.

4. Proposed Activities:

a. Installation of PV system – *Install 2 PV systems*

Carry out the installation of 2 x PV system at the Khongmuang health post and meeting hall.

b. Maintenance training of the solar system – *Conduct 2 x training sessions*

After the completion of the PV system, 2 x training sessions will be conducted at the respective sites on how to maintain the systems after the project phases out for sustainability purposes.

c. Installation of lighting system for the Health centers – *Installation of 10 lamps*

The lamps should complement the solar system installed. The lamps required for Khongmuang health post and meeting hall are 10 lamps. That is, 2 lamps for the dormitory, 3 lamps in the health post, 1 lamp near the refrigerator for vaccination cooling and 4 lamps in the meeting hall.

d. Reconstruct of the element school- Reconstruct 3 classrooms consist of roof, wall and floors**5. Short description about Community Development and Environment Association (CDEA)**

In early 2004 the government unveiled its new policy on local not-for-profit organizations (NPO) and their role in the socio-economic development of the country. CDEA was officially registered with the Lao PDR government on the 26 of February 2004, under the Lao Union of Science and Engineering Association (LUSEA). The organization had experiences in previous and on-going projects in the form of supporting and providing the training on the management of Village Development Fund , organic composting with schools and training and constructing bio sand filters for the rural communities. We'd like every much to pursue the mission of serving the rural communities with the donor's assistance through the implementation of these activities mentioned above.

Budget

The requested budget for PV \$ 5,950.53

The budget for school repair \$ 8,000 .00

Total Budget Requested \$ 13, 950.53

Project Duration: 3 month

Mr. Khampha KOEMANICHANH

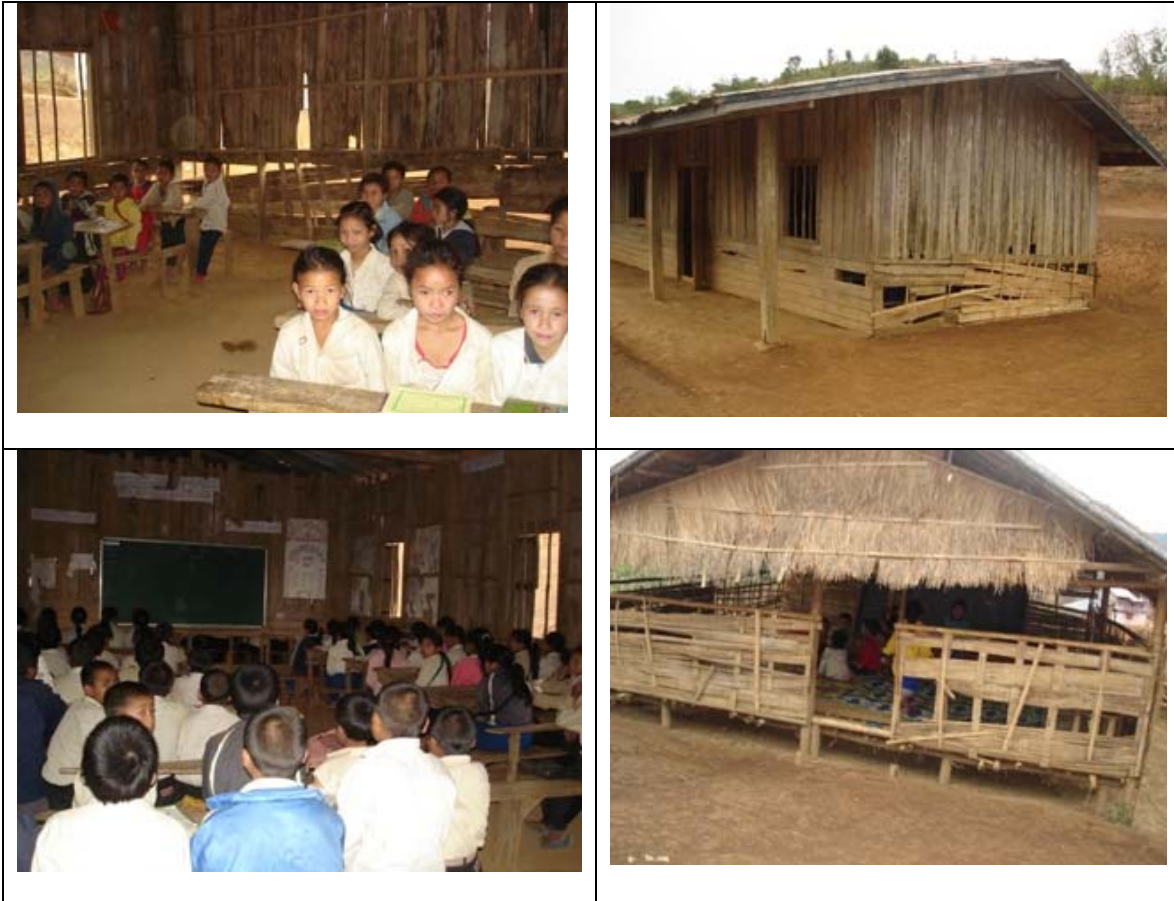
President of the of Community Development and Environment Association

P.O.Box: 9932

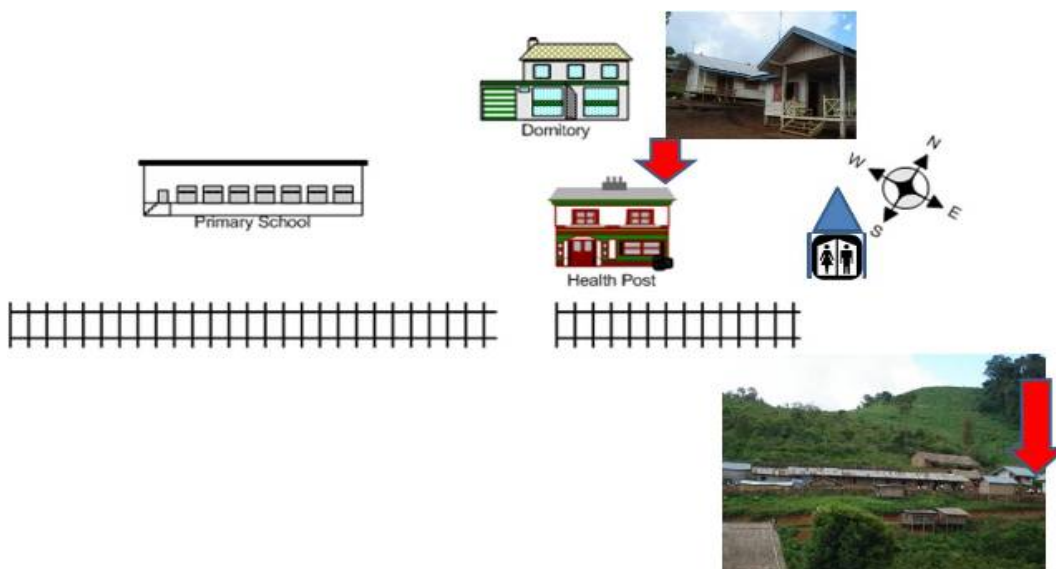
Vientiane Capital

Tel: (856-20) 2222187

Email: kph_cdea@ yahoo.com



Project map:



Quotation of the PV system for the post health centre



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 Vientiane Lao PDR
 Tel: ++856 21 313874
 Fax: ++856 21 314 045
 Mobile: ++856 20 5518016
 www.sunlabob.com

Quotation

1876

Customer

Name / ຊື່: Professor Khamphone; Faculty of Engineering

Address/ ທີ່ຢູ່ khamphon@fe-nuol.edu.la

City

Phone/ ໂທ (856-20)541 4347 or 246 7192

*2*PV System for Healthposts in Houne District, Oudomxay province.*

Quotation

Date/ວັນທີ: 17-Jun-09

Customer No: 1876

Rep/ ໂດຍ: Eknalinh

FOB: VTE

No.	Qty	Designation	Unit price US\$	Total US\$
<u>PV System Cooling Unit for healthpost 1</u>				
I		solar unit to operate 3*energy saving lamps for staff dormintory (5W 5hrs/day), 2*energy saving lamps for healthpost (7W 3hrs/day) and 1*energy saving lamp for vaccine storage room (5W 1.5 hrs/day). (2 sets)		
1	2	Solar panel 50W	\$364.87	\$729.74
	2	Charge controller CX 10A 12/24V (Internal monitoring and interface included)	\$33.74	\$67.48
	2	Haze battery gel 55Ah-12V	\$142.78	\$285.56
	6	Energy saving lamps (2*lamps 7W for healthpost +1* vaccine storage room and 3*lamps 5W for staff dormintory)	\$10.68	\$64.08
	2	Installation materials (set)	\$90.00	\$180.00
2		Solar unit to operate 4*energy saving lamps (7W 1-2hrs/day) for small office		
	1	Solar panel 30W	\$219.00	\$219.00
	1	Charge controller CA06, 6A 12V	\$21.00	\$21.00
	1	Ritar battery gel deep cycle 33Ah-12V	\$70.61	\$70.61
	4	Energy saving lamps	\$10.68	\$42.72
	1	Installation materials (set)	\$50.00	\$50.00
II		Cooling vaccine Unit		
	1	Solar Fridge 50L (phocos)	\$1,200.00	\$1,200.00
	2	Solar panel 75W	\$491.33	\$982.66
	1	Charge controller CX 20A 12/24V	\$68.53	\$68.53
	1	Haze battery gel 150Ah 12V	\$340.61	\$340.61
	1	Installation materials (set)	\$110.00	\$110.00
III	1	Mounting structure with 3 panel for SHS & Cooling unit at Health post	\$160.00	\$160.00
	1	Frame + pole (1x50W) for staff dormintory.	\$50.00	\$50.00
	1	Frame without pole (1x30) for small office	\$20.00	\$20.00
IV	1	Installation fee & Perdiem technicians including training user and manual (2*technicians*6 days and 15USD/person/day).	\$450.00	\$450.00
	1	Transportation from VTE-Installation spot	\$450.00	\$450.00
TOTAL AMOUNT OF THE COMPONENTS:				\$5,561.99
			<i>Turnover Tax 10%:</i>	<i>\$556.20</i>
Grand Total:				\$6,118.19

The quote is based on our current price with already deducted discount and is valid 30 days

Warranty: Solar panel 20 years Guarantee: all of installations materials 1 years
 Charge controller and Fridge 2 years
 Energy saving lamp 8,000 hrs

Quotation of the PV system for the post health centre with DGS comments



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Quotation

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Customer

Name / ຊື່: Professor Khamphone; Faculty of Engineering

Address/ ທີ່ຢູ່: khamphon@fe-nuol.edu.la

City

Phone/ ໂທ (856-20)541 4347 or 246 7192

*2*PV System for Healthposts in Houne District, Oudomxay province.*

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1	2	Solar panel 50W	4.87	\$729.74
	2	Charge controller CX 10A 12/24V (Internal monitoring and interface included)	4	\$67.48
	2	Haze battery gel 55Ah-12V	2.78	\$285.56
	6	Energy saving lamps (2*lamps 7W for healthpost +1* vaccine storage room and 3*lamps 5W for staff dormintory)	\$10.68	\$64.08
	2	Installation materials (set)	0.00	\$180.00
2		Solar unit to operate 4*energy saving lamps (7W 1-2hrs/day) for small office		
	1	Solar panel 30W	0.00	\$219.00
	1	Charge controller CA06, 6A 12V	0.00	\$21.00
	1	Ritar battery gel deep cycle 33Ah-12V	61	\$70.61
	4	Energy saving lamps	\$10.68	\$42.72
	1	Installation materials (set)	0.00	\$50.00
II		Cooling vaccine Unit		
	1	Solar Fridge 50L (phocos)	00.00	\$1,200.00
	2	Solar panel 75W	1.33	\$982.66
	1	Charge controller CX 20A 12/24V	3.53	\$68.53
	1	Haze battery gel 150Ah 12V	0.61	\$340.61
	1	Installation materials (set)	0.00	\$110.00
III		Mounting structure with 3 panel for SHS & Cooling unit at Health post		
	1	Frame + pole (1x50W) for staff dormintory.	0.00	\$160.00
	1	Frame without pole (1x30) for small office	\$50.00	\$50.00
	1	Frame without pole (1x30) for small office	\$20.00	\$20.00
IV		Installation fee & Perdiem technicians including training user and manual (2*technicians*6 days and 15USD/person/day).		
	1	Transportation from VTE-Installation spot	0.00	\$450.00
			0.00	\$450.00
TOTAL AMOUNT OF THE COMPONENTS:				\$5,561.99
Turnover Tax 10%:				\$556.20
Grand Total:				\$6,118.19

The quote is based on our current price with already deducted discount and is valid 30 days

Warranty: Solar panel 20 years Guarantee: all of installations materials 1 years
 Charge controller and Fridge 2 years
 Energy saving lamp 8,000 hrs

Proposal for the electrification of the of the post health centre with PV systems in German

Projektübersicht:

PV-Anlage für Khongmuang Health Post und Reparatur der elementary school Khongmuang

Khongmuang Village liegt in der Phousea Zone, Hound District, in der Oudomxay Province, die sich im zentralen Nordwesten von Laos befindet. Hound District hat eine Bevölkerung von 65.579, die größtenteils der ethnischen Gruppe Kamu angehört. In diesem District gibt es ein main health centre, das 9 kleinere health posts in den 9 einzelnen Zonen unterstützt. Die health post und die elementary school in Khongmuang versorgen auch 10 weitere Orte in der Umgebung mit insgesamt 3.250 Einwohnern. Neben den Schülern aus Khongmuang nehmen etwa 100 Kinder aus den umliegenden Orten an der Schule teil, wobei die Entfernung der Orte bis zu 10 km beträgt und manche Schüler so mehr als 2 Stunden täglich zur Schule laufen müssen.

Die health post benötigt dringend Elektrizität während der Abend- und Nachtstunden, um die Patienten, vor allem Frauen, behandeln zu können. Außerdem wird Elektrizität zur Kühlung der Impfstoffe und Medikamente dringend benötigt. Bisher gibt es keine Möglichkeiten, um die Versorgung mit Energie sicherzustellen. Auch wenn Dieselgeneratoren im Einsatz sind, kann die Kapazität schon jetzt nicht mehr aufgebracht werden, um die health post mit Licht und Energie für den Kühlschrank zu versorgen. Dies ist begründet in den stetig steigenden Dieselpreisen, die zurzeit knapp 1 €/ℓ betragen. Der Bedarf an Diesel liegt momentan bei 20 ℓ/Monat. Außerdem benötigt die meeting hall ebenfalls ein PV-System, um die Stromversorgung für Licht und Lautsprecher in den Abendstunden zu gewährleisten, damit einerseits Informationsveranstaltungen durchgeführt werden können, andererseits Nachhilfestunden, bzw. Lernen der Kinder ermöglicht wird.

Die durch anhaltend hohe Dieselpreise verursachte Dieselknappheit sorgt momentan dafür, dass der Generator die Kühlung der Medikamente und Impfstoffe auf -8° C nicht sicherstellen kann, obwohl der Verbrauch an Licht schon auf das Nötigste reduziert wurde. Eine alternative Energiequelle, Sonnenenergie aus PV-Modulen und Batterien, könnte für dieses Problem Abhilfe schaffen, wenn die Kosten für Treibstoff dadurch erheblich reduziert werden und sowohl die Versorgung mit Licht als auch mit Kühlung sichergestellt ist.

Die Grundschule in Khongmuang Village wurde 1992 durch Unterstützung von ADB 1 gebaut und besteht aus 3 Klassenräumen, für je 200 Schüler. Leider wurde die Schule 1996 durch ein Unwetter stark beschädigt und nahezu zerstört. Seitdem ist die Grundschule sehr einfach konstruiert, die Bewohner haben mit ihren begrenzten Ressourcen ihr Möglichstes versucht, die Schule wieder aufzubauen; sonst hätte der Schulbetrieb während der Regenzeit gar nicht fortgesetzt werden können. Neben diesen Problemen wächst die Anzahl der neu hinzukommenden Kinder rasant, so dass die Tische und Stühle während der Hauptunterrichtszeit schon jetzt nicht mehr ausreichen.

Projektziele:

- PV-Anlage für die Kühleinheit in der health post
- Training in Management und Unterhalt der PV-Anlagen
- Verbesserung des Beleuchtungssystems der Krankenstation
- PV-Anlage für die meeting hall
- Reparatur der Schule

Projektbeschreibung
(Kurzübersicht)

Projektstandort	Khongmuang Village, Phousea Zone, Hound District, Oudomxay Province, Laos		Az: *1) KST:
Projektbezeichnung	PV-Anlage für Khongmuang Health Post und Reparatur der elementary school Khongmuang		
Projektlaufzeit	Beginn: _____ Laufzeit: 3 Monate		
Projektpartner im EL	CDEA - Community Development and Environment Association		
Antrag an die Schmitz-Stiftungen	x.x.2009	eingereicht durch: DGS e.V. International Solar Energy Society / German Section	
Zielgruppe	<u>Direkt Begünstigte:</u> - 3,250 Bewohner der Phousea Zone, insbesondere Frauen - etwa 600 Schüler <u>Mittelbar Begünstigte:</u> 		
Projekthintergrund			
Ziele des Projektes sowie erwartete Ergebnisse	<u>mittelbar (Vision, ideelle und langfristige Ziele, „goals“):</u> - bessere Gesundheitsvorsorge und schnellere Behandlungsmöglichkeiten - anhaltend verbesserte Bildung der Kinder <u>unmittelbar (konkrete Ziele, realistisch, kurzfristig, messbar, „objectives“):</u> - Installation und andauernder Betrieb (Unterhalt) der PV-Anlage - Training in Management und Unterhalt der PV-Anlagen - Verbesserung des Beleuchtungssystems der Krankenstation - PV-Anlage für meeting hall, Ermöglichen des Lernens und Zusammenseins - Reparatur der Schule		
Beantragte, zu finanzierende Maßnahmen	- PV-Anlage für health post und meeting hall - Installation von 10 Lampen in der Krankenstation - 2 Trainingsstunden in Management und Handhabung der PV-Anlage - Reparatur der Schule: Dach, Boden, Wände der 3 Klassenräume		
Beantragte Summe SHS	10.750	EUR	
Eigenanteil Partner im EL		EUR	
Konfinanzierungsanteil		EUR	
Öffentliche Mittel		EUR	
Gesamtprojektsumme		EUR	
Folgekostenfinanzierung	Folgekosten für den Unterhalt der PV-Anlagen können über Einsparungen an Diesel finanziert werden.		

*1) bitte nicht ausfüllen

Appendix 4: MOU on showcase project

MOU on the General co-operation

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນາຊາດອັນດີ

ສະຫະສະມາຄົມພັດທະນາສາດແລະວິທະຍາສາດ ແຕ່ງຊາດ
ສະມາຄົມພັດທະນາຄຸນຄົນແລະສິ່ງແວດລ້ອມ

ປ. ກອງເໝືອງ ວັນທີ 02/04 / 2009
ເລກທີ 012 / ທນຊສ

ບົດບັນທຶກ ການປຶກສາຫາລື ເພື່ອການຮ່ວມມື
ລະຫວ່າງ
ບ້ານ ກອງເໝືອງ
ແລະ
ສະມາຄົມພັດທະນາຄຸນຄົນ ແລະສິ່ງແວດລ້ອມ

- ສິ່ງ ໃຜ່ການປຶກສາຫາລືລະຫວ່າງ ປະທານສະມາຄົມພັດທະນາຄຸນຄົນແລະສິ່ງແວດລ້ອມ ແລະຄະນະປຶກສາ ບ້ານກອງເໝືອງ ເຂດບຸຊຸ, ເມືອງຮຸນ ແຂວງອຸດົມໄຊ ໃນວັນທີ 13 ມີນາ 2009

ສະມາຄົມພັດທະນາຄຸນຄົນແລະສິ່ງແວດລ້ອມ(ທນຊສ) ພ້ອມໆ ໃນຈຳນວນສະມາຄົມທີ່ປຶກສາອົບຮົມໃນ ສປປ ລາວ, ຊຶ່ງໄດ້ຮັບການສ້າງຕັ້ງຂຶ້ນໃນວັນທີ 26/02/2004, ໃນຕົ້ນປີ 2007, ສມຊສ ໄດ້ເຊັນສັນຍາຮ່ວມມືກ່ຽວກັບໂຄງການ ສ້າງເສີມການບໍາ ໄຊ້ພະລັງ ງານທົດແທນສ່າງມີປະສິດທິພາບໃນປະເທດສ່າງມີປະສິດທິພາບ ຫຼື ເອີ້ນວ່າໂຄງການ REEPRO, ຜ່ານລາຍລະອຽດແມ່ນລະບຸໄວ້ໃນສັນຍາ.

ກິດຈະກຳຫຼັກຂອງໂຄງການ REEPRO ແມ່ນການທົດແທນສ່າງມີປະສິດທິພາບ, ຄຸ້ມຄອງ ແລະ ຈັດຕັ້ງຄຸ້ມຄອງກ່ຽວກັບເລື່ອງພະລັງງານທົດແທນໃນເຂດລະດັບ ຄື: ມີກະດັບຊັງຄຊານ, ມີກະດັບວິຊາບາການ, ແລະມີກະດັບທຳອິດຊຶ່ງ ບັນາໄຊ້. ຈຸດປະສົງຂອງໂຄງການ ມີກະດັບຄຸ້ມຄອງເປັນລະດັບ ຄວາມຮູ້ ກ່ຽວກັບ ພະລັງງານທົດແທນສ່າງມີປະສິດທິພາບ ໃຫ້ແກ່ປະ ຊາຊົນໂດຍສະເພາະໃຜ່ການຕິດຕັ້ງ ແລະ ການບົດລະບົດອັດສາທິສະຫັງການມີຜ່ານຮ່ວມໃນການສ້າງເສີມການບໍາ ໄຊ້ພະລັງ ງານທົດແທນສ່າງມີປະສິດທິພາບ ໃນ ສປປ ລາວ ແລະ ກັບປູ່ເຈອ

ໃນການທົດສອບຄຸ້ມຄອງ ວິຊາບາການ ແລະ ບັນາໄຊ້ທຳອິດຊຶ່ງ ທີ່ມີການສ້າງໂຄງການໄດ້ຮັບເລື່ອກເລືອກ 6 ຄຸ້ມຄົນໃນທົ່ວປະເທດ. ຄຸ້ມຄົນເລົ່ານີ້ແມ່ນຈະໄດ້ຮັບການສ້າງເສີມ ໃນການພັດທະນາກ່ຽວກັບ ພະລັງງານທົດແທນ ສ່າງມີປະສິດທິພາບໃນຈຳນວນ ຄຸ້ມຄົນຕົວຢ່າງທີ່ໂຄງການອັດເລືອກ, ເຂດບຸຊຸ ເມືອງຮຸນກໍ່ເປັນບ້ານທີ່ໃຜ່ການຈັດຕັ້ງປະຕິບັດ ເປັນຄຳລະ ມີເອກະ ຂອງໂຄງການ REEPRO ໃນການສ້າງເສີມເລື່ອງພະລັງງານທົດແທນ ສ່າງມີປະສິດທິພາບ ປ. ກອງເໝືອງ ເຂດບຸຊຸ, ສ້າງເປັນບ້ານສ່າງມີປະສິດທິພາບໄດ້ຮັບການຕິດຕັ້ງໄຟ້າແສງຕາເວັນ ດັ່ງນັ້ນການສ້າງໂຄງການໂຄງການ REEPRO ຈະໃຫ້ການຮູ້ຄຸ້ມຄຸ້ມຄົນ ຄຸ້ມຄົນກັບບຸ້ມຄົນໃຊ້ໄຟ້າແສງຕາເວັນ ເພື່ອໃຫ້ຮູ້ເຂົ້າຮ່ວມເລົ່ານັ້ນ ຜູ້ຈັດຕັ້ງລະບົດອັດສາ ແລະບໍາ ໄຊ້ສ່າງມີປະສິດທິພາບ ແລະສາວພາບ.

ກໍລະນີສຶກສາຢູ່ບ້ານ ກອງເມືອງ ເຂດບູແລ

ສມຊສ ແລະ ອໍານວດການປົກຄອງ ບ້ານ ກອງເມືອງ ໄດ້ຕົກລົງເປັນເອກະພາບກ່ຽວກັບເລືອກເອົາບ້ານກອງເມືອງ ເປັນ ບ້ານ ກໍລະນີສຶກສາໂດຍແມ່ນໂຄງການ ສິບໄປ້ (REEPRO) ເປັນຜູ້ສະໜັບສະໜູນ ດັ່ງນີ້ເນື້ອໃນດັ່ງນີ້:

- ມີແຜນ, ຄ່າຕິດຕັ້ງ ແລະ ພິກອົບຮົມການນໍາໃຊ້ລະບົບໄທ້ອາສາງຕາເວັນໃຕ້ມີປະສິດທິພົນ ຈໍານວນໜຶ່ງຄູ່ຄູ່ ສາສາວາ ສໍາລັບແສງສະຫວ່າງໃນອາມກາງຄືນ, ຊຶ່ງປະກອບດ້ວຍຕໍ່ເກັບຄວາມເຂັ້ມ 1 ຄູ່ ເພື່ອເກັບຄວາມເຂັ້ມ ອັກຊັນ ແລະ ໃຊ້ສໍາລັບໂທລະໂສ່ງ
- ມີແຜນ, ຄ່າຕິດຕັ້ງ ແລະ ພິກອົບຮົມການນໍາໃຊ້ເມັ່ນແສງຕາເວັນໃຕ້ມີປະສິດທິພົນ ຈໍານວນ1 ໜ່ວຍ ສໍາລັບແສງ ສະຫວ່າງ ຢູ່ຫ້ອງປະຊຸມບ້ານ ໂດຍສະເພາະແມ່ນເວລາປະຊຸມອາມກາງຄືນ

ພິກອົບຮົມຂອງ REEPRO

ໂຄງການREEPRO ຈະສະໜັບສະໜູນການປິກອົບຮົມໃນເຂດບູແລ ຊຶ່ງມີເນື້ອໃນດັ່ງນີ້:

- ພິກອົບຮົມລະດັບ2 ເນື້ອໃນລະດັບວິຊາການ ໃນພື້ນທີ່ກ່ຽວກັບໄທ້ອາສາງຕາເວັນ, ຊີວະພວນ ແລະ ຜູ້ປະກອບ ການ
- ພິກອົບຮົມລະດັບ3 ເນື້ອໃນ ຜູ້ນໍາໃຊ້ (ລະດັບຫ້ອງຖິ້ມ) ໃນພື້ນທີ່ ການກໍາສະເໜີເລື່ອງພະລັງງານທົດແທນ, ຄຸນ ປະໂຫຍດຈາກການນໍາໃຊ້ພະລັງງານທົດແທນ, ການບິດລະບັດຮັກສາລະບົບໄທ້ອາສາງຕາເວັນ, ແລະການສາທິດ ກ່ຽວກັບ ເຕົາປະຕິບັດ.

ຊ່ວງໄລຍະເວລາ:

- ບົດບັນທຶກດັ່ງກ່າວນີ້ແມ່ນເຂັ້ມກ່ຽວກັບໄທ້ອາສາງຕາເວັນຊຸມຮ່ວມກັນຈົບເຖິງວັນທີ 31 ທັນວາ 2009.

ແບ່ງເນັ້ນຄວາມຮັບຜິດຊອບ ສມຊສ CDEA:

- ສມຊສ ມີໜ້າທີ່ຮັບຜິດຊອບ ການປະສານງານ, ຈັດຕັ້ງປະຕິບັດ, ຕິດຕາມ ແລະ ລາຍງານໜີ້ໄດ້ຮັບແລະຄວາມ ຄືບໜ້າໃນລະຫວ່າງ ແລະ ຫຼັງຈາກການປິກອົບຮົມ.
- ສມຊສ ຈະປະສານຕົນຕົນ ແລະ ຮ່ວມມືກັບໜ່ວຍງານຂອງໂຄງການ ສິບໄປ້ ເພື່ອຈັດພິກອົບຮົມກ່ຽວກັບການ ນໍາໃຊ້ ແລະ ສ້ອມແປງໃຫ້ກຸ່ມເກົ່າໃຊ້.
- ທຶນງານຂອງໂຄງການ REEPRO ຈະສະໜັບສະໜູນ ດ້ວຍງົບປະມານເພື່ອ ກໍລະນີສຶກສາ.
- ທຶນງານລາວໃນໂຄງການ REEPRO ຈະຮັບຜິດຊອບ ການອອກແບບ, ຕິດຕັ້ງ ແລະ ສອນປຶ້ມການນໍາໃຊ້ ລະບົບໄທ້ອາສາງຕາເວັນ ໃນກໍລະນີສຶກສາ
- ທຶນງານລາວໃນໂຄງການ REEPRO ພິກອົບຮົມກ່ຽວກັບການບິດລະບັດຮັກສາ ແລະ ກໍາໃຊ້ ໃຫ້ກັບຊາວບ້ານ ໃນເຂດບູແລ
- ສມຊສ ຈະຈັດວຽກໜ້າໃຫ້ອໍານວດການປົກຄອງ ບ້ານ ກອງເມືອງ ຮັບຊອບລ່ວງໜ້າກ່ອນຫຼັງທີ່ຈະມີການ ພິກອົບຮົມ

- ສະຖານ ຈະລາຍງານທຸກໆສາມເດືອນ ກ່ຽວກັບເລື່ອງກໍ່ລະເມີນໃນເມັດກະໄສໃຫ້ສໍາມາດການປົກຄອງ ບ້ານ ກອງເພື່ອງຮັບຮຽນທຸກໆສາມເດືອນ

ບ້ານ ກອງເພື່ອງ:

- ບ. ກອງເພື່ອງ ຈະຮ່ວມມືໃຫ້ກອງສະໜັບສະໜູນ ແລະ ຊ່ວຍເຫຼືອຊັບພື້ນຖານສໍາລັບການຕິດຕັ້ງລະບົບໄປຜ້າແສງຕາເວັນ ໃສ່ສຸກສາລາ ແລະ ຕ້ອງປະດູນ ຊຶ່ງເວລາຕິດຕັ້ງ ຊາວບ້ານ ຈະປະກອບສ່ວນ ແສງງາຍ ແລະ ຄຸປະກອນທີ່ມີ
- ບ້ານ ກອງເພື່ອງຈະໃຫ້ ຄວາມສະເໝີພາບ ທຶນງານຂອງໂຄງການ REEPRO (DGS, FFRC, EFEC, CDEA, NUOL, ແລະ STR) ໃນການຕິດຕາມກວດກາ ການຕິດຕັ້ງ (ລະບົບໄປຜ້າແສງຕາເວັນ), ການຝຶກອົບຮົມ ແລະ ຫາງດ້ວຍເອກະສານຕ່າງໆທີ່ກ່ຽວຂ້ອງກັບໄພຜ້າ
- ບ້ານ ກອງເພື່ອງ ຈະໃຫ້ກອງສະໜັບສະໜູນ ແລະຮ່ວມມືສ້າງເຕັມທີ ໃນເວລາການຝຶກອົບຮົມຂອງໂຄງການ REEPRO ມາຈັດຝຶກອົບຮົມ.

ທັງສອງຝ່າຍ ໄດ້ເຫັນດີເປັນ ເອກະພາບຮ່ວມກັນຕາມທີ່ໄດ້ລະບຸໄວ້ຂ້າງເທິງທຸກຝ່າງ, ສະນັ້ນ ຈິ່ງໄດ້ ເຮັດບົດບັນທຶກສະບັບນີ້ໄວ້ ເພື່ອເປັນບ່ອນຖືກໃນການຮ່ວມມື.

ພາຍເຫດ ບົດບັນທຶກສະບັບນີ້ ຈະໄດ້ເຮັດເປັນສອງພາສາ ຄືພາສາລາວ ແລະ ພາສາອັງກິດ, ມີຄວາມສັກສິດເທົ່າທຽມກັນ.

1 ຄູດາມອບໃຫ້ ສະພາຄົມພັດທະນາຊຸມຊົນ ແລະສິ່ງແວດລ້ອມ, ຫາສາເລ່ອລະມັນ ເພື່ອເປັນບ່ອນຖືກອີງໃນການຄຸ້ມຄອງ

1 ຄູດາມອບໃຫ້ _____

1 ຄູດາມອບໃຫ້ _____

ປະທານ ສະພາຄົມພັດທະນາຊຸມຊົນ ແລະສິ່ງແວດລ້ອມ
 President of CDEA

 Khampha KEOMANICHAN

ບ້ານ ກອງເພື່ອງ
 Khongmuang Village

 ບຸນ ຫາມ ອຸໂສ ຈິມ

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Lao Union of Science Engineering Association
Community Development and Environment Association
No: __012/CDEA

Khongmuang, dated_02/04/2009

MEMORANDUM of UNDERSTANDING
COMMUNITY DEVELOPMENT AND ENVIRONMENT ASSOCIATION
BETWEEN
KHONGMUANG VILLAGE
And
Community Development and Environment Association (CDEA)

- Based on the agreement made amongst Community Development and Environment Association and Khongmuang Administration on dated 13 March 2009

Community Development and Environment Association (CDEA) is one of the non-profit associations in Laos, established in 2004. In early 2007, CDEA had made the collaboration agreement in the REEPRO project "Promotion of the Efficient Use of Renewable Energies in Developing countries" as detail mentioned in the project agreement.

REEPRO project had main consisted of the development and performance of an extensive training programme on renewable energies for stakeholders from energy experts to villagers. The REEPRO training programme shall update the knowledge of the stakeholders and improve the quality renewable energy installations and their maintenance and promote the use of renewable energy in Laos and Cambodia.

The project team had selected 6 communities for the implementation of the level 2 and 3 training programmes. Those communities will encourage developing and implementing RES show case-pilot applications of renewable energy technologies. Oudomxai was selected as REEPRO pilot community with the Phouse zone in Hound district as area for the application of a REEPRO show case to promote of renewable energy technologies. Khongmuang is the centre of Phouse zone and all households in this village are already equipped with solar home system.

The REEPRO team will help the solar home system owners to encourage their systems and to operate them sustainably.

Pouse zone Show case

KHONGMUANG and the Community Development and Environment Association (CDEA) agree to jointly implement the Pouse zone show case in the frame of the REEPRO project. The following show case was agreed:

- Planning, Installation and sustainable operation of a Solar Home System set for lighting at night in the health post, including one cooling system for vaccine preservation and one loud speaker
- Planning, Installation and sustainable operation of a Solar Home System set for lighting in the meeting hall, and provide training on use of Solar Home System

REEPRO Trainings

The REEPRO project team will provide the following training program in the Pouse zone:

- Level 2 trainings -technician training, consist of the course of Photovoltaic, biomass and entrepreneur
- Level 3 trainings-stakeholder training, consist of the course of introduction of renewable energy, benefit of using renewable energy, maintenance solar home system and demonstration of efficient use of the rocket stove.

Duration:

- This agreement will operate from the date of signing until the end of the REEPRO project, December 31, 2009.

CDEA:

- CDEA will have main responsibility in coordinating, conducting, monitoring and reporting the results, progress of the training programmes during and after project implementation.
- CDEA will conduct the training of renewable energy technologies through collaboration with the REEPRO project team.
- The REEPRO team will financially support the implementation of the REEPRO show cases.
- The lao REEPRO team will take over the design, installation and operation of the solar home systems as REEPRO show case.

- The Lao REEPRO team will development and perform training courses on operation and maintenance for the villagers in the Phouse zone.
- The CDEA will inform the KHONGMUANG village about any upcoming training in advance.
- CDEA will provide quarterly progress reports on the show case to KHONGMUANG.

Khongmuang:

- KHONGMUANG. will provide the logistic and basis for the installation of the solar home systems for the post health centre and the meeting hall. Villagers have to contribute while the program implementing in form of labor and resources that is available in their local.
- KHONGMUANG will provide full access for the Lao REEPRO team (DGS, FFRC, EFEC, CDEA, NUOL and STRI) to any installed PV system at the Phouse zone for training and documentation purposes.
- KHONGMUANG.will support the REEPRO trainings in the pilot community KHONGMUANG. by providing training facilities.

SUPPORT OF AGREEMENT

It is understood that both parties shall support and promote the spirit of this agreement to encourage the success of the REEPRO project.

Remark: This MOU will be translated into English and sent to International Solar Energy Society, German Section

President of CDEA

Khongmuang Village

Khampha KEOMANICHAN

MOU on the joint development of a electrification project for the post health centre, meeting hall and school

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນາຖາວອນ

ສະຫະສະມາຄົມ ວິທະຍາສາດ ແລະ
ວິສະວະກຳສາດ ແຫ່ງຊາດ
ສະມາຄົມພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມ

ເລກທີ 012 / ສພຊສ.
ບ້ານ ກອງເມືອງ, ວັນທີ 02 / 04 / 2009

ບັນທຶກ ການປຶກສາຫາລືເພື່ອການຮ່ວມມື
ລະຫວ່າງ

ສະມາຄົມພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມ ແລະ ນາຍບ້ານ ບ້ານກອງເມືອງ.

- ອີງໃສ່ ການປຶກສາ ຫາລື ລະຫວ່າງ ປະທານ ສະມາຄົມ ພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມ ແລະ ຄະນະປຶກຄອງບ້ານ ບ້ານກອງເມືອງ ເຂດພູແຊ, ເມືອງຮຸນ ແຂວງອຸດົມໄຊ ໃນມື້ວັນທີ 13 ເມສາ 2009.

- ນາຍບ້ານ ບ້ານກອງເມືອງ ໄດ້ສະເໜີຕໍ່ ປະທານສະມາຄົມ ພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມເພື່ອໃຫ້ຊອກຫາ ທຶນມາຊ່ວຍ ຕາມລາຍການດັ່ງລຸ່ມນີ້:
 1. ພະລັງງານແສງຕາເວັນ 1 ຊຸດ ເພື່ອແສງສະຫວ່າງ ແລະ ປະຊາສຳພັນທາງໂຟນີ ກັບຫ້ອງການສາທາລະນະສຸກເມືອງຮຸນ, ພ້ອມດ້ວຍຕັ້ງເກັບຄວາມເຢັນ 1 ຊຸດ ເພື່ອເກັບຮັກສາຢາວັກຊີນ.
 2. ພະລັງງານແສງຕາເວັນ 1 ຊຸດ ເພື່ອແສງສະຫວ່າງ ເວລາປະຊຸມ (ກອງປະຊຸມຊາວບ້ານ ຈັດແຕ່ກາງຄືນ ເພາະມື້ເວັນ ຊາວບ້ານໄປເຮັດວຽກ).
 3. ໂຮງຮຽນ 1 ຫຼັງ ປະກອບມີ 3 ຫ້ອງ ປ1, ປ2 ແລະ ປ3.
- ສະມາຄົມພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມ ໄດ້ນຳເອົາຂໍ້ ສະເໜີດັ່ງກ່າວໄປປຶກສາຫາລືກັບອີງ ການຜູ້ໃຫ້ທຶນ ຄື ສະມາຄົມ ພະລັງງານແສງຕາເວັນ ສາກົນ ສາຂາເຢັງຣະມັນ, ສະມາຄົມດັ່ງກ່າວເຫັນດີຈະຊອກຫາແຫລ່ງທຶນມາຊ່ວຍເຫຼືອ ໂດຍຜ່ານ ສະມາຄົມພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມ.
- ເມື່ອກິດຈະກຳດັ່ງກ່າວໄດ້ຖືກຈັດຕັ້ງປະຕິບັດ, ສະມາຄົມພັດທະນາຊຸມຊົນ ແລະ ສິ່ງແວດລ້ອມ ມີ ໜ້າທີ່ ຕິດຕາມກວດກາ ການນຳໃຊ້ ແລະ ການປົກປັກຮັກສາເປັນແຕ່ລະໄລຍະທີ່ເໝາະສົມ. ສະມາຄົມ ພະລັງງານແສງຕາເວັນ ສາກົນ ສາຂາເຢັງຣະມັນ ສາມາດ ມາຢັ້ງມຢາມ ກວດກາ

ແນະນຳດ້ານເຕັກນິກ, ການນຳໃຊ້ ແລະ ການປົກປັກຮັກສາ ຕາມໂອກາດທີ່ເໝາະສົມ.

➢ ຖ້າມີຄວາມຈຳເປັນດ້ານແຮງງານ ແລະ ວັດສະດຸທ້ອງຖິ່ນທີ່ຫາໄດ້ ຊາວບ້ານຍິນດີ ໃຫ້ການຮ່ວມມື. ທັງສອງຝ່າຍ ໄດ້ເຫັນດີເປັນ ເອກະພາບຮ່ວມກັນຕາມທີ່ໄດ້ລະບຸໄວ້ຂ້າງເທິງທຸກຢ່າງ, ສະນັ້ນຈຶ່ງໄດ້ ເຮັດ ບົດບັນທຶກສະບັບນີ້ໄວ້ ເພື່ອເປັນບ່ອນອີງສຳລັບການຮ່ວມມືໃນຕໍ່ໜ້າ.

- ໝາຍເຫດ: ບົດບັນທຶກສະບັບນີ້ ຈະໄດ້ແປເປັນພາສາອັງກິດ ແລ້ວສົ່ງໃຫ້ ສະມາຄົມ ພະລັງງານ ແສງຕາເວັນ ສາກົນ ສາຂາເຢັງຣະມັນ ເພື່ອເປັນບ່ອນອີງໃນການໃຫ້ການຊ່ວຍເຫລືອ.

ປະທານ
ສະມາຄົມ ພັດທະນາຊຸມຊົນ
ແລະ ສິ່ງແວດລ້ອມ



ຄາພາ ແກ້ວມະນີຈັນທິ

ນາຍບ້ານ
ບ້ານ ກອງເມືອງ



ຍັງຍືນໂດຍ

ຫົວໜ້າທ້ອງຖານເມືອງ ຮຸນ



ທຄາເກັດ ພິນທະວິງ

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Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Lao Union of Science Engineering Association
Community Development and Environment Association
No: __012/CDEA

Khongmuang, dated_02/04/2009

MEMORANDUM of UNDERSTANDING
COMMUNITY DEVELOPMENT AND ENVIRONMENT ASSOCIATION
BETWEEN
KHONGMUANG VILLAGE

- Based on the agreement made amongst Community Development and Environment Association and Khongmuang Administration on dated 13 March 2009

WHEREAS

KHONGMUANG had applied the request to the Community Development and Environment Association (CDEA), with the need of

- To install of the Solar Home System one set for lighting at night in the health post, including
one cooling system for vaccine preservation and one loud speaker
- To install of the Solar Home System one set for lighting in the meeting hall, and provide training on use of Solar Home System
- To repair primary school at grade 1, 2 and 3

CDEA had applied and discussed with the International Solar Energy Society, German Section, and they had agreed to find the possible sources of funding to support as the request. This support would be transferring through Community Development and Environment Association (CDEA).

When or while this project activities implement and implementing, CDEA or DGS is able to monitor and follow up of the usage, techniques and maintenance of its system.

In necessity, villagers have to contribute in-kind, labor and resources that are available in their local areas to give collaboration during and after project. Both parties had made agreement upon the statement mentioned above. Therefore, this MOU had been made amongst two parties; in the collaboration of implementing this project.

Remark: This MOU will be translated into English and sent to International Solar Energy Society, German Section

President of CDEA

Khongmuang Village

Approved by

District Governor