

# RES FINANCIAL-SUPPORT MECHANISMS IN GREECE : GUIDELINES FOR INVESTORS

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## Foreword

This guide is addressed at the RES sector and its stakeholders and aims to provide information on the RES financial-support scheme that is currently applied in Greece. The guide will provide a useful introduction for readers who have limited knowledge of this scheme and will provide both details and wider context for those who have more experience.

The guide comprises three sections.

The first section provides detailed information on the price-support component (feed-in tariffs) of the existing RES financial-support scheme.

The second section outlines the basic provisions (terms, conditions, requirements) of the two principal investment-support instruments (capital subsidies for RES projects), namely the so-called National Development Law and the Operational Programme for Competitiveness of the Third Community Support Framework (CSF III).

Finally, the third section summarises the major points (conclusions and recommendations) regarding the present and future RES-financial support framework in Greece.

## Instruments for supporting renewable energies in Greece

Two are the basic components of the RES-support scheme currently in effect in Greece : a) a price-support component, comprising a feed-in tariff for RES-produced electricity, which is based on electricity consumer prices, and b) an investment-support component, providing capital subsidies to RES investment projects.

These two RES-support components, which are applied synergistically to eligible renewable energy projects, are detailed below.

### 1. Price support

The basic law governing RES electricity is Law 2773 of 1999, on the liberalisation of the domestic electricity market, and, specifically, its Chapter 10, Articles 35-41. This law has incorporated the majority of provisions of the earlier Law 2244 of 1994, which, unlike Law 2773, was devoted entirely to RES electricity matters. At present, there is no Greek law dealing specifically with heat production from RES.

The key provisions of Law 2773/99 concerning renewables are as follows :

- i) The Transmission System Operator (TSO) is obligated to grant priority access (priority in load dispatching) to RES electricity-producing installations up to 50 MW<sub>e</sub> in power capacity (up to 10 MW<sub>e</sub> in the case of small hydroelectric units).
- ii) The TSO is obligated to enter into a 10-year contract (PPA) with the RES-electricity producer, for the purchase of his electricity. The contract always includes a renewal option.
- iii) The RES-electricity production of an independent power producer, or the surplus electricity production of a RES autoproducer, is sold to the TSO at a predetermined buy-back rate, which is fixed percentage of the corresponding consumer electricity rate.
- iv) The electricity tariffication system, applicable to the sales of RES-produced electricity to the grid, is as follows :

#### *a. Autonomous (non-interconnected) islands*

The applicable rates (below) are all independent of the actual voltage level of the grid, to which the RES power station is connected.

a.1 Autoproducer

- Energy (all kWh) : 70% of the kWh selling price of the Γ22 consumer tariff of the Public Power Corporation (this is a low-voltage, general-use tariff, billed monthly)
- Capacity credit : None

a.2 Independent power producer

- Energy (all kWh) : 90% of the kWh selling price of the Γ22 consumer tariff
- Capacity credit : None

**b. Interconnected system (mainland)**

b.1 Autoproducer

- Energy (all kWh) : 70% of the kWh selling price of the Γ22 low-voltage consumer tariff (for connection of the RES producer at low voltage), or the B2 mid-voltage consumer tariff (for connection at mid voltage), or the A high-voltage consumer tariff (for connection at high voltage). The 70% rate is applicable to all three (3) time zones of the A high-voltage tariff (peak-load hours, mid-load hours, low-load hours)
- Capacity credit : None

b.2 Independent power producer

- Energy (all kWh) : 90% of the kWh selling price of the B2 mid-voltage consumer tariff (for connection at mid or high voltage).
- Capacity credit : 50% of the capacity charge (Euro/kWp/month) of the B2 mid-voltage consumer tariff (for connection at mid or high voltage).

The capacity credit is calculated on the basis of the peak measured output of the RES station,  $P_m$  (kW), between two successive measurements, as follows :

RES power capacity used as basis for capacity-credit calculation (kW) =  $\sigma \times P_m$  (kW)

where :  $\sigma =$  0.50 for wind and solar stations

0.70 for small hydroelectric stations

0.90 for geothermal and biomass stations

At today's (December 2004) electricity consumer prices in Greece, an independent RES producer is paid as follows :

- Interconnected system : Energy – 0.0661 Euro / kWh  
Capacity – 0.85 Euro/kWp/month (*for wind and solar*)  
– 1.19 Euro/kWp/month (*for small hydro*)  
– 1.53 Euro/kWp/month (*for bio-mass and geothermal*)
  - Non-interconnected islands : Energy – 0.0817 Euro / kWh
- v) Every RES-electricity producer is subject to a special reciprocity charge (annual fee), specified by a joint decision of the Ministers of Finance and Development, and equal to two-percent (2%) of the producer's electricity sales to the grid. This charge is collected by the TSO and is given to the Local Authority, within the area of which the RES generation unit operate, for the purpose of realising local development projects.
- vi) Law 2773/99 instituted a new license, the so-called electricity generation license, which is now the first license required to be obtained by any electricity-producing station, conventional or RES-based, in a long planning / licensing procedure that also includes presiting permit, land-use permit, approval of environmental terms and conditions, installation license and operation license.

## 2. Investment support

There are two main investment-support instruments that provide substantial public subsidies to RES investment projects (among others) : a) The so-called "National Development Law" (Law ...../04, issued in December 2004), and b) the Greek

Operational Programme for Competitiveness, one of the eleven (11) National and the thirteen (13) Regional Operational Programmes, in which the Third Community Support Framework (CSF III ; 2000-2006) for Greece is divided.

These two instruments are detailed below.

## 2.1 National Development Law (Law .../04)

This is a financial instrument-umbrella, covering all private investments in Greece, in all sectors of economic activity. It has a strong regional character, in that the level of public support depends strongly on the particular geographic region, in which the given private investment is planned to materialise. Regions with high unemployment rates and low incomes per capita receive the highest investment subsidies from the State.

Investments in RES installations (both electricity- and heat - producing ones) have a favoured status under Law ...../04, similar to the one bestowed to other selected categories of investments, such as investments in high technology, environmental protection, tourism, etc. More specifically, the main provisions of Law ...../04, concerning public support of RES investments are as follows :

- 35% public subsidy is granted on the total eligible RES investment cost (including grid connection cost). The level of subsidy is 40% in Thrace and in the border zone (20 km) of East Macedonia and Epirus, while it is 30% in the prefectures of Attica and Thessaloniki
- Alternatively, 100% tax deduction of the total eligible RES investment cost is granted for a 10-year period
- The level (%) of public subsidy is increased by 5 to 15 (bonus) percentage points in the following cases :
  - i) New enterprises (< 1 year) : 5% bonus
  - ii) Small & medium-sized enterprises : 5-15% bonus (SMEs in border regions of low GDP receive the maximum bonus)

In all case above, the overall level of public subsidy cannot exceed 55%

- The level of subsidy or tax deduction is independent of the RES technology (wind, biomass, small hydro, etc.)
- Required own capital : 25% (min) of the total investment cost

- Minimum investment cost required : 100,000-500,000 Euro (depending on size of enterprise)
- Maximum subsidy granted : 20 million Euro (cumulative over 5 years)
- Installation license is required for project application (grant proposal)

Proposals for private investments can be submitted to the National Development Law at any time and they are evaluated on their own merit, i.e. independently of other submitted proposals. Law ...../04 does not have any total budget cap, thus there is (theoretically) no limit in the number and budget of proposals that can be funded.

The payment of the public subsidy granted to an investment project is made in two instalments. The first 50% is paid upon completion of the 50% of the project, while the remaining 50% is paid upon official certification of full project completion and beginning of its commercial operation. Up to thirty per cent (30%) of the total subsidy can be paid to the investor as down payment, provided that he furnishes an equivalent (+ 10%) letter of guarantee. A revised project budget of up to 115% can be approved (and covered by public subsidy), in the course of realisation of the investment.

## 2.2 National Operational Programme for Competitiveness / CSF III (2000-2006) (Measures 2.1, 6.3 & 6.5)

The Measure 2.1 of Subprogramme 2 of the National Operational Programme for Competitiveness (NOPC) / CSF III (2000-2006) is devoted entirely to providing State support (grants) to private investments in: a) renewables, b) rational use of energy and c) small-scale (<50 MW<sub>e</sub>) cogeneration. The total budget of Measure 2.1, for the 2000-2006 period of CSF III, is 1.07 billion Euro, of which 35.6% or 382 million Euro is the public subsidy available to RES/RUE/CHP investments. About two-thirds of the total available subsidy (~ 260 million Euro) are foreseen to be awarded specifically to RES investment projects (mainly wind parks).

The main provisions of Measure 2.1 of NOPC, concerning public support of RES investments, are as follows :

- Public subsidy (grant) on the total eligible RES investment cost :
  - Wind parks, conventional solar thermal units : 30%
  - Small hydro, biomass, geothermal, high-tech solar thermal units, passive solar : 40%

- Photovoltaics : 40-50%

- Level of subsidy (%) is independent of the geographical region of the country (except for photovoltaics)
- Required own capital : 30% (min) of the total investment cost
- Minimum investment cost required : 44,000 Euro
- Maximum investment cost subsidised: 44 million Euro
- Installation license is required for project application (grant proposal)

Grants are awarded to RES projects by Measure 2.1 of NOPC (Action 2.1.3) following rounds of public calls for RES / RUE / CHP investment proposals and subsequent competitive evaluation of the submitted proposals (per round). Up to 80% of the public subsidy granted to an investment project can be paid by gradual instalments (against invoices) during the realisation of the project. The remaining 20% is paid upon official certification of full project completion and beginning of its commercial operation.

By the end of March 2004, 650 investment proposals had been submitted, overall, to the past calls and rounds of Action 2.1.3, having a total budget of about 2.3 billion Euro. Three hundred and twenty seven (327) of these proposals had been approved for public subsidy, having a total budget of about 1.2 billion Euro. One hundred and twenty six (126) investment projects had signed the relevant public support / materialisation contract. These projects had a total budget of 373 million Euro. In December 2004, the results of the latest round of calls for proposals were announced : 44 RES projects were approved for public grant (capital subsidy), having a total budget of about 107 million Euro.

In order to increase the effectiveness of Measure 2.1/Action 2.1.3, a new NOPC/CSF III Measure was created in 2004, Measure 6.5. This Measure, which has a total budget of 50 million Euro (2000-2006), provides 50% public financing (subsidy) to the cost of grid connection of a RES installation (mid- or high-voltage line + transformer). It should be noted that coverage of this cost by public subsidy (50%), although foreseen in the long existing Measure 6.3/Action 6.3.4, had not been activated in the past, due to certain legal issues (conformity with EU regulations) plaguing Measure 6.3.

It should be mentioned that a RES investment-subsidy programme, very similar to that of Measures 2.1 & 6.5 of NOPC/CSF III, existed also in the Second Community



Support Framework (CSF II ; 1994-1999) for Greece. This CSF II programme granted cumulatively about 92 million Euro of public subsidies to 77 RES investment projects, having a total budget of about 213 million Euro (i.e. mean subsidy rate  $\sim 43\%$ ) and a total installed capacity of  $160 \text{ MW}_e + 94 \text{ MW}_{th}$ . This programme was very instrumental in stirring up substantial RES activity and in materialising a large number of commercial-scale RES projects in Greece, particularly in the period 1997-2000.

### 3. Conclusions and recommendations

The following major points, regarding the present and future RES financial-support framework in Greece, can be summarised from the discussion in the preceding chapters :

1. The RES financial support scheme, currently in effect in Greece, is based on a mix of : a) feed-in tariffs for RES electricity and b) capital subsidies or equivalent tax incentives (deductions) on RES investments. This mix (support scheme) has been in place since 1994 (Law 2244/94), but it was practically activated in 1998, when the National Development Law 2601/98 was passed and the CSF II public funds for RES/RUE/CHP investments were made available for the first time. Macroscopically, the Greek RES support scheme appears to have produced, in its 6-year course, substantial positive and measurable results, as far as development, construction and operation of commercial-scale RES power capacity in Greece is concerned : from only  $71 \text{ MW}_e$  in 1997 (the same as in 1994), the RES installed capacity in the country reached  $500 \text{ MW}_e$  in 2004. The largest part of this RES capacity, in excess of  $400 \text{ MW}_e$  (or,  $83\%$  of the total), concerns wind parks. About  $4200 \text{ MW}_e$  of RES power capacity have already been granted electricity generation licenses by the National Regulatory Authority for Energy (RAE) and there are, currently, at various stages of their environmental licensing process.
2. Two major points of concern regarding the future evolution of the RES sector in Greece can be identified :
  - i) The materialisation rate of RES projects already licensed by RAE is still low: only  $12\%$  of the RES projects that have been granted an electricity generation license, have materialised so far, with a further  $5\%$  at various stages of construction (installation license granted). The slow materialisation rate of RES projects is almost entirely due to the

administrative and technical problems and barriers still plaguing RES development today, namely complex RES licensing procedures, grid saturation in areas of high RES potential and negative public attitudes (reactions) / legal issues. These problems should be firmly addressed and promptly resolved, in order for the current favourable RES support framework to take full effect and produce even more positive results.

- ii) Most of the RES development so far concerns wind parks, with minimal development of other RES power technologies (mainly some small hydro and biogas projects), while almost complete is the absence of commercial-scale solar, geothermal and biomass-electricity applications. This is largely due to the uniform, relatively low (6.6 Eurocents/KWh), buy-back tariff for RES electricity, currently in effect. This tariff does not differentiate between RES technologies, thus favours (in relative terms) the more mature, technically and economically, wind energy.
3. Two important factors should be taken into account when proposing potential improvements and/or modifications to the RES support framework, currently in effect in Greece : a) the crucial need for graduality in any change and b) the technical / economic constraints arising from the specific patterns of further RES development in the country, which are expected to prevail, at least until 2010.
- i) The currently intensifying efforts of the Greek State to resolve the RES-related administrative and technical problems (e.g. by the issuing of JMD 1726/03), in order to push RES development forward, coupled with the large number (~ 200 MW<sub>e</sub>) of new RES projects (mostly wind parks), which are already in the licensing pipeline, and which have based their business / materialisation plans on the existing RES support framework (National Development Law– EPAN/CSF III funds), effectively precludes any serious thought of drastically altering this framework, at least in the immediate future (until 2010). Drastic changes (e.g. the introduction of a quota / green certificate scheme) will only create new uncertainties, in an already burdened by problems and still immature (high risk) domestic RES market, and will lead to the shelving / abandonment of many ongoing RES projects and to diminishing domestic RES investment, before the current support system has a fair chance to prove its long-term potential and effectiveness (assisted by the State's corrective actions, presently under way).

- ii) Until the time-consuming grid extension / upgrading works in windy areas are completed, wind park investments will, by necessity, focus on geographical regions of Greece with moderate wind potential, in mountainous, difficult-to-access sites, such as in Continental Greece (Sterea Ellada), Peloponnese (except Lakonia), Eastern Macedonia, etc. It is exactly those regions and sites that comprise the large majority of electricity generation licenses already granted for wind parks by the Ministry of Development and RAE, but which have not been realised yet. The said sites are marginally viable, economically, even under the current favourable RES support framework, let alone under a substantially altered, more market-oriented (i.e. higher-risk) support scheme.
4. Efforts to improve the current RES support system in Greece should concentrate, at least in the immediate future (2004 – 2010), on :
- Maintaining its basic structure and provisions (feed-in tariffs, capital subsidies)
  - Resolving urgent administrative and technical problems and barriers, seriously delaying further RES development ( licensing procedures, grid saturation, public information campaigns, etc.)
  - Improving certain aspects / provisions / incentives of the current RES support framework

Such improvements may include :

- i) Differentiation of the buy-back (by the TSO) price of RES electricity, according to RES technology / type. Given the current modest level of this KWh price, i.e. 6.6 Eurocents/KWh (uniform for all RES), it is recommended that this level is retained for the commercially mature wind energy and small hydro technologies, and that it is substantially increased for solar, geothermal and (to a lesser extent) biomass-produced electricity.
- ii) As far as the EPAN/CSF III Programme is concerned, it is recommended that the separate EPAN instrument (Measure 6.5), which has been created to provide, among others, 50% financing (subsidy) to the cost of grid connection of a RES installation (mid- or high-voltage line + transformer), but which has been totally inactive - financially - so far, should be promptly activated, to provide important financial support to many RES projects,

currently under realisation with CSF III or National Development Law support.

- iii) Establishment and prompt activation of the long overdue TPF (Third Party Financing) mechanism for RES investments, through the passing of a relevant law.
5. Both State financial - support instruments for RES investments, namely EPAN/CSF III and National Development Law, are based on significant capital subsidies (30-50% of capital cost, depending on RES type), rather than on KWh price subsidies. This has been a successful choice in practice, because it has encouraged the realisation of many RES projects by small - and medium - size investors (SMEs), whose cash flows are strengthened considerably by the upfront infusion of cash subsidy, while the financiability (by banks) of their RES projects is also improved. This is important, and it will continue to be so in the next few years, given the substantial uncertainties and risks still plaguing RES investment efforts in Greece: complex, time- and cash-consuming licensing procedures, negative public attitudes, legal battles, a forced shift (due to grid saturation) towards development of areas and sites with moderate or low RES potential, etc.
  6. Beyond 2010, and assuming that State (public) capital subsidies for RES investments will be decreasing, a stronger RES electricity - price support may be necessary. Such a KWh price support may be combined with a more market-oriented RES support scheme, similar to the current Spanish system, where the buy-back price of RES electricity is comprised of a market (pool) electricity price component (fluctuating) plus a fixed environmental bonus (Eurocents / KWh). Such a system incorporates, in a satisfactory manner, the market price signals, while, at the same time, providing sufficient stability and reliability in business plan and cash flow predictions, that are necessary to ensure viability and financiability of commercial RES projects.