

## **GREEK ENVIRONMENTAL STRATEGIC POLICES**

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### **INTRODUCTION**

The term Sustainable Development refers to the development that satisfies the needs of today without endangering the capacity of future generations to satisfy their own needs. For its realization, the combination of social progress, which will recognize and take into account the needs of the citizens, effective environmental management and persistence on high rates of financial enlargement and activity is essential. The aim of Sustainable Development is a better quality of life for all citizens, that live and work today, as well as for those of the next generations.

While trying to trace the current Greek situation, we have concluded that the social, as much as the natural environment, suffers strains that derive from human activity and are connected to the rates of development, whether financial or those referring to the standard of living. Sustainable development gives the opportunity of using technological and scientific attainments, in such a way, that alternative political propositions may arise, which will ensure the increase of productivity, effectiveness, social cohesion and sensible management of natural resources.

The Greek Strategy on sustainable development, apart from the aim of financial enlargement, comprises three fundamental keystones: environmental policy, social solidarity policy, as well as the configuration of partial policies of each section, in an integral strategic plan.

In this framework the environmental policy is analyzed in measurements and actions that refer to: climate change prevention policies, air pollution control, rational solid waste management and management of forestal and water resources, desertification prevention policies and protection of biodiversity as well as sectoral policies (energy, tourism, transport etc).

Greece has a rich environmental reserve. The relatively non-degraded natural environment, which stands out for its high biodiversity in combination with great variety of biotopes, the quality of swimming waters and of the Country's coasts, as well as the quality of the atmosphere, are, generally, in better condition than those of most European Countries, despite the partial problems.

However, in other sectors, particularly in those where financial policy has not incorporated environmental dimension, smaller progress turns up. At the same time, the dramatic socio-economical changes of the recent years, have begun effecting the quality of the environment. The constantly rising consumption levels, in combination with the further financial development of the Country, are expected to create considerable strains on the natural resources, and, in many cases, to threaten the balance of ecosystems, as

well as public health. For this reason, national strategies have been adopted, which aim at the prevention of environmental degradation of our Country.

The successful application of the Sustainable Development Strategy is ensured by the promotion of institutional and administrative reforms. To this effect, the Greek government adopted full incorporation of European Community Legislations in national law and enforced the preparation of complete Sustainable Development Plans of the Municipalities.

Furthermore, for the benefit of successful realization of Sustainable Development Strategy, the very important tool of Environmental Impact Assessment is used, since 1990. Environmental Impact Studies are compiled for every important project or activity, whether planned or in effect, aiming at the effective encounter of environmental impact. An additional mechanism, which was recently put in effect, is the Special Commission of Inspectors of the Environment, which has undertaken the obligation to inspect the application of environmental terms, determined by the administration.

Another recent development, is that Greece has applied and adopted the new system (Directive 2001/42/EC) about the Strategic Evaluation of Environmental Impact of specific projects and programs. This is aiming at the incorporation of environmental criteria in the planning, so that the principles of Sustainable Development are secured, ensuring that environmental impact evaluation will be made, for certain plans and programs that are prone to having considerable impact.

Below, the current situation and policy concerning the most important Greek environmental sectors is analyzed:

### **1. Greenhouse Gases Emission and Climate Change Prevention Policies**

The emission of greenhouse gases in Greece show a steady increase during the last decade, following the rising rate of GDP. Among the 6 greenhouse gases, the most important are Carbon Dioxide (CO<sub>2</sub>) and Methane (CH<sub>4</sub>), with contribution 80% and 8% respectively.

Energy production and use is the most important source of greenhouse gases, especially of CO<sub>2</sub>, while waste disposal and the sector of agriculture have the greatest share of responsibility for the production of CH<sub>4</sub>. Finally, industry has a great share of responsibility for CO<sub>2</sub> emissions, deriving from cement production as well as for emissions of fluor compound.

Specifically, analyzing the contribution of the energy demand sectors, in CO<sub>2</sub> emissions, we can conclude that the highest share of responsibility should be attributed to the production of electric power and secondarily to transport.

Based on the population, the CO<sub>2</sub> emissions are approximately equal to the average of EU. The emission rate per unit of primary energy demand is 40% higher than the Community average, which confirms the negative, in relation to the gas emissions, composition of the Greek energy mixture. The comparison becomes even more uncomplimentary, if it is done based on the intensity of CO<sub>2</sub> emissions, since Greece,

due to the high energy consumption, presents a value which is double than the Community average.

The fundamental keystones of action of the current National Strategy on Climate Change Prevention Policies include the restructuring and diversification of energy supply, the rational use and conservation of energy, as well as measures for the restriction of more greenhouse gases. Greece has adopted the targets set by the Kyoto Protocol and has a National Plan that allocates emission permits to the industry.

## **2. Air Pollution Emissions**

In national level, basic air pollution emissions follow in great extent the rising rate of GDP. However, in the cases of Nitrogen oxides (NO<sub>x</sub>) and of sulphur dioxide (SO<sub>2</sub>), a considerable detachment tendency is observed from 1998 and on.

Given the fact that these two pollutants derive in a percentage of 98% from the energy sector, this positive development is, in a great extent, attributed to the improvement of fuel quality, to their partial substitution by natural gas (especially referring to SO<sub>2</sub>), as well as to additional measures taken, of directive and inspective character. We may conclude that in the case of SO<sub>2</sub>, the larger share of responsibility is attributed to the sector of Electric Power Production, while, in the case of No<sub>x</sub>, is attributed to transport.

However, despite the recent, small improvements, additional efforts must be made, especially as far as SO<sub>2</sub> is concerned, where the value recorded is almost double than the Community average of emissions per capita, in order for air pollution to be restricted effectively and for the aims deriving from international agreements to be accomplished.

The fundamental keystones of action of the National Strategy on Air Pollution include the restructuring and diversification of energy supply, rational use and conservation of energy in the sector of building construction, measures for the sector of transport, measures for industry, as well as institutional and organizational measures that enforce effective energy management.

## **3. Solid Waste**

Financial development, intensified urbanization, the increase of mass tourism and the change of consumption standards has led, in the recent years, in the considerable increase of the quantity of produced solid waste. Even though this increase has closely followed the rate of GDP enlargement, from 1994 and on, a substantial detachment tendency is recorded. However, a close connection with the rise of population remains.

This double tendency indicates that additional income is conducted mainly to non-consumption commodities, which do not have an increasing effect on waste. On the other hand no substantial change has been recorded of the fundamental consumption standards.

The annual production of solid waste, deriving from the domestic and the commercial sector, amounts to approximately 4 million tons, with production per capita, significantly lower than the EU average (400 kg against 480 kg per year). 85% of this quantity is collected and disposed systematically, though only 55% is buried at organized landfills

and a percentage slightly lower than 10% is recovered in plants of mechanical biological treatment. The percentage of uncontrolled dumping in "wild landfilling" remains high, creating pollution problems on superficial and underground waters, while uncontrolled self-combustion of waste at these sites is responsible for the aggravation of the air with toxic gases and for the causing of fire, at a percentage of 10%.

There is noticeable progress on the field of hazardous solid waste and mud disposal. During the last decade, the total production of the above waste has been reduced by 30%, while 76% is disposed at safe, controlled sites, 23% is recycled and 1% is treated with stabilization. 85% of the annual production of industrial waste comes from large plants of the fields of: basic metallurgy, chemical industry (especially that of fertilizers) and of oil distillation, while small quantities of hazardous waste come from a larger number of relatively small industrial units. Recently, a new ministerial law concerning toxic waste management sets general technical specifications for this. Also, a national plan for toxic waste is getting into effect regulating all kinds of special waste.

In the recent years, a series of solid waste management projects have been incorporated in various funding programs and are, by now, complete or at the stage of realization. These projects include: Landfills, Recycling Centers, Solid Waste Transfer Stations and Composting Plants. Unfortunately, it should be remarked, that it is difficult for the local societies to accept installation of such plants at their district and a strong Not In My Backyard (NIMBY) effect remains a great obstacle for all new installation of plants. At the same time, the uncontrolled landfills are abandoned, following an organized national plan, and a significant national project for the equivalent site reclamation is in progress.

In Greece there are national plans into operation for the recycling of special materials that progress according to a Business Plan controlled by the Ministry of Environment (for streams like Packaging, Electric / Electronics, tyres, batteries, Old Cars and Oils).

The fundamental keystones of action of the National Strategy on Solid Waste emphasize on the safe disposal and utilization of domestic waste, using modern technology, the industrial and hazardous solid waste management, as well as the measures on reduction of solid waste production.

#### **4. Water Resources Quality and Use**

Water Management in Greece presents problems, more on quantity, than on quality. Even though Greece has enough water resources, the uneven apportionment of reserves and rainfalls (both in terms of territory and in terms of time), in combination with the irrational use of water, often cause inadequacy problems of this precious resource in several districts of the Country. Also in some areas (mostly rural ones) contamination problems occur (e.g. mostly from nitrates) as well as abasement of the water-bearer (e.g. due to over-pumping and desalination). The total of withdrawals amounts to over 8.7 bio. cubic meters, which correlated with the available reserves, presents a level of use equal to 12%, which is close to the average of OECD Countries.

The majority of water consumption is attributed to agriculture (more than 80%), since irrigation demand has doubled during the past twenty years. Watering needs contribute

with 10% at the total of withdrawals, presenting a slight reduction of their proportion during the last decade, as a result of infrastructure works, as well as of reformation of billing policy and of systematic consumers-information-campaign.

A significant progress has been observed at the management of sludge. Approximately 60% of the Greek population is connected to sludge treatment units. Included are all cities with population larger than 50.000 citizens.

The goal of water resources rational management, focuses mainly on the quantitative dimension of management, aiming at the protection of available reserves and the assurance of equal access in them, by all citizens of the Country (in every region and at all times). At the same time, the timely prevention of the qualitative abasement risks for water systems (superficial, underground and sea waters) is a priority, for reasons of public health protection, as well as for the conservation of the comparative advantage that Greece has, concerning tourism.

The fundamental keystones of the National Strategy on Water Resources emphasizes on a complete approach of water management, via a strategic plan on decentralization, infrastructure improvement and expansion, taking into account socio-economical approaches on water resources management, as well as protection from hazardous substances and risks.

The Greek coasts are considered to be among the cleaner ones in Europe, while the majority of the coasts that attract tourists have attained the European signaling of the Blue Flag. After a systematic and wide-covering sampling conducted by the Greek Ministry of Environment, it emerges that 98% of the samples is positively in accordance with the prerequisites of the relevant EU directive, while pollution phenomena, near big urban centers are avoided by the completion and expansion of sludge treatment units.

## **5. Land Use and Desertification Prevention Policies**

Land use in Greece is determined, in a great extend, by the standards of urban development of the after-war period, which are based on the continuous expansion of structured land at the edges of big urban centers. 37% of the population lives in the two big urban centers (Athens and Saloniki), which present a much bigger density of population, than the national average (920 and 280 citizens/km<sup>2</sup>, respectively), while, in total, 60% inhabits cities of population bigger than 10.000 citizens. For the last two decades, a significant retardation of the increase rate of urbanization, is observed, due to systematic efforts for the development of the province.

Concerning forestal resources, the rate of their exploitation against the rate of their reproduction is satisfactory and equal to 0.6, value parallel to the EU average. However, forestal systems are mainly threatened by fire and in some cases by urban growth. During the last 20 years, an average of 40.000 hectares of forest is destroyed annually.

Due to these strains, great parts of the inland, as well as Crete and many Aegean islands, run significant risk of desertification, which will probably be intensified by prevalence of climate change.

The fundamental keystones of the current action of the National Strategy on desertification include measures for the protection of forests, water resources, rural lands and grasslands from the intense exploitation, as well as the enforcement of research, information and education exchange actions and effective use of control mechanisms.

## **6. Nature and Bio-Diversity**

Greek bio-diversity is among the larger of Europe and of the Mediterranean, as a result of the geographical position, the geological history and the diversity of landscape of Greece. Moreover, the mild human intervention, has significantly contributed to the satisfactory conservation of the elements of bio-diversity through the ages. It is, today, estimated, that the fauna of the Country numbers from 30 to 50 thousand species, while its flora exceeds 6.300 species and sub-species of superior plants. Greece holds the 2<sup>nd</sup> place among the 15 member – Countries of EU, concerning the diversity of superior plants, with Spain holding the first place. Greece also stands out for its high endemism of species. 4% of the flora species and 22% of the fauna species of our Country are considered threatened today.

The fundamental keystones of action of the National Strategy on Bio-diversity include measures for the preservation and restoration of ecosystems, for effective water and land resources management, as well as the promotion of horizontal environmental policies and incorporation of the component of bio-diversity at Greek sectoral policies.

## **7. Production and Use of Energy Resources**

The most significant strains on environment, especially on atmosphere quality, derive from energy production and consumption. The demand per capita of primary energy in Greece is 30% lower than the EU average, reflecting a more environment-friendly consumption model.

Energy consumption in Greece, has increased during the last decade, with rates significantly higher than those registered in most EU Countries, especially at the field of building construction. This increasing tendency is in a great deal justifiable, as energy consumption per capita in Greece is still in the lowest range among all EU Countries (excluding Portugal and Spain).

At the same time, the Greek energy system, has been until recently characterized by an intense adherence to traditional fuels. Especially in the sector of electricity production, the choice of intense utilization of domestic lignite reserves, although it was a justified reaction at the age of energy crisis, aiming to enforce energy autonomy in Greece, at the present age of net integration, market liberalization and environmental protection, it is being reconsidered.

The grounds of reconsideration are already set and are systematically promoted in the recent years. Natural gas (even though it had not entered the Greek Energy System before 1998) increases speedily its share in the total balance sheet. Also, the particularly positive, new institutional framework for the development of Renewable Energy Sources (RES) (including attractive prices that are guaranteed for RES – produced electricity sold to the Greek Energy system) forms the prerequisites for the significant increase of their

contribution percentage, which already is today at the level of the EU average, despite the relatively limited water resources, in comparison with other EU Countries. The intense interest of Greek and international private investors to this direction comprises a very encouraging indication for the expectations of RES in Greece, so that the targets set by EU concerning RES utilization are expected to be reached and even exceeded.

The goal of the National Strategy of Greece emphasizes on the decrease of energy consumption intensity of the Greek economy, the opening and liberalization of the energy market and the diversification of energy mixture to the direction of environment friendly energy resources. This goal, is accomplished with actions that include rational energy use and conservation, co-production plants development, the fast penetration of Natural Gas, the drastic increase of the RES contribution, as well as the improvement and interlock of electric system networks.