

# FINAL TECHNICAL IMPLEMENTATION REPORT

DELIVERABLE D1A



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## Deliverable D1a

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# **Capacity and Institutional strengthening for Rural Electrification and Development - Decentralized Energy Options**

Intelligent Energy – Europe (IEE)  
COOPENER

**Final Technical Implementation Report (FR)**

**Period covered: from April 1<sup>st</sup> 2009  
to  
December 31<sup>th</sup> 2009**

Project Website: <http://www.cap-redeo.com>

## ABBREVIATION/ACRONYM

### **Cambodia**

CDEC	Local Cambodian engineering firm
DIME	Department of Industry, Mines and Energy (Province)
EAC	Electricity Authority of Cambodia
EDC	Electricité du Cambodge
HC	Health Center
HP	Health Post
JICA	Japan International Cooperation Agency
MIME	Ministry of Industry, Mines and Energy
MoEYS	Ministry of Education, Youth and Sport
MoH	Ministry of Health
MoP	Ministry of Planning, National Institute of Statistic
MPWT	Ministry of Public Works and Transport
OD	Operational district (administration office)
PPP	Public Private Partnership
REF	Rural Electrification Fund
RH	Referral Hospital
UoA	University of Agriculture, Department of Geographical System

### **Lao PDR**

DOE	Department of Energy/MEM
EDL	Electricité du Laos
MEM	Ministry of Energy and Mines
NUOL	National University of Laos
PDEM	Provincial Department of Energy and Mines
NGD	National Geographical Department, Office of Prime Minister
MoE	Ministry of Education
MoH	Ministry of Health
MIC	Ministry of Industry and Commerce

### **Common used**

DP	Development Pole
IPD	Indicator for Potential Development
HDI	Human Development Index
GIS	Geographical Information System
GPS	Global Position System

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# 1 Summary

## 1.1 Final Period Objectives

Started 3 years ago, the CAP-REDEO project finally reached its final step, and was completed successfully in time last December 2009.

This final report covers the implemented period from April 1<sup>st</sup> 2009 to December 31<sup>st</sup> 2009 which was not described in the last progress report. The objective of this report is to summarize the latest activities done for CAP-REDEO for the short period running from April 1<sup>st</sup> 2009 until now.

This report will also include a global summary of activities and results obtained for the whole project which is now finished.

To sum up the project, CAP-REDEO was created to answer to a strategic requirement from Lao PDR and Cambodia to develop technical capacity and to be endowed with hands on tools to direct investments and decide between off-grid and on-grid options, renewable or fossil fuel based off-grid production and priority areas from the perspective of maximizing development impact of scarce resources.

Both countries launched a Rural Electrification Programme some years ago and required support to improve rural electrification impact focusing on sustainable development and poverty alleviation by establishing effective cross sectoral linkages and improving planning capacities. This global objective was partially achieved using a specialized tool a.k.a. GEOSIM© and its integrated innovative approach.

In terms of results, the project main achievements were completed by the end of 2008 with the end of all training modules and the delivery of provincial rural electrification plans for two pilot provinces in Lao PDR and Cambodia (Khammuane and Kampong Cham).

The capacity building phase dedicated to electrification institutions in both countries (EDC, EAC, MIME and REF for Cambodia and EDL and MEM for Lao PDR) was also finished in the same time in 2008 and the final workshop marked the end of the planning and capacity building phase. Results and reports validated and produced are resumed on the various deliverables which can be downloaded from the project website.

The period from April to December 2009 was used by ETC to complete its own activities regarding business opportunities evaluation and stakeholder consultations at national level and for the selected provinces. Using the planning outputs and experience acquired on the field, many interviews were carried out and conclusions found are enclosed on the document annexes. The last provincial workshops were also organized for the period to discuss with local investors and electrification actors about such opportunities offered by the development of decentralised rural electrification projects and the potential improvements of national policies.

## 1.2 Achieved results and lessons learnt

### 1. Main achieved Results

The CAP-REDEO project pointed out innovative processes regarding the rural electrification planning and proposed - through participative provincial and national workshops and trainings - some relevant solutions to improve the methodology and tool used within concerned institutions.

The following aspects can be mentioned as main achievements from CAP-REDEO:

- ✚ Development of an alternative planning approach for rural electrification maximizing impact on population providing basic infrastructure services and affordable modern income generation opportunities
- ✚ Institution awareness among high level decision makers of the important role using a rational specialized model to improve planning efficiency and techniques
- ✚ Delivery of a Geographic Information System tool a.k.a. GEOSIM© dedicated to rural electrification planning, a complete GIS database for the country and trainings among local partners
- ✚ Development of rural electrification plans for 2 pilots provinces (Khammuane for Laos and Kampong Cham for Cambodia) in close collaboration with local and national partners with the help of GEOSIM®
- ✚ Identification and analysis of local business opportunities in the energy sector to promote local initiatives

The participative and integrated methodology implemented through the planning tool GEOSIM© was well accepted among partners where a lack of tools and support was strongly mentioned.

The project reinforced the cooperation between rural electrification actors for both countries providing a shared approach and tool to evaluate projects.

Regional plans developed with the collaboration of project's partners through the GEOSIM© methodology helped finally to develop electrification projects, from which the local population may benefit in the future, optimizing existing investments.

Specific training sessions at Provincial and National level were organized and regular meetings of the working groups as open workshops ensured sharing of exchanges and ownership building. The methodology implemented for the 2 provincial plans was finally achieved through a hands-on “learning by doing” approach wherein a focus group has been formed at the national level, and at the Provincial levels.

Given the efficiency of such a powerful tool, further work was also performed for MIME to evaluate grid extension project in the Kampong Cham province which demonstrated a strong support from MIME.

## 2. Lessons learnt

1- The GEOSIM GIS tool for electricity planning is particularly suited for governments, utilities and private enterprises at the provincial and local levels due to a lack of tools and knowledge in the rural electrification field. It offers an easy way to perform quickly some rural electrification plans and evaluate investments required for any electrification project including grid extension.

2- The project encountered some difficulties to train designed participants for a long period of time. Many training modules were conducted for 2 years but it appears that nominated attendants often changed from one training to the other due to a lack of availability or a change of responsibilities which limited the training impact for some institutions.

3- Importance of multi sectoral groups in such project to involve all rural development actors in the project.

4- To take rural electrification from planning to implementation, a dynamic sector is needed with a mix of capable and experienced governmental, private sector and civil society organizations. Whereas governmental organisations and utilities can be further strengthened, there is a strong need to build the capacity and to increase the number of civil society and private sector organisations operating in the rural energy sector at the national and the local level in both countries. Unless this institutional issue will be recognized and addressed, scaling-up of rural electrification will be difficult despite the increased availability of funds for rural energy.

## 3. Identified problems and corrective actions

### Data collection

Difficulties to get some reliable data concerning biomass potential due to different causes: information gathered at national level often underestimates the real potential in terms of production. The data is sometime obsolete or simply not available or very difficult to find and piece of information are spread and scattered into various services and organisations.

The creation of multisectoral groups was quite efficient to help data collection inside ministries.

The project encountered some difficulties finding local specialists for mini-hydro and biomass technology and potentials. However, with the help of Ministries of Energy from both countries and thanks to IED specialists, some solutions were found finally to evaluate potentials.

### Team modification

Many team changes occurred during the project life. Mr. Tuan Nguyen, IED project leader, was replaced by Mr. Cyril PERRET at the end of 2007.

Within ETC the most important problem was of internal nature as well: Mr. René Magermans, the ETC senior project manager on CAP REDEO, left also the organization unexpectedly at the end of 2008. This caused a serious delay in the implementation and finalization of the ETC tasks on the project, as contacts and trust with local stakeholders and consultants had to be built-up by putting other ETC experts on the project in both countries.



Mr. Jaap de Winter took charge of the ETC coordination for the project. The project initially planned to finish by the end of 2008 finally lasted until the planned end in 2009 due to this delay.

### **Trainings**

-One of the other key issues was to involve decision makers in the rural electrification methodology as much as possible, especially the specific tool GEOSIM® designed for them. So far, mainly engineers, and electrification specialist participated in the training sessions to update the database and run scenarios. For a more sustainable capacity building, it was also important to involve planning directors and decision makers, to make sure they understand the software capabilities.

A new training module intended for decision makers was then added to the regular training sessions to ensure decision makers understand this new approach provided by GEOSIM®.

-An important turnover was observed for the proposed training modules among attendants.

A progressive method for trainings is quite important and essential for participants to progress and be able to use by themselves the methodology and tool. But as some participants changed from one training session to another, it's even more important to integrate a complete summary of the previous steps into the training structure for each module.

## **4. Activities and impact after the end of the project**

Activities for CAP-REDEO are totally completed.

This very successful project demonstrates the efficiency of having a specific and broadcasted methodology and tool to prepare optimized electrification plans maximizing impact of sustainable projects on population. Both countries required, at the end, to extend this experience done within a pilot province to the whole country.

A project may succeed soon with Cambodia to prepare electrification plans for all provinces under French funds in 2010.

During the implementation of CAP REDEO, the rural energy NGOs LIRE from Laos and GERES from Cambodia joined the EASE network for knowledge sharing and learning on rural energy access, facilitated by ETC. This resulted among others in:

- ✚ Capacity building of LIRE and dissemination of pico-hydro turbines in rural areas through a joint project with LIRE in Laos.
- ✚ Dissemination of improved cook stoves for palm sugar production by small holders through a joint project with GERES in Cambodia.
- ✚ Information exchange with the Technical Training Program of ETC during the implementation of the CAP REDEO project resulted in a technical training project in Cambodia on medium voltage lines.
- ✚ Local organizations approached ETC for support to obtain funding for rural energy activities through the Finnish Energy and Environment Partnership.

## 2 Consortium management during the action

Cooperation between consortium members was very effective even if shared activities were not simultaneously done. IED completed its activities by the end of 2008 as planned while ETC, due to an important activity break caused by its former project coordinator departure completed its tasks only last December 2009. However, regular meetings held on the phone, on the internet or in the field were done with ETC to exchange information and coordinate actions and work plan. Identifying zones with high potential for development and areas concerned by off-grid rural electrification was indeed very important for all partners and strategic for the province study to have a consistent and global approach of the rural development. That's why, results from the decentralised energy supply option study from the IED team were also exchanged to orient ETC for their own investment program study. The biomass potential sites identified thanks to the GIS database were also areas likely to be searched for decentralised energy supply option project investors. In return, IED got some feedback from ETC field trips about those identified potentials.

A last meeting took place in Vientiane in July 2009 between Mr Cyril Perret (IED) and Mr. Jaap de Winter (ETC) and Mrs. Tamara Flink (ETC) to plan the remaining activities to be done by ETC in order to complete the project. Latest exchanges were done through the internet and Skype conferences.

With stakeholders, the cooperation was also very fruitful and the various meetings held at national and provincial level allowed sharing experiences and ideas on local issues drawing a realistic and adapted RE plan.

Various meetings and debriefings were held with local subcontractors in the same time. This cooperation was also decisive to collect consistent data to the multisectorial stakeholders, prepare and conduct provincial surveys and organize the various meetings, workshops and trainings.

The list of consortium project's team is as following (not included supporting technical and administrative staff):

- Project director : Anjali Shanker (IED)
- IED Project manager : Tuan Nguyen up to October 2007, and Cyril Perret from November 2007
- ETC Project manager : René Magermans up to December 2008, and Jaap De Winter from January 2009
- IED team members : Adrien Jacob, and Romain Frandji
- MIME team members : Tun Lean, Heng Kunleang
- EDC team members : Chan Sodavath
- MEM team members : Anousak Phongsavath
- EDL team members: Mr Bounnong

The project website was regularly updated by Mr. Cyril PERRET in charge of publication and offered for public dissemination, publishable reports for downloading.

## **Co-operation with other projects/ programmes**

As required by IEE project officer, cooperation was reinforced with local COOPENER projects.

In 2007, first collaboration contacts were done with DGS and IED on the **REEPRO** project. IED staff participated in the second meeting organised by the REEPRO coordinator and information has been exchanged between both projects.

New contacts were made for the few last months of CAP-REDEO's life and IED subcontractors participated in meetings held in Lao PDR and Cambodia for the **RESIREA** (Renewable Energy Sustainable Programs for Intelligent Rural Electrification and Poverty Alleviation) project and organized by Mr. Maigne, coordinator of the project.

Website information was communicated to both projects as well.

### 3 Progress of work plan and achievements

#### 3.1 Progress and achieved results per Work package

**Table 2: Final state of hours spent (in %) of the action per partner and per work package**

Work package	Actual/Planned Achievement - hours		IED	ETC *
	Actual	Planned		
WP 1: Management	Actual	1 073	81%	19%
	Planned	459	72%	28%
WP 2: Planning, institutional framework, policy: multisectorial integration of rural electrification	Actual	922	87%	13%
	Planned	629	90%	10%
WP 3: Provincial level Rural Electrification and development plans and policy elaboration	Actual	3 508	49%	51%
	Planned	1 650	62%	38%
WP 4: Training on tools and institutional /policy level capacity strengthening	Actual	1 620	64%	36%
	Planned	1 244	67%	33%
WP 5: Communication and dissemination	Actual	851	88%	12%
	Planned	832	60%	40%
WP 6: Common dissemination Activities	Actual	118	86%	14%
	Planned	98	67%	33%
<b>Total Action</b>	Actual	7 905	67%	33%
	Planned	4 912	68%	32%

#### **WORK PACKAGE 1: Management**

The successful work done demonstrated so far, that the global organisation set-up for coordination of this project was efficient enough. Most partners contributed largely to the different allocated tasks.

1/ Coordination with ETC was efficient thanks to many discussions and meetings held on the phone, by Skype or directly, either in IED office or during field missions. All reports and deliverables were submitted to ETC in order to exchange information on target areas and help ETC focusing on relevant local issues.

However, it appeared that ETC subcontractors in Laos (LIRE) and Cambodia were not always informed on all project aspects and what was done by IED. A few remarks coming from the last stakeholders meetings and consultations demonstrated a lack of information from their side.

2/ Communication with subcontractors was also very intensive and done sometimes on weekly or even daily basis. Local subcontractors (CDEC, Donekanoy Tiphason...) were

involved with most of the local activities such as surveying, collecting data and information, discussing with ministries, organizing meetings and workshops.

The cooperation with the Ministry of Industry, Mines and Energy (MIME) in Cambodia and the Ministry of Energy and Mines (MEM) in Lao PDR was excellent. This strong collaboration allowed the consortium to have the best working conditions possible for the project. Ministries were really concerned with data collection, workshop organisation and participation, and they took a large part of the project success.

We can also mention EDC Training Center which offered its facilities to hold trainings.

3/ The project website (see <http://www.cap-redeo.com>), regularly updated by IED simplified documents dissemination among stakeholders and workshop participants offering access to reports, newsletters, pictures, events program, training materials.

## **WORK PACKAGE 2: Planning, institutional framework, policy: multisectorial integration of rural electrification**

One of the great challenges of the project was to involve the local partners into the planning approach and have them concerned as much as possible with the adopted methodology for better cross sector collaboration.

A first phase set the creation of the multisectorial working groups. The following Stakeholders meetings pursued the collaboration of this leading group.

The multisectorial meetings allowed all participants to express their point of view and exchange ideas to reach consensus. All assumptions, parameters, indicators have been discussed at national and provincial level and were finally used as inputs for the planning tool GEOSIM.

The final results of discussed and assumed assumptions are described in detail within the documents provided in the annexes to this report (Spatial analysis, Load Forecast, Supply Options) or in the project website.

For the interim period, several tasks have been performed to complete data collected and analysed from the first stage described in the progress report. As information is not always available or consistent enough and may require some further enquiries, several informal meetings were done with the electrification actors (EDL for Laos and EDC and EAC for Cambodia) in order to complete the database and parameters needed for the GEOSIM planning tool.

Those previous “individual” meetings, carried out on electrification parameters, identification of existing MV lines and ongoing projects were finally decisive and very helpful to prepare and orient discussions during national stakeholders meeting. Utilities (EDL, EDC) and ministries (MoEM, MIME) as well as EAC provided a very productive contribution to the project needs.

## **WORK PACKAGE 3: Provincial level Rural Electrification and development plans and policy elaboration**

### **The GEOSIM software**

The development plans and policy elaboration is based on the methodology applied with the GEOSIM® software developed by IED. This methodology initiated and improved through past projects (REDEO, IMPROVES...) can be divided into 3 main inter dependant modules

- Spatial Analysis
- Load Forecast
- Supply Options

Because training sessions are following this 3 steps approach, then 2 versions have been used and delivered on the partners' computers for the interim period.

The first version was an intermediate version integrating 2 out of the 3 main GEOSIM® modules (Spatial Analysis and Load Forecast). It has been installed during the March/April 2007 training sessions to allow participants to train themselves.

The second version and final one was installed for the June 2007 training sessions. CDROM and licences were provided to each partner. This version offers the full GEOSIM functionalities to users and may already be used for others planning purposes than for CAP-REDEO planning.

### **List of Manifold® and GEOSIM® licences installed**

<i><b>Institution</b></i>	<i><b>Country</b></i>	<i><b>Number of licences</b></i>
MoEM (+ PDEM)	Laos	4
EDL	Laos	1
MIME (+DIME)	Cambodia	3
EAC	Cambodia	1
EDC	Cambodia	2
REF	Cambodia	1

Two additional licences have been installed too in subcontractors' computers.

The GEOSIM® software was delivered within a package including a **user guide** for each module.

### **Inputs**

One of the first steps of the GEOSIM® methodology was to collect multisectorial geo-referenced data to create a GIS database for the whole country. Manifold® GIS software was used to compile all those data collected among the multisectorial group by subcontractors.

Two main databases were created, one for Lao PDR and one for Cambodia. Those databases were finally finalized, updated and then handed over officially on CDROM to each stakeholder during the national Stakeholders meetings last March/April.

Because some data were quite difficult to collect, identify or compile, some collected data were concerning only pilot provinces. It was decided then to have a specific GIS database for the selected pilot provinces of Khammuane (Lao PDR) and Kampong Cham (Cambodia) where more information was available.

A CDROM was burned for each institution from both countries and included those 2 finalized databases (at national and provincial level).

The collected GIS data were checked and reprocessed, then integrated into the Manifold software by the subcontractor IT staff and classified into 5 different folders by types of data<sup>1</sup> – (1) Administrative folder, (2) Energy sector folder, (3) Infrastructures folder, (4) Multi-sector data folder and (5) Water resources folder.

These GIS data then were presented in thematic maps such as spatial distribution of electrification by provinces, districts, villages, population density, energy systems...

Regarding the thematic structure and presentation maps, we have the following structure (at least, its final organisation will be adapted according to the data availability and country's contexts):

- 1) Administrative (country, province, district, village)
- 2) Rural electrification where we should present
  - a. Electricity network
  - b. Groups diesels, substation, SHP, PV, Biomass
  - c. REE or PESCO with number of customers, installed capacity
  - d. Villages electrified, non electrified
- 3) Energy sector data :
  - a. its control area and
  - b. network, power plants, substation
  - c. at district level : % of EDC customer (/household), MV & LV density (per household), consumption/households (from statistical handbook)
- 4) RE Indicators :
  - a. Country level : population, density, % of households has access to electricity, consumption per capita
  - b. Provincial level : same as country level
  - c. District level: same as country level
- 5) Multi-sector data :
  - a. Health : different type of health centers, drinking water systems
  - b. Education : schools, number of students
  - c. Local economy: bank services points, markets,...
  - d. Infrastructure and others (roads, river, lakes, others layers)
- 6) Spatial analysis
  - a. IPD and Development Centres
  - b. Hinterland,
  - c. Accessibility

### **Surveys**

As a main means to check the reliability of collected data at village and household level, and also in order to complete missing information, many surveys were conducted in both pilot provinces (Khammuane and Kampong Cham) for some selected villages by the subcontractor teams.

The results of these surveys were consigned on the Load forecast report. Main indicators were then calculated and compared with previous surveys' indicators to find the most relevant figures to be used for the rural electrification plan and for the GEOSIM model. The final indicators were also discussed during stakeholders meetings and workshops.

### **Scenarios**

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<sup>1</sup> The final structure of the GIS national database may vary, depending on the data availability and contexts (REE in Cambodia and PESCO in Laos, for example)

Based on this GIS database, and using the agreed indicators and assumptions discussed at meetings, several scenarios have been identified to electrify the selected pilot provinces. The scenario results that were given by GEOSIM were analysed and discussed again for the Mid-term workshop.

Each scenario was discussed with stakeholders, then modified and results were finally consigned into the Network Options report.

### **Formulation of provincial level policies**

Many interviews were conducted by ETC during the last stakeholders meetings with private sector and institutions representatives. Conclusions ended up to recommendations resumed on the last deliverable enclosed.

## **WORK PACKAGE 4: Training on tools and institutional / policy level capacity strengthening**

One of the main tasks to accomplish with CAP-REDEO was to implement various training sessions in order to improve knowledge on rural electrification among stakeholders at national and provincial level.

With the help of subcontractors, a complete cycle of training modules were organized in both countries.

Attendants were designated by the project partners because of their computers skills and their ability to understand rural electrification issues. More than 8 to 11 participants followed the training module per country.

- ✚ The modules A- database structuring and management and B- Energy and development links, impacts and indicators have been carried out during the kick-off meeting week in Vientiane 3-5 April 2007 (see inception report for more details).

- ✚ Trainings were held on 25-27 September 2007, at the EDC Training Centre in Phnom Penh and on 8-10 October 2007, at VOPS training office in Vientiane. The training was provided by two experts from IED with support from local staffs.

In Phnom Penh, 11 participants from different governmental institutions being involved in the rural electrification planning sector were invited as participants– 5 from MIME, 2 from EDC, 2 from EAC and one from REF. In Vientiane, 8 participants from MEM, EDL, PDEM and subcontractors SV Company & Sensavang Co. Ltd participated in the three-days training.

During this period, three modules were proposed to stakeholders in Cambodia and Lao PDR:

- GIS and Manifold functionalities ( Basic notion)  
*Training Implementation ID: C*
- Module D – GIS rural electrification tool – Module “Spatial analyst” of the GEOSIM model  
*Training Implementation ID: D*
- Module F – Load forecasting analysis: backgrounds and exercises on bottom-up approach.  
*Training Implementation ID: F*

Some others trainings were programmed as mentioned below:

- ✚ Training courses on "Spatial Analysis", "Load Forecast" and "Advanced GIS", Phnom Penh (Cambodia) 26-28 March 2008.



- ✚ Training courses on "Spatial Analysis", "Load Forecast" and "Advanced GIS", Vientiane (Lao PDR) 7-9 April 2008.

The objectives of the two training sessions were to:

- Develop a better understanding of GEOSIM Load Forecast and Spatial Analyst modules
- Acquire a Practical knowledge of GEOSIM
- Learn how to analyze results and sensitivity factors
- How to edit results through maps (with Manifold), reports (with GEOSIM)....

The training strategy generally involved the presentation of concepts using computer projector displays. Lecture notes were provided for each section of the course. During the training of software, the trainer led participants through computer exercises using a computer projector display which was identical to the display on participants' computers, while the other trainers assisted participants on a one-to-one basis.

*Training Implementation ID: D-F-G*

- ✚ RE planning methodology and GEOSIM use training for planners and decision makers in Vientiane 1,3 June 2008

The main objective was to provide an exhaustive overview of GEOSIM software and the used methodology through a practical study case. This intensive training was especially dedicated to final users to give a real insight of the software capability.

*Training Implementation ID: E-G*

- ✚ Technical Training courses on "Supply options" in Thakek (Khammuane province) 5-6 June 2008

- ✚ Technical Training courses on "Supply options" in Kampong Cham (Kampong Cham province) 9-10 June 2008

The objectives of the two training sessions were to:

- Understand the GEOSIM supply options module concepts
- Update the model data and parameters and run it
- Analyze Supply options module results
- Review the whole planning methodology and prepare a new plan

This training, in the same way as the trainings done 2 months before, gave a technical view of the methodology and also strengthened the technical skills required to run the whole GEOSIM model.

*Training Implementation ID: F-G*

Trainings sessions were also supported respectively by MIME, EDC training centre and MEM and the ministries facilitated the overall organisation by sending invitation letters, mobilising their staff for provincial trainings...



*Training course – Thakek (5 June 2008)*



*Training course – Kampong Cham (10 June 2008)*

To be more effective, some training packages were divided into several sessions. Introduction was given first for some modules, to give a first insight and help users to understand the concept. Then a second more comprehensive session was given once the concepts were understood which allows for a better technical understanding.

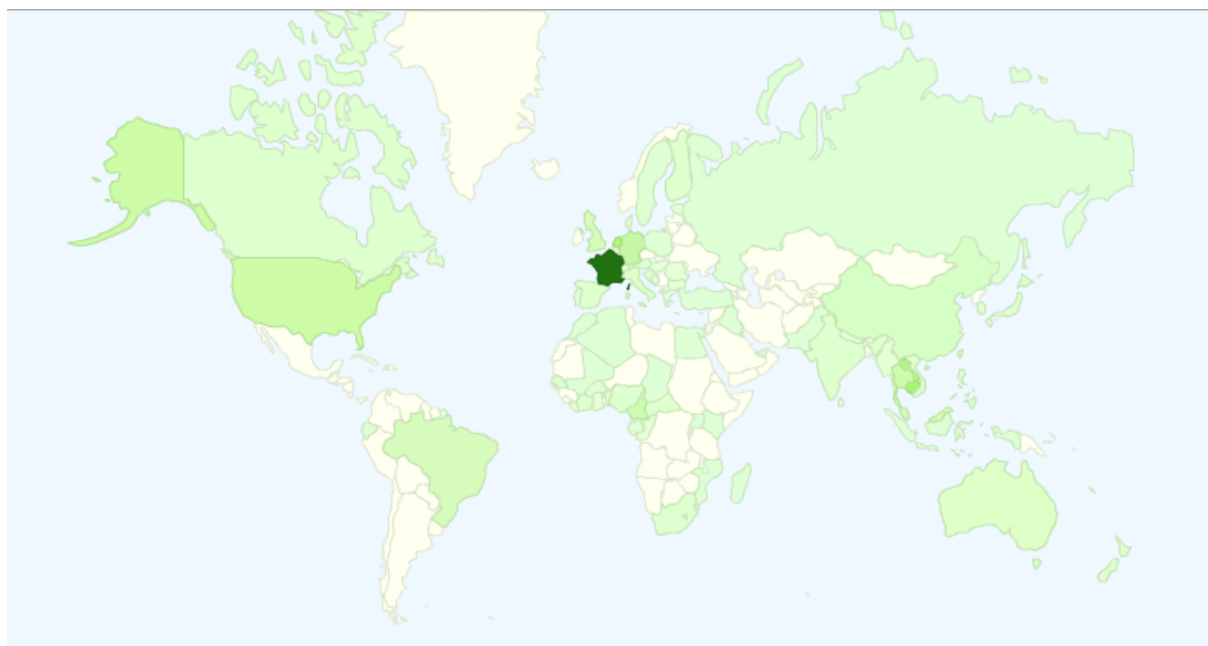
Trainings sessions offered also the opportunity to check and install the GEOSIM software into dedicated computers from institutions. All the used trainings materials was also delivered to training participants including a soft copy and hard copy of PowerPoint presentations, user guides (translated for some of them), exercises , quick step guides, documents (questionnaire for surveys..). A complete GIS database was also provided with GEOSIM software with the country / province data.

## **WORK PACKAGE 5: Communication and dissemination**

### Project Website

A project website was created during the first months of the project period. Since then, it was regularly updated following the project pace and proposing for public dissemination: information on rural electrification and development in Lao PDR and Cambodia, various internet links, materials used for the project, reports edited, pictures, newsletters...

The website statistics gave a good idea of visitors' frequency. The website got more than 1600 visits for 30 months of functioning from 85 countries around the world.



*CAP-REDEO website visiting countries*

Visites		Pages par visite		Temps moyen passé sur le site	
<b>1 599</b>		<b>5,06</b>		<b>00:03:47</b>	
Total du site (en %) : 100,00 %		Moyenne du site : 5,06 (0,00 %)		Moyenne du site : 00:03:47 (0,00 %)	
Niveau de détail : Pays/Territoire					Visites ↓
1.	France				458
2.	Cambodia				129
3.	Netherlands				111
4.	Laos				108
5.	Germany				66
6.	United States				61
7.	Cameroon				56
8.	Thailand				54
9.	Malaysia				40
10.	United Kingdom				37

*Top 10 visiting countries (per visits)*

### Multisectorial working group at national and provincial level

Working groups were built up at national and provincial level. National partners such as MIME, MEM, EDC, EDL, REF and EAC took part of the national multisectorial working as main members. Some people from others ministries involved with rural development attended also to the national stakeholders meetings such as Ministries of Health, Education, Industry... The provincial representatives of key partners from Khammuane and Kampong Cham provinces took part in the provincial stakeholders group.

Many meetings were then regularly organized to inform and exchange with stakeholders at national and provincial level as listed below:

- ✚ The first meeting jointly held for Cambodian and Lao stakeholders in Vientiane April 3<sup>rd</sup> 2007. This meeting was held jointly with the kick-off meeting to introduce the project, its objectives and activities to all concerned parties. It was decided to have informal multistakeholder groups with core stakeholders from energy players (ministries, utilities, regulators, private companies).
- ✚ The core stakeholder meeting was held on 1<sup>st</sup> June 2007 at MIME office with the presence of H.E Tuan Lean, Director General of energy of MIME. The participants were EDC, EAC, REF, CDEC and IED representatives.
- ✚ National multistakeholder meeting in Phnom Penh, on 1/10/2007, with participation from sector-wide representatives of concerned ministries and organisations. To present the database, the preliminary results and finalise the adopted analytical grid for Cambodia.
- ✚ National multistakeholder meeting in Vientiane, on 11/10/2007, with participation from sector-wide representatives of concerned ministries and organisations. To present the database, the preliminary results and finalise the adopted analytical grid from Laos.
- ✚ Provincial multistakeholder meeting in Kampong Cham province (Cambodia) on September 28<sup>th</sup> 2007.
- ✚ Provincial multistakeholder meeting in Khammuon province (Lao PDR) on October 5<sup>th</sup> 2007.
- ✚ National multi-stakeholder meeting in Phnom Penh – 25 March 2008
- ✚ National multi-stakeholder meeting in Vientiane (Lao PDR), 4 April 2008
- ✚ Provincial stakeholder meeting in Thakek (Khammuane province) 5-6 June 2008
- ✚ Provincial stakeholder meeting in Kampong Cham (Kampong Cham province) 9-10 June 2008
- ✚ Provincial multi-stakeholder meeting in Vientiane (Lao PDR), 22 June 2009
- ✚ National multi-stakeholder meeting in Vientiane (Lao PDR), 24 July 2009
- ✚ Provincial and national stakeholder meeting in Kampong Cham (Kampong Cam province) 9 November 2009.



Figure 1 : National multistakeholder meeting in Phnom Penh (Cambodia), October 1st 2007



### Regional Workshops and Dissemination

3 main regional workshops were organised during the project life either in Lao PDR or Cambodia: A kick-off meeting (Vientiane), a mid-term meeting (Vientiane) and a final meeting (Phnom Penh). Working group members joined by representatives from other invited institutions were invited then to attend and participate in those meetings.

IED and some representatives from MIME and MEM participated also in a dissemination workshop on Clean Energy Development organised in Surabaya (Indonesia) where more than 200 participants from more than 10 ASEAN countries attended for 3 full days.



*Dissemination Workshop – Surabaya (10-12 December 2008)  
Lao and Cambodia CAP-REDEO representatives (MEM, REF)*

### Newsletters

Finally 6 newsletters will be published for CAP-REDEO and uploaded on the project website. It was decided edit a sixth newsletter to mark the end of CAP-REDEO project describing the latest activities which occurred since the previous planned newsletter. This newsletter keeps in this way, readers updated about the project final achievement. Each newsletter was sent to more than 50 persons from national institutions to local private sector actors for rural development and donors.



## **WORK PACKAGE 6: Common dissemination Activities**

### Contributions to IEE actions:

- The project **Factsheet** was updated on the IEE website and is available for public access on the IEE projects database.
- IED answered to IEEEA invitation to contribute to more than 4 newsletters “**Intelligent Energy News Review**” (N°3, 4, 5, 6) writing short updates on the CAP-REDEO project.

### Disseminations and cooperation with relevant EU programmes:

- Bilateral meetings between the CAP REDEO coordinator IED and the DGS was performed mainly in 2007. An IED representative participated in the 2<sup>nd</sup> project meeting of REEPRO in Laos and IED and DGS met in October 2007 in Lyon. During the October meeting between Antje Klauß-Vorreiter (DGS), Tuan Nguyen (IED) and Adrien Jacob (IED) the synergies of both projects were identified and it was agreed to exchange results and to take into account the selection of **REEPRO** pilot or project communities within the CAP REDEO pilot provinces Khammuane in Laos and Kampong Cham in Laos.
- IED representatives in Cambodia and Laos also joined **RESIREA** meetings (Renewable Energy Sustainable Programs for Intelligent Rural Electrification and Poverty Alleviation) organised by FONDEM coordinator Mr. Yves Maigne and held in December 2009.

3.2 Review of deliverables

Del. N°	WP N°	Deliverable name	Month of completion	Submission with report	Deliverable uploaded at website?
D1a	1	Inception Report	2	Inception Report	Yes
D1a	1	Interim Report	18	IR	Yes
D1a	1	Final Report	36	FR	Yes
D1b	1	Progress Report 1	9	PR1	No
D1b	1	Progress Report 2	27	PR2	No
D2a	2	Status, policies, institutions of rural electrification planning development	3	No	Yes
D2b	2	Multisectorial working group-members finalized	6	No	Yes
D2c	2	Indicators of rural electrification and development	6	No	Yes
D2d	2	National Electrification and development indicators – GIS tool and user manual	9	NA	
D3a	3	Provincial level Stakeholder group	6	No	Yes
D3b	3	Synergies of RE and development: local stakeholder views	12	PR2	Yes
D3c	3	Provincial Rural Electrification for development plans from the CAP-REDEO tool	18	NA	
D3d	3	Policy orientations to be drawn from plans	24	PR2	Yes
D3e		Energy for development investment programmes and policy recommendations	36	FR	Yes
D3f		Final CAP REDEO user manual and tool	30	NA	
D4a		Eight training courses		PR1, NL1, IR	
D5a		Web site	2		
D5b		National stakeholder meetings		PR1, IR	
D5c		Provincial Stakeholder meetings		PR1, IR	
D5d		Regional Workshops on planning results		IR	
D5e		Newsletters	7, 13, 19, 25, 31		Yes

### 3.3 Review of performance indicators

Performance indicator	Comments
Progress, intermediary and final reports	OK - All contractual reports were submitted to IEEA. This final report is closing the contract
Quality of report	OK – All reports were submitted to partners either directly or during national stakeholder meetings
Number and quality of participant to the national Multisectorial Working group	OK – More than 20 participants were part of the multisectorial group for each country (list given on the D2b report)
RE planning indicators approval	OK – Reports approved by the National Multisectorial Stakeholder group in June 2008
RE planning methodology	OK – Methodology and tool approved by national institutions from each country
Provincial rural electrification plan	OK – Results presented for the mid-term workshop , modified by the consultant and approved for the final workshop
Number and quality of local stakeholders to the provincial Multisectorial Working group	OK – list given on the D3c report
GIS tool and user guide	OK - More than 14 GEOSIM software license were installed and about 10 persons were trained by country (see Newsletters, training participants' list reports...)
Number and quality of stakeholders to the training courses	OK – 7 to 10 people followed for each country the training sessions
Quality of website	OK – Website updated every 2 months approximately.
Number and quality of participants to the National Workshop	OK – National workshops were organised and representatives from all institutions involved in the project attended the meeting including representatives from EU and French Embassy
Number and quality of participants to Regional Workshop	OK – Regional dissemination workshop took place in Surabaya (Indonesia) gathering more than 200 people mainly from ASEAN countries but not only. Presentations were made by Ministries of Energy from Laos and Cambodia supported by IED.
Level of dissemination of the Newsletter	OK - 6 Newsletters were published for the project duration and sent to as many people as possible

### 3.4 Success stories

- During the provincial workshop in Kampong Cham (Cambodia), it was an ‘eye opener’ for all participants to bring the national planning agencies together with the local organizations involved in planning, implementation and operation of rural electricity projects.
- On MIME demand, additional scenarios were asked to IED in order to evaluate investment required for grid extension in Kampong Cham. GEOSIM results were then presented to MIME. The project and software was really well understood by the Ministry and results were quite useful to respond to real and actual concerns.
- The involvement of all stakeholders coming from different horizons was amazing and all participants were really interested by the project outputs.



## 4 Lessons learnt

### 4.1 Management

Consortium management is a difficult task when it comes to project planning. Planned to last for two years, the CAP-REDEO project finally used its full allocated duration of three years to be completed.

The difficulty to plan for such a long time is often due to unpredictable events such as staff departure which can cause some delays and must be taken into account at the beginning of the project. Consequently a real risk remains for agenda synchronisation between consortium partners which can impact project coordination and synergies. The CAP-REDEO project was fortunately well organized enough with separated and consecutive tasks. IED initial agenda was finally respected while ETC coordinator departure caused one year delay on ETC activities. No consequences were noted even if final workshop occurred finally a year ahead the last ETC stakeholder meeting.

About coordination with key stakeholders, one of the main challenges was also to involve the top decision makers into the project which is sometime not so easy due to busy internal agenda. However, CAP-REDEO project received a really good attention from Ministries of Energy and Institutions involved which demonstrated real interests from high level stakeholders.

### 4.2 Dissemination Activities

CAP REDEO offered a very fruitful opportunity to confront two countries with very different energy policies, level of electrification and issues. As Lao PDR is engaged in electrifying some remote areas, Cambodia, limited by its energy sources, must stimulate private sector with renewable sources.

The stakeholders meeting and workshops were then a good way to exchange ideas, discuss about issues and solutions found to resolve it. Independently, a Cambodian team from REF decided to visit their Lao counterpart to learn about distributed energy program name VOPS. Discussions were then very interesting and a strong interest was demonstrated for those international meetings.

In the same time, at national level, it was also very important to confront the different points of view between institutions and ministries in charge of rural electrification. It enriches discussions focusing on problems and objectives to be reached.

The project results and impacts were then presented by Lao PDR and Cambodia ministries of energy representatives with the support from IED for the Clean Energy Workshop in December 2008 organized by the University of Surabaya (Indonesia). The innovative approach was welcome by other ASEAN participants as one of the first attempts to rationalize the rural electrification methodology and appreciated its comprehensive and innovative methodology.

### 4.3 Conclusions

1- GEOSIM and its methodology for rural electrification were widely well accepted and stakeholders were also very enthusiastic with the produced results and the GEOSIM tool potential. GEOSIM offers a strong and tested means to draw plans in rural electrification optimizing impacts on population and proposing some realistic projects which could interest the private sector. However, regarding access, i.e. achieving the goals described above, planning is still in the making and using a tool such as GEOSIM will be very useful:

- To assess the cost of achieving the global objectives set;
- To detail these objectives and costs on a provincial basis;
- To compare the supply options, and time frames under various scenarios;
- To take decisions as to which investments to prioritize and what kind of framework / support measures would be needed in order to possibly encourage private investments

2- Laos and Cambodia are two countries where energy issues are a main issue, especially considering the poverty alleviation objectives. Both countries are engaged with ambitious electrification objectives so the capacity building remains an important issue. Due to staff turnover and the absence of stable and concerted planning services within institutions, there is still a strong need for additional training and support to have local actors fully independent.

3- However, as financing sources remain still shy especially in Lao PDR, it is fundamental that private investments are backed by a clear and efficient energy policy to stimulate private sector.

4- To take rural electrification from planning to implementation, a dynamic sector is needed with a mix of capable and experienced governmental, private sector and civil society organizations. Whereas governmental organisations and utilities can be further strengthened (see 2-), there is a strong need to build the capacity and to increase the number of civil society and private sector organisations operating in the rural energy sector at the national and the local level in both countries. Unless this institutional issue will be recognized and addressed, scaling-up of rural electrification will be difficult despite the increased availability of funds for rural energy.

## 5 Others issues

It was ascertained that the institutional and sectorial contexts in Cambodia and Lao PDR are quite different which required the elaboration of different approaches and efforts to reach the fixed objectives. The data availability and accessibility are a good example of this statement. Due to data availability and updates, the National GIS database structures have been adapted, as well as the analytical grid, with criteria and values which were adjusted to local conditions. Consequently, the IPD and development poles are using different criterions and the results are not fully compatible between Cambodia and Lao PDR.

Data collection issues too are one of our main concerns as it is time consuming and required mobilisation of human resources. Continuous updates and database maintenance should also be considered, not only for the exercise duration, as there is continuous change and update information in administrative border, village's locations, sectorial data changes (school, hospital and health points...).

The 11th ACE Governing Council Meeting held in Thailand in January 15th 2009 decided to endorse the software and its innovative methodology based on Geographic Information System (GIS) for further wide scale implementation in ASEAN countries in partnership with New and Renewable Sources of Energy Sub Sector Network (NRSE SSN). This international appreciation acquired partly thanks to the CAP-REDEO success is giving even more credits to the GEOSIM software and methodology and conclude the project in the best way.



**Table 3: List of contact persons after end of the action**

*The following list of multi-stakeholder group's members has been established for Lao PDR*

	Name	Position	Organisation	Address	Tel, fax, mob, email
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19	Mr. Bounyavath Nilaxay Mr. Ounhuane Siliamphone, Mr. Thongsay Sengmuang,	Engineer,  Senior staff,  Technical staff	Ministry of Telecommunic ation, Transportation, Post and Construction, Department of Transportation		
20	Phayvanh Vongsaly	Financial consultant, Rural electrification program	MEM/ DOE		+856-21 564 9373 <a href="mailto:airnoyvong@yahoo.com">airnoyvong@yahoo.com</a>

The following list of multistakeholder group's members has been established for Cambodia

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3	Mr. Phan Bunthoeun	Ministry of Industry, Mines and Energy	Chief	
4	Mr. Chim Theaream	Ministry of Industry, Mines and Energy	Deputy	012 908 119
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6	Mr. Math Rofat	Ministry of	Staff of	

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12	Mr. Chea Savan	Rural electrification fund secretariat	IT staff	
13	Mr. Chiv Mean Hea	Ministry of Health	Deputy of Director General	
14	Mr. Phol Norith	Ministry of Education,	GEE chief department, Institute of Technology of Cambodia	
15	Mr. Has Bunton	Ministry of Planning	Deputy Director General	
17	Mr. Soun Dy	Provincial Department of industry, Mines and Energy	Director	
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