HELLENIC REPUBLIC

HELLENIC MINISTRY FOR THE ENVIRONMENT, PHYSICAL PLANNING AND PUBLIC WORKS

NATIONAL ALLOCATION PLAN FOR THE PERIOD 2005 – 2007

DECEMBER 2004

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1. INTRODUCTION

According to Directive 2003/87/EC, establishing a scheme for greenhouse gas emission allowance trading within the Community, each Member State of the European Union (EU) must develop and submit to the European Commission a National Allocation Plan (NAP) for the three-year period 2005-2007. The NAP states the total quantity of allowances, the allocation of allowances among the installations which are subject to the scheme and all basic rules that regulate the allocation of allowances, as well as the way of functioning of the relevant system.

The NAP was developed according to the criteria listed in Annex III of the Directive and the guidance published by the Commission for their implementation. At the same time, the Plan includes the necessary baseline information to justify its provisions.

The Plan consists of 7 Chapters and 1 Appendix:

Chapter 2 (*Determination of the total quantity of allowances for the period 2005-2007*) describes the methodology used to determine the total quantity of allowances and its outcome, taking into consideration the evolution of greenhouse gas emissions at a national level as well as at activity level and at installation level.

Chapter 3 (*Allocation of the quantity of allowances at activity and at installation level*) describes the rules for allocation of allowances at activity level and at installation level and the results of allocation of allowances for each activity. In addition, it includes the remaining basic rules of the operation of the system.

Chapter 4 (*Other technical issues*) describes how the emissions reduction potential at activity level and clean technologies was taken into account in the formulation of the NAP.

Chapter 5 (C*ommunity legislation and policy*) presents information about how issues related to pooling of installations, the frame and rules of access of new entrants to the market of allowances, as well as legislative / policy instruments that lead to increase of greenhouse gas emissions are managed in the frame of NAP.

Chapter 6 (*Public Consultation*) summarises the comments received during public consultation and how they were dealt with.

Chapter 7 *(Criteria other than those in Annex III to the Directive)* refers to any additional criteria applied for the development of the NAP.

Finally, ***Appendix A*** includes the detailed allocation of the quantity of allowances at activity and at installation level.

2. DETERMINATION OF THE TOTAL QUANTITY OF ALLOWANCES FOR THE PERIOD 2005-2007

2.1 National emission limitation obligation under Decision 2002/358/EC

The last official national greenhouse gas emissions/removals inventory (report and calculated emissions tables) was submitted to the European Commission and to the Secretariat of the United Nations Framework Convention on Climate Change in February 2004 and covers the period 1990 – 2002.

The results of the Emissions Inventory have been partially revised, because in the period after February 2004, the new methodological approach for the sector *Land Use Change and Forestry* (LUCF) was implemented, and new and more accurate data on activities and emission factors for some of the underlying sectors became available.

The results of the revised emissions/removals inventory for the period 1990 – 2002 are presented in ***Table 2-1***.

Under Council Decision 2002/358/EC concerning the approval, on behalf of the European Community, of the Kyoto Protocol (the Protocol) and the joint fulfilment of commitments thereunder, Greece **has committed to limit the increase of its greenhouse gas emissions for the period 2008 – 2012 to 25% compared to base year emissions**. The base year for CO_2, CH_4 and N_2O emissions is 1990, while for F-gases (PFCs, HFCs, SF_6) the base year is 1995. Given the fact that LUCF sector was a sink for greenhouse gas emissions in 1990, greenhouse gas removals by this sector are not taken into account when calculating the Assigned Amount for the country during the first period of commitment under the Protocol (2008-2012), according to Article 3.7 of the Protocol. As a result, according to the most recent results of the Greenhouse Gas Emissions Inventory, **base year emissions for Greece are estimated to be 110,212.31 kt CO_2 eq**.

Total greenhouse gas emissions in Greece in 2002 (not including emissions/removals from LUCF sector) have risen by 21.1% compared to base year emissions.

The Assigned Amount for the country during the first period of commitment under the Protocol (2008-2012) – or, in other words, the total quantity of greenhouse gas emissions allowed in Greece during this five-year period – is calculated from the base year emissions and the emission reduction target (25% of base year emissions).

More specifically, according to the above, total greenhouse gas emissions in Greece during the period 2008 – 2012 **shall not exceed 688,826.94 kt CO_2 eq** ($5 \times 1{,}25 \times$ base year emissions).

In order to simplify calculations, the emissions reduction target (25%) is assigned to the year 2010. As a result, the **ceiling for annual emissions for that year is** taken to be **137,765.39 kt CO_2 eq** ($1{,}25 \times$ base year emissions).

Table 2-1: **Total GHG emissions (in kt CO_2eq) by IPCC sectors for the period 1990-2002**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
A. Greenhouse Gas Emissions/Removals per Sector													
Energy	80996	81035	82933	82874	84862	84622	87217	91802	96777	96035	101636	103881	103998
Industrial Processes	9140	9034	8784	9309	9791	11520	12173	12736	13085	13718	12879	12479	12526
Solvent and Other Product Use	170	176	172	169	162	153	151	152	151	159	145	155	155
Agriculture	13603	13389	13182	12584	12822	12573	12864	12578	12439	12456	12425	12216	12175
Land-Use Change and Forestry	-3440	-3815	-3240	-4054	-3736	-4614	-4217	-4159	-3705	-4671	-3211	-5545	-5701
Waste	4044	4072	4225	4350	4554	4651	4797	4917	5155	4555	4617	4556	4609
Total without LUCF	107953	107707	109298	109285	112190	113520	117202	122185	127606	126924	131701	133287	133464
Total with LUCF	104513	103892	106057	105231	108455	108905	112985	118026	123901	122253	128490	127741	127763
B. Greenhouse Gas Emissions per Gas (without LUCF)													
CO_2	83905	83736	85296	85324	87168	87497	89795	94526	99133	98512	104072	106244	106172
CH_4	8715	8716	8883	9021	9284	9418	9728	9840	10166	9504	9644	9638	9787
N_2O	14140	13890	13958	13149	13436	13152	13691	13459	13434	13341	13564	13468	13418
HFCs	935	1107	908	1638	2209	3369	3916	4194	4669	5435	4272	3845	3999
PFCs	258	258	252	153	94	83	72	165	204	132	148	91	88
SF_6	Not estimated												
Total	107953	107707	109298	109285	112190	113520	117202	122185	127606	126924	131701	133287	133464
C. Greenhouse Gas Emissions/Removals from LUCF													
CO_2	-3493	-3840	-3319	-4124	-3798	-4651	-4238	-4201	-3835	-4681	-3386	-5568	-5704
CH_4	48	24	72	64	57	34	19	39	118	9	159	21	3
N_2O	5	2	7	7	6	3	2	4	12	1	16	2	0
Total	-3440	-3815	-3240	-4054	-3736	-4614	-4217	-4159	-3705	-4671	-3211	-5545	-5701

2.2 National and Community policies and measures considered to determine the total quantity of allowances

2.2.1 Greek National Programme to reduce Greenhouse Gas emissions for the period 2000-2010

The 2nd National Programme for Climate Change was developed and adopted in 2002 (Ministerial Council Act 5/27-2-2003) with an aim to establishing a set of policies and measures to reduce greenhouse gas emissions. The aim of the Programme was for Greece to fulfil its national obligations under the Kyoto Protocol during the first commitment period (2008-2012), that is to limit **the increase of greenhouse gas emissions to 25%** during the aforementioned five-year period **compared to base year emissions**

The main actions foreseen by the 2nd National Programme were:

- Further penetration of Natural Gas (NG) in all energy demand sectors and electricity generation, including combined heat and power generation.
- Promotion of Renewable Energy Sources for electricity and heat production
- Energy saving in industry and the residential – tertiary sector.

- Promotion of energy efficient appliances and energy equipment in the residential – tertiary sector.
- Structural changes in agriculture and in chemical industry.
- Emission reduction actions in transport and waste management.

Table 2-2 summarises, by sector and by category of intervention, the greenhouse gas emissions reduction potential that is estimated in the National Programme from the implementation of several measures. There is a distinction between: (a) *technological potential*, for which a higher degree of penetration / implementation of measures and no interdependence among them is assumed (i.e. when calculating potential, synergy between two or more parallel implemented measures is not taken into consideration), and (b) *economic potential*, for which more realistic degrees of penetration / implementation of measures are assumed, while synergies between two or more parallel implemented measures are also taken into consideration.

***Table 2-2*: Estimated technologic and economic GHG emissions reduction potential of the measures included in the 2nd National Programme for Climate Change (kt CO_2 eq).**

Measures of Greenhouse Gases Emissions reduction	Technologic Potential		Economic Potential	
	2005	2010	2005	2010
Promotion of Natural Gas	**3191**	**3925**	**1787**	**2198**
Operation of NG Power Plants as base load units	3065	3350	1716	1876
Further Penetration of NG in Industry	126	337	71	189
Further Penetration of NG in Residential/Tertiary sectors	0	237	0	133
Further Penetration of NG in Transport	0	2	0	1
Promotion of Renewable Energy Sources	**1489**	**6359**	**834**	**3561**
Further Penetration of RES in Electricity Generation	770	4027	431	2255
Further Penetration of RES in Industry	343	385	192	216
Further Penetration of RES in Residential/Tertiary Sectors	376	1628	210	912
Further Penetration of RES in Transport	0	319	0	178
Other Measures in Industry	**234**	**238**	**131**	**133**
Other Measures in Residential/Tertiary Sectors	**874**	**2250**	**489**	**1260**
Other Measures in Transport	**188**	**595**	**105**	**333**
Agriculture	**49**	**92**	**34**	**64**
Waste	**37**	**98**	**26**	**69**
Industrial Processes	**0**	**4651**	**0**	**4651**
Total	**6061**	**18208**	**3406**	**12270**

Within the framework of 2nd National Programme , the technological potential to reduce greenhouse gas emissions is estimated to be 6.1 Mt CO_2eq for 2005 and 18.2 Mt CO_2eq for 2010. The economic potential is estimated to be 3.4 Mt CO_2eq for 2005 and 12.3 Mt CO_2eq for 2010, respectively.

Based on the aforementioned measures, the economic potential calculated for each one and the timetable for their implementation, an emissions projection scenario ("Measures" scenario) – apart from the Business as Usual (BaU) scenario [1] – is developed within the framework of the 2nd National Programme , in which the Kyoto target is reached exclusively through the implementation of the national policies and measures mentioned above (without of course excluding the potential exploitation of Protocol flexible mechanisms, provided that it is judged advisable and all rules for these mechanisms are applied). According to this scenario, the increase of greenhouse gas emissions in Greece in 2010 can be limited to 24.5% compared to base year emissions ***(Table 2-3).***

***Table 2-3*: Projections of GHG emissions in the BaU scenario and with additional "measures" scenario included in 2nd National Program (in kt CO_2eq)**

Sector	1990	1995	2000	2005		2010	
	Historic α Data	Historic α Data	Historic α Data	BaUβ	Measures	BaUβ	Measures
Energy	80789	84386	101062	107787	104441	116890	109404
Industrial Processes	9591	11725	12874	13667	13667	15899	11248
Solvent and Other Product Use	177	156	169	173	173	177	177
Agriculture	10448	9737	10227	9736	9702	9668	9604
Land-Use Change and Forestry	1391	-307	4138	2030	2030	2030	2030
Waste	3749	4422	5319	4042	4016	2542	2473
Total	**106145**	**110119**	**133789**	**137435**	**134029**	**147206**	**134936**
Change from base year (=100)	***97.9***	***101.6***	***123.4***	***126.8***	***123.6***	***135.8***	***124.5***

α Data for the years 1990, 1995 and 2000 are based on the results of the GHG emissions Inventory included in the 2nd National Programme of Climate Change. These results have been partially revised in the subsequent Inventories.

β The BaU scenario presented in the Table was developed in the context of the 2nd National Programme of Climate Change (2002). This scenario has now been revised in order to consider updated information regarding input data as well as recent developments in the various economic sectors. It is presented in Section 2.3 below.

2.2.2 Other national policies and measures

The main pilars of the national strategy for the energy sector were taken into consideration in the development of the National Programme for Climate Change 2000-2010 (Paragraph 2.2.1), and in the updated BaU scenario (Paragraph 2.3) that was formulated in the framework of the NAP. Furthermore, for those sectors with energy demand that do not come under the Emissions Trading Directive (i.e. residential, transport), the main policy principles that are applicable (energy conservation, etc.) are summarized in Section 2.6. An estimation of greenhouse gas emissions reductions that can be achieved is also given.

[1] Scenario in which the policies and measures for the limitation of greenhouse gas emissions are restricted to existing policies and measures, as well as to those officially planned or announced. It constitutes the reference point because its divergence from the quantative emissions reduction target in the frame of the Protocol is also an indicator of the effort to reduce emissions that the country should make.

2.2.3 Community legislative and policy instruments

According to **Criterion 4** of the **Annex III of the Directive**, community legislative and policy instruments, which more or less affect the evolution of greenhouse gas emissions and therefore the total quantity of allowances, were evaluated and taken into consideration for the formulation of the NAP. The most important among those to the greenhouse gas emissions evolution in Greece and the way they were considered during the formulation of the NAP are summarised as follows:

- Directive 1996/92/EC concerning common rules for the internal market in electricity. The implementation of this Directive is expected to alter the mix of fuels and energy sources that are used in the power generation sector in Greece, contributing to further utilisation of natural gas and renewable energy sources. In the BaU as formulated here it has been assumed that all new units that will be incorporated in the Greek interconnected power generation system will either use natural gas (mostly combined cycle units) or will be related to RES operations.
- Directive 1996/61/EC concerning integrated pollution prevention and control. In the present BaU and specifically as regards greenhouse gas emissions by the energy use, a number of actions are included, that are related to the implementation of Best Available Techniques in certain industrial sectors. As a result, emission reductions are achieved by using more efficient technologies, "cleaner" fuels, etc.
- Directive 1999/31/EC for the landfill of waste. This Directive is taken into consideration when formulating the BaU scenario and specifically in the evolution of greenhouse gas emissions by the solid waste sector. In putting together the timetable for implementing the Directive, the possibility of using the 4-year grace period (foreseen in the article 2 of the Directive) to achieve the reduction of biodegradable waste going to landfills is also taken into consideration. Thus, the quantitative objectives to reduce biodegradable waste going to landfills are to be achieved in 2010, 2013 and 2020 (instead of 2006, 2009 and 2016 which is determined in the general cases of implementation of the Directive).

- Directive 2001/77/EC for the promotion of electricity produced from renewable energy sources in the internal electricity market. Within the BaU and specifically the greenhouse gas emissions by the energy sector, significant RES penetration in electricity production and continuation of existing support policies for their promotion are assumed (Law 2244/1995, Development Law, etc.) leading to significant emission reductions through the reduction of the operation of thermal units. However, due to delays in the construction of relevant infrastructure (supporting networks, etc.) as well as the high rate of increase of the country's electricity demand, it is estimated that the Greek 2010 RES target (20.1% of electricity production by RES) will not be achieved in BaU by the year 2010.
- Directive 2001/81/EC for national emission ceilings for certain atmospheric pollutants. This Directive was taken into consideration during the formulation of the BaU, specifically regarding SO_2 and NO_x emissions. In particular, the development/evolution of the energy system by the year 2010 was considered under the provision that the total emissions of those pollutants would not exceed or approach the national limits set by this Directive.

- Directive 2002/91/EC for the energy performance of buildings. In the BaU, improved energy performance of new buildings as well as improvements in existing buildings is taken into consideration.
- Directive 2003/17/EC relating to the quality of petrol and diesel fuels. In the f BaU, additional greenhouse gas emissions have been taken into consideration, which result from the operation of new units or increased operation of existing units in the Greek refineries, in order to produce the mandated very low sulphur fuels.
- Directive 2003/30/EC for the promotion of the use of biofuels or other renewable fuels for transport. In the transport sector, BaU does not incorporate the penetration of biofuels for the period 2005-2007, mostly because there were uncertainties until recently, regarding their production and availability to the Greek energy system. Nevertheless, the 2nd National Programme for Climate Change includes a relevant measure, which is expected to bring about emission reductions as high as 178 kt CO_2eq / year by the year 2010. Emission reductions from the use of biofuels in the transport sector have been taken into consideration in the formulation of the trajectory to achieve the Kyoto target within the framework of the NAP (see Section 2.4 below).
- Voluntary agreement between the European Commission and motor manufacturers (ACEA, KAMA, JAMA) for the introduction of low emissions vehicles in the market. This voluntary agreement has been incorporated in the BaU in estimating emissions by the transport sector.

2.3 Greenhouse gas emissions projections– Updated Business as Usual (BaU) scenario

As it was already mentioned, in order to determine the total quantity of allowances based on the most recent information that will most accurately show tendencies of evolution of greenhouse gas emissions in various sectors, the forecasts of greenhouse gas emissions evolution that are included in the 2nd National Programme for Climate Change were updated, incorporating the most recent developments / data. This update was considered essential, since the 2nd National Programme (and the forecasts included in it) was produced in the beginning of 2002, and since then additional data have become available relevant to the evolution of greenhouse gas emissions in the country, i.e. the results of the implementation of various policies and measures affecting emissions, the prospects of growth of Greek economy and of specific sectors of interest, etc. Information with regard to basic assumptions and estimations that affect greenhouse gas emissions is given in the next paragraphs and the updated results of forecasts for Greece from all sectors of economic activity are summarised afterwards.

It should be pointed out that in order to forecast the evolution of greenhouse gas emissions by the energy sector, the ENPEP (ENergy and Power Evaluation Program) software package was used, while for the non-energy sectors the calculations were based on adapted tendency models, which calculate greenhouse gas emissions taking into account the development of activity data, suitable emission factors and concrete assumptions per sector and by applying a calculation methodology per sector/ gas, as also applied in annual greenhouse gas emissions inventory.

2.3.1 Basic assumptions

This Paragraph summarises the basic assumptions that were made for the formulation of the current Business as Usual (BaU) scenario of greenhouse gas emissions in Greece for the period up to 2020.

General

Demographic characteristics: According to the population census conducted by the National Statistical Service in 2001, the population of Greece increased with an average annual rate of 0,67% during the period 1991-2001, while the average annual population growth rate during the period 2000-2020 is estimated to be approximately 0.4% ***(Table 2-4).*** This rate is higher during the period 2000-2005 (approximately 0.6%), mainly as a result of integration of a significant number of immigrants in the Greek society, which is likely to decrease after 2010. During the period 2000-2020, the average household size (in number of individuals per household) is estimated to decrease by approximately 0.8% annually, reflecting ageing of population, as well as new living standards that are progressively adopted. Consequently, the total number of households for the period 1990-2020 presents a total increase of 43.8%, reaching 4,574,104 households by 2020.

Macroeconomic sizes: The development of energy demand of a system depends to a great extent on the course of development of relevant economic activity sectors, but also on the way that this growth is diffused in the population and the involving repercussions in its living standards. Thus, in the frame of BaU it is assumed that the program of convergence of Greek economy with the average European levels will continue throughout the period examined, maintaining constantly higher rates of development compared to the Community average. More specifically, it is assumed that the GNP will increase during the period 2000-2006 with an average annual increase rate of about 3.8% (according to recent estimations by the Ministry of Economy), while during the period 2006-2010 this rate is reduced to 3.4%. For the period following 2010, the annual financial growth rate is expected to stabilize around 3%. With regard to the Greek economy structure, the assumptions regarding the development of primary, secondary and tertiary sector are presented in Table 2-4.

Energy Sector

Climatic conditions: It is assumed that future climatic conditions will be similar to those of the period 1995 - 2000. The assumption that climatic conditions will be more close to the historical mean would have ignored the fact that average annual temperature has increased noticeably over the last decade, and accordingly it would have led to a unjustifiably abrupt increase of energy demand for space heating after the year 2000, and a probable underestimate of the energy demand for air conditioning. In case future climatic conditions move towards the historical mean, then the energy consumption (primary and final) will be somewhat different than the one presently predicted.

Prices/ Taxation of fuels: The fluctuations of international prices of fuels that were adopted in the frame of this study are presented in Table 2-4. Moreover, it was assumed that basic characteristics

of the existing tax policy for fuels will not be altered and a carbon tax will not be imposed on fuel prices during the period under consideration.

It should be pointed out that these assumptions are not significantly different from the ones adopted in the European Commission study on the development of energy systems in most European countries.

At this point, it should be noted that the elasticity of energy demand in various sectors of consumption of the Greek energy system with regard to international prices of oil/ natural gas is low, and consequently only relatively small differentiation in total greenhouse gas emissions by important short-term fluctuations in the prices of fuels in question are expected (in any case, price increase of oil usually involves reduction of consumption but also increase of solar energy share, which is less influenced by the fluctuations in question, given the fact that electricity production in Greece is based mainly on lignite combustion). On the contrary, total greenhouse gas emissions are altered considerably when price fluctuations lead to changes of the relative economic attractiveness between oil/ natural gas and solid fuels consumption (e.g. with the imposition of environmental tax).

***Table2-4*: Main assumptions in the BaU scenario.**

	Historic Data			Projections			
	1990	**1995**	**2000**	**2000-2005**	**2005-2010**	**2010-2015**	**2015-2020**
Population (mio.)	10.2	10.5	10.9	0.6%	0.4%	0.3%	0.2%
Household size (cap/hh)	3.2	3.1	3.0	-0.7%	-0.8%	-0.8%	-0.8%
GDP (bil. € 1995)	75.1	79.9	94.6	3.9%	3.4%	3.0%	2.9%
Gross Value Added (bil. € 1995)							
Primary Sector	6.08	7.28	7.30	2.0%		0.7%	
Industry	15.3	14.8	17.0	2.7%		1.8%	
Public Services	14.9	15.6	17.2	2.3%		1.8%	
Private Services	31.3	34.5	43.2	5.0%		4.0%	
International Fuel Prices							
Coal ($2000/t)	63.1	50.0	35.1	38..4			
Oil ($2000/bbl)	27.3	21.2	28.1	-4.8%	0.0%	1.8%	1.7%
Natural Gas($2000/toe)	146.6	113.8	110.9	-4.8%	0.0%	1.8%	1.7%
Transport Activity							
Passenger Transport (bil. p-km)	84	101	118	3.2%	3.0%	2.7%	2.3%
Goods Transport (bil. t-km)	18	23	26	3.1%	2.9%	2.4%	2.1%

Discount rate: The discount rate used for the evaluation of alternative energy technologies, is different depending on the profile of the particular decision-maker active in the energy sectors under consideration. In particular, consumers in the domestic sector usually prefer investments with small payback period, so a discount rate of 14%, considerably higher than the one expected in the

financial markets, was adopted. On the other hand, the industries, utility companies, refineries, etc, prefer long-term investment policies, so that discount rate of 6% was considered more suitable. Finally, for the tertiary sector where smaller size enterprises are active as a rule, a medium interest-rate of discount of 9% was adopted.

Industrial Processes

Prediction of emissions by the industrial processes sector was based on: (a) the analysis of statistical data of sectors activity, (b) the use of emission factors that were presented during the last national greenhouse gas emissions/removals inventory, as they were modified in view of input from the questionnaires filled in by the units in the frame of NAP compilation. The possibility of technological improvements for the next five years has not been included in the BaU scenario.

Further specific assumptions regarding the industrial processes are presented in ***Table 2-5***.

***Table2-5*: Main assumptions for the BaU scenario in Industrial Processes[2].**

Cement Production	Clinker production changes with a mean annual rate of 0.4% for the period 2000 – 2020, while the exploitation of plants capacity remains high
Lime Production	Limestone consumption changes with a mean annual rate of 1.5% for the period 2000 – 2020
Glass Production	Glass production changes with a mean annual rate of 1.8% for the period 2000 – 2020
Use of Carbonic Calcium	Limestone consumption for aluminum, iron and steel, and ceramic production changes with a mean annual rate 1.7% for the period 2000 – 2020
Iron - Steel	Steel production changes with a mean annual rate of 4.6% for the period 2000 – 2020, due to the investments realized after 2000
Aluminum Production	Aluminum production remains at 2000-2003 levels
Chemical Industry	HCFC-22 production remains constant, while the ammonia and nitric acid production decreases significantly
F-gases Consumption	The apparent consumption of cars air-conditioners and domestic refrigerators increase annually by 2.5% for the period 2000 – 2020, while the apparent consumption of air-conditioning units increases with an average annual rate of 4.5%

Agriculture

The basic driving parameters of the sector's greenhouse gas emissions evolution are taken to be the size of agricultural area, the livestock population and the use of nitrogen fertilizers. In order to forecast the development of these parameters, development trends during the last decade were evaluated. The results indicate that a small reduction of agricultural area size with simultaneous improvement of production index, a small increase of livestock population, and a noticeable reduction of synthetic nitrogen fertilizers use can be expected.

Waste

The prediction of emissions from this sector is based on: (a) population growth, (b) daily waste production by type of geographical area (urban, semi-urban, rural), which is assumed to follow the last decade's trend for each area, (c) the implementation of Directive 1999/31/EC of the European Council for the landfill of waste, using a 4-year grace period in achieving the objectives of the Directive for biodegradable waste (see Section 2.2.3 above), which result in the quantitative objectives of the Directive being achieved in the years 2010, 2013 and 2020 (instead of 2006, 2009

[2] In the annual GHG Emissions Inventory, emissions from ferroalloys production are included in the *Energy* sector.

and 2016 that is determined for the general cases of application of the Directive), (d) the completion of construction of new sanitary landfill sites and wastewater treatment plants, in accordance with the strategic plan by the Ministry for the Environment and (e) the evolution of industrial production (which is closely related to the production of industrial waste).

2.3.2 Prediction of development of the energy system

According to the results of energy model ENPEP that was used during the formulation of the NAP in order to forecast developments in the country's energy sector and relevant greenhouse gas emissions, the total primary energy demand in Greece is expected to continuously increase in the long run (from 23.9 Mtoe in 1995 to 34.9 Mtoe in 2010 and to 41.4 Mtoe in 2020), with an average annual increase rate of around 2.2% (***Table 2-6***). Liquid fuels cover most of primary energy demand. Nevertheless, their contribution is seen to decrease from 60% in 1995 to 54% in 2010 and to 53% in 2020. Solid fuels consumption shows a total increase of 14% for the period 1995-2020, while their contribution falls from 35% in 1995 (roughly 8.4 Mtoe) to 23% in 2020 (roughly 9.5 Mtoe). Natural gas is forecast to cover a significant part of primary energy demand, that is 14.6% in 2010 and 19.6% in 2020, resulting in the relative reduction of solid and liquid fuel contribution. Finally, the contribution of RES, including large hydroelectric, in total primary energy demand is seen to decrease during the period examined from 4.8% in 1995 (1.15 Mtoe) to 4.3% in 2010 and to 4.2% in 2020 (1.5 Mtoe and 1.72 Mtoe respectively) . In absolute values, RES exploitation increases by 50% from 1995 up to 2020. The low share of RES in primary energy consumption, despite the incorporation of large RES investments in BaU (concerning mainly wind energy parks), is mainly due to the reduction of biomass consumption for heating in the domestic sector, due to improved living standards of population.

BaU forecasts a significant improvement of energy intensity of the system, which decreases with an average annual rate of 1.1% during the whole period under consideration. Still, the primary energy consumption per capita continues to increase during the period under consideration. However, the average annual increase rate during the period 2000 – 2020 is lower compared to that of the period 1995 - 2000 (1.5% and 2.8% respectively).

Electricity demand is expected to increase with an average annual rate of 3% during the period 2000 - 2010, while this rate is decreased to 2.5% during the following decade.

***Table 2-6*: Gross inland consumption in Greece (in ktoe)**

	Gross Inland Consumption (ktoe)						Annual Average Change (%)		
	1995	2000	2005	2010	2015	2020	95/00	00/10	10/20
Solid Fuels	8374	9131	9260	9336	9383	9533	1.7%	0.2%	0.2%
Liquid Fuels	14238	16192	17405	18940	20327	21950	2.6%	1.6%	1.5%
Renewables	1152	1299	1413	1502	1556	1722	2.4%	1.5%	1.4%
Natural Gas	58	1710	3028	5094	6622	8096	96.7%	11.5%	4.7%
Electricity	69	-1	150	-1	100	100	-141.5%	-1.9%	
Total	***23891***	***28331***	***31256***	***34871***	***37990***	***41402***	***3.5%***	***2.1%***	***1.7%***
Energy Intensity	0.30	0.30	0.27	0.26	0.24	0.23	0.0%	-1.5%	-1.2%

(ktoe/mio. Euro 1995)									
Gross Inland Consumption per capita (toe/cap)	2.27	2.61	2.79	3.05	3.27	3.52	2.8%	1.6%	1.5%

The installed capacity of the system increases by roughly 9.2 GW during the period 1995-2020. The use of lignite and petrol stations does not change considerably during the period examined. More specifically, only one new lignite-fired unit is installed in the system after the year 2000 (it has already been installed in Florina), while certain new petrol-fired stations are installed during the same period in the autonomous systems of the islands. At this point, in view of the importance of lignite for the safety of energy coverage of the country, the possibility to integrate new modern, highly efficient lignite-fired units in the system, to replace old stations should be kept in mind. This consideration could lead to the installation of at least one lignite-fired unit by 2012 although such a development has not been included in the present BaU.

The increased needs in electrical energy and capacity are mainly covered by the installation of new combined cycle natural gas units. The total installed capacity of units of this category increases roughly 5 times during the period 2000 – 2020, and reaches 5.8 GW (31% of total installed capacity) in 2020. This rather impressive increase is mainly due to the significant economic and technical advantages of this technology. Furthermore, the installed capacity of electricity generation units using RES is expected to increase significantly. Despite the fact that the installed capacity of large hydroelectric units increases only slightly during the reported period, roughly 1.6 GW of wind energy parks are expected to be installed, as a result of rich wind potential in Greece and supporting policies applied by the Greek government.

Regarding the production of electrical energy, one should note that natural gas units would cover roughly 28% of total net electricity production in 2010 (1,6 Mtoe), while this percentage reaches 36% (2.6 Mtoe) in 2020. This significant penetration of natural gas in the Greek electricity system limits the relative contribution of lignite-fired units from 67% in the year 1995 to 47% in 2010 and to 38% in 2020. However, in absolute rates the electrical energy produced by lignite-fired stations increases by 5.1% during the period 2000 - 2020. The share of electricity produced by petrol-fired stations is decreased to 13% in 2010 (755 ktoe) and to 12.6% in 2020 (911 ktoe), respectively, while the contribution of RES (including big hydroelectric) increases from 9.7% in 1995 to 11% in 2010 (634 ktoe) and to 10.7% in 2020 (773 ktoe).

The final consumption of energy in Greece increases continuously during the whole period of study (from 16.1 Mtoe in 1995 to 24.8 Mtoe in 2010 and to 29.7 Mtoe in 2020), with a medium annual increase rate of 2.5% ***(Table 2-7***). Liquid fuels have the higher share in the final energy consumption, albeit with a small reduction in their share from 70% in 1995 to 65% in 2010 and to 63% in 2020. The contribution of electricity in the final consumption of energy increases from 19% in 1995 (3.1 Mtoe) to 20.9% in 2010 (5.2 Mtoe) and to 22.3% in 2020 (6.6 Mtoe). Natural gas covers roughly 6.5% of final energy consumption in 2010 (1.6 Mtoe), while this percentage increases to 7.9% in 2020 (2.4 Mtoe). Obviously, this penetration reduces the relative contribution of liquid fuels and as the rate of increase of electricity use. The share of RES is decreased from 5.1% in 1995 to 3.4% in 2010 and to 3.2% in 2020. The reduction of share of RES in final energy

consumption, despite the penetration of solar systems, is mainly due to reduction of biomass consumption in the domestic sector.

***Table2-7*: Evolution of final energy consumption per fuel in Greece (in ktoe).**

	1995	2000	2005	2010	2015	2020
Solid Fuels	972	818	810	768	777	816
Liquid Fuels	11225	13711	14962	16197	17347	18655
Electricity	3063	3840	4498	5178	5881	6614
Thermal Energy	0	55	87	199	316	331
Renewables	825	909	871	855	867	936
Natural Gas	43	349	982	1603	2067	2356
Total	***16128***	***19682***	***22210***	***24799***	***27254***	***29707***

2.3.3 Results of emissions projections

The overall outcome of greenhouse gas emissions projections for the period 2000-2020 in BaU are presented in ***Tables 2-8*** (by sector) and ***2-9*** (by gas).

With regard to the increase rate of total greenhouse gas emissions in BaU compared to base year, it should be made clear that, as it was already mentioned in Paragraph 2.1, emissions/removals by the *Land Use Change and Forestry* sector have not been taken into account for the calculation of base year emissions, because in 1990 this sector was a "net" sink for greenhouse gas emissions. Moreover, contribution by this sector is not included in national totals (as it is a greenhouse gas emissions sink throughout the period 1990 – 2020) since in accordance to the Protocol:

- Emissions/removals by anthropogenic activities that (a) cause land use changes due to forestation, reforestation or deforestation (b) took place after 1990 and (c) have been calculated with verifiable methodologies (Article 3, Paragraph 3) should be included. However, the data available for land use in Greece do not allow the forecast of relative emissions/removals for the time being.
- A Contracting Party that belongs in the Annex I of the Convention and has ratified the Protocol, has the possibility, provided that it makes a decision, to include emissions/removals by activities undertaken after 1990, involving revegetation and forest management, cropland management and grazing land management. Since there is no relative decision and the available data are not sufficient, no forecast regarding this matter has been made in the frame of the present project.

Thus, taking the above into consideration, BaU foresees that **greenhouse gas emissions in 2010 (153.5 Mt CO_2 eq) will increase by 39.2% compared to base year emissions** (110,2 Mt CO_2 eq), while in 2020 (173.7 Mt CO_2 eq) the corresponding increase rate is estimated to be 57.6%.

The basic conclusion from the results of the BaU emissions forecast is that a significant increase of greenhouse gas emissions is expected in Greece by the end of the present decade, which for 2010 (39.2%) exceeds considerably the national target to limit the increase of emissions during the period 2008 - 2012 to 25% of base year emissions. This development, which determines the degree of effort to reduce emissions during the whole period up to 2012, is taken into consideration for the formulation of the NAP, as required by ***criterion 1 of Annex III of the Directive 2003/87***.

Table2-8: **Projections of GHG emissions in the BaU scenario, disaggregated by sector (in kt CO_2eq).**

Sources / Sinks	1990	1995	2000	2005	2010	2015	2020
Energy	80996	84622	101636	111041	121671	129909	139253
Industrial Processes	9140	11520	12879	14171	16414	18998	21299
Solvent and Other Product Use	170	153	145	158	161	164	166
Agriculture	13603	12573	12425	11969	11592	11227	10872
Land-Use Change and Forestry	-3440	-4614	-3211	-4942	-4992	-4706	-4440
Waste	4044	4651	4617	5265	3612	2500	2103
Total (without LUCF)	**107953**	**113520**	**131702**	**142604**	**153450**	**162798**	**173693**
Total (with LUCF)	**104513**	**108906**	**128491**	**137662**	**148458**	**158092**	**169253**

***Table 2-9*:** **Projections of GHG emissions in the BaU scenario, disaggregated by gas (in kt CO_2eq).**

Gas	Base Year	1990	1995	2000	2005	2010	2015	2020
CO_2	*83905*	83905	87497	104072	114107	124269	132200	141176
CH_4	*8715*	8715	9418	9644	10338	9013	8117	7935
N_2O	*14140*	14140	13152	13564	13050	12924	12768	12652
HFCs	*3369*	935	3369	4272	5022	7158	9626	11842
PFCs	*83*	258	83	148	88	88	88	88
SF_6	*NE*	NE	NE	NE	NE	NE	NE	NE
Total	**110212**	**107953**	**113520**	**131702**	**142604**	**153450**	**162798**	**173693**
Change from Base Year	**100**	**98**	**103**	**119**	**129**	**139**	**148**	**158**
Land-Use Changes and Forestry		**-3440**	**-4614**	**-3211**	**-4942**	**-4992**	**-4706**	**-4440**
CO_2		-3493	-4651	-3386	-4994	-5044	-4759	-4492
CH_4		48	34	159	48	48	48	48
N_2O		5	3	16	5	5	5	5

2.4 Towards the achievement of emission reduction target and relevant consequences for the period 2005-2007

In the frame of the 2nd National Programme for Climate Change a rational planning of various emissions reduction actions had been attempted, starting with the most mature actions and distributing the rest in time, so as to achieve the Kyoto national target by 2010. According to this planning, emissions reduction via the 2nd National Programme compared to the BaU scenario of the 2nd National Programme, would reach 3.4 Mt CO_2eq (2.5% of BaU) in 2005 and 12.3 Mt CO_2eq (8.5% of BaU) in 2010. Given the fact that base year emissions and forecast of emissions have been revised since the 2nd National Programme its implementation should be intensified if the Kyoto target is to be achieved using national policies and measures.

The 2nd National Programme anticipated the extended use of natural gas electricity generation units by 2005, so that the contribution of natural gas in the sector is considerably increased and the electricity generation by lignite is limited accordingly. The delays in the electricity market liberalization led to delays of several planned investments in this sector. A prime example of this is the fact that the first private natural gas combined cycle electricity generation unit will not start operation before the summer of 2005, while the operation of other private units - even with most optimistic scenarios - is not anticipated before the end of 2007. Based on the above, it is obvious that the direct application of this measure presents difficulties. The extended use of natural gas units to cover base load will only become feasible from 2008 and afterwards, when sufficient installed power capacity in the electric system will materialize through private investments.

Another fundamental policy axis of the 2nd National Programme , which has been significantly delayed in relation to the targets set, are measures for conservation and rational use of energy in the domestic/ tertiary sector. The delays in construction of natural gas city networks and finalisation of the Regulation for the Rational Use and Conservation of Energy-RRUCE (now expected in 2005, but practically resulting in emissions reductions much later) are the most important reasons that results as planned in the 2nd National Programme) have not been substantially realised as yet. Although urban networks construction is currently in progress (action is financed by the Ministry of Development), and the adoption of RRUCE is expected to intensify interventions for energy saving in buildings, nevertheless, significant emissions reductions through these measures should only be expected in 2008 and afterwards, since this type of intervention needs to involve a large number of consumers in order to result in significant emissions reductions.

Thus, in the frame of this NAP, a path to achieve the Kyoto target in 2010 (Kyoto path) has been adopted, which uses the BaU presented in Section 2.3 as the starting point, the plan of actions of the 2nd National Programme , modified to account for the delay in the extended use of natural gas units for electricity production as well as in the realization of measures in the domestic/tertiary sector until at least 2008. Excluding these two measures of the 2nd National Programme for the period 2005-2007 the trajectory to reach the Kyoto target shown in ***Figure 2-1*** is arrived at.

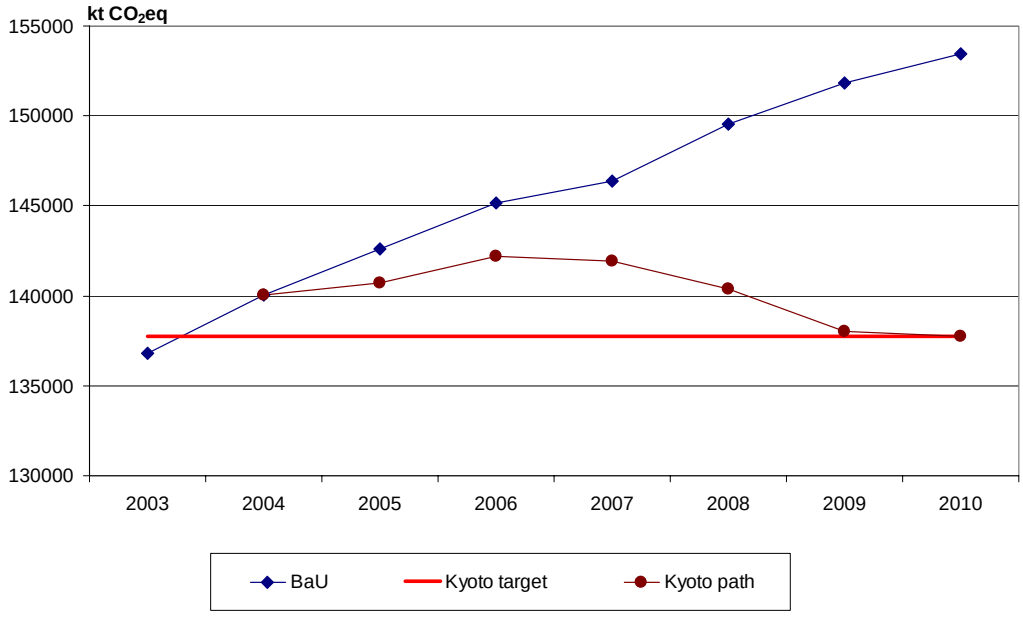

***Figure 2-1*: Evolution of GHG emissions in Greece according to the BaU scenario and the "Kyoto path" up to the year 2010.**

According to this path, greenhouse gas emissions in the country during the three-year period 2005-2007 should decrease compared to the revised BaU by 2.1% in total, with required reductions compared to the BaU of 1.9 Mt CO_2eq in 2005, 3 Mt CO_2eq in 2006 and 4.4 Mt CO_2eq in 2007. The effort to achieve reductions during the period 2005-2007, given the existing situation and the forecast of BaU, is considered to be realistic. It is also expected to drive the industrial units that fall under the Directive to undertake emissions reduction initiatives to their corresponding extent, without creating significant problems to their daily operation and economic viability. At the same time, by intensifying preparatory actions, it is expected that the planned measures in the domestic/ tertiary sector and the enhanced use of natural gas units in electricity generation from 2008 and afterwards will ensure that the Kyoto target will be achieved in 2010.

2.5 Determination of the total quantity of emission allowances for the period 2005 to 2007- Results

2.5.1 Determination of historical and estimated emissions for the installations covered by the ET Directive 2003/87/EC

2.5.1.1 Historical emissions

Directive 2003/87/EC is an institutional milestone within the European Union, aiming to assist the European Community and Member States to reach their Kyoto target. The scheme for greenhouse gas emissions allowance trading that it establishes will affect crucially the operation of installations coming under the scope of Directive.

Under this framework, the development of the National Allocation Plan should be based on information that describes, as accurate as possible, the current situation of installations and allows the calculation of greenhouse gas emissions (only CO_2 for the period 2005-2007). It is evident that installations covered by the Directive are the only source of information at this stage of analysis.

Utilizing all available data and information from sectoral institutions, relevant studies/inventories that took place recently under the scope of environmental Directives, or other relevant projects, 141 installations were found to be in compliance with the requirements of Annex I to the Directive. These include: 30 electricity industries, 16 other industrial combustion installations, 4 refineries, 1 metal ore roasting and cindering installation, 5 pig iron and steel production installations, 8 cement clinker production installations, 16 lime production installations, 3 glass manufacture installations, 43 ceramic production installations and 15 pulp and paper production installations.

In order to estimate the overall emissions of CO_2 for every installation covered, an inventory, that included 3 basic stages, was prepared:

(I) The first stage (***collection of adequate data input***) comprised the compilation and distribution of questionnaires (at activity levels as identified in Section I of the Directive) to

the installations, the audit of the questionnaires that were submitted by the installations and the search for missing information in the cases of inadequate questionnaire submission.

(II) The second stage (***Data input process – Results***) comprised the estimation of the overall CO_2 emissions of each installation, based on the questionnaire activity data submitted. The configuration of the activity questionnaires, as well as the estimation of emissions, was based on the Guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC, as specified in Decision 2004/156/EC of the Commission . The sectoral results were evaluated, and where possible, compared to the results of the Greek National Inventory Report of greenhouse gas emissions. It should be noted that, at this stage, there was no verification of the data submitted by installations by an independent accredited inspector, since the relevant legislative framework was not yet in place. It should be noted that installations whose greenhouse gas emissions form the majority of the total emissions (primarily emissions from electricity production, refineries and clinker production units), have in place and adhere to —an internal verification process of their daily activity data.

(III) Finally, the third stage (***Annual average historical emissions***) comprised the identification of (α) a reference time period of indicative operation of installations and (β) an emissions benchmark that reflects the operation of every installation during the selected reference period. This benchmark is chosen to be the annual average historical emissions during the period 2000-2003, and is calculated on the basis of the following:

i. A reporting time period (4 or 5 years), which covers the most recent available years and is considered to be representative of the operation of installations, is selected. For the NAP of the period 2005-2007, the quadrennium 2000-2003 was selected as a reporting time period, for the following reasons: α) for this period appropriate data are available for the majority of installations, β) it includes recent data (2002, 2003), which can be easier verified, c) during this period there were some major changes in the energy production processes at installation level, such as energy savings and fuel substitution, that can be given due consideration.

ii. From the reference time period, the year with the lowest emissions is excluded and the average emissions are calculated from the rest. This constitutes an indirect acknowledgment of those installations that, during this time period, undertook actions resulting in the reduction of greenhouse gas emissions (e.g. substitution of HFO with natural gas). This procedure is followed not only for process emissions, but also for combustion emissions.

iii. In case the available data of an installation covers only 2 years of full operation, the average historical emissions benchmark is calculated without excluding the one with the lowest emissions.

iv. In case an installation starts operating during the last year of the reference period, or even in the middle of the year (hence the data submitted do not correspond to conditions of full operation), the emissions are calculated based on the available technical characteristics of the installation.

v. In case the capacity/type of activity of the installation has been changed during the time reference period, the emissions are calculated based on the years following the change. Where the change has taken place after the last year of the reference period and before the first year of the emissions trading period, then the historical emissions are calculated on the basis of the new capacity/type of activity.

The annual average historical emissions at activity level result from the sum of the annual average historical emissions of the installations forming the activity. Consequently, the annual average historical emissions of every activity do not correspond to the average annual activity emissions during the period 2000-2003 obtained by the application of the rules stated above. Those might be higher than all the emissions of the quadrennium years as would be the case for installations, which were not operating (or had just started operating) during this quadrennium or in cases where some installations of a specific activity did not submit data for every year of the quadrennium.

The historical emissions per activity are presented in ***Table 2-10***.

***Table 2-10*: Historical CO_2 emissions per activity for the period 2000 – 2003 based on data provided by the involved installations (in t CO_2)**

	2000	2001	2002	2003	Mean Annual Historic Emissions [1]
CO_2 EMISSIONS FROM COMBUSTION ACTIVITIES					
Electricity Generation	50,758,590	51,942,385	51,568,727	52,232,875	55,501,465
Other Combustion Plants	1,141,279	1,122,562	1,173,155	1,078,103	1,174,601
Refineries	2,855,119	2,902,443	2,904,198	2,931,586	2,942,929
Sintering	110,707	92,302	94,797	94,865	100,123
Iron and Steel	109,117	156,241	152,345	143,682	181,659
Cement Production	4,236,993	4,298,080	4,244,830	4,245,390	4,459,805
Lime Production	189,297	202,161	217,332	238,165	236,136
Glass Production	36,414	81,855	87,340	76,149	83,533
Ceramic Production	494,026	534,105	568,684	591,116	591,260
Paper Production	177,475	188,859	212,068	200,394	215,649
Total	**60,109,016**	**61,520,993**	**61,223,476**	**61,832,323**	**65,487,160**
CO_2 EMISSIONS FROM INDUSTRIAL PROCESSES					
Electricity Generation	63,406	89,397	65,858	87,897	151,861
Other Combustion Plants					
Refineries	648,318	610,924	656,339	665,884	678,644
Sintering	612,710	659,885	746,279	733,640	713,268
Iron and Steel	251,599	324,161	444,575	401,609	595,145
Cement Production	6,555,583	6,584,823	6,331,435	6,386,465	6,752,921
Lime Production	479,245	481,340	545,134	586,122	598,258
Glass Production	12,389	25,810	29,827	24,831	27,057
Ceramic Production	163,324	162,280	192,078	232,695	238,733
Paper Production					
Total	**8,786,574**	**8,938,620**	**9,011,526**	**9,119,144**	**9,755,887**
TOTAL CO_2 EMISSIONS					
Electricity Generation	50,821,996	52,031,782	51,634,585	52,320,772	55,653,327
Other Combustion Plants	1,141,279	1,122,562	1,173,155	1,078,103	1,174,601
Refineries	3,503,436	3,513,367	3,560,537	3,597,470	3,621,573
Sintering	723,416	752,187	841,076	828,506	813,391
Iron and Steel	360,717	480,402	596,920	545,291	776,804
Cement Production	10,792,575	10,882,903	10,576,265	10,631,854	11,212,726
Lime Production	668,542	683,501	762,466	824,286	834,394
Glass Production	48,803	107,665	117,167	100,981	110,590
Ceramic Production	657,350	696,385	760,763	823,811	829,993
Paper Production	177,475	188,859	212,068	200,394	215,649
Total	**68,895,590**	**70,459,613**	**70,235,003**	**70,951,468**	**75,243,047**

[1] The methodology for estimating historical CO_2 emissions at activity level is presented in bullet III above.

2.5.1.2 Emissions Projections

The projection of greenhouse gas emissions from installations participating in the trading scheme for the purposes of this NAP was carried out according to the following:

- For activities where all the installations of the activity fall under the scope of the Directive, the projections derive from the updated BaU, the results of which were presented in section 2.3.
- For activities where only a part of the installations of the activity fall under the scope of the Directive, then the emission trends estimated from the updated BaU scenario (section 2.3) are applied on the annual mean historical emissions of each installation (section 2.5.1.1.). The total projected emissions at activity level equal the sum of the projected emissions at installation level.

The total projected CO_2 emissions of installations covered by the emissions trading Directive (at sectoral level), in relation to the total projected greenhouse gas emissions, are presented in ***Table 2-11***. For the first period of emission allowance trading (2005-2007), CO_2 emissions of installations falling under the Directive are projected to be approximately 52.5% of the total greenhouse gas emissions.

***Table2-11*: Projected CO_2 emissions from the installations under Directive 2003/87 in relation to total GHG emissions in Greece according to the BaU scenario (in kt CO_2eq).**

	2005	2006	2007	2008	2009	2010	2011	2012
CO_2 EMISSIONS FROM COMBUSTION ACTIVITIES								
Electricity Generation	54,580	55,891	56,109	57,169	58,255	58,917	59,483	59,757
Other Combustion Plants	1,207	1,224	1,241	1,258	1,276	1,293	1,311	1,330
Refineries	2,937	2,929	2,921	2,914	2,907	2,901	2,892	2,883
Sintering	100	100	100	100	101	101	101	101
Iron and Steel	176	185	190	190	190	190	191	191
Cement Production	4,407	4,409	4,412	4,417	4,423	4,426	4,430	4,435
Lime Production	241	243	246	249	252	256	259	262
Glass Production	84	84	84	84	84	85	85	85
Ceramic Production	592	593	594	596	597	599	600	601
Paper Production	213	213	212	215	218	221	224	227
Total	64,537	65,870	66,110	67,193	68,303	68,989	69,575	69,872
CO_2 EMISSIONS FROM INDUSTRIAL PROCESSES								
Electricity Generation	152	152	152	152	152	152	152	152
Other Combustion Plants	0	0	0	0	0	0	0	0
Refineries	972	1,307	1,307	1,307	1,307	1,307	1,307	1,307
Sintering	714	715	715	716	716	717	717	718
Iron and Steel	602	632	647	648	649	649	650	651
Cement Production	6,958	6,962	6,967	6,975	6,984	6,989	6,995	7,004
Lime Production	601	608	615	622	630	639	647	655
Glass Production	27	27	27	27	27	27	28	28
Ceramic Production	229	231	233	235	237	238	240	241
Paper Production	0	0	0	0	0	0	0	0
Total	10,256	10,633	10,664	10,682	10,702	10,718	10,735	10,754
TOTAL CO_2 EMISSIONS								
Electricity Generation	54,732	56,043	56,261	57,321	58,406	59,069	59,635	59,909
Other Combustion Plants	1,207	1,224	1,241	1,258	1,276	1,293	1,311	1,330
Refineries	3,909	4,235	4,228	4,221	4,214	4,208	4,199	4,190
Sintering	815	815	816	816	817	818	818	819
Iron and Steel	778	817	837	838	839	840	841	841
Cement Production	11,365	11,370	11,379	11,392	11,407	11,415	11,425	11,439
Lime Production	842	851	861	872	883	894	905	917
Glass Production	111	111	111	111	112	112	112	113
Ceramic Production	821	824	827	830	833	837	840	842
Paper Production	213	213	212	215	218	221	224	227
Total	**74,793**	**76,503**	**76,774**	**77,875**	**79,006**	**79,707**	**80,311**	**80,626**
Total National GHG Emissions	**142,604**	**145,137**	**146,336**	**149,549**	**151,808**	**153,451**	**155,121**	**156,433**
Contribution of ETS Units	**52.4%**	**52.7%**	**52.5%**	**52.1%**	**52.1%**	**51.9%**	**51.8%**	**51.6%**

2.5.2 Determination of the share of installations covered by the Directive to the total emissions

According to Criteria I of Annex III of the Directive 2003/87/EC, the total quantity of allowances to be allocated to covered installations shall be consistent with the Member State's obligation to the Kyoto Protocol. During the first implementation period of the Directive (2005-2007) there is no quantitative target to be met. For this reason, the "path" to the Kyoto target has been determined (see paragraph 2.4).

Based on this "path" towards achieving the Member State's target under the Kyoto Protocol, the next step, which pertains to the estimation of the total allowable emissions, concerns the decision regarding the share of emissions that should be granted to the total trading population covered by the Directive. According to the relative statement of the Commission (COM (2003) 830), Member States shall use the most recent available data (not necessarily historical data) in order to arrive at a fair share-out of emission allowances. There are 3 basic approaches possible:

- **The historical emissions approach**. The share of installations coming under the Provisions of the Directive is calculated based on the installations' historical emissions (for a particular year or period) in relation to the total greenhouse gas emissions in the country during the respective year or period.
- **The forecasting approach**. The share of installations coming under the Provisions of the Directive is calculated based on their projected emissions and the projected national greenhouse gas emissions.
- **The least-cost approach**. This approach constitutes a path towards the Kyoto target based on implementing the least-cost options first, which at the same time results in a method of calculating the share of covered installations.

According to the results presented above, the covered installations' **historical share** is estimated to be **52.8%** of the total greenhouse gas emissions of the country (excluding the land use changes and forestry sector), whereas the **forecasted share** for the period 2005-2007 is estimated to be at an average of **52.5%**. The marginal reduction is attributed mainly to the changes in the electricity production sector (use of natural gas and renewable resources, in a sector that represents 74% of the total emissions coming from installations covered by the Directive).

Based on the **least-cost approach,** the covered installations' share for the period 2005-2007 is estimated to be **50.6%** of the total emissions, indicating that the electricity production sector has less expensive abatement possibilities than other sectors.

The estimation of the total quantity of emission allowances for the period 2005-2007 was developed using the forecasting approach. This was decided upon by taking into account the potential increase of greenhouse gas emissions in Greece, the delays in the completion of infrastructure projects, and the necessity to maintain the GDP growth rates of the Greek economy in an effort to converge with the EU average GDP.

2.5.3 Total quantity of allowances for the period 2005-2007

According to the "path" towards the Kyoto target as mentioned in Paragraph 2.4 and the selected approach for determining the covered installations' share of the total greenhouse gas emissions (Paragraph 2.5.2), **the total emission allowances to be allocated for the triennium 2005-2007 were estimated to be 223,266,053 t CO_2. These allowances will be allocated for free (which means that for the period 2005-2007 there is no intention of auctioning allowances).**

The projected total quantity of allowances for the period 2005-2007 is 2.1% lower than the projected emissions of covered installations in the "business as usual" scenario. Compared to 2003 (the most recent year for which data is available), the total quantity is 4.9% higher, where the change in comparison to 2003 is estimated by taking into account equivalent distribution of allocation of the total allowances for the period 2005-2007 during the 3 years of the period (that is 74,422,018 t CO_2 / year).

In determining the total quantity of allowances, all the parameters for the proper implementation of **Criteria 1 of Annex III of the Directive** were taken into consideration, and more particularly:

(a) The Kyoto "path", on which the calculation of total allowances is based, was developed taking into account not only the target, but also the planning of emission reduction measures included in the 2nd National Programme for the limitation of GHG emissions, together with the most recent developments regarding the progress of reduction measures.

(b) Total allowances were calculated on the basis of the most recent available data with respect to the share of emissions from covered installations to total GHG emissions of the country, while for the calculation, one of the three suggested approaches (i.e. the forecasting approach) was followed.

(c) The determined total quantity of allowances resulted from the combination of the "path" towards the Kyoto target and the proportional share of emissions of the covered installations. This quantity did not increase due to the future use of flexible mechanisms of the Protocol, which would allow total GHG emissions to exceed the Kyoto target, because the country has not yet developed a specific policy for the exploitation of the mechanisms, such as commitment of financial resources in the state budget, agreements with other countries, etc. However, it must be noted that the country is exploring the possibility of buying allowances after 2007, so as to maintain the sufficiency of electric energy at satisfactory levels. In this case, plans exist for the purchased allowances to be used to introduce into the Greek power system, by 2015 at the latest, the installed power of modern technology lignite power units with a minimum capacity of 600 MW. Obviously, these allowances concern the period after 2007, since no lignite power units will be constructed during 2005-2007.

(d) The total quantity of allowances during the period 2005-2007 is 2.1% lower than the projected emissions of the covered installations in BaU.

In addition, the total quantity of allowances to be allocated is in accordance with the decision 93/389/EC (that was replaced by the decision 280/2004/EC), since this quantity not only fails to exceed the projected emissions of the covered installations for the period 2005-2007, but also is 2.1% lower than those projected emissions, and as a result, the allocation of the total allowances meets the **Criteria 2 of Annex III of the Directive.**

2.6 Policy and measures taken for emission reduction in sectors not covered by the Directive 2003/87

The National Allocation Plan is based on the assumption that the current policies and measures included in the 2nd National Program for Climate Change 2000-2010 and aimed at the reduction of greenhouse gas emissions in sectors not covered by the emissions trading Directive will be maintained (though with some deviations). In particular, it is estimated that substantial reductions of greenhouse gas emissions will be accomplished in the residential and services sector, the transportation sector, the sectors of agriculture and domestic waste, and in the manufacturing sector, primarily through the limitation of f-gases emissions. According to the results of the analysis undertaken in the 2nd National Program, the implementation of the relevant measures is necessary so as to reduce the total greenhouse gas emissions and meet the objectives of the Kyoto Protocol, as far as Greece is concerned. This is especially true since the National Program prioritizes and emphasizes the accomplishment of the targets under discussion through national actions. It should be noted that there is always the possibility of exploiting the Flexible Mechanisms of the Kyoto Protocol. Nonetheless, the contribution level of the relevant mechanisms to the requirements for emissions reduction has not yet been determined, while the maximum possible reduction of emissions is pursued through national policies and measures. In support of the above, according to the results included in the National Program, there are significant technical resources in the country that can be used to reduce emissions in a cost-effective way. The following paragraphs briefly describe the main points of actions projected in the National Program for the greenhouse gas emissions reduction in sectors that do not fall under the emissions trading Directive.

2.6.1 Residential and Services Sector

As already mentioned, in the National Program there are a series of actions aiming at the proper use of energy in the residential and services sector. Specifically, the main actions of the Program concern:

- Improvements in the energy performance of existing buildings with changes in the shell (insulations, installation of double glazing, etc.).
- Upgrades to the heating and cooling system through the proper maintenance or replacement of boiler central heating, installation of roof fans, promotion of more efficient air conditioning devices, etc.
- Promotion of more efficient electric appliances and changes in build-in lighting.
- Further exploitation of natural gas for heating, cooling, etc.
- Further promotion of renewable energy sources, primarily the use of solar systems, photovoltaic and biomass (district heating).

The implementation of the above actions is projected to contribute to the reduction of greenhouse gas emissions in the residential and services sector through the reduction in fuel use in various energy uses , as well as through the use of "clean" fuels (natural gas, renewable energy resources) in the national energy balance. Additionally, the implementation of the relevant measures will

contribute to the reduction in electric energy use in this sector, which results in further emission reductions in the electricity production sector. The capacity for greenhouse gas emissions reduction in the residential and services sector as calculated in the 2nd National Program (assuming realistic implementation rates) is projected to be 2.3 Mt CO_2eq for the year 2010.

2.6.2 Transport

The main actions in the transport sector, as presented in the National Program, concern:

- Increased vehicle performance through regular and more frequent vehicle maintenance.
- Improvements to the transportation control system through the promotion of public transportation, the use of LNG buses, the improvement of traffic lights performance, the adoption of disincentives for the use of passenger cars in urban centers, etc.
- The use of new fuels and especially biofuels.

The total reduction capacity of greenhouse gas emissions in the transport sector is expected to reach 0.5 Mt CO_2eq until 2010, according to the National Program.

2.6.3 Agriculture-Domestic Waste

In the fields of agriculture and domestic waste, some important actions have already taken place and been incorporated in the "business as usual" scenario of the National Program, as well as in the current Report. As a result, the additional actions for emissions reduction included in the National Program have a yearly capacity of 0.13 Mt CO_2eq in 2010. The most important actions in the agriculture and domestic-waste sectors concern:

- The promotion of an animal-waste management system.
- The reduction in the use of nitrogen fertilizers primarily through the promotion of biological agriculture.
- The exploitation of the produced biogas in landfills.

2.7 Auctioning of allowances

In article 10 of the Directive 2003/87, which refers to the method of allocation of allowances, it is stated that during the period 2005-2007 Member States allocate at least 95% of the allowances for free (consequently the percentage of the allowances that will be sold through auctions or other means cannot be more than 5% of the total quantity of allowances). Auctioning is a way of selling allowances to the covered installations or to any other interested party (natural or legal entity). Auctioning may concern either a percentage of the total allowances or the unused allowances of the reserve for new entrants.

Auctioning of allowances is not projected to take place for the period 2005-2007, as mentioned also in Paragraph 2.5.3., and the total allowances will be allocated for free.

As for the **unused allowances of the reserve for new entrants** through 31 December 2007, as already mentioned in Paragraph 5.2., these are expected to be auctioned from the **competent**

authority by the 15th of February 2008 at the latest. The relevant decision will be taken in due time and subsequently made public to all the interested parties.

3. ALLOCATION OF EMISSIONS ALLOWANCES AT ACTIVITY AND INSTALLATION LEVEL

3.1 Allocation of the total quantity of emission allowances at activity level

3.1.1 Methodology for the allocation of allowances

In Greece, the activities that are covered by the provisions of the Directive 2003/87/EC differ significantly in terms of the ratio of their emissions from combustions and emissions from processes and in terms of the expected growth trend during the period 2005-2007. Considering this, the allocation of emissions allowances is carried out in two stages, first at activity level and then at installation level.

The activities under examination are the ones referred to in Annex I of the Directive, namely **energy activities and other combustion installations, mineral oil refineries, production and processing of ferrous metals, production of cement and lime, manufacture of glass and ceramic products and production of paper and cardboard**

The allocation of emission allowances at activity level is based on the following principles:

(1) The quantity of emission allowances for the reserve of the known new entrants (section 5.2.2.1) is initially subtracted from the total quantity of emission allowances, considering that the emission allowances of the reserve cover the emission of the new installations that will serve basic energy, development and environmental needs of the Greek economy (production of electricity and liquid fuels production of fuel with better environmental performance), as well as of the covered installations.

(2) With respect to the emissions of ***CO_2 from processes***, their reduction, in the vast majority of the cases, requires the modification of the existing raw and secondary materials and/or the modification of the current production process technology (the latter might affect the type and quantity of the raw and secondary material). These types of modifications are promoted by the current international and national legislation such as the IPPC Directive (96/61/EC) and the Greek Law 2965/2001 on the sustainable development in the Attica Region. However, for those activities for which the great majority of installations consists of small and old fashioned facilities (e.g. installations for the production of lime or ceramics) it is expected to be rather difficult technically and economically to implement these modifications soon (at least for the foreseeable future).

Moreover, there are activities for which the only feasible way to reduce CO_2 emissions from processes is to reduce the utilization rate in one of the installation processes. This is considered to have negative effects on the domestic employment and international competitiveness of some enterprises. For example, for cement production installations, the reduction of emissions from processes related to the production of clinker requires a reduction in domestic clinker production (and, consequently, a reduction in the furnace's operation time to such levels that might result in a higher level of unemployment) and the importation of clinker.

Considering the above, the basic principle for the allocation of emission allowances at activity level for the period 2005-2007 refers to the **non-requirement for reduction of the projected emissions of CO_2 from processes**.

However, taking into account that the next trading period, 2008-2012, is much more demanding in terms of emission reduction, it is necessary to begin effectively promoting the implementation of the Best Available Techniques (BAT) in the Greek industry, in order to reduce, among other things, the emissions of CO_2 from processes.

(3) With respect to the emissions from combustion, it is considered vital to promote and support the co-generation. This, despite the fact that it results in increased CO_2 emissions at installation level, replaces the production of electricity, which in Greece, for the time being, is connected to relatively high energy losses (due to the low efficiency of many old production facilities and losses of approximately 9% during the transmission of the electricity) and high emission factor for CO_2 per kWh (average emission factor for Greece for 2003: 1,080 kg CO_2/MWh, energy production from natural gas 470 kg CO_2/MWh). As a result, the non-requirement for reduction of the CO_2 emissions from the existing co-generation units (irrespective of the fuel used) is adopted.

(4) Regarding the remaining foreseeable combustion activities, the emission allowances will be reduced (using the appropriate compliance factor) to such an extent as to be equal to the quantity of the remaining emission allowances after the subtraction of the aforementioned quantities.

(5) Finally, regarding the emission allowances of the reserve of the Unknown new entrants (section 5.2.2.2), their quantity was determined based on the most recent year of available data (2003) and as a percentage of the emissions of CO_2 in 4 specific activities (production of ceramics, lime, paper and cardboard and other combustion installations), in which it was estimated that there is possibility to have new entrants. Hence, for the allocation of the emission allowances at activity level, the quantity of allowances of the unknown new entrants reserve is subtracted, proportionally from the quantity of allowances of the various activities, which have been calculated according to the previously described steps.

Considering the above, the basic calculation equation is:

$$\mathrm{TA} = \mathrm{A}_{\mathrm{auction}} + \mathrm{A}_{\mathrm{KNER}} + Cf_p \cdot \sum_{i=1}^{10} \left(\overline{\mathrm{EP_i}} \cdot \mathrm{GrP_i} \right) + Cf_c \cdot \sum_{i=1}^{10} \left(\overline{\mathrm{EC_i}} \cdot \mathrm{GrC_i} - \overline{\mathrm{CHP_i}} \cdot 3 \right) + \overline{\mathrm{CHP_i}} \cdot 3 \quad (1)$$

where:

TA	*total quantity of* emission allowances for the period 2005-2007
$A_{auction}$	*quantity of* emission allowances auctioned for the period 2005-2007
A_{KNER}	emission allowances of known new entrants reserve for the period 2005-2007
Cf_p	*compliance factor for emissions of* CO_2 from processes (equal to 1)
Cf_c	*compliance factor for emissions of* CO_2 from combustion
$\overline{\mathrm{EP_i}}$	historic emissions from processes for activity -i
GrP_i	*growth factor for process emissions for the activity*-i

$\overline{EC_i}$ historic emissions from combustion for activity -i

GrC_i *growth factor for combustion emissions for the activity*-i

$\overline{CHP_i}$ historic emissions from cogeneration for activity -i

The growth factors GrP_i και GrC_i for each activity are determined from combining the elements of tables 2-10 and 2-11.

From equation (1), the compliance factor for the remaining foreseeable combustion activities is equal to

$$Cf_c = \frac{TA - A_{auction} - A_{NER} - Cf_p \cdot \sum_{i=1}^{10}\left(\overline{EP_i} \cdot GrP_i\right) - \overline{CHP_i} \cdot 3}{\sum_{i=1}^{10}\left(\overline{EC_i} \cdot GrC_i - \overline{CHP_i} \cdot 3\right)} \qquad (2)$$

The subtraction of the quantity of the emission allowances in the reserve of unknown new entrants from the various activities is made proportionally according to

$$SA_i' = SA_i \cdot \left(1 - \frac{A_{UNER}}{\sum_i SA_i}\right) \qquad (3)$$

where:

SA_i' emission allowances for the total of the existing installations of activity-i for the period 2005-2007

SA_i emission allowances for the activity-i for the period 2005-2007 prior to the subtraction of the unknown new entrants reserve

A_{UNER} emission allowances of the reserve of the unknown new entrants for the period 2005-2007

It is noted that the average annual historic emissions at installation level used (as totals) in equation (1) are determined based on the principles and rules presented in section 2.5.1.1.

3.1.2 Results of the allocation of allowances at activity level

The results deriving from the application of the aforementioned allocation methodology, in combination with the total quantity of emission allowances and the size of the reserves, are presented in ***Table* 3-*1.***The table includes the total average compliance factor per activity (as it derives from the application of the methodology presented in section 3.1.1) based on the average annual historic emissions for the period 2000-2003 as well as the emissions of the most recent year (2003). The presentation of the factor for both cases is considered significant since it provides a better view of any particular characteristics of the year 2003 compared to the historic period.

Finally, it is noted that specific issues related to the competition outside the EU (**criterion 11 of Annex III of the Directive**) are not taken into account, since the potential problems should be addressed within the framework of EU policies.

***Table 3-1*: Comparative assessment of CO_2 emissions from ETS units in the BaU scenario and the allowances provided per activity.**

	ELECTRICITY GENERATION	REFINERIES	IRON & STEEL	SINTERING	CEMENT	LIME	GLASS	CERAMIC	PAPER	OTHER COMBUSTION	TOTAL
BaU	**167,035,780**	**12,372,571**	**2,432,016**	**2,445,470**	**34,114,699**	**2,553,899**	**332,836**	**2,472,670**	**637,951**	**3,672,693**	**228,070,584**
TOTAL ALLOWANCES	*162,914,253*	*12,189,422*	*2,418,379*	*2,438,022*	*33,787,421*	*2,535,837*	*326,615*	*2,429,084*	*622,166*	*3,604,853*	***223,266,053***
COMPLIANCE FACTOR WITH RESPECT TO BaU	0.975	0.985	0.994	0.997	0.990	0.993	0.981	0.982	0.975	0.982	**0.979**
NEW ENTRANTS											**9,475,497**
TOTAL ALLOWANCES IN EXISTING PLANTS	156,199,372	10,296,226	2,392,650	2,421,885	33,215,274	2,503,008	316,331	2,356,754	596,454	3,492,603	**213,790,556**
OVERALL COMPLIANCE FACTOR WITH RESPECT TO HISTORIC EMISSIONS	0.944	0.948	1.027 [1]	0.993	0.987	1.000	0.953	0.946	0.922	0.991	**0.969**
OVERALL COMPLIANCE FACTOR WITH RESEPCT TO 2003 EMISSIONS	0.995	0.954	1.463 [1]	0.974	1.041	1.012	1.044	0.954	0.992	1.080	**1.004**

[1] The compliance factor is greater than 1 as significant investment were realized in the period 2001-2003 resulting to considerable increase in their production levels.

3.2 Allocation of the total quantity of emission allowances at installation level

3.2.1 General rules for the allocation of allowances

3.2.1.1 Existing installations

The methodology for the allocation of emission allowances per installation, taking into account the allocation at activity level as it was determined during the previous stage, includes the following basic points:

- The allocation is based on the historic emissions from an installation during the baseline period (2000-2003), which are calculated based on the rules presented in section 2.5.1.1 . This way, emission reduction actions that were made by an installation within the baseline period, are indirectly taken into account, since the average annual emissions for a series of years is calculated excluding the year with the minimum emissions (which could for example be the year after the introduction of natural gas).
- Moreover, rules similar to the ones used during the allocation at activity level are implemented, with respect to process and co-generation emissions (a compliance factor equal to 1 is considered).
- In order to take into consideration an installation with an initial date of operation falling after the last year of the baseline period (which consequently had zero emissions during that period),

the "adjusted historic emissions" are estimated, taking into account the emissions foreseen if the installation were operating full time.

- In addition, if an installation utilizes biomass – either exclusively or supplementary to a conventional fuel – then again the "adjusted historic emissions" are estimated taking into account the emissions foreseen if the installation were using the conventional fuel instead of the biomass. If such an adjustment did not take place, then the historic emissions of the installation would be very low, or even zero (since the emission factor of biomass for CO_2 equals to 0). During the adjustment for an installation that uses biomass and conventional fuel, the historic emissions are increased by 5% of the emissions of the conventional fuel that is replaced by biomass. For installations that use exclusively biomass, the aforementioned percentage is increased to 10%.

The results deriving from the implementation of the allocation methodology are presented in section 3.2.3.

3.2.1.2 Closure of installations

The permanent closure of installations is governed by the following scheme:

- The closure of an installation is considered permanent when one of the following conditions stands:
  - The operation permit for an installation is removed / withdrawn by the competent authority.
  - The operator of the installation has provided written notification to the competent authority for the provision of the greenhouse gas emission permit stating that he will no longer be in operation.
  - The closure is a result of a court order (e.g. bankruptcy).
  - The installation has permanently modified its activity,
  - An installation's emissions for one year during the period of the implementation of the Emission Trading Scheme – as they are registered in the last verified annual emission report of the installation that has been submitted to the competent authority – **are lower than 10%** of the average annual historic emissions of the installation during the baseline year. Confirmation of the permanent closure is provided to the operator of the installation within 1 month from the submission of the verified emission report to the competent authority. The operator is granted 10 working days in order to submit – if he wishes – a written application to the competent authority that proves that the closure is temporary. The competent authority issues a decision within 10 working days from the receipt of the application, and notifies the installation's operator. In the case that the closure is determined to be permanent, the greenhouse gas emission permit is removed from the installation.
- For the years following the year of permanent closure of the installation, no emission allowances are issued. The emission allowances of those installations remaining through the end of the trading period are transferred to the reserve of the unknown new entrants, unless

the operator selects to transfer the remaining emission allowances to a new installation he operates ("transfer rule", section 3.2.1.3).

- In case emission allowances are issued for the year that follows the year of the permanent closure , the installation is obliged to return the total emission allowances to the competent authority. If the installation does not have in its possession enough emission allowances, it should go to the market and buy the missing quantity; otherwise it shall pay the fine stipulated in article 16 of the Directive.
- From the emission allowances issued for the year of permanent closure of the installation, the installation has to return to the competent authority the emission allowances needed to cover its emissions during the year until its permanent closure .
- If an installation, for which permanent closure was confirmed in a year of the trading period, re-operates in a year of the same trading period, then it is considered as a new entrant and falls under the provisions for new entrants.

In the case of temporary closure of an installation:

- The installation keeps the total amount of emission allowances issued during the year of temporary closure , as well as the greenhouse gas emission permit.
- The issuance of emission allowances for the installation is restricted until the year of the re-operation of the installation, but the total quantity of emission allowances is proportionally reduced, in relation to the time period during which the installation did not operate, and the remaining emission allowances are transferred to the unknown new entrants reserve.

3.2.1.3 Transfer of allowances to new installations

For the first trading period (2005-2007) the following scheme is foreseen (transfer rule):

- The transfer of emission allowances from an existing installation that closes to a new one (the term "new" also covers the extension of another existing installation, which according to the Directive 2003/87 is considered new entrant) is possible only in the case that the two installations carry out the same activity of Annex I of the Directive 2003/87 and have the same operator.

- If the capacity of the new installation is greater than the old one, the additional emission allowances are provided by the new entrants reserve according to the rules that govern the allocation of emission allowances among new entrants.

- If the capacity of the new installation is lower than the old one, then

  (a) for the additional emission allowances (not needed by the new installation), the procedure foreseen for the permanent closure is followed;

  (b) the part of the emission allowances of the old installation that is transferred to the new one is calculated according to the rules for the calculation of the emission allowances for the new entrants (the aim being the equity between the new entrants

from transfer of emission allowances and the new entrants that receive the emission allowances directly from the new entrants reserve).

- With respect to the timing of the permanent closure of an old installation / beginning of operation of the new installation there is no time restriction, but:
  - After the permanent closure of the old installation no more emission allowances are issued for it.
  - Emission allowances for the new installation will be issued as soon as it starts its operation (and apparently after it has gained greenhouse gas emission permit).
  - The quantity of emission allowances to be transferred from the old installation to the new one will be reduced proportionally to the time period between the permanent closure of the old installation and the beginning of operation of the new one, in relation to the time period between the permanent closure of the old installation and the end of the trading period.
  - This reduction will not take place in the case that the capacity of the new installation is greater that the old one's and the estimated emission allowances for the new installation (without considering the time period before the beginning of its operation) extend the reduced quantity of allowances mentioned earlier.

3.2.1.4 New entrants

The framework and the manner in which new entrants will be able to begin participating in the emissions trading scheme is presented thoroughly in Section 5.2.

3.2.2 Special rules for allocation of allowances

3.2.2.1 Early action

In the method of allocation at activity and installation level early action is taken indirectly into consideration, because in order to estimate the historical emissions at installation level (and as a result at activity level, by summing up the emissions of the activity installations) the average emissions of the years of the selected baseline is used, with the exception of the year with the lowest emissions. If the reason for emission reduction during that year was, for example, energy savings or substitution of a fuel with another one having a lower CO_2 emission factor, then this emission reduction (leading also to lower emission allowances) is not taken into account, and the installation is favored by the allocation of allowances.

Under the above framework, the selection of an appropriate baseline suggests an indirect way of accommodating early action. It is evident that the more early years covered, the more early action is taken into account, as in most of the cases the measures taken to reduce emissions were implemented during the more recent years. Nevertheless, the use of an early base period makes the finding of reliable data for past years difficult, thus reducing the reliability of emissions projections. The baseline used for the elaboration of the Greek National Allocation Plan was the

period 2000-2003. The use of data prior to 2000 was not feasible, as most of the covered installations did not have the appropriate data for the emissions projections available.

3.2.2.2 Emissions from processes

The level of difficulty (in some cases even impossibility) to reduce the CO_2 emissions from processes, from a technically and economically standpoint, is a critical factor in the adopted method of allowance allocation at the activity and installation level. This difficulty is recognized through the use of a compliance factor equal to 1 for all the process emissions for the period 2005-2007.

Until the next trading period, installations have sufficient time to study and adopt Best Available Techniques (e.g. using the IPPC Brefs) or other techniques/technologies leading to emission reductions from CO_2 processes. For this reason, it is not necessary that the compliance factor equal to 1 be applied to the next trading period as well.

3.2.2.3 Co-generation

In the framework of the allocation methodology that was adopted, co-generation emissions (regardless of fuel) are treated the same way as emissions from process, that is, by using a compliance factor equal to 1 both for existing installations and new entrants. However, the estimation of allowances for new entrants will be based on a total efficiency factor equal to 85% in order to promote more energy-efficient installations.

3.2.2.4 Increase of emissions due to legislative requirements

The inevitable increase of CO_2 emissions in certain installations, due to legislative requirements, has been taken into account in the framework of this allocation plan, especially in the case of oil refineries, which are obliged to produce low sulfur fuels in accordance with Community Directive 2003/17/EC. This directive demands that the oil refineries produce "sulfur-free" gasoline and diesel, that is, with a sulfur content less than 10 ppm.

The following notes are made regarding the ability of the Greek oil refineries to apply the Directive 2003/17/EC:

- "Hellenic Petroleum" oil refinery installation in Aspropyrgos will have to install a desulfurisation unit, which is planned to start operations at the beginning of 2006.
- "Hellenic Petroleum" oil refinery installation in Thessalonica will have to operate a new process unit that will further reduce the content of sulfur in diesel at the beginning of 2005.
- "MOTOR OIL" oil refinery is constructing a new hydrogen production unit, which is expected to be fully operational by the summer of 2005.

The expected increase of emissions in the above installations has been accounted for within the formulation of the known new entrants reserve. A compliance factor equal to 1 (one) has been used to estimate their allowances, having in mind that these investments are implemented in order to

fulfill the provisions of European Directives that aim to protect the environment by improving the quality of fuels. Moreover, the oil refineries do not have any other alternative than to comply with the relevant European and national legislation.

3.2.3 Allocation of allowances at installation level

The estimated allowances at installation level, are presented in **Annex A.**

The allowances of each installation for the period 2005 – 2007 will be assigned in three equal annual amounts.

3.3 Other issues regarding allocation of allowances

3.3.1 Transferring of allowances between allocation periods (banking)

The National Allocation Plan does not permit transferring of allowances between the first (2005-2007) and the second period (2008-2012). This was decided in view of the similar provisions that are included in the rest E.U. Member States' NAPs.

Regarding the handling of unused allowances of any reserves by the end of the period 2005-2007, as refers in the rules of admission for new entrants in section 5.2, they will be sold (possibly through auction) at the beginning of 2008, while those left unsold will be cancelled.

Thus, the following scheme is ensued:

- Transferring those allowances that have not been surrendered by the installations and cancelled by the Competent Authority by 30 April, 2008 to the period 2008-2012 is not permitted. The Competent Authority will cancel allowances that have been allocated for the period 2005-2007 and have not been surrendered by the installations by the 30 April 2008.
- Installations are permitted to transfer allowances from one calendar year to the following years within the same period (intra-period banking).
- The allowances of the new entrants reserve that remain unused at the end of each calendar year within the same period will be transferred to the reserve of the next calendar year.
- The allowances of the new entrants reserve that remain unused through 31 December, 2007, will be sold (possibly through auction and up to the upper limit that is permitted by the Directive, which is 5% of the total allowances).

3.3.2 Unilateral inclusion of additional installations (opt-in)

Application of emissions allowances trading to installations carrying out activities listed in Annex I of the Directive 2003/87 below the capacity limits referred to in that Annex (option provided according to Article 24 of the Directive 2003/87) is not suggested for the period 2005-2007. This has been decided upon considering that:

- No such installation has submitted a relevant application so far.

- The expansion of the Directive's scope for installations with capacities below those referred in Annex I of the Directive concerns mainly installations producing lime, ceramics and industrial combustion. However, those installations producing lime and ceramics that do not fall under the provisions of the Directive 2003/87 are few and with very low annual emissions of CO_2. Their inclusion in the emissions trading scheme would entail excessive implementation costs relevant to the expected environmental benefits.

3.3.3 Temporary exclusion of certain installations (opt-out)

The temporary exclusion of installations from the emissions trading scheme for the period 2005-2007 is not allowed (option provided according to Article 27 of the Directive 2003/87).

3.3.4 Pooling

So far, the central administration has not received any application to form a pool from installations that carry out the same activity. Nonetheless, **the NAP allows the submission of applications from operators wishing to form a pool for all categories of activity and for the period 2005-2007**, provided that the European Commissions will also accept the relevant application from the competent authority .

4. VARIOUS TECHNICAL ISSUES

4.1 Emissions reduction potential (including technological potential)

According to the third **criterion** in the Directive's Annex III concerning Emissions Trading, the number of allowances to be allocated should be calculated on the basis of the available technological, economical, etc. potential for GHG emissions reduction, in the context of the business activities specified in the Directive. This criterion is obligatory regarding the total allowances to be distributed, and optional regarding their allocation per activity.

During the creation of the NAP, this criterion was taken into consideration for the determination of the total allowances to be distributed and partly for their allocation at activity level. More specifically:

- The updated BaU, being a part of NAP (Paragraph 2.3) and configuring the evolution of GHG in Greece and the share of the activities covered by the Directive, on which the determination of the total quantity of allowances was based, takes into thorough consideration those alternative technologies available throughout the industries that could lead to emissions reduction, and also estimates their future possible penetration per business activity. The appropriate calculation tools, employed in order to create the BaU, simulate the technical and economical characteristics of those alternative technologies in an analytical manner, while the decision makers decide on the basis of the technical characteristics per business activity, on the cost efficiency of those technologies (investment cost, operational costs, fuel costs, etc), on the existing legal framework aspects, and finally on the decision makers' relevant behavioral practices regarding the various business activities.
- Specifically, as far as the electricity generation industry is concerned (which is the main source of GHG emissions in the country), the BaU was created on the basis of analytical simulations of the electricity system operation, where alternative choices (differentiated regarding their technology and the type of fuel used) were assessed for the extension of the already installed system power, further taking into consideration the renewable sources' penetration perspectives (especially the wind-power generation units).
- The chosen implementation path in the NAP, for the achievement of the national goal to limit GHG according to the Kyoto Protocol, was based on the plan for the implementation of the policies and measures that were included in the Second National Programme on Climate Change. This Programme includes the detailed analysis of both the technological potential on reducing emissions and the relevant economic potential (by encouraging negative cost or low cost measures).
- At activity level, the NAP accounts for the fact that the available practices for reducing industrial processes emissions of activities that fall into the Directive framework are rather limited. Therefore, these emissions are fully covered by a number of corresponding allowances. On the other hand, the NAP acknowledges the fact that the potential for reducing emissions is significantly greater in the area of combustion installations for which specific compliance

factors are defined in order for the relative installations to take initiatives in reducing these emissions.

4.2 Clean technologies

The implementation of the emissions trading system creates substantial motives for introducing clean technologies in several industrial sectors. **As a result, in the NAP context, no special treatment was considered necessary regarding clean technologies** by issuing extra allowances (**criterion 8, Annex III of the Directive**).

An exception was taken in the case of electricity and heat co-generation installations, since the applied compliance factor was set equal to 1. The rationale was to incorporate the fact that while the system of a co-generation installation contributes overall in reducing emissions, at the installation level it leads to increased emissions. Therefore, employing a general compliance factor for the combustion installations and the co-generation systems would be regarded as a counterincentive for the technology's penetration of the energy system.

Furthermore, taking into account that the NAP is based on statistical evidence (consumption, production of products etc.) derived from the relative installations' data, considering the clean technologies as a criterion for allocating allowances would require the thorough audit and verification of the data in order to create the appropriate quantitative ratios per business activity. These ratios would also serve as a benchmark for each unit in deciding whether it employs clean technologies or not. Such an analysis has not been conducted for the time period 2005-2007 due to the tight time schedule for creating the NAP but is expected to be in the compilation of the NAP for the 2008-2012 time period.

5. COMMUNITY LEGAL FRAMEWORK AND POLICIES

5.1 Competition Policy (articles 81-82 and 87-88 of the Treaty for the constitution of the European Community)

As it has already been mentioned in paragraph 3.3.4, pooling for the period 2005-2007 will be permitted without any constraints, provided that interested installations will submit a relevant application. However, no applications have yet been submitted to the Central Administration.

5.2 Policies for the internal market – New Entrants

5.2.1 New Entrant Definition

The installations that are characterized as new entrants for the needs of the 2003/87 Directive for the Emissions Trading are the following:

(1) Each ***already existing installation*** (an installation is characterized as "already existing" if it has been in operation up through the NAP's official announcement to the European Commission) that meets the Directive's Annex I requirements on business activity and capacity, and yet has not been identified by the Administration and thus has not been included in the NAP's installations list announced to the Commission.

(2) Each ***new installation*** (an installation is characterized as "new" in the case where NAP's official announcement date to the European Commission is prior to the installation's operation permit issuance date) that meets the requirements specified in Annex I of the Directive 2003/87.

(3) Each ***already existing installation*** that did not meet the requirements specified in Annex I of the Directive 2003/87 at the time of the NAP's official announcement to the European Commission, but legally changed the nature of its business activity after the announcement in order to meet the relevant requirements.

(4) Each ***already existing installation*** that did not meet the requirements specified in Annex I of the Directive 2003/87 at the time of the NAP's official announcement to the European Commission, but legally expanded in such a manner that, based on the new total capacity (or the nominal thermal power, if the extension involves or has an impact on the installation's combustion activities), it meets the requirements specified in Annex I of the Directive 2003/87.

(5) Each ***already existing installation*** that meets the requirements specified in Annex I of the Directive 2003/87, is included in the NAP's installations list announced to the Commission, and has legally expanded in such a manner that the new total capacity (or the nominal thermal power, if the extension involves or has an impact on the installation's combustion activities) is more than 10% of the total capacity before the extension.

Further to the above, ***another prerequisite for a new entrant to come under the normative framework is to receive a GHG emissions permit/permit update by the Competent Authority*** *(cases 1-2 & 3-5 respectively).*

It should be noted that in case 5 (extension of an already existing installation) the GHG permit can be renewed and cover the whole installation (both the previous installation and the extension), but only the extension can come under the terms for new entrants, concerning the issuance of allowances.

5.2.2 Structure and size of the new entrants reserve

The potential new entrants for the period 2005-2007 in Greece include the following:

(1) New installations/extensions of already existing electricity generation installations located within the islands system (including the islands of Crete and Rhodes)

(2) New electricity generation installations located within the interconnected system

(3) New co-generation installations

(4) Other extensions concerning already big existing installations

(5) Potential new installations/extensions of already existing installations regarding the rest activities identified in the Directive 2003/87

Concerning the first four categories, the situation is almost known, due to following:

- The Greek Public Power Corporation has conducted a three-year plan, and, therefore, the new units and their operational characteristics are already known.
- Three electricity generation installations are being constructed within the interconnected system and will be ready for operation in the period 2005-2006 (PPC Lavrio V, PPC Lavrio turbines, Greek Petroleum Unit), while a DESMIE tender (the Greek electricity system operator) is still pending (the units to be constructed based on the tender's results will be incorporated into the system in 2007, since the estimated construction time is 30 months). Furthermore, it is expected that one more electricity generation unit will be incorporated by June 2007 (Aluminum Hellas).
- Concerning the co-generation issue, according to the data derived from RAE (the Greek Energy Regulatory Authority), 5 units with a nominal thermal power exceeding 20MW (therefore coming under the Directive 2003/87 terms) possess an installation permit and are likely to commence operations within the next 3 years. There are 8 more co-generation installations having a nominal thermal power over 20MW each (approximately 150MW_e of total power) that do not possess an installation permit and as a consequence it remains to be seen if and when they will be constructed.
- Concerning the other installation extensions, these include new units of hydrogen production and desulfurization implemented in the already existing refineries, in order to meet the various EU Directives requirements concerning the lower levels of sulphur in fuels (the relative

investments will occur at MOTOR OIL refinery premises and at PETROLEUM HELLAS (ΕΛΠΕ) premises located at Aspropirgos and Thessaloniki) and the construction of a new rolling mill at the Halivourgiki installation.

Concerning the potential unknown new entrants, their number and their level of CO_2 emissions are factors that cannot be easily estimated. However, it is predicted that their emissions will not be significant since a) it is unlikely that new installations will be constructed in the clinker, glass, iron & steel production activities during the next 3-years, and b) there is a low growth rate primarily in the lime, ceramics and paper production activities and secondarily in the various combustion installations.

Taking into consideration the above factors, the new entrants reserve is foreseen to be distinguished into two separate reserves, the ***known new entrants reserve*** and the ***unknown new entrants reserve***.

The ***known new entrants reserve*** includes specific installations, for which the quantity of their allowances for each year in the 2005-2007 period, has been defined on the basis of certain rules documented in section 5.2.2.1.

The ***unknown new entrants reserve*** does not include specific installations, but it includes only a total number of allowances deducted from the already existing installations number of allowances.

5.2.2.1 Known New Entrants Reserve

This reserve includes the electricity generation installations, the co-generation installations, the extensions of the already existing refineries, and the extension of the Halivourgiki installation.

The new entrants allowances regarding the first two categories were calculated based on the equation (1) ή (2) and on elaborating the relevant data submitted by the operators of the installations:

$$A_i = P_i \times H_i \times \sum_j \left(SC_j \times LHV_j \times 10^{-6} \times EF_j\right) \times CF_i \qquad (1)$$

$$A_i = P_i \times H_i \times 3.6 \times 10^{-3} \times BA_i \times EF_j \times CF_i \qquad (2)$$

where

A_i: annual installation-i allowances (t CO_2/y)
P_i: new entrants installation-i power (MW)
H_i: installation's-i hours of operation (h/y)
SC_j: specific fuel consumption-j (t/MWh, kNm^3/MWh etc)
LHV_j: fuel's minimum calorific value-j (MJ/t, MJ/kNm^3 etc)
EF_j: fuel's emission coefficient-j (t CO_2/TJ)
BA_i: installation's -i efficiency ratio
CF_i: installation's -i compliance factor (compliance factor, ≤ 1)

Equation (1) was employed for the new entrants electricity generation installations of the island system, where the power, the annual hours of operation, and the specific fuel consumption for each installation were determined based on the operator's official annual planning.

Equation (2) was employed for the new entrants electricity generation installations of the interconnected system. For all installations the operating hours were estimated to be 7,100 annually, assuming the annual full operation of the units. An exception was made for the PPC's gas turbine generator unit located at Lavrio, where only 50 hours of operation were estimated annually since the unit will only operate on a part time basis in order to cover the peak load demand. The efficiency for the installations is set at 52% except for the gas turbine generation unit that is set equal to 28% (based on the official data submitted by the operator).

As far as the co-generation units are concerned, equation (2) was employed with an annual estimation of operation hours ranging between 3,500 and 7,500, depending on the type of activity (3,500 hours for all installations except those of the industrial sector, 5,000 hours for paper mill co-generation activities, 6,500 hours for iron and steel co-generation activities and 7,500 hours for refineries co-generation activities). The total efficiency ratio is set at 85%.

Furthermore, each operation's commencement date is taken into consideration (as it is officially documented by each operator) regarding the calculation concerning the emissions allowances per installation for each year during the period 2005-2007. Therefore, in the case where a new entrant installation commences its operation at some intermediate point within the time period 2005-2007, a reduction in the number of allowances for that specific year will take place in a prorated basis proportional to the amount of time the installation did not operate in the specific year. Especially in the case of the two electricity generation units construction, in the context of DESMIE tender, the operations commencement date was determined to be in December 2007, due to the fact that the required construction is estimated to be completed 30 months after the tender has been awarded.

Concerning new co-generation installations, only those, which have already received an installation permit or an environmental permit, have been included in the reserve. Their operations commencement date (except one unit that is being constructed and is expected to be ready by May 2005) is scheduled for January 2006 for those that possess an installations permit and for June 2006 for those that possess an environmental permit.

Regarding the refineries and steelwork extensions, the calculation was based on specialized analytical data submitted by the relevant operators.

For all new entrant installations the ***compliance factor is set equal to 1*** (meaning, that the allowances are equal to the estimated emissions of the installation). The rational is the following:

- In the case of the islands system, the new electricity generation installations together with the extensions of the already existing installations are expected to result to an increased efficiency ratio, while their annual average emissions contribution to the national CO_2 emissions will be less than 1%.

- In the case of the interconnected system, all the new electricity generation installations will operate on natural gas, which is a very significant action that is included in the 2nd National Programme for the limitation of GHG emissions during the period 2000-2010.
- In the case of co-generation, its promotion constitutes one of the goals that the 2nd National Programme has set in the context of limiting GHG emissions, while the calculations of the emissions (on the basis of which the number of allowances is estimated) has been done by assuming a high efficiency ratio (85%).
- In the case of refineries extensions, these occur in order to meet the various environmental requirements set by the relevant Directives concerning the fuel quality and, therefore, the compliance with the legal framework is mandatory (inevitably, in such cases there is an increase in the CO_2 emissions).
- In the case of the Halivourgiki installation, the new rolling mill will operate by using natural gas, the market penetration of which in the Greek heavy industry remains a priority of the National Programme.

The allowances for the known new entrants reserve, calculated on the basis of the methodology explained above, are presented in ***Table 5-1***. The known new entrants reserve consists of the 4.1% of the total allowances mentioned in paragraph 2.5.3.

The rest rules with respect to the operation of the reserve are presented in Paragraph 5.2.3 below.

***Table5-1*: Known new entrants reserve for the period 2005-2007**

A/A	Known new Entrants	Allowances			
		2005	2006	2007	Total 2005-2007
ELECTRICITY GENERATION – AUTONOMOUS SYSTEMS IN ISLANDS		**125,746**	**445,327**	**1,037,360**	**1,608,433**
N-1	RHODES (gas-turbine)	21,962	43,924	43,924	**109,811**
N-2	RHODES (MEK)	0	0	227,128	**227,128**
N-3	ATHERINOLAKOS	0	98,769	338,635	**437,404**
N-4	ICARIA	4,279	8,558	8,558	**21,396**
N-5	PAROS	9,359	37,435	37,435	**84,228**
N-6	THIRA (SANTORINI)	14,161	42,483	56,644	**113,289**
N-7	CARPATHOS	6,465	19,395	19,395	**45,254**
N-8	COS	55,413	110,826	110,826	**277,065**
N-9	CHIOS	0	23,397	46,793	**70,190**
N-10	SIROS	0	15,008	30,015	**45,023**
N-11	MILOS	0	20,652	35,403	**56,054**
N-12	MICONOS	0	10,775	21,550	**32,324**
N-13	SAMOS	14,107	14,107	61,054	**89,268**
ELECTRICITY GENERATION – INTERCONNECTED SYSTEM		**628,557**	**1,678,271**	**2,949,777**	**5,256,605**
N-14	PPC LAVRIO V	0	608,202	1,042,632	**1,650,834**
N-15	PPC (gas-turbine)	4,350	0	0	**4,350**
N-16	ENERGIAKI THESSALONIKIS (ELPE)	624,207	1,070,069	1,070,069	**2,764,346**
N-17 & N-18	2 UNITS HTSO [1]	0	0	92,602	**92,602**
N-19	ALUMINIUM OF GREECE	0	0	744,474	**744,474**
COGENERATION		**53,004**	**233,640**	**251,723**	**538,367**
N-20	MOTOR OIL	53,004	90,864	90,864	**234,731**
N-21	THERMI SERRON	0	40,943	40,943	**81,887**
N-22	THERMI DRAMAS	0	44,690	44,690	**89,379**
N-23	HELLENIC CORPORATION OF STEEL	0	39,061	39,061	**78,123**
N-24	TERNA-MEL	0	18,082	36,165	**54,247**
OTHER UNITS		**306,565**	**682,763**	**682,763**	**1,672,091**
N-25	MOTOR OIL	301,000	602,000	602,000	**1,505,000**
N-26	ELPE	5,565	38,981	38,981	**83,527**
N-27	CHALIVOURGIKI (SHEETMETAL LENGTHWISE)	0	41,782	41,782	**83,564**
TOTAL ALLOWANCES TO KNOWN NEW ENTRANTS		**1,113,871**	**3,040,002**	**4,921,623**	**9,075,497**

[1] The installed capacity per unit is unknown since the call for tenders organized by the Hellenic Transmission System Operator is still open. On the completion of the process, allowances will be allocated to each unit separately (N-17 and N-18).

5.2.2.2 Unknown new entrants reserve

As stated above, the probability of having new entrants (i.e. new installations or extensions of the existing ones) – besides the ones included in the Known Entrants – during the 2005-2007 period is rather small and mainly concerns 4 of the activities that fall into the Directive (Lime, Ceramic, Paper and Other Combustion Installations). These sectors are not expected to present high growth rates in the following three-year period, while the annual emissions of the existing installations (which are used in the determination of the absolute size of the Unknown New Entrants Reserve) are generally low (<50 kt CO_2/y for the majority of installations producing lime, <25 kt CO_2/y for the installations producing paper and cardboard, <30 kt CO_2/y for the installations producing ceramic and <40 kt CO_2/y for the other combustion installations). With regard to the other combustion installations, it is important to remember that the planned co-generation units have already been included in the Known New Entrants Reserve.

Furthermore, it is noted that any existing installations that fall into the Directive and have not been identified and therefore have not been included in this NAP will be considered as unknown new entrants.

Based on the above, it has been estimated that a total quantity of allowances that equals to the 15% of the 2003 emissions of existing installations in the activities of lime, ceramic, paper-cardboard and other combustion installations are sufficient to cover the logically expected needs of the new entrants in these sectors. This percentage corresponds to 400,000 t CO_2 for the 2005-2007 period.

For the unknown new entrants, the application of the following methodology on allocating allowances is provided. This methodology has been adopted in order to avoid any discrimination with regard to the existing installations but also to take into consideration the fact that the new entrants enter in a market where the cost of carbon (which is reflected on the price of allowances in the free market) is already known, and therefore they may also consider this parameter when taking investment decisions on fuels, technologies, etc. used.

The applied methodology is as follows:

- The calculation of the allowances for a new entrant installation for the 2005-2007 period will be done by the competent Authority based on the following:

  (a) *Installation that has an operation starting date before 1/1/2000*[3]: the installation's average annual historical emissions for the 2000-2003 period, which are calculated by the Competent Authority following the same method used for the calculation of installations included in this NAP. In order to enable the calculation, the installation submits, with its application for its inclusion into the unknown new entrants reserve, the verified emissions data for the 2000-2003 period.

  (b) *Installation that has an operation starting date between 1/1/2000 and 1/1/2001*[4]: the installation's average emissions for the 2002-2003 period, which are calculated by the Competent Authority following the same method used for the calculation of installations

[3] i.e. it is an installation that is not included in this NAP
[4] i.e. it is an installation that is not included in this NAP

included in this NAP. The responsibility to submit emissions data applies as mentioned in case (a).

(c) *Installation that has an operation starting date between 1/1/2001 and 1/1/2002*[5]: the installation's emissions for the 2003 period. The responsibility to submit emissions data applies as mentioned in case (a).

(d) *Installation that has an operation starting date between 1/1/2002 and 1/1/2003*[6]: the installation's estimated annual emissions. The installation submits, with its application for its inclusion into the unknown new entrants reserve, data for its estimated emissions, based on the methodology mentioned in the installation's permit for GHG emissions. These data are reviewed by the Competent Authority.

(e) *Installation that has an operation starting date later than 1/1/2005*: the installation's estimated emissions submitted by the installation with its application for its inclusion into the unknown new entrants reserve. For the estimation of its emissions, the installation applies the methodology mentioned in the installation's permit for GHG emissions. The estimation and all relevant necessary data are reviewed by the Competent Authority.

- In the case where the activity of an installation is such that there are also *emissions from processes that fall into the application field of the Directive based on the provisions of the Directive*, the compliance factor that will be used by the Competent Authority for the calculation of the allowances for these emissions **will be equal to 1** (i.e. the installation is not obliged to reduce this part of its emissions)[7].
- Regarding the rights for *the emissions from a co-generation unit* (if the installation is a co-generation unit or includes a co-generation unit), the compliance factor that will be used by the Competent Authority for the calculation of the allowances for these emissions will be equal to 1 (i.e. the installation is not obliged to reduce this part of its emissions, despite the used fuel)[8]. The annual operation hours that will be used for the calculation should be documented properly, based on the installation's operation nature. These hours shall not be more **than 7,500**, while the overall efficiency ratio for the calculation of the allowances **is set on 85%**[9].
- Regarding the allowances for *the emissions from other combustions (beside co-generation)*, they will be calculated by the Competent Authority as follows:
  - In the case where the installation uses exclusively biomass (note: the use of biomass means null emissions), then the allowances equal the 10% of the emissions that would result if the new entrant used, instead of biomass, the worst – regarding emissions – fuel amongst the various fuels being used by existing installations of the same activity (based on the most recent data arising from the operation of the emission trading scheme)[10].

[5] i.e. it is an installation that is not included in this NAP.
[6] i.e. it is an installation that is not included in this NAP.
[7] A similar compliance factor is used for the current installations.
[8] A similar compliance factor is used for the current installations.
[9] Maximum number of annual operation hours that has been used for the Known New Entrants Cogeneration units.
[10] A similar approach has also been used for the current installations.

- In the case where the installation uses biomass in combination with a complementary conventional fuel, then the allowances equal the 5% of the emissions that would result if the new entrant used, instead of biomass, the complementary conventional fuel[11].
- In the case where the installation uses a conventional fuel besides natural gas, then the compliance factor chosen for these emissions equals the average combustion compliance factor applied in the existing installations of this activity.
- In the case where the installation uses natural gas and has an operation starting date later than the 1/1/2005, then the compliance factor for these emissions is taken as equal to 1, while in any other case it is equal to the average combustion compliance factor applied in the existing installations of this activity.

The rules that govern the reserve's operation are presented in Paragraph 5.2.3.

5.2.3 Access rules for the entrance of the new entrants into the emissions trading market

Concerning the access of the new entrants to the emissions trading market (**criterion 6 of the Annex III to the Directive**) the following rules are adopted:

- The basic way for new entrants to access the emissions trading market is the allocation of allowances to the new entrants through the new entrants reserve. The allocation of the reserve allowances is free of charge.
- In order for a new entrant to have the right to access the reserve, he must submit an application to the Competent Authority that should be accompanied by the installation's current permit for GHG emissions and its operation permit.
- The new entrants reserve is split in two parts: the Known New Entrants reserve and the Unknown New Entrants reserve. The initial total amount of allowances in each reserve is specific (see Paragraph 5.2.2).
- Each new entrant not included in the list of Known New Entrants has the right to access only the Unknown New Entrants reserve. Respectively, each Known New Entrant has the right to access only the Known New Entrants reserve and more specifically only the number of allowances that are provided for him.
- The number of allowances allocated to each Known New Entrants may not exceed the number mentioned in Table 5-1, which has been calculated based on the new entrant's specific planned operation starting date. In the case that the operation starting date is later than the date used in the NAP for the calculation of the New Entrant's allowances, the allowances that it will receive from the reserve are reduced accordingly, and the difference is transferred to the Unknown New Entrants reserve. In the case that the new entrant's operation starting date is prior to the date used in the NAP for the calculation of the new entrant's allowances, the Known New Entrant will not receive additional allowances from the Known New Entrants reserve.

[11] A similar approach has also been used for the current installations.

- In the case that an installation planned in the Known New Entrants reserve does not start operating before the 31 December 2007, the total amount of allowances that have been reserved for this installation is transferred to the Unknown New Entrants reserve.
- The issuance of the Known New Entrants reserve allowances is performed annually, based on the quantities of the allowances presented in Table 5-1. The allocation of the Unknown New Entrants reserve allowances is performed, at the latest, within 10 working days after the new entrant's application (to be included in the respective reserve) approval date. The new entrant receives the total amount of allowances till the end of the current emissions trading period. In the case that the operation starting date is later than the date used in the NAP for the calculation of the new entrant's allowances, the allowances that it will receive from the reserve are reduced accordingly.
- The allocation of allowances to the Unknown New Entrants is performed according to the methodology presented in Paragraph 5.2.2.2.
- The allocation of allowances to the Unknown New Entrants is performed on a "first come first serve" basis according to the submission date of their application to access the reserve.
- In the case that the amount of allowances kept in the Unknown New Entrants reserve in a specific time period is not sufficient to cover the new entrant's application, the new entrant is required to acquire the needed allowances from the free market.
- Any non-allocated allowances remaining in the Known and Unknown New Entrants reserve at the end of a year within an emissions trading period (besides the last year of the period) are transferred to the following year.
- Any non-allocated allowances remaining in the Known and Unknown New Entrants reserve on 31 December, 2007, will be sold by 15 February, 2008 by the State (probably via auction and in any case according to transparent processes that will be communicated to all interested parties in time). If after this sale (probably via auction) there are still unsold allowances, then these will be cancelled.

5.3 Other legislative and political means

The EU legislative and political means, including the environmental policies that lead to increase of emissions, which have been taken into consideration for the development of the NAP, are presented in detail in Paragraph 2.2.3.

6. PUBLIC CONSULTATION

The National Allocation Plan was put in public consultation on 20 December 2004. Specifically, the text was published on the website of the Ministry for the Environment, Physical Planning and Public Work (YPEXODE); a relative Bulletin of Press was published; and finally the interested enterprises were informed - via e-mails or fax – of the NAP's publication on the Internet. The deadline for the submission of comments was set for 24 December 2004. Any comments on the NAP should have been sent to YPEXODE to a specific e-mail address or by post.

In total, **41 comments** were submitted in writing, mainly by the interested enterprises, and to a smaller degree by other entities. In addition, answers were provided to a number of phone inquiries, which were mainly about the implementation of the Directive's Articles and the EC guidelines for the development of NAP.

In brief, the written comments received and their handling within the NAP development framework are as follows:

(1) Application for the removal of an installation from the installations list according to Directive 2003/87.

4 installations producing ceramics were removed from the initial list of installations, since, according to the submitted comments, the capacity of these installations was judged as lower than the relative limits of Annex I of the Directive.

(2) Application for the inclusion of an installation to the installations list according to Directive 2003/87.

Following the submission of data by installations that showed they fall into the Directive implementation framework, 6 installations were added to the initial list of installations: 1 combustion installation, 4 installations producing ceramics, and 1 installation producing lime.

(3) Submission of additional or/and clarifying data on installations activities / recent extensions.

Certain installations have submitted additional or/and clarifying data concerning their historical fuels consumption, their consumption of raw materials, and their extensions that took place either in the 2000-2003 three-year period or in 2004. This information was examined and, where sufficiently documented, the essential modifications were performed. These modifications have lead to the re-estimation of historical emissions for certain installations and in other cases (as in the case of iron & steel) to the readjustment of the installations BaU.

(4) Requests to determine allowances based on the installation's largest capacity and not on the actual emissions or activity

Such a methodology for the determination of allocation for certain installations does not comply with the EC Guidelines for the development of NAP.

(5) Requests based on the incorrect interpretation of the Articles of the Directive 2003/87

The relative request concerned the exception of combustion installations from industrial activities. It was rejected, since this exception does not comply with the interpretation of term "energy activities" of Annex I of the Directive.

(6) Requests for an increased weight factor for the early actions and especially for actions undertaken before 2000.

This NAP rewards only the early actions taken from 2000 and afterwards, since it was estimated that previous actions took place mainly for economic reasons and not for the reduction of emissions.

(7) Requests for an increased weight factor for the energy more efficient technologies.

This NAP rewards indirectly the application of energy efficient technologies through the way of calculating the historical emissions per installation. Moreover, it rewards imminently cogeneration through the use of a relevant compliance factor equal to 1.

(8) Requests for an increased weight factor for cogeneration.

See point (7).

(9) Requests for rewarding the use of biomass.

This NAP rewards the use of biomass through the general allowance allocation rules per installation (see Paragraph 3.2.1.1).

(10) Comments concerning the potential effects on the competitiveness of enterprises due to the unofficial verification of the data submitted by the installations.

For the development of the NAP, all possible controls to check the correctness of submitted data were conducted. Moreover, the large (concerning emissions) installations apply official verification procedures for the data of their activity for other reasons and thus, the largest part of the emissions may be considered as reliable. The largest need for verification exists for the sectors of ceramic and lime.

(11) Comments concerning the effect of the implementation of the Directive on the competitiveness of the Greek enterprises compared to that of their competitors in neighbour countries outside the European Union and competitors that do not fall into Annex I of UNFCCC.

These comments cannot be limited to the Greek case, but they concern all the European Union (see Paragraph 3.1.2).

(12) Comments concerning the possibility of installations that fall into the Directive to reduce CO_2 emissions (including the possibility of access to the natural gas network).

The allocation methodology recognises basic difficulties for emissions reduction within the 2005-2007 three-year period like those that relate to the restriction of CO_2 emissions from processes (and for this reason the relative compliance factor used equals to 1 for these emissions). Other installations' particularities were impossible to take into consideration at the present phase, since it would require the collection of considerably more data on an installation level, as well as the development of indicators or a methodology for the applicability on the particular installations, something that was not feasible in the present phase.

(13) Comments concerning the possibility of reducing CO_2 emissions in sectors that do not fall into the Directive (e.g. transports)

The possibilities of reducing CO_2 emissions in the sectors that do not fall into the Directive (see Paragraphs 2.2.1, 2.6) were taken into consideration at the determination of the "path" towards the achievement of the Kyoto target (see Paragraph 2.4), which also determines the total amount of allowances to be distributed.

(14) Comments concerning the rules for determining the allowances for the Known New Entrants (e.g. efficiency ratio and annual operation hours of the units generating electricity)

The relative comments were taken into consideration and the relative rules for determining the allowances of the reserve (as well as the allowances of the individual Known New Entrants) were reformed accordingly, so as to ensure the equal treatment of all new entrant installations.

(15) Comments concerning the determination of the operation starting dates of units generating electricity in the Known New Entrants reserve

The relative comments were taken into consideration and the individual Known New Entrants allowances were reformed accordingly.

(16) Demands concerning the Unknown New Entrants reserve (e.g. increase of size, right to access for all indebted activities)

Regarding the size of the Unknown New Entrants reserve, it was judged sufficient to cover future needs and thus remained as initially planned. As for the right to access the reserve of all activities, the relevant rules for the new entrants allow the access to all installations that fall into the Directive (provided, of course, that there are available allowances in the reserve).

(17) Comments concerning the "path" towards the achievement of the Kyoto Protocol target and the flexible mechanisms contribution to this

The relative comments for adopting a course for the achievement of the Protocol target that would be closer to BaU for the 2005-2007 period, considering that the flexible mechanisms of the Protocol might be used, were rejected since no specific official activity has been programmed towards that direction for this three-year period (e.g. allocation of financial funds in the state budget, forming international agreements in order to trade allowances, etc.).

(18) Requests for the introduction of motives for the replacement of obsolete and low energy performance installations

Motives are given indirectly based on the rules for the transfer of allowances to new units. Examples from other countries that have been reported include the danger of transferring allowances to the next period, an action that is not foreseen in this NAP.

(19) Requests for the provision of data concerning the specific way of determining the emissions time sequence per installation

The emissions calculation methodology per installation / activity is briefly described in the NAP (see Paragraph 2.5.1.1). However, as is clearly mentioned, this methodology conforms to the EC Decision 2004/156/EC and has used all data submitted by the installations, with the exception of the CO_2 emission factors (where the factors used in the National GHG Emissions / Absorptions

Inventory were chosen). The analytical data used for the calculation and the results per installation are at the disposal of the interested installations at the competent authorities (Ministry of Development, YPEXODE).

(20) Requests for the adoption of more ambitious targets for the reduction of emissions coming from electricity generation

As presented in Paragraph 2.5.2, the adoption of considerably more ambitious targets for the restriction of emissions (something that means on a practical level an important reduction of emissions coming from electricity generation), taking into account the direct evolution prospects of greenhouse gases emissions in Greece as well, will slow down the growth rates of the Greek economy's prospects for convergence with the European Community average level.

(21) Comments concerning the installation operation particularities for the 2000-2003 four-year reporting period

To the extent that this was possible (and particularly in cases where the particularities concerned specific years within the 2000-2003 four-year period resulting in low installations emissions for those years) an effort was made to incorporate this information in allocating the allowances to the installations through calculating the annual historical emissions.

7. CRITERIA BESIDES THE ONES MENTIONED IN ANNEX III OF THE DIRECTIVE

For the development of the NAP, the only criteria that were taken into consideration were the ones set in Annex III of the Directive.

ANNEX A

Allocation of allowances per installation for the period 2005-2007

No	CODE.	INSTALLATION	TOTAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2)	ANNUAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2/y)
1	1-1	TPS LIPTOL	1,116,138	372,046
2	1-2	TPS PTOLEMAIDA	14,078,365	4,692,788
3	1-3	TPS KARDIA	29,493,437	9,831,146
4	1-4	TPS AGIOS DIMITRIOS	38,844,314	12,948,105
5	1-5	TPS AMINTAIO	15,680,415	5,226,805
6	1-6	TPS MEGALOPOLI (Units I, II & III)	13,390,825	4,463,608
7	1-7	TPS MEGALOPOLI (Unit 4)	7,814,881	2,604,960
8	1-8	TPS FLORINA	7,931,474	2,643,825
9	1-9	TPS AGIOS GEORGIOS	2,002,832	667,611
10	1-10	TPS LAVRIO	9,407,595	3,135,865
11	1-11	TPS KOMOTINI	2,847,574	949,191
12	1-12	TPS ALIVERI	3,312,077	1,104,026
13	1-13	TPS LINOPERAMATA	2,750,440	916,813
14	1-14	TPS CHANIA	2,296,687	765,562
15	1-15	TPS SORONI RHODES	1,359,908	453,303
16	1-16	APP LESVOS	472,814	157,605
17	1-17	APP SYROS	195,148	65,049
18	1-18	APP KOS	376,391	125,464
19	1-19	APP CHIOS	290,329	96,776
20	1-20	APP SAMOS	214,965	71,655
21	1-21	APP PAROS	279,616	93,205
22	1-22	APP MIKONOS	151,158	50,386
23	1-23	APP THIRA	170,784	56,928
24	1-24	APP LIMNOS	103,544	34,515
25	1-25	APP MILOS	71,660	23,887
26	1-26	APP KARPATHOS	55,425	18,475
27	1-27	APP KALIMNOS	97,138	32,379
28	1-28	APP IKARIA	47,415	15,805
29	1-29	TPS ATHERONOLAKOS	1,038,421	346,140
30	1-30	HERON THERMOELECTRIC S.A.	307,604	102,535
TOTAL 1 (ELECTRICITY GENERATION > 20 MW)			**156,199,372**	**52,066,457**
31	2-1	ALUMINIUM DE GRECE S.A.	1,548,996	516,332
32	2-2	ELVAL HELLENIC ALUMINIUM INDUSTRY S.A.	191,380	63,793
33	2-3	HELIOFIN	27,246	9,082
34	2-4	MAXIM S.A.	63,533	21,178
35	2-5	ANEZOULAKIS BROS FIERATEX S.A.	44,676	14,892
36	2-6	HELLENIC SUGAR INDUSTRY (ORESTIADA FACTORY)	190,419	63,473
37	2-7	HELLENIC SUGAR INDUSTRY (PLATI IMATHIAS FACTORY)	199,634	66,545
38	2-8	HELLENIC SUGAR INDUSTRY (LARISSA FACTORY)	202,878	67,626
39	2-9	HELLENIC SUGAR INDUSTRY (SERRES FACTORY)	120,925	40,308

No	CODE.	INSTALLATION	TOTAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2)	ANNUAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2/y)
40	2-10	HELLENIC SUGAR INDUSTRY (XANTHI FACTORY)	122,641	40,880
41	2-11	MEVGAL S.A.	29,428	9,809
42	2-12	NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS	9,514	3,171
43	2-13	UNIVERSITY OF PATRAS	7,709	2,570
44	2-14	HALYVOURGIA THESSALIAS (ROLLING MILL PLANT)	71,517	23,839
45	2-15	KAVALA OIL	308,763	102,921
46	2-16	GRECIAN MAGNESITE S.A.	353,344	117,781
TOTAL 2 (OTHER COMBUSTION > 20 MW)			**3,492,603**	**1,164,201**
47	3-1	HELLENIC PETROLEUM S.A. (ASPROPYRGOS REFINERY)	4,738,409	1,579,470
48	3-2	HELLENIC PETROLEUM S.A. (THESSALONIKI REFINERY)	1,110,505	370,168
49	3-3	MOTOR OIL HELLAS - CORINTH REFINERIES S.A.	3,619,891	1,206,630
50	3-4	HELLENIC PETROLEUM S.A. (ELEFSIS REFINERY)	827,421	275,807
TOTAL 3 (REFINERIES)			**10,296,226**	**3,432,075**
51	4-1	LARCO GENERAL MINING AND METALLURGICAL S.A.	2,421,885	807,295
TOTAL 4 (SINTERING)			**2,421,885**	**807,295**
52	5-1	HELLINIKI HALYVOURGIA S.A.	254,780	84,927
53	5-2	HALYVOURGIKI INC.	638,248	212,749
54	5-3	SIDENOR S.A.	465,758	155,253
55	5-4	HALYVOURGIA THESSALIAS	430,814	143,605
56	5-5	SOVEL S.A.	603,050	201,017
TOTAL 5 (IRON & STELL)			**2,392,650**	**797,550**
57	6-1	HERAKLES GENERAL CEMENT COMPANY S.A. - VOLOS "OLIMPOS" PLANT	8,536,435	2,845,478
58	6-2	HERAKLES GENERAL CEMENT COMPANY S.A. – PLANT II	4,220,611	1,406,870
59	6-5	TITAN CEMENT COMPANY S.A. –PATRAS PLANT	3,232,793	1,077,598
60	6-6	TITAN CEMENT COMPANY S.A. – ELEFSINA PLANT	418,892	139,631
61	6-7	TITAN CEMENT COMPANY S.A. – KAMARI PLANT	5,929,101	1,976,367
62	6-4	TITAN CEMENT COMPANY S.A. – EFKARPIA THESSALONIKI PLANT	3,750,381	1,250,127
63	6-3	HERAKLES GENERAL CEMENT COMPANY S.A. – PLANT III (ex HALKIS CEMENT GROUP S.S.)	5,494,265	1,831,422
64	6-8	HALYPS BUILDING MATERIALS S.A	1,632,796	544,265
TOTAL 6 (CEMENT)			**33,215,274**	**11,071,758**
65	7-1	ASVESTOLAMIKI – DOUKERIS A	89,430	29,810
66	7-2	PARASCHOU, ST., BROS S.A.	60,078	20,026
67	7-3	“THE UNION” LIME INDUSTRY – DOUKERIS CHR.	153,397	51,132
68	7-4	CRETAN LIME INDUTRY S.A.	68,003	22,668
69	7-5	KYKNOS S.A.	119,984	39,995
70	7-6	MACEDONIAN LIME INDUSTRY TITAN	153,161	51,054
71	7-7	RAIKOS S.A.	733,707	244,569
72	7-8	PASTOURMATZIS & CO.	65,096	21,699
73	7-9	TSIRIGOTIS, A.L. & A.N., S.A.	292,162	97,387
74	7-10	AIMOS S.A.	34,697	11,566
75	7-11	CaO THESSALIAN LIME INDUSTRY S.A.	186,152	62,051
76	7-12	VELESTINO LIME S.A.	96,653	32,218
77	7-13	DEVETZOGLOU, B. A., S.A.	258,882	86,294

No	CODE.	INSTALLATION	TOTAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2)	ANNUAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2/y)
78	7-14	BOUGAS BROS	54,484	18,161
79	7-15	TSAROUCHAS	48,564	16,188
80	7-16	OLYMPOS THESSALIAN LIME INDUSTRY – SIAMIS & CO.	88,558	29,519
TOTAL 7 (LIME)			**2,503,008**	**834,336**
81	8-1	VALAVANIS, N., BROS S.A.	54,273	18,091
82	8-2	YIOULA GLASSWORKS S.A.	196,597	65,532
83	8-3	CRONOS GLASSWORKS S.A.	65,461	21,820
TOTAL 8 (GLASS)			**316,331**	**105,444**
84	9-1	AKEK S.A.	69,438	23,146
85	9-2	ANAGNOSTARAS, A., BROS S.A.	44,818	14,939
86	9-3	VAVOULIOTIS – GOUNARIS – MITAKIS "CHALKIS" S.A. (EVIA PLANT)	100,333	33,444
87	9-4	VAVOULIOTIS – GOUNARIS – MITAKIS "CHALKIS" S.A. (VIOTIA PLANT)	158,043	52,681
88	9-5	VEAK S.A.	82,022	27,341
89	9-6	VITROUVIT S.A.	33,172	11,057
90	9-7	GALANIS, J., S.A.	10,290	3,430
91	9-8	KATSIKIS, G., CERAMICS INDUSTRY S.A.	32,680	10,893
92	9-9	CERAMICS ALLATINI S.A.	13,539	4,513
93	9-10	HALKIDIKI S.A. BRICKS INDUSTRY	59,476	19,825
94	9-11	KERAMOURGIKI VASSILIKOU S.A.	29,572	9,857
95	9-12	MAMAKOS A. & CO.	343	114
96	9-13	KEPAMOTECHNIKI ARGOUS S.A.	7,211	2,404
97	9-14	AGRINIO TILE INDUSTRY S.A.	32,584	10,861
98	9-15	D.I. KOKKINOGENIS S.A.	56,236	18,745
99	9-16	MALIOURIS, B., S.A.	67,704	22,568
100	9-17	MAGIARIS S.A.	8,224	2,741
101	9-18	MAVRIDI S.A.	57,466	19,155
102	9-19	PANAGIOTOPOULOS TILE & BRICK IND. S.A.	50,636	16,879
103	9-20	PLINTHOKERAM LTD.	21,446	7,149
104	9-21	ZARKADOULAS, CHR., BROS S.A.	15,587	5,196
105	9-22	RETHYMNIOTIKI BRICK INDUSTRY S.A.	47,165	15,722
106	9-23	ROIDI BROS	16,360	5,453
107	9-24	SAPOUNAS, TH., BROS & CO "THE 8 BROTHERS" S.A.	138,322	46,107
108	9-25	SOLOMOU BROS	32,783	10,928
109	9-26	TECHNORAMIKI S.A.	20,420	6,807
110	9-27	FILKERAM - JOHNSON S.A.	109,282	36,427
111	9-28	KOTHALIS S.A.	152,108	50,703
112	9-29	ARISTEIDOPOULOS BROS CERAMICS S.A.	23,070	7,690
113	9-30	KALOGIANNI BROS	5,971	1,990
114	9-31	ARGOS TILES S.A.	11,828	3,943
115	9-32	KERAMOURGIKI RAFINAS S.A.	66,778	22,259
116	9-33	SPARTI CERAMIC INDUSTRY	13,648	4,549
117	9-34	MITSIADI BROS – PAPASTERGIOU A.	7,620	2,540
118	9-35	MITSIADIS D. & S.	8,834	2,945
119	9-36	MOUGIOS I. "TITAN"	17,844	5,948
120	9-37	SAKELLARAKOS, G., S.A.	29,072	9,691

No	CODE.	INSTALLATION	TOTAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2)	ANNUAL ALLOWANCES FOR THE PERIOD 2005-2007 (t CO2/y)
121	9-38	TSASERLIS	2,228	743
122	9-39	CHRISTODOULIDIS S.A. TILES INDUSTRY	36,570	12,190
123	9-40	TERRA S.A.	578,181	192,727
124	9-41	THESPROTIKI KERAMOURGHIA S.A.	57,882	19,294
125	9-42	PRINTZIS, D., BROS S.A.	11,203	3,734
126	9-43	KATSANIS, G., S.A.	18,766	6,255
TOTAL 9 (CERAMICS)			**2,356,754**	**785,585**
127	10-1	GEORGIA PACIFIC HELLAS S.A.	32,119	10,706
128	10-2	ATHENS PAPER MILL S.A.	74,901	24,967
129	10-3	V.E.K.A. PAPER MFG CO. S.A.	10,408	3,469
130	10-4	VIOCHARTIKI PAPER MILL S.A.	39,345	13,115
131	10-5	VIS CONTAINERS MFG CO. S.A.	37,527	12,509
132	10-6	MEL MACEDONIAN PAPER MILLS S.A.	103,984	34,661
133	10-7	PACO PAPER INDUSTRY A. VL. KOLIOPOULOS S.A. (FTHIOTIS PLANT)	59,958	19,986
134	10-8	PATRAS PAPER MILLS S.A.	15,437	5,146
135	10-9	TECHNOCART S.A.	17,387	5,796
136	10-10	THRACE PAPER MILL S.A.	69,430	23,143
137	10-11	KOMOTINI PAPER MILL S.A.	51,249	17,083
138	10-12	PATRAS PAPER MILLS – KORONIOTIS S.A.	8,467	2,822
139	10-13	SONOCO HELLAS S.A.	14,422	4,807
140	10-14	FTHIOTIS PAPER MILL S.A.	51,338	17,113
141	10-15	PACO PAPER INDUSTRY A. VL. KOLIOPOULOS S.A. (KORINTHIA PLANT)	10,482	3,494
TOTAL 10 (PAPER)			**596,454**	**198,818**
TOTAL ALLOWANCES FOR EXISTING INSTALLATIONS			**213,790,556**	**71,263,519**