

**IRESMED PROJECT**

**INTEGRATION OF RENEWABLE ENERGIES  
IN THE SOUTHERN MEDITERRANEAN COUNTRIES**

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Contract JOR3-CT 98 - 0209 / IC21-CT 98 - 0401

**PUBLISHABLE FINAL REPORT**

Draft

Research funded in part by  
**THE EUROPEAN COMMISSION**  
In the framework of the  
Non Nuclear Energy Programme  
**JOULE III**

## **I- EXECUTIVE SUMMARY**

The IRESMED project aimed at analyzing the integration of solar and wind energy for electricity supply in the rural regions of the southern Mediterranean countries. Research was carried out on the selection of the most appropriate sites to install the renewable energy systems, on the technologies most suited, on the cost/benefit analysis and on the possible financing schemes. A major issue was the competitiveness of renewable energies vis-à-vis fossil fuel options and thus detailed selection of the adapted sites (where the solar or wind resources are highest and which are close to load centres) have been done based on cost/benefit analysis in order to select the least cost options. The external benefits related to social or environmental aspects were also taken into account.

IRESMED constitutes a powerful consortium of electric utilities, national research centers and other supporting organizations from both sides of the Mediterranean basin. It includes those institutional actors who bear responsibility for the introduction and subsequent large scale implementation of renewable energies in the various participating countries.

The project analysed all aspects of large-scale integration of these renewable energy sources into the Mediterranean Partner countries participating in the project. This included the analysis of solar resources in regions where there is a potential demand for PV, and analysis of wind resources in areas of high potential for economical power generation with wind. It included the characterization of sites using GIS tools, economic evaluation in comparison with alternatives, study of institutional aspects including barriers to exploitation, possibilities of local manufacture of components, and financing requirements. All of these aspects have to be considered in the exploitation of the results.

IRESMED defined the potential market for PV in rural electrification in large regions of Morocco, Algeria (case of PV plants), Tunisia, Egypt and the Palestinian National Authority. The results indicate a very large market in Morocco where several projects are already underway with outside support. Algeria provides a large market for PV plants to supply isolated grids with diesel in the southern regions. Tunisia provides a significant market for PV electrification in the center and eastern part of the country. There are smaller needs for isolated rural villages in Egypt (Sinai) and PNA.

The applications of PV for water pumping and water desalination have been also analysed on a technical and economic point of view ; there appear to be needs for PV water pumping in many isolated villages, but the needs for desalination with PV power supply is much more limited.

IRESMED has also defined the potential market for wind power in the most promising regions in Morocco, Tunisia, Egypt, Turkey, Jordan and Palestinian National Authority. The results indicate a very large market in western Turkey which has already attracted interest from private developers. The potential market in Egypt is also very large on the Red Sea coast, and substantial development along the Gulf of Suez is taking place. The indicated resources in Morocco are also very large in the northern and western part of the country. Tunisia appears to have moderate potential on the northern coast. Jordan has also a moderate potential. The potential of the Palestinian National Authority is small due to limited wind resources and area available.

All these results show the large opportunities and potential market in these countries for European companies which are the world-wide leaders in wind and PV technologies. International funding agencies and other potential investors have also been informed of investment opportunities during the course of the financing tasks, and conversely the southern Mediterranean partners have become more aware of the eligibility criteria for various sources of funding. The World Bank and the European Investment Bank are aware of the IRESMED studies and results. The financing agencies and banks have been informed of the non confidential results of the project.

**Key words:** renewable energy, photovoltaic, wind power, Mediterranean countries, sustainable development



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### **III- OBJECTIVES OF THE PROJECT**

The IRESMED project aimed at analyzing the integration of solar and wind energy for electricity supply in the rural regions of the southern Mediterranean countries. Research was carried out on the selection of the most appropriate sites to install the renewable energy systems, on the technologies most suited, on the cost/benefit analysis and on the possible financing schemes. A major issue was the competitiveness of renewable energies vis-à-vis fossil fuel options and thus detailed selection of the adapted sites (where the solar or wind resources are highest and which are close to load centers) was done based on cost/benefit analysis in order to select the least cost options. The external benefits related to social or environmental aspects were also taken into account.

Another major issue in developing countries is the lack of available financing for renewable energy projects which can contribute to the social and economic development and the protection of the environment but are more capital intensive than fossil fuel based systems and also are to be used, in the case of rural electrification, and thus purchased, by very poor rural populations. For these reasons adequate financing mechanisms must be developed which combine private sector financing alongside with financial support from the governments and international aid, otherwise the lack of financing will block the integration of renewable energies in these rural regions.

The research thus covered the various phases of an integration study on such a large scale: research on available wind and solar resources, study of potential sites for PV or wind power, evaluation of adapted systems, cost/benefit analysis including social and environmental aspects, methodology for financing schemes and market development.

The countries concerned are Morocco, Algeria, Tunisia, Egypt, Israel, Palestinian National Autonomy, Jordan and Turkey.

#### **IV- TECHNICAL DESCRIPTION OF THE PROJECT**

The organisation of the Iresmed project was structured along two main interrelated tasks:

*Task1 dealing with the integration of PV in rural electrification programmes;*

*Task 2 dealing with the integration of wind power for embedded electricity production*

Each task was also divided in subtasks concerning research on specific issues (see diagram below).

The Task 1 was coordinated by EDF and ENEL/CESI. The aim of Task1 was to study the potential for PV for decentralized rural electrification in the regions with high potential in the southern Mediterranean countries. In a general way, the IRESMED Project was aiming at sustaining the Southern Mediterranean Countries in their effort to integrate PV in the rural electrification programmes.

The Southern Mediterranean partners (SMP) involved in this part of the project are : CDER, in co-operation with ONE, (Morocco) , SONELGAZ (Algeria), STEG (Tunisia), NREA (Egypt) and PEC (PNA).

CDER, STEG, NREA and PEC studied the potential for PV in non electrified rural areas. The analysis of non electrified rural populations was studied for large regions of these countries and the potential for PV in terms of number of systems and of investments were estimated. For this purpose G.I.S. data bases were created and the evaluation for the potential for PV was done according to the methodology and tool agreed upon in subtask 1.1.

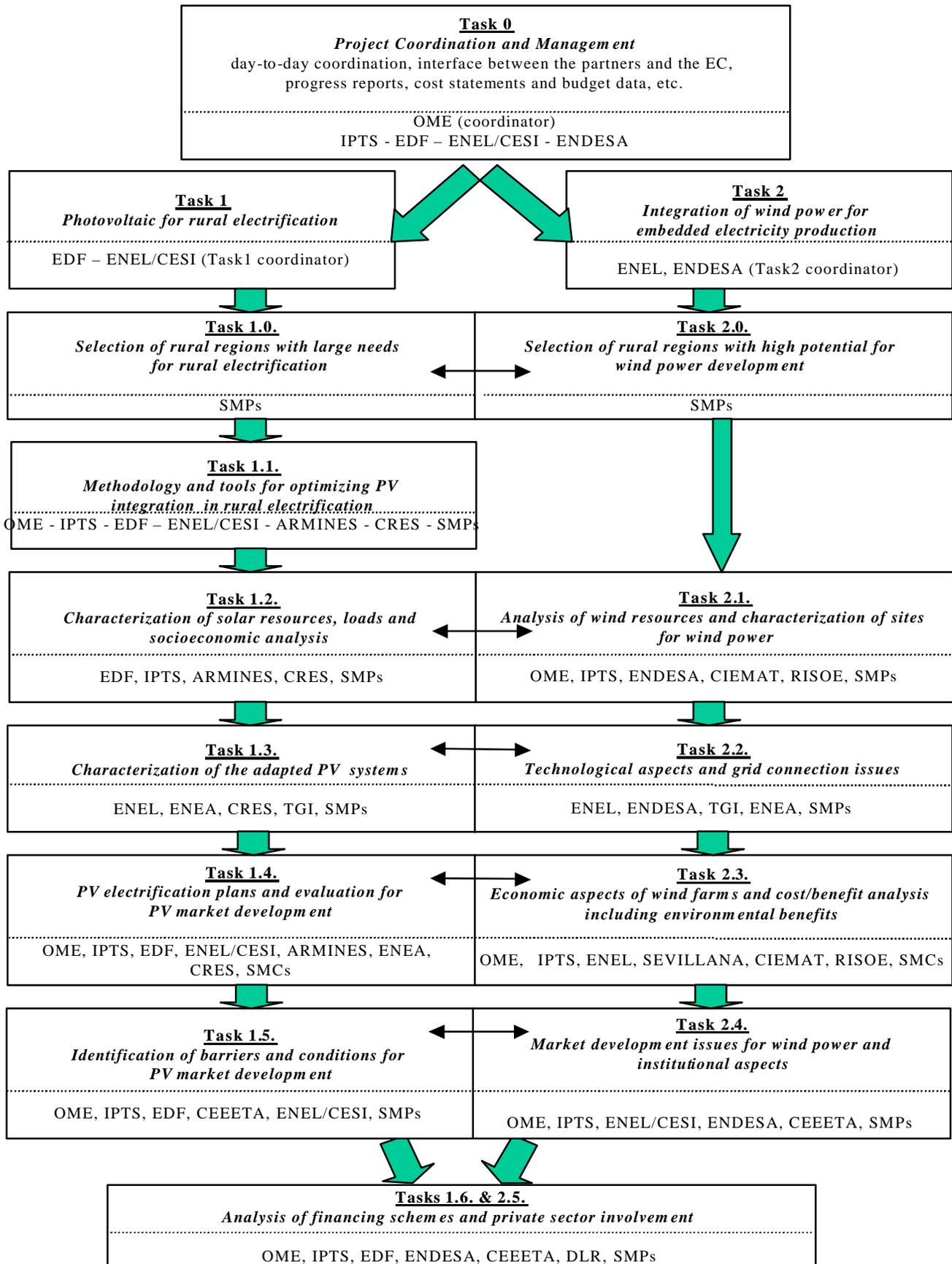
In Algeria , the topic of the research was different as SONELGAZ has studied the installation of PV plants in isolated electricity networks (which are now supplied by diesel plants in the south of Algeria) in order to reduce the use of these diesels which have high cost of fuel and of maintenance.

The general objective of Task 2 was to analyze the integration of wind power for electricity production in rural regions of the southern Mediterranean countries. The research concerned several aspects: characterization of sites, analysis of suited wind turbines, cost/benefit analysis, market development and financing schemes. The SMP participating are: CDER (Morocco), STEG (Tunisia), NREA (Egypt), NEPCO (Jordan), PEC (PNA) and EIE (Turkey). The Task 2 was coordinated by ENEL/CESI and ENDESA.

There were close links between the Task 1 and the Task 2, for example in using GIS tools for analysis of the regions suited for RE utilization in these countries, in using similar cost-benefit methodologies, similar methodology for evaluation of national impacts, a common approach to technology transfer and a common approach to financing. These links were facilitated by having the same partners working on the respective aspects of Tasks 1 and 2.

A specific task (Task 0) concerned the co-ordination and management of the project; this Task was performed jointly by OME and IPTS and related to the planning and supervision of the research, co-ordination of report preparation, supervision of deliverables, contacts with the EC and preparation of meetings and missions.

## Project Organization and Task responsibilities



## **V- RESULTS AND CONCLUSIONS**

The presentation of the main results and conclusions of the project will be done on a Task per Task basis.

### ***V-1. Task 1 : PV for rural electrification***

The Task was coordinated by EDF and ENEL/CESI. The aim of Task1 was to study the potential for PV for decentralised rural electrification in the regions with high potential in the southern Mediterranean countries.

#### **Subtask 1.1: Methodologies and tools for optimising PV integration in rural areas**

This subtask was coordinated by EDF. The objective of the research carried was to develop and use an innovative method for the planning and integration of PV in rural electrification programmes. This method is based on a GIS approach in order to compute for the various villages of the region studied the costs of the electrification by grid extension and by PV ; then the least cost option is selected for each village which enables to know which villages have to be electrified by PV as in these cases it represents the least cost option. The spatial representation of the villages is very important as the cost of the option of electrification by the grid is dependent on the distance. Moreover, an assessment has to be made on the electricity needs per household and per village.

A methodology and the related computer tools has thus been defined and circulated by EDF and ARMINES. The softwares LAPER and SOLARGIS were installed and the users trained in these countries (within subtask 1.4).

#### **Subtask 1.2 Characterisation of solar resources, loads and socio-economic analysis**

This subtask was coordinated by ARMINES and EDF coordinated the socio-economic analysis. The necessary data for the technico-economic studies in Subtask 1.4. was gathered within this subtask. Each southern Mediterranean partner has prepared the databases needed dealing in particular with the list and geographical locations of the villages and the present status of electricity networks. Solar radiation data was also included in the GIS. The databases have been included in the LAPER or SOLARGIS softwares allowing to perform the calculation of the villages suited for PV electrification (within subtask 1.4).

Also, the socio-economic surveys in specific villages in each country have been performed; the results are used to better assess the type of PV systems needed according to the socio-economic type of households and related appliances used and also purchasing power.

#### **Subtask 1.3: Characterisation of appropriate PV systems**

ENEL/CESI was in charge of coordinating this subtask which aimed at analyzing the best suited PV systems given the local context in the southern Mediterranean countries and also at evaluating the prospects for a higher local manufacturing of the components through technology transfer (this part is coordinated by ENEA). An important part of the subtask was also dedicated to the analysis of systems for water pumping and water desalination using PV (coordinated by CRES and Mekorot).

### Analysis of suited PV systems

ENEL/CESI has prepared a Report on “Characterisation of Appropriate PV Systems” and worked on a set of rules for the sizing of PV systems. ENEL has also prepared a Report on “technical aspects and costs of PV plants and this report has been discussed with Sonelgaz.

### Technology transfer study

This part of the project was dealing with the prospects for technology transfer. The organizations involved were the following: ENEA, TGI, CDER, SONELGAZ, STEG, NREA and PEC.

The methodology for the elaboration of a pre-feasibility study to complete a technology transfer analysis for the manufacturing of PV systems has been set up by ENEA. While TGI applies a bottom up approach, looking for instance at the components of the systems, their cost, local availability, type of manufacturing plants in the countries and so on, ENEA covered a more upstream part, assessing of the feasibility of a complete manufacturing facility within the SMCs region concerning PV modules and systems. Because the PV module represents one of the most important part, it was proposed the investigation be based on the reference case of a PV module manufacturing facility to be implemented in one Southern Mediterranean region. The objective was to define the economic competitiveness and the potential level of achievable technology transfer. The output is a feasibility study for the investigated kind of manufacturing facility.

### Water related application

This part of the project, PV-Water related applications, was dealing with the integration of photovoltaics to supply electricity to water pumping and water desalination systems in remote areas of the South Mediterranean Countries. The organizations involved in this part of the project are CRES, MEKOROT, NREA, PEC and CDER.

CRES prepared a report dealing with a general review of PV pumping and desalination systems including technical description, economical data, market availability as well as case studies. Also, a list of manufacturers and suppliers of PV pumping and desalination systems is provided.

MEKOROT’s report was dealing with the optimisation of small-scale Reverse Osmosis (RO) systems for brackish and sea water desalination. A re-design of small brackish and seawater desalination systems investigated under INTERSUDMED Project is presented. The systems characterized by simple design, easy operation, and low energy consumption.

Case studies were applied to Egypt, Palestine and Morocco.

### **Subtask 1.4: PV electrification plans and evaluation for PV market development**

This subtask was coordinated by the SMP with the support of OME and EDF. The objective was to define PV electrification plans in the context of rural electrification where integration of PV is optimised according to economic criteria and also to other relevant parameters depending on the SMC concerned. The characteristics of the type and number of PV systems needed for electrification and the related investments were the output of this task. The sites suited for PV systems were selected using the GIS softwares and taking into account cost benefit analysis along with potential social, economic and environmental benefits.

The PV electrification plans have been elaborated for Palestine, Egypt and Morocco with LAPER, and for Tunisia with Solargis ; the cost benefit studies are performed for PV projects using the methodology elaborated by IPTS and EDF in co-operation with the SMPs.

The same methodology for cost benefit analysis was used by Sonelgaz and ENEL/CESI for the economic analysis of PV plants in the South of Algeria.

The results indicate a very large market in Morocco where several projects are already underway with outside support. Algeria provides a large market for PV plants to supply isolated grids with diesel in the southern regions. Tunisia provides a significant market for PV electrification in the center and eastern part of the country. There are smaller needs for isolated rural villages in Egypt (Sinai) and PNA.

### **Sub-task 1.5. Identification of barriers and conditions for PV market development**

This subtask was coordinated by OME. The methodology and a questionnaire on the organization scheme have been prepared by OME and EDF. For each country, the following aspects were analysed:

- Analysis of the rural electrification (RE) sector, its structure and its funding. With particular reference to decentralized rural electrification (i.e. outside the national grid), how does this fit in with overall RE programmes in the country, what is its regulatory framework, which taxation regime will be applied and how will it be integrated into other regional development projects;
- With regard to the organizational domain, the objective was to study the private and public players who are likely to become involved in decentralized rural electrification. What role might they play in terms of commercial promotion, installation, operation and maintenance of the equipment and customer administration.

CEEETA and OME analysed also the successful experiences and new approaches of PV projects on large scale. The results were presented to the partners during the final meeting.

A study on social and macro-economic impacts of large scale PV projects in SMCs was performed by IPTS.

### **Sub-task 1.6. Analysis of financing schemes and private sector involvement**

This subtask was coordinated by OME. Possible financing schemes were proposed for the PV electrification projects. This task particularly emphasized on the following topics:

- Review of past experience of PV projects, to illustrate the variety of mechanisms able to be adapted to specific local conditions and needs in the SMCs
- Role of financial institutions (national or international) and private sector in PV projects
- Study of financing mechanisms which can be implemented to finance PV project (lending schemes, Consumer finance, revolving fund).
- Business Plans to allow an analysis of the profitability of the selected PV projects, to evaluate their investment needs, and to study their financing schemes. A questionnaire, prepared by EDF, including the information needed for the Business Plan was filled in by the SMPs and analysed by EDF.

OME and CEEETA were in charge with the analysis of the possible financial schemes involving public and private developers. The related report have been presented to the partners during the final meeting.

Also contacts have been established with financing institutions (World Bank, EIB and private banks) in order to obtain information on their position vis-à-vis the financing of PV projects and their eligibility criteria.

## ***V-2. Task 2 : Integration of Wind Power***

The general objective of Task 2 was to analyse the integration of wind power for electricity supply in rural regions of the southern Mediterranean countries. The research concerned several aspects: characterisation of sites, analysis of suited wind turbines, cost/benefit analysis, market development and financing schemes. The SMP partners participating were: CDER (Morocco), STEG (Tunisia), NREA (Egypt), NEPCO (Jordan), PEC (PNA) and EIE (Turkey). Task 2 was coordinated by ENEL/CESI and ENDESA.

### **Sub-task 2.0. selection of regions with high wind power potential**

The SMP have selected the regions with high potential for wind power development taking into account high local wind resources and also proximity to the electricity network and to demand centers.

**EGYPT:** The best sites for wind power development in Egypt are located on the Red Sea coast ; in particular near Zaafarana, in the Gulf of Suez, is studied wind farm development.

**TURKEY:** In Turkey, the west coast is very promising due to its good wind resources and the proximity to the load centers. For the IRESMED project, a large region is studied (200km x 200 km) centered on Izmir.

**TUNISIA:** The northern regions of the country, comprising the region of Bizerte and Cap Bon) are the most appropriate to consider the installation of wind farms.

**MOROCCO:** In Morocco was studied sites in the north of the country bordering the Mediterranean sea and also the region near Essaouira , on the Atlantic coast where the wind potential is high.

**JORDAN:** In Jordan the regions suited for wind power development are located on the north (near the border with Syria) and along the Arava valley in the South.

**PNA:** In the PNA, the wind resources are limited and the study will aim at evaluating which sites could be suited for wind farm development.

### **Sub-task 2.1. Analysis of wind resources and characterisation of sites for wind power**

This Subtask aimed at the analysis of the potential for the use of wind power in several regions of the Southern Mediterranean countries and at the study of specific sites for wind farm development. It was undertaken by CDER, STEG, NREA, NEPCO, PEC and EIE with the support of RISO and CIEMAT.

The phases of this subtask were the following :

- Establishing a common methodology for site characterization.
- Implementation of site characterization methodology by the SMP, including working sessions on the WASP software at CIEMAT and RISO offices.
- Provide support by RISO and CIEMAT on the site analysis by the SMP with WASP.
- Use of regional wind resource mapping by a meteorological mesoscale model (KAMM) for one region in Western Turkey and one region in the Gulf of Suez in Egypt and one region in North of Morocco.

The results were presented in reports prepared by each SMP with the support of RISO and CIEMAT.

### **Sub-task 2.2. Technological aspects and grid connection issues**

This Subtask was coordinated by ENEL/CESI and the objectives for the activity were mainly the characterization of technological solutions for wind energy exploitation to be considered as reference for the National Projects in South Mediterranean Countries examined in the IRESMED program, and a general survey on the existing situation for the projects already under development with special attention to the problems arising from the connection to large wind farms to the grid.

The results are given in report D2.2a - “Characterization of Wind Turbines Adapted to Local Context” and report D2.2b on grid connection issues.

### **Technology transfer study**

A methodology for the study of technology transfer of wind turbine components has been prepared by TGI and ENEA. The component concerned are blades, generators, control systems, etc.

### **Sub-task 2.3. Economic aspects of wind farms and cost/benefit analysis including environmental benefits**

This sub-task dealt with the economic evaluation of wind power use and its competitiveness in the framework of embedded (distributed) production. A cost/benefit methodology was proposed and used in the economic analysis.

The results of the cost-benefit analysis enabled the partners to assess the competitiveness, that is, its ability to provide electricity at the most promising sites and to evaluate the production costs and the pay back time for the investment. The cost-benefit analysis enabled to better assess the purchasing prices that are needed for the development of wind power by private developers. Most importantly, the cost-benefit analysis provided the economic and financial justification for the wind farms. A crucial dimension of the cost-benefit analysis concerned the valuation of the various externalities linked to electricity generation with wind farms.

IPTS prepared of a report ( “Methodology for cost-benefit assessment, with economic and environmental aspects”,) and a specific computation software was elaborated by ECYR and IPTS and used by the SMP partners.

The cost-benefit analysis was carried out on two bases. The first was a strictly financial basis. The second may be called an economic or social basis, considering externalities such as

environmental and social benefits. The results of the analysis was expressed as rate of return, net present value, and levelized cost of producing electricity.

#### **Sub-task 2.4. Market development issues for wind power and institutional aspects**

The coordinator of this subtask was OME which worked in close co-operation with CEEETA and ENDESA. A work plan has been defined concerning the analysis of the institutional framework and the legislation regarding the development and financing and wind farms, in particular by private investors. The methodology has been prepared by OME and sent to the partners. A key issue is the role of Independent Power Producers(IPP) and the type of tariffs allocated to wind power producers. CEEETA was in charge with the review of the development of wind power in European Union countries.

The SMP gathered and analysed information on the legislative and institutional framework in their countries. Detailed studies on the conditions for private wind power projects (as IPP) were done by the SMP with the support of ENDESA for Morocco, Jordan and Turkey and OME for Tunisia.

In parallel IPTS was in charge of the realization of a study on the social and economic benefits at the national level of wind power projects.

#### **Sub-task 2.5. Analysis of financing schemes and private sector involvement**

This subtask was coordinated by OME which worked in close co-operation with ENDESA, IPTS and DLR. A work plan has been elaborated and sent to all the partners of the project. The aspects related to the financing schemes were presented by ENDESA.

This way, the structure of the owner company of the wind farm (participated in its majority by the own promoters) was exposed, as well as the financing model (known as *project financing*). Documents required by the banks like conditions to the loan concession were also exposed (a complete list of administrative authorizations, and another contracts: construction, operation and maintenance, administration services and electricity hire-purchase contract).

The way of loan concession was detailed for wind farm as well as the assumed liabilities by the Wind Company (created to develop the wind farm) related to the reserve account of debt service with the bank entity and the range of covering of the main debt, like guarantee signs and payment solvency.

The SMP studied the possible financing schemes for wind farm projects in their country with the support of ENDESA and OME. IPTS was in charge of contacts with international financing institutions.

DLR also intervened in this subtask. The analysis work done by DLR focused on financing of solar thermal plants in Egypt, which, in the present conditions, need large financial support from external sources (such as grants or soft loans) in order to be competitive vis-à-vis coal or gas power plants.

DLR also intervened in this subtask. The analysis work done by DLR focuses on financing of solar thermal plants in Egypt and Jordan, which, in the present conditions, need large financial support from external sources (such as grants or soft loans) in order to be competitive vis-à-vis coal or gas power plants.

To conclude, the results of the Iresmed project can be placed generally in two major categories: the use of photovoltaics (PV) for rural electrification and the use of wind power for grid-connected generation of electricity. The PV systems can be used to support water pumping or desalination in areas not connected to the grid.

The study concerned large regions in 8 southern and eastern Mediterranean countries which shows the magnitude of the project in terms of the land area covered and thus the potential for PV systems and wind farms. The IRESMED project is thus very ambitious.

The project analysed all aspects of large-scale integration of these renewable energy sources into the Mediterranean Partner countries participating in the project. This included the analysis of solar resources in regions where there is a potential demand for PV, and analysis of wind resources in areas of high potential for economical power generation with wind. It included the characterisation of sites using GIS tools, economic evaluation in comparison with alternatives, study of institutional aspects including barriers to exploitation, possibilities of local manufacture of components, and financing requirements. All of these aspects must be considered in the exploitation of the results.

IRESMED defined the potential market for PV in rural electrification in Morocco, Algeria (case of PV plants), Tunisia, Egypt and the Palestinian Authority (PA). The results indicate a very large market in Morocco where several projects are already underway with outside support. Algeria provides a significant market for PV plants to support isolated grids with diesel in the southern regions. Tunisia provides a significant market for PV in the center and eastern part of the country; several projects are underway. There are needs in Egypt and PA but results indicate these are smaller than in the other countries studied.

There appear to be needs for PV water pumping in many villages , but the needs for desalination with PV power supply is much more limited.

IRESMED defined also the potential market for wind in the most promising regions in Morocco, Tunisia, Egypt, Turkey, Jordan and PA. The results indicate a very large market in western Turkey which has already attracted interest from private developers. The potential market in Egypt is also very large on the Red Sea coast, and substantial development along the Gulf of Suez is taking place. The indicated resources in Morocco are also very large in the north and western part of the country. Tunisia appears to have moderate potential on the northern coast. Jordan has also a moderate potential. The potential of PA is small due to limited wind resources and area available.

IRESMED analysed the economics of renewables both with and without consideration of the external environmental and social benefits. In the case of rural electrification, PV systems were compared with the alternative of grid extension. The results indicate large areas where PV is the most economical solution, even without considering externalities. However, results from socio-economic surveys indicate that the potential customers for PV are mostly very poor and require external assistance to pay for the installation.

The cost of wind-power in the best regions studied is less than its cost in Europe. However, in most cases the cost of competing fossil fuels are low due to the fact that the price of gas in these countries is much lower than in Europe ; for example the electricity production cost in Egypt with combined cycle power plants using natural gas is in the range of 2.5 US cents

which is very low . Wind farms, therefore, usually require favourable financing terms or political will with specific targets or projects to be implemented for wind power development.. If one considers externalities, the function/cost ratio is more favourable. If there is joint implementation of the Kyoto Agreement to limit carbon dioxide emissions, European investments in wind farms in these countries may become an attractive alternative. (CO2 emission trading schemes).

All these results show the large opportunities and potential market in these countries for European companies which are the world-wide leaders in wind and PV technologies. International funding agencies and other potential investors have also been informed of investment opportunities during the course of the financing tasks, and conversely the southern Mediterranean partners have become more aware of the eligibility criteria for various sources of funding. The World Bank and the European Investment Bank are aware of the IRESMED studies and results. The financing agencies and banks have been informed of the non confidential results of the project.

## **VI- EXPLOITATION PLANS AND ANTICIPATED BENEFITS**

The exploitation of the results of the Iresmed project can be placed generally in two major categories: the use of photovoltaics (PV) for rural electrification and the use of wind power for grid-connected generation of electricity. The PV systems can be used to support water pumping or desalination in areas not connected to the grid.

The implementation of the projects studied is dependent on the availability of financing for these projects and on the decision by the governments and utilities concerned to launch them.

The European industry through the associations such as EURELECTRIC, EWEA, EPIA, EUREC, etc were informed of the Iresmed project and will be informed of the non confidential results of the project. This will provide opportunities for them to enter this large potential market. European companies are the world-wide leaders in wind technology and have a strong position in PV. IRESMED should provide additional opportunity for marketing European energy products.

International funding agencies and other potential investors were also be made aware of investment opportunities during the course of the financing tasks, and conversely the southern actors became more aware of the eligibility criteria for various sources of funding. The World Bank and the European Investment Bank are aware of the IRESMED studies. Financing agencies and banks will be informed of the non confidential results of the project.

Large rural electrification projects with PV require first a national government commitment for support, because the customers cannot afford the full cost of installation. Experience has shown that it is desirable for each customer to share in the initial cost so that he feels a degree of ownership and responsibility for maintenance. Having defined the project and once the financing is available, it would be implemented through preparation of technical specifications, calls for tenders, and acceptance of offers for equipment and services. International contribution to funding is likely to be sought along with private sector participation. International funding agencies are increasingly requiring strong private sector participation in these projects, with the expectation of better long-term performance and cost recovery. The national governments may require that use be made of national capabilities for manufacture of components and local labour. IRESMED studies of institutional aspects and potential for local manufacture will contribute to this aspect of the implementation.

Large scale wind power projects requires detailed feasibility studies. The feasibility studies will be carried out by the utilities and wind-farm developers involved. Provided the economics are attractive (related to adequate purchasing tariffs), the private sector can play a major role as it is the case in Turkey. Projects can be awarded to IPP's based either on competitive awards or in response to unsolicited proposals. These are basically governmental decisions. The process is not spontaneous, however, as wind power is seldom the least cost alternative. The projects must involve financial contributions from international funding agencies or governments, or legislative schemes that pass the higher costs onto the power users. These aspects have been studied in IRESMED, and each national and local situation is unique and require special treatment. In the case of large wind programs, the national governments are likely to seek local manufacture of components; IRESMED provides preliminary evaluation of these possibilities.

Decision-makers in the European Commission will have an improved knowledge for their decisions on the ways to promote EC co-operation with the southern and eastern Mediterranean countries on the integration of renewable energy on a large scale. IRESMED identified the opportunities for such co-operation.

The partners of the project presented to the EC, the Industry and the EIB the results of the Iresmed project. The Seminar on the development and financing of wind farms and solar power projects in the Southern and Eastern Mediterranean countries was thus held on October 25, 2000 in Brussels (Belgium). This workshop, in which more than fifty representatives of energy companies, industrialists and financing institutions participated, allowed to present the results of the Iresmed project with a special focus on the proposals for promoting financing of PV and wind power projects in the Mediterranean countries. The proceedings of the Seminar will be widely disseminated.

IPTS has also set up a web site on the Internet to facilitate communication among the participants; this web site will be used later as a center for disseminating the non-confidential results of the project, the publishable report and the proceedings of the Iresmed Seminar. The participants in IRESMED are also expected to disseminate some of the non confidential results in their respective countries.