


EIE-06-256 REEPRO

Intelligent Energy  Europe

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

REEPRO Level 1 Train the Trainer Programme –

Training kit Editing workshop

Laos, March 7<sup>th</sup>, 2008

Report

Location :

The Lao-Korean E-governance Centre.

National Authority for Science and Technology

Nahaidieo. Vientiane capital. Lao PDR

March 2008

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## 1 Background

The REEPRO TOT\_L1\_training kit editing workshop was held on 7<sup>th</sup> March, 2008 at the Lao-Korea E-Governance centre, Prime Minister Office. Some of the level I trainers, who have good teaching/training skills were invited to participate the workshop.

The training materials of the following modules, particularly presentation slides have been reworked and uploaded in project server.

**Table 1: Level 1 Training modules version 2**

	<b>course</b>	<b>module name</b>
<b>BA</b>	<b>BM/PV</b>	<b>Basics</b>
BA01	BM/PV	Renewable energy resources
BA02	BM/PV	Fundamentals of Electricity
BA03	BM	Biomass Basics
<b>BF</b>	<b>BM</b>	<b>Biofuel</b>
<b>BG</b>	<b>BM</b>	<b>Biogas</b>
BG01	BM	Microbial Basics
BG02	BM	Processes and Parameters of AD Systems
BG03	BM	Input and Output Materials and their Use
BG04	BM	Components of AD Systems
BG05	BM	Small AD Plants
BG06	BM	Dimensioning of big AD Plants, Example Calculation (optional)
BG07	BM	Dimensioning of small AD Plants, Example Calculation
<b>BU</b>	<b>BM/PV</b>	<b>Business (EN, FI, PD)</b>
BU01		Financial Analysis
BU02		Project Management
BU03		Financing Tools in Laos/Cambodia
BU04		Entrepreneurship
BU05		Tariff system calculation (optional)
<b>CS</b>	<b>BM/PV</b>	<b>Project (Case study Biomass)</b>
CS01		Photovoltaic
CS02		Biogas
GA	BM	Gasification
<b>IN</b>	<b>BM/PV</b>	<b>Introduction</b>
IN01		The REEPRO Training Programme
IN02		Introduction of the course participants
<b>PT</b>	<b>BM/PV</b>	<b>Power Transmission, Storage</b>
PT01		Electrical transmission grids
PT02		Electrical distribution grids
PT03		Safety in electrical distribution
PT04		Generator station
PT05		Battery charging concepts
PT06		Low Voltage Hybrid grids
<b>PV</b>	<b>PV</b>	<b>PV</b>
<b>ST</b>	<b>PV</b>	<b>Solar Thermal</b>
<b>EW</b>	<b>BM/PV</b>	<b>Excursion/Practical Work</b>

## 2 The workshop objective and methodology

The objectives of the training programme were:

- To Edit the level I training kit, considering the feedbacks of the 1<sup>st</sup> Level I Trainers' training
- **The methodology** of the editing workshop is as followed: Slides of each module of training kit were reviewed and then the comments, suggestions and opinions on the shown slides were given by the participants.

## 3 Participants

1. Dr Jan Kai Dolbemman	President, DGS
2. Dr Khamphone Nanthavong	Coordinator for the TOT Level 1, FE/NUOL
3. Assoc. Prof. Sengprasong Phrakonkham	Head, Electrical Engineering Department, FE/NUOL
4. Assoc. Prof. Sengratry Kythavone	Mechanical Engineering Department, FE/NUOL
5. Mr. Khampha Keomanichanh	Community Development and Environment Association (CDEA)
6 Mr. Thongvanh Vilayphonh	Mechanical Engineering Dept, FE/NUOL
7. Mr. Bounsou Matmanisone	Technology Research Institute (TRI)
8. Mr. Vongsavanh Chanthaboun	Lecture, Mechanical Engineering Dept, FE/NUOL
9. Mr. Sili Khoupnavong	Freelancer, Electricity contractor
10. Mr. Phonepaseuth	Staff, TRI
11. Mr. Volachit Piliyasouth	Staff, TRI

## 4 General considerations

The following considerations were taken into account while reviewing the presentations:

- The level I presentations are intended for trainers of level I and II, such people as staffs of local authorities (provincial departments or district offices of energy and mines, industry and commerce, ...); local craftsmen, entrepreneurs, or freelancers, engineers etc. Some of these people lack of knowledge/experiences in renewable energy. Probably many of them have only completed higher secondary or vocational education.
- Therefore, the presentations must be as simple, as easily understandable as possible. The deep training materials of more technological contents would provide confusion for trainers rather than good understanding.

## 5 The Outcome of the workshop

### 5.1 The general comments and suggestions

- As decided by the project meeting on February 6th in Karlsruhe, slides with only text should be avoided.
- Detailed Definitions, Massive text or tables with numerous of data/figures should be included into textbook or technical manual, but not slides
- More Simple diagram or/and pictorial illustrations should be put into slides, especially where only text or numerical information in order to provide easy understanding to trainees
- Complex diagrams/graph should be avoided; they could be placed into textbook
- Where possible, pictures of local trees, oil plants, systems, etc should be put in, instead of using European one
- Unclear (at least for local trainees) pictures/diagrams/illustrations should removed or to be replaced by easily understandable one

## 5.2 The general comments or suggestions for each module

### 5.2.1 Introduction (IN01 and IN02):

- All Participants agreed with the contents and presentations of this part.

### 5.2.2 Basics (BA): to limit number of slides of 45

- **BA01:** complex graphs/illustration should be removed (slides 5, 16, 17, 19, 24, 25, 30); to combine some identical slides into single one (12+13, 14-15, 36+37, 41+42). Resource assessment should be attached to relevant type of RES. The slides on biomass should include materials from Matthias (BA03)
- **BA02:** to combine slides 3+4; 5+6; to remove generator picture in slide 9, put in new picture into slide 11;
- **BA03:** the contents are too deep for trainers level II of the Least Developing Countries (LDC). Besides, materials on biogas digestion already included into biogas module and hence no need to put here.
- **Some slides on other RES** such as Geothermal, tidal, wave, etc should be included into BA slides (at least some pictures of geyser are shown)

### 5.2.3 Power Transmission (PT): PT01:

- Remove slide 2.
- Better to put the contents of slide 2, 4, 5, 10, 12 into explanatory or textbook.
- For slide 2 to provide pictures of high, medium and low voltage.
- Add pictures or schemes, illustrating electricity storing methods into slides 18, 19 instead of only text.
- Add battery structure pictures/diagram into more slides instead of slide 20
- Slides 21-22 are to be removed because they are too complicated for the local trainees
- Add pictorial illustration into slides 23, 24
- Remove slide 26

- For slide 32, it would be better if put some simple pictures of simple protective equipments, which are familiar or widely used in Cambodian and Lao Markets instead of text only

#### **5.2.4 Biofuel (BF01):**

- Remove slides 2-5: their contents are better to put into textbook or explanatory notes
- In order to provide easier understanding to local trainees, we suggest to use more pictures of tropical plants (such as palm, coconut, sunflower, jatropha, etc ) for illustrating various sources of bio-oil (slides 6, 8, 9, 10,11)
- Slides 7 are to put into text book or explanatory notes and should be more about tropical oil plants
- Remove slide 9: too “far” for local trainees
- We suggest not include so many slides on rap seed (just slide 11 would enough) because it is not known for our trainees. Slide content like slide No. 11 would be best solution: the picture(s), some overall data or characteristics.
- Remove Slides 12-13.
- Not include slide 14 (linseed)
- Combine slides: 16+18, remove slide 17; combine 23+24+26 and more pictorial/diagram illustrations
- Slides 25-27, 32-40, 42 → into textbook or explanatory notes only
- Remove slides 29, 31, 41: they would provide more confusion to the trainees

#### **5.2.5 Biogas (BG):**

- Obviously, the participants have a feeling that the materials are too “deep” for local trainees; microbial biology would make them more confused. Besides, the materials on large biogas plant they selves are excellent, but too complicated for local trainees. Therefore focus more on small digester would be better.

##### **BG01:**

- Remove slides 2, 3, 4
- In slide 5, diagram illustration of the process would be better, detailed materials→ into textbook or as explanatory notes
- Slide 8 is too complicated for the trainees
- Left figure in slide 9 and slide 11 are too high for trainees, better to remove
- Slides 12-13 better to be included into textbook or notes

##### **BG02**

- Slide 2 desirably to be simpler: just to illustrate the most important factors of influence
- Slides 2-8 are more appropriate for textbook or explanatory notes
- Trainees would get difficulty to understand slide 9, 10
- In classification of anaerobic processes: simple way to show all three processes and each process is in separate slide(s) (relevant slides are 11-15). Detailed Contents of these slides better to put into textbook or notes

### **BG03:**

- Table with a lot of figures/data or massive textual information should be placed into textbook or technical manual (slides 2-6, 8, 10-13, 17-22); some core information only could be presented in the slides;
- The Pictures desirably are related to reality of the least developing countries such as Cambodia and Laos. The Pictures of modern European systems may not provide any understanding for the local trainees (slides 7, 9, 15-16)

### **BG04: missing file**

#### **BG05:**

- In slide 3, if possible, simple illustration would be the best
- Detailed description of each BG digester type, its components and construction materials should be placed into textbook or technical manual
- In presenting digester type, desired structure of slides would include the following contents: picture or sketch/diagram of digester, some specific information and characteristics (advantages/disadvantages)
- Balloon, Horizontal, earth pit, Ferro cement types have no pictures, at least sketched illustrations would be needed (slides 18-21)
- Slide 22 better is to be illustrated by a pictures/diagram
- Contents of slides 23-25 → textbook/explanatory notes
- Building materials should be presented with pictures; detailed data/infos → textbook
- Actually, all digester's components/accessories should be shown in pictorial illustration/sketched diagram to provide easier understanding to trainees (slides 35-39)
- Detailed Benefits of biogas digester, biogas production, energy demand, etc should be placed into textbook instead (slides 40-42)
- Biogas digester sizing should be placed separately into practical exercise (slides 43-49)
- Some local pictures of small biogas accessories/components (stove, lamp, gas meter), pig stable, etc can be found from the Asia Pro Eco report (slides 50).
- Substrate types and management are to put into textbook, but for presenting slides: only illustration accompanied by some short information would be better
- Again, Slides 62-73, 76, 79 are to be placed into textbook/technical manual or as explanatory notes for trainers

#### **BG06:**

- Participants of editing workshop have suggested not to present this module to local trainees/technicians due to its complicity and still "far away" for our trainees

#### **BG07:**

- this module is OK

### **5.2.6 Business (BU):**

- The participants have recognized that this module is important and at the same time rather difficult for local trainees, who have not had basic education in this field. The suggestions are as followed:

- **BU01:** all difficultly understandable terminologies or definitions should be placed into textbook only, but not in the presentations for local trainees. The slides should include only the most popular financial terms of micro financial operations. Besides, more simple examples, desirably from the reality of LDC would be the positive.
- **BU02:** as the same suggestions as for BU01.
- **BU03:** TRI is to rework the presentation contents and slides, focusing only on those financial tools, which applicable for small scale financing in off-grid rural electrification and development
- **BU04:** as the same suggestions as for BU01-2, more simple examples of rural business establishment/creation/development

### 5.2.7 Gasification (GA):

- In order to reduce numbers of slides and therefore presented materials, some massive textual contents/tables are suggested to put into textbook or technical manual only.
  - Attached to each type of gasification process explanation text can be placed also into textbook or as explanatory notes of the slides
  - More pictorial/sketched diagram illustrations would be the positive for the trainees

### 5.2.8 Photovoltaic (PV):

- modules are to be uploaded

### 5.2.9 Lao Project case study:

- PV project case study is to be worked out for Ban Mane village in Khammuane province, Laos. Biomass case study – not yet sure what and where to choose

## 6 Other related matters

- After the market surveying in Vientiane by Kai, Khamphone and Khampha, NUOL team is assigned to design and produce prototype of training tool kit, using as much as possible locally available equipment, tools and materials, then to test it and report the test results to project management. Missing tools (e.g., compact energy meter) are to bring from Europe. The full set of training tool kits must be accomplished before the April training.
- The NUOL team, in collaboration with CDEA and TRI, is also to work out the project case study, for which Ban Mane village of Khammuane province has been identified
- The 2<sup>nd</sup> Lao training for TOT level 1 trainers is to be held on 28-29 April, 2008 at Vientiane capital. Venue is to be announced
- The 1<sup>st</sup> level 1 training by trainers in May 2008 is to be held in Thakhek, Khammuane province. The date is to be agreed during the 2<sup>nd</sup> training for TOT level 1 in April
- The first level 2 training is to be organized in July 2008. The venue not yet decided, but probably to be held in province (Southern or Northern)