Mediterranean and National Strategies for Sustainable Development

Priority Field of Action 2: Energy and Climate Change

Energy Efficiency and Renewable Energy

Morocco - National study's summary

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1. Challenges and Energy Sustainability

In Morocco, economic growth is strong, above 8%, and is sustained by the deployment of strategic programs for infrastructure development (motorways, ports, housing, health, tourism, drinking water, rural electricity, agriculture, industry). In 2005, energy demand accounted for approximately 5%, with over 8% for electricity, 5 to 6% for gas and 3% for other oil products.

Morocco is not a fossil energy producer and as such faces many diversified challenges:

- High dependency on fossil energy imports (96% of national requirements). In 2005, energy consumption reached 12.3 Mtoe (coal 30.2%, oil products 62%, natural gas 3.1%, wind 0.4%, imported electricity 1. 7%, and hydropower 3%).
- Basic energy consumption per capita remains low, at 0.41 toe/capita/year and at 480 kWh per capita/year. Energy intensity levels are still reasonable, at 0.26. However, disparities between consumer categories are high and show strong potential for growth.
- Necessary investments exceed 1 bn €/year
- Access costs are high due to the State's support of oil products (around 700 M € in 2005) to high electricity prices, nearing 3.5 bn € (20% of global imports); urban/rural price equalisation systems and the evening consumption peaks (3 700 MW vs 2 200 MW during off-peak hours in 2006) further increase electricity costs
- The environmental impact in term of greenhouse gas emissions (60% from industry) and of the pressure on forests is high: in rural areas, biomass is used for heating and cooking and consumption is estimated at 3.3 Mtoe, generating annual losses of some 30 000 hectares of forest surface and indicating that access to energy supply services is still limited in these areas.

The public authorities have developed a strategy:

- To secure supply through the upgrading of refineries, increasing oil storage and reception capacity in the ports and reinforcing electric and gas grid connections with Spain and Algeria;
- To diversify energy sources with the introduction of natural gas, sustained oil exploration efforts and promotion of RE use;
- To generalize access to energy through the Global Rural Electrification Program (PERG), aiming at extending the scope of electrical services over the next ten years (current rate at 90% vs 20% in 1996), promoting the supply of LPG and the development of local expertise and services through the creation of micro-enterprises (Maisons Energies);
- To optimize costs through gradual market liberalization and in-depth reforms of the energy sector: partial indexation of costs on international market prices, coherent taxation;
- To control energy consumption through DSM programs and more incentive pricing;
- To ensure secure energy supply and control, and environmental protection.

In its efforts to cover environmental requirements, Morocco is working on projects to improve the quality of fuels through the production of 10 and 50 ppm diesel and to stop leaded fuel supply, to secure the highly vulnerable supply of drinking water, to promote the use of gas instead of firewood, to use renewable energies (RE) for combating deforestation and to mitigate the environmental impacts of urban sprawl, by considering *Opportunities for Energy Efficiency in Buildings*, traffic and waste management plans …

Awareness on energy issues is widespread in the country, as demonstrated by the interest shown by institutional decision-makers, politicians, economic stakeholders and civil society, spurred by the uncertain evolutions of costs resulting from the national pricing system.

The degree of sustainability in energy development is difficult to assess, as national plans for energy mix are still essentially based on fossil energies and on sector-based development practices to the detriment of integrated approaches. A trend scenario would be required to facilitate global coverage of energy and environmental issues.

2. Indicators in numbers:

Renewable energies (RE) represent 0.4% of the national energy balance (excluding biomass) and nearly 10% of electricity production, supported by strong hydropower sources and the newly installed wind energy parks (64 MW installed and 240 MW under deployment). Many initiatives are dedicated to RE such as solar power plants, pumping stations, hydraulic turbines, waste recycling, water pumps, sea water desalination, air conditioning and solar water heaters. RE is also the focus of many economic and social programs, as in the case of rural electrification, where individual photovoltaic solar systems account for 7% of energy production.

Energy sources are significant. Forecasts estimate wind energy potential at 6 GW, the solar heater market at 1M m^2, and highlight strong potential for biomass enhancement (9 million hectares of wooded areas and strong national agricultural traditions). The expectations in this field are high among institutional stakeholders, economic players and also consumers. Unfortunately, as explained hereafter, developments are hindered by specific constraints.

Experience in energy efficiency and RE is wide-ranging. Morocco has organized programs in capacity building and national expertise development (specialized design offices), in upgrading industrial and commercial infrastructures, in pilot projects and initiatives for technical and financial support in the preparation of audit recommendations. The visibility and impact of these initiatives remain limited due to the sector-based approach preferred over a more global and sustainable approach.

The national expertise in renewable energy has been applied to construction, industry and protection of resources (firewood…). Globally, potential energy savings exceed 15% (17% in industry with an ROI time of 18 months). Potential in cogeneration is assessed at 400 MW. As in the case of RE, awareness is high among the institutional and economic stakeholders and among consumers and energy prices are attractive (partial indexation of oil costs on international market prices, pricing per *tranche* for low voltage electricity, peak and off-peak pricing for medium and high voltage).

3. Current RE and RUE policies

During the National Debate on Energy, held in October 2006, RE and RUE were considered as full-fledged energy sectors, on a par with Oil Products and Electricity. Indeed, the main objective of the National RE and RUE Development Program is to increase the share of RE in the national electricity balance by 20% and their contribution to the energy balance by 10% by 2012, aiming at energy savings of nearly 800 Mtoe.

These goals will be achieved through wind energy installations with a total installed capacity of 1 200 MW, through the supply of sustainable and decentralized energy-related services to 300 000 rural households, through the promotion of biofuel production, the design of energy efficiency approaches in construction and support to operators for implementation, and through energy demand management initiatives in favour of the industrial and commercial sectors.

The relevant legislation, regulations and incentives are currently under validation and include such instruments as:

- A framework Law on energy efficiency and RE;
- Support funds for energy efficiency and RE programs;
- A decree giving RE electricity self-producers access to the national grid and increasing the production threshold from the current 10 MW to 50 MW;
- Reorganization of the CDER as an operational agency to implement the national RE and energy efficiency policy.

It is interesting to note that this approach is part of a global World Bank program to reform the energy sector, through loans to Energy Development Policies. GTZ also supports the process and contributes to the development of the regulatory implementation and support mechanisms for the framework law.

With the support of GEF, UNDP and the Italian Government, promotional campaigns focus on new wind energy installations, on awareness-raising among potential energy self-producers, and on the launch of solar heating regulations applicable to buildings. These campaigns also target the generalization of solar energy and Low Consumtion Light in the public housing sector, the optimization of street lighting management with local authorities, the preparation of DSM action plans within the framework of SME and SMI upgrading operations.

4. Obstacles, possible solutions, necessary reforms

The regulatory mechanism described above aims at removing the barriers and obstacles to the large-scale development of RE and energy efficiency.

There are four main obstacles to incentives and institutional approaches: regulations are lacking, there is no dedicated agency, RE and energy efficiency are low priorities for national development programs dedicated to raising awareness and to ensuring sustainable demand in RE and energy efficiency technologies and services, and taxation does not provide attractive market conditions.

Although technology is not in itself a barrier, consideration of global quality approaches remains limited and capacity expansion is insufficient (public and private). The same applies to the information and public awareness-raising. There are still too few national R&D efforts to develop and upgrade equipment and services.

Lastly, from the financial standpoint, not only does the current approach reduce visibility, it is also unfavorable to investments, particularly as regards supply growth. Traditional funding mechanisms (PPI) are costly and financial operators favor the traditional energy sector over RE and energy efficiency. Finally, the added value of RE and RUE in employment and in attracting new investments is not taken into account.

The mechanism developed by public authorities to promote RE and energy efficiency is highly favorable to the achievement of the objectives through relevant reforms:

- Operational regulations which more fully integrate energy and environment;
- Wide-ranging and mandatory standards promoted through labelling;
- Strategies to pool private operators in favour of more available quality equipment and services, of adapted financial instruments and mechanisms to ensure proper alignment of stakeholder initiatives and genuine market sustainability;
- Support and monitoring tools, all too often neglected in RE and energy efficiency policies;

- Capacity expansion and awareness-raising strategies to educate the population in the RE and energy efficiency culture;
- Innovative private and public partnerships to enhance the regional visibility of operators.

5. Success story:

Energy efficiency: the tool to decouple economic growth and increased energy demand

In Morocco, energy efficiency programs bring innovations in the field of technology, organization and funding. They include: PROMASOL, for the development of the solar water heater market, the use of improved wood savings technologies to upgrade hammams and bakery ovens, and promotional campaigns for local expertise and services.

Within the framework of current national programs, the RE Development Center is working on designing the energy efficiency approach to collective housing. The approach involves capitalizing on promotional mechanisms, consolidating partnerships and supporting strategic infrastructure construction projects in the fields of Health, Housing, National Education, Hotels and Local Communities.

This is a fully-integrated approach to energy in construction work. It covers heating regulations, standards and labels (architectural design, building materials and equipment), normative technical guidelines for professionals, the upgrading of the capacity of public and private operators, the development of a pilot program in the above-mentioned areas, and sustainable funding through the financial resources of the different institutions.

The program was developed jointly by the partners, convinced of the need to cooperate in satisfying requirements and in meeting the ever stronger demand for comfort, by contributing to energy demand management, to environment protection and to optimized institutions budgets.