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INTERGOVERNMENTAL NEGOTIATING COMMITTEE
FOR A FRAMEWORK CONVENTION ON CLIMATE CHANGE

EXECUTIVE SUMMARY OF THE NATIONAL COMMUNICATION OF

SPAIN

submitted under articles 4 and 12 of the United Nations
Framework Convention on Climate Change

In accordance with decision 9/2 of the Committee, the interim secretariat is to make available, in the official languages of the United Nations, the executive summaries of the national communications submitted by annex I parties.

Copies of the Spanish national communication can be obtained from:

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SPAIN

1. The present document, "Spain's report on the Convention", was drawn up in pursuance of the commitment entered into by the Spanish Government when, in December 1993, 1/ it ratified the United Nations Framework Convention on Climate Change (FCCC) 2/ (referred to below as the *Convention*), article 12 of which sets out the specific elements involved in the "communication of information related to implementation".

Content of Spain's first report

2. Chapter I, *"Summary of the national report"*, is composed of a short summary of the content and structure of the document, as well as a preview of the main data relating to sectoral policy and net emission levels for greenhouse gases of greatest importance for the purposes of the Convention, which are covered in more detail in chapters VI to VIII, containing the information requested from developed countries (as listed in annexes I or II to the Convention) on ratification.

3. Chapter II, *"Concepts and general background"*, contains a brief discussion of the importance of the climate system, and more specifically the climate, in human activities, as reflected in the growing concern about climate change that may cause substantial changes in the natural environment. Also included is an outline of the international and national scientific and political process which, starting in the middle of the 1960s, culminated in the holding of the United Nations Conference on Environment and Development, now known as the *Earth Summit*, and the entry into force of the Convention.

4. Chapter III, *"The context"*, is a summary of the national situation as regards the range of aspects relating to social and economic activities, which determine requirements concerning sectors directly involved in resources subject to indirect monitoring under the Convention. The chapter refers to global factors that may have an impact on climate, as well as Spain's geographical, physical, climatic, demographic and economic context. This overall view is complemented by a comparison of energy-related carbon dioxide (CO_2) emissions in the member countries of the Organisation for Economic Cooperation and Development (OECD).

5. Chapter IV, *"Climate forecasts"*, sets out a short summary of current knowledge in the field of climate system modelling, presenting the climate scenarios forecast up to the middle of the next century (in a representation of the main components of climate in space and time) and the foreseeable impacts on the regional (meaning subcontinental) scale. This summary is designed to serve as a general introduction to the problem of climate change and the foreseeable impacts of such change in our geographical area.

6. Chapter V, *"International commitments entered into by Spain"*, is a detailed summary of decisions and policies in the field of the environment or climate adopted or under consideration in international forums in which Spain participates - the United Nations, the European Union, OECD, and so on - where their agreements and undertakings directly or indirectly affect the climate system and climate.

7. Chapter VI, *"Main lines of action: towards a national climate programme"*, is a detailed summary of policies and measures adopted at the national level which make a significant contribution to reducing emissions and increasing removals by sinks of greenhouse gases and ozone precursors, as required under article 12, paragraph 2 of the Convention. This summary of strategic policy is subdivided on the basis of the various sectoral policies in the fields of energy, industry, transport, housing, farming and livestock-raising, and forestry.

8. Chapter VII, *"Monitoring of greenhouse gases and ozone precursors"*, contains a detailed inventory of emissions by source and removals by sinks of greenhouse gases and ozone precursors for the base year 1990, and an estimate of trends during this decade, as inferred from the sectoral policies outlined in chapter VI. This inventory was drawn up along the lines approved by the Intergovernmental Negotiating Committee, using the method devised jointly by the Intergovernmental Panel on Climate Change (IPCC) and OECD in pursuance of article 12, paragraph 1 of the Convention.

9. Chapter VIII, *"Additional information on other aspects of interest"*, includes sections containing information on Spain's economic contribution to the financial machinery under the Convention; programmes for cooperation with developing countries and transfer of technology (relating to climate and climate change) to them; programmes for observation of and research on the climate system; programmes of public information and awareness creation on the consequences of climate change; and a summary of studies carried out on the vulnerability of various sectors in Spain to climate change.

A foretaste of the main elements of Spain's report

10. Spanish policies and measures aiming at the limitation of emissions of greenhouse gases and ozone precursors and the enhancement of sinks fall within the broader context of a medium-term and long-term environmental strategy. Spain's environmental policy must address the problems that arise in five priority areas:

- Desertification
- Waste management
- Water resources management
- Management of biodiversity
- Quality of the urban environment.

11. In most cases the action required to alleviate or eliminate the problems in these specific priority areas is at the same time conducive to relieving the problem of climate change.

12. The basic tools of Spain's environmental strategy are:

- Interdepartmental coordination and integration between sectoral policies and other policies: for the purpose of ensuring the coordinated

harmonization of standards and the achievement of environmental objectives throughout the country, the *Sectoral Conference on the Environment* has been developed, gathering together those responsible for dealing with environmental issues in the central Government and in the Autonomous Communities. In May 1992 for the same purpose the Government set up the National Climate Commission, which coordinates the work of all the ministerial departments engaged in applying the climate change policy.

- Popular participation: with this in mind the *Advisory Council on the Environment* was set up in February 1994, composed of ecologists, representatives of private businesses, consumers, young people and distinguished professionals and researchers.

- Extensive application of the technique of environmental impact assessment.

- Reorientation of market mechanisms using price systems, agreements between the Government and business sectors, tax changes, more effective systems of penalties and environmental audits of companies.

13. These strategic foundations will be drawn on to tackle the main lines of action: efforts to remedy serious shortcomings leading to environmental degradation, incorporation of environmental considerations in State policies and cooperation in the development of supranational environmental policies.

14. Specifically, environmental policy as regards the atmosphere may be described in terms of the following general objectives:

- Analysis and monitoring of the state of the atmosphere: air pollution, transboundary problems and global problems.

- Development of environmental plans and programmes regarding the atmosphere, for the management of environmental resources and the reduction or elimination of pollution.

- Study and analysis of processes of production and consumption which have impacts on the atmosphere.

- Establishment of basic norms in this area.

15. Below is a brief description of sectoral policies of significance for climate change in terms of measures that help to reduce emissions of greenhouse gases and enhance carbon sinks.

Energy policy

16. The main thrust of energy policy is set out in the National Energy Plan (PEN), which has been adopted by the Government and endorsed by Parliament. The current plan covers the present decade, 1991-2000.

17. Environmental protection was introduced into PEN 91 as a major objective for the first time.

18. The main instrument included in PEN 91 with the aim of reducing the environmental impact of energy processes, and in particular the greenhouse effect, is the Energy Saving and Efficiency Plan. This plan breaks down into four programmes of measures:

- *The Energy-saving programme*, whose aim is to cut final energy consumption without affecting levels of economic activity. The programme is directed towards industry (more efficient burners, furnaces and other equipment), transport (technical and management measures) and buildings (updating of technical regulations and creation of awareness among users).

- *The Energy substitution programme*, aimed at increasing the use of natural gas to replace petroleum products and coal. This programme is targeted on industry (replacement of fuel oil and coal in cement works and the steel industry, and replacement of electric power in kilns, furnaces, etc.) and buildings (replacement of coal and fuel oil in heating systems).

- *The Cogeneration programme*, aimed at promoting the use of residual heat and combined-cycle electric power generation with natural gas. Cogeneration projects are being adopted in energy-intensive industries (refining, chemicals, paper and so on) and for hospital and hotel complexes.

- *The Renewable energies programme*, which provides for major development of these energies, as regards both final uses for heat and electricity generation.

19. One of the overall objectives of the Energy Saving and Efficiency Plan is to improve energy efficiency over the period covered by PEN 91 by 12 per cent as measured by the consumption of primary energy per unit of gross domestic product.

20. Another fundamental aspect of energy policy set out in PEN 91 is energy supply policy, with the planning of new investment in electric power plant. Here it is necessary to combine the targets of cost minimization, development of domestic resources, diversification and protection of the environment. In this regard it is noteworthy that almost 70 per cent of the 5,965 MW of new installed capacity in the year 2000 is non-CO_2-emitting equipment:

- 942 MW of hydroelectric capacity

- 1,835 MW of new gas capacity

- 300 MW of gas turbines

- 1,000 MW of (nuclear-generated) electric power imported from France.

21. Notable among objectives and measures designed to reduce emissions of greenhouse gases other than CO_2 are:

- Reduction of emissions of nitrogen oxides (NO_x) from thermal power stations through the use of low-NO_x generators, modification of burners, staged combustion and "reburning" with natural gas;

- Limitation of emissions of methane (CH_4) arising from the transport and distribution of hydrocarbons (C_xH_x) through the use of improved compression equipment and leak detection and pipe repair systems. Methane from the coal industry is to be used for energy generation.

Industrial policy

22. The main programme of measures in the industrial sector of significance for the environment, and in particular for climate, is the Industrial and Technological Programme in the Field of the Environment, adopted in 1989, which runs from 1990 to 1994. Its purpose is to encourage the supply of environmental goods and services and to foster adaptation on the part of industry to growing environment-related requirements.

23. Projects related to greenhouse gas reduction involving total investment of 68,952 million pesetas were carried out between 1990 and 1993.

Transport and infrastructure policy

24. Generally speaking, potentially the most beneficial actions in the transport sector are those aimed at encouraging more energy-efficient modes of transport. Of particular importance is the promotion of public passenger transport.

25. In this context, the Urban Transport Financing Act entered into force in 1990, as a result of which the general State budget includes allocations for local organizations responsible for urban public transport. In this way the State partially subsidizes operating costs for public transport, and so encourages its use in congested urban areas. These subsidies amount to 30,000 million pesetas a year.

26. In the same context, the *Plan on Transport in the Major Cities* for 1990-1993 was adopted with the aim of modernizing public transport installations and vehicles. The Plan focuses on railways as the most energy-efficient mode. Up to this year a total of 68,265 million pesetas has been invested in infrastructure on railway networks providing access to the major cities, and 100,000 million pesetas on renewal of rolling-stock.

27. Another measure adopted in 1993 to improve the relative position of railways vis-à-vis roads was the introduction of tax exemption for diesel oil for railway use.

Farming and livestock-raising policy

28. The major measures adopted under the farming and livestock-raising policies may be classified in three groups:

- Energy saving and diversification measures:

- Programme for the promotion of no-tillage and minimum tillage techniques

- Programme for tractor maintenance and improvement

- Experimental programme for the replacement of diesel oil by biofuel and fuel oil by plant-based oils

- Programme for the methanization of pig manure effluent with subsequent use for energy generation in pig farming

- Programme for promotion of the use of plant stubble and pruning wastes for burning and energy generation.

- Measures covering wastes from farming and livestock raising:

  - Drafting and distribution of a code of farming practice relating to livestock management, including rules on:

    - Storage of pig manure effluent

    - Lagooning techniques

    - Spreading of manure effluent.

- Measures to ensure the more rational use of fertilizers:

  - Application of automated methods for determining recommendable doses of fertilizer based on soil, climate and crop characteristics

  - Popularization of non-traditional fertilizer application techniques

  - Dissemination of the code of farming practice relating to ceilings on the application of organic nitrogenous fertilizer - 179 kg of nitrogen per hectare per year.

Forestry policy

29. The importance of forests and more generally of natural ecosystems in Spain, and the substantial risks of degradation facing the resources of the natural environment in Spain, mean that policies designed to enhance and extend natural carbon sinks make a fundamental contribution to achievement of the objectives of the Convention.

30. There are three main programmes of action to upgrade and protect forests and other natural ecosystems:

- *The Programme for the restoration of plant cover and erosion control*: its main aims are detection and control of soil erosion processes and

regeneration and improvement of plant cover. The principal activities being carried out under the programme are:

- Reforestation with the environmentally most valuable species

- Improvement and ecological upgrading of the existing vegetation.

31. The basic instruments used in pursuing these activities are agreements between the central Government and the Autonomous Communities for cooperation in hydrological and forestry activities to promote basin rehabilitation.

32. Under these agreements the central Government carried out reforestation activities covering a total of 63,700 hectares and forest upgrading activities covering 108,000 hectares between 1990 and 1993.

- *The Programme for protection of ecosystems against forest fires*

  - The preventive measures are:

    - Public awareness campaigns

    - Research into causes and punishment of those responsible

    - Promotion of preventive forestry under the Priority Action Plan against Forest Fires

    - Promotion of mobile surveillance for purposes of dissuasion, also under the Plan

  - The fire control measures are:

    - Boosting of the fleet of fire-fighting aircraft

    - Upgrading of the skills of fire-fighting personnel

    - Introduction of computerized methods for forecasting fire behaviour

    - Development of a national fire hazard forecasting system.

- *The Programme for the protection of ecosystems against pests and air pollution:* a standing interdepartmental working group on the health of forests has been in existence since 1984 to provide information on forest health problems and strategies and action to tackle specific problems.

33. Between 1987 and 1990, 460 elements in the European network for monitoring the effects of pollution on forests were put into place in Spain to study the evolution of forest damage and apply corrective measures.

34. Between 1993 and 1994, 50 permanent plots representative of the various forest systems were set up to permit more thorough study of the relationship between air pollution and the health of the forests.

35. As far as future plans in forestry policy are concerned, a medium-term and long-term forest strategy sets out forecasts regarding reforestation and conservation of plant cover. The strategy covers the period 1993-2032, with targets set for the year 2000, 2012 and 2032.

36. Total planned investment (figure 1 in the full report) will be 3,900,000 million pesetas in 1993 pesetas, of which 700,000 million will be spent between now and the year 2000.

37. Actions scheduled under the Plan will involve reforestation (figure 2 in the full report) over 8,400,000 hectares (1,600,000 between now and 2000) and conservation work (figure 3 in the full report) over 6,770,000 hectares of forest (1,330,000 hectares between now and 2000).

38. Royal Decree No. 378/1993, governing the first stage of the forestry strategy, provides for a system of assistance to promote investment in forests and forest development activities in rural areas.

Inventory of gases in 1990

39. As agreed by INC/FCCC, the inventory of greenhouse gases and ozone precursors for the base year 1990 should conform to the guidelines drawn up by IPCC and OECD. However, in view of the fact that Spain's EU membership obliged it to draw up an inventory of these gases using the atmosphere component (CORINE-AIR) of the Coordinated Information System on the State of Natural Resources and the Environment (CORINE), as well as the short time available to convert and incorporate the data from each activity in the various categories (the inventory prepared on the basis of CORINE-AIR was available for the month of June 1994), the inventory set out in this report is the one drawn up using the CORINE-AIR method, although some summary tables of the inventory prepared using the IPCC/OECD method are also provided.

40. The greenhouse gases covered in the inventory are CO_2, CH_4 and nitrous oxide (N_2O), while the ozone precursors are NO_x, carbon monoxide (CO) and volatile organic compounds (VOCs) other than methane.

41. A more thorough examination of the summary tables of the inventory of gases prepared using the IPCC/OECD method shows that the total net emissions of CO_2 are distinctly higher than those for the other gases, at 256,476.9 kt; taking into account the number of inhabitants recorded in Spain in 1990, the per capita figure for emissions is about 6.6 tons.

42. The figures are as follows for the remaining gases in the inventory: CH_4 - 2,142.5 kt of total emissions, 54.8 kg per capita; N_2O - 94.7 kt of total emissions, 2.4 kg per capita; NO_x - 1,247.4 kt of total emissions, 31.9 kg per capita; CO - 4,950.6 kt of total emissions, 126.7 kg per capita; and VOCs other than methane - 1,118.8 kt of total emissions, 28.6 kg per capita.

43. Figure 4 in the full report shows the percentage share of each sectoral activity in emissions of greenhouse gases and ozone precursors by source. The activities in question are energy conversion (combustion and fugitive emissions of fuels), industrial processes, use of solvents, farming and wastes.

44. Besides these five headings, the value corresponding to change in land use and forestry has been added for the specific case of CO_2; the partial net balance is negative, i.e. managed forests function as a sink for CO_2.

- Of the net balance for CO_2, more than four fifths (87 per cent) stems from energy conversion, 14 per cent from industrial processes and 1 per cent from wastes, giving a total of 102 per cent of the net balance, the surplus of 2 per cent being the equivalent absorbed by change in land use and forestry (figure 5 in the full report).

- Emissions of CH_4 break down between farming (41 per cent), energy conversion (35 per cent) and wastes (23 per cent), with industrial processes accounting for 1 per cent.

- Two thirds (67 per cent) of N_2O emissions originate from farming, a fifth (22 per cent) from energy conversion, 11 per cent from industrial processes and a very small amount from wastes.

- Almost all emissions of NO_x stem from energy conversion (96 per cent); the remainder, in order of importance, from wastes (2 per cent), industrial processes (1 per cent) and farming (1 per cent).

- As for NO_x, emissions of CO originate for the most part (81 per cent) from energy conversion, 8 per cent originate from farming, and the remainder from wastes (6 per cent) and industrial processes (5 per cent).

- All processes contribute to emissions of VOCs other than methane, though to different extents - just over half (57 per cent) in energy conversion, 27 per cent in use of solvents, about 9 per cent in the farming sector, 6 per cent in industrial processes and just 1 per cent from wastes.

Forecast inventory of gases for the year 2000

Forecast greenhouse gas emissions for the year 2000 are as follows:

- Energy-related CO_2: 276,504.7 kt

- NO_x: 892 kt

- VOCs other than methane: 668 kt.

45. No estimates of the evolution of emissions of the remaining compounds in the inventory (CH_4, N_2O and CO) and non-energy-related CO_2 are presented because there are no reliable data or hypotheses from which a value for the year 2000 could be estimated.

Financial contribution

46. Spain contributed 10 million special drawing rights to the Global Environment Facility (GEF) during its pilot phase.

47. It has also undertaken to supply a little over 12 million special drawing rights for fund replenishment in the coming three years.

Transfer of technology

48. The Science and Technology for Development Programme, in which Spain, Portugal and 19 Latin American countries participate, was set up in 1984 as a result of a Spanish initiative.

49. This programme includes innovation projects falling under the activity known as IBEROEKA, which operates as a technology transfer mechanism with a potential to promote achievement of the objectives of article 4, paragraph 5 of the FCCC.

50. Innovative technology and alternative energy activities in Latin American and North African countries are also financed and developed through a variety of bodies. Noteworthy are projects for the installation of electricity supply systems using photovoltaic solar energy techniques, in cooperation with universities.

51. In all, Spain spent 2,650 million pesetas on technology transfer in 1992 and around 1,500 million in 1993.

Observation of and research on the climate system

52. Internationally, Spain is a participant in the European climate observation and research effort, playing an active role in the two most notable European initiatives, the European Network for Research on Global Change and the European Climate Support Network, the second of which was set up at the initiative of Western European meteorological and hydrological services.

53. Spain is also cooperating in other EU-promoted projects. Worthy of mention are those dealing with erosion and desertification control, integrated water resources management and specialist support for certain production sectors.

54. Agreements for cooperation in climate modelling have been drawn up with such centres as the Max Planck Meteorology Institute and Météo France for joint work on regional climate-modelling experiments.

55. At the national level the *National Plan for Research and Development* incorporates a *National Programme on Environment and Natural Resources* featuring many activities relating to climate change. A national climate programme is currently being drawn up; it will encompass all national activities relating to climate and climate change, and will contain joint plans for measures to address its causes or palliate its adverse effects.

56. As far as observation is concerned, Spain maintains a network of 125 principal weather stations and a temperature and rainfall-measuring network of over 2,000 temperature-measuring stations and 5,000 rainfall-measuring stations, and also participates in international efforts through its membership of specific observation networks set up for the purpose, such as the Background Air Pollution Monitoring Network (BAPMoN) and the Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP), to which it contributes in the form of a base

station in the Izaña (Canary Islands) Special Observatory and 6 other regional observatories evenly distributed throughout the country.

Notes

1/ Spain signed the Convention in Rio de Janeiro, Brazil, on 13 June 1992, during the "Earth Summit", and ratified it on 21 December 1993. The instrument of ratification was published in the **Boletín Oficial del Estado**, No. 27, of 1 February 1994.

2/ **United Nations General Assembly** document A/AC.237/18(Part II)/Add.1, of 15 May 1992, and document A/AC.237/18(Part II)/Add.1/Corr.1 of 27 May 1992; at the suggestion of the INC/FCCC at its fifth session, held in New York (United States) from 30 April to 9 May 1992.

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