



INTERIM REPORT

TECHNICAL IMPLEMENTATION

DELIVERABLE D1A



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Deliverable D1a

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Intelligent Energy – Europe (IEEA)

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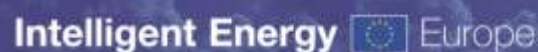
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Capacity and Institutional strengthening for Rural Electrification and Development - Decentralized Energy Options

Intelligent Energy – Europe (IEE)
COOPENER

Interim Technical Implementation Report (IR)

**Period covered: from October 31st 2007
to
June 30th 2008**

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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ANNEXES

1. Deliverable D4a – Advanced training F,C,A
2. Deliverable D4a – Training E and G
3. Deliverable D2a – Draft User manual
4. Deliverable D3c – Rural Electrification Plan using GEOSIM (Spatial analyst, Load Forecast and Supply Options’ reports)
5. Deliverable D5b - National Stakeholders meeting during the period
6. Deliverable D5c – Provincial level stakeholders meeting during the period
7. Deliverable D5d – Mid term Workshop

1 Summary

1.1 Interim Period Objectives

The global objective of the project in Laos and Cambodia is to improve the impact of rural electrification on sustainable development and poverty alleviation by establishing effective cross-sector investment and planning capacities using Geographical Information Systems (GIS) as the convening factor. It will develop technical capacity and 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 maximising development impact of scarce resources.

The project has signed in December 2006, followed by a period of mobilisation and full implementation. The inception report (D1a) and progress report (D1b) has delivered full details on the project activities during the first 6 months.

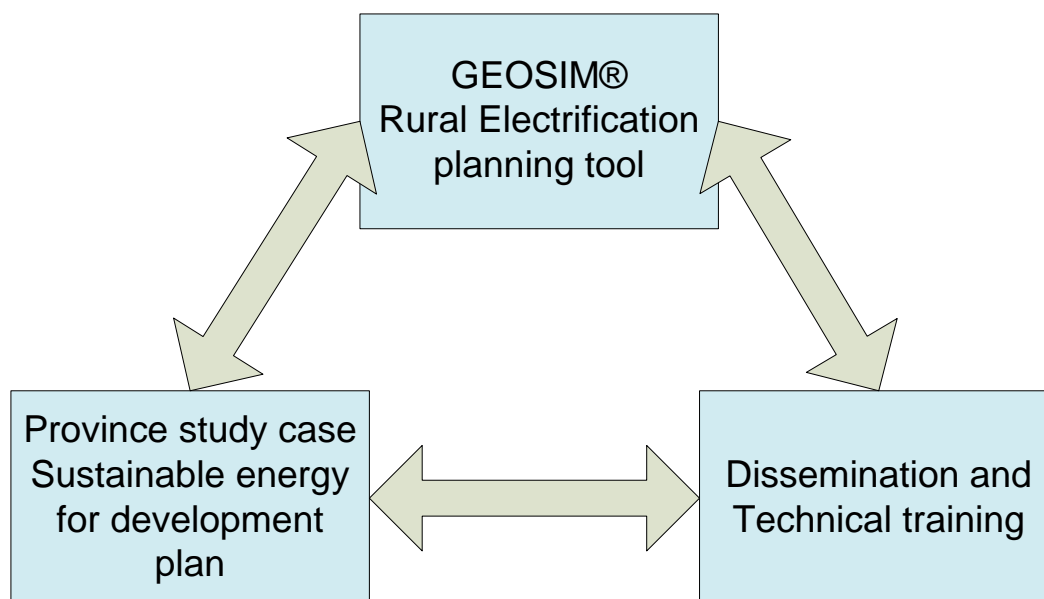
This report covers the implemented period from November 1st 2007 to June 30th 2008 – the first progress report at month 9 having covered the period from April 15th To October 31st 2007. The objective of this report is to highlight the detailed conducted activities and results achieved based on the short term action plan made during the kick-off meeting organized in Vientiane, Lao PDR, on 03-04 April 2007, as well as other issues encountered during its implementation. It also proposed next steps of activities adapted to the project's development.

The main objectives during this interim period are:

- completion of national and provincial GIS databases, surveys carrying out and analysis, identification of Decentralised supply options potential (Biomass, Hydro..);
- Demand analysis for the selected pilot provinces, proposed draft decentralised energy supply options based on software runs;
- Training on the various module of the GEOSIM planning tool modules;
- National and provincial stakeholder meetings to discuss assumptions and interim results and build ownership and a mid term meeting to present and discuss results;
- Newsletters

In order to enhance the capacity and institutional strengthening for rural Electrification and development among project stakeholders and partners, IED followed a very progressive method focusing on 3 main interdependent activities

- Technical trainings and capacity strengthening
- Rural electrification planning tool implementation
- Practical study case based on sustainable energy for development plan



The objectives of this interim period was then to stress on the main issue of this “Capacity and institutional strengthening for rural electrification and development” program conducting those 3 mains tasks simultaneously.

- 1- Main trainings sessions should be completed
- 2- GEOSIM® software installed on stakeholders and partners computers
- 3- Provincial study case completed

The aim of completing early those steps is to prepared stakeholders and partners to the next step which is a “learning by doing” phase that will require a self made RE plan from each of them using the GEOSIM tool and the experience acquire from the first provincial plan.

1.2 Achieved results

Overall, the objectives of the workplan as laid out in the contract have been met, with one minor deviation which shall be detailed below.

Activities carried out for the interim period in order to achieve those objectives are as follows:

- Survey Questionnaires have been translated, executed and analysed on the target provinces of Kampong Cham (Cambodia) and Khammuane (Lao PDR);
- National database has been finalized, burned on CDs and handed over to the project stakeholders
- Second newsletters edited and sent to partners and stakeholders
- Website updated
- Training courses prepared and given. More than 30 persons from Lao PDR and Cambodia have been trained. Capacity has been considerably strengthened in terms of methodology and also technically, on GIS software skills....

- Electrification and Decentralized Energy options plans have been done for the two selected provinces (Khammuane for Lao PDR and Kampong Cham for Cambodia) This RE planning study, using the GEOSIM tool has been divided into 4 main steps which have been concluded respectively by specific reports :
 - 1- Spatial Analysis
 - 2- Load forecast / demand analysis
 - 3- Potential identification
 - 4- Energy Supply options
- The planning software tool has been installed and tested for all project partners (a package including GEOSIM® licenses and Manifold® GIS software licence) :
 - o Laos : MEM, PDEM, EDL
 - o Cambodia : MIME, DIME, REF, EAC, EDC
- Planning concerted between all stakeholder and methodology discussed, and agreed between partners. Fruitful Workshop and stakeholder meetings have been held allowing all to participate and be part of the planning process. This planning exercise has been also the starting point to further discussion regarding RE planning but also national Grid extension
- Stakeholders meetings and a Mid-term workshop were organized as scheduled

For this interim period few difficulties were encountered and following are the lessons learnt from those new situations:

- 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 info are spread and scattered into various services and organisations...
- Very important to structure training session according to skill and language levels and eventually dissociate technical training from end user and decision maker training as finally both profiles are needed in order to update data into GIS database and run the model following political and strategic priorities;
- 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 some complete summary of the previous steps into the training structure.

1.3 Identified problems and corrective actions:

It was asked of all partners to send staff to participate in the training sessions. As the project started with some technical training on GIS and database, the subsequent trainings gathered mostly IT staff from partners, although it was specified that the subsequent trainings had a different target group and would interest planners and decision makers. As a result, IT staffs were trained on planning methodology and planners and decision makers who would likely be using this tool were only informed about the results thanks to the National Stakeholder meeting but not about the tool which was dedicated to them.

Consequently, knowing that planners and decision makers are often busy and can attend a full training session, a new intensive training targeting only decision makers and planners was added in June 2008. This short training dedicated to planners and decision makers gave a full overview of the methodology using all the modules of the GEOSIM tool in the same time.

The final objective is to have the planners to run the model while IT staff can update the database and bring some technical support for each module to the planners.

Deliverable D3b – Synergies of RE and development: local stakeholder views, to be prepared by ETC will probably be delayed by 3 to 4 months due to delays encountered in information collection by ETC.

For the mid term meeting, a common meeting in the form of a restricted regional workshop, was held between Lao and Cambodian partners, which was very useful in exchanging views within different contexts. The full regional workshop, inviting other countries to disseminate results will be held at the time of final results.

1.4 Main activities until the end of the action

The final phase will stress the capability of trained staff and partners to run the GEOSIM software preparing their own electrification plan following the methodology taught from the past training sessions. Focus will be on running a variety of scenarios and work on interpretation of results.

A final stakeholder meeting will be held as well a Regional Workshop on planning results. During these last meetings syntheses will also be drawn on policy orientations to be drawn from plans as well as potential investment programmes which can be derived from the planning tool results.

2 Consortium management

Cooperation from all the consortium members is a quite important task which required attention and time in order to achieve the projects activities in the best way.

Some meetings have been held between IED and ETC mainly in order to exchange ideas and conclusions from the different part of the methodology.

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. 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 zones where ETC tried to identify potential project investors. In return, IED got some feedback from ETC field trips about those identified potentials.

Along with this close cooperation, various meetings and debriefings were held with local subcontractors. This cooperation was also decisive to collect consistent data

from the multisectorial stakeholders , prepare and conduct provincial surveys and organize the various meetings, workshop and training.

The work program has been implemented in such a way that a specific task for project coordination, management, and reporting has been included to specially allow for the implementation of the management procedures. The project's team was designed at the beginning of the implementation process to ensure continuous exchanges of results and problem solving. 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
- IED team members : Adrien Jacob, and Romain Frandji
- MIME team members : Tun Lean, Heng Kunleang,
- EDC team members : Chan Sodavath,
- MIH team members : Anousak Phongsavath,
- EDL team members: Mr Bounnong

3 Progress of work plan and achievements

3.1 Progress and achieved results per Work package

WORK PACKAGE 1: Management

The successful work done so far show that the global organisation set for this project is quite efficient. Most of partners contributed largely to the different required tasks.

Local subcontractors in both countries were heavily involved in most of the local activities such as surveying, collecting data and information, discussing with ministries, organizing meetings and workshop...

Several meetings have been set since the progress report period and are listed below:

- ✚ National multi-stakeholder meeting in Phnom Penh – 25 March 2008
- ✚ National multi-stakeholder meeting in Vientiane (Lao PDR), 4 April. 2008
- ✚ Mid-Term workshop in Vientiane – 2 June 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



Mid Term Workshop – Vientiane (2 June 2008)

The website has been regularly updated by IED and reports, newsletters, pictures, events program, training materials uploaded for public access (see <http://www.cap-redeo.com>)

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.

The previous report set the creation of the multisectorial working group. 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 annex 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 on the progress report. As information is not always available or consistent enough and may required some further enquiries, several informal meeting 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” meeting, carried out on electrification parameters, identification of existing MV lines, 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 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 – grid extension, off grid options, pre-electrification.

Because trainings 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 training sessions to allow participants to practise.

The second version and final one was installed for the June training sessions. CDROM and licences provided to each partner. This version offer 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

Institution	Country	Number of licences
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 (see attachment).

A copy of each presentations, exercises and user guides also were distributed to each training attendant.

Inputs

One of the first steps of 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 provinces of Khammuane (Lao PDR) and Kampong Cham (Cambodia) where more information would be available.

A CDROM were burned for each country proposing then those 2 databases (at national and provincial level)

Surveys

As it is essential to stick to the reality and get information directly from the field, different surveys have been carried out on both provinces (Khammuane and Kampong Cham).

The results of these surveys have been consigned on the load forecast reports included in annex, deliverable D3d.

The subcontractors were the main actors on these surveys.

Scenarios

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

and discussed again for the Mid-term workshop see annex D5d, and the first report on planning results presented (see in annex, D3d).

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

Several trainings have been programmed since the progress report period and are listed 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 throw map (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 students on a one-to-one basis.

*Training Implementation ID: **F-G-C-A***

- ✚ 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 for final user 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 than the trainings done 2 months gave a technical view of the methodology and also strength the technical skills required to run the whole GEOSIM model.

The objective has been reached thanks to some general presentation and very practical exercises based on real data.

Training Implementation ID: F-G

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



Training course – Thakek (5 juin 2008)



Training course – Kampong Cham (10 juin 2008)

To be more effective, some training packages have been 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 is given once the concepts have been understood which allow a better technical understanding. The training support documents and agenda as well as list of participants are provided in Annex – D4a.

WORK PACKAGE 5: Communication and dissemination

The website is updated regularly 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 610 visits for a year of functioning from 60 countries around the world



CAP-REDEO website visiting countries

Pays/Territoire	Visites ↓
1. France	174
2. Cambodia	59
3. Laos	50
4. Germany	45
5. United Kingdom	30
6. Netherlands	27
7. Malaysia	22
8. United States	21
9. Thailand	16
10. Cameroon	14

Top 10 visiting countries (per visits)

Two newsletters have been published and uploaded into all partners' websites (see the website). These newsletters keep readers regularly updated about the project's development, its achievements and planning of next activities which allow the readers to follow closely the project's implementation.

WORK PACKAGE 6: Common dissemination Activities

IED answered to the invitation by IEE to contribute last December to the Intelligent Energy News Review N° 3 by writing a short update on the CAP-REDEO project.

3.2 Deviations

- Initial schedule has been respected basically and only few differences can be noticed. Plan has been accelerated as it might be more effective to follow a training rhythm more intensive in order to focus attention and concentration on the methodology and not let too much time between training sessions.
- The delivery of the intermediate version of the software has been delayed and came with the training programmed in March. It was not really necessary to install the software without giving adapted training in the same time.
- Specific training for decision makers have been scheduled along the technical training

Some training were more dedicated at decision maker and planners level which focused on methodology and RE strategy while some more technical training session aimed at IT personnel and provide more knowledge on tool manipulating (GIS, windows interface, and technical methodology used by GEOSIM®)

The mid term workshop with high level participation of decision makers took place with an intensive exchange of views between Lao and Cambodian partners. However, it was not felt appropriate at this time with only interim results, to open the workshop to a wider Asian public – as Lao and Cambodian partners also wanted to build ownership in the results. The wider workshop, with the objective of disseminating results and a participation of 70 persons, will be organised once the final results are present. Specific time and effort will be put in making this a high profile event, possibly also inviting interested parties from the African continent.

3.3 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		
D1b	1	Progress Report 1	9	PR1	No
D1b	1	Progress Report 2	27		
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	yes	
D3a	3	Provincial level Stakeholder group	6	No	Yes
D3b	3	Synergies of RE and development: local stakeholder views	12		
D3c	3	Provincial Rural Electrification for development plans from the CAP-REDEO tool	18	yes	
D3d	3	Policy orientations to be drawn from plans	24		
D3e		Energy for development investment programmes and policy recommendations	30		

D3f		Final CAP REDEO user manual and tool	30		
D4a		Eight training courses		PR1, NL1, IR, yes	
D5a		Web site	2		
D5b		National stakeholder meetings		PR1, IR, yes	
D5c		Provincial Stakeholder meetings		PR1, IR, yes	
D5d		Regional Workshops on planning results		IR, yes	
D5e		Newsletters	7, 13, 19, 25, 31		Yes

3.4 Review of performance indicators

Performance indicator	Comments
Progress, intermediary and final reports	<ul style="list-style-type: none"> - Progress report has been delayed for about 2 months due mainly to a change of Project manager within the IED team as M. Nguyen left the company and was replaced by M. Perret. - Interim report is also delayed voluntarily for about 1 month. Due to election in Cambodia, the Mid-term workshop have been scheduled in June finally and in order to integrate these last activities into this report, a delay was necessary.
Quality of report	OK - Report D2a validated by national institutions (MEM, MIME, EAC, REF...) during the National Stakeholders meeting
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
RE planning methodology	
Provincial rural electrification plan	
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	
Quality of website	OK – Website updated every 2 months approximatively.
Number and quality of participants to the National Workshop	
Number and quality of participants to Regional Workshop	Not applicable yet
Level of dissemination of the Newsletter	Ongoing task

4 Work plan for the next period

The work plan for the coming period will take place as defined in the project schedule focussing now on activities related to :

- Training and institutional capacity strengthening – learning by doing sensitivity analysis on regional plans (WP4);
- Provincial level investment project identification and policy formulation (3.5) based on the projects identified;
- Multisector working group meetings to discuss results
- Final regional workshop encompassing participants from Asia and possibly Africa, which will be a high profile dissemination activity.

4.1 Planned activities

Different objectives have been given to stakeholders along with deadlines:

- 1st July : Select their own pilot study zone for planning (within the studied province or somewhere else within the country using the national database)
- 1st August : Prepare and send to IED their Spatial analysis from their study zone
- 1st September : Prepare and send the Demand analysis
- 1st October : Identify potentials (Hydro, Biomass) within their area
- 1st November: Analyse decentralised energy supply option projects and send the generated GEOSIM report relative to their results.

All this approach and studies will be then analyse with IED for the next meeting which would take place next November or December...

4.2 Planned meetings and dissemination activities

As most of CAP-REDEO activities have been completed, it was agreed for the last mid-term workshop that the final workshop would take place in Phnom Penh (Cambodia) around mid-November 2008 but the date still need to be fixed by local partners.

Finally, the final dissemination regional workshop needs to be organised, with a profile and wide participation – targeting early 2009 or end 2008.

Web site will be updated and newsletters published.

5 Others issues

Work package	Actual/Planned Achievement - hours		IED	ETC *
	Actual	Planned		
WP 1: Management	Actual	609	71%	29%
	Planned	459	72%	28%
WP 2: Planning, institutional framework, policy: multisectorial integration of rural electrification	Actual	1 135	92%	8%
	Planned	629	90%	
WP 3: Provincial level Rural Electrification and development plans and policy elaboration	Actual	2 397	64%	36%
	Planned	1 650	62%	38%
WP 4: Training on tools and institutional /policy level capacity strengthening	Actual	1 433	59%	41%
	Planned	1 244		33%
WP 5 : Communication and dissemination	Actual	921	49%	51%
	Planned	832	60%	40%
WP 6: Common dissemination Activities	Actual	55	18%	82%
	Planned	98	67%	33%
Total Action	Actual	6 550	66%	34%
	Planned	4 912	68%	32%

 Estimates for actuals