



CE-INCO/CRES ' SOLARBUILD' Project

**WP2: Definition of the renewable energies and energy efficiency
needs in the south Mediterranean countries**

Task 1

Definition of the key sectors and technology needs

ALGERIA

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ALGERIA

1- Introduction: General description of the country

Algeria is located at the north of the African continent. It shares terrestrial borders with Tunisia in the North-East, Libya in the east, Niger in south-east, the Sahara Occidental, Mali, and Mauritania in the south-west and Morocco in the west. Its surface is 2381741 Km² (which is constituted by 85% of desert). Algeria offers a maritime frontage of 1200 km bordering the Mediterranean.

The climate covering Algeria consists of three great sets, corresponding to the various existing reliefs. Thus, a Mediterranean climate covers the coastal cities where winter temperatures vary between 8 and 15 °C, climbing to 25 °C in May to reach an average of 35 °C in July and August. In the centre (in the mountains of Kabylie and Aurès) and in the high plateaus, the temperature borders the (5°C) to (-7°C) in winter, whereas the summer temperature varies from 35 °C to 40 °C. In the Sahara, the temperature varies between 15 and 28 °C in winter and exceeds 45°C, in summer.

The Algerian population reaches the 33.8 million inhabitants which 65 % are less than 30 years old. 4.4 million Inhabitants are concentrated in the capital of the country 'Algiers'.

2- ENERGY IN THE BUILDING SECTOR

2.1/ General Data on the building sector:

The number of dwellings in Algeria is approximately six million units which more than 800 000 exceed the 50 years of age. The rhythm of construction is in constant growth: It was equal to 135000 dwellings/year, at intervals of 1999 to 2004 and moved to the rhythm of 200000 dwellings/year, corresponding to the National Programme of realization of one million dwellings, during the five-year period 2005-2009.

Common type of construction:

The structure of the buildings is generally carried out of reinforced concrete, using the columns and beams system or the tunnel formwork system. The external walls consist of double partitions, constituted of hollow bricks, integrating air gap into the medium. The total thickness of the double partitions varies between 25 cm (air gap of 5 cm between two bricks of 10cm) and 30 cm (air gap of 5 cm between two bricks of 10 and 15 cm or air gap of 10 cm between two bricks of 10 cm). The coatings of the frontages are carried out of cement mortar (2 cm thickness).

Joineries are made of wood with a simple glazing of 4 mm. The surface and the orientation of the windows are not designed according to climatic conditions'. The heat insulation is limited to the roofs terraces which integrate in the system of sealing, 4 cm of polystyrene or cork.

Heating and cooling:

Generally, the dwellings are heated with gas heaters, installed in central spaces. Exceptionally, the central heating systems can be present in certain dwellings. Concerning the buildings not served with natural gas, the heating is generally ensured by the butane gas, the gas oil or the electricity.

Air-conditioning in the form of ' *Split system*' is usually present in the buildings. The various powers of the air-conditioners systems present are 9 000, 12 000, 18 000 and 24 000 BTU.

2.2/ statistical data:

The residential sector presents an energy consumption of 35% of the national final energy consumption. This consumption consists of 37% of natural gas, 30% of LPG (it is mainly butane) and of 14% of electricity. The petroleum products (mainly gas oil) account for 19% of the energy consumption of this sector.

The energy consumption of the service sector accounts for 6% of the national energy balance. This consumption is prevailed by the electricity which reaches 50% of the total energy consumption of this sector. It is followed by natural gas (35%), and petroleum products (9%).

2.3 / List of the institutes working in R.E.:

Organisations	adresses
Ministère de l'énergie et des mines Direction des énergies renouvelables (Ministry for energy and mines- Renewable Energies Direction)	
Agence pour la promotion & la rationalisation de l'utilisation de l'énergie - APRUE (Agency for the promotion & the rationalization of the energy use)	2, rue Chenoua – BP :265 Hydra Alger
Station d'expérimentation des équipements en milieu saharien SEEMS (Centre of the equipment test in the Saharan environment)	BP:478 – Route de Reggane - Adrar
Unité de développement des techniques du silicium – UDTS- (Unit of development of the silicon techniques)	02, bd Frantz Fanon BP:399 – Alger gare
Centre de développement des énergies renouvelables - CDER (Centre of the renewable energies development)	86, route de l'observatoire Bouzaréah Alger

Unité de développement des équipements solaires - UDES (Unit of the solar equipment development)	Bou Ismaïl
CREDEG (Filiale SONELGAZ)	Route de Ouled Fayet N°36, Colline des grands vents El Achour-Alger
SONATRACH – New Energy Algeria (NEAL)	10, rue du Sahara Hydra Alger

3- Context and policy supporting the control of energy in the building sector:

3.1/ Procedure of building permit for the public and private buildings:

No requirement relating to the energy consumption of the buildings is included in the procedure applied for obtaining the building permit.

3.2 / Legal framework and financial resources:

The 99-09 law relating to the energy control defines measurements to be implemented for "the rational energy use, the renewable energies development and the reduction of the environmental energy system impacts' ". It also defines a model of energy consumption which envisages directing the energy request towards "the priority and maximum use of natural gas for the final thermal uses" and envisages "the orientation of electricity towards specific uses".

The application of the 99-09 law, in the building sector was concretized by the promulgation of the 2000-90 executive decree, related to the thermal regulation in the new buildings. This decree takes into account the calorific losses references in winter and calorific contributions references in summer, according to the climatic zones.

The National Programme of Energy Control (PNME), envisaged for the five-year period 2006-2010, constitutes the principal measure of encouragement and incentive to the renewable energies use, in particular in the building sector. This program includes projects of aid to the investment in the solar water heating system in the residential and

the service sectors. The financing of the projects defined in the PNME is ensured by the National Fund for Energy Control (FNME).

3.3/ National policies contributing to the concretization of the energy control and the environmental protection:

Environmental protection is taken into account in the Algerian legislative framework particularly in the 03/83 law relating to the environmental protection; the 99-09 law relating to the energy control; the 01-20 law relating to the land settlement and its sustainable development and the 03/01 law relating to the environmental protection within the framework of the sustainable development. Concerning the promotion of renewable energies, the National Assembly adopted on August 2004, the law relating to the promotion of renewable energies within the framework of the sustainable development.

Moreover, Algeria undertook to cover in 2010, 5% of its requirements in electricity by renewable energies, especially by solar energy. In this way, the 04-92 executive decree relating to the costs of the diversification of electricity production, expects granting substantial incentives for the electricity production from renewable energies.

4- Inventory of solar technologies applications:

4.1 / Identification of the existing solar applications:

The solar photovoltaic constitutes the most developed renewable technology. It is applied in the following projects:

- The electrification of 20 villages in the great Algerian south, realized by the National Company of Electricity and Gas (SONELGAZ). That allowed connection of more than 1 100 households;

- The rural electrification of 1 000 households, within the framework of the steppe areas development programme, financed by the High Commission Office for the Steppe Development (HCDS).



The batteries room, in function since 1999
The electrification of 20 villages in the great Algerian south



Photovoltaic panels
The electrification of 20 villages in the great Algerian south

4.2/ State of the solar energy technologies local market:

Most of the solar technologies equipments are imported, with the exception of the few prototypes of solar water heating system, produced by the Unit of the solar Equipment development (UDES).

5- Barriers to the development of solar technologies in the building:

The major constraints which are opposed to the solar technologies development are related to the financial aspect. The equipment prices are very high and the time for return on investment in this type of technology is generally very long.

This situation is owing primarily to the relatively weak energy price (in particular the gas), and to the importation of the majority of the equipment used in solar technologies. Thus, the absence of local industries development in the solar technologies field implies very high capital costs which consequently, limit the diffusion and the integration of renewable energies in the building.

6- Prospects for development of solar technologies:

In the framework of its engagements to cover in 2010, 5% of its requirements in electricity by renewable energies, Algeria situates the essence of this production in significant thermal solar installations. Taking into account the current legislation which expects granting consequent incentives for the electricity production from renewable energies, the thermal solar electricity production should be in growing development. In this way, the National Company of the Electronics industries (ENIE), is currently developing a solar unit which envisages the manufacture of the solar cells and the photovoltaic panels encapsulation.

Parallel to the solar electricity production, the National Programme of Energy Control (PNME 2006-2010), aims to boost the thermal technologies, through the promotion of projects getting aid to investment in the solar water heating systems in the residential and the service sectors. These projects financed by the National Fund for Energy Control (FNME), aim to ensure the diffusion of solar water heating system, in the residential and the service sector, and to create a local market of this technology.