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*Edito*



It is a real honour for me to introduce the last issue of the MEDRES Project Newsletter. The project has achieved considerable results thanks to the dedication of its partners and the support of the European Commission (DG Research). A synthesis of major

outcomes will be presented at the occasion of the Conference organised by the MEDRES Consortium in Cairo on December 14<sup>th</sup>.

We hope that this meeting will foster new cooperation opportunities between the two sides of the Mediterranean in order to continue to build on knowledge transfer and regional cooperation. We also hope that the European Commission will pursue its support to regional projects in the framework of sustainable energy in the benefit of the Euro-Mediterranean partnership.

I look forward to welcoming you in Cairo in this occasion and wish all of you happy New Year 2010.

Dr. Hassan Younes,  
Minister of Electricity and Energy, Egypt



*Coming Event*

**MEDRES Final Conference**

**Cost-effective renewable energy for rural areas  
in the Mediterranean region**



**14 December 2009  
Mena House Oberoi Hotel  
Cairo – EGYPT**

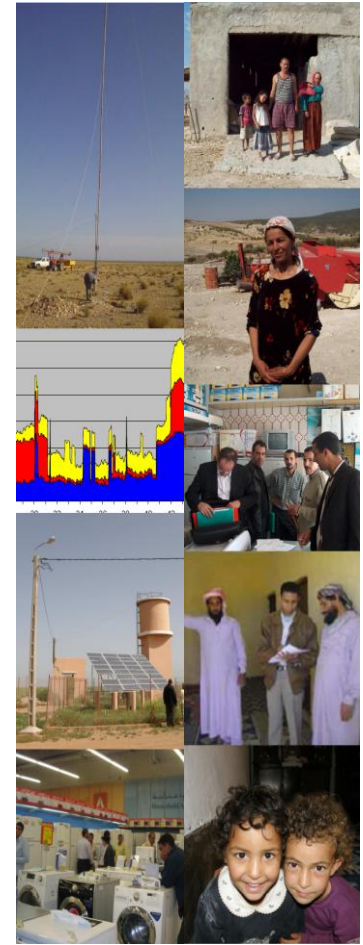
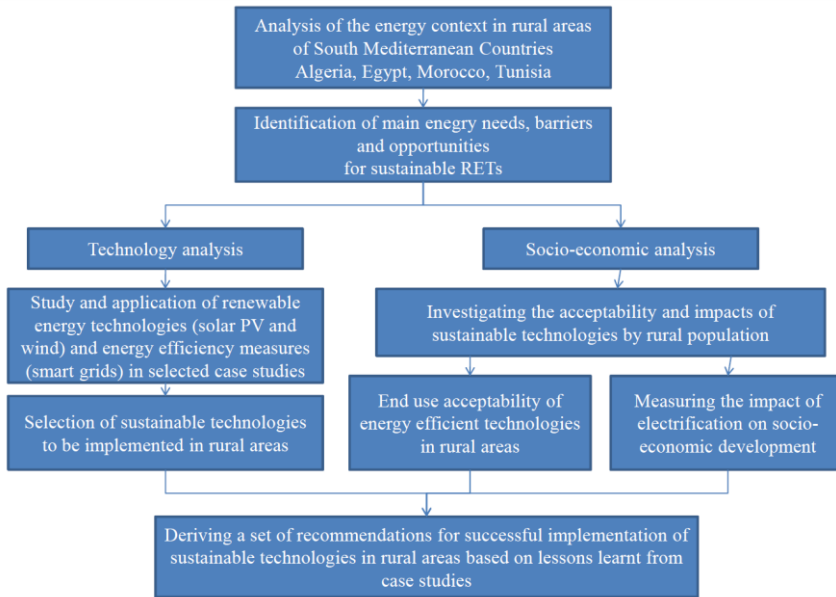


**Under the high patronage of his Excellency Dr Hassan Younes, Ministry of Electricity and Energy, Egypt**

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The aim of EU-INCO project MEDRES is to foster international cooperation along the Mediterranean region on the use of innovative energy technologies and solutions to achieve sustainable development in the area. In order to contribute to this ambitious objective, enhanced knowledge transfer and knowledge sharing are needed. Based on this, a quite balanced consortium composed of several participants with complementary skills from the Euro- Mediterranean region has been built up under the coordination of OME.

The uniqueness of the MEDRES project lies on its multi-focused approach which combines the implementation of innovative sustainable energy solutions with the study of the socio-economic implications that these technologies bring. An additional peculiar element is its focus on peri-urban and rural areas as a suitable domain for the diffusion of innovative technologies.



**WP2 - Sustainable power for rural areas and villages:  
Scientific and Technical Progress**

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**Objectives**

The objectives of WP2 are to inform about best practices and to realize technical studies for selected projects identified by the partners as being strategic. A specific attention has been given to diesel minigrid

retrofit using photovoltaic energy and to distributed generation in weak grids. Other innovative technologies studied in rural areas are microgrids (which can operate on-grid or off-grid) and demand response.

**Capacity building**

- Five workshops have been organized:
- Hybrid minigrid systems: theory and practical work
  - Power quality: theory, measurements and analysis
  - Sizing Hybrid Minigrids with the software HOMER
  - Demand response: theory, applications in South Mediterranean countries
  - Microgrids

**Case studies on-grid**

- Five case studies on-grid have been led:
- Wind and PV integration in the Kerkennah islands (Tunisia)
  - Solar roof for CDER building in Marrakech (Morocco)
  - Microgrid for Nobareya farm (Egypt)
  - Potential for demand response in Tunisia and Egypt
  - Potential for microgrids in Tunisia and Egypt

**Case studies off-grid**

Project	Country	Load kWh/day	Pmax kW	PV power kW	Battery kWh	Solar fraction %
<b>Ait Ichou</b>	Morocco	10	2	3	34	100
<b>Afra</b>	Algeria	330	38	60	270	85
<b>Djanet</b>	Algeria	57000	4000	2000	0	20
<b>Siwa city</b>	Egypt	70000	4500	1000	0	8

## Conclusions

- If real prices are taken into account, photovoltaic technology could play an important role as fuel saver in existing diesel minigrids.
- PV can be easily integrated without battery in existing minigrid systems if the solar share is not too high (< 10%). For example in Southern Algeria, the total load is estimated to be around 800 GWh in 2010 and 40 MW of PV could be easily integrated as solar roofs or in bigger plants.
- Grid connected production by small Wind and PV plants is a good option for rural areas but power quality studies are needed to avoid oversizing the RE plants.
- No potential is foreseen in the near future for microgrids.
- Basic implementations of Demand Response could play a more important role in rural areas (eg. Night tariffs) but the priority today is on energy efficiency measures.



### WP3 - Assessing the Energy Efficiency Standards & Labelling (EE S&L) programmes for fridges in Egypt, Morocco and Tunisia with a focus of poor consumers in peri-urban areas

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#### Energy efficiency, a main tool of energy policies in the future

In the context of a project investigating cost-effective solutions in low-income areas (rural and periurban) in the Mediterranean Region, partners chose to focus on the issue of Standard and Labelling Programmes and on their impact on low-income consumers. In 2007 the partners

agreed that a real opportunity for a joint survey existed because in two countries such a programme had been implemented on fridges (Tunisia and Egypt) and in a third such a programme was under development (Morocco).

#### A joint survey

Expert interviews and a field visit in each country were conducted in 2008. They showed the community of issues and enabled to develop a joint survey design which proposed a two-fold approach for this quantitative survey: one field survey in low-income urban households, the other in shops and supermarkets located in the same peri-urban areas. The questionnaires were spread at the end of 2008 in low income neighbourhoods in Cairo, Tunis

and Rabat. About 400 interviews were conducted in households (300) and in shops (80 retailers interviews). At the beginning 2009 the data was collected and analysed by EIFER, who provided a first report and analysis to the partners. Partners produced country reports on this basis. A final meeting in Bilbao (October 2009) allowed the partners to share their results and build joint recommendations.

#### Main results

Urban low-income households represent a fast growing share of the population. They own old refrigerators (more than 9 years in average) and most interviewees declare they would like to change their fridges but won't do it in the near future, most likely for economic reasons. The survey points out different barriers to their access to EE appliances:

**Price** is the first obvious barrier to the diffusion of energy-efficient refrigerators, given the specific income constraint of low-income consumers and the relatively high prices of energy-efficient appliances.

**Information:** Lack of awareness is a second barrier. On one hand a vast majority of the interviewed low-income households express the need to save energy in their daily life, as electricity bills are representing a quite important

share of their monthly income (5 to 8%). But on the other hand they show little knowledge of EE mechanisms in general and of EE labels in particular.

The shop survey showed a lack of penetration of EE information in the shops. It also pointed out a lack of understanding and training of the selling staff on EE issues. This may explain why the retailers seldom inform the consumers on these issues and on the advantages of EE alliances.

**Offering:** in some of the surveyed countries, we observed that labels and most efficient appliances are not systematically present on the market. The expected market transformations resulting from the implementation of S&L programmes are thus still incomplete and could be enforced.

## Two main recommendations

- 1) Low income consumers is an issue for EE policies, in the field of Standard and Labelling specific mechanisms and actions should be developed to support this specific target group (R&D, training and education, economic incentives, public private partnerships..).
- 2) This reflexion on low income target groups is an opportunity to develop Regional cooperation in the field of EE Standard and Labels programmes (sharing best practices, developing joint survey to build empirical databases, develop joint foresight...).

### WP4 – Measuring the impact of electrification using renewable energy sources on socio-economic development in rural areas

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## Objectives

The aim of this work package was to develop methodological tools in order to be able to assess the impact of rural electrification on local socio-economic development and to test them on field case studies.

From those first results, lessons learnt on the methodological approach were drawn and recommendations for the implementation of successful rural electrification projects were proposed.

## The methodological approach

In this perspective, 20 indicators were selected in cooperation with HELIO International. As there is no preexisting set of indicators at the international level, the indicators were selected among internationally recognized ones, depending on their ability to assess the contribution to Millennium Development Goals as well as to five types of sustainability (environmental, economic, social, technical and civic). They were then discussed and

adapted to the local context and project timeframe during a workshop held in Marrakech in January 2008.

Methodological tool were then developed:

- sets of questionnaires
- an “energy uses table” which allowed gathering information about the used energy sources and related expenses in a concise way.

## Four case studies

The selected case studies were representing a panel of different stages and ways to access electricity:

	<b>Algeria</b>	<b>Egypt</b>	<b>Morocco</b>	<b>Tunisia</b>
<b>Baseline</b>	PV micro-power plants	No electrification	Solar home Systems	No electrification
<b>Current</b>	PV micro-power plants and national grid	Wind and diesel hybrid system with local grid (5 hours a day)	National grid	Solar home Systems



### Some lessons learnt ...

- The socio-economic study is the opportunity to make sociologists and technicians speak together.
- The success of the study highly depends on the contact established with the interviewee. A resource person from the village or working with the village is thus crucial.
- Quantitative questions are very difficult to get answers to. They should always be accompanied by a more qualitative (subjective) question.
- The acceptability of a project will highly depend on the local dynamics which are crucial to interpret the results.

### .... and recommendations

- Starting from the needs.
- Proposing the right energy for the right uses (electricity, heat, motive power).
- Fostering the development of income generating activities.

