



## **MED-ENEC project**

# **Market analysis and capacity assessment MED-ENEC**

**The energy efficiency and Renewable energy market  
in the Mediterranean building sector**

### **Case study of Morocco**

**A survey made by  
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*"The European Union is made up of 27 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms." The European Union is committed to sharing its achievement and its values with countries and peoples beyond its borders."*

## TABLE OF CONTENT

<b>1. Executive summary</b>	<b>5</b>
<b>2. Objectives of the Med-ENEC project</b>	<b>5</b>
<b>3. Introduction</b>	<b>7</b>
<b>4. Dynamic of the building sector</b>	<b>8</b>
<b>5. Table of a product-market combination</b>	<b>10</b>
<b>6. Specific information on the applicable services and the available products in Morocco</b>	<b>13</b>
<b>7. Trends analysis of the construction sector with regard to the energy efficiency and the renewable energy</b>	<b>18</b>
<b>8. Segments of the market and business opportunities for the energy efficiency and the renewable energy</b>	<b>26</b>
<b>9. The market niches</b>	<b>29</b>
<b>10. Organisations representing the energy efficiency and the renewable energy</b>	<b>32</b>
<b>11. Relevant local, national or regional events</b>	<b>35</b>
<b>12. Initiatives for networks of professionals in Morocco</b>	<b>36</b>
<b>13. Concise assessment of capacities</b>	<b>38</b>
<b>14. Potential Help Desks</b>	<b>42</b>
<b>15. Recommendations</b>	<b>43</b>
<b>16. Conclusion</b>	<b>44</b>
<b>17. Appendices</b>	<b>48</b>

## **1. EXECUTIVE SUMMARY**

The study gives the present situation of the Moroccan energy context and the recent dynamics that experiences the building sector. In the Southern and Eastern Countries of the Mediterranean area, the electricity consumption, that has more than tripled during the last three decades, should be multiplied by the same factor by 2025, according to the reference projections of the Mediterranean Observatory of Energy (OME). The residential and services sector represent close to 40% of needs in energy.

However, most programs of cooperation on the subject focus on the production and the distribution of electricity, whereas implementation of appropriate and more proactive policies in favour of the energy demand and the diversification of energy sources could contribute extensively to adapt energy supply to the needs of consumers in the future.

The energy needs of the Mediterranean countries are growing, notably by searching a better comfort in housing. This comfort cannot be gotten solely through an increase of the energy consumption for the heating and the air-conditioning, but rather, through new constructional concepts, that require an optimized energy consumption thanks to the integration of the passive solar contributions, the best orientations of the buildings, the use of insulating materials, the natural ventilation of the buildings and to the recourse to the saving energy facilities.

The electric consumption due to the lighting in buildings can be reduced by using the low energy consumption bulbs . Other devices with low energy consumption can be used to reduce the demand of electricity, such as solar water heaters. With regard to buildings already equipped with air-conditioning systems, it is possible to reduce considerably the needs of energy avoiding the excessive cooling, thanks to the introduction of temperature regulation systems.

The present Morocco case study attempts to improve knowledge of potentialities offered by the building market, which experiences a sustained development of its urbanization. Different programmes and projects in the building, renewable energies and energy efficiency sectors, such as the Azur plans, the social building plans, the satellites cities project, the Promasol or Ecosol programmes, have been analysed.

Different SWOT analysis on the combination product-market as well as on professional organization networks and suppliers have been achieved in order to put their interest in evidence and show the concrete feasibility of their development, to promote and to encourage good practice exchanges with their counterparts in MED-ENEC partner countries.

Recommendations have been formulated with the goal to reinforce the institutional, technical and political aspects in the concerned fields, notably with regard to the authorized, normative, financial and fiscal aspects (as subsidies, loans at reduced rate and fiscal exonerations), as well as the technical specifications and procedures of agreement/ certification and other measures of capacity building (the study visits & exchange), notably in domains of marketing, maintenance and after-sale services.

These recommendations plead for an enhancement of the transfer of know how and technologies (north-south, but also south-south) and an encouragement to the creation of professional networks including architects, engineers, manufacturers and sellers of products, etc, and to the implementation of pilot / demonstration projects, implying the supplying of products and their suitable installation (ideally in zones in which they will have a big value of example).

## **2. OBJECTIVES OF THE PROJECT**

The goal of the MED-ENEC project is to boost energy efficiency and the use of solar energy in the building sector, aiming to reduce, both, the needs of energy supply and the negative environmental impact of the energy installations. In the South and East Mediterranean Countries, the electricity consumption has more than tripled during the last three decades. It

should be multiplied by the same factor by 2025. According to the reference projections of the OME, the residential and services sector represents close to 40% of needs in energy.

However, most programs of cooperation on the subject focus on the production and the distribution of electricity, whereas implementation of appropriate and more proactive policies in favour of the energy demand and the diversification of energy sources could contribute extensively to adapt energy supply to the needs of consumers in the future.

For this reason this project is essential. The problem must be dealt with in a regional perspective in order to take advantage of the catalyst effect and to encourage the exchange of experiences between Mediterranean partners. Its objectives are compliant to the EU Energy Initiative (EUEI) adopted during the WSSD in Johannesburg in 2002 and to the agreed orientations during the euro-Mediterranean conferences of the energy ministers.

## **2.1. Technical aspects**

The increasing difficulties that most of the Mediterranean countries face to satisfy the requirements of air-conditioning and heating in the urban zones can be solved at the buildings level, rather than by a simple increase of the energy consumption to the electric systems of air-conditioning and heating. Indeed, there are many ways to construct new buildings and to renovate the existing buildings that permit to reduce, or to avoid, the recourse to a system of air-conditioning or heating (thanks to the passive solar architecture or the bioclimatic approach).

These methods of construction take into account the shadiness, the insulation, the natural or mechanical ventilation, the good distribution of the thermal mass and the control of the day light to minimize the undesirable thermal gains during the day, in combination with the ventilation/ nocturnal cooling

Other new technologies exist such as geothermal heat pumps and the cold storage that can be used to cool while consuming less electricity than a conventional electric air-conditioning device. The electric consumption in buildings can be reduced significantly thanks to the utilization of the weak energy consumption bulbs. Other devices with low energy consumption can be used to reduce the electricity demand, such the solar water heater. With regard to buildings already equipped with air-conditioning systems, it is possible to reduce considerably the needs of energy avoiding the excessive cooling, by the introduction of the temperature regulation systems.

The project has notably for goal to improve the knowledge of these technologies, to put their interest in evidence, to show their concrete feasibility and to promote their adoption and their development and to encourage good practice exchanges between MED-ENEC countries partners.

## **2.2. Expected results of the project**

The project should encourage a modification of the proportion of the different energy sources in the region and should contribute to reduce greenhouse gases effect (GHG) and their negative on the climate change impacts.

The project will produce 4 major results:

### **2.2.1. Result 1:**

Regional and sub-regional information, communication and cooperation networks in the construction and energy sectors among the MEDA countries and with the EU-member states are established.

### **2.2.2. Result 2:**

Policy instruments, standards and incentive measures within an adequate regulatory framework orienting on the relevant topics and guidelines for energy efficiency in the construction and building sectors are available for adoption by policy makers.

### **2.2.3. Result 3:**

New services & businesses and technology cooperation between European and MEDA partners established to support communities, real estate developers and building owners with comprehensive and cost effective services. For this purpose several business development activities will be organised: capacity building workshops, investors meetings, twinning activities between EU and MEDA institutions, support of helpdesks and information offices, support/initiate expositions and fairs, encouragement of industry pools and instruments for the promotion of new business opportunities.

### **2.2.4. Result 4:**

Best practices and new technologies as well as integrative approaches are demonstrated and documented through pilot projects

## **2.3. Conduct of work**

The present study focuses on the market analysis and the capacity assessment (activity 3.1 and 3.2). Its objectives aim to develop a clear information basis on the market in terms of quantity and quality (offer and demand) for the energy efficiency and renewable energy products and services in the construction sector in partner countries. It must also give some concrete recommendations to boost the market volume (offer and demand) for these products and services such as the organization of fairs, the industry support, investors meetings, building capacities, knowledge transfer, support to energy efficiency projects, grooming, promotion of twinning agreements between institutions and country partners as well as the promotion of professional networks exchange.

The tasks to be achieved are executed according to the referred terms of reference.

## **3. INTRODUCTION**

In Morocco, the economical, environmental and social required conditions for the institution of a sustainable development are submitted to several challenges: globalisation, rapid technological advancement, education, energy, struggle against poverty and the exclusion, climate change and desertification etc. To take up these challenges a permanent work at all levels is essential. On the energy plan, since the closing of Jerada coal mines (end 2000), Morocco has practically not produced any fossil energy. It results a very high rate of energy dependence (more of 95% in 2005.). In 2005, imports of the raw oil reached close to 7 millions tons, which is an increase of 13% with regard to 2004, with an invoice corresponding to 4 billion of US\$ besides in increase of 60% with regard to 2004. This increase is due to the rise of importation and the effect of

increase of raw oil prices that passed from 36.21 US\$ per barrel to 55 US\$ (2005). The oil product part in the energy balance of Morocco is 60.1%. After oil it is coal that occupies the second place in the Moroccan energy balance with 32.2%.

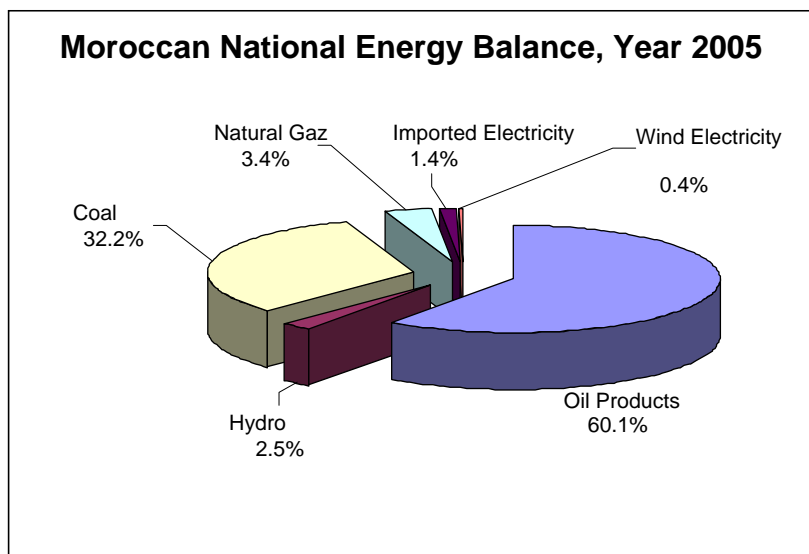


Figure 1: Moroccan National Energy Balance: year 2005  
Source: Moroccan Ministry of Eergy and Mines

This dependence represents for the country a very high-energy invoice (1,9 billion US\$ in 2000, 2,7 billion US\$ in 2004 and 3,7 billion US\$ in 2005). The energy consumption will also know an important increase. Indeed according to forecasting this consumption will reach 15 millions TOE and 25,000 GWh by of 2010 against 12.25 millions TOE and 19,500 GWh of electricity in 2005. Morocco also faces an over-exploitation of its forest resources provoking a yearly deforestation of more than 31,000 hectares. The yearly biomass-energy consumption is superior to 11 million tons (89% in rural and 11% in urban areas).

Otherwise, the only abundant energy resources in Morocco are the renewable energies such as:

**Wind energy:** with a considerable exploitable potential of wind energy passing beyond the 7,000 MW, whereas the currently installed power doesn't exceed 54 MW.

**Solar** with a big solar layer of 4.7 to 5.6 KWh/m<sup>2</sup>/day, a yearly average of sunshine of more than 3,000 hours

**Hydroelectricity:** with an installed power of 1,729 MW in 2005, representing 33% of the national installed capacity.

Because of this situation, Morocco must reduce its dependence on fossil energy resources. That is why, one of the strategic orientations of the national energy and environmental policy concerns especially the conservation and the rational use of energy as well as the protection of the environment. To reach this goal, all actions must be based on the promotion of efficient and viable production and on the efficient utilization of energy in all sectors.

#### 4. DYNAMIC OF THE BUILDING SECTOR: Big building projects

At the end the 20<sup>th</sup> century, more than half of the Moroccans already lived in cities. According to a yearly growth rate of 3.6%, (Source: General census of the population in 2004) the urban population will increase up to 57% until 2007 as compared to 51.4% in 1994. This demographic pressure pushes our cities toward mutations characterized by an increasing urbanization due to

the increase of needs in lodging and to the associated infrastructures. Indeed with its 4,023,725 lodgings of which 75% are occupied as a main residence, the residential sector in urban area accuses a deficit of 750,000 lodgings. To absorb this deficit by 2012, the number of new lodgings to construct must be superior to 150,000 units per year according to the assessment of the ministry of habitat in 2005.

From an energy point of view, the global cost of buildings is not only bound to the technical working facilities (air-conditioning, water, heating, electric devices, equipment, lighting, audiovisual, communication) but also to the manufacture, the transport and the implementation of materials and facilities. However the real estate park in Morocco generally develops itself while occulting the integration of environmental, energy and climate criteria at the level of the conception, the construction, the equipment, the exploitation and the maintenance of buildings.. Indeed, the recourse to no optimised electric and fossil energy facilities to satisfy needs of service and comfort, the weak quality of building associated to the lack of norms and regulations in this domain involve a considerable increase of energy and environmental expenses.

With a part of 25% of the national energy consumption, the tertiary and residential sectors are among the greatest consumers of energy in Morocco after the industry and the transport. They represent an important load for competitiveness and burden therefore the economic development of the country. However the potential of the energy conservation in these sectors is appraised to more than 18% (source: CDER, Ministry of Habitat and Urbanism) and can be gotten thanks to the setting up and the respect of a suitable authorized regulation and to the production and the rational management of the technical facilities, materials and comfort. Environmentally, the reduction of the negative environmental impacts of this sector passes by the reduction of the fossil energy consumption and the increase of the renewable energies part and also the use of passive energy systems in construction.

The building sector in Morocco experiences a sustained national dynamics (lodgings, tourism, hospitals...). As an example, we can mention:

#### **4.1. The Azur plan with the objective of 10 millions tourists by 2010:**

Six new zones with high potential have been identified, in view to close the gape in the Moroccan tourist structure. According to the Azur plan six zones of the Agadir size will be built within ten years: Larache (Lixus), Essaouira (Mogador), Saïdia, El Jadida (Mazagan), Taghazout (Agadir) and white beach (Guelmim). State of six zone assignment: conventions signed to this day concern the station of Saïdia assigned to the Spanish group Fadesa, stations of Mogador and Lixus assigned to the Belgian group thomas & piron (in partnership with the Accor group), the Mazagan station assigned to the South African group Kerzner international. The call of offers for the station of Taghazout has been launched and the selected groups will be known by end July 2006. Finally, the station of the white beach (Guelmin) has been withdrawn for the moment from the Azur plan; the government will reopen discussions with pre-selected groups that had shown an interest for this zone. Similar to the Azur plan, there are many big private projects in the main Moroccan cities. For example, in Casablanca the Accor group launched the construction of casa city center whose global investment rises to 598 millions euros (3 hotels, parking lots, commercial and real estate center). In Tangier, several projects of tourist complex are foreseen, such the Houara site financed by benefiting a Quatari group up to 170 millions of US\$ or in Marrakech with 1.5 billion dirham of russo-Moroccan investors.

#### **4.2. The national program of 200.000 social lodging per year:**

The national program of the 200 000 social lodgings that started in 1995 has leads to the approval of about of 250 000 lodging on more than 3500 real estate projects. The

public sector initiated a big size projects with a mean of yearly realization of 330 lodgings by project. The private sector contributes massively to the realization of this program by constructing more than 78% of the accredited lodging against only 22% for the public sector.

#### **4.3. The satellites cities program**

On the model of European cities like Marne la Vallée (Paris) in France, Morocco has decided to limit and divert the expansion of metropolises, to create first two new big cities: Tamansourt close to Marrakech, Tamesna close to Rabat-Salé-Témara. Others cities like Zenata close to Mohammedia and Gueznaya, Melloussa and al Majaz close to Tangier are programmed. The state with the help of the ministry of the habitat, will do the urbanistic studies, will balance the real estate and will plan the out site facilities. Promoters will be responsible of the construction. The most important promoters of social lodging are interested in these operations: Addoha, Chaâbi liliskane, Chaïma and others. The other projects consist in arranging of the Bouregreg valley, on 4000 ha: the construction of 2 marinas, a tram tunnel, the construction of the Bouregreg river embankments, the construction of an art and profession city, of an esplanade, bridges and a tram, of an economic and cultural space (on a island), of a plan of water surrounded by a technopole, of a sports city and an irrigation basin of green spaces, etc. The cost of this project is valued to 1 billion US\$ and will be financed partially by the State and the local authorities.

The global investment cost of the national program called 'city without shanty towns' put in place for the shanty towns & slums resorption is of 1.7 billion US\$ of which 0.54 billion US\$ subsidies of the State, 0.9 billion US\$ from the solidarity habitat fund (SHF) nourished by the tax on the cement, and 0.277 billion US\$ from the general budget of the State. Individuals, from the banking loans, will be able to get credits on 20-35 years, implemented by the SHF. With regard to the land, about 5600 hectares of domain or collective land have been dedicated to this program. To the fiscal level it is granted the exoneration of all taxes, royalties, involvement and contribution to the real estate promoters that pledge to achieve at least 2,500 lodgings on five years. This program concerns 262,128 households (1.5 million of people) in about 60 cities.

### **5. PRODUCT-MARKET COMBINATION TABLE**

For a whole view on the applicable products of energy efficiency and renewable energies as well as the available services for segments of the residential building market (individual houses, apartment blocks, etc.) and of the commercial buildings (administrative buildings, offices buildings, hotels, tourist and sport complex, schools, etc.), products and services for the new and existing buildings are taken in consideration and are analysed in the table below with a qualitative analysis of maturity of the product market combination (new, mature) and of tendencies of their evolution.

Building type	Products										
		<i>double glazing</i>	<i>Roof insulation</i>	<i>Front insulation</i>	<i>Partition insulation</i>	<i>Floor insulation</i>	<i>High Efficiency lighting</i>	<i>Solar Water Heaters</i>	<i>Cork</i>	<i>Plaster</i>	<i>Climatiseurs</i>
<b>Residential</b> (Maisons individuelles, Appartements, Villas...)	<b>New</b>	2	2	2	2	2	4	2	1	4	2
	<b>Existing</b>	2	1	1	1	1	2	1	1	3	2
<b>Commercial</b> (Hotels, Bureaux, Banques...)	<b>New</b>	3	2	2	2	2	4	3	1	4	4
	<b>Existing</b>	2	1	1	1	1	3	2	1	3	3
<b>Public</b> (Hopitaux, Internats, Casernes, Ministères, Aéroports...)	<b>New</b>	3	2	2	2	2	3	2	1	4	3
	<b>Existing</b>	2	1	1	1	1	2	2	1	3	2

Level of maturity indicated by a number between 1 (new) and 5 (mature)

rapid decline  
slow decline  
stable  
slow growth  
rapid growth

Building type	Services							
		<i>Glazing installers</i>	<i>ESCOs</i>	<i>Tightness services</i>	<i>Consulting &amp; engineering in materials of construction</i>	<i>Technical control of the constructions</i>	<i>Plasterer</i>	<i>Insulation (Cork, Mineral wool, polystyrene, Polyurethane)</i>
<b>Residential</b> (Maisons individuelles, Appartements, Villas...)	<b>New</b>	4	2	4	4	3	4	1
	<b>Existing</b>	2	2	3	4	2	3	1
<b>Commercial</b> (Hotels, Bureaux, Banques...)	<b>New</b>	4	3	4	4	4	4	4
	<b>Existing</b>	2	3	4	4	4	3	2
<b>Public</b> (Hopitaux, Internats, Casernes, Ministères, Aéroports...)	<b>New</b>	4	2	4	4	4	4	3
	<b>Existing</b>	2	2	4	4	4	3	2

Level of maturity indicated by a number between 1 (new) and 5 (mature)

rapid decline  
slow decline  
stable  
slow growth  
rapid growth

Some important suppliers by product are mentioned below in the table 1:

<b>Product</b>	<b>Suppliers</b>	<b>Contact</b>
Glass Window & aluminium joinery	Grenson & Perfittini	212 37 74 95 31
	Getalu	212 37 65-92-73
Cork (panels)	Silima	212 37 74 11 59
Insulation glass Wool	Fedaliene Thermal Insulation Society	212 23 31 57 34 Sitif.maroc@menara.ma
Plaster	Lafarge- Maroc	212 22 524972
Polyurethane	Enguiquif	212 22 24 61 76
Polystyrene	Sté matériaux nouveaux	212 22 25 35 47
Prefabricated Houses	Sedec	212 37 74 11 19/38
Composite materials (polystyrene+concrete)	Mixta Africa	-Tel. +34 93 444 19 74 Fax. +34 93 410 00 56 Web <a href="http://www.mixtafrica.com">http://www.mixtafrica.com</a> Mail: <a href="mailto:info@mixtafrica.com">info@mixtafrica.com</a>

Table1. Some suppliers by product

For the Moroccan market, more data is not available. For example, the table 2 below shows the volume in M\$US of the wool, glass wool and rock wool imports together. It is no way to know the volume of the mineral wool import alone

<b>Country</b>	<b>2003 en M\$US</b>	<b>2004 en M\$US</b>	<b>2005 en M\$US</b>
FRANCE	0,972	1,185	1,520
U KINGDOM	0,00	0,021	0,00
NETHERLANDS	0,319	0,097	0,236
DENMARK	0,380	0,304	0,614
AUSTRIA	0,00	0,042	0,00
GERMANY	0,002	0,053	0,003
PORTUGAL	0,053	0,078	0,123
SPAIN	1,105	0,981	0,2175
ITALY	0,013	0,056	0,030
TURKEY	0,00	0,00	0,002
ARABIA SAOUDITE	0,00	0,00	0,011
CHINA	0,00	0,00	0,004

Table2: The volume in M\$US of the wool, glass wool and rock wool imports

## **5.1. Cork**

The surface of the oak cork forest in Morocco represents 15% of the worldwide surface whereas the national production (15000 tons per year) corresponds only to 4% of the worldwide production. 90% of the cork production is exported. Only 10% are consumed on the national market, notably for the decoration. The thick part of exports (82%) is constituted by plugs in cork, small discs and panels in agglomerate cork. The principals' clients of Morocco in this domain are the former USSR, France, Germany and the United Kingdom. In this country, cork is used in various activities such as thermal insulation, the manufacture of the soles and plugs. In some European countries, many insulating materials (glass wools, and rock wools, asbestos,...) are classified as carcinogenic materials. That is why, natural and renewable materials as cork and hemp are used more and more in building insulation.

## **5.2. Glass & aluminium joinery**

The sector of the aluminium joinery developed itself a lot, mainly during the last ten years, for skeletons for windows and glazed bays with simple glazing. In particular in the commercial complex, commercial and administrative buildings use. The utilization of the double-glazing is a relatively new one technique, notably in the tourist sector (in 90% of classified hotels), in 30% of villas, Airports, clinics, banks.

## **5.3. Glass wool, polyurethane and polystyrene**

Because of the limited demand of this product in the thermal and acoustics insulation of the building, its main use is oriented toward the industrial applications (the cold rooms, refrigerators, ovens...). In addition, the polystyrene is used in the packing.

## **5.4. Plaster**

Taking into account the Moroccan tradition in decoration, this product has been used a lot for a long time. But its utilization as an insulating product is relatively recent.

## **5.5. Prefabricated houses and composite materials (polystyrene + concrete)**

The introduction of these new processes of construction was encouraged by the dynamics of the construction sector in Morocco.

# **6. SPECIFIC INFORMATION ON THE RELEVANT SERVICES AND THE AVAILABLE PRODUCTS IN MOROCCO.**

The specific information (availability, names of companies) on the relevant services and the available products in Morocco, are detailed below:

## **6.1. Identification of the main stakeholders**

The role of the real estate promoter is to ensure the coordination of the necessary operations related to the study, the mobilization of the land and financing, the realisation and the marketing. This activity implies several categories of stakeholders regrouped as follows:

### **6.1.1. Public promoters**

The State is considered to be the most important real estate promoter in Morocco excepted for the national program of the 200 000 social lodgings for which the private

sector contributes by more than 78% of the accredited lodging against only 22% for the public sector.

Among its different establishments, we can note:

Establishments under authority of the Ministry of habitat and urbanism are:

**Erac:** the regional establishments of amenities and construction, there are seven (7). These establishments work on the activation of the public real estate promotion and the stimulation of private real estate (Etablissement Régional d'Aménagement et de Construction).

**Anhi:** national agency of struggle against the unsanitary habitat has for mission the enhancement of the state participation in removing shantytowns and restructuring of the clandestine habitat (Agence Nationale de lutte contre l'Habitat Insalubre).

**Snec:** the national society of equipment and construction was created in 1987 to accompany the State in gaps of the rural and social habitat and in the realization of big fundamental amenities (Société Nationale d'Equipeement et de Construction).

**Attacharouk:** this society of amenities, construction and real estate promotion was created in 1987 to take charge of the resorption program of the big shantytown Ben M'sik in Casablanca.

**Holding al Omrane:** more recently. The society holding al Omrane was created to regroup the whole of these establishments (organisms under tutelage). The project al Omrane has for objective to accredit the intended Landed offer for the social habitat, to double the actual rhythm of the social habitat production in cooperation with the private sector, and activate resorption programs of the precarious habitat.

The Bank of deposit and management: This 'bank' also brings its financial contribution and participates to the development of the real estate promotion. Here are some different subsidiaries:

- The real estate general company (Compagnie Générale Immobilière)
- The Moroccan real estate and landed Company. (.....)
- The society of promotion of the rental habitat (Société de promotion de l'Habitat locatif)

### 6.1.2. Private promoters

It is important to mention companies of real estate promotion, cooperatives and the neighbourly organisations of habitat (les amicales d'habitats), tradesmen, craftsmen, landowners as well as households.

Lately real estate private groups have been created thanks to the launching of big social lodging projects combined to incitement measures led by the State. They even passed beyond the public promoter production. In order to defend their interests, some big enterprises of the real estate promotion grouped themselves within the following associations:

- **Alpic:** Association of 'Plotters' and real estate promoters of Casablanca (Association Promoteurs Immobiliers).
- **Ulpim:** Union of 'Plotters' and Moroccan real estate promoters (Union Promoteurs Immobiliers)
- **Anaim:** National association of real estate agents (Association Nationale des Agents Immobiliers).

- **FNBTP**: National federation of building and the public works (Fédération Nationale du Bâtiment et Travaux Publics).
- **Fni**: National federation of the real estate (Fédération Nationale des biens Immobiliers).

According to a study conducted by the direction of the real estate promotion in 2000, the total number of real estate promoters existing in the 16 regions of the kingdom is 14 public promoters and 779 private.

In regions of Great Casablanca and Tangier - Tetouan we find again the biggest number of promoters, with respectively 186 and 184 promoters, followed-up by regions Rabat-Salé-Zemmour-Zaer (99 promoters) and Fes-Boulmane (82 promoters).

Among the most important private promoters, we can mention:

- Group chaabi liliskane
- Group adoha
- Fadesa Morocco
- Group Thomas&piron international
- Group jamai
- Society immocor
- EAMAR group

### 6.1.3. Architects

The architects of whose the responsibility and missions have been defined in several texts of law remains a major actor in the domain of the construction and the plot.

They are represented by the national council of the architects order and its 9 regional councils represent one. In 2005, the number of architects was 2683, distributed like follows: 64.6% in the private sector and 35,4% in the public. Regions of Great Casablanca and Rabat-Salé concentrate 2/3 of architects, respectively 31.6% (847 architects) and 30.6% (822 architects).

### 6.1.4. BTP enterprises

The whole of the BTP (Buildings and Public Works) enterprises is composed of about 52,000 units of which 2,800 enterprises are structured and organized with a preponderance of construction enterprises (58%). It covers the totality of the national territory with a relative concentration in Casablanca (22%), Rabat-Salé (17%) and Meknès Tafilalet (11.4%).

The BTP employs more than 520,000 people, i.e. 9.7% of the active population.

The majority of organized enterprises are affiliated to the national federation of the building and public works (FNBTP). The FNBTP regroups 16 professional associations representing all branches of building and public works, as:

- **AMA**: Moroccan Association of Elevators (Association Marocaine des Ascenseurs)
- **AMC**: Moroccan Association of The Construction (Association Marocaine de Construction)
- **SOUL**: Moroccan Association of electricity (Association Marocaine d'Electricité)
- **AMEC**: Moroccan Association of Enterprises of Pipeline (Association Marocaine des Entreprises de Canalisation)
- **AMEF**: Moroccan Association of Enterprises of Forage (Association Marocaine des Entreprises de Forage)
- **AMEP**: Moroccan Association of Enterprises of Paintings (Association

- Marocaine des Entreprises de Peinture)
- **AMETI:** Moroccan Association of tightness and insulation (Association Marocaine d'Etanchéité et d'Isolation)
- **AMM:** Moroccan Association of Joinery (Association Marocaine de Menuiserie)
- **AMPCC:** Moroccan Association of Plumbing, Heating And Air-conditioning (Association Marocaine de Plomberies, de Chauffagistes et de Climatisation)
- **AMPG:** Moroccan Association of Producers of Granulates (Association Marocaine de Producteurs de Granulats)
- **ANFA:** National association of the Façades and windows promoters (Association Marocaine des Façades et Promoteurs de Fenêtres)
- **APIM:** Moroccan Association of Importers of Material of BTP (Association Marocaine des Importateurs de matériaux BTP)
- **AMIL:** Moroccan Association of Industries of the Cork (Association Marocaine des Industries du Liège)

## 6.2. Producers and suppliers of construction materials

Industrials of construction materials, occupy an important place in the transformation industries sector. The construction materials sector is composed of the following industrial activities:

- Manufacture of various articles in ceramic
- Industry of the glass
- Manufacture of construction materials in cooked earth
- Cement
- Manufacture of various agglomerate
- Manufacture of products in marble, carved stone and slate
- Manufacture of product in asbestos and abrasive products
- Manufacture of lime and plaster
- Manufacture of extruded polystyrene and the polyurethane,
- Manufacture of cork panels for the thermal insulation

For the cement, the table 3 below gives localization and the capacity of cementers' production:

Cementers	Localisation	Capacity of production tons/year
Lafarge Maroc	Bouskoura, Meknes, Tanger, Tetouan	5,000,000
Ciments du Maroc	5 000 000	3,000,000
Holcim Maroc	Oujda, Fès	2,266,000
Asment	Ain atig	800,000

Table3: Localization and the capacity of cementers' production:  
Source: Rapport de l'habitat en chiffre 2003

The table 4 below presents the production index evolution of the construction materials between 1996 and 2003 with a basis index 100 in 1992

Year	2000	2001	2002	2003
Materials				
Glass	122,7	128,9	16,6	158,7
Cooked Earth	98,8	92,6	107,2	113,4
Cement	124,9	135	140,6	153,7
Lime and plaster	118,4	124,8	118,9	133,3

Table 4: Production index evolution of the construction materials between 1996 and 2003

It is necessary to note that there are about ten industrial transformation and valorisation units of the cork localized mainly in the region of Rabat-Salé. Nearly all activities of these units are centred on the manufacture of plugs except only one society (Silima) that manufactures panels for the thermal insulation 95% of the Moroccan production of cork are destined to the export generating the equivalent of 15 millions of US\$ per year (2002). For Moroccan market, more data is not available and needs deepened study to be done if necessary.

### **6.3. Producers suppliers and installers of insulation materials**

The introduction of insulating materials such as the wool of glass, the wool of rock, the polyurethane, the extruded or expanded polystyrene, and the cork in the construction sector remains very limited due to the lack of application of norms and specific regulations to the energy efficiency and comfort in the building. Consequently, as professionals have stressed, the majority of these materials, is destined to the industrial activities (heat exchangers air conditioning...).

The sector of manufacture and supplying of insulation materials divides in two categories. The first concern:

#### **6.3.1. Materials:**

- Fedalienne Society of Thermal Insulation (Tél: 023 31 57 34)
- Entreprise Cherifienne of Insulation (Tél: 022 44 64 42)
- Society New Materials (Tel: 022 25 35 47)
- Society INTERFER (Tel:022 62 15 05)
- Society POLYTECH (Tel: 022610285)
- Society PANAF (Tel:022.35.26.51 Fax:022.35.68.67)
- Society SILIMA (Tel:037 74 11 59)
- Society SOREXI. (Tel: 21222618230).

#### **6.3.2. Installers:**

The second category concerns the installers of these products that remain dominated by the activity of aluminium joinery. With the exception of some very reduced activity in thermal and acoustic insulation of the external building lodging, the larger uses of these products in the building sector is hindered by the no-availability of expertise and by the weakness of the market.

### **6.4. The technical consulting institutions**

On the 500 technical consulting institutions, 412 are regrouped in the Moroccan federation of engineer advice (FMCI) and 70% are dispatched in the region of Casablanca and Rabat/Salé and 40% of them operate in the building domain. It is necessary to note that domains of activities of consulting institutions have been specified in the decree of 22/03/1999, instituting the approval system for the transfer of some publics market.

### **6.5. The laboratories and control institutions**

The Moroccan association of laboratories of the building and public works (AMLBTP) includes the following control laboratories:

LPEE, TESCO, LABOTEST, VBTP, GEORET, FLAMBAR, NBR, and OCT;

The LPEE laboratory possesses an important representation at the national level. Except the GEORET localized in Tetouan, the other laboratories are situated mainly in the Casablanca-Salé axis.

There are also about ten control institutions, accredited by de Ministry of Commerce and Industry, as EXPERTEC, SOCOTEC, FIVE CONTROLE, etc.

## 7. TREND ANALYSIS OF THE CONSTRUCTION SECTOR IN RELATION WITH THE ENERGY EFFICIENCY AND RENEWABLE ENERGIES.

An analysis of the trends in the construction sector in term of energy efficiency and renewable energies, as well as a SWOT analysis of supply of relevant products is given below:

### 7.1. Trends analysis

Economically, the sector of Building and Public Works (BTP) is one of the most dynamic sectors thanks especially to the large building sites launched in Morocco such as for example the fifteen new cities project programmed for the fifteen next years. Today, this new dynamic gives to the BTP sector its strength especially as the total deficit in housing was estimated in 2002 to 700.000 units. The urbanization rate is currently of 55%, with prospects for 62% for 2010, as well as the youth of the Moroccan population (more than 60% have less than 30 years), increase the demand for housing.

The evolution of the consumption of cement presented in the table 5 below shows the current tendency of the sector of construction. Indeed, close of April 2006, the consumption of cement rose to 3,33 million tons against 3,06 million one year before, (8,77% increase), according to the Association of the Cement-Manufacturers. For only April, the sales were established with nearly 961.500 tons, i.e. 9,42% of more over one year.

Consumption	2006		2005		Ecart%	
	Month	Cumul	Month	Cumul	Month	Cumul
National x1000 (ton)	961,4	3330,4	878,6	3061,9	9,42	8,77

Table5: Evolution of the consumption of cement: Source: Association of the Cement-Manufacturers

In the first quarter of 2006, the tendency would remain constant in the BTP. In the 4th quarter 2005, the High Commission in the Plan reveals that the BTP sector continued its bull tendency. The margin of the not used capacity of cement production is estimated at 33%.

If the majority of professionals in the construction sector are conscious that the building energy efficiency is necessary to reduce the energy consumption, most of them need real policies and concrete actions in this domain. The most known practices are the recourse to the solar water heater. We note an emergent professional interest with regard to the energy efficiency. However, professionals wait that the state imposes adequate normative and authorized regulation. Also, professionals lack arguments to convince the work master, because their own present knowledge remains insufficient.

The construction materials sector is composed today of an important number of production and shaping units covering most basis products of finish.

Along with the production, there exists a varied and competitive import activity, making the building sector one of the development vectors of the country. The majority of construction materials are produced locally, except the special cement, wood (in big quantity) and the glass.

Materials of the big works (as bricks, cement, ready concrete to the use...) are relatively abundant; on the other hand materials of the second work undergo a strong competition

with imported products mainly from Europe and recently from Asia and Turkey with very competitive prices.

The whole of branches of the sector consist to:

- **Fabric of building:** cement, materials in cooked earth, prefabricated products on basis of cement, ready use concrete, lime, etc.
- **The second work:** in this under sector, there is a considerable number of products that is manufactured locally or imported (sanitary, electric equipment, heating, joinery...)

Trends of the construction sector in relation with the energy efficiency and renewable energies could be appreciated through some energy efficiency programs in the building sector. These programs could answer the following points:

- The lack of energy consideration in the conception, the construction, the equipment and the management of buildings;
- The appreciable increase of the energy expenses as a consequence of quality of service and comfort;
- The increase of the oil prices.

## 7.2. Promasol Program (web: [www.cder-gp.ma](http://www.cder-gp.ma) and [www.cder.org.ma](http://www.cder.org.ma))

The Promasol program has been decided in year 2000. It is a part of a National Solar Water Heaters (SWH) program in Morocco. It aims to develop a technical, organisational and financial support mechanisms as well as the demand inhibition of the SWH (in particular the leasing) in order to sustain the local market.

The Promasol is a market development program of SWH. It was initiated to answer the different preoccupations in term of energy, economical and social order.

This program of 100,000 m<sup>2</sup> SWH on four years in collective applications takes place on three axes:

- Facilitate the access to SWH: mobilization and adaptation of financing tools (leasing), insurance risks for investors, fiscal redevelopment (reduce prices of SWH by 50%), and creation of manufacture units and services companies, support to local manufactures initiatives.
- Improve the quality of facilities: norms, solar result guarantee, laboratory of test, solar result guaranty.
- Sensitive and promote: partnership, communication and marketing.

The 1<sup>st</sup> phase of the program consists in installing the SWH for collective buildings in health, the education and tourism departments decreasing their energy consumption. This initiative would give a group of activities in the domain of SWH, whose objective is to install during 4 years 100,000 m<sup>2</sup> of SWH for the individual and collective applications. No subsidies are used; only the implementation of the three axes above and a big communication and awareness campaign has been done.

The objective of Promasol is also to develop, in 4 years, the SWH market volume from 5,000 m<sup>2</sup>/yr to more than 40,000 m<sup>2</sup>/yr, to generate a cash flow of 40 millions US\$ related to 100.000 m<sup>2</sup> of implanted SWH, to save imported energy of 100,000 TOE and reduce GHG emissions besides of 1,3 millions tons CO<sub>2</sub> equivalents.

### 7.3. The building energy efficiency code

The Ministry of Energy and Mines and the Center of Development of Renewable Energies, in co-operation with the PNUD-FEM, are about to launch a project concerning the energy efficiency in the building with the cooperation of the FEM, the UNDP and the Italian Government. The principal partners are:

- UNDP-Reduction and the PNUD-FEM
- Ministry of Finances
- Ministry of Habitat
- Ministry of Health,
- Ministry of the National Education, the Higher Education, Scientific Research and the Management Training
- Ministry of Tourism
- Professionals of the building,
- The Order of the Architects

The global budget of the project is of 15.351.000 US\$. It is detailed in table 6 as follows

Source of financing.	Preparatory phase of assistance	Implementation phase
PNUD-FEM	275,000 US\$	3.000.000 US\$
UNDP-Rabat	50.000 US\$	
CDER	26.000 US\$	
Italian Government		1.200.000 US\$
Other silent partners		800.000 US\$
Targeted investments of the Ministry for Health		4.000.000 US\$
Targeted investments of the Ministry for the Habitat		4.000.000 US\$
Targeted investments of the private sector		2.000.000 US\$
<b>TOTAL</b>	<b>351.000 US\$</b>	<b>15.000.000 US\$</b>

Table 6: Global budget of the project: Source: CDER

This project is organized in two phases: 9 months as preparatory phase (April - December 2005) and 4 years (2006 - 2010) as an implementation phase.

The building energy efficiency project aims at the integration of energetic considerations in a first time, in three key sectors: habitat, tourism and health, according to the three following axes:

- Buildings conception (architecture, envelope, construction materials, opening facades, orientation, etc.)
- Working of facilities (design, transforming of power, energy facilities, etc.)
- Energy management in buildings

The implementation of these axes includes the following aspects:

- Creation of thermal regulatory framework for buildings.
- Development and setting up of a thermal regulatory code for hospitals, hotels and collective habitat
- Technical norm development for building promoters and setting up a strategy of mobilization and awareness.
- Removing of constraints and promotion of multi-sectorial initiatives.
- Development of a compensation program for investments in energy efficiency in the sector.
- Identification and promotion of energy efficiency investments in the building sector.

#### **7.4. Ecosol Program of ONE/PNUE-DTIE** (*web: [www.uneptie.org/energy/finance](http://www.uneptie.org/energy/finance)*)

The National Office of Electricity (ONE) in partnership with the United Nations Environmental Program (UNEP/DTIE) develops this program. The financial instruments for the SWH have been developed further, with a particular attention to the service of loans developed for the hotel sector. The service aims to provide the aid to the local financial institutions in the concession of a loan and portfolio leasing while subsidizing the interest rate of loans, and while using ONE invoicing services to compensate the monthly payments. The project started in January 2006.

The Ecosol financial mechanism benefits from a subsidy from UNEP not exceeding the 6%. The customer can choose between:

- An investment credit: that is an immobilization and risk to burden the customer's balance. The interest rate is 6%.
- A leasing: considered like an exploitation load and don't affect the ratio of indebtedness of the customer.

This fund of 1,2 million US\$ permits to:

- Decrease the customer's risk, reducing the credit interest rate and the leasing, thanks to the ONE,
- Spread out the initial investment on several years
- Offer a financing at 0% to the potential purchasers
- Motivate banks and leasing institutions to keep a portfolio of quality loans, because they lend their own funds

#### **7.5. Energy audit in the hotel and hospitable sectors**

In the framework of the Moroccan-Andalousian cooperation, energy efficiency programs in the hotel sector have been implemented by the renewable energy development center CDER in six hotels (Almohades, intercontinental, Solasur and el Menzeh in Tangier, Safir and Hyatt Regency in Tetouan).

For the hospitable sector, the energy audits have been done in a sample of 16 hospitals selected by the ministry of health and the CDER and are representative of the different regions of the kingdom (north, south, east, west and center). The sample is constituted of eight hospitals of 'pavillonnaire' type and eight hospitals with central building. The older hospital of the sample dates from 1916 (hospital al khatib in Fès) and most recent has been inaugurated in 2001 (provincial hospital of Taounate)

The table 7 below deals with the audited hospitals

City	Hospital	Number of functional Beds	Total Surface in m <sup>2</sup>	Built Surface in m <sup>2</sup>
Agadir	Hassan II	590	192 000	25 000
Al Hoceima	Mohamed v	333	40 000	29 280
Beni Mellal	H.p de beni Mellal	416	100 000	59 400
Casablanca	My youssef	170	14 940	13 870
Fès	Ibn al khatib	373	120 000	16 000
Fès	Al ghasani	462	140 000	48 402
Inezgane	Prefectoral	310	28 260	14 665
Kénitra	Al idrissi	398	65 000	11 000
Khemisset	Khemisset	134	13 266	7 348
Meknès	Mohamed v	576	46 440	3 643
Meknès	My smaïl	253	185 000	47 152
Oujda	Al farabi	545	20 000	19 000
Safi	Mohamed v	618	47 000	9 400
Settat	Hassan ii	233	44 320	12 900
Taounate	H.p de Taounate	65	15 552	7 060
Taza	Ibn baja	317	57 460	4 340
<b>Total</b>	<b>16</b>	<b>5 793</b>	<b>1 129 238</b>	<b>328 460</b>
<b>Mean</b>	<b>-</b>	<b>362</b>	<b>70 577</b>	<b>20 529</b>

Table 7: audited hospitals: Source: CDER

The audit of 16 hospitals showed the possibility to install 1,100 m<sup>2</sup> of SWH to produce more than 46,700 liters of sanitary hot water; with an investment of 0,34 US\$ and a valued return time of 6 years.

In the same way of identification and assessment of energy economy projects, the achieved diagnostic had for object to analyse the technical-economical feasibility of solar equipment to ensure needs of sanitary hot water for the audited hospitals. The choice of SWH systems of every audited establishment was based on the defined priorities by persons responsible of the hospital and the improvement of the service offered to patients.

In this regards, several actions have been identified as:

- Optimisation of the electric invoice by the adjustment of the subscribed power and the improvement of the power factor,
- Efficient management of the electric consumptions by the replacement of inefficient lights sources by low consumption lamps,
- Use of individual electric meters for function lodgings instead of their feeding from the hospitals facilities,

- Management of the maximal electric demand, the substitution of the used energy, the renovation or repair of the inefficient facilities,
- The improvement of the furnace combustion efficiency.

For the 16 audited hospitals, the realizable profits are about 21% of the invoices of energy corresponding to an economy of 1.727.00 US\$/year

## **7.6. Energy Efficiency in airports**

This program was initiated in 1998 by the national Utility of Airports (ONDA). It concerned the energy audits of Mohammed V Airport, Marrakech, Agadir, Tangier, Rabat/Salé and Fès Airports. Results of audits showed the reduction potential of 41% in the electricity invoice that rose to 2,2 M US\$ for Mohammed V Airport. This airport represented 80% of the total energy consumption for all national airports. Following to this audit, centralized technical management systems have been implemented, in order to control and manage the working of air conditioners while measuring in real time the energy expenditure in US\$ by equipment thanks to data loggers and devices of measure. According to the ONE, the electric invoice passed from 2,19 million US\$ for the year under study (octobre1999/septembre 2000) to 1,4 million US\$ in 2001 In March 2002, the assessment permitted to note a reduction of 0,75 million US\$/year in the electric invoice that is to say 34% (Source: National Office of the Airports).

## **7.7. Program of emergent rural center promotion**

Fifty new rural centers in 13 regions with more than 2000 inhabitants and with a remarkable dynamics in their socio-demographic, economic and urban evolution, have been identified by the Ministry In charge of the Habitat and Urbanism, in order to ensure their promotion, by strengthening their assets and their capacities as a favourable space capable to attract emigrants from the rural zones whose flux is usually destined to the big urban agglomerations, already saturated or in way of saturation. The promotion of these centers involves the following sectors:

- Facilities and service activities;
- Establishments of teaching and education;
- Facilities and health services;
- Socio-cultural facilities;
- Tourist infrastructure;
- Amenities and environment

A pilot program is in preparation by Ministry In charge of the Habitat and Urbanism. The integration of renewable energies in lodgings is one of priorities of this program

## **7.8. Program of rationalization of electricity and water consumption in the local authorities**

The total energy expenditure of the local communities amounted to 61 million US\$/year in 1997 with an annual progression of about 7%. For this reason, a study achieved by the general local community direction with the UNDP support, has for objective to implement at the national level a payment system of the electric invoice by a label. It is necessary to note that this program aimed only to the optimisation of the electric invoice through the subscribed power and doesn't concern the optimisation of the design or working of facilities; no audit has been done so far.

According to this study, the specific actions like the optimization of the electric invoicing, followed invoices, improvement of the technical training, would allow a

gain of 33% on the electric consumption of the local authorities corresponding to a profit of 20 million US\$/year.

Two local communities were identified like important in energy economy:

- The local authority of Zouagha moulay yakoub in Fès with a gain of 91% of the total invoice and whose electric invoice reached in 1997 approximately 5950 US\$/year.
- A local authority in Marrakech with a gain of about 94% on the electric invoice concerning the operation of a water jet for a fountain (101.00 US\$/year).

### 7.9. The management project of energy in Morocco (GEM)

Considered as the most important project of energy management in Morocco, the GEM project in partnership between the Moroccan government and the USAID, was initiated in 1986 by evaluating the energy economy potential which was estimated at 410.000 TEP that is to about 4,7% of the consumption of primary energy. The project was achieved in 1996 with a total cost of 9,8 MUS\$.

For the residential sector, the GEM project carried out a demonstration program for the management of the electricity request in the Yacoub el Mansour city in Rabat. The goal was to examine the possibility to implement an efficient management program for the electricity consumption (residential, electrical lighting, electric devices...).

This demonstration program covered 1500 households of the city of which the energy consumption per inhabitant is given as follows:

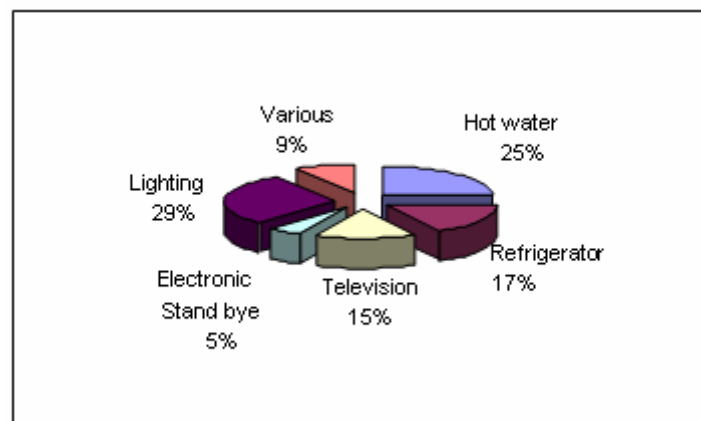


Figure 2: consumption of energy per inhabitant

The main results showed that by replacing the incandescent lamps with the low lamps consumption as well as the newly designed refrigerators allows an energy economy of about 23% on the households' electric invoices and 20% of economy concerning the lighting for the commercial sector.

The main factors hindering the use at a large scale of low lamps consumption were the price (15 to 20 US\$ in 1986 as compared to 1,5 to 5 US\$ currently), the lack of certain lamp quality and the insufficient information.

### 7.10. The national program to implement a strategy for normalization 2006-2010

The aims of this program managed by the Ministry in Charge of the Habitat and Town Planning (MDCHU) is the development of a national strategy of

standardization in building sector. With the partnership of the professionals of the building, this program will be spread out over 4 years (2006/ 2010). The priority actions to undertake by the Ministry are:

- The enrichment of the normative and lawful arsenal (in progress)
- The installation of a system of certification, managed by private offices approved by the MDCHU, for the development of the projects of quality in the sector of the habitat
- The revision of the specifications annexed to the conventions signed with the State and the real estate promoters profiting of advantages granted by article 19 of the finance law 1999. This revision concerns the guarantee of the respect of the national standards in building projects.

Concerning standards on thermal and acoustic comfort a specific program started in 2006 by the creation of two comities in acoustic and thermal comfort. This program is in progress.

## 7.11. SWOT Analysis of the building sector

### 7.11.2. Suppliers of heat insulation material

Suppliers	Specialization	Strength	Weakness
Lafarge Plâtres	plaster panels and partitions for heat and acoustic insulation	<ul style="list-style-type: none"> <li>• National anchoring</li> <li>• Large experience</li> </ul>	
Société Fedalienne d'isolation	Glass wool	Good experiment in the industrial sector	Lack of experience in the building sector
SILIMA	Cork panel	<ul style="list-style-type: none"> <li>• Experience in the building sector</li> </ul>	Need adaptation of the equipments for the building market
Enguiquif	Polyurethane	<ul style="list-style-type: none"> <li>• Good experiment in the industrial sector</li> </ul> Export	Lack of experience in the building sector
MixrtaAfrica	Manufacture and assembly of insulating block concrete	<ul style="list-style-type: none"> <li>• Heat insulation integrated in the load-bearing wall</li> </ul> Innovating Process	Regional cover (northern of Morocco)
IRP	Polyurethane	Simplicity of implementation for the roofs and the frontages	National Market very little developed

Table 8: Suppliers of heat insulation material

### 7.11.2. Solar Heating Water suppliers and service

Suppliers	Strength	Weakness
Sococharbo	Good and long experience	Label quality and test Certificate CDER
Capsolair	Good experience	Label quality and test Certificate CDER
Phototherm / Giordano	Good experience	Label quality and test Certificate CDER
ATCOMA	Good experience	Label quality and test Certificate CDER
Batitherm	Good experience	Label quality and test Certificate CDER

Table 9: Solar Heating Water suppliers and service

## 8. MARKET SEGMENTS AND BUSINESS OPPORTUNITIES OF ENERGETIC EFFICIENCY AND FOR THE RENEWABLE ENERGIES

The ordering of the segments of the market with the most important business opportunities for the energy efficiency and the renewable energies in the sector of the construction is given below through the niches of market or new products and services that can be launched with success:

### 8.1. The commercial sector: Hotel business, inns and self-catering cottage

At present Morocco receives more than 5 million tourists currently per year and plans to reach more than 10 million tourists by 2010. This strategy is accompanied by large-scale construction programs of tourist complexes, such as the azure plan (see 4.1). This new plan of development of the tourism in Morocco will create 600.000 direct jobs to which should be added five times more indirect jobs and jobs created by the infrastructures of construction, of which 80.000 rooms and 170.000 supplementary beds with an investment of 0.8 to 0.9 billions US\$. The needs of water in the classified hotels are of more than 300 l/jour and by tourist, thus involving an important requirement of domestic hot water. Let's note that Morocco recorded more than 43 million nights in 2005 in classified and not classified hotels, in campsites and other residences. It should be noted that the average national occupancy rate is 45% (75% in the tourist cities as Marrakech and Agadir). These numbers show that the business opportunities for the energy effectiveness and renewable energies in this sector are very important in this sector (estimated to millions m<sup>2</sup> of solar water heaters).

### 8.2. The residential sector

The residential sector represents a considerable potential (see figures below). It is essentially related to the following niches

- villas,
- individual residences
- apartments grouped in buildings
- Housing associations

For the year 2004, the figures below, elaborated by exploiting the various statistical data collected from the Statistics Direction of the High Commission to the Plan, show that the Moroccan type houses and apartment type represent 96% of the existing, lodgings, 92% of total built surface and, 91% of the total floor surface.

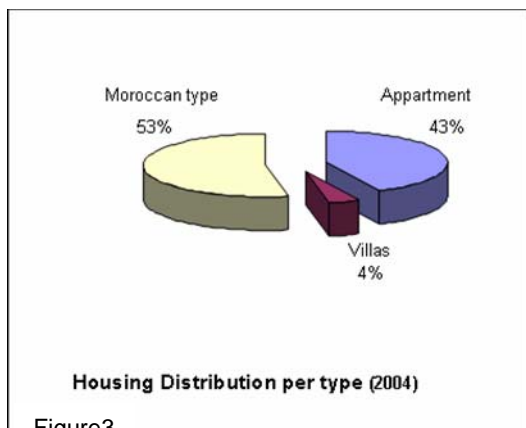


Figure3

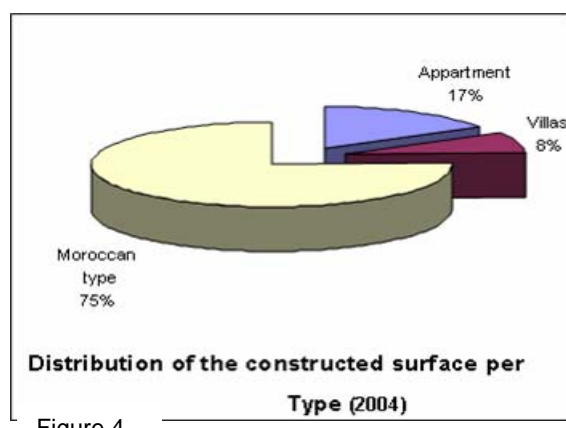


Figure 4

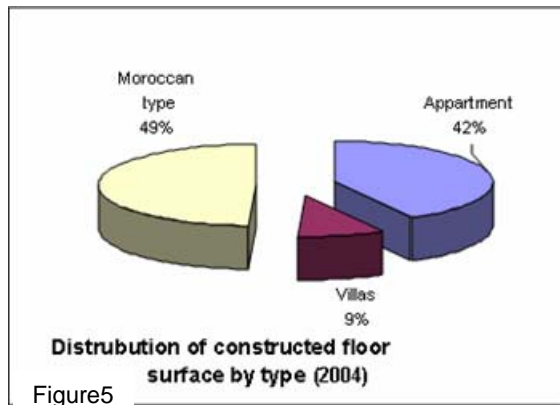


Figure5

From these data, we estimated the surface of the walls, of the facades and of the partitions using weighting specific coefficients to each type of construction. (See table 10 below).

	Projects number	dwellings number	Constructed surface X 1000 m <sup>2</sup>	Floors surface X 1000 m <sup>2</sup>	Facade rate	Facades surface X 1000 m <sup>2</sup>	Partition rate	Partitions surface
<b>Authorized constructions</b>								
<b>Apartment</b>	7125	45035	844	5607	1	5607	0.5	2803,5
<b>Villa</b>	3359	4566	388	1211	1.2	1453,2	0.7	847,7
<b>Moroccan type</b>	34878	55983	3880	6569	1.1	7225,9	0.7	4598,3
<b>Industrial and commercial type</b>				1599	0.8		0.3	
<b>Administrative type</b>	4186		4734			1279,2		479,7
<b>Other</b>	192		18	289	1	289	0.4	115,6
<b>Total</b>	445		132		1	132	0.5	66
<b>Total</b>	50185	105584	5646	15407413		15986		8911

Table 10: requests in buildings (floors, walls and partitions: 2004,). Source: High Commissariat of plan

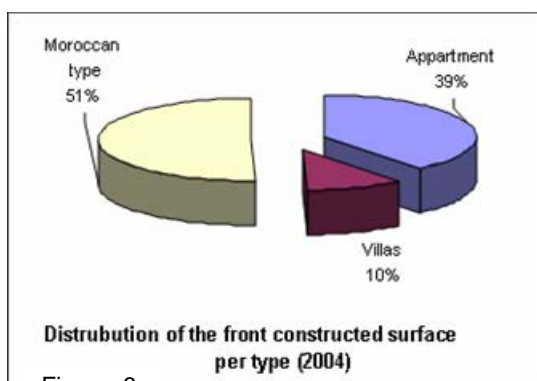


Figure: 6

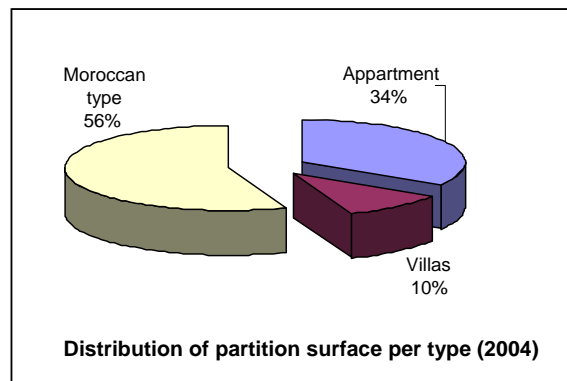


Figure: 7

In 2004, these are close to 16 million m<sup>2</sup> of outside vertical walls and close to 9 million m<sup>2</sup> of partitions, to which are added 15.4 million m<sup>2</sup> of floor surface.

**These numbers show the potential of development of the market of the thermal and acoustic insulation insofar as a suitable law and a normative framework is issued, applied and observed.** However currently there are neither laws nor regulations concerning the heat and acoustic insulation of the building in Morocco. Moreover one of the objectives of the project of the energy efficiency code is to fill this lack. However a committee of standardization managed by the MDCHU has just been created at the

beginning of 2006 and undertakes the installation of standards in thermic and acoustic of the building.

Currently, the floors are essentially made from products made of concrete, the surfaces of wall and partitions are generally constructed from masonry elements (brick of terracotta and breeze-blocks) or by the traditional materials.

### **8.3. The services and administration sector**

#### **8.3.1. Health (hospitals)**

For the 16 audited hospitals by the CDER, more than 50 actions in favour of energy economy have been identified: restoration of the existing equipments, acquisition of the low consumption lamps, the installation of the solar water heaters, the insulation of the windows, the regulating of the boilers.

The energy audits showed that the potential gains are about 21% in the energy invoices (more than 0.17 MUS\$/year on the audited hospitals).

#### **8.3.2. School establishments, university cities, residencies, military barracks...**

University halls of residence, boarding schools, military barracks, the youth hostels, the Dar Talib and Taliba (are lodging establishments for pupils and students coming from rural areas to help them to continue their studies) present an important potential of solar heaters integration for the domestic hot water. The new constructions design should consider the energy efficiency measures, bioclimatic architecture and eco-efficient concepts.

### **8.4. The industrial and cottage industries sector**

The project of the hammams, under execution by the CDER in collaboration with the AFD and the UNDP, revealed a potential of more than 70 hybrid rural hammams which use improved boilers and an extra solar water heaters with an average surface of 100 m<sup>2</sup> by hammam.

In the industrial sector, besides the possible energy economy in lighting processes, the air conditioning, there' is an important potential in sanitary hot water notably in the textile activities which employ a lot of man power.

Globally, the building comes in the second position after the infrastructure works, with a total contribution of 26,4%, that is 0.45 billion US\$, then noticing an increase of 96,8% compared to the year 1998.

### **8.5. Use of the cork in thermal and acoustical insulation**

In spite of the 15% of the suberose world surface, Morocco contributes now only by 4 to 6% in the world production of cork. The valorisation of the cork in the building thermal insulation constitutes an opportunity. Indeed, the interviews that we carried out with all cork factories heads confirm that their production is mainly directed to the plugs. Indeed, in absence of regulation concerning thermal insulation of building, cork demand, as an insulating material is very limited. The creation of new companies or the technological and technical accompaniment of the existing companies as regard manufacturing insulating systems containing cork aggregates (resulting from waste of the cork industry), can constitute a business opportunity for the European companies like Aliécure (France), Small Liege (Belgium). The development of the market of cork-insulator will be reinforced more with the introduction of the efficiency energy code in the course of installation.

## 8.6. Use of gypsum in thermal and acoustical insulation

The gypsum deposits are important in Morocco, notably in the region of Safi with a reserve of 6,5 billion tons. Besides the traditional use of plaster (decoration) it, can be exploited to manufacture thermal and acoustical insulating panels. As example, in 2003 the German group Knauf one of the world leaders in the manufacture of thermal and acoustic insulation systems based in particular on plaster set up its factory at Safi. This factory supplies the northern and western of Africa. Lafarge Morocco (subsidiary company of the French group Lafarge) is repositioned in the sector of the plasters and clearly posts its ambition to be one of the actors of reference in this activity with the extension and the rebuilding of its plaster factory at Safi. The business appropriateness is real since on one hand the activity of the plaster remains embryonic in Morocco. with an average consumption of 200.000 m<sup>2</sup> per annum whereas Tunisia for example consumes nearly a million m<sup>2</sup> and on the other hand, the building energy efficiency code will develop the recourse to the insulating complexes containing plaster.

## 9. THE MARKET NICHES

Promising market niches for co-operation between European companies and those of MEDA countries; are discussed a below:

First the table 11 bellow gives information on:

- The products that are locally manufactured and those which are imported;
- The local products that are exported to the other MEDA countries;
- The network distribution or agent in the country of the European producers who import,

Function	Product	Product manufactured locally	Product imported from	Product exported to	Company
	Cork	X		<ul style="list-style-type: none"> <li>• Russia</li> <li>• France</li> <li>• RFA</li> <li>• U.K</li> </ul>	<ul style="list-style-type: none"> <li>• Association Des Exportateurs Industriels De Liège Du Maroc (SILIMA )</li> </ul>
	Plaster	X			<ul style="list-style-type: none"> <li>• Lafarge Plâtres Maroc</li> <li>• Association Des Fabricants Industriels De Plâtre</li> </ul>
	Wood		<ul style="list-style-type: none"> <li>• Gabon</li> <li>• Romania</li> <li>• Mediterranean countries</li> </ul>		<ul style="list-style-type: none"> <li>• Association Des Importateurs De Bois Au Maroc</li> <li>• Sicob</li> <li>• Cema-Bois De L'atlas</li> <li>• Exoparquet S.A.</li> <li>• Socob Societe Commerciale Des Bois</li> <li>• Cartonnerie Du Sud</li> <li>• Ste Mne Des Emballages Fantasia</li> <li>• Maghreb Pack</li> <li>• Permbois</li> </ul>
Thermal and acoustical insulation	<ul style="list-style-type: none"> <li>• rock wool</li> <li>• glace wool</li> <li>• Polystyrene</li> <li>• Polyurethan</li> </ul>		<ul style="list-style-type: none"> <li>• France</li> <li>• U. Kingdom</li> <li>• Netherlands</li> <li>• Denmark</li> </ul>		- Rockwool France

	e		<ul style="list-style-type: none"> <li>• Austria</li> <li>• R.F.A</li> <li>• Portugal</li> <li>• Spain</li> <li>• Turkey</li> </ul>		- KNAUF
construction materials	Cement	X	X		<ul style="list-style-type: none"> <li>- Lafarge Maroc</li> <li>- Holcim</li> <li>- Ciment Du Maroc</li> <li>- Asment</li> </ul>
Glass for domestic use	Window glass Glazing, shaping and transformation of the flat glass	X	<ul style="list-style-type: none"> <li>• Spain</li> <li>• France</li> <li>• R.F.A</li> <li>• USA</li> <li>• Turkey</li> <li>• Italia</li> </ul>		<ul style="list-style-type: none"> <li>- Vete Sa</li> <li>- Stalvit Sarl</li> <li>- S.O.C.A.L</li> <li>- Proalu S.A.R.L</li> <li>- La Maison Du Verre</li> <li>- Sotraglace Ma</li> <li>- Imaver</li> <li>- Glastec</li> <li>- Sevam Ste</li> <li>- D'exploitation De Verreries Au Maroc</li> <li>- Protex Maroc</li> <li>- Vitrierie Anfa</li> <li>- Ets Hamzi Ahmid</li> <li>- Vitrierie Taliouine</li> <li>- Zriouli Lahcen</li> <li>- Jet Alu</li> </ul>
Domestic hot water	Solar water heaters & accessories	X	<ul style="list-style-type: none"> <li>• Spain</li> <li>• France</li> <li>• R.F.A</li> <li>• USA</li> <li>• Turkey</li> <li>• Greece</li> <li>• Australia</li> </ul>		<ul style="list-style-type: none"> <li>- Capsolair</li> <li>- Afrisol</li> <li>- Atcoma / Gioca</li> <li>- Clean Energie</li> <li>- Ets Malhfi</li> <li>- Fogaosol</li> <li>- Getradis (Rabat)</li> <li>- Giordano Maroc</li> <li>- Kefal (Rabat)</li> <li>- Noor Web</li> <li>- Phototherm</li> <li>- Sococharbo</li> <li>- Solicap (Rabat)</li> <li>- Solon Solar Industries</li> <li>- Sunlight Power Maroc (Rabat)</li> <li>- Toutedec</li> <li>- Tropical Power (Rabat)</li> </ul>
Electrical production	Photovoltaic panels & accessories	X	<ul style="list-style-type: none"> <li>• Spain</li> <li>• France</li> <li>• FRA</li> <li>• USA</li> <li>• Japon</li> <li>• China</li> </ul>		<ul style="list-style-type: none"> <li>- Accus National</li> <li>- Electro Contact</li> <li>- Elmalali (Ets)</li> <li>- Energetica (Rabat)</li> <li>- Energies Continues</li> <li>- Ines</li> <li>- N.R.J International</li> <li>- S K F M</li> <li>- Sicotel</li> <li>- Smadia</li> <li>- Smcim</li> <li>- Space Radio</li> <li>- Spolyten (Oujda)</li> <li>- Techna</li> <li>- Total Energie</li> <li>- Temasol</li> </ul>

Economic lighting	Lamps low consumption		<ul style="list-style-type: none"> <li>• Spain</li> <li>• France</li> <li>• RFA ;</li> <li>• USA</li> <li>• Turkey</li> <li>• China ;</li> <li>• Poland</li> <li>• Italy;</li> <li>• UK</li> </ul>		<ul style="list-style-type: none"> <li>- Cristalstrass</li> <li>- Arvanitakis</li> <li>- Promelec</li> </ul>
Air-conditioning			X		<ul style="list-style-type: none"> <li>- Airclima</li> <li>- Icat-International</li> <li>- Mif Maroc</li> <li>- Carrier</li> </ul>
Engineering	energy Audits building	X			<ul style="list-style-type: none"> <li>- Cder</li> <li>- Gemtec</li> <li>- Ads</li> <li>- Cleantech</li> <li>- Noratech</li> <li>- Fédération Marocaine Du Conseil Et De L'ingénierie</li> <li>- Projema</li> <li>- Gamma Etudes</li> <li>- Afric Ingennering</li> <li>- Cid</li> <li>- Team Maroc</li> <li>- Maroc Développement</li> <li>- Ingema</li> <li>- Scet-Scom</li> <li>- Sud</li> </ul>
Formation	Basic Formation	X			Ena; Est; Fst ; Emi ; Ehtp; Ofppt
	Continuing formation	X			Ofppt; Cder; One Universities

Table11: imported & exported products by companies and countries.

In Morocco these are several business opportunities especially in the following niches:

### 9.1. Renewable energies:

In this field, the professionals are organized within the Moroccan Association of Solar and Wind Industry (AMISOLE). This association is centred on thermal, photovoltaic and wind energies matters. This sector is also supported by public authorities through the ministry for Energy and the Mines, the CDER and the ONE. e.g Plan of Rural Electrification of Morocco, production of power Electricity programme (Wind parks, Thermosolar centrals ...), as well as other programs such as PROMASOL and ECOSOL cited above.

### 9.2. Energy efficiency:

The potential of the energy efficiency is well known through the various initiatives carried out. This potential is of nearly 20% in the building sector and of 5 to 10% in the industrial sector by developing businesses in:

- The manufacture and/or the marketing of thermal and acoustic insulating complexes containing cork or plaster. These two materials represent business opportunity for the reasons developed in paragraph 4 of VIII. The foam of polyurethane is also an interesting material because in addition to its excellent thermal insulation properties, its implementation is relatively easy and fast. Moreover in the urban Beni Makada district in Tangier, the first buildings built

by the Spanish company Fonaments Solides Morocco, will be insulated by projection of polyurethane foam. All the residences are already entirely sold on plan.

- The segment of the double-glazing worth to be promoted knowing that the joinery aluminium activity is well developed.
- The training and qualifying in the field of the services of council, installation and maintenance of the equipments and products dedicated to the energy efficiency and renewable energies.
- The introduction on a large scale of the lamps low consumption in particular with the fall of their prices today.

These business opportunities will be developed more thanks to accompaniments of order:

- Normative and regulatory measures: introduction by the CDER of the quality charter (label quality and the solar results guaranty ), the installation of Moroccan standards relating to solar thermal like standards Nm 14.5.003, and Nm 14.5.004 for the promotion of solar heating water.
- Technical: Optimized architectural design, heat and noise insulation, solar production of domestic hot water, the use of the solar roofs for the production of electricity, the recourse to the high energy performance equipments (lighting, refrigeration, air-conditioning, heating ).

## 10. ORGANISATIONS REPRESENTING ENERGY EFFICIENCY AND RENEWABLE ENERGIES

The organizations and administration that represent the energy efficiency and the renewable energies companies that can support the setting up of industrial, groups, as well as the twinning conventions and the meetings of investment, are listed and briefly described below:

Organisations	Contact	Description
CDER	Tel 037 77 01 96 Site web: <a href="http://www.cder.org.ma">www.cder.org.ma</a>	Center of Development of the Renewable Energies, public administration under the tutelage of the Ministry of the energy and Mines and having the administrative and financial autonomy
FMCCIS	<a href="http://www.fccism.cci.ma">www.fccism.cci.ma</a> Tel: 037.76.70.51 / 78 / 81	Moroccan Federation of Trade Rooms
AMISOLE	063 04 04 43	Moroccan Association of the Solar and Wind Industries. This association regroups about thirty active societies in the thermal, photovoltaic and wind fields. AMISOLE is also member of the CGEM
AMGE	Tel 022 39 17 55 & 022 94 34 80	Moroccan association of Management of the Energy. This association works in the domain of the industrial energy efficiency
AMFREE	037 88 15 61/62/63 061 38 70 05	Maroco-French Association of the Energy and the Environment This association regroups about hundred national and international experts in the domain of the energy and the environment

The regional councils	<p>Wilaya de La Region de Laayoune-Boujdour-Sakia Al Hamra Tel.: 048 89 37 51/50 - 048 89 23 35 Fax : 048 89 17 22</p>	<p>These councils are elected in every region. They take all necessary actions for the economic, social and cultural development projects of their regions</p>
	<p>Wilaya de la Region de Souss-Massa-Draa, Tel.: 048 84 01 03 Fax : 048 84 04 14</p>	
	<p>Wilaya du Gharb-Chrarda-Bni Hssen Tel.: 037 37 47 31 à 37 fax: 037 37 90 15</p>	
	<p>▪ Wilaya de Chaouia-Ouardigha  Tel. : 023 40 24 66 / 40 07 52 à 56 fax.: 023 40 36 33</p>	
	<p>▪ Wilaya de Marrakech-Tensift-Al Haouz  Tel: 044 43 20 03  Fax: 044 30 89 34</p>	
	<p>WILAYA du GRAND CASABLANCA  Tel: 022 22 41 83 / 022 22 29 17  Fax : 022 22 26 48 44</p>	
	<p>▪ Wilaya de La Region de Rabat-Sale-Zemmour-Zaer  Tél: 037 70 70 72  Fax: 037 70 19 62</p>	
	<p>▪ Wilaya de La Region de Doukkala-Abda  Tel: 044 62 31 47/044 62 31 47 Fax: 044 62 00 61</p>	
	<p>▪ Wilaya de Meknes-Tafilalt  Tel: 055 52 11 63 / 52 28 31/32/33/34/35/36/37  Fax: 055 52 09 88.</p>	
CRI	<p>Sous la tutelle du ministère de l'Intérieure Tel 037 76 56 60 – 037 76 05 26</p>	<p>Regional Centers of Investment. These centers constitute a wicket for the realization of the investments in a given region. There are 16.CRI in total</p>

German room of Trade and industry	Tel: 022 44 98 22 / 23 Fax: 022 44 98 23 Email <a href="mailto:info@dihkcasa.org">info@dihkcasa.org</a> Internet <a href="http://www.dihkcasa.org">www.dihkcasa.org</a>	These structures first have a vocation to enliven the business communities between the economic operators of the two countries by organizing events of public relations, meetings of members, collective pavilions in the fairs and foreign lounges, of the national promotion campaigns, etc. They allow their members to integrate a network of enterprises to exchange commercial information and to benefit from the support and the appraisals of this network.
Belgo-Luxembourger Room of Trade and industry	Tel: 022 20 00 61. Fax: 022 20 33 83	
Spanish Room of Trade and industry	Tel: 022 30 56 02 / 30 73 19 / 28 Fax: 022 30 31 65	
French Room of Trade and industry	Tel: 022 22 23 99 / 26 35 42 / 20 02 04 / 20 57 42 to 45 Fax: 022 20 01 30	
Italian room Of Trade And industry	Tel: 022 327 82 17/ 26 46 51/ 26 56 53 Fax: 022 27 86 27	
Switzerland room of Trade and industry	Tel: 022 36 27 93 / 36 49 16 Fax: 022 36 49 66	
British room of Trade	Tel: 022 44 88 65/60 Fax: 022 44 88 68	
OFEC	<a href="http://www.ofec.co.ma">www.ofec.co.ma</a>	The role of the Office of the Fairs and Exhibitions of Casablanca is to: -manage opportunities of exhibitions and to organize national or international demonstrations. -welcome the foreign business men and to help them to tie contacts with other economic operators. -develop and strengthen the economic ties of Morocco with the rest of the world.
ONE	<a href="http://www.one.org.ma">www.one.org.ma</a>	National office of Electricity, public utility under the tutelage of the Ministry of the Energy and Mines and having the administrative and financial autonomy
CIEDE	<a href="http://www.ciede.org.ma">www.ciede.org.ma</a> Tel & Fax:00212 (0)37772722	Center of Information on the Durable Energy and the Environment. This structure was created in partnership with the CDER and the Ministry of the regional development Water and the Environment
ESTS	Tel: 0378815/61/62/63	High School of Technology of Salé. State school of Higher education under the tutelage of the Ministry of the National Education, the Higher Education the Managerial staff Training and of the Scientific Research
ENIM	<a href="http://www.enim.ac.ma">www.enim.ac.ma</a>	National school of the Mineral Industry. State school of engineering under the tutelage of the Ministry of the Energy and of Mines and having the administrative and financial autonomy
OFPPT	<a href="http://www.ofppt.org.ma">www.ofppt.org.ma</a>	Utility of the Professional Grooming and the Promotion of Work. Public establishment under the tutelage of the Ministry of the Employment and the Professional Training
EMI	<a href="http://www.enim.ac.ma">www.enim.ac.ma</a>	Mohammedia school of engineers. State Establishment of Higher education under the tutelage of the Ministry of the National Education, the Higher Education and the Scientific Research

## 11. NATIONAL AND REGIONAL RELEVANT EVENTS

In the table below the local, national or regional applicable events (exhibitions, fairs, commercial delegations/commercial missions), are briefly described.

### 11.1. National events.

National events	Description	Date	Localisation	contact
Immo Pro 2006	The first edition of the professional immobilier Market "immo pro" This lounge concerns the offer and the demand concerning the professional immobilier. and target the investors or future Moroccan and foreign investors	22 /03/2006	Casablanca	<a href="http://www.immo-pro.ma">www.immo-pro.ma</a>
Batisud	Third lounge of the building and the real estate promotion	20- 23 April 2006	Marrakech	Tél :022 49 12 29 Ou 022 49 02 00
ArchDecor	Lounge of the decoration, the architecture and the interior and outside planning	16-17 mach 2006	Marrakech	
BTP EXPO	International lounge of the building and the public works and forum	22 au 25 mach 2006	Casablanca	<a href="http://www.ofec.co.ma">www.ofec.co.ma</a>
Third Conference of the Integrals of the socially responsible investment	Organized under the theme "The socially responsible investment. United Arab Emirates, one of the most important real estate investor in Morocco was the guest of honour.	1-2 /12/2005	Skhirat	<a href="http://www.maec.gov.ma">www.maec.gov.ma</a>
National summit of the tourism	At the national seats of the tourism of Marrakech in January 2001, the King, Mohamed VI gave a major political impulse to the sector of the Tourism	January 2001	Marrakech	<a href="http://www.mincom.gov.ma">www.mincom.gov.ma</a>
International building lounge (SIB)	Material of second work, construction equipments and construction materials	22/11/2006 au 26/11/2006	Casablanca	<a href="http://www.ofec.co.ma">www.ofec.co.ma</a>
The signature of the contract programs between the state and the National Federation of the Building	According to the signature of the contract programs between the State and the National Federation of the Building and Public Works (FNBTP, the enterprises don't have the obsession anymore to fill their notebook of orders. Having more visibility, they concentrate henceforth on the management of their development, their organization and their qualification.	June 2004		<a href="http://www.mhu.gov.ma">www.mhu.gov.ma</a>
EnviroMaroc	Morocco-German lounge that regroups several active private operators concerning environment, energy efficiency and clean energies	May annually	Casablanca	<a href="http://www.gtz-pgpe.ma/html/enviromaroc.htm">www.gtz-pgpe.ma/html/enviromaroc.htm</a>
Morocco German meeting on the renewable energies	With the involvement of the institutional (CDER, MEM, Rooms of Trade and industry - NHIK), the NGOs...	Regularly		
France EXPO	French exhibition that united several French participating and exposing that enhances their know-how and their specificities. The objective the development of the business opportunities and investment.	March annually	Casablanca	<a href="http://www.insert-export.com">www.insert-export.com</a>
Regular Industrial meetings	With the different business missions: Italy, Spain, Canada...	Regularly		
Symposia, days of survey, seminars...	Organized on the energy efficiency, the renewable energies and the environment themes by the Universities, the associations. (AMFREE, AMISOLE, ASES, ARFDD, FORUM21...) and public and private organisms	Regularly		Fax 037881564/67

Interregional fairs of the Four Motors	<p>These fairs are the fruit of interregional cooperation between the different Moroccan and European regions. The Four Motors for Europe are an interregional cooperation association composed of four European regions: Baten-Wutemberg (Germany), Lombardy (Italy), Rhone-Alps (France) and Catalonia (Spain) - in addition to Wales and Flanders</p> <p>This meeting, the first in Morocco outside of the European Union, dealt with the lasting development and the environmental technologies in the Mediterranean basin. The elected and the governmental persons responsible of the two sides could think thus on different ways able to reinforce the territorial decentralized cooperation between the two parts.</p>	16 au 18 January 2006	Skhirat.	www.rhonealpes.fr
First International Congress of the Eco-efficiency and Environmental Impacts  IC3EI	The Morocco-French association of the Energy and the Environment AMFREE organizes the 1st International Congress on the Eco-efficiency and Environmental Impacts.	April 2008	Salé	037 88 15 64/67 fixed
Salon Belgica	The second edition will know the participation of a hundred Belgian professionals mainly in the sector of the BPW	8-11 November 2006	Casablanca	www.brussel-s-export.be

## 11.2. Regional events.

Regional events	Description	Date	Localisation
VETECI	Lounge of the window, the wall cloth and the structural glass	10-16 may 2006	Madrid
Carthage	International lounge of the building, Materials of construction equipments, Materials of public works,	17-21 may 2006	Tunis
Constru_Lan	International lounge of the house and the building. Interior and outside decoration		Bilbao
Médibat	Mediterranean lounge of building on the theme of relationship between Building and New technologies of the Information and Communication (NTIC).	9-12 march 2005	Sfax
SIBMC	International lounge of the building, the construction materials and the public works,	3-8 march 2006	Alger
SIMAO06	The real estate Exhibition of Madrid	4-8 April 2006	Madrid
Carthage	International building, materials and building machinery Show		
FERIA	International Exhibition of building, building materials and public works	9-12 August 2006	Madrid
Exponor	International lounge of the construction material	23. -27. October 2007	Leça da Palmeira Portugal
CONSTRULAN	International lounge of building habitat and decoration	April 2008	Bilbao
TEKTÓNICA	International lounge of the construction and building	27 -31 March 2007	Lisbonne

## **12. INITIATIVES FOR PROFESSIONAL NETWORKING IN MOROCCO**

This paragraph describes 3 initiatives for networks of professionals in Morocco and suggested how twinning with other organizations of the MEDA countries or the EU can be arranged within these initiatives.

### **12.1. First initiative: business opportunity development between the public and private operators of the partners countries**

A program aiming at the promotion of use to large scale of the efficient technologies in energy, the renewable energies, the new architectural concepts, the new use of thermal and acoustical insulating materials in the building has been achieved (cork, plaster, glass, wool rock wool, polystyrene, double glazing, etc.).

To promote this initiative the MED-ENEC project can help the realization of meetings of exchanges of experience and good practices between the partner countries. These meetings should associate the researchers, the promoters, the financial backers and the main industrial and euro-Mediterranean enterprises working in the domain of the energy efficiency, the renewable energies, the new conceptions (architecture, construction materials, solar roofs...).

### **12.2. Second Initiative: Backing of the expertises, controls and tests**

Equipment of a laboratory for tests, control and characterization implies on two components

#### **12.2.1. Material**

This aspect will concern the normalized tests of the construction insulation and the masonry elements. The tests will carry on

- The thermo physical properties such as the thermal conductivity, the thermal diffusivity and the fire resistance.
- The acoustical properties such as the acoustic absorption and the acoustical weakening indices.
- The steam permeability of materials.

#### **12.2.2. Water solar heaters**

This aspect will concern all normalized tests on the water solar heaters.

This laboratory will to be put in place in the frame of a partnership between the Moroccan building operators, the concerned Ministries, the euro-Mediterranean organisms as the European Network Building Research Institutes (ENBRI) the centers of expertises in the southern Mediterranean countries.

The council of regions can play a determining role because of the numerous twinning that bind them to their euro-Mediterranean counterparts.

To promote this initiative an international symposium can be organized on the role of the tests and characterization of the materials and facilities in the energy efficiency of the building. To this symposium will be invited the main European and Mediterranean experts to debate on possibilities of setting up this laboratory. The coordination and the organization of this symposium will to be confided to a national NGO working in the domain.

### 12.3. Third initiative: backing of the human expertises

To put in place a degree course of Master formation levels within the university in the domain of the energy efficiency building. The modules of this formation will concern:

- The optimization of the consumption of the energy in the building
- The building conception adapted to the local context for a better thermal acoustical and optical comfort
- The physical characterization by measurements and modelling of the thermal and acoustical behaviour of the building and materials
- The optimization of the building envelope conception,
- The economy and the energy management
- The Use and the mastery of the computer tools and the specialized softwares
- The energy audit.
- The optimal dimensioning working and tests of the technical facilities of the building
- Advanced programming languages.

This degree course will be able to be put in place in the Setting of the MEDA Program and using different agreements of partnership and twinnings of the Moroccan university and their European counterparts. The training will include an initial course for both students and professional (the so called formation continues). The professional partners of the training will benefit from financial advantages and payment facilities. This degree course will be confided to one of the higher education school working in the domain such as the High School of Technology of Salé.

## 13. CONCISE ASSESSMENT OF THE CAPACITIES

This paragraph provides a concise assessment of the capacities of the most applicable suppliers of the service and the educational actions and of education.

### 13.1. SWOT analysis of the applicable educational formations

Education level	Strength	Weakness	Opportunities	Threats
Engineer	A strong national experience concerning high-level education	<ul style="list-style-type: none"> <li>• The building sector is characterized by an important insufficiency of the high-level technical framing</li> <li>• The formation is oriented mainly toward the civil engineering</li> <li>• Absence of modules on the building energy efficiency</li> <li>• At the present rhythm the quantitative and qualitative needs in engineers for the building sector won't be filled before the 2020</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• The setting up of an institutional, normative and regulatory framework on the energy efficiency.</li> <li>• Possibility to vary the offer of formation in the setting of the reform of the higher education (Master, Specialised Master...)</li> <li>• The possibility to setting up some professional licenses within the Sciences Faculties</li> <li>• The MEDA program</li> <li>• The offshoring initiative program</li> </ul>	<ul style="list-style-type: none"> <li>• Weak budget allocated to the scientific equipments</li> <li>• Gap between the technological changes that occur in the conception, production and management of building and their introduction into a national education system.</li> <li>• The national market doesn't encourage the specialization in the building energy The majority of the enterprises and the technical offices prefer some multidisciplinary profiles</li> </ul>

			<ul style="list-style-type: none"> <li>• 10000 engineers initiative program</li> </ul>	<ul style="list-style-type: none"> <li>• The academic establishments don't benefit currently from the professional tax It doesn't encourage them to register their human resources in the continuing formation offered by academic centers</li> </ul>
High technician (from academic formation)	Formation adapted well to the national market	<ul style="list-style-type: none"> <li>• On the 8 High Schools of Technology, only the EST of Salé lectures the building energy (thermal insulation of the building, heating and air-conditioning, renewable energies)</li> <li>• Few skilled technician formation level</li> <li>• Cooperation and the coordination between education/formation centers and local authorities (CDER) is insufficient to generate a global dynamics of the formation and research.</li> </ul>		
Technician from. Professional grooming	<ul style="list-style-type: none"> <li>•The BTP enterprises contribute to 8% in the professional formation tax</li> <li>•Formation in adequacy with the needs of the market</li> </ul>	The BTP enterprises use really only 2% of the professional formation tax for the formation of their human resources		
Continuing education		<ul style="list-style-type: none"> <li>•Not sufficiently developed</li> <li>•Lack of diffusion and information on a large scale</li> </ul>	The FNBTP threw a program of sartorial formation in collaboration with the MEDA program The eligible enterprises benefit from the third paying system, in the setting of the special formation contracts (CSF).	Lack of valorisation in the professional promotion of the recipients

### 13.2. Important service providers

Important suppliers of solar heating water and setting up services are grouped in the table below:

Suppliers	Acronym	Tel	Sector	Pertinence
GAMMA ETUDES & CONCEPTIONS	GAMMA ETUDES	037777749	Building	Good experience affiliated to the Moroccan Federation of the Council and Engineering (FMCI)
MAROC DÉVELOPPEMENT	<u>M.D</u>	037730353	Building	Good experience affiliated to the FMCI
TEAM MAROC	<u>TEAM MAROC</u>	037728545	Building	Very active affiliated to the FMCI
<u>BUREAU D'ETUDES D'ENQUETE ET DE RECHERCHE</u>	<u>BETA-STRUCTURES</u>	037766451	Building	Very active affiliated to the FMCI
INDESA	<u>INDESA</u>	037733715	Building	affiliated to the FMCI
VIABITEC	<u>VIABITEC</u>	022402294	Building	affiliated to the FMCI
GENIE CIVIL MEDITERRANEEN	<u>GECIMED</u>	055941023	Building	affiliated to the FMCI
GOLDON ETUDES ET CONSEILS EN INGENEERING	<u>G.E.C.I</u>	044449717	Building	affiliated to the FMCI
CABINET AFRICAIN D'ETUDES TECHNIQUES	CAET	037727301	Building/Energy	affiliated to the FMCI
SOCIETE MAGHREBINE D'INGENIERIE	INGEMA	037687800	Building/Energy	long experience affiliated to the FMCI
LABORATOIRE PUBLIC D'ESSAIS ET D'ETUDES	LPEE	022547575	Building/Energy	Good territorial cover affiliated to the FMCI
SOCIETE D'ETUDES ET DE RECHERCHE POUR LE DEVELOPPEMENT	SERD	022990681	Building/Energy	affiliated to the FMCI
Conseil Ingénierie et Développement	<u>CID</u>	037579500	Building/Energy	Affiliated to the FMCI Competence confirmed in the field and versatility
SCET-SCOM	SCET-SCOM	037 73 20 22/23	Building/Energy	Affiliated to the FMCI
MULTI SERVICES GENIE CIVIL CONSULTING	<u>MUGECICO</u>	022662922	Building/Energy	Competence confirmed in the field and versatility
ADS MAROC	<u>ADS MAROC</u>	037681011	Energy	Affiliated to the FMCI Goode experience
GLOBAL QUALITY CONSULTING	<u>GQC</u>	022394984	Energy	Affiliated to the FMCI
Ste PHENIXA	<u>PHENIXA</u>	037208545	Energy	Affiliated with the FMCI Very present in the infrastructure and energy sector Affiliated to the FMCI

Solution Optimale des Ressources en Energie	<u>SOR-ENERGIE</u>	037370744	Energy	Affiliated to the FMCI
Noratech	NORATECH	037 56 32 11	Energy	Active in the field of energy and the environment
CLEANTECH	CLEANTECH	037 68 18 91	Energy	Active in the field of energy and the environment
GEMTECH	GEMTECH	gemtech@gemtech.ma.	Energy	Active in the field of energy and the environment
Les Maisons de l'Energie		Contact CDER	Energy	There is about hundred house of energy as ESCOs in particularly in rural areas supported by the CDER

### 13.3. Important gaps between the present training and the capacities and knowledge.

The most important gaps is between the continuous technological changes in terms of methods of conception, of dimensioning of the energetic system and the forwarding of these changes towards professional especially professional specialised software and new calculation methods

Lack of popularization of the scientific and academic knowledge towards the professionals

### 13.4. Institutes of education

The classification of the five best teaching establishments as well as their relevance, specializations and **strength**, are given below

Institut	Degree	Specialization	Strength	Relevance
EMI	Civil Engineer	Building and Public Works	<ul style="list-style-type: none"> <li>• Long experiment</li> <li>• Proficiency recognized</li> <li>• Good tutoring rate</li> <li>• Professional placement in firms</li> <li>• Diploma paper</li> </ul>	<ul style="list-style-type: none"> <li>• The building, Bridges and Highways section is directed towards the design and the calculation of the structures and the study of the behaviour of the grounds</li> <li>• high rate of insertion in professional environment</li> </ul>
Ecole Supérieure de Technologie de Salé	High-level technician	Civil engineering with one Option in Energy Networks of the Building industry	<ul style="list-style-type: none"> <li>• Long experiment</li> <li>• proficiency recognized</li> <li>• good tutoring rate</li> <li>• Professional placement in firms</li> <li>• Diploma paper</li> </ul>	<ul style="list-style-type: none"> <li>• Building and Energy Network option of the exempts modules of formation in the field of renewable energies air-conditioning, the energy audit, heating, acoustics and technical management of the building energy consumption</li> <li>• high rate of insertion in</li> </ul>

				professional environment
OFPPT	Technician	Building and Public Works	<ul style="list-style-type: none"> <li>• Two Institutes dedicated to the Building and Public Works trades</li> <li>• It forms nearly 10.000 trainees in this sector, which represents 9% of manpower</li> </ul>	High rate of insertion in professional environment
FSTM	Professional licence	Energetic	Goode experience proficiency	
FSTT	Professional licence	Civil engineering	<ul style="list-style-type: none"> <li>• Goode experience</li> <li>• Proficiency</li> </ul>	

#### 14. POTENTIAL HELP DESKS

Organizations which could set up and manage information services related to energy efficiency and renewable energies, are presented bellow

Organisation	Information Service	contact
<b>Centre d'Information sur les Energies durables et l'Environnement (CIEDE)</b>	General information on environment, and renewable energies	<a href="http://www.ciede.org.ma">www.ciede.org.ma</a> Tel & Fax: 00212 (0)37 77 27 22
<b>Ecole Supérieure de Technologie de Salé (ESTS)</b>	Technical information on photovoltaic, Solar heating, sustainable construction and building thermal and acoustical insulation systems	Tel 00212 (0)37 88 15 61/62/63 Fax 00212 (0)37 88 15 64/67
<b>Centre de Développement des Energies Renouvelables (CDER)</b>	General information on renewable energies	Tel 037 77 01 96 Site web : <a href="http://www.cder.org.ma">www.cder.org.ma</a>
<b>Association Maroc Française de l'Energie et de l'Environnement (AMFREE)</b>	Technical information on photovoltaic, Solar heating and building thermal and acoustical insulation systems	Tel 00212 (0)37 88 15 61 Fax 00212 (0)37 88 15 67
<b>Direction Technique de l'Habitat</b>	General information on sustainable construction	Tel: 037 57 75 51
<b>Ecole Nationale d'Architecture (ENA)</b>	General information on sustainable construction	Tel 037.77.52.30 Fax : 037.77.52.76

		Email : <a href="mailto:ena@maghrebnet.net.ma">ena@maghrebnet.net.ma</a>
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## 15. RECOMMENDATIONS

Globally, concerning the exploitation of the renewable energies and the energy efficiency potentialities in all sectors and notably in the building one, all intervening parties (administrations, manufacturers of materials, technical offices, architects, real estate promoters, financiers...) are unanimous on the fact that their estimation of the possibilities of business development is limited. This fact is due to several factors:

**15.1. On the institutional plan:** the efforts made by the authorities for the exploitation of of the renewable energies and the energy efficiency potentialities remain insufficient. We can note:

- The absence of normalization and regulation to the level of the thermal and acoustical insulation of the building
- The absence of a national law on the energy efficiency
- The absence of a global view for the development of the renewable energies.

**15.2. On the technical plan:**

- Insufficiency of data and precise sectorial studies on the energy consumption in all sectors including building one????
- Lack of national expert in the domain of the efficiency, audit and the energy diagnosis.
- Insufficiency of the energy diagnoses in the building
- Weakness of the maintenance of the technical facilities in buildings

**15.3. On the training plan:**

- Very little high-level grooming in the domain of the efficiency and the energy audits
- Insufficiency of training programs appropriated to the different professional categories.

**15.4. On information and awareness plan**

- Lack of institutional channels of information and awareness campaign
- Weak coordination and harmonization of information, which affects reliability of the data.

**On the basis of the analysis of the market, what are the 5 business development activities on which this project must concentrate to boost the market of the renewable energies and the energy efficiency?**

We one recommends the following actions:

**Recommendation 1: To sustain the efforts of normalization and regulation**

- To work out a general regulation of construction at every level of the conception and of the realization of the building

- To issue an appropriate regulation in particular for every building element particularly concerning tightness, thermal and acoustic insulation
- To assist the setting up the thermal and acoustical normalization of the construction materials
- To sustain the laws on the energy efficiency and the renewable energies

**Recommendation 2: To reinforce the knowledge of energetic consumption in the different segments of the sector of the building (residential, commercial, administrative, tourist...).**

**Recommendation 3: Reinforce the education:**

- To reinforce the studying of the “University diploma of Technology” type (DUT) and of the Engineer and Master type in the domain of the sciences and the technology of the building (integration of the renewable energies, the thermic and the acoustics of the building, the audit and the energy management, the air-conditioning systems optimization, the architectural conception.
- To elaborate technical manuals on the energy efficiency in the building adapted to the climatic specificities of the euro-Mediterranean countries on the good practices of construction, the normative, the regulation and the institutional settings of the different partner countries.
- To help the associations to achieve educational projects concerning the energy efficiency and the renewable energies (didactical material which could be exploited in situ by the public. The same type of material can be designed in order to be transported in schools and other places).

**Recommendation 4: To sustain the actions of information and sensitization:**

- To organise regular regional campaigns of information for both general and professional public.
- To make people become aware of the energy efficiency problem in different institutions (school, universities, administrations, societies, etc.).
- To institute one day of the energy efficiency.
- To create an euro-Mediterranean bulletin of the energy efficiency and the renewable energies.

**Recommendation 5: To sustain attendant measures**

- To help and to accompany the operators and the associations technically and financially for the realization of some pilot projects.
- To create of an observatory of the building in Morocco to follow the evolution of manufacture of the construction materials, energy consumption the evolution of the market of the solar energies in the building, the evolution of the thermal and acoustic insulation materials in the building.

## **16. CONCLUSION**

Globally, the analysis of the energy efficiency and integration of the renewable energies market in the building sector as well as the interviews achieved to this effect with different intervening parties (see the annex 2), revealed a considerable insufficiency of the appraisal of the potentials and the possibilities of business development in these domains.

Also, the majority of the people contacted consider that the market of the energy efficiency in the building is not developed for several reasons, notably because of the absence of an institutional authorized outline, and of a financial incitation in this sense in the building sector.

In general the professionals are reluctant to anticipate things because of the scepticism concerning the issue of the national law on the energy efficiency. They consider that the development of the energy efficiency in the sector of the building will be born under the constraint of the regulation and the strict controls of its implementation.

In absence of this authorized issue, the professionals don't take any initiatives concerning the energy efficiency in the building sector (thermal and acoustic insulation), because they don't hide their fear concerning to assume the generated supplementary costs.

Out off, on about fifteen factories of cork, only one manufactures thermal insulation panels. The main activities of the other enterprises are concentrated on the manufacture of the plugs, soles and notice boards. All heads of these factories state that they are ready to manufacture the thermal and acoustic insulation panels for building if the demand appears and underline the insufficiency of means of test and certification.

It should be noted that Morocco is undertakes important programs of development in the different sectors. The BTP sector offers important opportunities of development of the energy efficiency and integration of the renewable energies, notably through the Azure program dealing with the construction of tourist infrastructures for 10 millions tourists in 2010, the yearly program of 200,000 lodgings, the programs of the satellite cities, the programs of economic villas, the regional programs such the planning of the valley of Bouregreg, the Saphira project.

The setting up of an institutional, authorized inciting and financial, will permit a substantial and long lasting development of the market of the products and all outlines used in the energy efficiency and the renewable energies, like the double glazing, the insulating materials, the facilities to better exploit energy performances, the solar water heater ...

## 17. APPENDICES

### 18.

#### ANNEXE 1:

#### Table of Abbreviations

- OME : Mediterranean Observatory of Energy
- EUEI : European Union Energy Initiative
- GHG : Greenhouse gases effect
- SHF : Solidarity habitat fund
- Erac: : Regional establishments of harnessing and construction,
- Anhi : National agency of struggle against the unsanitary habitat
- Snec : National society of equipment and construction
- Alpik : Association of 'lotisseurs' and real estate promoters of Casablanca.
- Ulpim : Union of 'lotisseurs' and Moroccan real estate promoters
- Anaim : National association of real estate agent.
- FnBTP : National federation of building and the public works.
- Fni : National federation of the real estate.
- BTP : Buildings and Public Works
- FNBTP : National federation of the building and public works
- AMA : Moroccan Association of Elevators
- AMC : Moroccan Association of The Construction
- SOUL : Moroccan Association of electricity
- AMEC : Moroccan Association of Enterprises of Pipeline
- AMEF : Moroccan Association of Enterprises of Forage
- AMEP : Moroccan Association of Enterprises of Paintings
- AMETI : Moroccan Association of tightness and insulation
- AMM : Moroccan Association of Joinery

- AMPCC : Moroccan Association of Plumbing, Heating And Air-conditioning
- AMPG : Moroccan Association of Producers of Granulates
- ANFA : National association of the Façades and windows promoters
- APIM : Moroccan Association of Importers of Material of BTP
- AMIL : Moroccan Association of Industries of the Cork
- FMCI : Moroccan federation of engineer advice
- AMLBTP : Moroccan association of laboratories of the building and public works
- LPEE : Public Laboratory of Tests and Studies
- SWH : Solar Water Heaters
- Promasol : National Solar Water Heaters Program
- ONE : The National Utility of Electricity
- UNEP : United Nations Environmental Program
- CDER : Renewable energy development center
- ONDA : National Utility of Airports
- ENA : National School of Architecture
- ESTS : High School of Technology of Salé
- FST : Faculty of Sciences and Techniques
- EMI : Mohammedia School of engineers
- EHTP : Hassania School of Public Works
- OFPPT : Professional formation and promotion of Work Utility
- CGEM : Moroccan confederation of the companies of Morocco
- HCP : High commission in the plan
- 

## ANNEXE 2:

### List of the organizations contacted by mail

Institution	Contact
Order of the Architects	Fax: (037) 26 29 83
Ministry for the Land planning of Water and the Environment	<a href="http://www.matee.gov.ma">www.matee.gov.ma</a>
Information Center on Durable Energy and the Environment	Tél & Fax :037 77 27 22
Center of Development of Renewable Energies	Tél 024 30 98 14/22 ou 037 68 84 07
Ministry for Energy and Mines	<a href="http://www.mem.gov.ma">www.mem.gov.ma</a>
National Utility of Electricity	<a href="http://www.one.org.ma">www.one.org.ma</a>
Ministry for the Habitat and Town planning Technical direction of the Habitat	Tel: 037 57 75 51
Holding Al Omrane	<a href="http://www.alomrane.ma">www.alomrane.ma</a>
CGEM	Fax: (022) 25 38 39
Professional Association of the Cement	Fax: (022) 29 52 74
Federation of the Building materials Construction	Fax: (022) 39 54 49
Moroccan association of Solar and Wind Industries	063 04 04 43
Moroccan Association of Construction	Fax: (02) 25.05.24
Moroccan association of Sealing and Insulation	Fax: (02) 30.11.53
Association of the Industrial Plaster Manufacturers	Fax: (022) 20 30 14
National federation Of the Building and Public works	Fax: (022) 48 32 74
Moroccan association of Plumbing Heating and Air-conditioning	Fax: (07) 37.08.23

### ANNEXE 3:

#### List of spontaneously contacted persons

<b>Name</b>	<b>Occupation</b>	<b>Administrations</b>
A.Bensari	Division of the co-operation	Ministry for the Land planning of Water and the Environment
B.Chatre	head of the energy department	Ministry for Energy and Mines
H. Sabri	Head of the standardization Division	Ministry for the Habitat and Town planning Technical direction of the Habitat
P.Kiefer	Director	AFRISOL society
M.Bouidri	President	Moroccan Association of Construction
M.Sekkat	Director	Cherifiennne Society of heat insulation
R.Bouazzaoui	Head of department Building materials	Direction of Industrial Production Ministry of Industry, Trades and the levelling of the Economy
M. Taouil	Mechanical division	Direction of Industrial Production
M Alami	Mechanical division	Ministry of Industry, Trades and the levelling of the Economy
Choukairi	Electric and electronic direction	Direction of Industrial Production
Khadraoui	Direction of the statistics	Ministry of Industry, Trades and the levelling of the Economy
K. Bensallah	Head of the thermal Department	Sococharbo society
K.Duvey	Sales manager	IZDIHAR Association IED Innovation Energy and Development
M Fernandez	Officer Project	IZDIHAR Association IED Innovation Energy and Development
S Zerhouni	Direction Art and Urban	Archimèdia Group
O Alaoui	Direction art and urban	Archimèdia Group
M. ANAS	President	Industrial Cork Association
M.Fati	Sales manager	Fédalienne Heat Insulation Society
M.Kadmiri	Director	New Materials
M. Hamida	Head of Civil Engineering Service	office of technical studies SCET SCOM
-----	Sales manager	TEMAROC society Cork Industry
M.Salimi	Head of department of Administrative Statistics Collects	Statistics Direction HCP
Jean luc	Director	COMATRAL society Cork Industry
A. EI HOKMI	Officer of Smoke clearing and Fire protection	CAT International
-----	Sales manager	SABATEMAROC society Industrie du liège
-----	Sales manager	SOTCOLI society Industrie du liège
-----	Sales manager	Aglorex: Industrie du liège
-----	Sales manager	Etrure Sidi Yahia
-----	Sales manager	Grenson et Perfetini Menuiserie aluminium double vitrage
-----	Sales manager	SEDEC society
-----	Sales manager	Experctec (office of control)

## ANNEX4: TERMS OF REFERENCE

### Market analysis and capacity assessments MED-ENEC

PN: 55.3054.8-001.00

#### 1. Short description of the project

The overall objective of the MED-ENEC project “Energy Efficiency in the Construction Sector in the Mediterranean” is:

*“To give a boost to energy efficiency measures and to the use of solar energy in the construction sector, in order to reduce both energy supply requirements and the ever-growing impact on the environment of air-conditioning installations.”*

The project purpose has been defined as follows:

*“Service providers for Energy Efficiency and Renewable Energy Applications provide cost effective solutions (for building owners and developers and communities) to reduce environmental impacts.”*

The project will produce 4 major results:

▪ • Result 1:

Regional and sub-regional information, communication and cooperation networks in the construction and energy sectors among the MEDA countries and with the EU-member states are established.

▪ • Result 2:

Policy instruments, standards and incentive measures within an adequate regulatory framework orienting on the relevant topics and guidelines for energy efficiency in the construction and building sectors are available for adoption by policy makers.

▪ • Result 3:

New services & businesses and technology cooperation between European and MEDA partners established to support communities, real estate developers and building owners with comprehensive and cost effective services. For this purpose several business development activities will be organised: capacity building workshops, investors meetings, twinning activities between EU and MEDA institutions, support of helpdesks and information offices, support/initiate expositions and fairs, encouragement of industry pools and instruments for the promotion of new business opportunities.

▪ • Result 4:

Best practices and new technologies as well as integrative approaches are demonstrated and documented through pilot projects

Within the four expected results of the project, the market analysis and capacity assessments are part of result 3.

The market analysis and capacity assessments to be carried out for all 10 beneficiary countries are one of the first activities of the project (Activity 3.1 and 3.2).

#### 2. Objectives

The objectives of the market analysis and capacity assessment are to provide

(1) a sound information basis in terms of quantity and quality of the market (supply and demand) for energy efficiency and renewable energy products and services in the construction sector in the MEDA countries and

(2) concrete recommendations for activities boosting the market volume (supply and demand) for these products and services such as organisation of fairs, support

industry pools and investors meetings, capacity building, knowledge transfer, support of energy efficiency helpdesks, promotion of twinning arrangements between EU and MEDA institutions as well as promotion of professional networking.

### 3. Results

#### (A) Market Analysis

1. Provide a product-market combination table (see example below) for a (qualitative) overview of relevant energy efficiency and renewable energy products and services available for the following market segments

- a. Residential buildings (houses, apartment blocks, etc)
- b. Commercial buildings (hotels, offices, etc)/(semi) government and all other buildings (schools, hospitals, government offices, sports facilities, libraries, etc);
- c. Both products and services for new and existing buildings should be taken into account. If existent, 2 top providers/suppliers should be mentioned by name (incl. their website). Indication of level of maturity of the product market combination (very new, mature), indication of growth rate (fast or slow growth, stable, slow or rapid decline of the market).

The excel format for the product market combination table can be provided to you digitally.

2. Provide specific information (availability, names of companies) on relevant services and products available in your country. Please fill out the table in Annex 1 for this purpose.

3. Describe and analyse the trends in the construction sector with regards to energy efficiency and renewable energy. Provide a SWOT<sup>1</sup> analysis of the supply of relevant products.

4. Rank the market segments with the most important business opportunities for energy efficiency and renewable energy in the construction sector. List areas or market niches where new energy efficiency and renewable energy products and services could be successfully launched,

5. Describe areas or market niches that are promising for cooperation between European and MEDA country businesses; Furthermore: Provide a table with:

- a. • Products that are locally produced and the ones that are imported;
- b. • Locally made products are exported and where to (only if EU or other MEDA countries);
- c. • Leading European producers that are importing, have distribution network or agent in the country.

6. List and briefly describe organisations that represent energy efficiency and renewable energy businesses such as industry associations, chambers of commerce, etc, or other networks that could support the set up of industry pools, twinning arrangements and investment meetings

7. List and briefly describe relevant local, national or regional events (exhibitions, fairs, trade delegations/missions);

8. Describe 3 initiatives for professional networking in your country and suggest how twinning with other MEDA or EU organisations could be arranged as part of these initiatives.

9. Provide a concise capacity assessment of relevant service providers (3A2) and educational facilities:

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<sup>1</sup> In a SWOT analysis, the Strengths, Weaknesses, Opportunities and Treats are analyzed. Often, the strengths and weaknesses being internal and the Opportunities and Threats being external factors. For more information on SWOT analysis, have a look at [http://www.mindtools.com/pages/article/newTMC\\_05.htm](http://www.mindtools.com/pages/article/newTMC_05.htm)

10. • Provide a SWOT analysis for relevant 1) educational facilities and 2) service providers and identify the most important gaps in the present facilities, capacity and knowledge

11. • Rank the 5 best service providers and state their (relevant) specialisation/strengths

12. • Rank the 5 best educational facilities and state their (relevant) specialisation/strengths

#### (B) Recommendations

- On the basis of the market analysis, what are the 5 activities the business development activities (see result 3, page 1) in this project should concentrate on, in order to give a boost to the renewable energy and energy efficiency market? Please give 5 recommendations.
- On the basis of the capacity assessment, what are the 5 activities the business development activities (see result 3, page 1) should concentrate on, in order to give a boost to the renewable energy and energy efficiency knowledge/facilities? Please give 5 recommendations.

#### 4. Methodology:

The activities for the market analysis and capacity assessment consist of:

- Internet/document search
- (telephone) interviews with selected experts
- Analysis of collected information
- Reporting/Documentation

#### 5. Outputs:

For each country, a market analysis, a capacity assessment and recommendations have to be presented in form of a comprehensive report. The draft report has to be submitted in electronic form (MS Word) until 02.05.06 at the latest; the final version 7 days after receipt of the comments.

#### 6. Time frame/Inputs

The study will be supervised by the key expert Jeroen Verschelling and the team leader and will be carried out by national short term experts. For each country to be covered the respective expert may charge up to eight work days.

#### Table with availability of services and products

Services	Available Yes/no	Company name+ website/address
a. ESCO services / Energy contracting <sup>1</sup>		1 2 3
b. Installation and maintenance services for energy efficiency and renewable energy equipment, such as solar water heaters;		1 2 3
c. Energy audits for buildings;		1 2 3
d. Design and engineering of installations (solar water heaters or air-conditioning systems);		1 2 3
e. Design services of energy efficient buildings (architects)		1 2 3

f. Retrofitting of existing buildings with insulation, double glazing or energy efficient heating, ventilation, cooling or lighting;		1 2 3
g. Energy efficiency awareness campaigns;		1 2 3
h. Other relevant services.		1 2 3
<b>Products</b>		
i. Solar water heating systems;		1 2 3
j. Air-conditioning systems, ventilation systems;		1 2 3
k. Shading devices (sun screens etc);		1 2 3
l. Insulation material and double glazing;		1 2 3
m. Efficient lighting systems;		1 2 3
n. Equipment for (electric) power factor improvement;		1 2 3
o. Building energy management systems that control the various loads (heating, cooling, ventilation, hot water etc) in the building and can potentially also be used to schedule loads in order to lower peak demands		1 2 3
p. Energy efficient household appliances (A-labelled fridges and other domestic appliances, etc.);		1 2 3
q. Energy efficient office equipment; such as green or 'A' labelled PC and printers		1 2 3
r. Photovoltaic systems and related equipment (invertors, mounting systems, etc);		1 2 3
s. Other relevant products		1 2 3

<sup>1</sup> ESCO means Energy Service Company where ESCO owns installations (such as airco units) and provides the energy service (such as cooling or hot water). Sometimes the ESCO generates electricity on site and provides both electricity as well as heat.