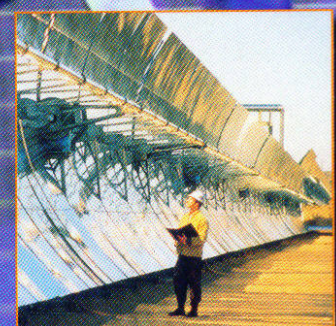
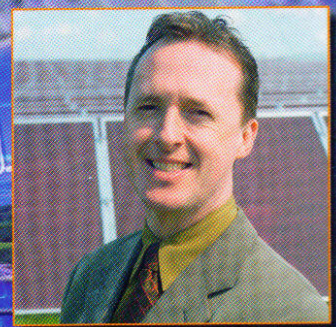
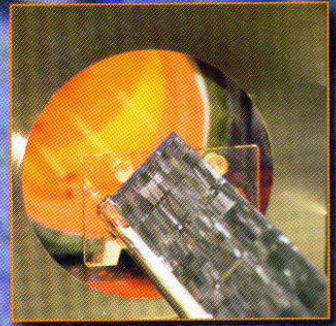


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SUN & WIND ENERGY



**Thermosiphon:
international
bestsellers**

**USA subsidies:
bright future
for solar**

**Cell manufacturing:
automation
and quality**

**Offshore prototypes:
giants for the sea**

**Wood chips:
a powerful resource**

**Solar specialists
in Greece**

Greek solar families

For over 30 years now, the Greek solar thermal market has been dominated by simple thermosiphon systems. But that could well change in the future:

The local solar suppliers have begun to market combi-systems. A few companies have been successful with large-scale installations for hotels. And the first solar-based air-conditioning systems have been manufactured.



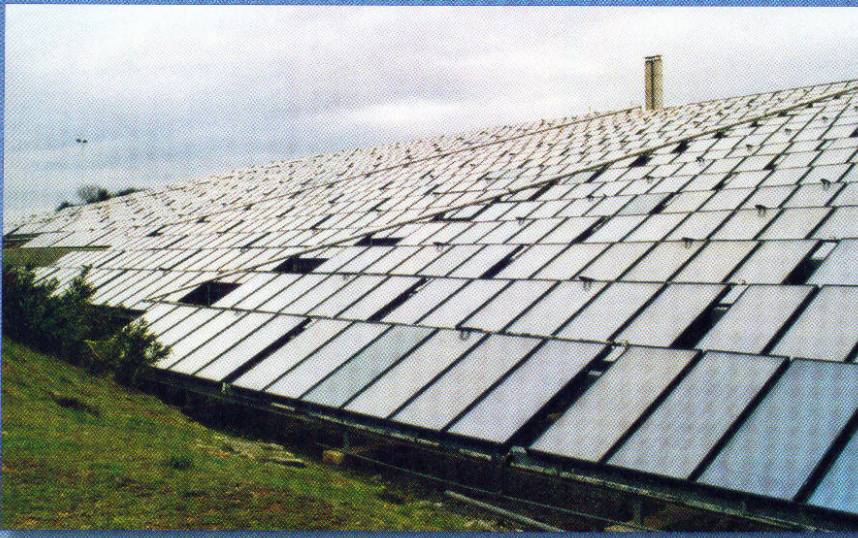
0.25 m² per inhabitant: Greece boasts the highest rate of installation for solar collectors in Europe, after Cyprus and on a level with Austria.



Facing south: A look up at the roofs is an ideal means of orientation in the Greek capital.



The solar installation is certainly impressive. Collectors with a total area of 2,700 m² stand on the oblique supports and supply the necessary heat to drive two adsorption refrigeration machines in a cellar room below. The energy provided by the sun ensures a supply of hot water at a temperature between 70 and 75 °C, and enables the refrigeration systems to deliver its chilled water at 8 to 10 °C. This cold is used for air-conditioning in the production halls and offices of cosmetics manufacturer Sarantis in Oinofyta, an hour's drive north of Athens. At the same time, the solar system covers the company's hot water requirements. It has been in operation for six years.



Solar collectors as far as the eye can see: In Oinofyta, an hour's drive north of Athens, a 2,700 m² solar installation supplies the energy required to cool the production halls of cosmetics manufacturer Sarantis.



Outside Athens: The Centre for Renewable Energy Sources (CRES) is the Greek national entity for the promotion of renewable energy sources, the rational use of energy and energy conservation.

Supplier diversity: The families living in this house in Athens each had their solar system installed by a different manufacturer.



»The system is not new as such. There are already several solar cooling systems in Europe – mainly for demonstration purposes,« explains Vangelis Lamaris, managing director of the Greek solar appliances manufacturer Sole, who planned and erected the installation in Oinofyta. »But because we have chosen to use the adsorption principle, which functions with lower temperatures than an absorption machine, we are able to use our flat-plate collectors as the heat source and can thus manufacture the system for a lower price than would be the case with vacuum tubes. This, in turn, means that we can offer the systems as a commercial product.« Two hotels on the island of Crete have been convinced by the concept.

Combi-systems the key to new markets

The Sole systems are still very much in the minority. The overall solar thermal market in Greece remains dominated by thermosiphon systems, usually closed systems, which account for a 95% share. Typical systems comprise a 150-litre tank and one or two collectors with an effective area of 2.5 to 4 m². These systems cost around 900 € and serve to replace electric water heating systems for domestic use – both in individual homes and multi-tenant buildings. In the latter case, each family possesses its own system.

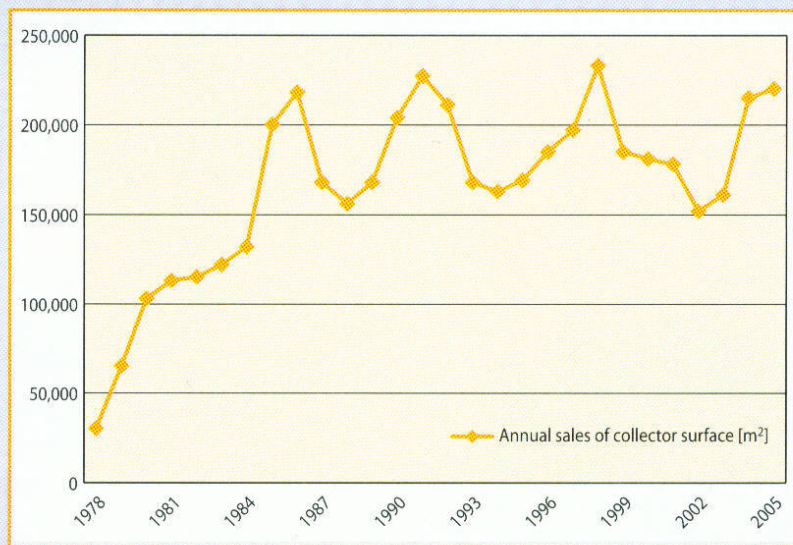
»Without state subsidies, it has only really been feasible to use solar thermal systems for water heating,« is



Information on solar heating: Combi-systems are the topic of the moment in Greece. The company Xilinakis Nobel presented its system during the heating trade fair Climatherm 2006. Photos (18): Joachim Berner

Solar pioneer from the early days: Panos Lamaris founded the company Sole in 1974. In the meantime, his son Vangelis has taken over the reins as managing director.

Collector surface installed per year in Greece. The total installed collector surface in operation is 3,047,000 m² (4.35 GW_{th}). Source: Cres/EBHE



how long he has been working for Sole, his usual answer is: »Since I was born.«

When his father set up his company, most people in Greece were using electric water heaters. In the mid-1980s, the country experienced a solar boom, with an annual installed collector area of more than 200,000 m². Stimulated by a government advertising campaign and rising energy prices, more and more consumers discovered the solar alternative. Almost 300 local suppliers were at that time competing for the new cus-

tomers, most of them small businesses with only a few employees and a small range of hand-made products. In the years which followed, the annual installation figures varied between 150,000 and 200,000 m². Many of the small garage firms disappeared following the introduction of national standards for solar components. The few which remained, however, slowly began to expand their capacities and invested in modern production machinery. The figures from the last two years show that the Greek collector market has almost returned to the level it enjoyed in recent years (see figure). Solar systems are subject to value-added tax at a rate of 18%, electric water heaters, on the other hand, at only 8%. Even so, the exploding energy prices have encouraged many people in Greece to view the sun as an energy source once more. According to the EBHE, one in three Greek households is already benefiting from solar energy. Taking the installation figures, the country stands firmly among the leaders. Only Cyprus and Israel can point to a greater installed collector area per inhabitant than Greece.

the way Iordanis Paradissiadis explains the high proportion of gravity-flow systems. Paradissiadis is the managing director of **Intersolar**, a manufacturer of black-painted and highly selective solar collectors, solar boilers, complete thermosiphon heating systems and bathroom radiators. Until a year ago, he also helped to coordinate activities of the Greek solar thermal manufacturers as president of the industry association EBHE. Today, the member companies find themselves on the threshold to a new solar era: They have begun to offer combi-systems. »We are seeing an increasing interest in such systems, especially since the oil prices have risen so dramatically,« says Vangelis Lamaris. A new brochure on solar heating has already been produced to attract prospective customers.

From garage firm to series production

His company is one of the oldest and most established in the country, having been founded by his father Panos 32 years ago. Panos Lamaris is considered the solar pioneer in Greece. A native Cypriot, he moved to Athens in the early 1970s – and brought the solar technology with him from his home island. He was EBHE president for 13 years, and for six years president of the European Solar Industry Federation ESIF. As so often the case in Greece, his son Vangelis followed him into the business. »I never thought of doing anything else.« When asked

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Greek manufacturers discover foreign markets

Since the early 1990s, the Greek manufacturers have not only been producing for the domestic market, but have also been exporting ever greater numbers of systems to

