



# **Applying European Emissions Trading and Renewable Energy Support Mechanisms in the Greek Electricity Sector (ETRES)**

*Extended Summary in English of the original Report under Task 5:*

**“Vision, Framework and Strategy for the Greek Electricity Sector’s participation in Emissions Trading and Renewable Energy Support Mechanisms”**

October 2005

## **Overview**

The present report is an extended summary of the final report “Vision, Framework and Strategy for the Greek Electricity Sector’s participation in Emissions Trading and Renewable Energy Support Mechanisms” which was written in Greek as a part of our obligations under Task 5 of the ETRES Project.

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# **1. Introduction**

The purpose of this section is to present the steps and actions that were taken towards the fulfillment of the obligations under Task 5 of the project, titled “Vision, Framework and Strategy for the Greek Electricity Sector”.

The second chapter –which forms the main body of the present report- presents a broad stakeholders’ consensus on the determinant issues regarding the integration of the European Emissions Trading Scheme and the Renewable Energy support mechanisms to the Greek electricity sector, namely:

- Greece’s obligations under the Kyoto Protocol
- The European Emissions Trading Scheme
- Greece’s participation in the Scheme
- The Greek electricity sector’s market structure and its distinctive characteristics
- The potential for the development of renewable energy in electricity generation in Greece and the relevant support mechanisms

The views of stakeholders (institutions and companies involved in and affected by the developments in the Greek electricity sector) presented were recorded during the consultation that took place under Task 5 of the Project and is described in the following paragraphs. This combination of the stakeholders’ views forms the vision, the framework and the strategy for integration of the European Emissions Trading Scheme and the Renewable Energy support mechanisms to the Greek electricity sector.

The third chapter briefly presents the latest developments in the European and national level that took place during the last stage of the consultation, regarding the issues elaborated in the second chapter, and which affected the framework and the strategy for the Greek electricity sector.

Finally, in the fourth chapter the principal conclusions of this report are presented in a concise manner.

More information regarding the European Emissions Trading Scheme, the renewable energy support mechanisms and their implications on the Greek electricity sector can be found in the reports produced so far under the ETRES Project and can be accessed at the Project’s website (<http://www.cres.gr/etres/documents.htm>)

## **1.1. Task 5 of the ETRES Project**

The objective of Task 5 is to formulate a combined vision, the relevant framework and the appropriate strategy for the Greek electricity sector's participation in the European Emissions Trading Scheme (ETS) and the renewable energy support mechanisms, after a wide consultation with the stakeholders involved.

The actions taken for the fulfillment of the obligations under Task 5 and the consultation procedure is described in the following paragraphs.

## **1.2. Establishment of a Task Force**

A Task Force was established for the purposes of Task 5, comprising of senior figures from the relevant governing authorities and industry. Its role was to provide valuable input -through meetings, debates and consultations- for the production of the final report for Task 5.

The reports prepared for the project so far (Tasks 1-4) were used as input material to the Task Force.

The persons chosen by the project partners to participate in the Task Force were:

- Mr P. Papastamatiou, consultant to the Ministry of Development on energy issues (Chairperson)
- Ms E. Politi from the International Relations Dept of the Ministry of Environment
- Prof. D. Lalas, (then) President of the National Observatory of Athens<sup>1</sup>
- Mr K. Symeonidis from the Confederation of Greek Industries
- Dr D. Kanellopoulos, from the Environment Team of the Strategy and Planning Dept of Public Power Corporation (PPC)
- Ms P. Pagoni, head of the Environment, Health & Safety Dept of Greek Petroleum (ELPE)
- Mr D. Georgantonis, Director of Energy in Aluminium of Greece (AoG)

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<sup>1</sup> Since the establishment of the Task Force, Prof. Lalas has been substituted as president of the NOA by Prof Zarefos.

### **1.3. The Questionnaire**

As provided by the Project documents for Task 5, a detailed Questionnaire consisting of 48 questions in total on the determinant issues regarding the Greek electricity sector's participation in the European Emissions Trading Scheme (ETS) and the renewable energy support mechanisms was prepared and submitted to the Task Force.

Its role was to facilitate the members of the Task Force to present their views, positions and comments in a concise and specific manner and the responses to the Questionnaire have been taken into account and incorporated in this report.

### **1.4. First Meeting of the Task Force**

The first formal meeting of the Task Force took place on 30.03.2005 at AoG premises.

The meeting opened with a brief presentation from RAE on the European Emissions Trading Scheme (ETS) and its implications on the Greek electricity sector, with a particular focus on the development of Renewable Energy Sources (RES) for electricity generation in Greece.

Three rounds of discussion followed with the members of the Task Force stating their views respectively on:

- Greece and its obligations under the Kyoto Protocol, the Greek NAP and the Kyoto flexibility mechanisms.
- Implications on the Greek Industry -and the electricity sector in particular- from the implementation of the ETS.
- RES support mechanisms in Greece and the potential for further development.

The positions of the members of the Task Force during the meeting were recorded and have been incorporated in this report.

### **1.5. Draft Report and Workshop**

A draft report for Task 5 based on the responses to the Questionnaire and the discussion during the Task Force's meeting was produced and submitted for consultation to a large number of stakeholders in the Greek energy industries (agencies, corporations, investors, organizations, consultants, individuals).

On 30 June a major workshop took place in the "Golden Age" hotel in Athens which was attended by 40 representatives of companies participating in the ETS and/or involved in the Greek electricity sector. During this workshop the draft report was presented and in the discussion that followed stakeholders were able to make their comments and state their views which have been incorporated in this report.

## **2. Presentation and Synthesis of Stakeholders' positions**

### **2.1. Introduction**

This chapter presents a synthesis of the positions of the stakeholders on the vision, framework and strategy for the integration of the European Emissions Trading Scheme and the Renewable Energy support mechanisms in the Greek electricity sector. The positions have been grouped by issue as follows.

### **2.2. Greece's obligations under the Kyoto Protocol**

According to the National Emissions Reductions Programme, which was also adopted in the National Allocation Plan, Greece expects to meet its Kyoto target (+25% above 1990 levels) with domestic measures and policies alone. Those measures are expected to yield significant results after 2008. It is therefore difficult today to estimate whether meeting the target is realistic. A review of these measures' efficiency and results so far is being undertaken by the Ministry of Environment.

However, the general view is that it is quite unrealistic that the target will be met. Greece is expected to take advantage of the Kyoto Protocol's flexibility mechanisms (mainly International Emissions Trading) as the most practical and efficient way for meeting the target. However no relevant political decisions have been made, no budget has been allocated and the relevant authorities have not been established.

The expected overshooting of the target has been attributed to the limited and delayed introduction of natural gas to the electricity and the tertiary/residential sectors, the absence of coherent and long-term policies for energy conservation and emissions abatement, especially in the transportation sector and the insufficient development of renewable energy sources.

The implications of meeting the Kyoto target to the Greek economy sectors will depend on the sectors' emissions reduction requirements and abatement potential, and on the respective requirements and potential of the relevant sectors in other countries. In any case, an increase in the price of energy and energy-intensive products should be expected, probably as early as 2006.



On the positive side, the process of meeting the Kyoto target could help the Greek economy by forcing it to change its polluting and inefficient production and consumption characteristics.

### **2.3. The European Emissions Trading Scheme**

The Scheme is expected to help the installations reduce their emissions in a cost-effective way. As already envisaged in the National Allocation Plan, the overall emissions will not be significantly reduced during the first period, but during the second and especially the third period the reductions will have to be more significant.

The EU should make efforts to get other countries (more significantly USA, China, India) to reduce their emissions not only in order to guarantee the environmental effectiveness of the Scheme but also in order to diminish any international competitiveness disadvantages that European companies participating in the Scheme may have.

The regulatory framework of the Scheme is considered satisfactory. Its most important drawbacks are the lack of harmonisation in the allocation methodologies between member states and the uncertainty surrounding the rigidity that will be required in the following periods.

Expanding the Scheme to other sectors/gases is deemed desirable in order to increase liquidity in the allowance market but also to enforce emissions reductions in sectors that are not covered by the scheme and exhibit significant increases in their emissions, such as the transportation sector.

The delay in registering projects in the Kyoto mechanisms will reduce the liquidity in the allowance market and therefore higher allowance prices are expected at least during the first period. In the implementation of the Linking Directive (2004/101) into national law, the Greek state should not set rigid limits for the companies to use project-generated credits in order to meet their obligations.

There is significant scope for Greek companies to take advantage of the Kyoto mechanisms (especially in the Balkans) and use such credits for compliance under the scheme as envisaged in the Linking Directive but the corporate world in Greece doesn't seem ready yet to act or even to realise the requirements and opportunities that arise.

The evolution of the allowance price and the degree of allocation rigidity in subsequent periods will certainly affect the investment strategies of the companies participating in the Scheme. But this is expected to happen after 2008 since the short time-frame of the first period and the uncertainty over what will be required in subsequent periods do not allow for significant changes in the short term.

#### **2.4. Greece's participation in the Scheme**

The majority of the stakeholders consulted consider the Greek NAP as sufficiently well-documented, with realistic assumptions and projection and satisfactory allocation methodology. However, significant abatement potential that exists in other sectors such as the transportation and domestic/building sectors has not been taken into account and this reflects the absence of a relevant strategic planning and the delaying in implementing necessary measures.

Some objections were raised by the incumbent utility PPC such as:

- The projections used in the Greek NAP significantly underestimate energy demand and installed generation capacity
- Some of its plants should have the benefit of early action for investments made during the past decade
- The expected private new entrants will not be able to operate their plants by the time envisaged in the NAP. Therefore the known new entrants' reserved should be reduced by almost 1.5 million allowances which should be credited to PPC which will have to produce the electricity until the new plants are operational.
- For reasons of security of supply, lignite's share in electricity generation should not be drastically reduced
- The compliance factor for electricity generation should not be lower than in other sectors

In order to estimate the relative success of the Scheme for the Greek economy and if such data is available, the total compliance cost for Greece (total cost of allowances purchase + cost of relevant actions and investment) per excess ton emitted is a representative index that should be compared with the respective ones from other EU countries.

There should be no early action reward for subsequent periods, since everyone involved are already aware of the cost parameter of emissions and their obligations under the Scheme.

There is scope for further emissions reductions in the generation sector if i) increased penetration of natural gas is consistently encouraged ii) RES penetration is accelerated iii) introduction of more efficient and energy saving technologies are introduced to existing lignite plants.

Finally, it was pointed out that the great delay that has been observed in establishing the Greek Registry has imposed significant financial burdens to those companies participating in the Scheme that want to purchase allowances and are unable to do so as long as the Registry is not operational.

## **2.5. The Greek electricity sector**

There is general support for the establishment of a liberalised electricity market in Greece as envisaged in the Directives 1996/92 and 2003/54. However, Directive 2003/54 has not been fully implemented as national law and in any case the process of liberalisation develops slowly and faces many obstacles.

The following were mentioned as reasons for the unsatisfactory process of the electricity market liberalisation in Greece:

- The existence and persistence of monopolistic structures in the energy markets that could allow exercising of market power.
- The higher marginal cost of new natural-gas fired plants compared to PPC's portfolio that is dominated by lignite fired plants
- The reluctance of potential new entrants to bear the relevant business risks together with the absence of a regulatory framework that would create a healthy and reliable financiability environment, at least for the first investors that it would be up to them to kick-start the liberalisation process in the generation sector

The recently adopted System and Transactions Code and –in the long term- the creation of the South-Eastern Europe regional electricity market is expected to boost the liberalisation process.

The Regulatory Authority's role should be that of the independent regulator that ensures market competitiveness and restricted to that of a consultant to the Ministry of Development. Many stakeholders argued that PPC, despite its huge importance to Greece's development and energy supply, should be treated in the liberalised market as a market player and not be allowed to dictate national energy policy. Given its dominant market position it is imperative that its operation is according to the spirit of the Electricity Directives in a transparent way.

The effect of the Scheme to the fuels' share in electricity generation is expected to be insignificant during the first period because new investments had already been planned and decided and also because the very tight margins in the Greek System to not allow for significant fuel-switching. In the medium term and depending on the evolution of the prices of emission allowances and natural gas, an increase in the latter's share should be expected.

A disagreement among stakeholders emerged concerning the government's scope for dictating fuel and/or technology in new plants.

The total additional cost from the implementation of the ETS is the cost of purchasing the needed allowances plus the cost of relevant targeted actions and investments (eg change in the dispatch order of plants) and only to that extent should be passed through to the final consumers.

To the extent that windfall profits are not allowed to be accrued by the producers and that the allowances allocation has been made in a way that reflects the techno-economic abatement potential for each sector and installation, any increase in the price of electricity is expected to be reasonable and superable.

PPC and the Ministry of Development have started a process of reviewing the rate structure, especially for middle- and high-voltage customers, in order for those to reflect the true cost of electricity and to incentivise energy efficiency and conservation. The long-term aim is to provide as many customers as possible with real-time metering.

In the non-interconnected systems of the Greek islands, the scope for significant emissions reductions is limited unless the systems are interconnected with each other and/or the mainland grid, renewable energy penetration is increased by means of hybrid systems and measures for energy conservation during summer peak hours are implemented.

Imports of electricity through the northern interconnectors are already maximized for the great part of the year due to economical and system stability reasons. As the price of imports is dictated by supply and demand conditions, a carbon cost parameter will be reflected in the import price, especially after 2007 when Bulgaria (the principal electricity exporter to Greece) is expected to join the EU and its electricity sector will be covered by the ETS. In any case, the emissions cost should be a parameter while determining the possible expansion of Greece's international interconnectors' capacity.

## **2.6. The potential for the development of renewable energy in electricity generation and the relevant support mechanisms**

It is generally agreed that Directive's 2001/77 indicative target of 20.1% for renewable energy penetration in electricity generation in 2010 is unrealistic and that the development of renewable energy sources (RES) is one of the most commendable policies for emissions reduction.

Priorities and actions towards overcoming the obstacles to the further development of RES in electricity generation should be:

- The construction of the necessary grid expansions
- The issuance of the Special Framework for Land Planning for RES
- The rationalization and simplification of the licensing procedures for RES projects.
- The implementation of a relevant public awareness programme

The development of wind energy as the single most significant RES in Greece was and remains efficient for the national economy since it is the most techno-economically mature technology, there is a high wind potential in many areas of Greece and the relevant technical know-how exists in Greece for a long time.

The existing RES support framework is deemed reasonable and effective and should remain broadly unchanged for the next five to ten years. The possible introduction of a Green Certificates-based support mechanism is considered immature for the near future as there exists little relevant experience in the international level, its effectiveness is arguably wanting compared to that of the existing system and a rigid harmonization of the relevant regulations in all member states is needed. The Ministry of Development

has stated that there exists no such option at least until RES capacity in Greece is lower than 1600MW.

Greece should also encourage the development of other new-generation RESs, especially solar power and biomass, not only in electricity generation but also in heating.

## **3. Latest Developments**

### **3.1. The European Emissions Trading Scheme**

With the approval of the Greek NAP on 20 June, the ETS framework is finalized for the first period. By the time the consultation for Task 5 of the Project ended, 6 countries had fully operational registries and the allowance price was around 21 €/ tCO<sub>2</sub>.

The Commission has started the process of reviewing the ETS with a Review due in mid 2006. The Commission has also stated its intention of including civil aviation in the Scheme for the second period but any other expansion of the Scheme or significant changes to its framework is not expected before 2013.

In its financial statement for the first quarter of 2005 PPC estimated its cost for purchasing allowances for that period's production at 19.5 million euros.

### **3.2. Green Paper on Energy Efficiency**

On 22 June the Green Paper on Energy Efficiency was adopted by the Commission. This text presents a number of actions that could help the EU achieve in a cost effective way a reduction of 20% in energy consumption by 2020 through changes in consumer behaviour and the adoption of energy efficient technologies.

### **3.3. Liberalisation of the Greek electricity market**

On 14 July a draft law that would complete the implementation of Directive 2003/54 was publicised for consultation. Its main provisions are

- The unbundling of the distribution sub-sector from PPC
- The opening of the market for the non-interconnected systems of Crete and Rhodos
- The Transmission System Operator (TSO) is responsible for the development and maintenance of the national grid
- Accounting separation for the distinctive activities of power producers is enforced
- Third parties are allowed to construct transmission lines

### **3.4. Interconnection of Cyclades islands to the mainland grid**

On 21 June the report of a Committee consisting of representatives from RAE, TSO and PPC on the option for interconnecting Cyclades islands to the mainland grid was made public. The interconnection is expected to be operational in 2010 and will facilitate the gradual cease of operation of thermal plants on the islands.

### **3.5. Licensing of RES projects**

A renewed significant interest for investment in RES projects has been evident in 2005 with 194 applications for projects totalling 3630MW (98% of them coming from wind farms).



## **4. Concluding remarks**

1. It is still early to make any accurate quantifiable estimations on the effect of the ETS on the Greek economy, industry and electricity sector. However an increase in the price of energy products should be expected.
2. In the current period no significant changes in the electricity sector are expected due to the limited time frame and the tight margins of the Greek System. In the mid-term an increased penetration of natural gas and RES is expected.
3. The vision for the creation of a liberalised electricity market in Greece in the spirit of the EU Directives is not only an obligation as a member state but also a strategic choice of the Greek economy and society
4. The start of operation of the first privately owned power plants and the finalization of the regulatory framework is expected to boost the liberalisation process.
5. Construction of the necessary grid expansions, adoption of the relevant Land Planning Framework and simplification of the licensing procedures are essential for the further development of RES projects in Greece. The existing support framework should remain broadly unchanged in the short term.