

**EUROPEAN COMMITTEE OF SOCIAL RIGHTS
COMITÉ EUROPÉEN DES DROITS SOCIAUX**



23 January 2006

**Collective Complaint No. 30/2005
Marangopoulos Foundation for Human Rights v. Greece**

Case Document No. 4

**WRITTEN SUBMISSIONS FROM THE GREEK
GOVERNMENT ON THE MERITS**

registered at the Secretariat on 12 January 2006

**OBSERVATIONS OF THE HELLENIC GOVERNMENT
ON THE MERITS OF THE COLLECTIVE
COMPLAINT 30/2005
“MARANGOPOULOS FOUNDATION FOR HUMAN
RIGHTS (MFHR) AGAINST GREECE”**

According to the Decision of the European Committee of Social Rights as of 10/10/2005 on admissibility of the collective complaint no 30/2005 lodged against Greece by the International Non-Governmental Organization ‘Marangopoulos Foundation for Human Rights’ for violation of articles 2 par. 4, 3 par. 1 and 2, 11 of the European Social Charter, we hereby submit duly and timely our observations on the merits of the allegations of the complainant organization.

The Hellenic Government denies in their total the allegations made by the complainant organization and requests the rejection of the above complaint as unfounded.

The observations of the Greek Government include a memorandum of the Public Power Corporation (DEI) refuting the allegations of the complainant organization.

More specifically, the Greek Government wishes to observe the following:

- *As regards the time of employment of the occupational doctor*

As regards the time of employment of an occupational doctor, that is determined by the Presidential Decree 294/88 in relation to the number of employees and the degree of danger arising from working at an enterprise. Moreover, enterprises with an increased professional danger due to employees’ exposure to carcinogenic factors, lead or asbestos, may have to employ an occupational doctor even for more than one employee.

- *As regards occupational accidents*

The Labour Inspectorate is the inspecting mechanism of the Ministry of Employment and Social Protection for ensuring the enforcement of the labour legislation. The Labour Inspectorate enters all work areas, however, it does not have the authority to inspect enterprises of Ore or other Mines and Quarries according to paragraph 2, Presidential Decree 17/96. The Ministry of Development and its agencies (Inspectorates of Ore Mines) is competent to control the enforcement of the

legislation on hygiene and safety of workers at the aforementioned categories of enterprises.

In respect of the frequency of occupational accidents, to which your complaint refers, we wish to inform you as follows: It is true that if someone isolates a number of accidents occurring in one year from its time sequence without taking into consideration many other important parameters, one may draw any conclusion he/she wishes. The real picture, however, of the occupational accidents in Greece is not that presented by the complainant organization. The occupational accidents occurring in Greece and also the fatal occupational accidents are continually decreasing if we examine the progress of accidents from 1977 to this day. That is, while in 1977 3.81% of the insured persons suffered an occupational accident, in 2002 such percentage had decreased considerably to 0.82%. Such a decrease is steady and smooth during the last twenty-five years.

It is worth mentioning, however, some very important parameters so that objective conclusions can be drawn in relation to the increase of the fatal occupational accidents observed. More specifically:

- 43 of the 188 fatal occupational accidents in 2001 (23%) had a traffic or pathological cause;
- as it is known, in our country during that period very big projects were in progress and there was a great increase in the building and other activities in view of the Olympic Games of 2004 and the Third Community Support Framework;
- in our country there is a great percentage of foreign workers who have objective difficulties (language problems, lack of education, low level of work experience, etc.) in dealing with them.

As you will observe on the table of the fatal occupational accidents, which we will present hereinafter, the percentage thereof is already continually decreasing.

YEAR	FATAL OCCUPATIONAL ACCIDENTS	DECREASE %
2001	188	-
2002	153	20%
2003	145	7%
2004	127	13%

Furthermore, as regards the allegation by the complainant organization that the inspection is insufficient and no effective sanctions are imposed, such accusation is inaccurate as shown in the table presented.

YEAR	INDICTMENTS	SUSPENSIONS OF OPERATION	FINES	AMOUNTS
2 nd semester 1999	26	50	22	17.226€
2000	299	393	207	146.823€
2001	892	611	744	552.458€
2002	1429	1495	2336	2.261.945€
2003	1608	1650	3041	3.799.130€
2004*	1490	1991	2238	2.721.300€

The emerging small decrease in the sanctions in 2004 compared to 2003 may in no case constitute a substantiation of such accusation by the complainant organization,

since it suffices to think that 2004 was the year of the Olympic Games when the Olympic and other projects reached a peak and were completed.

- *As regards the content of the collective arrangements*

According to article 4, Law 1876/1990, the content of the collective arrangements is determined exclusively either by the social partners (trade unions of employers - employees) in case of signature of a Collective Labour Agreement or by the issuance of an Arbitration Decision. Article 1, par. 1 of the said Law stipulates that the law concerns all those working under a private law dependent work relation for any domestic or foreign employer, enterprise, undertaking or agency of the private or public sector of economy, etc.. Article 2 of the same law stipulates that the issues that may constitute the content of a collective arrangement include those concerning the entering into, the terms and expiry of individual work contracts falling within the scope of implementation of the arrangement. Therefore, the issues concerning the reduced working hours, the granting of additional holidays or additional paid days of leave to the employees of the Public Power Corporation at lignite mines may be regulated on the basis of the procedure of Collective Labour Agreements and, of course, on the conditions laid down by the law.

- *As regards the legislative framework on the protection of the environment*

Greece has a developed system of rules of law for the protection of the environment. Such legislative framework has as a primary legal basis both the Constitutional provision on the issue (article 24) and the laws of the European Union. The basic national law on the protection of the environment is Law 1650/1986 (Official Gazette 160 A/1986) as subsequently amended in particular by Law 3010/2002 (Official Gazette 91 A/2002). Thematically, Law 1650/1986 includes a wide range of arrangements in various fields of the environment (atmosphere, water, soil, nature, landscape, special matters such as the hazardous substances, waste, noise, etc.). Those legislative arrangements aim at the protection of all natural and anthropogenic factors and elements being in interaction with and affecting the ecological balance, quality of life, health of citizens, historical and cultural tradition and aesthetic values. It should also be noted that by this law as currently in force and its enforcement provisions, the institution of Environmental Impact Assessment and Environmental Impact Studies was established and developed mainly on the basis of the pertinent legislation of the European Union. Finally, in the aforementioned legislative 'arsenal' we should count together several more recent laws and a number of International Conventions signed and ratified by our country. The effort at protecting the environment, in particular

towards prevention, is largely based on the implementation of the above institution. According to the legislation in force as described hereinbefore, the performance of new projects or activities or the expansion, modernization and relocation of existing projects shall require the approval of terms for the protection of the environment. Such approval shall be given on the basis of the Environmental Impact Study submitted from time to time by the investor. Upon the decision on the approval of environmental terms the Management shall impose requirements, terms, restrictions and differentiations for the performance of the project or the activity, in particular with respect to the location, size, kind, technology applied and the general technical characteristics of the unit planned to be constructed, that is, elements that concern and affect not only the surrounding, natural environment but also the work environment. Thus, for instance the technology to be used should be friendly both to the macroenvironment and on a local scale to the work area of specific persons. Moreover, it is pointed out that the decision on the approval of environmental terms is a precondition for the issuance of administrative deeds as required from time to time, in accordance with the provisions in force, for the performance of the project or the activity. The above process of environmental licensing (preceding the final licensing of various projects or activities) is more demanding for bigger, more important units, in this case such as the extractive activities referred to in the complaint under consideration. According to those stated above, the environmental legislation, in general, and the institution of Environmental Impact Studies, more specifically, for the realization of various projects and activities in our country contribute substantially to the protection of the environment, both the general environment concerning the overall population of the country and also the work environment.

- *As regards the environmental terms of operation of power production units of the Public Power Corporation S.A.*

More specifically, the Directorate for Air Pollution and Noise Control, Ministry for the Environment, Physical Planning and Public Works, is competent to issue environmental terms of operation of power production units of the Public Power Corporation S.A., which are lignite-fired. According to the environmental terms approved for those units, the Public Power Corporation is under the obligation to perform measurements for the control of the quality of the atmosphere in the greater area of every lignite station. More specifically, nine atmospheric quality control stations operate in the Prefectures of Kozani and Florina and other three operate in the Prefecture of Arcadia. In those stations measurements of concentrations of SO₂,

Nox/NO₂, suspended and respirable particulates, as well as measurements of meteorological parameters, such as the intensity and direction of the wind, humidity, etc., as the case may be, take place. The results of the measurements are notified at regular intervals to the competent agencies. The measurements results submitted for the years 2000-2004 have been evaluated by the Atmospheric Quality Department of the Directorate for Air Pollution and Noise Control and no exceeding of the limit values stipulated in Directive 80/779/EEC has been observed. As regards the measures of pollution control imposed on the lignite units, those focus on the reduction of the emissions of particulates with respect to the Steam-Electric Stations of Northern Greece, while they focus on the reduction of both the particulates and SO₂ with respect to the Steam-Electric Stations of Southern Greece. The different treatment is due to the highest sulphur content of the lignite in the area of Megalopoli, but mainly due to the highest alcaic constituents content of the lignite ash in Northern Greece, which retain largely (90%) the sulphur dioxide produced by the incineration and as a result there has been a significant reduction in the emissions of such pollutant. For the reduction in the emissions of particulates, the electrostatic filters of all old units of the Public Power Corporation in Northern Greece have been replaced and as a result the emissions of particulates do not exceed under normal circumstances 100 mg/Nm³. An exception are the units I to IV of the Steam-Electric Station of Aghios Dimitrios, whose filters are of an old technology and have a reduced efficiency. For this reason, the construction of new electrostatic filters with a contracted rate of emission of particulates at 50 mg/Nm³ has been assigned to a consortium of contractors following a tender. The project shall be completed in 2007. The problem of the emissions of SO₂ from the Steam-Electric Stations of Northern Greece will be dealt with through the construction of an exhaust-gases desulphurisation unit in Unit III of the Steam-Electric Station of Megalopoli A, while Units I and II of the same Steam-Electric Station will suspend their activities until 2010. The Steam-Electric Station of Megalopoli B already has a desulphurisation unit, which after the problems it presented on the commencement of its operation has had a significant efficiency improvement and it may now be considered that the control of the emissions of SO₂ from that unit is sufficient. With respect to the emissions of particulates at the Steam-Electric Station of Megalopoli B, modern high-efficiency filters have been installed, while in Unit III of the Steam-Electric Station of Megalopoli A interventions are taking place for the improvement of the efficiency of the electrostatic filters, which shall be completed by the beginning of 2006. The

possibility of interventions in the electrostatic filters of other units of the Steam-Electric Station (I and II) is limited given that their remaining lifetime is little.

- *As regards the Inspectorates of Ore Mines*

In addition, as concerns issues raised in the said complaint and falling within the jurisdiction of the Inspectorates of Ore Mines we wish to note the following: (a) The legal framework governing the operation of ore mines with a view to ensuring a rational exploitation of the deposits, the restoration of the environment, safety and hygiene of both the workers and the local residents, is considered sufficient in the first place, while the effort at its improvement through the harmonization with the relevant guidelines of European Union is continuous. We should specifically mention the continuous effort at improving the working conditions through the effective Regulation of Mining and Quarry Works, while its overall reformation is being considered so that the amendments from time to time are incorporated; (b) Despite all existing weaknesses of the agencies inspecting the operation of ore mines and quarries of the country (Inspectorates of Ore Mines of Northern and Southern Greece) due to lack of personnel, we must note that those agencies make a very serious effort in cooperation with the employees associations of the Public Power Corporation and detailed instructions are given for every issue arising from the operation of mines. Continuous is the effort at imposing measures for the safety of the workers and the local residents and at the restoration of the environment, as well as at a rational exploitation. Within the context of the study in progress on the reorganization of all agencies of the Ministry of Development, care shall be taken for the harmonious operation of the Inspectorates of Ore Mines in relation to the staff and the material and technical infrastructure thereof.

The memorandum of the Public Power Corporation and observations supplementary to it follow below.

**Public Power Corporation SA
Memorandum**

**on the Collective Complaint 30/2005
“Marangopoulos Foundation for Human Rights against Greece”**

I. PPC LIGNITE MINES

With regard to the accusations on the activity of Western Macedonia and Megalopolis Lignite Centres (mining, transportation, lignite, spoils and combustion derivatives deposition as well as lignite stockpiling), summarized in the following thematic units:

- Mining activity
- Environmental management
- Waste management in the mines' premises
- Safety and hygiene at work,

we underscore the following:

1. MINING ACTIVITY

1.1 Lignite production

Lignite is the most important raw material our country disposes of whose exploitation so far has decisively contributed to the energy development of the country.

The lignite and electricity generation resources exploitation activities have been the basis for the development of energy policy in Greece in the last 30 years.

In the last years the yearly lignite production rate in the mines of Western Macedonia and Megalopolis Lignite Centers is 70 million tons and the rate of total mining activities exceeds 300 million cubic meters.

Lignite combustion covers around 60% of the total electricity demand in Greece, enabling, thus, household consumers to benefit from the lowest electricity price among EU countries. The yearly rate of lignite production places the particular mining activity among the biggest ones in a global scoreboard. To be more precise, our country holds the fifth position on a global scale and the second one in the EU as regards lignite production.

According to researches to date, the most certain geological stocks of Greece are estimated to 6,7 bil. tons. On the basis of the technological and economic data and the researches on lignite deposits so far, the stocks of the big lignite deposits to be exploited are around 3,2 billion tons, tantamount to 450 million tons of oil and their current value is above 150 billion \$.

Lignite exploitation is carried out in an organised way, according to studies elaborated by the services of the Mines Directorate General, by executives with long standing experience in mines affairs in cooperation with international research bodies (RWEs).

- The development of mines' operation is based on a **Strategic Plan** (TMMP) which aims at optimally capitalizing on the existing lignite deposits for the supply of lignite steam power plants and covers the entire deposits' life cycle till their depletion. Via this long-term planning a combined Mines' development is harmonised to meet the needs of lignite steam power plants for the next 30 years. This planning

is a specialised one including detailed one-year, three-year and five-year mining studies.

As for the short-term planning, mines draw up and implement the following programs:

- 5-year of rotating Operational Action Plans
- Yearly action programs
- The main objectives are monitored on a monthly basis.
- Lignite production and the machinery operation hours are checked on a daily basis
- The implementation of action programs is checked quarterly during the meetings of the Mines Directorate General executives.
- All important matters are monitored in a coordinated and systematic way.
- Benchmarking employing specific indicators is applied for best evaluating and assessing the results (Productivity indicators, equipment valorisation indicators, time indicators, accident indicators etc).

The development of mining activities is inevitably carried out in areas with mineral deposits. As a result, the ability to control environmental impact via the appropriate territorial planning of projects is very limited.

The quality of the lignite produced is marked by frequent and intense variations on account of the multi-stratified nature of the deposit. Generally, lignite is a fuel with high concentration in humidity and ash and poor in calorific content. Its low content in sulphur, especially of Western Macedonia deposits, combined with the high content of ash in quicklime CaO significantly contribute to abating carbon dioxide release in the atmosphere. It is highlighted that SO₂ (sulphur dioxide) and NO_x (nitrogen oxide) emissions by the Units operating in Western Macedonia basin are extremely low and below the threshold fixed by the relevant regulations and foreseen by environmental terms. In order to deal with **landslide and landslip** in slope mining and depositions of spoil materials, specific mention is made to environmental terms of mines, in particular in relation to high resolution land surveying measurements, so as to have an immediate response in cases of failure.

1.2 Surface and underground water affected by mines' development.

With regard to surface water and hydrographic network a series of studies have been conducted by independent researchers and Universities concluding that:

- a. Lakes situated in the wider regions of PPC projects are not affected by the latter:
 - Due to their distance from the projects
 - Due to the geological composition of the layers in between.
- b. The hydrographic (rivers and brooks) found in the intervention area is affected and very often the diversion of these lakes and brooks is required. These diversions follow the elaboration of specific environmental studies, which are approved by the competent services. It should be stressed though that runoff water volume is not affected negatively. It should be also

underlined that PPC activity positively contributes to the water balance of Ptolemaïda and Amyntaio basin. Indeed, underground water pumped through hydro drilling for mines' protection goes back to the basin, or is used for water supply or irrigation needs of region's citizens. Moreover, 30% of the quantity used to cool Units and derives from another hydrological basin is also discharged in Ptolemaïda-Amyntaio basin, enriching it with 15.000.000-20.000.000 cubic meters of water yearly. As a result, Begoritida lake level, on the decline up to now due to constant irrigation pumping, has been steady in the last years registering a slight increase.

In conclusion, taking into account: a) PPC's positive contribution to the water balance of the basin (transportation of water from Polyfytos lake), b) the geology of the area (small radius of cone of dell around the mines' trenches), and c) the biological cleaning and sedimentation tanks, the impact on surface and underground waters from mines' operation, namely the drop of the ground water table level due to the hydrogeological protection drillings in the mines and the water pollution due to the dispersion of processed wastewater are fully controlled.

1.3 Ash transportation and deposition

Ash management includes two stages:

The first stage, carried out by steam power plants (AHS), covers the dosimetric discharge of the ash from the silos and its being sprayed (adding 30% of water per ash weight) in water-spray systems (MIXER).

In the second stage implemented by the Mine, the ash is transferred through conveyor belts from the AHS to the Mines; it is mixed with earthy material and placed in the deposition areas of the Mine. Ash spraying, adding 30% of water guarantees its transfer through the conveyor belts without dust release in the atmosphere. For additional safety reasons and in order to comply with the environmental terms, the parts of the conveyor belts adjacent to residential areas shall be covered during the current year with special sheds. Along the ash conveyor belts, at particular spots abutting on residential areas, protective embankments are raised planted over with trees to protect these areas from the dust. Alternatively, these conveyor belts could be covered by specific sheds drastically restricting emissions. We highlight that ash transfer through closed conveyor belts is problematic due to the ash composition.

2. ENVIRONMENTAL MANAGEMENT IN THE MINES

2.1 Environmental impact from lignite exploitation

A productive activity of this kind and size obviously does affect the environment in many different ways. The main environmental effects on account of the mines' operation and development are summarized as follows:

- Vast stretches of land are blocked for big time spans
- Soil morphology is altered
- Flora and fauna of the region are disturbed
- Residential areas may need to be displaced, as well as the road and railway networks
- Atmospheric pollutants (dust), noise, solid waste and waste water arise.

The Mines Directorate General acknowledges that environmental regeneration in the lignite mines areas constitutes an issue of vital ecological, social and economical importance. Fully harmonised to EU Directives, the Directorate General systematically proceeds in a speedy way to reshaping new soils and to protecting and upgrading the environment.

2.2 Environmental assessment of mines' activity and issuing of Environmental Terms

The Mines of Western Macedonia and Megalopolis Lignite Centres systematically implement programs to deal with the impact of their activity on the environment. Based on the legislation in effect and the specific strategic studies for the regeneration of Mines new soils, the relative Environmental Impact Studies were elaborated and submitted to the Ministry of Environment, Urban Planning and Public Works. The Environmental Terms of operation for all big PPC mines have already been approved. These Environmental Terms briefly include:

- Elaboration of specific technical implementation studies for moulding and re-establishing the Mines' final surfaces (tree-planting, agricultural crops, creation of lakes etc.)
- Elaboration of soil stability studies and hydrogeological studies (water balance, integrated management of surface and underground waters etc) in the mines' operation wider region.
- Measures for limiting nuisance in neighbouring areas (creation of green zones, measurements of noise and vibrations at the boundaries of built-up areas, abatement of dust released etc)
- Wastewater processing and disposal
- Environmental quality control in the wider region of mines with extended air quality measurement networks
- Integrated management and by-products disposal (old equipment, old tyres, accumulators, oils-lubricants etc)
- Fire-protection measures to avoid lignite spontaneous ignition.
- Keeping a journal and files for environmental parameters
- Regular updating of the competent services and submission of a yearly report.

2.3 Environmental management policy. Actions for its protection in the mines

Having respect and environmental protection as the overriding principles, The Mines Directorate General develops its environmental management policy along the following axes:

- Respect for Environmental Terms.
- Compliance with the existing national and European legislative and regulatory requirements
- Constant improvement of environmental performance in every activity

- Development and preservation of a performative and effective environmental management system

The negative parameters of the productive activity were promptly detected. The Mines Directorate General, in its intent to deal with them in the best possible way abiding by the principles and the objectives fixed, has proceeded to a raft of activities so that, after lignite extraction activities are completed, the area be harmonised with the rest of the landscape.

The basic principles for a successful environmental management policy are:

- To be cognizant of the area's environmental conditions
- To pick up the appropriate methods and techniques for soil rehabilitation
- To have a general urban planning of the stretches of land to be rehabilitated (land use maps)
- Systematic implementation of environmental protection and rehabilitation programs in accordance with the approved Environmental Terms (Joint Ministerial Decisions)
- Follow-up and assessment of the environmental rehabilitation results, by means of state-of-the-art Geographical Information Systems (GIS).

To render the aforementioned interventions more effective, PPC is subject to regular controls by the competent services of Kozani and Florina Prefect Administrations, while being in a constant contact with the Organisations of Local Administration and trying to solve any eventual problems with regard to the environment and the development perspectives of the wider region.

2.4 Objectives and perspectives

The Mines Directorate General environmental projects focus on the following actions:

- Pollution prevention at source.
- A natural resources' rational management.
- An aesthetic and harmonious incorporation of new lands in the immediate and wider environment in which projects are implemented.
- Rehabilitation of green areas through tree planting and landscape rehabilitation in the new mines' land.
- Elaboration of communication channels with the competent authorities, bodies, organisations and local communities.
- Participation in the formulation of a new national and European environmental legislation on mines.

Moreover, an Environmental Management Program is put forward at Western Macedonia Lignite Centre aiming at raising awareness and training the staff on environmental issues.

In this whole effort to meet these objectives, all Mines DG officials share the conviction that environmental protection concerns everyone and calls for the sensitisation and mobilization of all employees. To achieve this target, emphasis has been given on setting up special operational units and systematising works pertaining

to the environment. The big brunt of the work is placed on instilling to employees the idea that environmental protection is a vital factor for mines' operation and on incorporating this idea in the Corporation's mindset.

2.5 Actions for environmental protection in the Mines

2.5.1 Expropriations - relocations. Land use

It is known that PPC, in order to use the lignite deposits of the country proceeds into forced expropriation of big farmlands, pursuant to Law 797/79.

PPC pays big sums of money to the owners of these lands as compensation, according to court rulings. Expenditure is also high for the acquisition of land in residential areas in which case the latter should be relocated.

The lands expropriated to date reach 155.000 *stremma* (1 *stremma*= 1.000 m²) for Western Macedonia Lignite Centre and 36.000 *stremma* for Megalopolis Lignite Centre.

So far, the residential areas Kardia, Charavgi and Exochi (3.000 inhabitants in total) have been relocated in order to exploit the mines in Western Macedonia Lignite Centre, whereas the residential areas Kleitou and Komanos are under the relocation process.

Similarly, for Megalopolis Lignite Centre expropriation has been carried out for the residential areas Psathi, Marathousa, Gefyraki and Anthochori.

The new stretches of land after the exploitation of deposits and the rehabilitation of soil according to Law 2941/12-9-2001 belong to PPC. This provision is similar to what applies in other EU countries (Germany) operating similar exploitations, where the land from expropriation and the rehabilitated final surfaces of the depositions constitute assets of the Corporation.

The implementation of the new law offers the following opportunities:

- The Corporation, having completed the rehabilitation of the rest environmental projects, can exchange them for new lands needed to develop the Mines, thus helping to preserve farmers' income in the region. By means of this exchange of land, farmers in the region maintain their basic means of livelihood, i.e agricultural crops.
- PPC, with the Real Estate Company about to be set up, is examining the optimal and most efficient use of these lands that would boost employment and would contribute to the development of the region.
- The new law provides for the setting up of affiliate companies for the exploitation of facilities with, or, without the participation of regional bodies, for developing productive activities (greenhouses, timber production etc), creating new jobs and, hence, developing the area.

2.5.2 Rehabilitation of new soils

Western Macedonia and Megalopolis Lignite Centres systematically implement land rehabilitation programs gradually detaching them from the Mines with the aim to be used for agricultural crops, forest or other uses. For this purpose, special strategic

studies have been conducted for rehabilitating the new soils of Mines by an interdisciplinary team from the National Technical University (NTU). These studies were taken into consideration prior to formulating the final proposals for the submission of the Environmental Impact Studies at the Ministry of Environment, Urban Planning and Public Works. According to the aforementioned studies, once the exploitation works have been completed, provision is made for the creation of 113.000 *stremma* of agricultural land and 75.000 *stremma* of forest land in Western Macedonia Lignite Centre. To date, 22.600 *stremma* of forest land have been created mainly in incline surfaces and 9.000 *stremma* of cultivation land in horizontal end surfaces of depositions.

For Megalopolis Lignite Centre around 27.000 *stremma* of forest land are set to be created, while the rest shall be created in farmlands including leisure and sports areas, facilities, lakes and wetlands.

a) Tree-planting

More than 6.500.000 trees have been planted so far in Western Macedonia Lignite Centre and more than 800.000 in Megalopolis Lignite Centre, namely a rate exceeding 600.000 trees/year. Agrestal kinds are mostly preferred in the areas of mines like acacias, pine trees, poplar-trees, Arizona cypress-trees, eucalyptus trees, as well as fruit-bearing trees like walnut trees, hazel trees, apple trees, pear trees pistachio trees in selected areas of mines facilities.

b) Creation of cultivation areas

The creation of experimental cereal crops began in 1986 with the aim to determine the fertility evolution of the new soils.

The evaluation of the results so far has shown the productivity of the depositions being in the same levels as the productivity of the wider region and in some cases even superior. At the same time, the productivity of the lands in question is compared to that of the experimental fields created by covering the depositions with fertile soil deriving from the surface of the expropriated lands.

Apart from cereal crops, in the rehabilitated lands of the mines in Western Macedonia Lignite Centre, in cooperation with the National Institute of Agricultural Research and Florina Technical & Vocational Institute a pilot greenhouse of soilless culture is in operation with the use of district heating. Moreover, a model orchard is in operation in the interior deposition of the Main Field to examine how fruit-bearing trees develop in the new soil and to show farmers of the region the new potential to embark on agricultural activities of high added value.

In Megalopolis Lignite Centre experimental crops were carried out in particular kinds of plants (e.g potato, beans, tomato) yielding satisfactory results. The results regarding the experimental sowing of cereals, oats and vetch gave similar results like in the wider region.

c) Specific projects for new soil rehabilitation-creation of ecosystems

Apart from large scale projects on the creation of cultivation and forest lands, there are a big number of other specific interventions for the new lands' optimal use. In the rehabilitated depositions ecosystems have been developed collecting the fauna from the ecosystems destroyed or disturbed. This fauna is enriched with the release of species from the breeding houses. Lakes-wetlands have been created in all depositions

and as a result a big number of fauna and flora species are massing around them and there is also enrichment with fish.

As to Western Macedonia Lignite Centre, these interventions are focused on the old mine area of the Main Field, the exploitation of which has been completed. As a case in point, we would like to mention the construction of the Exhibition Centre, being visited every year by more than 5.000 people from all over Greece and abroad, the Artificial Wetland, next to the National Motorway Kozani-Ptolemaida, which has evolved into an important ecosystem and with the cooperation of Universities it is expected to be used as an environmental education park. Another example is the Small Animals Refuge, which covers an area of 80 *stremma* and is used by the Forest Inspectorate and the local hunting associations to enrich the fauna of the region (with hares, partridges, pheasants), the Open Theatre constructed by workers in the Department of Environment using old material collected from the mines, the Forestry Park at the exterior deposition of the Main Field, where a model forest park has been created with all kinds of trees thriving in Northern Greece, the trains' history park and the facilities of the Department of Environment and the Intensive Training School for the staff of the Mines.

Respectively, in the rehabilitated areas of Megalopolis Lignite Centre, many projects have been carried out, such as

- Exhibition Centre facility with the prospect to organise it in order to fill visitors in regarding the Lignite Centre's activities.
- Leisure park (grove, playgrounds, playing-field), where various events take place in cooperation with the Municipality of Megalopolis.
- Artificial wetlands creating artificial lakes, some of which enriched with fish.
- Moto Cross race track, which has repeatedly hosted world games and has been characterised as model race track by representatives of this sport of international acclaim.
- Air corridor, which hosts private flight clubs of light aircraft.

2.6 Elaboration of specific studies and research programs for the optimal use of new soils.

The Mines DG apart from the necessary studies to comply with the approved environmental terms and Legislation and to cover the needs of Lignite Centres, does elaborate other studies in collaboration with other DGs on how to optimally use the new soils after the rehabilitation of lands from lignite exploitation.

Furthermore, it participates in various research programs in cooperation with Universities and other Bodies in order to enlarge knowledge in specialised technologies in new soils rehabilitations.

We indicatively mention the following programs and studies:

- pilot greenhouse of soilless culture in Western Macedonia Lignite Centre
- Diachronic evolution of the fertility of the soils developed in lignite mines' depositions.
- Research for the agricultural use of the lands that derived from lignite extraction in the areas of Ptolemaida and Amyntaio.

- Planning and setting up a Geographical Information System of Western Macedonia Lignite Centre in cooperation with the Greek Habitat and Wetlands Centre
- Research on heavy metals behaviour on the soils developed in the lignite mines of the Northern Field and of Kardia, an area in Ptolemaïda. Impact on crops (National Technical University of Crete).
- Research program in cooperation with Florina Technical & Vocational Institute for the model orchard and greenhouse.

It should be mentioned that the above research programs and the results of experimental crops showed that, on the one hand fertility of the new soils is of equal or bigger per *stremma* performance compared to the natural soils of the region, while trace elements' and heavy metals' content in the nuts of cereals cultivated in the regenerated soils are equal or smaller from the ones of the nuts cultivated in the normal soils of Ptolemaida.

The heavy metals' and trace elements' concentration in the restored soils of the mines and in the nuts produced from cultivating these soils, were studied by a scientific team from the University of Crete under professor Ant. Foskolos. The results from the analyses showed that the agricultural exploitation of the mines' rehabilitated surfaces can by no means harm the health of individuals who will consume the products since the cultivated soils are similar to the rest of the lands of Ptolemaida basin.

2.7 Elaboration of specific studies and research programs for Environmental Protection

The Mines DG, apart from the necessary studies to comply with the environmental terms and Legislation on environmental protection issues (air, water, soil), participates in Research Programs in collaboration with Universities and Bodies in order to investigate any possible effects and a systematic way to deal with them.

We indicatively mention the following programs and studies:

- Hydrogeological research for the water supply of the Municipality of Kozani.
- Water resources management system and methods of artificial enrichment in lignite exploitation areas- 'Elimeia'.
- Composition and technological use of PPC steam power plant lignite ashes of Ptolemaida-Amyntaio region.
- Study of the possible impact on the water regime of Cheimaritida lake from the exploitation of Amyntaion lignite mine.
- Hydrogeological conditions of Southern Field basin-Water balance.
- Hydrogeological study of drainage and protection of Southern Field mine.

3. WASTE MANAGEMENT IN THE MINES PREMISES

3.1 Implementation of Environmental Programs based on the Environmental Planning to deal with the impact from Mines operation

The two Lignite Centres of Western Macedonia and Megalopolis systematically implement all necessary measures-in accordance with the environmental planning- to observe Environmental Terms in the Mines.

In detail, measures to suppress pollutants, air ones (dust, suspended pollutants), liquid, solid ones (useless material) and noise are:

a) Dust, suspended particles

In order to deal with the dust generated from the mines when moving the excavation materials with conventional means, either permanent spraying networks are used, constructed along the main road networks, or tank-wagon vehicles for secondary roads. Additionally, the lignite transportation trucks have special covers. Moreover, big parts of the internal routes of the Mines are paved with asphalt.

b) wastewater

The waste from the mines complexes (offices, dressing-rooms, repair workshops) before reaching their natural recipients, are processed in biological cleaning installations. Oils and lubricants used in the repair workshops of diesel engine equipment, in the machinery and the vehicles, are collected by the Management Department and are promoted for recycling.

c) Solid waste - warehouses of useless and other materials

For a better collection, selection and disposal of useless materials (irons, machines' parts etc) 'squares' (i.e a kind of open warehouses) have been constructed in selected areas.

The disposed materials are stocked in a warehouse of useless materials and are sold after a tender. Materials liable to cause pollution (e.g oils from electric engines) are collected in barrels to be sold. Materials that may become hazardous waste (e.g machines batteries) are collected in the useless materials warehouse to be sold.

d) noise

To reduce noise in the repair workshops premises, measures are taken according to the Regulation on Mine and Quarry Activities and the legislation in effect.

To limit noise caused by the machinery and the vehicles during lignite extraction, special earthen sonic barriers are constructed, so as not to disturb the neighbouring residential areas. The above Regulation has a modern mobile noise measurement station to record noise pollution and deal with it.

Therefore, it is obvious that Mines DG considers an effective environmental protection as equally important as the productive and economic objectives.

3.2 Waste burial from steam power plants

Operating an asbestos land filling area in the interior deposition of the Kardia Field Mine involves waste coming exclusively from the AHS of the region and operation is carried out in accordance with environmental terms approved by the Ministry of Urban Planning and Environment, based on what is stipulated by the legislation and best practices for the final disposal of dangerous waste. Therefore, there are minimal risks for the environment.

4. SAFETY AND HYGIENE AT WORK

PPC lignite mines deal with safety and hygiene issues of workers just like with the other basic business activities and their management is an integral part of the Administrative-Organising Structure of Mines DG. In the two Lignite Centres two Operational Units have been set up on a Department level with the responsibility to manage safety issues and staff training in the lignite mines. These Services have been in operation for 25 years now and fall under the Directorate's responsibility.

The staffing and operation of the Services managing safety and hygiene issues at work is governed by the following legislative framework:

➤ Regulation on Mine and Quarry Activities

It is the main regulatory framework governing the activities of research, exploitation, use and processing of mineral raw material in every mining or quarry area.

➤ Law 1568/85

It is the main Law stipulating

- The setting up and the competence of Workers' Safety and Hygiene Committees
- The employment obligation and the competence of Safety Technicians and Work Doctors in the Corporation
- The setting up of Bodies on a national level to improve working conditions
- Issues of machinery occupational risk prevention
- Workers' protection measures from natural, chemical and biological agents

➤ Presidential Decree 105/95

This decree refers to the labelling of risks at work place

➤ Presidential Decree 396/94

This decree refers to the minimum Safety and Health requirements for the use of the personal protection means by workers.

The object and the competence of the Hygiene, Safety at work & Training Services, as provided for in the existing organisational chart of the Lignite Centres and the Corporation can be summarized as follows:

- To implement a targets-oriented policy to prevent accidents and occupational diseases, to deal with occupational risks and in general to improve working conditions in the Mines
- To control the working environment and to observe any provisions and instructions on Health and Safety at Work in all mines and Lignite Centres Units.
- To elaborate and implement training programs for the Lignite Centres' staff.
- To study and constantly update on the new materials, supplies, tools, methods to safely carry out a task and to support Units on their use and implementation
- To develop intra-communication in the Lignite Centres on issues of Health and Safety at Work
- To manage issues related to hazardous substances or non waste (PCBs, Ni-Cd accumulators, asbestos, used mineral oils etc) existing or used in the Mines facilities.
- To care for the readiness of fire-extinguishing stations, their vehicles and the general fire-extinguishing means.
- To collect and study statistical data on accidents and other related issues.

Hygiene management at work place is structured as follows:

In Western Macedonia Lignite Centre and in particular in each one of the four mines a doctor's surgery has been set up and operates on a 24hour basis with nursing staff, equipped with all the necessary medical devices (e.g cardiopulmonary resuscitation device, audiometer, spirometer, sphygmomanometer etc) and ambulances. In these 4 surgeries 4 work doctors offer their services with an employment program proportional to the number of workers and according to what is stipulated by the relevant legislation (work doctor's hours=number of workers X 0,8 yearly). Work Doctors monitor the staff by referring them for regular medical check up to the Regional Staff Insurance Brackets. They also draw up the Personal Health Booklet for every worker.

In Megalopolis Lignite Centre a surgery has been set up and operates, staffed on a 24hour basis, with nursing staff and equipped with all the necessary medical devices. In this Surgery one work doctor offers his services.

Mines' DG has planned the policies and in general the risk management system and work safety system in the mines on the basis of the **principles' framework** below:

- The majority of accidents and adverse events are not caused by 'careless' workers but by a lack of updating, training and control, which are the responsibility of the company.
- All accidents are preventable
- Preventing and safeguarding workers' safety constitutes important factor to reduce production cost
- Safety at work, health and production are sides of the same coin.

The policies and management methods of the risk for safety at work developed and applied so far in the mines, are the following:

- Safety is incorporated in the productive process
- Regulations and directives are issued for the organisation and the specifications of all works executed in the Mines and for work safety requirements

- Staff is trained on risk analysis and assessment with the aim to build a work safety culture
- Control for the efficiency, reliability and effectiveness of the total management system of work safety. Re-planning of actions to improve the results.

4.1 Regulations and work safety instructions

The regulations and work safety directives drawn up in the last 10 years for all works carried out in the mines are the following:

- General Safety Regulation. This regulation includes the general obligations of workers on work safety matters.
- Specific Safety Regulation for electric machinery in the Mines
- Specific conveyor belts' Safety Regulation
- Specific Safety Regulation for self-propelled machinery in the Mines
- Specific Safety Regulation for machine –works
- Specific Safety Regulation for transporting-storing and using oil products

These specific regulations cover the organisation and the technical specifications for the execution of works with the above machines as well as the work safety demands. These regulations were approved by the Ministry of Development and are distributed, duly signed, to Mines' workers and technical staff.

At the same time the following **directives** have been issued in volumes:

- Directive on the management of chemical substances
- Safe fire-extinguishing intervention under voltage
- Directive on safety labelling & health
- Directive on the protection from falls and slips
- Directive on the rescue of victims from electrocution
- Directive on safe driving
- Directive on the management of cleaning liquids-decontamination
- Directive on reducing noise
- Directive on the use of tools with insulation
- Directive on protection means from fall
- Directive on the management of devices with sf6
- Directive on head protection means
- Directive on hearing protection
- Directive on work gloves
- Directive on respiration protection means
- Directive on the management of used mineral oils
- Directive on the demolition of asbestos-asbestos cement
- Directive on the management of devices with PCBs

For the **evaluation and measurement** of the working environment quality and the harmful agents modern measurement methods are used. The results are recorded and when limit values fixed by the relevant legislation are exceeded, work doctors and Mines' officials are informed.

In the last years in order to prevent occupational risk, mines have elaborated **Written Assessment Studies** of the occupational risk for all the jobs executed by the staff. These Studies take down and analyse all factors affecting safety at work and workers' hygiene (equipment, productive process, organisation of work, directives and safety regulations) and then via *in situ* measurements, in cooperation with the workers directly involved, the following are determined:

- Sources of risk
- Risk assessment
- Consequences of the risk, and
- Prevention measures

For the training needs of the mines' staff specific **educational programs** are implemented every year. For work safety in particular, there is a rotating 8-hour program compulsory for all workers. In total, 24.000 hours of training take place per year on work safety matters. Daily conferences are organised on work safety and hygiene issues with the participation of the employers or top executives and the committees-workers' representatives.

The evaluation of statistical data on accidents (frequency and severity indicators, fatal accidents) show that:

- Accidents' indicators in PPC mines have been on a significant decline in the last years.
- In comparison to similar exploitations in America and Germany, frequency and severity indicators classify PPC mines as having the highest safety degree in Europe and worldwide vis-à-vis their productive activities.
- Frequency indicators being around 5 and severity indicators around 200, place PPC mines about 25% below EU average for the indicators of similar activities.

5. WORKING CONDITIONS IN THE MINES

Lignite activity is carried out in open mines with the method of constant extraction-transportation-storage. To exploit lignite heavy electrified machines are used, bucket-bearing excavators, conveyor belts, depositors, and a big number of heavy diesel-fired earthworks machinery, bulldozers, loaders, heavy lorry vehicles) to support the main exploitation equipment and the operation of specific worksites (hard ones etc). The machines run under particularly hard conditions (dust, mud, water) and due to the kind of works, they sustain strong vibrations. Handling these machines calls for physical strength and alertness.

Mines operate on a 24-hour basis, during the whole year regardless of weather conditions. Therefore, workers are directly exposed to weather conditions (very low temperatures in winter months, with heavy snow and frost, or heavy rains, whereas very high temperatures in summer time). These conditions hinder the operation, the handling, the supervision and the maintenance of the equipment and increase workers' demands.

On account of these adverse weather conditions in the mines, as described above, workers fall under the category of heavy and hazardous professions and are retired with the lowest age limit. Moreover, workers in a guarding post are entitled to 5 more days in their normal leave.

As for working on Sundays and holidays:

- Workers are granted an equal number of hours of rest as the working hours and they are also granted a compensation amounting to 0,75 of their wage.
- If, upon request by the wage earner, no compensation is paid, the number of hours of rest is increased by 75%.
- If, by an exception, upon request by the wage earner due to work needs, no rest is granted, the compensation per working hour is calculated as 1,75 of the wage.

6. CONTRACTORS' EMPLOYMENT IN THE MINES

The contracts for projects undertaken by contractors in the Lignite Centres fully safeguard legality, since PPC imposes binding conditions on Contractors regarding the respect of both workers' general legislation and Mines' specific Legislation (Regulation on Mine and Quarry Activities and L. 1568/85).

In the contracts' volumes signed by contractors, obligations are explicitly stated with regard to the implementation of labour legislation and Safety and Hygiene matters. In detail, contracts provide for:

- Contractors' obligations vis-à-vis the staff (skills, specialisation, necessary licenses etc)
- Obligations vis-à-vis insurance funds, respect for collective labour bargaining agreements etc
- The necessary engineering equipment to implement the project, which should have legal licenses.
- Securing the projects against any kind of risk from road accidents and *force majeure*, third party liability insurance, transportation insurance, contractor's staff insurance and insurance for vehicles and machinery.
- Contractor's obligations for the prevention of accidents (they are outlined in a special volume), in accordance with the existing legislation.
- Instructions in a special volume for work safety in the worksites.

Upon the execution of contracts, the legislation in effect applies and the administration and supervising services make daily efforts to constantly improve the operation of the worksites.

PPC SA Services cooperate and assist Labour Inspectorates in various places to monitor whether labour legislation provisions are abided by in relation to Health and Safety issues at the workplace of the Contractors staff, in the mines' premises and facilities. The control by the Inspectorate of Northern Greece Mines (INGM) is continuous and thorough, both in technical issues as in the measures taken for workers' safety and hygiene. The Directorate and the competent bodies of Lignite Centres update INGM on the above, follow its orders and instructions and in any case

assist its audit mechanisms in their task. Additionally, through letters they ask for its intervention with on the spot inspection, in cases legality is infringed.

7. PPC CONTRIBUTION TO THE DEVELOPMENT OF LIGNITE AREAS AND THE SOCIOECONOMIC IMPACT

Socioeconomic impact deriving from the development of Western Macedonia and Megalopolis energy centres mainly refers to the radical change of the productive fabric of these areas and the displacement of the population by creating local urban centres.

Prior to the onset of lignite exploitation, the mines' areas were agricultural, forest and animal breeding lands of low productivity and declining population. With the development of the energy centres, an era of economic recovery and prosperity began; new jobs were created in activities different from the traditional ones in the areas in question, income per capita increased and restructuring began at a speedy rate.

For the energy centres' development, the relocation of the residential areas situated over the lignite deposits was deemed necessary. To date, in Western Macedonia 3 residential areas of 3000 inhabitants have been relocated, and in Megalopolis 3 residential areas of around 200 inhabitants have been relocated. A big part of this population settled down in the cities of Ptolemaïda and Megalopolis.

Since 1997, a fee for the development of industrial areas has been instituted, which amounts to around 0,4% of PPC's yearly turnover and it is distributed to the Municipalities of Kozani, Florina and Arcadia, where lignite mines and lignite units operate. During the period 1997-2004 the sum of 75,0 mil. € was allocated to the 3 municipalities. For 2005 the total sum to be allocated to these municipalities is estimated to 15,15 mil. €. The fee distribution is done according to the energy generated by the steam power plants of the abovementioned areas and-as law foresees- the funds to be raised are set to be used to finance specific infrastructure, development and environmental protection projects. The important sums given on a yearly basis by PPC on account of this fee are expected to become an important driving force for development and progress in the municipalities' wider region. Apart from the social return projects and the fee for the development of industrial areas, 5,0 mil. € are allocated on a yearly basis for new soils' rehabilitation projects and environmental protection in the lignite mines. Moreover, based on the annual report regarding the operation of mines only (salaries, procurement, contract works etc), 350 mil. € yearly goes to the local communities of Kozani, Florina and Arcadia Municipalities.

District heating

PPC in cooperation with various Municipalities has implemented a series of projects for energy supply in the form of warm water for cities' district heating in an effort to ensure constant heating of residences and cities without polluting the environment.

District heating has already been in operation successfully in the cities of Kozani and Ptolemaïda for years now and recently district heating operated in the city of

Amyntaio offering citizens thermal energy, which-via the appropriate policy by the municipalities-has significantly improved their living standards providing cheaper heating energy and reducing pollutants.

As a result, Municipalities showed great interest to provide extra thermal energy from the closest AHS. The Corporation, responding to this rising interest, is already studying and negotiating for additional thermal energy supply in the Municipality of Ptolemaida from Units III/IV of Kardia steam power plant (AHS) and for the extension of district heating in Kozani from Units I-IV of Ag. Dimitrios AHS.

II. LIGNITE-FIRED POWER PLANTS

Lignite is our national fuel which underpins the development of the country and energy supply safety.

Energy supply safety along with environmental protection and competitiveness constitute the three main objectives of the EU energy policy. Greece is situated in the South-eastern end of EU and, therefore, is an energy islet with limited capacity of power exchange. Safe power supply requires constant use of domestic lignite, which is not affected by energy crises and price fluctuations like the competitive fuels.

It should be underlined that the National Allocation Plan of Emissions' Rights, approved by the EU, par. 2.3.2 (Forecast of the energy system evolution) mentions the following: 'In the light of lignite's importance for safely covering the energy needs of our country, there is the possibility to introduce in the system new state-of-the-art lignite Units of high performance replacing the obsolete stations. Such a planning could include the construction of at least one lignite Unit until 2012'.

PPC is systematically monitoring the quality of the environment in the areas it develops its activities and in particular in Western Macedonia and Megalopolis.

PPC in order to ascertain whether its activities in Kozani-Ptolemaida basin and in Megalopolis affect population's health, it sponsored epidemiological studies. According to the results of these studies, further down mentioned in detail, there is no evidence of health hazards on citizens from the Corporation's activities.

1. Environmental management policy in electricity generation

Hereunder we present the basic axes of PPC environmental policy and the actions undertaken to implement this policy.

1.1 Basic axes of PPC environmental policy in electricity generation

Basic axes of PPC environmental policy in electricity generation are focused on the following:

- Community and National legislation on environment is abided by and it constitutes an inviolate condition for every activity.
- The Best Available Techniques are applied gradually, both for new and existing units in the framework of a Directive for an integrated Pollution Prevention and Control.

- Domestic energy resources (mainly lignite) and the country's water resources are capitalised on.
- Dialogue with interested parties to plan development programs or projects and dialogue on its existing operations.
- Promotion of scientific knowledge and know-how by participating in EU research programs to deal with environmental matters.
- Coordination with other policies running in parallel, like hygiene and safety at work, etc
- Constant exchange of information and cooperation with other bodies of the same industrial sector on a European level to elaborate anti-pollutant techniques or, to limit pollution.
- Elaboration of realistic programs to inform the staff on the Corporation's environmental affairs.
- Development of external communication in order for the public to be acquainted with the work carried out by PPC SA on environmental protection.
- Evaluation of environmental performance in comparison with the results yielded and the methods employed by other similar bodies on a European level.
- Strengthening of the administration and management of environmental issues.
- Integrated approach for a holistic environmental protection.

The implementation of PPC SA environmental policy for electricity generation is a commitment of PPC administration and it is fully incorporated in its Operational Plan, both vis-à-vis the design of new Production Units, as in the running and exploitation of the existing Units. This commitment constitutes, on the one hand, the objective of the Corporation for sustainable development, and on the other, an expectation and demand by all interested parties: shareholders, clients, state's stakeholders, associates, suppliers and the society as a whole.

1.2 Environmental actions in electricity generation

The environmental actions and the objectives of this policy are analysed in the following units.

1.2.1 Development of new Units with integrated environmental assessment

The environmental component is a basic parameter for the planning of a big energy project (thermal or hydroelectric). Already from the spatial planning phase of the project, the following criteria are taken into account, among others:

- The development potential of the wider region
- Consensus from the local community
- Geomorphologic characteristics and the area's seismic activity
- Meteorological and hydrological data
- Distance and view from residential, tourism and archaeological areas and from areas of special environmental protection.

The next stage is a thorough examination of the environmental impact from the construction and operation of the project. All necessary environmental studies are conducted (dispersion of air-pollutants, diffusion-transfer of cooling-water heat, dams

failure studies etc) and the most important points are identified to be taken into consideration in the planning.

Upon studying and contracting the project, the most modern and integrated technological solutions are applied, including antipollution technology.

1.2.2 Respect for Environmental Terms in construction and operation/environmental assessment of production activities

a. Joint Ministerial Decision on Environmental Terms Approval (ETA)

All steam power plants (AHS) and hydro electrical stations have been subject to a full environmental impact assessment. On the basis of this assessment and the legislation in effect, the relevant Studies on Environmental Impact were conducted and submitted to the Ministry of Environment and Urban Planning. All Environmental Terms of Operation of the existing AHS Units have been approved, except of those in Megalopolis I,II,III.

Joint Ministerial Decisions (JMD) on Environmental Terms Approval (ETA) include among others:

- Limit values for the emission of air pollutants (SO₂, NO_x, particles etc) and liquid waste.
- Limit values on environmental quality for the air, noise and Liquid waste recipient.
- Monitoring and recording of gaseous waste
- Processing and dispersion of liquid waste
- Processing and dispersion of solid by-products/hazardous or non waste
- Transportation and storage of liquid fuel and aggregates
- Recording of fuel and ashes quality
- Environmental Quality Control in the wider area of generation plants with extended air quality measurement networks
- Management of hazardous substances
- Journal keeping
- Measures to deal with emergencies and equipment damages
- Plant operation in correlation with environmental parameters
- Regular briefing of the competent services and submission of a yearly report
- Extraordinary briefing of the competent services in case of damage of the anti-pollutant gear and excessive emissions' limit values

In all steam power plants (AHS) and hydro electrical plants an extended program of systematic management, monitoring and recording of all the parameters related to the above is applied.

The controls' results are assessed by specialised scientific staff of the Corporation and, by extension, by the respective scientific staff of the Services to which the results of the environmental measurements are notified.

PPC, by applying the Operation Environmental Terms, has installed and operates permanent automatic measurement systems for suspended particles emissions in

lignite generation plants. It has also appointed someone in charge of the automatic system operation and maintenance in general of the respect for the environmental terms.

Therefore, it becomes clear that:

- Power plants operate with particularly strict environmental terms
- All measures are taken for environmental protection
- The competent authorities (both on a local and central level) are informed directly on any operational problem or excess of limit values

The above Joint Ministerial Decision on ETA fully covers what is mentioned in JMD 40786/2143/88 (parag. 59 of the said complaint).

In particular, with regard to trace elements' measurements in samples from measurement stations of air quality, liquid industrial waste, flying ash, as well as in samples of soils rehabilitated for new cultivation, the first yearly sampling and measurement cycle has been completed starting on 19/2/98.

The results of the relevant analyses were referred to the Ministry of Environment and Urban Planning and the continuation of measurements was not deemed necessary.

b. Environmental assessment of production activities

For the environmental assessment of production activities it is important to monitor air quality. PPC, applying JMD on ETA, has installed extended networks in the area of electricity generating plants. In particular, for lignite plants we mention the following:

Region of Megalopolis

PPC SA, by applying the Operation Environmental Terms of Megalopolis IV steam power plant (AHS), has an installed measurement network around Megalopolis basin. Until 2001 the network included 7 stations for sulphur dioxide measurement and 2 stations of suspended particulate solid matters measurement. In 2001 the POLLUTANTS DISPERSION STUDY IN THE REGION OF MEGALOPOLIS was elaborated by the specialised laboratory of Aerodynamics, Fluids Section of the National Technical University. The forecasts of studies' models confirm the values of PPC measurement stations, and definite conclusions were drawn on the location to place three new automatic measurement stations for all pollutants. These new stations are of state-of-the-art technology and apart from the pollutants, they measure and record meteorological parameters (wind direction and speed, humidity etc), in the appropriate positions, approved by the Ministry of Environment.

These stations tele-transmit in real time all data to the monitoring staff through PCs and special telecommunication lines. Moreover, procedures are in place in order for data to be transmitted automatically to the competent environment department of Arcadia Prefecture Administration.

Region of Kozani-Florina

For the air quality control in the wider area of Kozani and Florina Municipalities and applying JMD on ETA in lignite steam power plants there is in operation a system to monitor/record and process the values of the main air pollutants and meteorological

parameters. The Air Quality Measurement network in Kozani-Florina Municipalities is developed in 9 locations. In 8 of them there are stations with analysts for the constant measurement and recording of the pollutants, whereas in one station only suspended particulate matters are measured and recorded. The selection of the stations' location of the monitoring network was done by the pertinent service of the Ministry of Environment in cooperation with PPC SA and the competent services of Kozani and Florina Prefecture Administration. The air quality measurement stations in Kozani and Florina region are equipped with a wireless teletransmission system of measurements connected with the competent service of Kozani Prefecture Administration.

Measurements results

The results from air quality measurements showed the following:

- **In the areas of Megalopolis and Kozani-Florina there were no excessive established limit values of air quality for sulphur dioxide and nitrogen acids**
- In the wider region of Megalopolis steam power plant (AHS) there is no excess of air quality limit values for total suspended particles
- In Kozani basin the ground concentrations of suspended particles are generally lower from the respective limits and are declining on account of the progress of electrostatic precipitators replacement projects in the lignite units of the basin.

Elaboration of specialised studies

The above results not only are confirmed by the Corporation's measurement network but also by specialised studies elaborated by universities on behalf of the Corporation. A case in point is the results of the program 'Study of the chemical composition of suspended particles to determine the participation rate of their emissions' sources in the Eordaia basin atmosphere'.

On the basis of data deriving from the abovementioned program implemented by the Aristotelian University of Thessaloniki/Chemistry Faculty/Laboratory for the control of environmental pollution in the years 1996-2000, the following conclusions were drawn among others:

1. The chemical analysis of corpuscular emissions from various sources of Eordaia region (flying ash and lignite of PPC steam power plants, waste gas from various types of vehicles, household heating, waste and biomass combustion) proved that there are no sources emitting suspended particles with a high content of toxic and hazardous substances (e.g PCBs, dioxins, PAHs and heavy metals).

- Sampling and analyses of TSPs (total suspended particles) in 10 points in the area of Eordaia (1. Pontokomi, 2. Polimylos, 3. PPC building area, 4. Kozani, 5. Amyntaio, 6. Kleitos, 7. Florina, 8. Ptolemaida, 9. Vegoritida, 10. Petrana) between October 2000 until November 2001 showed that:

-The concentrations of heavy and toxic metals contained in TSPs are in levels usually observed in residential areas. There were not found increased concentrations of toxic elements that could cause environmental problems.

-Polycyclic Aromatic Hydrocarbons (PAHs) were found in normal levels for respective cases.

2.The application of identification and quantification model of suspended particles' emissions sources yielded the following results:

- The main source of suspended particles' emissions is the diesel oil combustion (Lorries, buses, taxis, agricultural vehicles etc) ranging from 30% (Petrona) up to 51% (Pontokomi) in the cold period and from 2% (Florina) up to 22% (Kleitos) in the warm period.
- As far as the participation of the flying ash, it ranges from 2% (Florina) up to 18% (Kleitos) in the cold period and from 2% (Florina) up to 22% (Kleitos) in the warm period.

Therefore, any 'air pollution' systematically referred to in the complaint is not documented but based on general references in the literature, disregarding the real data of measurements and specialised studies.

c. Renewal of JMD on ETA- Adjustment of generating plant in the new environmental legislation (IPPC Directive and 2001/80/EC)

As it was mentioned, the environmental policy of Production Directorate General includes, among others, the faithful observance of the Community and National environmental legislation, which constitutes an inviolable term for every activity and the implementation of the Best Available Techniques (BAT), both in the new and the existing units gradually, in the framework of the 96/61/EC Directive for an Integrated Prevention and Pollution Control (IPPC Directive).

The new steam power plant Melitis in Florina Prefecture was constructed taking into account the most state-of-the-art anti-pollutant technology, according to the aforementioned Directive.

We underscore that the Corporation's executives, in cooperation with the Ministry of Environment, Urban Planning and Public Works actively participated in all stages for Best Available Techniques Determination for the large combustion facilities, in the context of information exchange the Commission is organising between Member States and the interested industrial sectors (art. 16 of the Directive).

Moreover, PPC's executives participated as national representatives in the Technical Working Groups, under the auspices of the European IPPC Bureau (EIPPCB) for the publication of BAT manuals on big Industrial Cooling Systems, Large Combustion Facilities and 'Economics & Cross Media'.

This participation resulted in an immediate and prompt updating of the Corporation on the issue, and in incorporating timely the necessary environmental investment in the environmental planning.

The gradual BAT application in the existing combustion facilities is set to be completed in November 2007, according to the IPPC Directive.

This important environmental investment on lignite Units foresees the improvement of the existing and the addition of new electrostatic precipitators, of modern technology and high performance rate. It also foresees the establishment of a

desulphurisation facility of waste gas in Unit III of Megalopolis steam power plant, improvement of the operation of the waste gas desulphurisation complex of Unit IV, as well as measures for energy saving and increase of lignite Units performance rate.

PPC SA has promptly submitted renewal applications to the Ministry of Environment for Units I, II, III of Megalopolis steam power plants and for the existing steam power plants for which the Joint Ministerial Decision on the Environmental Terms of Operation Approval has expired. These applications are accompanied with the necessary complementary data, according to the legislation in effect.

In this context, PPC also submits to the competent department of the Ministry reports on BAT application in each of its facilities. These reports on lignite steam power plants include Best Available Techniques (BAT) for the reduction of air pollutants' emissions, for the processing of liquid industrial wastes, for the delivery and transportation of fuel and flying ash, unloading and storage of raw materials, for the combustion, cooling systems and soil disposals.

The measures implemented by the Corporation, besides the compliance of generating plants with IPPC Directive provisions, cover the requirements of Directive 2001/80/EC for the limit of certain pollutants by Large Combustion Facilities. By means of this Directive, the country submitted a National Emissions' Reduction Plan (NERP) to the EU for the existing combustion facilities (including all lignite units, except for Melitis steam power plant). NERP includes all the abovementioned environmental investment by the Corporation regarding the lignite plants per se. According to information we have at our disposal, this plan was accepted by the European Commission.

In compliance with Directive 2001/80/EC, PPC declared to the competent Authorities that it shall restrict the operation of Units I and II of Megalopolis steam power plants (20.000 hour-operation) from 2008-2015.

1.2.3 Implementation of Environmental Programs to enhance the environmental behaviour of the existing Thermoelectric Units

The individual environmental programs to enhance the environmental behaviour of the existing Thermoelectric Units and their operation on the basis of BATs include:

- Programs of carbon dioxide emissions' reduction
- Installation of anti-pollutant equipment for the reduction of particles' emissions
- Installation of fuel desulphurisation systems for the reduction of SO₂ emissions
- Installation of improved systems of liquid waste processing
- Programs for energy performance increase and energy saving
- Household district heating programs by steam power plants via co-generation

a) Programs of carbon dioxide emissions' reduction

The program of carbon dioxide emissions' reduction which regards generation activities consists of:

- Introduction of natural gas as a new fuel in electricity generation
- Development of the country's hydrodynamic resources
- Energy saving and rational use of it
- Application of the most efficient lignite burning technologies
- Follow-up of the technologies' evolution for carbon dioxide capture and storage
- Preparation of the Corporation for the implementation of Kyoto Protocol flexible mechanisms taking special care to implement Directive 2003/87/EC on instituting an emissions' trading system
- Elaboration of a program for a systematic monitoring and reporting of carbon dioxide emissions for all Corporation's Units, in full compliance with the Directive's 2003/87/EC provisions and the European Commission's Decision 156/29.01.2004.

b) Installation of anti-pollutant equipment for the reduction of particles' emissions

For the reduction of particles' emissions from the lignite power plants the Corporation is implementing a program for the replacement, upgrading and addition of new electrostatic precipitators of state-of-the art technology and high performance. The implementation of the program so far in PPC SA Units has remarkably increased the air quality in the areas adjacent to the plants.

In the context of the said program, since 1987 to date PPC SA has replaced the existing electrostatic precipitators in the lignite units I and II of Kardia steam power plant, in the units I, II, III and IV of Ptolemaida steam power plant, in the units I, II of LIPTOL steam power plant, of units III and IV of Kardia steam power plant and of the ash electrostatic precipitators of unit III of Megalopolis steam power plant. In the context of the same program and amidst efforts to constantly improve the environment, intervention projects have been completed in the electronic and construction parts of the electrostatic precipitators.

By replacing the latter in the ten oldest units of Kozani-Ptolemaida basin, the suspended particles' emissions have been significantly limited because the total performance rate of the electrostatic precipitators of the Energy Centre plants have been increased from 97, 29% in 1987 to 99, 80% today.

Though this shift looks small in mathematical figures, nevertheless the real emissions of the Energy Centre plants-which is what is sought after- have been diminished fourfold since 1987 to date, though total energy generation has risen, whereas specific emissions of suspended particles per kWh produced has dropped by six times.

According to the Corporation's operational plan 2001-2005,

- The Contract was signed in September 2004 and the upgrading of the existing electrostatic precipitators and the addition of new ones has began in the four lignite units of Agios Dimitrios steam power plant costing 130 million euros. The project is being implemented smoothly according to the contractual timetable.

- The project for the improvement of the existing electrostatic precipitators and the addition of new lignite electrostatic precipitators are under way in the Unit III of Megalopolis steam power plant, of total expenditure of 26 million euros.
- Oil plants also implement a program for the reduction of emitted particles, mainly involving the use of extra combustion improvers and the substitution of the existing oil burners with new ones of dispersion with steam.

All the above in combination with the introduction of natural gas to the country's energy balance led to the reduction of particles' emissions coefficient from the large combustion facilities by around 85% in the decade 1990-2000.

All Environmental Impact Studies become public according to the legislation in effect. Moreover, in the Technical Reports of the Best Available Techniques submitted to the Ministry of Environment and Urban Planning, along the lines of the renewal of the Joint Ministerial Decision on ETA in our facilities, with regard to electrostatic precipitators' performance rate, the technical characteristics of the Units' electrostatic precipitators are described.

The important reduction of the special emitted particles and the important improvement of the quality of the atmosphere is the best indicator of the high level performance and function of the electrostatic precipitators. These data are communicated to the competent authorities in the framework of the observance of the JMD on ETA by the annual reports on environmental quality.

c) installation of fuel desulphurization systems

The installation of fuel desulphurization systems in lignite Units aims at drastically reducing sulphur dioxide emissions. Already two such premises are in operation:

- in Unit IV of Megalopolis steam power plant
- in the new steam power plant of Melitis in Florina

In parallel, the following projects are put forward:

- installation of a fuel desulphurization system in Unit III of Megalopolis steam power plant of 70 million euros
- upgrading of the fuel desulphurization system in Unit IV of Megalopolis steam power plant, of 10 million euros, to further improve the environmental quality in the area of Megalopolis

We underscore that there is not excessive sulphur dioxide in soil concentrations, neither in the area of Megalopolis nor in the area of Kozani.

d) installation of liquid waste processing systems

The program of environmental investments for the improvement of the existing liquid industrial waste processing systems in lignite plants includes:

- installation of a liquid waste processing system in Units I-III of Megalopolis steam power plant

All other lignite plants have full waste treatment systems in accordance with the Best Available Techniques.

e) programs to enhance energy performance and energy saving

The Corporation is implementing a raft of projects to upgrade the Units in order to enhance energy performance and energy saving by reducing pollutants' emissions. These measures aim at:

- upgrading steam turbines
- upgrading cooling towers
- upgrading boilers
- upgrading auxiliary systems

The most important complete projects of the above are the following: the upgrading of two steam turbines (Units III, IV of Kardias steam power plant), the upgrading of five cooling towers (Ptolemaida, Kardias and Amyntaio steam power plants) and various other upgrading projects (such as boiler reconstruction in Unit II of Ptolemaida steam power plant).

In addition, the following important projects are being promoted:

- Upgrading of the cooling towers of Units I,II,III and IV of Agios Dimitrios steam power plant. The project shall be constructed gradually and is set to be completed in the second semester of 2007. Its budget amounts to 9,27 million euros.
- Upgrading of turbine generators of Units III and IV of Agios Dimitrios steam power plant. The project shall be completed the second semester of 2006 and its budget amounts to about 36,80 million euros.
- Upgrading of the Cooling Tower of Unit III of Megalopolis steam power plant. The project shall be completed the second semester of 2006 and its total budget amounts to 3,57 million euros.
- The Technical Specifications have been completed and a call for tender is being awaited for the procurement and the installation of systems to measure on line Agios Dimitrios steam power plant performance rate.

All the above projects aim to increase the Units' performance rate and to reduce the specific pollutants' and carbon dioxide emissions.

f) Households' district heating programs from lignite steam power plants with co-generation

The combined generation of heat and electricity, known as 'co-generation' and the related technologies are applied in the lignite Units of our country –in particular in the last decade- in regional heating or district heating systems, where thermal energy is used through hot water for the heating of households at the outskirts of regions.

The Corporation in cooperation with various municipalities has implemented a series of projects on energy generation in the form of hot water for the district heating of

cities in an effort to ensure ongoing heating of households without polluting the environment from the diffused combustion foci in the build-up areas.

In brief the projects from lignite plants are:

- District heating in Ptolemaida of 50 MWth power from Unit III of Ptolemaida steam power plant
- District heating in Ptolemaida of 25 MWth power from LIPTOL steam power plant.
- District heating in Kozani of 67 MWth power from Units III/IV of Agios Dimitrios steam power plant.
- District heating in Kozani of 70 MWth power from Unit V of Agios Dimitrios steam power plant.
- District heating in Megalopolis of 20 MWth power from Unit III of Megalopolis steam power plant.
- District heating in the wider region of Amyntaio of 25 MWth power from Units I/II of Amyntaio steam power plant.
- Capacity to provide thermal power of 70 MWth for district heating in Florina from Melitis steam power plant after the necessary equipment is installed by the Municipality of Florina.

Generation of thermal energy in steam power plants is carried out with abduction (extraction) of a part of the steam which drives the Units' steam turbines. The steam is driven in the appropriate exchangers who warm the water of district heating network closest to the steam power plant of the city-municipality.

Already the district heating of Ptolemaida and Kozani have been successfully operating for years offering citizens much available thermal energy, which, by means of the **proper pricing policy by municipalities, significantly increased citizens' living standards offering cheaper heating energy and reducing pollutants' emissions from diffused foci in residential areas.**

As a result, municipalities are very much interested in providing extra thermal energy from the closest steam power plants.

Responding to this interest, the Corporation is in the process of studying and negotiating for extra thermal energy provision of 60 MWth in the Municipality of Ptolemaida from Units III/IV of Kardias steam power plant and for extension of Kozani district heating from Units I-IV of Agios Dimitrios steam power plant.

1.2.4 Certification of Environmental Management Systems of PPC SA Generation Plants by ISO 14001

To implement Environmental Policy PPC SA is promoting a gradual Certification by ISO 14001 of the internal Environmental Management Systems already operating in all Generation Plants. The process of Development, Implementation and Certification of Environmental Management System by ISO 4001 has already begun in Agios Dimitrios steam power plant-the biggest lignite plant in the country, situated in Eordaia valley-, in Chania steam power plant (oil) and in Nestos Complex (two hydroelectric plants).

The environmentally accepted mode of plants' operation shall be corroborated by the certification of the Corporation's Generation Plants.

1.2.5 Other environmental actions for electricity generation

Environmental actions include elaboration of specific studies and programs, research programs implementation in cooperation with high educational institutes and bodies, active participation in drawing up a new national and environmental legislation and training of executives involved in electricity generation.

2. Remarks on specific matters referred to in the Complaint

2.1 CO₂ emissions in Greece

For this matter we highlight:

- Pursuant to the agreement for the joint participation of member-states in the effort to abate greenhouse gases emissions and to meet Kyoto Protocol targets, Greece should meet the target +25% for 2010 in relation to the baseline year (1990- CO₂, CH₄, N₂O, 1995 –F-gases). Greenhouse gases emissions for the whole country are set to have been increased by 39,2% until 2010 compared to baseline year emissions. **It should be said that the implementation period of Kyoto Protocol covers the time span 2008-2012.**
- Taking into consideration the Protocol objectives, the country has drawn up the 2nd National Program on climate change which lists the measures by means of which to achieve convergence. These measures regard all sectors responsible for greenhouse gases emissions.
- **The fulfilment of targets could be achieved either by limiting emissions, or by using flexible mechanisms, stipulated in the protocol (greenhouse gases emissions trading (ET), clean development mechanisms (CDM), joint initiatives (JI))**
- The EU, through Directive 2003/87/EC, established the European System of Greenhouse Gases Emissions Trading which begins on a pilot level for the period 2005-2007 with the aim to organise and correctly prepare member-states for the Kyoto period (2008-2012). In this System, each member state shall fix the commitments imposed on the facilities which fall within the scope of the Directive 2003/87/EC through the National Plans for the Allocation of Greenhouse Gases Emissions Rights. Greece has drawn up a National Allocation Plan for the first period (2005-2007) establishing restrictions for the liable facilities and has traced a course to fulfil Kyoto Target, approved by the EU.
- According to estimates of the updated Scenario of Expected Evolution, as analysed in the National Allocation Plan, the greenhouse gases emissions for the whole country for 2010 amount to 153457 kt CO₂ eq, out of which only 51,9% (79713 kt CO₂ eq) shall be deriving from the facilities falling under the scope of Directive 2003/87/EC (Energy, Industry), while only 38,5% (59069 kt CO₂ eq) shall derive from total electricity generation. It becomes, therefore, obvious that convergence to Kyoto target does not exclusively regard Electricity Generation (and mainly PPC) but the country as a whole.
- The 2nd National Program on Climate Change, having regard to the economic and technological potential for the abatement of greenhouse gases emissions (§ 2.1.1 of the National Allocation Plan) mentions the possibility to achieve

Kyoto target with the substantial contribution by sectors not falling under the scope of the Directive 2003/87/EC (transports, buildings etc-with high potential in abating emissions). The National Program on Climate Change also makes reference to the effort being made the convergence with the objective not to have a restrictive impact on the development of the Country (Electricity generation, Industry).

- The National Allocation Plan has not postponed the effort to reduce emissions onto the next period-as it is suggested in the complaint- since the process towards implementing Kyoto Target includes restrictions for the period 2005-2007 (§ 2.4 National Allocation Plan).
- Moreover, what the complaint mentions regarding the so-called ‘weakness’ of the National Allocation Plan of not ending PPC dependence on ‘pollutant’ fuels is unsubstantiated because the National Action Plan has taken into account the increase of natural gas participation in the energy mix of the country and the development of Renewable Energy Resources, as provided for in the 2nd National Program on Climate Change.
- PPC SA participates in the European System of Greenhouse Emissions Trading, as established by Directive 2003/87/EC and is trying to contribute to the convergence of the country with Kyoto commitments. The Corporation began the effort to reduce CO₂ emissions by saving energy in generation, by transferring and distributing electricity, by introducing natural gas in the Corporation’s energy mix and by developing big hydroelectric projects and smaller Renewable energy resources projects prior to restrictions being fixed and the results are already visible, as the specific emission CO₂ (kg CO₂ /kWh) dropped by 21% in 2003 since 1990. This effort is under way via projects which increase the performance rate of electricity generation Units and district heating projects, while it keeps abreast with recent developments in CO₂ capture and storage via participating in big European Research Programs.
- Moreover, PPC shall employ the other two flexible mechanisms of the Protocol to achieve its objectives and is already active in this field.

2.2 Industrial waste management site

With regard to this we could stress the following:

- In the context of adopting a central strategy on industrial waste management from its Generation Plants, the Corporation proceeded to the study, planning and licensing of the appropriate site on environmental grounds in which asbestos cement waste management is carried out and management of other industrial waste which could potentially arise. This is carried out in a fully environmentally controlled manner.
- Asbestos cement waste mainly comes from the implementation of environmental investments for the upgrading of PPC Units Cooling Towers, financed by the 3rd CSF. The approved Investment Proposals are characterised as Environmental Energy Investments and cover Energy Saving and Environmental Protection Projects without any increase in the established power. The improved interventions include, among others, replacement of all the internal parts of Cooling Towers made up of asbestos cement with a new environmentally friendly material (UPVC).

- The Industrial Waste Management Site is situated in the deposits of the depleted lignite mines in Kozani (Kardia mine) and was designed taking into consideration all the requirements of the relevant National and European legislation.
- For the environmental licensing of the site, having thoroughly examined the submitted studies, decision no. **124528/07.05.2004 Joint Ministerial Decision on the Environmental Terms Approval of Project Operation was issued. This decision was signed by the Ministers of Environment, Urban Planning and Public Works, Development and Health & Social Solidarity.** The Joint Ministerial Decision on ETA foresees particularly strict measures for the construction and operation of the Industrial Waste Management Site and for monitoring the environmental quality. According to YPECHODE (Ministry of Environment, Urban Planning and Public Works), **the project ‘is a decisive step in the whole industrial waste management system and environmental impact is dealt with in an integrated manner so as to ensure a high environmental protection level’** (YPECHODE-Special Department on Environment/132154/27.03.03).
- **The project implementation by the Corporation is a pioneering one compared to waste management data in Greece to date** and contributes to the fulfilment of what is stipulated in article 5 of Joint Ministerial Decision 50910/2727/22.12.2003 ‘National Planning on Solid Waste Management’ (Government Gazette 1909/B/22.12.2003). According to this article, the above National Planning requires ‘the creation of a national facilities’ network on waste disposal taking into account the best available technologies not entailing a huge cost, as well as the geographical conditions or the need for specific facilities for waste categories. This network attempts to implement solid waste disposal provided it is economically and environmentally feasible **in one of the closest facilities** which shall employ the most appropriate methods and technologies to ensure a high environmental protection level and public health. By creating a national network the **country contributes to the principle of self-sufficiency**, according to article 5 of Directive 75/442/EEC, as modified in Directive 91/156/EC.’

This site is the only one in Greece for the management of such kind of industrial waste and its operation is very important for the country, given that Greece was condemned by the European Court of Justice and a new conviction is imminent, among others, for non creating infrastructures for the management of such kind of waste in the territory.

Management of all other waste (PCBs, Ni batteries, Cd, used mineral oils etc is in full compliance with the European and Greek legislation in effect and it is exemplary for the country. The same applies for the solid by-products (flying ash).

2.3 Agios Dimitrios steam power plant suspended particles emissions

Units I,II,III and IV of Agios Dimitrios steam power plant for more than 10 years and in particular until 1997 were registering suspended particles emissions below the established ceiling of emissions. After 1997 occasional exceeding of suspended particles emissions was observed which led to its systematic abatement and its final elimination in 2000 and 2001. Despite the fact that the electrostatic precipitators of

Agios Dimitrios steam power plant operated within the allowed emissions limits, the plant had planned for the implementation of a raft of actions aiming at improving the performance of Units' existing precipitators and already, since the beginning of 2000, the Corporation had included in its operational programming the environmental project '**Upgrading the existing precipitators and adding new ones in Units I,II,III and IV of Agios Dimitrios steam power plant**', in order to cover the additional environmental requirements it knew would derive from the EU environmental legislation under way, the development of which the Corporation is closely monitoring.

Dealing with the matter definitely required the implementation of the aforementioned environmental project. For this purpose the Corporation accelerated its implementation procedures and the Contract with the Project Contactor was signed in September 2004 with a contractual price of 130M€ and implementation timetable the 1st semester 2006 until the 2nd semester 2007.

In particular, we highlight that the technical specifications of the Project in question include the installation of extra equipment to reduce the exhaust gases temperature prior to entering the electrostatic precipitators, capitalising on the recent experience acquired lately in lignite units in Germany, having recently applied this pioneering technique.

2.4 Environmental Terms of Operation of Agios Dimitrios, Kardia and Ptolemaida steam power plants

Pursuant to the Joint Ministerial Decisions on Approved Environmental Terms, PPC SA promptly submitted renewal applications of the environmental terms of operation to the competent Directorate of YPECHODE. It also submitted all the complementary data for the renewal of the Joint Ministerial Decisions on Environmental Terms Approval, including the Technical Report with the Best Available Techniques for each one of the Generation Plants in question.

It should be stressed that **Agios Dimitrios, Kardia and Ptolemaida steam power plants** comply with their obligations emerging from the approved Environmental Terms of Operation. In spite of their having expired and until the renewal procedure is completed, they keep on submitting the reports and briefings on their environmental performance, exactly as they did when the terms of operation were in effect. This fact confirms that PPC SA operates in full transparency.

2.5 Epidemiological studies

PPC, in order to ascertain if its activities in Kozani-Ptolemaida basin and in the area of Megalopolis have an impact on the population's health, elaborated specific epidemiological studies. In particular:

a. For the area of Megalopolis: The epidemiological study elaborated by the Hygiene Laboratory of Patras University School of Medicine (Prof. Mr. X. Kondakis) to investigate the potential impact (including also radiation) on citizens' health in the wider region from Megalopolis Energy Centre activities (lignite mines, steam power plants, facilities and electricity transmission lines) reported no particular problem for citizens' health.

In particular:

- The mortality study in the Municipality of Megalopolis and in the Communities of Karytaina, Veligosti and Leontari were negative
- The study on pupils' absenteeism from elementary schools was negative
- Morbidity study was also negative

For the area of Ptolemaida: According to the conclusions of 'Epidemiological Research on health problems of Kozani Prefecture population', elaborated by Hygiene Laboratory of Thessaloniki University School of Medicine under Professor V. Koutsogiannopoulos:

- The bio statistical data collected (registered, scientifically documented mortality) do not make the case for a direct and high degree systematic action of an external factor which sets a high mortality level in the general population of Kozani Prefecture.
- The above conclusion is corroborated by data showing that **mortality in Kozani Prefecture is below the country's average**

All the above in combination with the results of the research program 'Study of the chemical composition of suspended particles to determine the participation rate of their emissions' sources in Eordaia basin ambient air' mentioned in par. 2.2.2 B3, on the composition of suspended particles and the contribution of each source in those prove there is no risk for public health from PPC activities in the areas of Kozani and Megalopolis. Therefore, whatever mentioned in the complaint on the non compliance of our country with article 11 of the Charter is totally unwarranted (par. 12, page 3 of the Summary, par. 104, page 38 of the complaint)

2.6 Conveyor belts

The lignite conveyor belts from the mines to the lignite yard and crushers' building, in the points which are not closed, usually operate without cover and humidification, because due to the high rate of lignite humidity (over 50%) and the voluminous work pieces, this is not necessary. Then after the lignite fracture in the crushers, the material is transferred in closed conveyor belts to avoid emissions' diffusion from the transport of the fine-grain lignite. State-of-the-art dust aspiration systems are installed in closed areas.

With regard to the transfer of flying ash, it is sprayed and mixed with wet ash so as to ensure elimination of any suspended particles' emissions.

2.7 ExternE Program

With regard to program ExternE mentioned in the complaint, we stress the following: ExternE Program has began since 1990 and is a research effort to develop and implement a methodology for assessing the external energy cost. According to the results published in 1997 on a European Level, based on data of 1995 published by the National Technical University (NTU), the external cost values of Thermoelectric Units with solid fuels in Greece are not the highest among other member states.

According to the research team of NTU Industrial and Energy Economy Laboratory, the external cost estimates have a high degree of uncertainty, due mainly to the deficient knowledge with regard to the extent of environmental impact and the

difficulty to assess the value on non-marketable goods which sustain the consequences of environmental degradation (e.g human health, historical monuments, and landscape aesthetics). Therefore, these results have value not as absolute prices (they may be higher or lower) but mainly on a comparative basis. Useful conclusions could be drawn for the selection of technologies, units' spatial planning and the charging of units.

According to a recent note by the head of the Hellenic team, Mrs. Danai Diakoulaki, Assistant Professor in NTU, it is necessary to revise the estimated values of electricity generation external cost, by updating the methodological framework, as it happens in all EU member-states, including new member states, where calculations are done with the new methodological framework (Ecosense program version 4.0). As mentioned on the website www.externe.info, the results from the revised methodology of ExternE program have not been published yet. Preliminary calculations by NTU on the basis of the updated methodology showed that external cost prices are at around 25% of older ones (shown on the table of the attached document 2 of NTU). Therefore, there is the need to revise the estimated external cost prices for the Greek electricity generation system, according to the latest methodological data and the changes in the system in the period 1995-2005. This revision shall provide external cost prices tantamount and comparable to those of other EU member states, while it shall allow researchers who already use the available data of 1995 for Greece to make sounder assessments on the basis of the latest technical data of the Greek electricity generation system.

The official position of the European Union of Electric Corporations, submitted in June 2004 to the European Commission, highlights the important uncertainties of ExternE study.

III. MEASURES TAKEN BY PPC SA FOR ITS PERSONNEL HEALTH AND SAFETY

Vocational risk prevention in PPC SA is the central axis of the Corporation's Policy and main thrust of its operational programming. In this context, the Corporation fully meets the obligations arising from the legislation. In particular:

- The Corporation has set up the Health and Safety at Work Directorate (DYAE), licensed by the Ministry of Employment and Social Protection as an Internal Protection and Prevention Service (ESYPP). The latter is the first to have been set up in the wider public sector based on the suggestions of the Ministry of Employment, fully staffed in the country's territory with 35 Work Doctors, 100 Safety Technicians on full and part-time employment and with 55 people as an Auxiliary Nursing Staff. On safety issues, Safety Technicians of the Mines and Plants cooperate with each other (for whom provision is made in the corresponding organisational charts depending on their responsibility level) as well as with the central directorates of these units. In particular, in Western Macedonia and Megalopolis energy centres for around 7000 employees, 7 work doctors are employed. ***At this point we underline that the complainant's allegations are unfounded because the number of work doctors to be employed is instituted in the Presidential Decree 294/88*** 'Minimum employment

time of Safety Technicians and Work Doctors and their knowledge level'.¹ PPC fully meets the requirements both for doctors and technicians.

- ESYPP of PPC SA has a fully equipped Measurements Unit for Harmful Substances at work places. It has measured almost all work places in the units mentioned. Measurements showed some excessive values at particular work places ***for which protection measures were taken as stipulated by law***. The exposure limit to dust is provided for by Presidential Decree 77/93 (10mg/m³ for 8-hour exposure).

- For jobs involving dust exposure even below legislation limits Personal Protection Means are provided. These measures cover the requirements of the Ministerial Decision B4373/1205/93, of the relevant European standards and the protection they offer is effective. It is noteworthy that without taking administrative measures ***due to the training and awareness of the staff***, the use of these means more than doubled in the last decade. In detail, yearly consumption recently went above 200.000 compared to 100.000 in 1995.

- ESYPP has fully equipped Work Medicine surgeries in each Unit for preventive medical check of the staff. Medical examinations have been grouped per employee category, as mentioned below:

- Personnel of alternating guarding posts
 - A. Yard repair workshop staff
 - B. Lubricators
 - C. Drivers
- Chemical laboratory staff
- Maintenance staff
 - A. electrical engineering maintenance staff
 - B. mills maintenance repair workshop
 - C. boilers-filters repair workshop
 - D. plugs' repair workshop
 - E. ash air compressors repair workshop
 - F. repair workshop for the maintenance of lignite and belts' transport systems
 - G. vehicles maintenance repair workshop
 - H. tool-machinery repair workshop
 - I. tests repair workshop
- Construction workers
- Oil-painters
- Carpenters
- plumbers
- weight removers
- feeders repair workshop
- sheet metal workers
- high risk works (works inside , in ash silo, de-assembling of pumps)
- office staff
- cleaning and cook staff

Apart from the clinical check up- medical history for all employees regardless of specialisation- they should be subject to the following laboratory controls.

¹ With presidential decree 294/88 corporations are classified in three categories depending on their risk level (A particularly risky, B of average risk and C offices. Each one fixes yearly employment hours for Safety Technicians and Work Doctors according to the number of employees)

All employees of category 1A are subject to

- general blood test (full blood count)
- thorax x-ray
- audiometric test
- spirometric control (simple spirometry)
- serum creatinine
- serum urea
- serum sugar
- triglycerides
- cholesterol
- HDL
- LDL
- Vision examination

All employees of category 1B and 1C are subject to

- Thorax x-ray
- spirometric control (simple spirometry)
- audiometric test (audiogram)
- general blood test (full blood count)
- serum creatinine
- serum urea
- serum sugar
- triglycerides
- cholesterol
- HDL
- LDL
- SGOT
- SGPT
- γ GT

Employees in group 1B are subject to cancer indicators test and biological fluids test and to check ups for exposure to solvents. Employees in group 1C are subject to an ophthalmological test and it we also check in this category whether the Presidential Decree 155/96 requirements are met for granting a professional driving license.

Employees in category 2 are subject to

- Thorax x-ray
- spirometric control (simple spirometry)
- audiometric test (audiogram)
- general blood test (full blood count)
- serum creatinine
- serum urea
- serum sugar
- triglycerides
- cholesterol
- direct and indirect bilirubin
- HDL
- LDL
- SGOT
- SGPT

- γ GT
- alkaline phosphatase

The exposed individuals are subject to check up in biological fluids for exposure in solvents and acids. Special emphasis should be also given to the nervous system.

Employees in category 3 are subject to:

- Thorax x-ray
- spirometric control (simple spirometry)
- audiometric test (audiogram)
- labyrinth control
- general blood test (full blood count)
- serum creatinine
- serum urea
- serum sugar
- triglycerides
- cholesterol
- HDL
- LDL
- SGOT
- SGPT
- γ GT
- alkaline phosphatase

The exposed individuals are subject to control in biological fluids to check for exposure in solvents or metals. The clinical examination shall put emphasis on the musculoskeletal and nervous system. Employees of category 3H, apart from the above, are also subject to electrocardiograph and carboxyhemoglobin test. Employees of category 2C, apart from the tests of category 3 are also subject to labyrinth test.

Employees of categories 4,5,6,7,8,9,10 and 11 are subject to the same tests of category 3. Moreover, employees of categories 4,5, and 9 are also subject to labyrinth test.

All employees of category 12 are subject to:

- general blood test (full blood count)
- spirometric control (simple spirometry)
- audiometric test
- serum creatinine
- serum urea
- serum sugar
- triglycerides
- cholesterol
- HDL
- LDL
- Vision examination

Special importance should be attached, when taking the medical history and doing examination, to conditions that might emerge from job related diseases.

Employees in category 13 are subject to:

- Thorax x-ray
- spirometric control (simple spirometry)
- general blood test (full blood count)
- serum creatinine
- serum urea
- serum sugar
- triglycerides
- cholesterol
- HDL
- LDL
- HAV
- HbsAg
- Stool culture for parasites

Finally, all employees within the premises of sub plants are subject to tests of category 3 and to electrocardiograph and cancer indicators test.

Medical examination so far to energy centres employees proved that 200 of them suffered from lower respiratory diseases and 100 of them suffered from upper respiratory system diseases. In any case employees are being followed up, more tests are carried out and measures are taken (ranging from exposure restriction to change of post).

The Corporation has conducted studies on risk assessment for all energy centres' units and these studies take all findings into consideration, as well as the medical examination results and harmful factors measurements.

With regard to contractors' supervision, PPC abides by the Presidential Decree 305/96 regarding the **project's master** obligations². All units have a common policy on that which foresees the following, among others:

- A Safety Technician and Work Doctor of the Contractor, the data of which and their working hours in the project shall be announced to the competent SEPE (Labour Inspectorate/KEPEK (Occupational Risk Prevention Centre) and PPC shall be notified.
- Obligation to keep a name list of all employees of the Contractor per specialisation which shall be declared to the employee's insurance organisation and shall be approved by PPC.
- Submission to PPC by the Contractor of the Occupational Risk Assessment and of Health Safety File and Health Safety Plan for the works he shall carry out provided the Contractor is obliged to.
- PPC shall submit to Contractor all necessary documents, signed, for the safe implementation of works (Technical directives, Construction and operational plans, manuals copies of developers' electrical mechanical equipment, Safe Work Procedures, Regulations, a catalogue of the Legislation on Employees' Health and Safety etc).

² the project master shall supervise and coordinate the implementation of the legislation's provisions by contractors, who are, though, in charge of their staff as their employers

- Contractor's obligation to train the staff under his responsibility and to submit to PPC a signed statement for their training.
- Obligation to grant the staff all the necessary Personal Protection Means.

Additional information on the PPC Memorandum

a. Actions for the Protection and Restoration of the Environment in the Lignite Mines

- New Environmental Impact Study on the mine of Mavropigi. The study was submitted to the Ministry for the Environment, Physical Planning and Public Works on 12.05.2005 and the approval of the Environmental Terms for the mine of Mavropigi is expected.
- Study on the delimitation of the water streams of the mine of Mavropigi. The study was combined with an Environmental Impact Study for the issuance of Environmental Terms and was submitted to the Prefectural Self-administration of Kozani on 20.05.2005 and to the Ministry for the Environment, Physical Planning and Public Works on 24.05.2005. The issuance of the Official Gazette by the General Secretary of the Region of Western Macedonia on the delimitation of the water streams of the mine of Mavropigi is expected.
- Study on the delimitation of the water streams of the mines of Ptolemaida. The study was delivered to the competent agencies of the Prefectural Self-administration of Kozani on 17.11.2005 and the Decision of the General Secretary of the Region is expected in April 2006.
- Study on the delimitation of the water streams of the mines of Megalopoli. The study was delivered to the competent agencies of the Prefectural Self-administration of Arcadia on 25.11.2005 and the Decision of the General Secretary of the Region is expected in April 2006.
- Environmental Impact Study on the diversion of Soulou. The Environmental Impact Preliminary Study has been drawn up and will be submitted in the very next days for the issuance of the Preliminary Environmental Assessment and Evaluation of the project, so that the Environmental Impact Study is then submitted and the Environmental Terms of the project are approved.
- Special Hydrogeological study on the mines of the Lignite Centre of Megalopoli - issues A and B. The study was submitted to the Ministry for the Environment, Physical Planning and Public Works on 22.06.2005.

- Hydrogeological study on the Mine of Amynteo - Lakkia. It was submitted to the Ministry for the Environment, Physical Planning and Public Works on 12.08.2005.
- Environmental Impact Study on the Lignite Field of Lakkia (expansion of the Mine of Amynteo). It was submitted to the Ministry for the Environment, Physical Planning and Public Works on 11.10.2005.
- The Decision of the General Secretary of the Region of Western Macedonia no 5216/25.02.2005, Official Gazette 292/D/18.06.2005 on the ‘Validation of determination of the border lines of water streams in the area of the lignite mine of the Public Power Corporation S.A. at Klidi’, Prefecture of Florina was issued and submitted to the Ministry for the Environment, Physical Planning and Public Works on 01.07.2005.
- The annual Environmental Report was submitted to the Ministry for the Environment, Physical Planning and Public Works and the Prefectural Self-administration of Arcadia on 06.10.2005 pursuant to the Joint Ministerial Decision on the Approval of Environmental Terms for the Lignite Centre of Megalopoli.
- The annual Environmental Report was submitted to the Ministry for the Environment, Physical Planning and Public Works and the Prefectural Self-administrations of Kozani and Florina on 10.10.2005 pursuant to the Joint Ministerial Decision on the Approval of Environmental Terms for the Mine of Amynteo.
- The annual Environmental Report was submitted to the Ministry for the Environment, Physical Planning and Public Works and the Prefectural Self-administration of Kozani on 07.10.2005 pursuant to the Joint Ministerial Decision on the Approval of Environmental Terms for the Mine of Ptolemaida.

b. Actions for the Protection of the Environment at the Power Stations

- A new Decision on the Approval of Environmental Terms was issued for the Steam-Electric Station of Kardias pursuant to the Joint Ministerial Decision 93855/14.07.2005.
- A new Decision on the Approval of Environmental Terms was issued for the Steam-Electric Station of Ptolemaida pursuant to the Joint Ministerial Decision 130497/15.07.2005.
- A letter on the Technical Reports on the Implementation of the Best Available Techniques for the Steam-Electric Station of Kardias and Steam-Electric

Station of Ptolemaida was sent on 30.09.2005 to the Ministry for the Environment, Physical Planning and Public Works, pursuant to subparagraphs 5.17 and 5.18 of the new Joint Ministerial Decisions in fulfilment of the obligations of the Public Power Corporation S.A..

- The new Decision on the Approval of Environmental Terms for the Steam-Electric Station of Aghios Dimitrios has been signed by the jointly competent Ministry for the Environment, Physical Planning and Public Works and the Ministry of Development and is expected to be soon forwarded to the Public Power Corporation S.A..
- In the meantime, the Steam-Electric Station of Aghios Dimitrios is fulfilling its obligations arising from the approved Environmental Terms on its Operation despite their expiry and until the completion of the renewal procedure thereof and continues to submit the required reports on its environmental performance.

For all the aforementioned reasons and given the above data concerning legislation, programmes-actions and measures of the Greek State and of PPC SA, we request the acknowledgement of the fact that there is no issue of violation by Greece of articles 2 par. 4, 3 par. 1 and 2, 11 of the European Social Charter and the declaration of the complaint lodged by the international NGO “Marangopoulos Foundation for Human Rights” against Greece unfounded.

**THE GENERAL SECRETARY
OF THE MINISTRY OF
EMPLOYMENT AND SOCIAL PROTECTION**

DIMITRIOS KONTOS