

Creating a credit market for solar thermal: the PROSOL project in Tunisia

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Introduction and Background

The United Nations Environment Programme (UNEP) has been working with the finance sector since the late 1990s to develop innovative mechanisms for the promotion of sustainable energy technologies in developing countries. Through its Renewable Energy and Finance Unit, UNEP has implemented a variety of “financial catalysts” with the aim to lower risks, buy down transaction costs, build capacity and address soft market barriers that constrain sustainable energy technologies growth.

The MEDREP Finance initiative represents one of the most recent and successful examples. It has been developed within a manifold programme launched by the Italian Ministry for the Environment, Land and Sea at the World Summit on Sustainable Development of Johannesburg in 2002. The aim of the Mediterranean Renewable Energy Programme (MEDREP) is to expand the share of renewable energy technologies in the Southern Mediterranean region, in order to reduce poverty, combat climate change and achieve long-term sustainability objectives.

A series of projects are being developed in Tunisia, Morocco and Egypt. Below, the structure of the PROSOL project in Tunisia is reported, as well as the results achieved. First, an overview of country-specific conditions is provided.

Framework conditions and solar thermal potential in Tunisia

Tunisia has a significant solar potential, with very high irradiation rates. According to the GIS-based data made available by the European Commission’s DG Joint Research Centre (JRC, 2007), the country benefits from 1,700 to 2,200 kWh/m² per year. The National Agency for Energy Conservation (ANME) estimates that solar thermal panels could satisfy approximately 70-80% of sanitary hot water needs in the residential sector. So far, solar water heaters cover only 3% of the market in the domestic sector. As one can see, the market is dominated by LPG-fired boilers, which constitute 78% of the existing stock (Missaoui and Amous, 2003).

While sun is an abundant source in Tunisia, the country has scant fossil fuel reserves and its net energy balance has been showing negative values since 2001. In particular, LPG is entirely imported.

Water heater typology	% of stock
Electric	10.40%
Natural gas	8.00%
LPG	78.40%
Solar thermal	3.20%

According to the data provided by the International Energy Agency (IEA, 2007) in 2004 LPG imports reached 364 ktoe (+22% over 2000 and +164% over 1990). Hot water demand is over 30 million m³ per year, and is projected to increase up to 70 millions m³ by 2010. This would imply a further growth in LPG imports, if current energy consumption patterns remain the same. This would translate into a higher deficit in the balance of payments, and in an increase of government's expenditures to subsidize the product. Currently, LPG is subsidized in a measure corresponding to 50% of its real price.

Solar thermal has been repeatedly proposed as a solution to lower the country dependency from imported fossil fuel sources. The first solar thermal energy strategy was developed by the Tunisian government in the 1980s. But only in the period 1997-2001 a real market and technology infrastructure have been developed, thanks to a project financed by the Global Environment Facility (GEF) and the Belgian Cooperation. The support mechanism was based on a 35% capital cost subsidy. At the end of the period, 50,000 m² of new solar thermal panels were installed, 8 suppliers (among which 3 manufacturers) and over 130 installers were operating in the market, for a total of 260 new jobs created. Despite these important results, as soon as project funds expired solar water heater sales dropped again.

The PROSOL project

PROSOL (Programme Solaire) is a 2-year project developed within the MEDREP umbrella. It has a total budget of Euro 1.7 millions, donated by the Italian Ministry for the Environment, Land and Sea.

The project was initiated in 2005 by the Tunisian Minister for Industry, Energy and Small and Medium Enterprises and the National Agency for Energy Conservation (ANME), with the support of the UNEP-MEDREP Finance Initiative.

The objective of PROSOL was to revitalize the declining Tunisian solar water heater market. The innovative component of PROSOL lies in its ability to actively involve the finance sector, and turn it into a key actor for the promotion of clean energy and sustainable development. By identifying new lending opportunities, banks have started building dedicated loan portfolios, thus helping to shift from a cash-based to a credit-based market.

The main features of the PROSOL financing scheme are:

- A loan mechanism for domestic customers to purchase solar water heaters
- A capital cost subsidy provided by the Tunisian government, up to 100 dinars (57 euros) per m²
- Discounted interest rates on the loans, progressively phased out.

A series of accompanying measures have been developed, which include an awareness raising campaign, a capacity building programme and carbon finance.

Besides UNEP and ANME, key partners include:

- The Société Tunisienne de Banque (STB)
- Two commercial banks (UBCI and Amen bank)
- The State electricity utility STEG (Société Tunisienne d'Electricité et du Gaz)
- Manufacturers, importers and installers of solar water heaters
- Local consultants

Functioning of the financing mechanism

In the PROSOL scheme, loans for solar water heaters are effectively driven by suppliers, who act as indirect lenders of money for their customers. The process begins when a customer decides to purchase a solar water heater from an eligible supplier. It is worth highlighting that only suppliers accredited by ANME can operate within PROSOL. To this end, products must meet a series of technical requirements and performance standards, as set in a manual prepared by ANME. The supplier submits a loan application to a participating Tunisian bank that qualifies the customer's ability to repay the loan. Once the bank approves the loan to the supplier, the solar water heater is installed at the customer's home. The customer pays only the administrative costs of the process.

After the installation, the supplier receives:

- The subsidy payment from ANME of 200 dinars (Euro 114) for a 200-litre system or 400 dinars (Euro 228) for a 300-litre unit, and
- A payment from the bank of 750 dinars (Euro 428) for the 200-litre solar water heater, or 950 dinars (Euro 542) for the 300-litre system.

The customer repays the loan on a pro-rata basis over a five-year term, through the electricity bills issued bi-monthly by STEG. In some cases, however, the extra cost for the solar water heater is compensated by reduced electricity consumption, thus lowering the overall amount to be paid.

Within this scheme, banks do not have any direct contact with the customer, who is the final beneficiary of the loan. They deal instead with solar water heater suppliers. This unusual arrangement provides a double security: loans are officially granted to the solar water heater suppliers who are responsible for repayments, and the consumer cannot easily default because the loan debt is recovered through the customer's electricity bill. In the event a customer does not pay the bill (and hence the solar water heater loan), banks can take action against the solar water heater suppliers that were granted the loan. At the same time, STEG suspends the electricity supply to the customer.

Highlights of main features

The most distinctive aspects of the PROSOL financing scheme are: the engagement of banks and the active involvement of the State utility.

In PROSOL, banks play a very important role since they provide the necessary funds to develop the market, accounting for the highest percentage of the finance for solar water heaters.

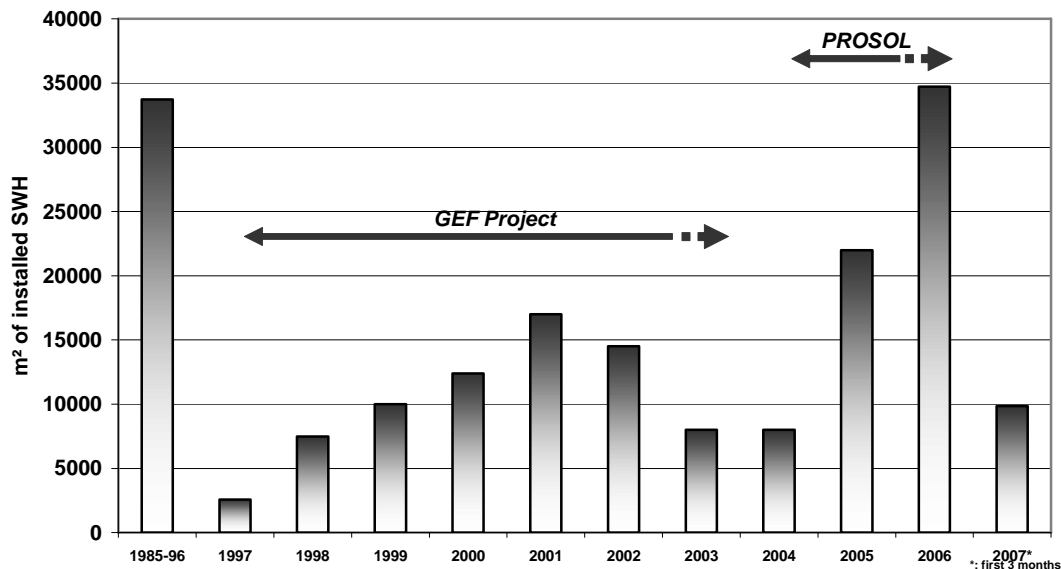
The engagement of STEG in recovering the loan payments through its electricity bills has provided enough guarantees to banks to extend the loan terms and lower the interest rates. In PROSOL, loan duration was five years instead of the usual three-year term. As for interest rates, the commercial lending rate for similar loan products in Tunisia is 14%. Within PROSOL, banks have agreed to a 7% reduction. Through the MEDREP Fund, UNEP has provided a 7% interest buy-down for loans disbursed in the first 12 month and 3% for subsequent loans. This means the rate initially charged to customers was 0% and after 12 months 4%.

The transparency of the system is ensured by independent third party evaluation. At the beginning of 2007, PROSOL was audited by KPMG.

Results and Outlook

Launched in April 2005, the PROSOL project has resulted in an immediate success. In less than one year (April-December 2005), sales reached the record figure of 7,400 solar water heating systems, for a total surface installed of 23,000 m². At the end of 2006, an additional 11,000 units were sold, corresponding to approximately 34,000 m². The capacity added in the year 2006 was higher than the cumulative capacity installed in the entire period 1985-1996, prior to the GEF project. On an annual basis, the 2006 figure doubled the sales in the previous best year – 2001 (under the GEF programme). Overall, in less than two years the solar water heater market has surpassed 57,000 m², representing as much as 50% of the cumulative surface installed from 1985 to 2004. The figures for the first trimester of 2007 (after the end of PROSOL) confirm this encouraging trend.

Solar Water Heaters Market Growth in Tunisia
1985-2006 and 1st trimester 2007



As regards geographical distribution, the majority of solar heating systems are concentrated in the Northern part of the country and in coastal areas.

In terms of equipments, most installations are represented by flat plate solar panels but vacuum tube collectors are slightly gaining market share.

As for financial data, banks have granted loans for more than 6 million dinars (Euro 3.4 million) in 2005 and 9 million dinars (Euro 5.3 million) in 2006.

The number of solar water heater suppliers eligible within PROSOL has rapidly increased, passing from 5 to 9 in few months and stimulating other applications. Today, the number of companies selling solar water heaters is 14, of which 4 producers. A new manufacturing plant is being established and new technology providers are entering the market.

As far as installers are concerned, their number has reached 384 units, i.e. three times the figure achieved at the end of the GEF project.

These remarkable results have led the Tunisian government to set very ambitious targets. The 11th quinquennial plan has fixed the objective to install 540,000 m² in the period 2007-2011, i.e. over 100,000 m² per year on average. If this target is met, the annual market for solar water heaters in Tunisia would become comparable to current levels of countries like Spain or Italy, whose population is

4-6 times higher. Solar thermal capacity in operation would reach 48 kWth per 1000 inhabitants, which is comparable to current levels of countries like Germany, Denmark or Switzerland (ESTIF, 2006).

Moreover, PROSOL has led to an important policy change. In fact, the

Capacity installed and main economic and environmental benefits over the life cycle of the SWH (15 yrs)	1996-2004	2005-2006	2007-2011
	Around the GEF period	PROSOL-related	New target
Solar thermal capacity installed (kW _{th})	57,000	40,000	378,000
Avoided LPG subsidies (TND)	28,219,000	19,665,000	186,300,000
Primary energy savings (toe)	56,000	39,000	373,000
Cumulative CO ₂ emissions avoided (tonnes)	307,000	214,000	2,025,000

Tunisian government has made solar water heaters eligible for the energy subsidy that previously was provided only on LPG.

In spite of the considerable strengths of the project, there were also some drawbacks. Two issues need to be addressed:

- The level of exposure of solar water heater suppliers, and
- The lack of dedicated tools for maintenance

As far as the former is concerned, in PROSOL solar water heater suppliers were the sole party dealing with banks and were obliged to accept responsibility for the loans they had taken out on behalf of their customers. Ironically, a successful vendor was measured by his level of indebtedness. This limit has been corrected in the new "PROSOL2", which was launched earlier this year. In "PROSOL2", end users are directly granted the loan from the bank, thus eliminating the burden for suppliers. The new mechanism has been entirely developed by local actors, and neither UNEP nor other international institutions are involved. This represents a very positive outcome, since it demonstrates that a self-sustaining market and policy decision making process are being built up.

With respect to the second issue, an audit of half the collective solar thermal surface installed during the GEF project led in early 2007 showed that over one third of the sample was not working anymore because of lack of maintenance. Although within PROSOL specific guarantee requirements are asked to vendors, similar problems might occur if no dedicated measures are adopted.

To avoid malfunctioning in the future, a maintenance cost subsidy has been incorporated in the new Solar Water Heating Loan Facility for the Tourism and Service Sector, in order to ensure long term efficiency of the systems installed, and create expertise in the sector. After the signing of the agreement by the Italian Ministry for the Environment, Land and Sea, the National Agency for Energy Conservation and UNEP the new facility is just being launched.

Accompanying measures

In order to give visibility to the project, inform customers on the advantages of the mechanism and promote the purchase of solar water heaters, a comprehensive communication plan was developed at national level. The following media were used: TV, radio, posters, brochures.

Moreover, a Training Support Facility was established to build capacity amongst financiers and expand their confidence degree in renewable energy technologies, with the ultimate goal to increase the number of sustainable energy loan portfolios.

Finally, carbon finance is another important component of PROSOL. A Project Idea Note (PIN) was prepared by ANME and submitted to the Designated National Authority in April 2006. A Project Design Document (PDD) is currently under development.

Conclusion

The PROSOL project is proving to be a real success story. In only two years, it has helped achieve a series of long-term goals which go far beyond the actual number of solar water heaters installed.

The first important change driven by the project is the setting by law (Law 82/2005 and decree 2234/2005) of a 20% capital cost subsidy on all new solar water heating installations. This provides a further stimulus to the development of the renewable energy technology market.

In order to improve technology level and decrease costs, the decree 4/2006 has exempted solar water heaters from VAT and decreased custom duties.

These measures help create a more level playing field where solar thermal can better compete against conventional energy sources, like natural gas or LPG.

The capacity building and the information exchange have also played an important role in stimulating a dynamic attitude of the Tunisian government, which has set

very ambitious targets for solar thermal and has established a comprehensive strategy made of policy, financial and fiscal incentives, awareness raising campaigns (including the “Solar month” campaign), monitoring measures, etc. Engaging the banks has proven to be a successful strategy, since they leveraged enough financial resources to stimulate the creation of a market for solar thermal. As other UNEP projects, PROSOL was relatively small-scale, but has triggered rapid expansion of the solar water heater market. This proves that considerable results can be achieved even with a limited budget, if money is channelled in the proper direction and synergies are exploited. With this respect, an extensive stakeholder consultation process has been carried out and collaboration with all partners involved has been tied in.



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