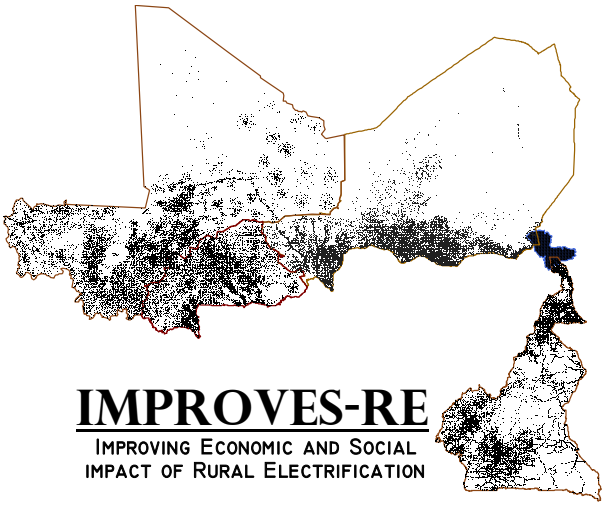

IMPROVES-RE

IMPROVING ECONOMIC AND SOCIAL IMPACT OF RURAL ELECTRIFICATION

Supported by the European Commission under the Intelligent Energy - Europe Programme

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TECHNICAL PROGRESS REPORT N° 3

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CONTENTS

1 INTRODUCTION

1.1 Global situation

This third report describes the activities carried out during the third semester (period 1st April 2006 to 30 September 2006).

Most activities result got from the exploitation of data collected during the second semester, which was dedicated to the establishment of a first analysis of the electrification situation and the launching of the socio-economic investigations.

The Main Deliverable of this period is D5 containing the local electrification plans that will be soon presented to local partners. It has circulated to all local partners and will be discussed during national workshops scheduled for November 2006.

1.2 Content of the report

It covers in particular:

- Identification of the Development poles in the pilot areas
- Elaboration of local electrification plans
- Finalisation of GEOSIM® tool
- Training on Geographic Information System software
- Dissemination and coordination activities

2 WP2: INTEGRATING CROSS SECTORIAL DIMENSION IN RURAL ELECTRIFICATION PLANS & WP3: DEVELOPMENT OF LOCAL RURAL ELECTRIFICATION AND MULTI-SECTORIAL PLANS

2.1 Local electrification plans

From socioeconomic data collected, completed by information on existing electric systems, following activities were undertaken.

- Selected pilot zones were subjected to an approach aiming at determining the most appropriated electrification planning option in terms of socio-economic impacts and financial viability.
- Within IMPROVES-RE model, electrification priority is given not only to the local development poles, but first of all to those having the highest population in their hinterland benefiting from services and economic opportunities offered by this pole.
- According to series of investigations in a sample representative of 20 localities (electrified and non-electrified) of the pilot zone, and depending on willingness to pay for the three main categories of customers (households, activities, services), the electricity demand was analysed at the planning horizon (20 years).

- Various technical options were examined to supply electricity for each pilot zone in order to select the ones providing the best ratio profitability/long term socioeconomic impacts.

This rural electrification plans are based exclusively on various well-proven technologies, which depend on the spatial and demographic context of the localities concerned and on the current state of the national electric system: isolated diesel, mini-grid diesel, national grid connected, development of small hydro power plants.

The whole population of pilot zones benefiting directly or indirectly from this rural electrification is around 1.212.313 inhabitants in 877 localities.

The report D5 presents the IMPROVES-RE planning methodology, with the objective to improve the socioeconomic impact of rural electrification. It therefore capitalises field and modelling works carried out since Bamako workshop in July 2005, whose theme was electrification planning, and concretises an approach based on a spatial and demographic analysis and a technico-economic optimisation. The report also presents several support measures to ensure to the identified projects the expected socioeconomic impacts.

The first simulations enabled to identify **496 rural electrification projects** (see D5):

- 71 "conventional" projects, targeting directly :

  -isolated diesel (41 projects),
  -mini-grid diesel (16),
  -national grid connected (13)
  -Small hydro power (1).
  -290.100 inhabitants in 157 localities directly targeted (including 84 local development poles)

- 265 projects of schools and health centres electrification through photovoltaic kits, for all the school infrastructures located in localities not electrified by conventional systems at the end of the planning:

  -254 schools
  -11 health centres
  -379.273 inhabitants in 291 localities concerned

- 160 projects of access to motive force based on multi-functional platform schemes, for localities with small access potential to development poles (remote localities) and that will not be electrified by the end of the electrification :

  -160 localities
  -74.648 inhabitants

Concretely**, identified projects directly target 608 localities and 744.000 inhabitants**, with a socioeconomic impact benefiting to the whole pilot zones, and an **investment budget close to 15,1 billions FCFA (23 M€),** out of which 12,7 billions FCFA (19,3 M€) for “conventional systems” (diesel, grid, hydroelectricity) and 2,4 billions FCFA (3,7 M€) for the common photovoltaic kits and the motive force.

D5, which was circulated to all the partners in August 2006, goes beyond WP2.2 as it already includes local electrification plans expected in D7 and will be updated in December 2006 with information collected during restitution workshops.

2.2 GIS Master planning tool "GEOSIM"

Local electrification plans were established using the GIS Master planning tool "GEOSIM" (WP3.1) which has been developed by the consultant using the Manifold GIS software. GEOSIM performs many of the calculations needed to produce the master plan and has been programmed such it allows the geographic presentation of the most important input and output data.

GEOSIM allows in particular producing maps which show:
- The location of settlements and their present electrification status.
- The location of potential mini and micro hydro plants.
- The settlements proposed for off-grid electrification and the power supply method.

GEOSIM also stores a range of socio-economic, geographical, infrastructure and resource data which are used to support maps.

GEOSIM© is a simulation software developed by IED. The assumptions and algorithms at the base of the planning model are presented in D5. These assumptions and analysis relate to :

- The methodology of load forecast model
- General parameters for cost calculations
- Power supply from Generators
- Small hydropower plants
- Economic and Financial Analysis of Least-Cost Projects
- Motive power service and PV packages for isolated localities

3 WP4.3: REVISION OF THE LOCAL RURAL ELECTRIFICATION AND MULTI-SECTOR PLAN (D9)

The locals plans, built from field surveys but also from computing tools which were developed, must now be validated by local and national actors, within the framework of a restitution workshop. Two levels of consultation are planned : at pilot zones and national levels.

On September 29th 2006 was held in the conference room of the South West Development Authority (SOWEDA), the restitution workshop of the rural electrification local plan for the RUMPI pilot zone as part of the Improves-Re programme in Cameroon.

The workshop was chaired by Mr ENEME A. NGOME, Rumpi Project Coordinator, and was attended by two local players, a local NGO, a micro-finance institution, three representatives of ministries being members of GTMER (Multisectorial Working Group for Rural Electrification), a representative of the Electricity Sector Regulation Agency (ARSEL), two Soweda's executives.

The presentations where done by three people from the consultancy company Etudes Engineering Développement (EED), local representative of the consortium (IED - RISOE - ETC). Participation of local actors to the workshop was not really high, due mainly to very bad transport conditions in the zone during rainy season.

The main objective was to submit the rural electrification local plan to the local players for validation and future appropriation; specific objectives were to:

- Mobilize, within the pilot zone, potential players at local scale for the implementation of electrification schemes identified through Improves-Re,
- Sensitise local players (locales communities, NGO, village associations, drinking water service managers, small companies, etc.) to economic, social and business development opportunities provided by decentralised rural electrification,
- Provoke the emergence of local operators for the development of rural electrification services.

Presentation ceremony was opened by Rumpi project coordinator, at Soweda. During his address, he thanked the European Commission and the Consultants group for having chosen the Rumpi zone as pilot zone for the implementation of Improves-Re methodology, characterized by an alternative approach of rural electrification planning. He especially expressed the hope that the population of this region put in the implementation of electrification projects at local scale.

The programme of the day was divided in two parts : (i) presentation of the local plan by two representatives of EED, and (ii) debates.

► PRESENTATION OF THE ELECTRIFICATION LOCAL PLAN FOR THE PILOT ZONE OF RUMPI

This presentation was made in two parts: the presentation of the alternative approach for rural electrification planning and results synthesis for Rumpi zone.

- **Alternative approach for rural electrification planning**

This part was presented by EED Manager and dealt mainly with two components of the Improves-Re model: the spatial planning model and the electric planning model. Since Improves-Re aims at improving the economic and social impact of rural electrification, it especially focused on the concept of impact and on the indicators of its measure within Improves-Re.

- **Synthesis of the results for Rumpi pilot zone**

This part was presented by the person in charge of Energy programmes in EED. The various scenarios of rural electrification were presented and commented.

► DEBATES

Debates focused on four main points:

- **The Improves-Re model for spatial planning**

  Though this model was already presented during the presentation workshop of the socioeconomic survey results (31 of March 2006), some of the participants wished to go further into the theory on which it is based, especially the gravitational models. Comments were made, especially by Mrs OMAM NJOMOH Esther, responsible of the local ONG Reach Out (REO) and Chief MBUA Peter, leader of the village of Bafia (Muyuka), on estimates on the potential population that could benefit from the electrification of the development pole.

- **The Improves-Re alternative model for electrification planning**

  This topic did not raise many questions, perhaps because of its technical character.

- **Synthesis of the results for the RUMPI pilot zone**

Regarding the electricity production sources, participants suggested to have more than one group for the diesel option (backup). This scenario is not really accepted by local players, because of unsuccessful past experiences, due to unsustainable operation and maintenance options. On the other hand, hydro electrical option, interconnected or not with conventional network, is much more appreciated. One of the major concerns was also to make sure of the smooth running of the installations that will be made.

- **The necessity of a local appropriation of Improves-Re approach and projects**

  This issue was raised by Mrs OMAM NJOMOH Esther, responsible of the local NGO Reach Out (REO) and Chief MBUA Peter, leader of the village of Bafia (Muyuka). To avoid the white elephants "syndrome", namely installation abandoned under the sun and in the forest few months after implementation, it will be necessary to work out a sensitization program at local authorities level in order to ensure the sustainability of the investments that will be realised following the present studies.

- **Implementation option of identified projects**

  In partnership with the Ministry of Energy and Water, the Electricity Sector Regulation Agency (ARSEL) and the French engineering consultancy firm IED, the Rural Electrification Agency of Cameroon (AER) has submitted a proposal to the European Commission under the Energy Facility, for the implementation of projects identified under the Improves-re methodology in Rumpi area. SOWEDA is associated to this new project and has signed a letter of interest addressed to the Minister of Energy and Water at the end of the workshop.

The SOWEDA representative closed the session by expressing the hope that some of the rural electrification scenarios worked out by the local plan will be financed, for instance through the European Union Energy Initiative, and will therefore enable part of the population of this zone to get out of darkness.

National workshops will be held in the four countries in November and December 2006 and will be the opportunity to analyse possibilities to concretise the projects identified.

4 WP6.2: TRAINING ON GEOGRAPHICAL INFORMATION SYSTEM (GIS) AND MANIFOLD SOFTWARE

A first training session (D4) on Geographical Information System (GIS) took place at IED, Francheville (France) from 28 November to 2 December 2005, with the participation of partners from Burkina Faso, Cameroon, Mali and Niger.

Unfortunately, due to Visa problems (Cameroon, Niger) and last minutes constraints (Burkina Faso), some participants had not been able to join the training.

A new one was then organised, for those who could not attend, from 14 to 18 of August 2006 in Ouagadougou, Burkina Faso. The training programme was quite similar to the December 2005 one.

This training was also attended by representatives of institutions of Burkina: DGE, FDE SONABEL.

Training session report available at: http://www.improves-re.com/upload/FI317.pdf

5 WP7 : DISSEMINATION – D12 & D14

D12: Publications, articles and newsletters

- IMPROVES-RE is one of COOPENER projects in the quarterly newsletter of the Intelligent Energy Executive Agency (IEEA) N°5 – October 2006

  Article available at: http://ec.europa.eu/energy/intelligent/library/doc/ien_5.pdf

- Two Electronic Newsletters "IMPROVES-RE News" (Deliverable 12) have been edited in French, including the following articles:

Newsletter IMPROVES-RE n°1, January 2006

1. Project launching in the four countries
2. Training workshopn°1: rural electrification planning in Bamako (Mali)
3. Training workshopn°2: Geographic Information System (GIS)in Francheville (France)
4. Synthesis of the IMPROVES-RE planning methodology
5. Socio-economic study in the pilot zones
6. Pilot zones selection

Newsletter IMPROVES-RE n°2, May 2006

7. Information on project progress
8. Indicators of Potential of Development (IPD)
9. Projects identification
10. Analysis of energy services and socio-economic study in the RUMPI pilot zone in Cameroon

Newsletter IMPROVES-RE n°3, October 2006, is in process of finalization.

Newsletters available at: http://www.improves-re.com/improves-re.asp?chapitre=5

- One publication was published in the reCOMMEND newsletter (newsletter of the community for energy, environment and development) of January 2006.

  Available at: http://www.energycommunity.org/reCOMMEND/reCommend5.pdf

D14: Web Site

The Web Site (www.improves-re.com) is regularly updated.

6 WP8 : COORDINATION

Consortium meeting in Leusden (Netherlands)

The second Consortium meeting took place in ETC's office in Leusden (Netherlands), on April 27, 28, 2006, with the following agenda:

- Update of the project implementation and building a common understanding of the next steps / activities of the project.
- Status of Deliverables
- Re-allocation of task and sub-sequent reallocation of budget
- Practical issues and miscellaneous

Interim report (D16)

The interim report , covering the activities carried out during the first 15 months of the project, was sent to and approved by the European Commission in August 2006.

7 NEXT EVENTS AND MISSIONS

Chronologically, next events and missions will be:

1/ Local plans restitution workshops:

- 2nd week of November in Ouagadougou, Burkina Faso
- 3rd week of November in Bamako, Mali
- 4th week of November in Niamey, Niger.
- Beginning of December or January in Yaoundé, Cameroon. Dates to be confirmed.

These workshops will be attended by:

- Local private partners: EDENE (Burkina), EED (Cameroon), ICD (Mali), CEH-Sidi (Niger)
- Institutional local partners
- Local stakeholders: officials, private entities, NGOs
- National stakeholders : multisectorial group members, national utilities, consultants, potential operators, etc.
- SOPIE representatives

In parallel to the restitutions workshops, will be conducted in each country training sessions on GEOSIM planning tool to the local and institutional partners.

2/ Consortium meeting in Risoe office, in Roskilde (Denmark), December 12, 2006.

3/ IMPROVES-RE final workshop in Bamako, Mali. Probably beginning of March, dates to be confirmed.