Greece's troubles have been well documented, but could renewable energy provide a glimmer of light?

Could solar help avert Greek tragedy?

THINKING ABOUT Greece used to create a picture of a summer holiday spent on the beach in the sun, sailing the steady winds of the Meltemi in the Cyclades. But today the country is intent on becoming the energy hub of Southeast Europe. So should the financial troubles facing it put off potential investors?

With opulent resources of sun and wind, a desperate need for economic stability and growth, and recent changes to investment and energy policy, Greece could be worth taking a closer look at when it comes to renewable energy investment potential. Indeed in recent weeks, the Greeks have courted representatives of the German solar industry - trying to persuade companies that the Greek market is ripe for investment; and spark an employment revival in the process.

On the surface this seems a hard sell, but recent changes to legislation could make the country potentially attractive.

The licensing procedure for projects using renewable energy sources (RES) has been simplified and a broad variety of incentives and compensation schemes introduced. Indeed, *Law No. 3894/2010* was passed by Greek legislature specifically to remove roadblocks in the permitting procedure, and fast-track large-scale strategic investments. This would include renewables.

Invest in Greece, a public agency, now operates as a one-stop-shop for planning procedures; as well as overseeing and coordinating all the necessary legal authorisations for project development. Under the system in place, project developers grant the agency the irrevocable authority to take all necessary steps in licensing procedure, and apply and collect the necessary permits and licenses for projects.

Under the fast-track procedure, all relevant permits and licenses for the investment are issued within a period of two months after submission to the agency of an application. The application needs to include a business plan, an investment impact assessment study and the payment of submission fees. The agency will determine whether or not the envisaged investment is considered strategic, and therefore is eligible for the fast-track procedure – this can be done prior to a developer making a formal application.

To date, several applications for the development of PV schemes have been submitted to the fast-track procedure.

Tax breaks

Meantime, the Investment Incentive *Law No. 3908/2011* has introduced a range of tax benefits, capital grants and leasing subsidies, which will help some projects, although PV parks are not eligible. These may be granted on a singular basis or as a combination.

Tax benefits are granted as tax reliefs on the profits generated by an investment. Capital grants are non-refundable payments by the State of Greece for part of the subsidised expenditure as laid out in the investment plan. The leasing subsidies cover part of the leasing rates for the acquisition of equipment for up to 7 years.

The percentage of aid for each investment, varying from 15% to 50% of the subsidised expenditures, depends on the size of the investor and the region (prefecture) in which the investment is made. Higher subsidies are granted, for example, for investments in Eastern Macedonia, Thrace, Epirus and Western Greece.

Greece sees itself as the emerging energy hub of Southeast Europe. Priority has been given to the promotion of energy generation from renewable sources (RES), in order to reduce emissions and help achieve the national target of 29% of all energy to come from RES sources by 2020. This is up from just 10% in 2010.

Greece sees itself as the emerging energy hub of Southeast Europe

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Production of electrical energy from:	Price of energy (EUR/MWh)		
	Interconnected system		Non interconnected islands
Solar (photovoltaic) stations	**>100 kW**	**≤100 kW**	
2011 August	351,01	394,89	394,89
2012 February	333,81	375,54	375,54
2012 August	314,27	353,55	353,55
2013 February	298,87	336,23	336,23
2013 August	281,38	316,55	316,55
2014 February	268,94	302,56	302,56
2014 August	260,97	293,59	293,59
Solar (photovoltaic) equipment of up to 10 kWp in the domestic sector and in small businesses	550		
Solar energy exploited by solarthermal power stations	264,85		
Solar energy exploited by solarthermal power stations with a system of storage, which secures at least 2 hours of operation at the nominal load	284,85		

Source: Law No. 3851/2010

Production of electrical energy from:	Price of energy (EUR/MWh)	
	Interconnected system	Non interconnected islands
Wind energy exploited through land facilities with capacity greater than 50 kW	87,85	99,45
Wind energy exploited through facilities with capacity smaller than or equal to 50 kW	250	

Source: Law No. 3851/2010

The RES *Law No. 3851/2010* promotes the development and implementation of RES projects and simplifies the existing administrative framework. The new legislation not only contains the feed-in tariffs for all types of RES, but it has also accelerated the licensing procedure.

Permitting procedure

The first necessary permit is the *Electricity Generation License*. The **Greek Regulatory Authority for Energy (RAE)** grants the *Electricity Generation License* after an evaluation process, which assesses the investor's technical and financial capability and the project's viability. A project must also comply with certain planning provisions. For example, the generation plant may not be installed within restricted zones and may not exceed official limitations for installed capacity.

In addition, the *Environmental Terms Approval (ETA)* needs to be obtained. The granting of the ETA depends on the level of the project's environmental impact. The process of scrutiny is carried out either by local or central Government authorities. So, either the **Department of Environment and Physical Planning** for the local region will grant the ETA, or the **Special Unit for Environmental Licensing of the Ministry of the Environment, Energy and**

Production of electrical energy from:	Price of energy (EUR/MWh)
Geothermal energy of low temperature	150
Geothermal energy of high temperature	99,45

Source: Law No. 3851/2010

Production of electrical energy from:	Price of energy (EUR/MWh)
Biomass exploited by stations with installed capacity ≤ 1 MW (excluding the biodisposal part of municipal wastes)	200
Biomass exploited by stations with installed capacity > 1 MW and ≤ 5 MW (excluding the biodisposal part of municipal wastes)	175
Biomass exploited by stations with installed capacity> 5 MW (excluding the biodisposal part of municipal wastes)	150

Source: Law No. 3851/2010

Climate Change (MEECC). Consent by other bodies including local authorities is also necessary.

After having obtained the ETA, an *Installation License* is required. This is issued, depending on the type of project, either by the General Secretary of the Region or by the Minister for the Environment, Energy and Climate Change.

Furthermore, the operator and the **Greek Public Power Corporation S.A. (PPC)** need to agree on the terms and conditions for access to the grid, and enter into a connection agreement. If the project is benefiting from guaranteed feed-in tariffs (*see below*) the operator will have to enter into a Power Purchase Agreement with the **Hellenic Transmission System Operator S.A. (HTSO)**, the grid operator of the mainland's inter connected grid. If the plant is erected on one of Greece's numerous islands - not connected to the mainland's grid (so called non-interconnected islands), then both a Connection Agreement and a Power Purchase Agreement is entered into with PPC as well.

Once project construction is complete and the plant has undergone commissioning tests, an *Operation License* is granted by whichever organisation issued the *Installation License*.

To date, the full authorisation procedure has been lengthy, and exceeded three and a half years on average, even for small solar power plants and wind farms. It has even reached 7 years for larger projects in the past. With today's new streamlined process, the MEECC coordinates everything between the different administrative bodies.

Moreover, the RES *Law No. 3851/2010* has set mandatory deadlines, establishing a firm time frame within which authorisation should be completed: the whole licensing procedure must not exceed much more than a year. Whether this will be achieved is yet to be seen and of course, large-scale RES projects can be considered a strategic investment and may be eligible for the two-month fast track procedure anyway.

Also, smaller scale projects (PV power stations with a capacity up to 1MWp; wind farms up to 100kW; geothermal plants up to 500kW; or biogas, biomass or biofuel plants of no more than 1MW) are exempt from the above licensing procedure to a certain extent. Applicants only need to have an approval for the environmental impact assessment, as well as enter into the grid connection agreement and the power purchase contract. PV power stations within the range 500kW to 2MW are, by ministerial decree, characterised as "zero impact" installations. For solar power stations with a capacity lower than 500kW and rooftop PV installations with capacity of up to 10kW, no approval in relation to their environmental impact is required.

> Under the fast track procedure permits are issued within two months

Tariffs

There are feed-in tariffs (FiT) in place for several forms of RES generation, but the most obvious field for investments in Greece is the solar market. Even if no special investment incentives were granted for PV power plants, Greece's geographic position makes it worth considering developing such plants anyway. Greece has an excellent solar incidence with a high number of sun radiation hours.

Indeed, it is estimated that about one third of Greece's energy demand could be met with solar and, therefore, it is expected the market will grow remarkably. The Greek solar PV FiT, as in many other European countries, varies depending on the size of the project, and the technology used for generating electricity (*see table*). The date for the applicable feed-in scheme for large PV plants is the date the Power Purchase Agreement begins. Furthermore, the tariff structure encourages the production of energy on non interconnected islands. In each case, the FiTs are guaranteed for a period of 20 years.

Meanwhile, with its mountainous regions and nearly 14,000km of coastline, Greece has optimal wind resources, which can be considered to be among the most attractive in Europe. To date, total installed wind capacity is about 1.3GW. By 2020, this is forecast to rise to 7.5GW.

Investment activity in the sector almost exclusively focuses on onshore wind projects for now. But by 2020, about 300MW is expected to be installed offshore. FiTs for wind-generated electricity vary, again, depending on whether the wind farm is on an interconnected or non interconnected island. Tariffs are granted based on a 20-year guaranteed Power Purchase Agreement. In addition, wind power investments may be eligible for additional subsidies under the *Investment Incentive Law* mentioned above.

Greece's geographic position is also favourable to geothermal resources, both high and low temperature. High temperature resources most suitable for power generation are found at depths of 1,000 to 3,000 metres. They can be discovered in some of the Aegean islands and in the basins of Central-Eastern Macedonia and Thrace. The generation of electricity from exploiting geothermal resources is also rewarded with a FiT scheme. Again, the compensation is based on a Power Purchase Agreement. In this case, however, payments do not distinguish between interconnected and non interconnected islands.

Biomass also provides substantial opportunities, with high potential for growth. Greece's agricultural sector might provide sufficient sources of biomass for power generation plants. Regarding biomass to energy, a FiT scheme applies and payment is granted based on the size of the generation plant. Energy generated from the use of biogas (from biomass) as well as gases from rubbish burial dumps and from sewage treatment plants, is also subject to an attractive FiT compensation scheme.

So despite all of the economic turmoil in Greece, the country's climate and natural resources make it optimal for generating energy from renewable sources.

In addition, the revised legal framework, combined with attractive feed-in tariffs, makes Greece worth considering as an attractive place for future foreign investments.

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