
Photo: Wolfgang Kaehler, Corbis


Photo: Nienke Wulp


Photo: Ashley Cooper, Corbis

Photovoltaic frenzy in nascent Greek market

Greece has embarked on an ambitious project of exploring its immense solar-energy potential. Investors have applied en masse to take advantage of the many opportunities provided by a new energy law. However, the state apparatus is unable to keep pace with the private initiatives.

By Ioannis Michaletos

At the energy conference PV Med 2007, held in Athens last year, the former Minister of Development & Commerce, Dimitris Sioufas, set out Greece's huge ambitions in solar energy. The intention is to develop an installed solar-power production of up to 640 MW for mainland Greece, and of 200 MW for the Greek islands by 2020. For the latter that means that most of the small & medium-sized islands in the Aegean and Ionian Sea will have 100% of their needs met by photovoltaic parks. The government plan is called Program for the Development of Photovoltaic Parks. The licensing procedure is planned to end by 2010, and all the units must be connected to the country's electricity network no later than 2014.

Renewable energy production in Greece still lags behind most northern European states. Solar energy in particular. According to figures from the Athens-based Center for Renewable Energy Production, a think tank specialized in this field, the 2006 production by photovoltaic systems accounted for a mere 5.4 MWh out of a total of 877.8 MWh produced by other forms of clean energy, such as wind parks and biofuels.
Compared with Germany for example, which produced 2 GWh in 2006 and accounts for approximately 50% of the

global market, Greece has a long way to go, despite the fact that it is a country blessed with ample sunlight - an average of 3,000 hours a year, especially in the southern regions.

As a driver to speed up the nation's solar energy production, the current government introduced a law (N. 3468/2006) last year that provides a number of incentives for the introduction of photovoltaic technology on a feasible commercial basis. According to Ioannis Agapitidis, Director of the Greek Center for Renewable Energy Production, the law is generous in granting an average of 40% state subsidy for the construction of solar parks in Greece. 'It simplifies the previous bureaucratic licensing process and really accelerates business interest in this new energy sector.'

The initiative of the Greek government should be seen against the background of the rapid increase of CO_2 emissions experienced in Greece. According to the EU Commissioner for the Environment, the Greek Stavros Dimas, 'carbon-dioxide emissions, based on the Kyoto Protocol and Community levels, should increase by just 25% in Greece (relative to levels in 1990). We are at 26% now and if we do not take immediate and strict measures we will reach 40%'.

The ambitious targets set by the government will, however, not be so easy to translate into practice. One barrier is the pervasive bureaucracy in Greece. Giorgios Anemodouras, President of the Greek Confederation of Photovoltaic Corporations, says that 'the state's measures are positive, but the bureaucracy is not. Members of the local communities where some of the projects are due to be developed fear the degradation of their area and do not understand the real benefits of the solar plants. They are led to believe that this will decrease tourism or worsen the image of their local real-estate sector. This is an issue where the companies and the government should do a lot more.'

The subsidy promised by the Greek Ministry of Development & Commerce will be a minimum of 30%, rising to 55% in remote villages, and averaging out at 40%. The energy produced can be sold to the Greek Power Corporation for 10 years (followed by the possibility of an extension period). The sales price that will be paid will be adjusted to the inflation rate and to any increases in rates from the Power Company. At the moment, sales are priced at €0.45-0.50 per kWh (€450-500 per MWh). In comparison, wind energy is sold in Greece at €72/MWh and all other forms at €63/MWh, i.e. at prices that are significantly lower. A review of solar-energy prices in other European countries produces the following comparative figures: Germany (€430), Luxembourg (€550), Spain (€200-400), Cyprus (€260), and Austria (€470-600).

> *Many islands in the Aegean and Ionian Sea will have 100% of their needs met by photovoltaic parks*

The promise of subsidies has resulted in an avalanche of applications for photovoltaic plants: over 3,500 by now with a total capacity of 1884 MW. This is three times as much as the target the government has set for 2020. But Ioannis Soukioroglou, an independent energy consultant and an experienced manager of Greek energy companies, points out that most of these projects will not come

Some solar companies active in Greece

SunTechnics (German, GTT PV modules, Solar-Thermal)
Delta Techniki (Greece, Crystal Si-amorphous Si panels)
Enercom (US, ECO & PVL PANELS)
SunEarth (China, Mono & multi-crystalline cells)
Arntjen Solar GmbH (Germany, Mono-Multi-crystalline cells, Thin Film)
Shangpin Solar (China, Mono-Multi crystalline cells)
Sky Global (Spain, BIPV, Thin Film, CPV panels)
BP Solar (UK, Anti Reflective glass, IntegraBus TM technology, multiple solder joint construction, World class silicon nitride cells)
KLT Energy (Greece, Heckert Solar Panels)
Kaco Geratetechnik GmbH (Germany, Transformerless inverters, Transform inverters, Powador 30000xi, Powador DC-switch)
Erpasa (Spain, Mono & multi-crystalline cells, flat panels)
Global Energy Solutions (Greece, Mono & multi-crystalline cells, Thin Film, Transparent)
Energotech S.A (Greece, Bifacial-Windsol panels, Mono & multi-crystalline cells)
Sunlight (Greece, APS System: Photovoltaic array, a diesel generator, a battery bank and a specially designed control system)
Conergy A.G (Germany, Mono & multi-crystalline cells, Solar-Thermal)

to fruition. 'Even though it appears to be a lucrative business, there are many hidden issues that must be considered by any prospective investor. The existing process is rigid, because each application is considered purely on a first-come, first-serve basis. If a company changes its


Photo: Nienke Wulp

status, i.e. merges, it will have to abort the process and re-apply, thus losing considerable amounts of time and effort. Finally, it should be made clear that the whole procedure takes 1 to 3 years, and during that period each applicant should already have legal company status in accordance with Greek corporate law. The costs of such a status amount to approximately €250,000-350,000 for an average of 2-3 years - a considerable sum for small and medium-sized farmers or landlords who hope for high returns in this industry. It seems inevitable that it is the experienced, established and financially robust companies will be the ones to benefit most.'

Local communities believe that solar parks are bad for tourism

There are some new entrants in the market - mostly from Germany which has become the undisputed global leader of the photovoltaic industry. Mr. Sarris, Country Manager Greece for SunTechnics - an international solar-energy producer with global revenues of €319 million in 2007 - says that there is a potential of €5 billion in investments in solar energy in Greece by 2020, should all plans be realized. SunTechnics estimates the necessary investment in a 100KW system with crystalline panels at around €600.000. The investors only have to put up 25% (€150,000) of the capital, since 40% is provided by the state and 35% on average through bank loans. This of course could be a highly profitable investment option.

Mr. Sarris, however, points out a detail that is often overlooked and that could derail future plans if it is not considered carefully. 'To date, the Ministry of the Environment & Public Works, which is responsible for providing the legal license for the land use, has not yet drafted a law that defines which real estate can have a photovoltaic-production facility and which cannot. In simple terms, no one can be quite sure. Some of the applicants have already invested in land that might be excluded, thus causing them considerable financial losses. Until a law is passed, potential investors should be careful not to acquire land for that purpose only.'

When asked when he believes the new law may be implemented he replied: 'I believe that it should have been voted on already. I think it will be early 2008, if not, the entire process will encounter enormous difficulties that will not be easy to overcome'. For the moment, a preliminary ministerial report is being circulated among potential investors, but it is neither official nor binding and the context is still unclear.

About the possibilities offered by Greek banks to solar entrepreneurs, Soukioroglou says that 'loans for a 10-year period are being granted with the provision of a 25% deposit by the interested investor. This amount is rather high for quite a few of the applicants, who include farmers trying to use their land for an alternative source of income or ailing small businesses hoping to use their business premises for photovoltaic plants. Again it seems that companies with a substantial cash flow and know-how will be better able to exploit the market than the small investors.' It should be noted that solar energy is quite expensive to invest in - an average of €6,000 per kW, whilst wind energy costs €1,500 per kW and natural gas €500-600.

Once you have a solar installation up and running, the problem is how to connect to the grid. According to documents from the Greek Power Corporation, for systems over 100 kW, there is a €30,000 connection fee and for systems less than 100 kW €9,000. In any case, the successful prospective producer should contact the Power Corporation and report on the technical details of his investment. Following this, the Directorate for Technical Works will draft a final report of acceptance. EER tried to get more details from the Power Corporation, but the company declined to comment. Sarris of SunTechnics says that 'it usually takes at least one month, but this will increase by 2010 when the bulk of the applications should be approved and they start selling their energy'.

Despite all the bureaucratic hurdles, some 150 solar-energy companies have been set up now in Greece over the past 12 months. A "market in progress" has been created, which has created many job opportunities, despite the fact that it is still in its early stages. The applications are three times higher than the allocated number of investments. Stelios Psomas, an energy consultant for the Greek Confederation of Photovoltaic Corporations, predicts a difficult procedure for the near future, as 'the land use is not defined, the specific terms for subsidies in relation to the appropriate geographical zone are not defined yet, and the household (less than 20kW) investment has yet to be defined as domestic use only. In short, many basic requirements are yet to be resolved and the future remains uncertain.' ■