

**GREEK ASSOCIATION OF RENEWABLE  
ELECTRICITY PRODUCERS**

**TASK 3 : A SUMMARY OF PRIORITY  
CONSIDERATION FOR THE INTEGRATION OF  
THE MOST SUITABLE RE SUPPORT  
MECHANISMS IN THE GREEK ELECTRICITY  
SECTOR**

**PROJECT ETRES (LIFE 03 ENV/GR/000219)**

**ATHENS 2004**

## 1. National targets and international obligations

EU Directive 2001/77/EC on electricity from renewable energy sources (RES) sets an indicative target for Greece, to cover 20.1% of its total electricity demand from renewables (including large hydro), by the year 2010. This target corresponds to about 2800-3000 MW of RES installations (over and above those of large hydro plants), that should be constructed and operated by 2010, i.e. a 6-fold increase over the country's currently installed RES capacity of about 500 MW (April 2004).

The above national target of 3000 MW of RES installations operating by 2010 is certainly ambitious but based on a realistic platform, taking into account the high RES potential of the country, especially its wind energy potential, and the high level of already expressed interest of Greek and international companies, to invest in renewables in Greece. Characteristic of this interest is the fact that in the last 3 years alone, a total of 13.000 MW of applications for RES projects have been made to the Greek Regulatory Authority for Energy, to obtain the required electricity generation license. After exhaustive technical / economic evaluation of these applications, the Regulatory Authority has already awarded electricity generation licenses to RES projects totaling about 4200 MW, 3700 MW (i.e. 87%) of which are wind parks. It is obvious from these last figures, that further RES development in Greece will be based chiefly on wind energy, which is by far the richest electricity – generating RES resource of the country.

Rapid RES development will also be the country's primary means of meeting its obligations under the Kyoto Protocol, on greenhouse gas emissions. Greece is obligated to curb the increase of its total greenhouse-gas emission levels to +25%, by 2008-2012, compared to the corresponding levels of 1990. According to Greece's National Plan to Limit Greenhouse Gas Emissions, which was approved by the Council of Ministers in February 2002 (Act of the Council of Ministers 5/27.02.2003), RES development (mostly wind) will contribute 32% of the total national effort required to meet the Kyoto Protocol's obligation. This 32% contribution of RES amounts to a decrease of approximately 4.4 million tonnes of CO<sub>2</sub> equivalent per year, in the national greenhouse gas emissions, and requires the installation of about 2500 MW of RES, i.e. a figure very close to Greece's RES electricity target for 2010, under Directive 2001/77/EC.

## 2. Current level of RES development in Greece & prospects for 2010

Against the ambitious RES-related national targets and obligations discussed above, Greece is failing at present to achieve any kind of sustained drive in RES development. The currently installed total RES electrical capacity in the country is about 500MW, 400MW of which are wind parks. After a modest rise in the three-year period 1999-2001, the rate of installation of new RES projects has fallen sharply in 2002: while 46MW of RES plants were installed in the country in 1999, 85 MW in 2000 and 103 MW in 2001, only 18MW were installed, in total, in 2002. At present, after completion (in the first semester of 2003), of a few remaining wind parks, licensed back in 2000-2001, very few new RES installations are planned for construction in the near future and, in particular, the construction of new wind parks has come to an almost complete stop. This investment "drought" in the Greek renewables sector has already produced serious side effects in the country's economy:

- a) Large public funds of the CSFIII (2000-2006), earmarked for the financial support (subsidies) of commercial RES investments under the Operational Programme for Competitiveness (Action 2.1.3), cannot be absorbed by new RES projects and are, thus, in immediate danger of being lost. These funds, amounting to approximately 350 million Euro, were planned to be the primary force that would "fuel" RES development in Greece, towards its 2010 targets.
- b) Large international energy companies, that have been trying for the last few years to invest in RES projects in Greece, especially in wind parks, have recently decided to discontinue their RES activities in the country, due to the big administrative (and other) obstacles they have been facing (see next section). This alarming exodus is more pronounced with German companies specialising in wind energy investments.

Against this background of failing RES development efforts, and mostly because of this, Greece is also failing seriously in meeting its Kyoto commitments. Instead of achieving the +25% increase in greenhouse gas emissions by 2008-2012, Greece has already reached this ceiling in 2001 (!) and is currently running at an estimated

rate of +45-48% increase in its national emissions by 2008-2012. Even with conservative estimates, this failure to meet its Kyoto obligations, will cost Greece about 70 million Euro per year, from 2008-2012 onwards, in penalties or in funds to buy emission permits from the international market.

To make matters worse, Greece has not yet incorporated into national law the EU Directive 2001/77/EC on RES electricity (deadline to do so: 27.10.2003), nor has it even started to develop a National Allocation Plan for emission permits, as required by the upcoming Emissions Trading Directive (deadline to do so: 31.03.2004).

This, rather bleak, situation for renewables in Greece is fully reflected in the latest report on RES development prospects in the EU, published by the European Renewable Energies Federation (EREF) in March 2004.

### **3. Key non-financial barriers to RES development in Greece**

The four (4) most important obstacles, still persisting today in the RES sector in Greece and delaying further RES investment, are:

- licensing procedures
- grid connection issues
- public attitudes (reactions)
- legal issues

These obstacles are outlined below.

#### **RES licensing procedures**

The complex licensing procedures for RES-to-power projects, set in the past by various Ministerial Decrees (MD), have constituted the single, most difficult obstacle in the effective materialisation of commercial-scale RES investments in Greece. These procedures involve a multitude of central, regional, prefectural and local authorities (departments, committees, councils, agencies, etc.), interwoven in a lengthy, bureaucratic and, at times, confusing licensing process, that invariably take 2-3 years to complete. Any single RES installation license requires the official expression of (positive) opinion of more than 25 public-sector entities, at the central, regional,

prefectural and local level, and needs to be checked, in terms of conformity, with 4 National Laws and 7 Ministerial Decrees.

The transfer, in late 1998 (Law 2647/1998), of most RES licensing jurisdictions and competences, from the central to the regional and prefectural authorities, had compounded the already difficult situation, creating more problems than those it was supposed to solve. This was due to the structural and organisational weaknesses that plagued, and still plague, regional and local administrations in Greece, such as severe budgetary constraints, lack of specialised knowledge, RES-related experience and trained personnel, parochial ideas and conflicts, etc.

The Joint Ministerial Decree (JMD) 1726/2003 (issued in May 2003) took significant steps, towards correcting the difficult situation and towards improving and speeding up the licensing procedures, specifically for wind parks, by: a) defining, clearly and unambiguously, the specific public authorities, agencies and directorates that are required to give an opinion (or to make a decision) regarding the licensing of a wind park project (see Diagramme 1), b) describing in detail the contents of the opinion, to be given by each one of the above authorities or agencies, and c) setting strict deadlines, of an irrevocable character, for the licensing authorities or agencies, within which they are required to give their opinions about the wind park project under consideration. The total licensing time for wind projects (excluding the electricity generation licensing step) has been set at 90 working days (maximum).

Unfortunately, in the one year that has elapsed since its passing, JMD 1726 has not been fully activated and enforced yet, due to minor legalities, which the Ministries involved (Ministry of Development / Energy, Ministry of Environment, Ministry of Agriculture) appear reluctant, so far, to iron out.

### **Limited capacity of the power transmission grid**

As of 2003, new RES capacity can no longer be connected to the existing grid (due to its capacity saturation), in the Greek regions of high wind potential, namely Thrace, Euboea / Cyclades Islands and southeastern Peloponnese (Lakonia). According to modest estimates, these regions can yield at least 1000-1500 MW of commercial wind power, with very attractive aeolic / economic characteristics.

Plans for upgrading the transmission grid in those regions (by re-enforcing and extending the existing power lines), so that they can uptake the above wind power capacity, have been drawn up by the PPC (Public Power Corporation) in the last 2-3 years, but have been mostly shelved. A crucial problem with these plans, even if-at some distant point-they are given the green light to go ahead, is their long period of materialisation, which exceeds 5-6 years, due to difficulties (public reactions, etc.) in land expropriation and construction of high-voltage power lines through environmentally sensitive areas. Such long time delays in upgrading the transmission grid in the above windy regions of Greece will result in the loss of about 180 million Euro of public subsidies from the CSF III (2000-2006), earmarked for wind park development in those regions.

### **Public attitudes (reactions)**

Although opinion polls in Greece invariably show a positive attitude and support of the general public towards renewables, this attitude seems to have a strong NIMBY ("Not In My Back Yard") component. This has been evident in the commercial development of wind energy in Euboea, which has taken place between 1998 and 2001, and has resulted in the installation of about 200MW of wind parks. This important RES development, the first of its kind in Greece, in terms of scale, has been met with increasing local opposition (from environmentalists, cultural clubs, some municipal authorities, part of the local population, etc.), which led in 2001 to a virtual stop of any further wind-park development, in many areas of southern Euboea. A similar situation has, more recently, unfolded in the prefecture of Lakonia, in southeastern Pelloponese, another Greek region with high wind potential, but with very few wind parks installed so far.

Reasons offered by local entities resisting wind park development in their areas include visual intrusion, noise, land devaluation, etc., but also perceived health problems to people and animals (due to radiation presumably emitted from the wind turbines!), negative impact on local tourism, deforestation, little or no benefit to the local economy (employment / added value), etc. Similar, more or less, arguments are employed also by local entities opposing the development of small hydro in other regions of Greece, such as Epirus, central Pelloponese, etc.

Unfortunately, the Greek State and its relevant public bodies (Ministry of Development, Centre for Renewable Energy Sources – CREC, Public Power Corporation – PPC, Universities, etc.) have been practically absent from any effort undertaken so far, to counteract this negative tendency and to inform, in a responsible and integrated manner, the general public (through country-wide publicity and information campaigns, etc.). Significant CSF III funds, earmarked specifically for this kind of RES information / dissemination actions, have not been activated so far, and are at danger to be lost.

### **Legal issues (Council of State)**

Starting in 2000-2001, local opposition to the installation of wind parks, mostly by individuals (farmers, hotel owners, etc.) and members of local cultural clubs (who, nevertheless, have been very vocal in their reactions), led to a barrage of legal appeals to the Supreme Council of State (SCS), against wind parks that had already obtained, through the complex and time-consuming procedures outlined before, their installation licenses.

This barrage of SCS appeals has intensified in the last two years and has now become the single, most serious threat, that can halt completely any further wind energy development in Greece. This is so, primarily for the following two reasons:

- i) Appealing to the SCS is a simple and relatively inexpensive procedure (required initial fee: 1500 Euro) and can immediately halt the materialisation of a fully (and legally) licensed wind park. In most of the wind park cases that have been brought so far to the SCS, the Council immediately ordered stoppage of the construction works until reaching its final decision, which, in the case of wind parks, has taken, on the average, three (3) years. Such a long time in reaching the Council's decision, usually leads to the abandonment of the wind park project and to the loss of millions of Euros in (already secured) public subsidies for the project.
- ii) All the decisions issued so far by the Supreme Court of State in wind park cases reflect the strong negative attitude of its majority towards wind energy development in Greece. The Court's arguments are based mostly on environmental /aesthetic concerns (perceived visual intrusion of wind turbines

into the mountainous, forest-rich and ecologically sensitive Greek landscape), but, recently, they tend to focus more on the lack of official land planning in Greece (definition, country-wide, of land uses, activity zones, etc.).

Although both issues above (i.e. environmental concerns and land planning) are certainly valid and important, and need to be carefully addressed by the State, one cannot help but notice that the SCS has, so far, selectively applied them to environment-friendly wind parks and not to pollution-ridden activities in the very same areas of (planned) installation of wind parks, e.g. to fossil fuel – based power plants (oil, lignite, natural gas), illegal landfills, quarries, poultry farms, etc. A very characteristic example of this selective application and interpretation of existing laws and regulations by the Supreme Court of State is the case of wind parks in Southern Euboea (see, also, section 2.3 below).

#### **4. Priority considerations (steps) to overcome the above barriers**

Based on the detailed discussion, presented in Chapter 2.2, of the major problems and barriers impeding further RES development in Greece, we outline below some priority considerations and basic steps that can be taken to overcome the said barriers and to accommodate commercial RES investment in the country.

##### a) RES licensing procedures

The following corrective actions may be undertaken to further improve and speed up the current RES licensing process :

- i) Strict adherence to the deadlines set for the various RES application – reviewing steps by the Ministerial Decrees 1726/03, 11014/03 and 2000/02. These deadlines are, still, rarely respected by the public electricity company, by the relevant departments of the Ministry of Development and the Ministry of Environment, Civil Planning and Public Works, by the regional and prefectural authorities, etc. For this reason, the irrevocable character of the above license-related deadlines, set by JMD 1726/03, must be strictly enforced in practice, i.e. beyond these deadlines, the respective departments, committees, etc. that have



not yet responded, must be counted as having positive opinions (answers) towards the RES-to-power project under examination.

- ii) Further reduction in the number of public-sector entities (departments, committees, agencies, etc.) that are required to give their opinion in the process of environmental licensing of RES installations. Given the inherent environment-friendly nature of renewables, it is fully justified to define simplified and time-condensed procedures, terms and conditions for granting environmental authorisation, specifically to RES projects.
- iii) Detailed examination of the possibility to incorporate all RES-licensing procedures into a "one-stop shop" mechanism, under the supervision of the Ministry of Development. Despite the obvious difficulties that such an undertaking, of an inter-ministerial character, poses, it may constitute the only viable -in the long run- solution, for the rationalisation and speeding up of the complex and inefficient RES-licensing procedures, currently in effect.

#### b) Limited capacity of the power transmission grid

It is imperative that the Transmission System Operator (TSO) promptly re-evaluates the existing technical plans for upgrading the power grid in Greece's windy regions and that he opts for technical solutions, that may not be the most economic, in terms of cost per km of power line, but allow the grid-upgrading project to be completed with the minimum of environmental/social problems and, thus, with minimum time delays. Such technical solutions do exist, and will allow rapid wind-park development in the said regions, utilising, in the process, the available CSF III public funds (2000-2006).

Once the above technical solutions are finalised by the TSO, the corresponding topographical and detailed engineering studies must be promptly carried out, while, in parallel, the required licensing and other legal procedures (e.g. expropriations) must proceed at a rapid pace, so that grid construction can actually commence in the first semester of 2005. A crucial prerequisite is to define the specific terms, conditions and procedures for the RES investors that will co-finance (50%) the grid extension / upgrading, in order for them to provide the TSO with the necessary financial guarantees (letters of credit, etc.), as well as for the TSO to commit itself (with relevant binding clauses) on the timetable for the construction / operation of

the grid extension in the country's windy areas (Thrace, Southern Euboea / Cyclades Islands, Lakonia).

The key goal, timewise, is to begin gradually connecting new RES installations (mostly wind parks) to the new grid in the first semester of 2006, i.e. at a time that will allow a number of these RES installations to apply to Action 2.1.3/EPAN/CSF III (2000-2006) and receive much-needed public support (capital investment subsidies).

c) Public attitudes (reactions) / legal issues

To counteract the growing negative tendency, both social and legal, towards local installation of wind parks and other RES projects, as well as to inform, in a responsible and integrated manner, the general public, a full-scale RES publicity and information campaign should be launched nationwide, similar to the one that the Greek Association of RES Electricity Producers (GAREP) carried out in 2001-2002, in Southern Euboea, specifically for wind energy. That particular multimedia campaign led to a significant shift in local public opinion (as shown in subsequent polls), towards a more positive attitude for commercial-scale wind park development.

The 2001-2002 GAREP initiative needs to be widened in scope, to include all renewables and to cover all geographical areas of Greece, and, also, to involve the active participation of all relevant public bodies (Centre for Renewable Energy Sources, Public Power Corporation, Universities, etc.), under the auspices and co-ordination of the Ministry of Development. Regional and local authorities, as well as professional associations, environmental societies, etc. need to be well integrated into this country-wide RES information campaign. The campaign should draw considerable experience, know-how and direction from the excellent example of Crete Island, where in the last few years there has been a rapid growth in RES development, wind energy in particular, with the full support and involvement of local authorities, local organisations and the local people.

## 5. Potential improvements to current RE support framework

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. Therefore, the current RES support framework has, in essence, a 6-year history (mid 1998-mid 2004), and it is within this limited period of time that its effectiveness and success should be judged.

Macroscopically, the current 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 MWe in 1997 (the same as in 1994), the RES installed capacity in the country reached 500 MWe in the beginning of 2004. The largest part of this RES capacity, in excess of 400 MWe (or, 83% of the total), concerns wind parks. About 4200 MWe 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.

The 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. This differentiation already applies to the level of capital subsidy on RES investment, granted by the EPAN/CSF III Programme

(Action 2.1.3). Given the current modest level of this KWh price, i.e. 6.5 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 cost ceiling of 900 Euro/KW, which is applied in Action 2.1.3 to the specific capital cost of wind parks that is eligible for subsidy, should be raised to at least 1000-1100 Euro/KW, in order to reflect current developments in the size and cost of new-generation wind turbines. Also, the separate EPAN instrument (Action 6.3.4 or Measure 6.5), which has been created to provide 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 Law 2601/98 support.
- iii) Concerning the National Development Law 2601/98 and its recent modifications, the following RES-related improvements are recommended :
  1. Inclusion of the grid connection cost (mid- or high-voltage line + transformer) to the capital cost of a RES project, which is eligible for subsidy. Currently, this connection cost, which, of course, is an integral part of any RES project, is many times not eligible to receive subsidy, due to a clause of Electricity Law 2773/99, according to which any newly constructed electricity line becomes, upon completion, property of the Public Power Corporation. This clause is in direct conflict with the National Development Law 2601/98, which decrees that the ownership of any capital asset that has received public subsidy under the said law cannot be transferred for at least 5 years. A simple solution, that would allow the grid connection cost to be subsidised, in a manner (and level) similar to the rest of the RES project's cost, is a modification of Law 2773/99. This modification will state that the ownership of a newly constructed grid connection line (+ transformer) of a RES project stays with the investor for

the first 5 years and, afterwards, it is automatically transferred to the Public Power Corporation.

2. Establishment and prompt activation of the long overdue TPF (Third Party Financing) mechanism for RES investments, through the passing of a relevant law. Interestingly enough, the TPF mechanism is foreseen in both financial support instruments for RES investments, namely Law 2601/98 and EPAN/CSFIII/Action 2.1.3. In fact, EPAN/CSFIII favours RES investment proposals employing TPF, by giving them higher grades in the proposal evaluation scheme. However, TPF is still totally absent from existing and planned RES projects, because of the lack of the necessary legal framework (TPF Law). This law, several drafts of which have been prepared and discussed in the last few years (but none has proceeded further), should deal with and regulate important issues linked to the TPF scheme. Such legal and financial issues include transfer of ownership, method for capital cost depreciation, VAT payment arrangements, handling of accumulated losses on the balance sheet, etc.
3. Abolishment of the current distinction / differentiation of Law 2601/98 incentives, between “new” (< 5 years) and “old” (> 5 years) enterprises / investors. Such a distinction does not serve any real purpose, except, perhaps, to cause the proliferation of new enterprise names and the establishment of hoards of new companies on paper. Its abolishment should, necessarily, be combined with the application of the total subsidy cup (maximum), currently in effect, per project, not per company / investor. This subsidy cup is presently 14.6 million Euro, a level set by Law 2601/98 back in 1998. Obviously, this level should be adjusted, at least for inflation (e.g. to 18 million Euro).
4. Adjustment of the payment schedule for public subsidies granted under Law 2601/98 to the corresponding payment schedule of CSF III/EPAN/Action 2.1.3 subsidies. This last schedule is more gradual, thus matches better the actual cash flows (expenses) of a RES investment project, during its materialisation phase.
5. Return of the current percentages of cash subsidies (30%) and tax-free reserves (70%), granted to wind park investments under Law 2601/98, to their initial values (40% and 100%, respectively), which were in effect

before the recent (January 2004) modification of Law 2601/98. This substantial decrease in subsidy, targeted specifically to wind parks, while having a small quantitative effect on the State budget (annual savings of about 10-15 million Euro) has already had a strong negative influence on domestic RES market activity, as the market goes through the present crucial stage of planning its further development (see discussion in previous chapters). The return of Law 2601/98 capital subsidies for wind park investments to their initial percentage value (40%) may be combined, as a balancing measure, with the abolishment of the accompanying interest-rate subsidy (30% ; see Ch. 1.2.2.3).

It is important to note that both State financial - support instruments for RES investments, namely EPAN/CSF III (Action 2.1.3) and Law 2601/98, 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.

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.