

POCKET BOOK

State of the Environment Report

SoER 2005 Portugal

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The Institute for the Environment welcomes
comments and suggestions
for future editions.

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INTRODUCTION

The State of the Environment Report 2005 (SoER 2005) is complemented by this Pocket Book edition for the second time, providing a concise approach of the 26 key indicators gathered in SoER.

This edition aims to highlight some aspects of particular relevance, resulting from the analysis of each indicator making it available to the decision-makers, experts and the public.

SoER 2005 – Pocket Book can be downloaded in PDF (Adobe Portable Document Format), from the Institute for the Environment website (www.iambiente.pt). Further information on the indicators included in this publication can be obtained from the SoER 2005, also available at the same site

In order to make an easier analysis of the trends from the environment point of view, we have applied a qualitative assessment using the traffic light symbols.

- No progress or negative trend
- Progress, but not enough to reach objectives and targets
- Positive trend, indicating satisfactory progress towards objectives and targets

General Context



INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
GDP and environmental impacts	D/P		The objective of dissociating wealth generation from the harmful consequences in terms of environmental impacts has not yet been reached in Portugal, though several response mechanisms have been adopted.
Eco-efficiency of the economic sectors	D		The expenditure in social protection is the highest public expenditure share per sector, and an increase is expectable regarding the population aging.
Population aging	E		Within the EU-25 countries, Portugal has the highest income distribution disparity. The National Action Plan for Inclusion aims to reduce this trend.
Income distribution	E		The increasing implementation of voluntary participation mechanisms, associating development with protection and improvement of environmental quality, highlights a rising concern by the private sector in adopting eco-management practices.
Public expenditure	R		
Environmental management instruments	R		

*** DPSIR**

D - Driving forces | **P** - Pressures | **S** - State | **I** - Impacts | **R** - Responses



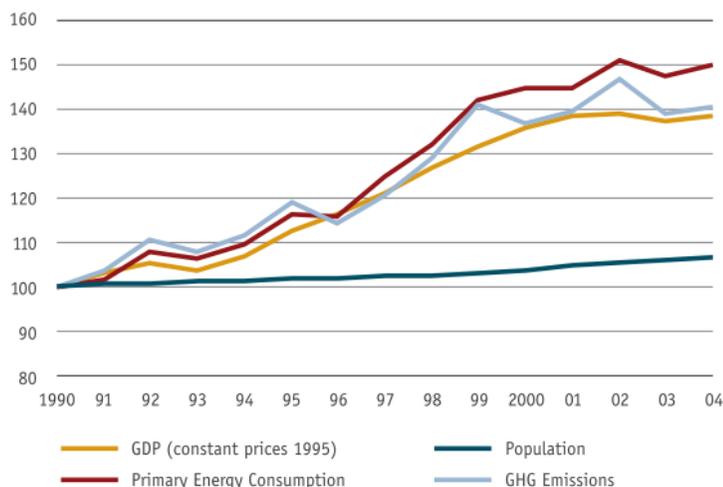
> Between 1990 and 2004 primary energy consumption grew 50% and greenhouse gas emissions (GHG) about 40%;

> From 2000 to 2004 the economic growth was fairly stable followed by a reduction or stabilisation of the primary energy consumption and the GHG emissions;

> Unlike the EU trend, where energy and carbon intensities from the economic activity showed a reduction, the values in Portugal remained stable or slightly increased.

GDP, POPULATION AND ENVIRONMENTAL IMPACTS

Index (1990 = 100)



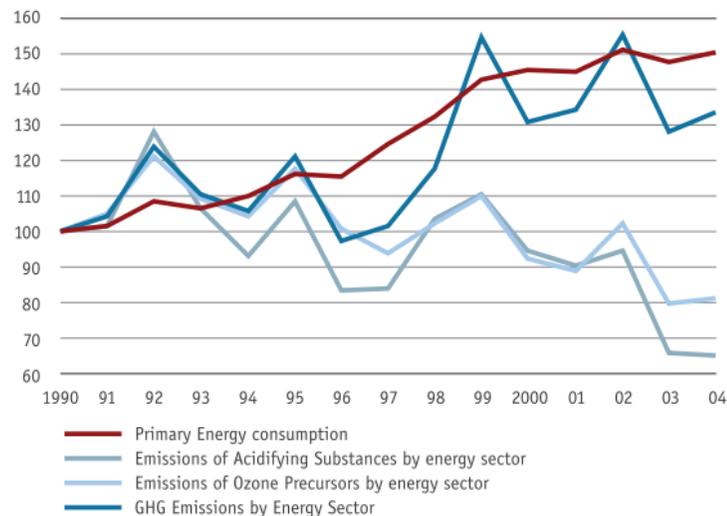
Source: INE, 2006; IA, 2006; DGGE, 2006



- > Energy is the main sector responsible for the greenhouse gas emissions. This sector registers a relative decoupling between growth of primary energy consumption and emissions of acidifying and ozone precursor substances.
- > In 2004 emissions from the transport sector remained stable or even reduced slightly some pollutants;
- > Eco-efficiency in industry sector has shown no significant oscillations;
- > Eco-efficiency in agriculture sector slightly improved throughout the most recent years.

ECO-EFFICIENCY IN THE ENERGY SECTOR – ENERGY GENERATION AND TRANSFORMATION

Index (1990 = 100)



Source: IA, 2006; DGGE, 2006

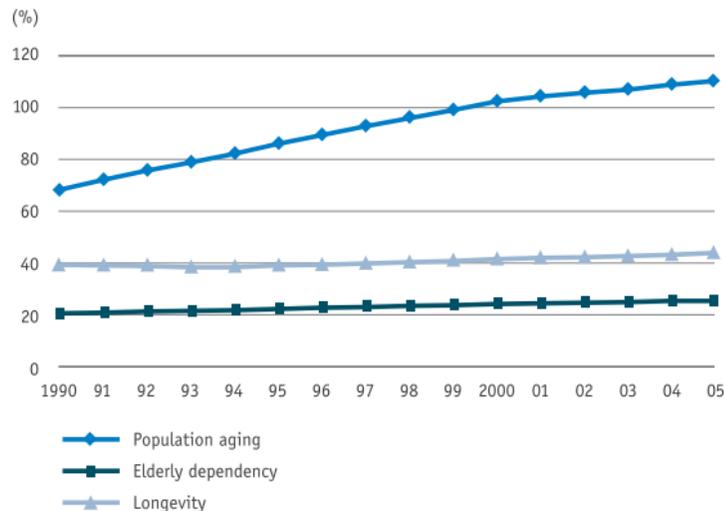


> Between 1990 and 2005 the Portuguese Population Aging Index has increased from nearly 68 to 110 people aged 65 and over, per 100 youths under age 15;

> At the same time the elderly dependency ratio, the longevity and the life expectancy rates have been rising;

> In 2005 the regions of Alentejo and Centro showed the highest population aging rates.

POPULATION AGING, ELDERLY DEPENDENCY AND LONGEVITY RATES



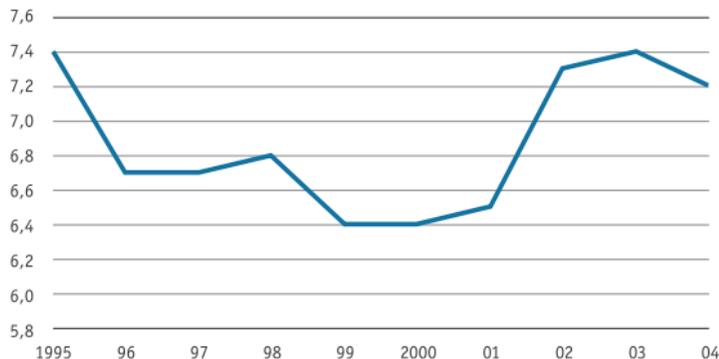
Source: INE, 2006



- > In 2004 and in the last ten years Portugal showed the highest income distribution inequality in the EU-25;
- > A lower inequality in the income distribution was registered between 1996 and 2001, throughout the period 1950-2004;
- > Portugal is the country in the EU-25 where the inequality between female and male salary is lower.

INEQUALITY IN THE INCOME DISTRIBUTION

Inequality in the income distribution
(low-income population rate / high income population rate)



Note: The income distribution inequality is calculated using the ratio between 20% of the population with the highest income and 20% of the population with the lowest income.

Source: *Structural Indicators - Eurostat, 2006*

> From 1995 to 2004 total expenditure of the Public Administration increased 80%;

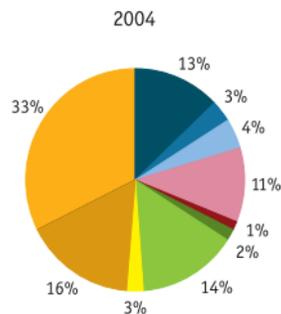
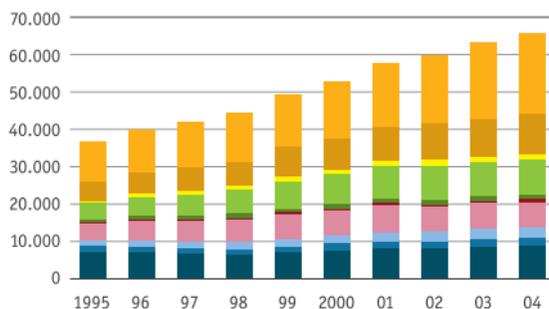
> These levels of public expenditure may affect the competitiveness of the country;

> In 2004 social protection accounted for 33% of the total expenditure in Public Administration, or 22% of GDP;

> The waste management, the waste water management and biodiversity and landscape protection are the sectors with more significant investment, among all different environmental management and protection sectors.

PUBLIC ADMINISTRATION EXPENDITURE, BY FUNCTION

Public Administration Expenditure, by function (10⁶ Euro)



Note: According to COFOG, Classification of the Functions of Government – classification system of Public Expenditure by function

Source: INE, 2006

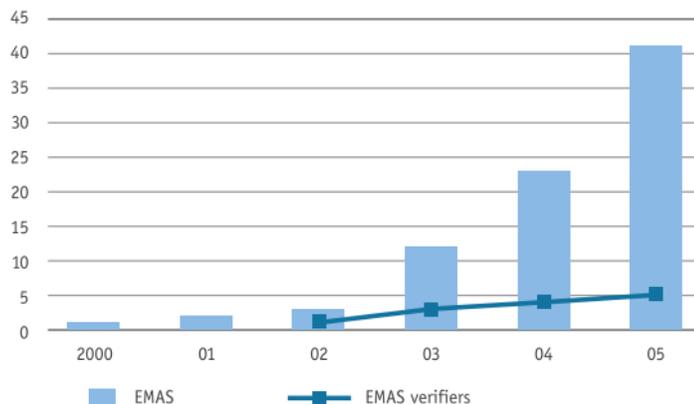
> In 2005, 149 Environmental Management Systems were certified by ISO 14001. The total number of certified companies is 499. 18 organizations were registered under EMAS. There are 41 organizations already registered;

> In Portugal there are five accredited organizations to perform EMAS environmental verifications and six certification organizations accredited under the SPQ (Portuguese Quality System) for ISO 14001;

> Five Portuguese companies have been awarded the Community Eco-Label for one or more of their products until late 2005.

ORGANIZATIONS WITH EMAS (TOTAL NUMBER) AND ACCREDITED ENVIRONMENTAL VERIFIERS IN PORTUGAL

Registered organizations (total) and accredited verifiers (%)



Source: IA, 2006; IPQ, 2006

Climate Change



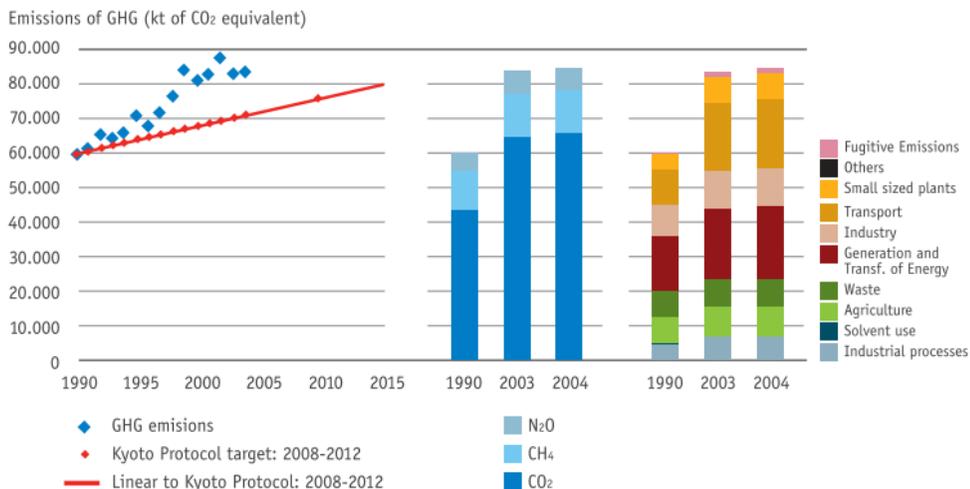
INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
Greenhouse Gas Emissions	D/P		Kyoto Protocol entered into force in 2005 as well as the implementation of the National Plan for Carbon Allowance Emissions Trading.
Rainfall and Surface air temperature	E		The Greenhouse Gas Emissions increased by 40%, between 1990 and 2004. The extreme meteorological phenomena are more and more frequent. The drought occurred in 2005 all over the country is an example.
Renewable Energy	R		In order to reduce energy dependence and reach targets, Portugal has increased energy generation from renewable sources. The National Program to Climate Change (PNAC 2006), the EU Emissions Trading Scheme and the Luso Carbon Fund are fundamental instruments to address this trend.

* **DPSIR**

D - Driving forces | **P** - Pressures | **S** - State | **I** - Impacts | **R** - Responses

- > From 1990 to 2004 greenhouse gas emissions (GHG) increased by 40%;
- > In 2004 GHG emissions were 9,6% above the target agreed in Kyoto Protocol (27%);
- > Energy sector and transport sector are the main sources of GHG in Portugal;
- > Portugal recorded a rather high carbon intensity, although having one of the lowest *per capita* CO₂ equivalent emissions in the EU-25.

GREENHOUSE GAS (CO₂, CH₄ E N₂O), EMISSIONS AND COMMITMENTS FOR THE PERIOD 2008-2012



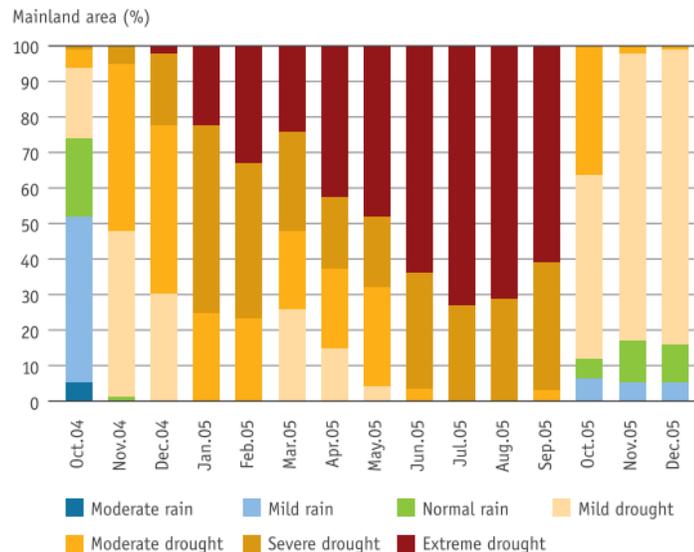
Note: Values do not take into account the emissions and removals of LUCF (Land-Use Change and Forestry) and the international "bunkers".

Source: IA, 2006



- > The lowest value for total annual rainfall index since 1931 was observed in 2005, classified as extremely dry;
- > Mean air temperature was 15,6°C, roughly 0,6°C above the average value for 1961-1990;
- > The winter of 2004/2005 was the coldest since 1970;
- > The summer of 2005 was the warmest over the past 75 years.

MAINLAND AREA AFFECTED BY METEOROLOGICAL DROUGHT ON 30TH SEPTEMBER



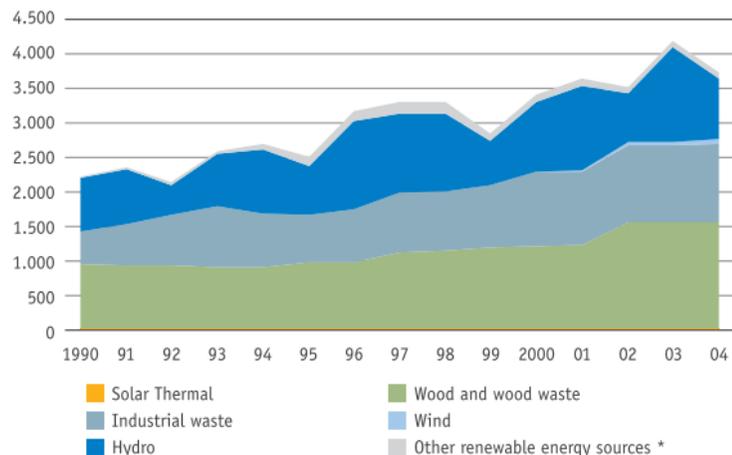
Source: IM, 2006



- > The main contribution from renewable energy sources (RES) to primary energy consumption came from biomass and hydropower;
- > Wind energy has shown the highest annual growth rates compared to other RES since 1996;
- > The share of RES in the gross energy consumption was about 35% in 2004 as well as in 2005, close to the 39% EU target to be achieved by Portugal by 2010;
- > Portugal was in 2004 the 3rd country in the EU-15 and the 12th in the EU-25 with the highest share of RES in energy consumption.

CONTRIBUTION OF RENEWABLE ENERGY (KTOE)

Contribution of renewable energy(Ktoe)



Not2: toe – tonnes of oil equivalent, equivalent to 10^7 kcal

* - includes solar photovoltaic, geothermal of low and high enthalpy, heat pumps, biogas and charcoal.

Source: DGGE, 2006

Air Pollution



INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
Emissions of tropospheric ozone precursors	P		The exposure to air pollution may cause negative impacts in human health. The most concerning pollutants are tropospheric ozone and particulate matter, according to UE "Thematic Strategy on Air Pollution", approved in 2005. They are the main responsible pollutants for the degradation of air quality in Portugal. Public access to information on air quality has improved.
Emissions of acidifying and eutrophying substances	P		
Air quality	E		
Tropospheric ozone exceedances	E		
Fine particulate matter pollution	E		

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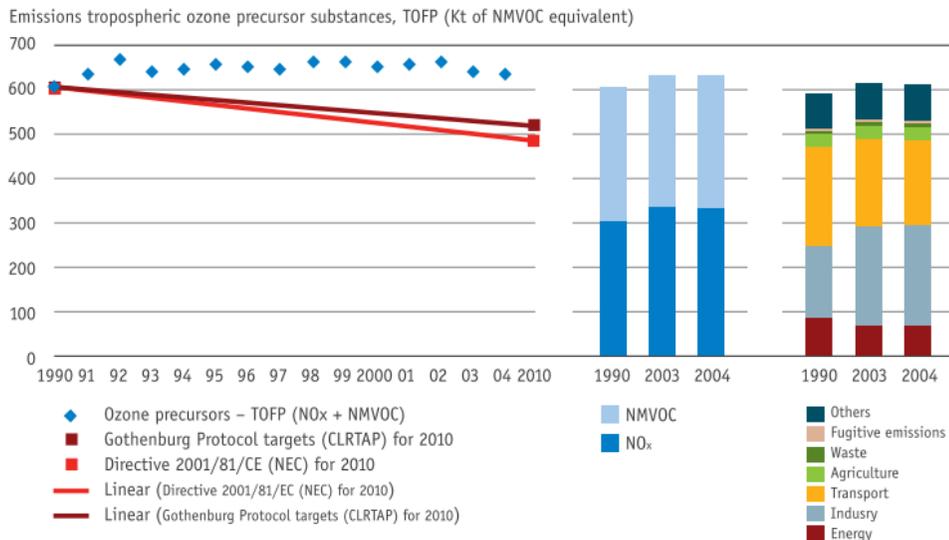
> Tropospheric Ozone Forming Potential (TOFP) values increased by 4% between 1990 and in 2004;

> Emissions of tropospheric ozone precursors are stable; Portugal still remains far from reaching its targets for 2010 (18% above the fixed target);

> The main gases responsible for the emissions in Portugal are Nitrogen Oxides (NO_x) and Non-Methane Volatile Organic Compounds (NMVOC), representing 47% and 42% respectively;

> Industry and transport sectors are the main sources of the emissions of tropospheric ozone precursors, with 68% of total emissions.

AGGREGATE EMISSIONS OF TROPOSPHERIC OZONE SUBSTANCES AND TARGETS FOR 2010



Note: Weighing / Conversion factors in NMVOC equivalent - TOFP (Tropospheric Ozone Forming Potential): NO_x = 1.22; NMVOC = 1.00.

Source: IA, 2006

> Between 1990 and 2004 emissions of acidifying and eutrophyng substances declined by 13%;

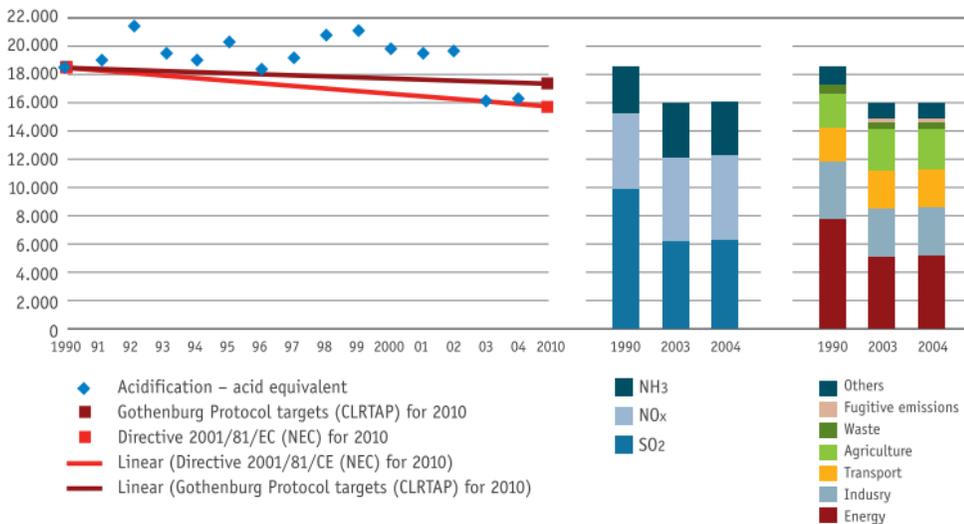
> In 2003 and 2004 Portugal was close to reach the 2010 targets agreed in the Gothenburg Protocol and the National Emissions Ceilings Directive;

> SO₂ and NO_x were the most important emissions of acidifying substances, with 40% and 37% respectively; the remaining NH₃ was responsible for about 23% of these emissions;

> In 2004 the principal source of these emissions was the energy sector (32%), followed by industry sector (22%) and agriculture sector (19%).

AGGREGATE EMISSIONS OF ACIDIFYING AND EUTROPHYING SUBSTANCES AND TARGETS TO BE REACHED BY 2010

Emissions of acidifying and eutrophyng substances (Kt of total acid equivalent)



Source: IA, 2006

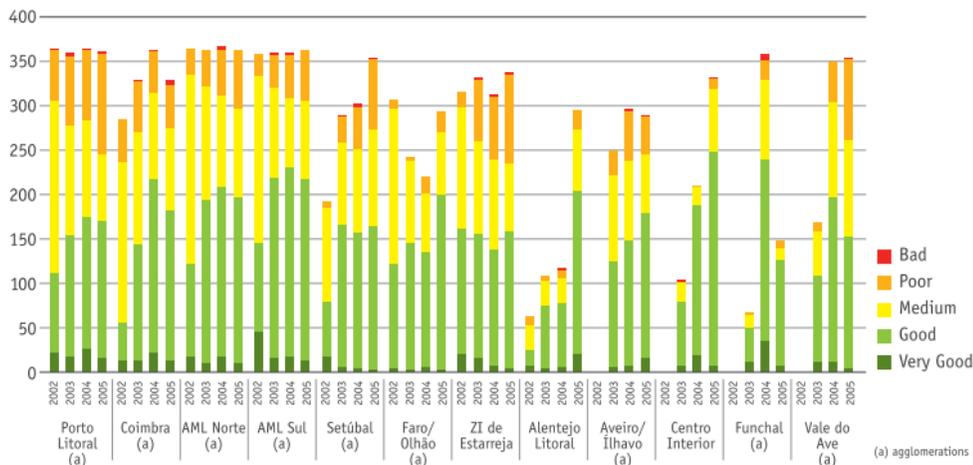


> In 2005 Air Quality Index (IQAr) is "Good" as recorded during the past years; the pollutants included in the accounts are: CO, NO₂, SO₂, O₃ and PM₁₀;

> In densely populated urban areas or those with some industrial clustering, there is still a significant number of "Poor" or even "Bad" days.

AIR QUALITY INDEX, IN ZONES AND AGGLOMERATIONS

IQAr (number of days)



Note: Agglomerations – areas of bigger settlement concentration with at least two monitoring stations – one traffic station and one urban background station.

Zones - areas with one rural background station to assess background air pollution and natural events.

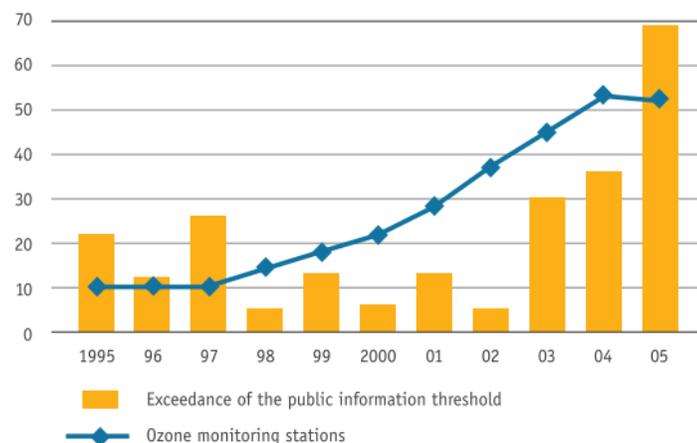
Source: CCDR, 2006



- > In 2005, 69 days registered exceedance of public information threshold, the highest number of days with exceedance values over the last decade;
- > The zone with most exceedances was Norte Interior, just like as in the previous year;
- > The regions of Algarve and Alentejo registered no exceedances of public information threshold.

EXCEEDANCE OF PUBLIC INFORMATION THRESHOLD VALUES AND TROPOSPHERIC OZONE MONITORING STATIONS

Exceedance (number of days), Stations (number)



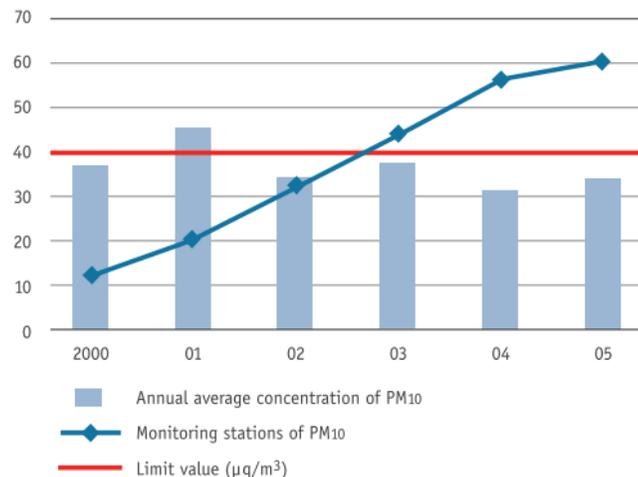
Source: CCDR, 2006



- > Annual background particulate matter concentrations (PM₁₀) have shown a decreasing trend;
- > In 2004 and 2005 the annual value was $\mu\text{g}/\text{m}^3$, under the annual limit value of ($40 \mu\text{g}/\text{m}^3$);
- > Annual average of PM₁₀ was $45 \text{ mg}/\text{m}^3$ in 2001, the highest annual score;
- > In 2005 seven zones exceeded daily limit value for PM₁₀; six of them are agglomerations around Porto and Lisboa and one from Estarreja industrial zone.

ANNUAL AVERAGE CONCENTRATION OF PARTICULATE MATTER (PM₁₀) AND STATIONS WITH PM₁₀ MONITORING SYSTEM

Concentration of PM₁₀ ($\mu\text{g}/\text{m}^3$) and Stations (number)



Source: CCDR, 2006

Water Use and Water Pollution



INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
Water extraction and consumption	P		<p>Approximately 92% of the population is served by public water supply and about 80% is served with sewerage and wastewater treatment. A great effort is however required to invest in water use efficiency by controlling the leakage in the water supply network and consumption inefficiency. Water National Plan and National Program for Water Efficient Use provide efficient solutions for these pressures.</p> <p>Nevertheless the investments made in urban and industrial wastewater treatment infrastructures, it is still necessary to act on the control of local and diffuse water pollution.</p>
Population with sewerage and wastewater treatment facilities	R		
Quality of surface waters and bathing waters	E		

* **DPSIR**

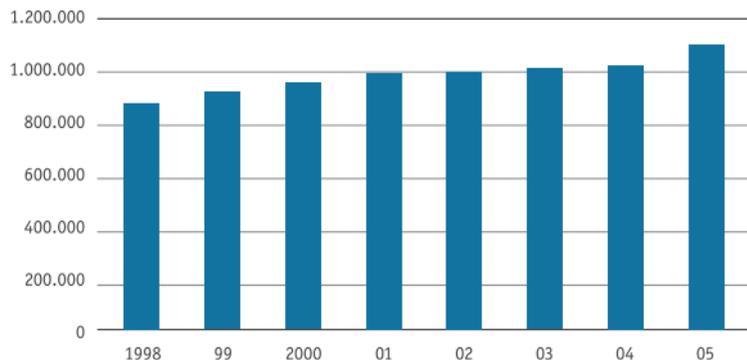
D - Driving forces | **P** - Pressures | **S** - State | **I** - Impacts - Impacts | **R** - Responses



- > In 2005 the volume withdrawn for public distribution reached 1 100 million m³;
- > In 2005 a generalized drought affected all continent;
- > Water consumption reached 655 200 m³ decreasing by 2% compared to the previous year;
- > 93,2% of the population was served by public water supply.

VOLUME WITHDRAWN FOR PUBLIC WATER SUPPLY (EXCLUDING AGRICULTURE AND ENERGY SECTORS) AND WATER CONSUMPTION

Volume withdrawn (10³m³)



Note: 2005 data is preliminary.

Source: INE, 2005 (data until 2004); INAG, 2006 (2005 data)

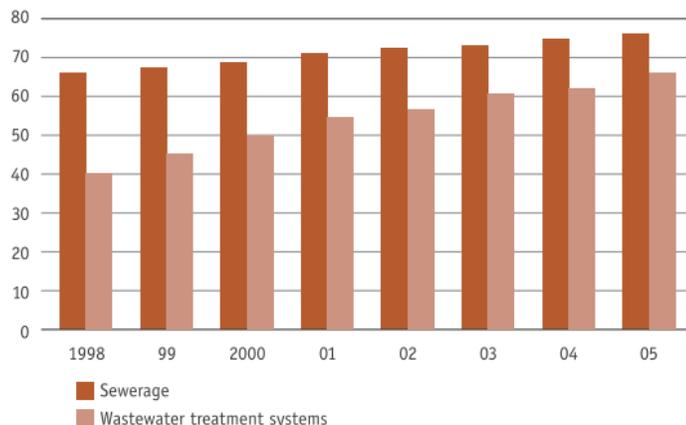


> In 2005, approximately 76% of the population was served by sewerage infrastructures and 66% was served by wastewater treatment facilities;

> 58% of the population served by urban wastewater treatment, benefited from wastewater treatment plants and 8% from septic tanks.

POPULATION WITH SEWERAGE AND WASTEWATER TREATMENT FACILITIES

Population with sewerage and wastewater treatment (% of total population)



Note: 2005 data is preliminary.

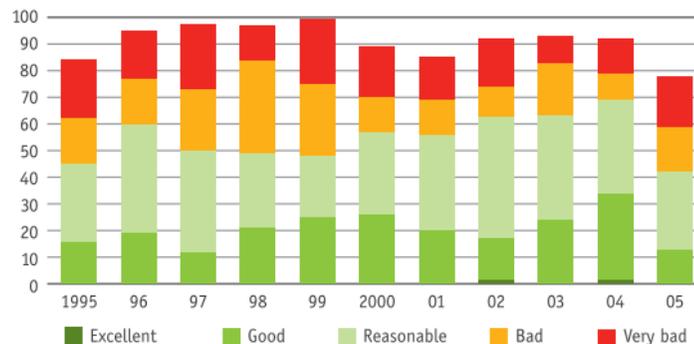
Source: INE, 2005 (data until 2004); INAG, 2006 (2005 data)



- > In 2005, water quality of about 46% of the stations was considered "Bad" or "Very Bad"; a great number of stations (37% of the total) was classified as "Reasonable";
- > In the same year, the most worrying situations were in Lis, Ave and Leça rivers basins;
- > Bathing water quality has significantly improved since 2001.

QUALITY OF SURFACE WATERS

Classification of water quality (% of the total number of stations)



Source: INAG, 2006

Land Use and Biodiversity



INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
Artificial Surfaces	P		One of the most significant changes in land cover was the growth of "Artificial surfaces" replacing essentially agricultural areas and forest.
Endangered species	E		Mainland area has suffered from countless pressures, mainly forest fires, which reached 338 262 ha of burnt area in 2005.
Classified areas	R		The potential threats to fauna are related to destruction, degradation and fragmentation of natural habitats resulting from human activity; some of these species are under special measures in order to help its recuperation and most of them included in areas under legal protection.
Organic farming	R		
Forest fires	P		National Program for Spatial Planning Policy, National Strategy for Nature and Biodiversity Conservation and other management tools are fundamental for the holistic approach to this situation; the most important ones are Spatial Planning for Protected Areas and Natura 2000 Sectorial Plan.

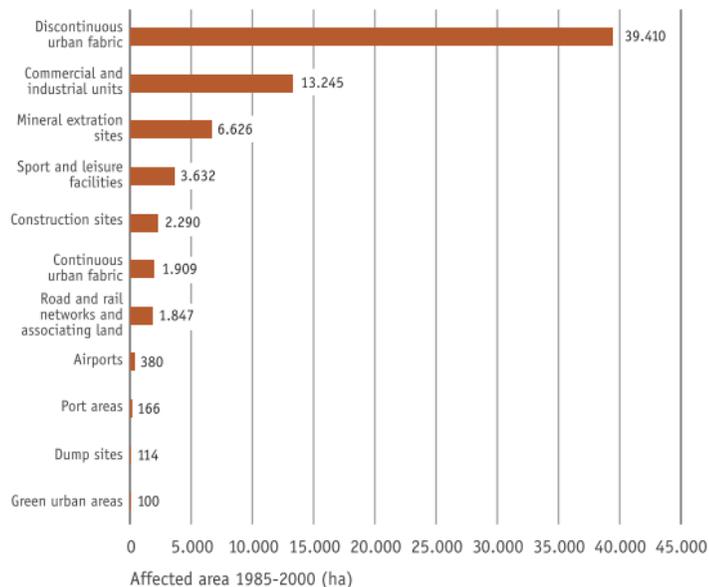
* DPSIR

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- > Between 1985 and 2000 the "Artificial surfaces" increased by 41% in Mainland Portugal;
- > This growth was essentially registered upon areas previously occupied by "Agriculture";
- > Algarve was the most affected region by the growth of "Artificial Surfaces" (55%);
- > In 2000 the "discontinuous urban fabric" covered about 67% of "Artificial surfaces".

ARTIFICIAL SURFACES INDEX, BETWEEN 1985 AND 2000



Source: IA, 2005

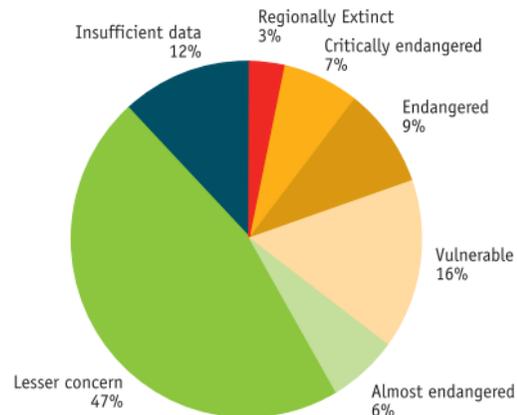


> The major threatening factors to biodiversity are related to destruction, degradation and fragmentation of natural habitats resulting from human activity;

> 42% of the entities were enclosed in three risk categories: "Critically endangered", "Endangered" and "Vulnerable" and also in the following categories: "Almost endangered" and "Regionally extinct";

> The group of fresh water and migrating fish had the highest percentage of species classified in the following categories: threatened or near threatened (69%).

DISTRIBUTION OF ENTITIES STUDIED IN PORTUGAL IN THE RED BOOK OF VERTEBRATES - PORTUGAL 2005



Fonte: ICN, 2005

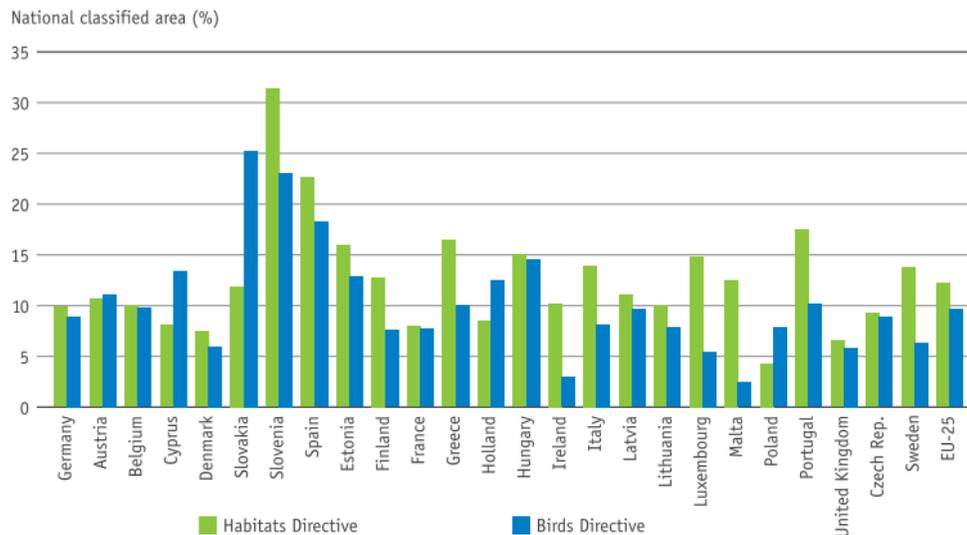


> In mainland there are 29 Special Protection Areas and 60 classified Sites which makes up 20,5% of the total in mainland plus 109 010 ha of marine zone;

> Areas classified under Birds and Habitats Directives and National Network of Protected Areas reach approximately 21,3% of the total in mainland plus 111 206 ha of marine zone;

> Under Birds and Habitats Directives, mainland shows a classified area corresponding to 10% and 17% of the EU-25 territory respectively. The classified marine zone was not taken into account by the same directives.

PERCENTAGE OF NATIONAL TERRITORY OF EACH MEMBER STATE CLASSIFIED AS "SITE" UNDER HABITATS DIRECTIVE AND AS "SPECIAL PROTECTION AREA" UNDER BIRDS DIRECTIVE



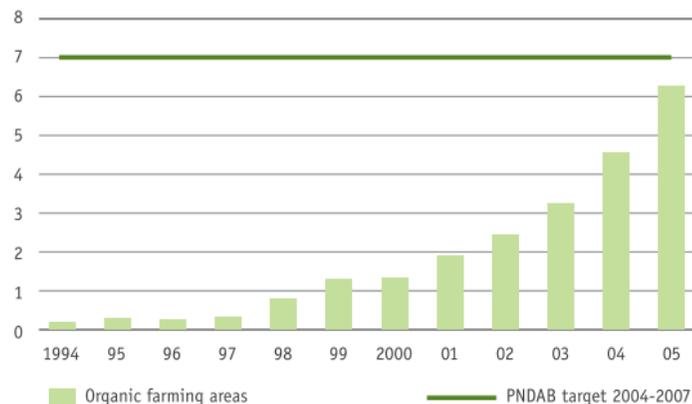
Source: European Commission, 2006



- > In 2005 the areas occupied by organic farming accounted for about 6,3% of Utilised Agricultural Area (UAA), and Alentejo was the region where biological farming is most expressive;
- > In the same year, 66% of the area under biological agriculture was occupied by pastures;
- > In 2002 these areas in Portugal were scarcely visible when compared to EU-25 countries, mainly the ones from North of Europe.

PERCENTAGE OF AREAS UNDER ORGANIC FARMING RELATED TO UTILISED AGRICULTURAL AREA (UAA) IN MAINLAND PORTUGAL

Areas under organic farming in the total UAA (%)



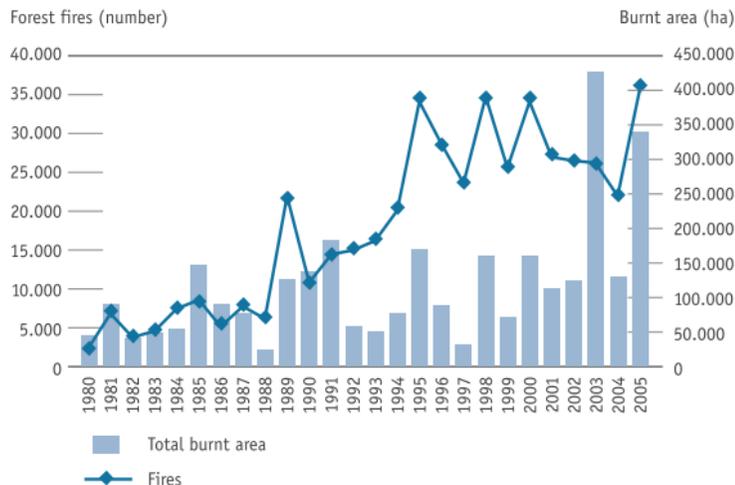
Note: PNDAB – National Plan for Organic Farming Development.

Source: IDRHa, 2006



- > In 2005 there were 35 697 forest fires resulting in 338 262 ha of burnt area;
- > The most affected were Coimbra, Viseu and Vila Real districts;
- > The number of fires, burnt area in mainland and burnt area in the National Network of Protected Areas (NNPA) were above the last 13 years annual average rates (1992-2004);
- > The Natural Park of Serra da Estrela was the most affected Protected Area in 2005, with a burnt area which makes up 56% of the total in the NNPA.

FOREST FIRES IN MAINLAND PORTUGAL



Source: DGRF, 2006

Waste



INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
Municipal waste generation	P		Portugal has one of the lowest per capita MW (Municipal Waste) figures in the EU-25, ensuring compliance with national targets for generation of municipal waste in 2005. The strategic plans are focused on the prevention of waste generation. Although some improvements have been made on treatment and final destination of waste, the national targets for 2005 were not reached. In January 2006 the Intervention Plan for Urban Solid Waste and Similar was approved, aiming to recover the delay in complying with European targets, particularly what concerns waste recycling and recovery.
Municipal waste treatment and final destination	R		
Waste recovery	R		

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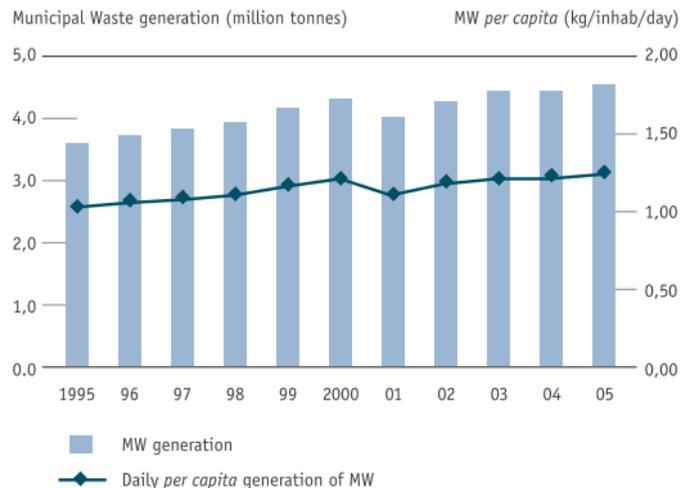


> In 2005 the generation of urban waste in mainland Portugal reached 4,9 million tonnes matching the target of the Strategic Plan for Solid Urban Waste (4,5 million tonnes);

> Around 1,2 kg of municipal waste per inhabitant is produced daily in mainland Portugal;

> In 2005, Lisboa e Vale do Tejo and North are the regions with the highest MW production levels with 38% and 33% respectively.

MUNICIPAL WASTE GENERATION IN MAINLAND PORTUGAL



Source: INR, 2006



Municipal waste treatment and final destination

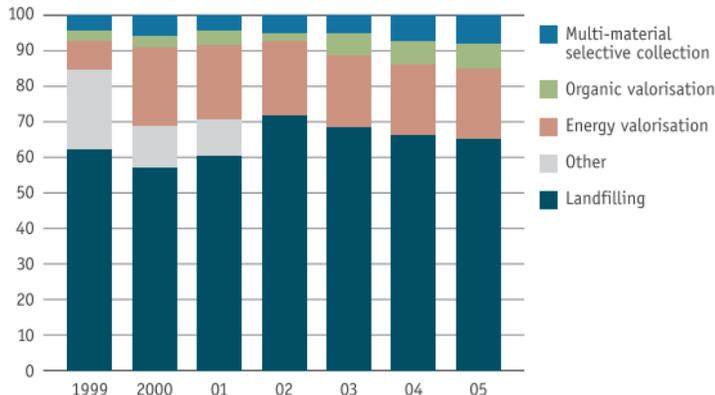
> In 2005, about 65% of municipal waste produced in mainland Portugal ended in landfills, 20% in energy valorisation, 8% subject to multi-material selective collection and 7% being composted;

> These values still remain far from the PERSU (Strategic Plan for Solid Urban Waste) targets, which aim at 25% multi-material selective collection;

> In the region of Azores, the selective collection reached 55% of the total MW and in the region of Madeira, the energy valorisation reached 74%.

MUNICIPAL WASTE TREATMENT AND FINAL DESTINATION IN PORTUGAL

Final destination of urban waste in mainland Portugal
(% of the total of MW)



Note: The item "Other" includes dumping (1992-2002) and controlled disposal of waste (2003-2005); multi-material selective collection for recycling, includes the packaging waste, paper/cardboard, glass and batteries collected at the eco-points, door to door and eco-centres; "organic valorisation" during 2005 also includes the organic valorisation of MW.

Source: INR, 2006



> In 2005, 41% of packaging waste produced in Portugal was recycled, while the recovery rate reached about 48%;

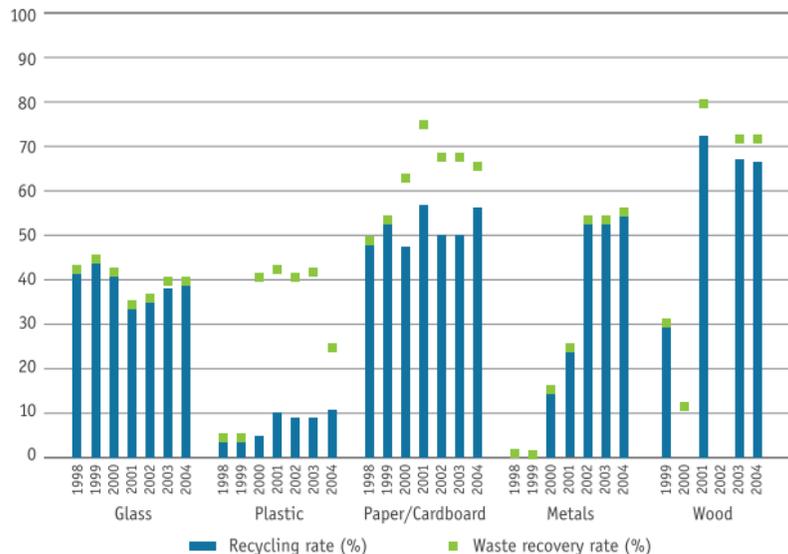
> The recycling rate of plastic packaging waste was the lowest one (11%); on the other hand the recycling rate of wood packaging waste reached 48%, the highest rate;

> The recycling of paper/cardboard and glass reached 56% and 39% respectively;

> Among 1 500 kt of packaging waste generated in Portugal in 2005, "Sociedade Ponto Verde" received 18% (274 kt) from urban waste management Systems (14%), from commerce/distribution (4%) and from industry (0,1%).

RATES OF RECYCLING AND RECOVERY OF PACKAGING WASTE, IN PORTUGAL

Recycling and recovery rates (% of total collected packaging waste)



Source: INE, 2006; IA, 2006; DGGE, 2006

Noise



INDICATOR	DPSIR* MODEL	TREND	TEMATIC SYNTHESIS
Analysis of noise maps	R		The main requirements to assess noise pressure levels are now established in mainland Portugal. The noise maps, although some of them still in progress, will allow a significant part of the population to access noise exposure levels. Based on this data it will be possible to set out action plans, particularly for critical areas in order to prevent and control noise emissions, decreasing exposure to environmental noise.

*** DPSIR**

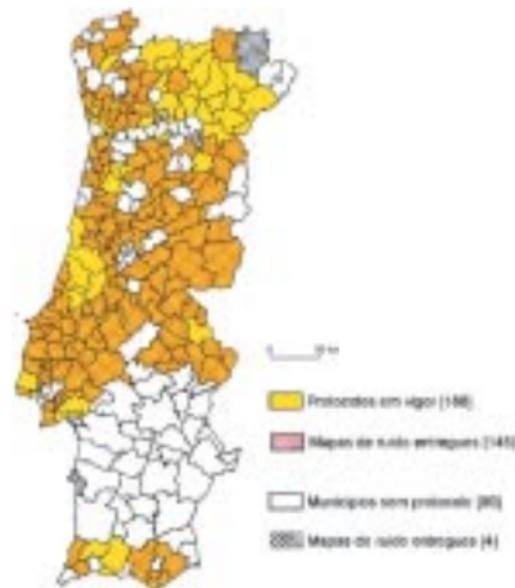
D - Driving forces | **P** - Pressures | **S** - State | **I** - Impacts - Impacts | **R** - Responses



> Since 2003 Portuguese municipalities are working on the preparation of noise maps; 188 have received State support to carry out this objective;

> Until end of December 2005 the Institute for the Environment received a set of 145 noise maps from municipalities with Support Program and 4 from municipalities not enclosed in the Support Program.

ANALYSIS OF NOISE MAPS – 31 DECEMBER 2005



Source: IA, 2006

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MINISTRY OF ENVIRONMENT, SPATIAL PLANNING AND REGIONAL DEVELOPMENT

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