



# *PROSOL TUNISIA*



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Tunisia has good solar conditions:

- ✚ The total annual radiation on horizontal level varies between **1500** and **1900 kWh/m<sup>2</sup>**
- ✚ The index of insolation, in annual values, varies between **64%** and **75%**. In monthly values, this index varies between **47%** and **89%**.
- ✚ The temperatures are relatively high. The monthly average exceeds **9°C** in general.

The solar water-heater is the best known and the most widely used renewable energies technology in Tunisia. Its development is, however, hampered by its lack of competitiveness with regard to the level of the initial investment, as compared with conventional systems (LPG- fired/ Gas-fired and electrical water heaters).

Within the framework of its strategy for the development of renewable energies, the Tunisian government have decided to launch an ambitious program aiming the development of the use of the Solar Water-Heater (SWH) in the residential sector, through the implementation of a number of encouraging measures. This program called PROSOL started in **February 2005**

## ***I. Different contributors to PROSOL:***

Therefore, on the initiative of the Ministry of industry, Energy Small and Medium size enterprises, and the participation of the National Agency for energy conservation (ANME), and with the backup of the Italian Ministry for the Environment and Territory through the United Nations Program for the environment (UNEP) and the Mediterranean Renewable Energy Center (MEDREC), it was decided to launch, a financial mechanism allowing the revitalisation of solar water-heaters market in Tunisia.

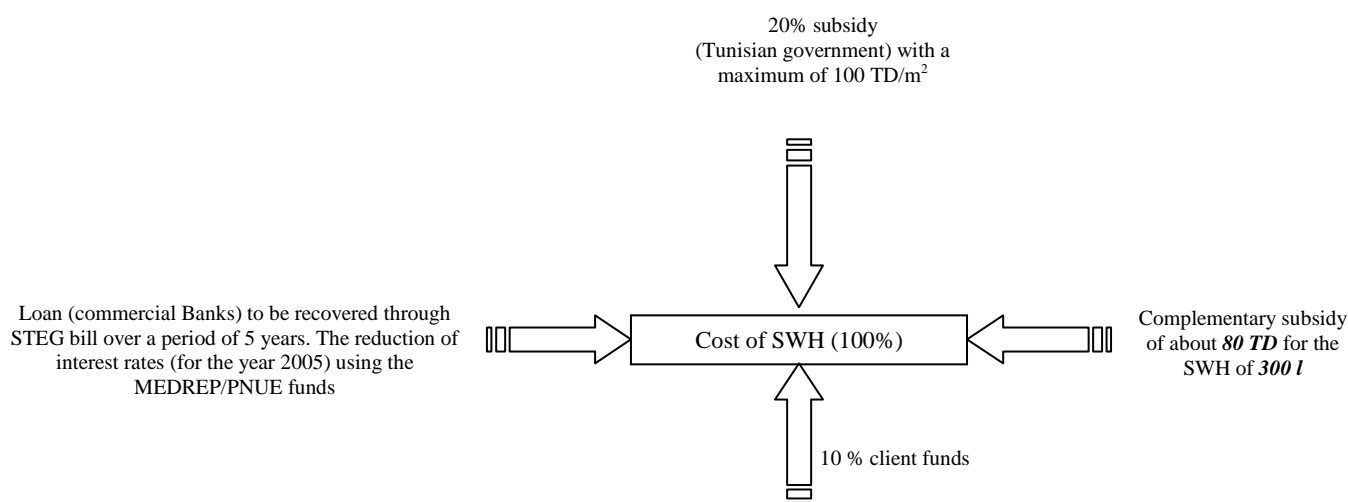
## ***II. Measures being taken within the framework of the program PROSOL 2005:***

In **2005** three types of solar water heaters have been commercialised in the residential sector, with the backup of PROSOL: **200 liters** solar water heaters, **300 liters** solar water heaters, and **500 liters** solar water heaters.

This program called “PROSOL TUNISIA” (Solar promotion for Tunisia), benefits of a series of institutional and financial backups used as promotional actions for the development of the market. These financial supports cover four essential items:

- ✚ A subsidy of **20%** on the cost of a SWH, served by the government through the National Fund of energy with a maximum of **100 TD/m<sup>2</sup>**
- ✚ A complementary subsidy of about **80 TD** on the cost of a solar water heater of **300l**, served by the Italian Ministry for the Environment and Territory through the MEDREC Funds.
- ✚ A loan mechanism for financing the left cost of a SWH for the consumer, granted over a period of **5 years**, and recovered through STEG electrical bill.
- ✚ The reduction of the interest rate, through the year **2005**, using the MEDREP/UNEP funds.
- ✚ The costumer takes in charge only **10%** cash of the cost.

### III. Financing mechanism of PROSOL



### IV. PROSOL results for the year 2005:

Table 1 : PROSOL results for the year 2005

|  |            |
|--|------------|
| Total surface of installed solar heaters (m <sup>2</sup> )         | 22 312     |
| total investment (TD)  | 10 130 541 |
| Subsidies (TD)   | 2 145 541  |
| Autofinance and loans (TD)   | 7 985 000  |
| Average price of the m <sup>2</sup> of heater (TD/m <sup>2</sup> ) | 454        |

### V. financial contribution of the actors :

Table 2 : Details of the subsidies for 2005

|   |                  |
|---|------------------|
| <b>Subsidies for clients to be recovered through STEG electrical bill</b> |                  |
| MEDREC (TD)   | 137 055          |
| Tunisian government (TD)  | 1 189 075        |
| <b>Total (TD)</b>   | <b>1 326 130</b> |
| <b>Subsidies for other (cash) clients</b>                                 |                  |
| MEDREC (TD)   | 107 678          |
| Tunisian government (TD)  | 711 734          |
| <b>Total (TD)</b>   | <b>819 412</b>   |
| <b>Total of the subsidies for 2005</b>                                    | <b>2 145 542</b> |
| <b>Reduction of the interest rate</b>                                     | <b>742 594</b>   |

## VI. Impact of PROSOL on the consumption of energy and on the national economy:

The 22 000 m<sup>2</sup> installed SWH using the backup of PROSOL program, have permitted for the year 2005:

- ✚ An energy economy of about **1 600 TOE**
- ✚ An avoided subsidy of LPG to the benefit of the government of about **576 000 TD**
- ✚ Avoided CO<sub>2</sub> emissions of about **4 160 TCO<sub>2</sub>E**.

## VII. Perennisation and extension to the tertiary sector of PROSOL

Considering the success of PROSOL during the first year (22 000 m<sup>2</sup> of solar collectors installed in one year being a historical record), it is proposed to perennialize the project PROSOL over the period 2006-2008 and to extend its use to the tertiary sector (hotels, hospitals, and Turkish baths) with the help of a probable modification of the financing mechanism to adapt it to the requirements of the tertiary sector.

The objective of PROSOL over the period 2006 - 2008 consists in installing 235 000 m<sup>2</sup> of SWH (195 000 m<sup>2</sup> for the residential sector and 40 000 m<sup>2</sup> for the tertiary sector), which will allow for the same period:

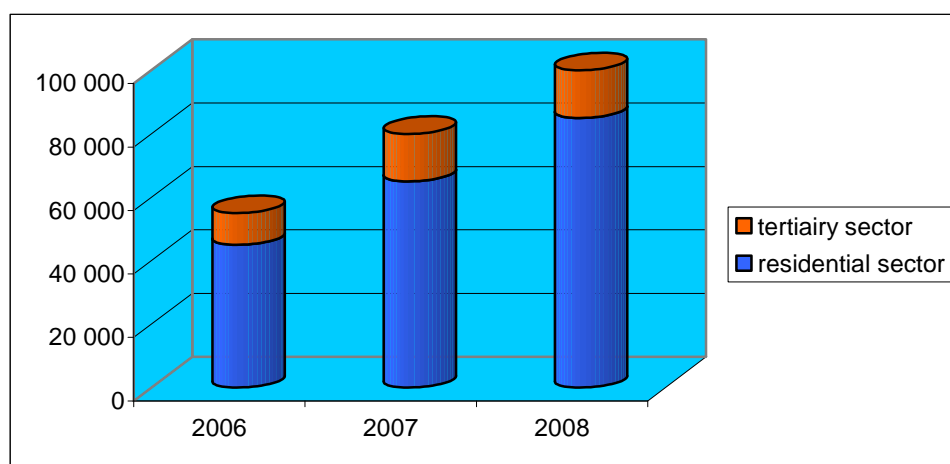
- ✚ An economy of energy of about **33 000 TOE**
- ✚ An avoided subsidy of GPL to the benefit of the government of about **13,4 Millions TD**
- ✚ Avoided CO<sub>2</sub> emissions of about **85 800 TCO<sub>2</sub>E**.

## VIII. Planning of PROSOL activities between 2006 and 2008

The planning of installation of solar water-heaters over the period 2006-2008 is indicated in the following table:

**Table 3 : Objectives of PROSOL over the period 2006-2008**

|                    | 2006   | 2007   | 2008   | Total   |
|--------------------|--------|--------|--------|---------|
| Residential sector | 45 000 | 65 000 | 85 000 | 195 000 |
| Tertiary sector    | 10 000 | 15 000 | 15 000 | 40 000  |



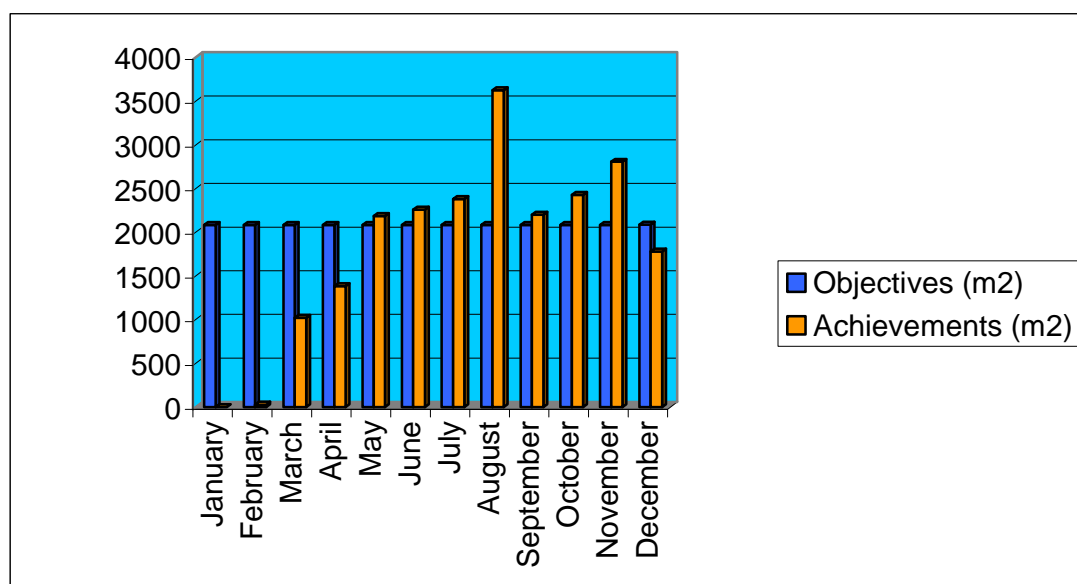
**IX. Appendice : Detailed assessment of the achievements of the program PROSOL in 2005**

**IX.1. Monthly achievements:**

The objective for year 2005 consisted in installing **25 000 m<sup>2</sup>** of solar water heaters. The achievements are about **22 312 m<sup>2</sup>**, which amounts to **89,25%** of the objective. The monthly distribution of installations is the following:

**Tableau 4: Monthly distribution of the installation of SWH (m<sup>2</sup>)**

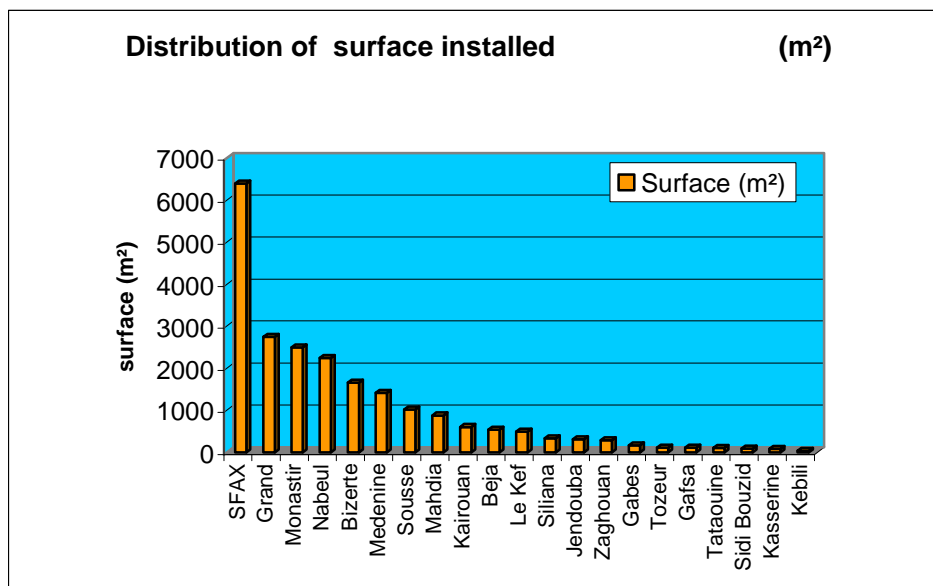
| Month        | Objective (m2) | achievements (m2) | Difference (%) |
|--------------|----------------|-------------------|----------------|
| January      | 2083           | 0                 | -100,00        |
| February     | 2083           | 28                | -98,66         |
| March        | 2083           | 1018              | -51,13         |
| April        | 2083           | 1386              | -33,46         |
| May          | 2083           | 2184              | + 4,85         |
| June         | 2083           | 2258              | + 8,40         |
| July         | 2083           | 2378              | + 14,16        |
| August       | 2083           | 3623              | + 73,93        |
| September    | 2083           | 2200              | + 5,62         |
| October      | 2083           | 2425              | + 16,42        |
| November     | 2083           | 2804              | + 34,61        |
| December     | 2087           | 2008              | -3,79          |
| <b>Total</b> | <b>25 000</b>  | <b>22 312</b>     | <b>-10,75</b>  |



**Figure 1: comparison of monthly objectives and achievements in 2005**

IX.2. *Distribution of the surface installed by governorate:*

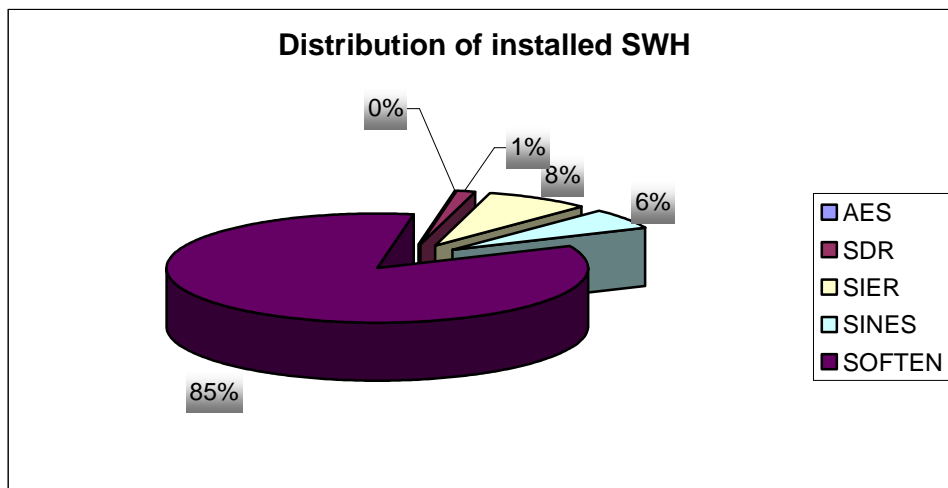
| Governorate  | Surface (m <sup>2</sup> ) |
|--------------|---------------------------|
| SFAX         | 6622                      |
| Grand Tunis  | 2740                      |
| Monastir     | 2490                      |
| Nabeul       | 2242                      |
| Bizerte      | 1658                      |
| Medenine     | 1414                      |
| Sousse       | 1016                      |
| Mahdia       | 876                       |
| Kairouan     | 602                       |
| Beja         | 534                       |
| Le Kef       | 492                       |
| Siliana      | 334                       |
| Jendouba     | 312                       |
| Zaghuan      | 288                       |
| Gabes        | 164                       |
| Tozeur       | 112                       |
| Gafsa        | 112                       |
| Tataouine    | 102                       |
| Sidi Bouzid  | 86                        |
| Kasserine    | 78                        |
| Kebili       | 36                        |
| <b>Total</b> | <b>22 312</b>             |



IX.3. *Distribution of SWH by Distributor:*

**Table 5: Distribution of SWH by Furnisher**

|              | 200 l        | 300 l        | 500 l     | total        |
|--------------|--------------|--------------|-----------|--------------|
| AES          | 0            | 0            | 0         | 0            |
| SDR          | 74           | 39           | 0         | 113          |
| SIER         | 326          | 318          | 0         | 644          |
| SINES        | 321          | 129          | 0         | 450          |
| SOFTEN       | 2 331        | 3 533        | 22        | 5 886        |
| <b>Total</b> | <b>3 052</b> | <b>4 019</b> | <b>22</b> | <b>7 093</b> |



**IX.4. Names and addresses of distributors (14 February 2006):**

|                      |                             |
|----------------------|-----------------------------|
| <i>distributor :</i> | <b>SOFTEN</b>               |
| <i>Address :</i>     | Rue des mathématiques, Z.I. |
| <i>City :</i>        | Grombalia                   |
| <i>Phone :</i>       | 72 210 600                  |
| <i>Fax :</i>         | 72 256 183                  |

|                      |                 |
|----------------------|-----------------|
| <i>distributor :</i> | <b>SINES</b>    |
| <i>Address :</i>     | 6 Rue Ibn Rochd |
| <i>City :</i>        | Tunis           |
| <i>Phone :</i>       | 71 340 944      |

|                      |                           |
|----------------------|---------------------------|
| <i>distributor :</i> | <b>SIER</b>               |
| <i>Address :</i>     | 7 Rue 8610 Z,I Chargaia I |
| <i>City :</i>        | Tunis                     |
| <i>Phone :</i>       | 71 800 130                |

|                      |                     |
|----------------------|---------------------|
| <i>distributor :</i> | <b>SDR</b>          |
| <i>Address :</i>     | Route de Gremda Km3 |
| <i>City :</i>        | Sfax                |
| <i>Phone :</i>       | 74 219 182          |

|                      |                   |
|----------------------|-------------------|
| <i>distributor :</i> | <b>AES</b>        |
| <i>Address :</i>     | 29 Av. Tahar Sfar |
| <i>City :</i>        | Sousse            |
| <i>Phone :</i>       | 73 212 908        |