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Report on the in-depth review of the national communication of Denmark

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Under Articles 4 and 12 of the Convention, Parties are required to prepare national communications on their implementation of the Convention. Guidelines for the preparation of national communications and the process for their review were agreed on by the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change, by its decisions 9/2 and 10/1, and by the Conference of the Parties, at its first session, by its decisions 2/CP.1 and 3/CP.1 (see FCCC/CP/1995/7/Add.1). In accordance with these decisions, a compilation and synthesis of 33 first national communications from Annex I Parties was prepared (FCCC/CP/1996/12 and Add.1 and 2).

When reviewing the implementation of the Convention by Parties, the subsidiary bodies and the Conference of the Parties will have this report available to them in English as well as the summary of the report in the six official languages of the United Nations. (These bodies will also have before them the executive summary of the first national communication of Denmark and country-specific information drawn from a compilation and synthesis report covering all countries that have submitted national communications.)

Summary[1]

1. The in-depth review of the first national communication of Denmark was carried out between August 1995 and June 1996 and included a country visit by the review team to Copenhagen from 14 to 18 August 1995. The team included experts from China, Hungary, Italy and the secretariat of the Organisation for Economic Co-operation and Development (OECD).

2. The commitment to pursue greenhouse gas mitigation was first formulated by the Danish Government in *Our Common Future, the Danish Government's Action Plan on Environment and Development (Follow-up to the Recommendations in the Report of the World Commission on Environment and Development and the UN Environmental Perspective to the Year 2000)* (1988) (referred to in this document as the Danish Government's Action Plan on Environment and Development of 1988) which was drafted as a national follow-up to the report of the Brundtland Commission. In this report, the goal of achieving sustainable development, locally and globally, was introduced as a general principle which should be applied in all political and administrative sectors, and ultimately, the society as a whole. Hence, responsibility for implementing climate-related policies and measures lies with individual sectoral ministries. The Ministry of Environment and Energy, and its agencies, however, has the task of aggregating the effect of sectoral policies and their projections and determining implications for national targets related to total national carbon dioxide (CO_2) emissions. Denmark has special experience in having merged the energy and environment ministries, which, in the team's opinion, has contributed to improving the coordination of policies related to climate change. In 1990, per capita emissions of CO_2 were approximately 10.3 tonnes, compared to an average of about 12 tonnes in the OECD countries.

3. The inventory in the national communication is based chiefly on the CORINAIR[2] methodology, but also draws in places on the Intergovernmental Panel on Climate Change (IPCC) defaults. Denmark has applied a correction for the trade of electricity to its inventory data. For the base year 1990, emission data were corrected for a net import of electricity, with all six greenhouse gases (GHGs) being affected. The adjustments are based upon the assumption that this amount of electricity would have been generated in Denmark, if the import had not occurred. An emission is calculated as if the net amount of electricity imported was produced under average conditions in Danish coal-fired power plants. The team noted that the correction for import/export of electricity is indicated in the communication in a transparent manner. Although the method of calculation was not transparent in the communication, it was clearly explained to the review team during the country visit.

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[1] In accordance with decision 2/CP.1 of the Conference of the Parties, the full draft of this report was communicated to the Government of Denmark, which had no further comments.

[2] CORINAIR is the component of the European Community's CORINE (Coordinated Information System on the State of Natural Resources and the Environment) dealing with air emissions inventories.

4. Fuel combustion is the dominant source of CO_2 emissions. These arise mainly in the energy and transformation industries. The correction for electricity trade amounts to approximately 11 per cent of total gross CO_2 emissions in 1990, which totalled 58,400 Gg. Carbon sequestration from land-use change and forestry was estimated to be about 2,600 Gg of CO_2. Owing to the poor quality of associated statistics, the value is reported, but not included in the national total of CO_2 emissions. Anthropogenic emissions of methane (CH_4) in 1990 amounted to 406.3 kilotonnes, with 64 per cent occurring in the agricultural sector and 30 per cent from waste. Agricultural soils constitute the single largest source of anthropogenic emissions of nitrous oxide (N_2O), contributing 81 per cent of the total of 10.5 kilotonnes in 1990.

5. A number of targets are mentioned in the national communication. The "Energy 2000" plan issued in 1990 foresees a reduction in CO_2 emissions of 28 per cent in 2005 compared to 1988 levels, for the whole of the energy sector excluding transport. The transport action plan of 1990 aims at stabilizing CO_2 emissions at the 1990 level in 2005 and then reducing them by 25 per cent by 2030. The combined effect of the two action plans is expected to be a reduction of more than 20 per cent of CO_2 in 2005, compared to 1988 levels. This 20 per cent target was subsequently adopted by the Danish parliament. The team noted that these targets were specified in terms of emissions corrected for import and export of electricity and climate variation, included international air traffic, but did not include emissions from marine bunkers and flaring.

6. Since the first oil price shock in 1973, policies have been implemented in Denmark to reduce energy consumption. By 1988, substantial energy savings and efficiency gains had been achieved, in particular in the heating of dwellings. Since 1990, energy policy has had a strong emphasis on the reduction of CO_2 emissions, mainly through increased efficiency in the end-use of energy, increased overall efficiency of the supply and conversion systems, and use of cleaner fuels and energy sources, including renewable energy sources. The range of policies and measures implemented by Denmark is not restricted to "no regrets" measures; at present, the maximum permissible cost of CO_2 reduction stands at DKr 210 per tonne of CO_2.

7. Energy and carbon taxes on fossil fuels and on electricity have been applied in Denmark for a long time. Broad exemptions have, until recently, insulated domestic industry and services from possible negative impacts on international competitiveness, with households and the public sector facing the highest effective tax rates. Electricity grids are divided into two parts, the eastern part linked to Scandinavia and the western part to the European mainland. Direct current (DC) connections exist from the western area to Norway and Sweden, and from the eastern area to Sweden and Germany. A DC connection between the two parts is planned on the Great Belt bridge, which is under construction. Electricity produced in these two independent markets is subject to a carbon tax, and, for households, an energy tax. Two new thermal power plants are under construction, which are much more efficient than the older ones. Exploration for natural gas began in the 1970s, and the gas was first used in the 1980s. The objective is to connect as many consumers as possible within the

areas covered by the grid. Local and regional heating plans during the 1980s aimed, where feasible, at the establishment or enlargement of natural gas or district heating grids, which resulted in a large expansion of the areas covered by one or the other of these supply options. Almost all grids for natural gas and district heating are in place, although not all households are connected. Some municipalities have used the option identified in national legislation of making connection compulsory when major parts of the existing heat installation need replacement, or at the latest after nine years. In general, there is a ban on the establishment of electrical heating in areas supplied by gas or district heating. By the year 2005, only 10 per cent of households will remain to be connected within district heating areas, and 30 per cent will remain to be connected to gas in gas areas. A number of measures to promote the use of renewable energy are in place, including subsidies of up to 30 per cent on initial investments, funded, to some extent, by revenues from carbon and energy taxes.

8. The public transport system is well developed, but the number of private cars is increasing, possibly because of the economic upturn. The team was impressed with the high use of bicycles and the road infrastructure for exclusive use by cyclists. A gasoline and diesel tax was introduced as a result of a decision taken in 1992. A CO_2 excise duty on gasoline was introduced in May 1993 and stands at an average of about 27 ore/litre. The construction of bridges is planned to connect the domestic transport system and to link Denmark to Sweden and Germany, across the Great Belt, Øresund and the Femern Belt, respectively. These bridges could succeed in diverting traffic to rail, but may have negative effects too, depending, *inter alia*, on the relative prices of ferries compared to tolls on the bridges. Waste management is covered in the action plan 1993-1997, in which targets are set to reduce the overall amount of waste, to reduce the amount of waste entering landfills to 21 per cent of the total amount of waste, to reduce waste incineration to 25 per cent and to recycle 54 per cent of total waste.

9. The national communication includes projections for emissions of CO_2, CH_4, N_2O, carbon monoxide (CO), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOCs) up to the year 2000, on a gas-by-gas basis, disaggregated by sector, as recommended in the guidelines. Data for the year 2005 are also provided. Removals of CO_2 by sinks are included in the projections, but listed separately. Although the coverage of GHGs is comprehensive, based on the communication alone, the projections analysis was not completely transparent; it was possible, however, to gain a qualitative understanding of the different models used. During the in-depth review, the Government made every effort possible to provide supplementary information, enabling the team to gain a better insight into the projection methodologies and the key parameters used in the analysis.

10. Updated projection information presented to the team during the visit indicates that CO_2 emissions in 2000, corrected for electricity trade and with the implemented or planned measures, are expected to be 10 per cent lower than electricity-trade corrected 1990 levels, and 15 per cent lower in 2005. If the projection for the trade-corrected emissions were to be realized, actual emissions in 2000 and 2005 would be lower or higher according to whether the fluctuating trade would result in import or export of electricity in those years. If electricity trade continues to follow the pattern observed from 1975 to 1993, the most likely

level will be about 2.5 megatonnes below the trade-corrected level. Actual emissions in 2000 and 2005 would then be respectively about 4 per cent and 10 per cent below actual 1990 emissions, ± 5 per cent. The team was informed that, in general, policies and measures in the energy sector are being implemented as planned, with the exception of two measures accounting together for 3 per cent of the anticipated CO_2 emission reductions by 2005. The missing reduction in 2005 compared to the target of 20 per cent reduction for energy including transport is mainly due to the projected inability of the transport sector, with the measures implemented presently, to meet its target of stabilizing at 1988 levels in 2005. Projected CO_2 emissions in this sector in 2000 are 5 per cent higher than 1990 levels, and 11 per cent higher in 2005. CH_4 emissions are projected to decrease by 13 per cent in 2000 compared to 1990 levels. N_2O emissions are projected to increase by about 10 per cent in 2000 compared to 1990 levels.

11. The national communication followed recommendations for reporting on expected impacts of climate change contained in the Intergovernmental Negotiating Committee guidelines. While Denmark has a long coastline and harbours and low-lying areas are regarded as vulnerable, it was felt that the impacts of sealevel rise could be controlled by management. There is no specific discussion of adaptation measures under way in the Danish national communication, although *possible* adaptation measures, such as the construction in the future of higher dykes, are mentioned in the context of expected impacts of climate change.

12. Denmark participates actively in international cooperation. Its official development assistance (ODA) in 1994 stood at 1.01 per cent of its gross domestic product (GDP). Denmark contributed US$ 22.8 million to the core fund of the pilot phase of the Global Environment Facility and US$ 35.1 million to its replenishment. Considerable support is also provided to the United Nations Environment Programme (UNEP) on various climate change activities. Denmark would need an agreed definition of transfer of technology before including information on that matter in its communication. During the country visit, however, the team found evidence of flows of technology to developed and developing countries alike, including the export of Danish windmills.

13. The team was satisfied that the recommendations of the guidelines for reporting on research and systematic observation were met. There is a long tradition of research in Denmark, especially in meteorology, with current efforts being well integrated into international activities. Although there is no specific section or chapter in the national communication devoted to education, training and public awareness, a number of examples of this are mentioned in the sections on policies and measures, which were complemented by additional information provided during the country visit.

I. INTRODUCTION AND NATIONAL CIRCUMSTANCES

14. Denmark ratified the Convention on 21 December 1993. Its first national communication was received by the secretariat on 1 September 1994.

15. The in-depth review of the first national communication of Denmark was carried out between August 1995 and June 1996 and included a country visit by the review team to Copenhagen from 14 to 18 August 1995. The team comprised Mr. Liu Deshun (China), Mr. Gábor Vattai (Hungary), Mr. Marco Venanzi (Italy), Ms. Bo Lim (Organisation for Economic Co-operation and Development secretariat), Mr. Aniket Ghai (UNFCCC secretariat) and Mr. Jacob Swager (UNFCCC secretariat, Coordinator). In the course of the visit, the team met with a broad range of government experts, as well as representatives of environmental and industry non-governmental organizations.

16. A number of features of Denmark's geography are significant. The natural gas and oil reserves in the North Sea are likely to have contributed to the importance of these fuels in the energy balance. The potential for wind energy is higher than in many other countries. The possibility of using sea water to cool steam down to low temperatures enables exceptionally high efficiency rates to be achieved in coal-fired generators. Also, easy access to harbours lowers the cost of transporting and handling coal. The presence of district heating grids in most major cities and towns has provided flexibility for fuel switching and shifts to more energy-efficient supply techniques, such as combined heat and power (CHP).

17. The commitment to pursue GHG mitigation was first formulated in the Danish Government's Action Plan on Environment and Development of 1988 which was drafted as a national follow-up to the report of the Brundtland Commission. In this report, the goal of achieving sustainable development, locally and globally, was introduced as a general principle which should be applied in all political and administrative sectors, and ultimately, the whole society. Hence the responsibility for implementing climate-related policies and measures lies with individual sectoral ministries. The Ministry of Environment and Energy, however, has the task of aggregating the effect of sectoral policies and their projections and determining implications for national targets related to total national carbon dioxide (CO_2) emissions. Denmark has special experience in having merged the energy and environment ministries, which, in the team's opinion, has contributed to improving the coordination of policies related to climate change. In addition, Denmark is considering establishing an interministerial committee on climate change.

18. Currently, climate change is addressed under a series of sectoral action plans, most notable of which are the energy and transport plans, and their follow-up plans. Other lesser plans can be found in the waste and forestry sectors. Work on an integrated climate change strategy is under way, and it is expected that it will be ready in one to two years.

19. Government officials stressed the need to understand the Danish efforts as part of the overall strategy of achieving sustainable development. It is a central part of the overall strategy to develop the necessary policies in a phased manner, involving regular revisions as

experience accumulates, in which adaptation to new developments in technologies and in society are incorporated. Officials stressed that targets set for individual sectors and years should hence not be seen as ultimate goals, but rather as steps toward the ultimate objective of sustainable development. It was their view that, in the same way, action plans only specify the actions decided to be taken in the next few years as next steps towards the targets, and must not be considered as the last steps taken.

20. A number of targets are mentioned in the national communication, some of which were specified first in the sectoral action plans. The "Energy 2000" plan issued in 1990 foresees a reduction in CO_2 emissions of 28 per cent in 2005 compared to 1988 levels, for the whole of the energy sector excluding transport. The transport action plan of 1990 aims at stabilizing CO_2 emissions in 2005 and reducing them by 25 per cent by 2030 compared to 1988 levels. The combined effect of the two action plans is expected to be a reduction of more than 20 per cent of CO_2 in 2005, compared to 1988 levels. This 20 per cent target was subsequently adopted by the Danish parliament. The team noted that these targets were specified in terms of emissions corrected for import and export of electricity and climate variation, included international air traffic, but did not include emissions from marine bunkers and flaring. Two additional targets are specified: one for the stabilization of CO_2 emissions at their 1990 level by 2000, in accordance with the Convention, and the other for a 5 per cent reduction of CO_2 emissions in 2000 compared to the 1990 level, as a contribution to the overall stabilization by 2000 for European Union (EU) countries.

21. Historically, Denmark has attached considerable importance to protecting the environment. Since the first oil price shock in 1973, policies have been implemented in Denmark to reduce energy consumption. By 1988, substantial energy savings and efficiency gains had been achieved, in particular in the residential sector.

22. Import and export of electricity to and from Denmark are dependent on, inter alia, rainfall variations in Sweden and Norway, which affect the supply of hydroelectric power in these countries. Resulting fluctuations in electricity trade can be quite large - sometimes up to 30 per cent of total electricity consumption - with resulting variations in the amount of electricity produced domestically, mostly with coal-fired plants. Future trade patterns may also be affected by features such as a decision in Sweden on whether to phase out the supply of nuclear power. To insulate policy-making from these swings, in particular in terms of the implications for additional measures necessary to meet CO_2 reductions targets, it was felt necessary by Denmark to include electricity trade adjustments in the data. The team noted that Denmark was aware that, in the global context, the use of this method of adjustment is problematic, as, if electricity is imported, emissions may be counted when they do not occur in reality, and conversely, they may not be accounted for if electricity is exported from Denmark. The adjustment to the data, however, has been presented in a transparent manner; both sets of data were included in the national communication. The team noted that savings in electricity by these trade partners might result in a greater amount of electricity becoming available for export to Denmark, thus raising the possibility of replacing electricity produced

domestically using coal by cleaner imported electricity produced in hydroelectric power plants abroad.

23. In 1990, per capita emissions of CO_2 were approximately 10.3 tonnes, compared to an average of about 12 tonnes in the OECD countries. In 1993, Denmark had the 10th lowest energy prices of the 23 countries participating in the International Energy Agency (IEA), of which the tax component is a substantial part.

24. The team noted that sectoral ministries have the responsibility of implementing laws concerning them, and that laws are not submitted by a ministry unless funds for their implementation have been approved in the annual budget. Some laws require confirmation from the EU that there is no conflict with existing EU directives.

25. As indicated in its introduction, the national communication does not cover the Faroe Islands and Greenland, which are parts of the Kingdom of Denmark. While GHG emissions from these regions might be expected to be low, the impact on fragile ecosystems might be significant. Although Denmark did not include a discussion of the impacts of climate change in the first national communication, it intends to do so in its second submission. The team noted further that it might be necessary to clarify the obligations of the governments of the Faroe Islands and of Greenland under the UNFCCC.

26. Finally, it is important to mention that much of the work on the Danish first national communication had begun before the Intergovernmental Negotiating Committee agreed on guidelines for the preparation of first national communications by Annex I Parties. Deviations from the recommended format should be viewed with this in mind.

II. INVENTORIES OF ANTHROPOGENIC EMISSIONS AND REMOVALS

27. The data on inventories contained in the national communication were prepared without the Intergovernmental Panel on Climate Change (IPCC) Draft Guidelines for National Greenhouse Gas Inventories and hence do not meet the standard format of the reporting instructions of the IPCC Draft Guidelines (1994). Denmark later submitted the IPCC standard data tables for both direct (CO_2, CH_4, N_2O) and indirect (CO, NO_x, NMVOCs) GHGs following the recommended IPCC source categories for energy, industrial processes, solvents, waste and agriculture. Standard IPCC notation, however, was not used in the data tables and, hence, it was not possible to establish if an emission was negligible, or not estimated. However, these tables, together with additional inventory data from 1972-1992 and supplementary information collected during the review, enabled the calculations for several GHG emission estimates reported in the national communication to be reconstructed.

28. The inventory in the national communication is based chiefly on the CORINAIR methodology, but also draws in places on IPCC defaults. For example, emission factors for N_2O outside the energy sector are based on the IPCC recommendations. National emission

factors for NO_x, N_2O, CH_4, NMVOC and CO for road transport are derived from the COPERT model, from CORINAIR. The team appreciated the progress made in comparing the CORINAIR and IPCC methodologies, and the significant contribution made by Denmark to the harmonization of the two methods. In general, uncertainties were not discussed in the national communication, but were addressed in supplementary documentation and during the country visit. In accordance with IPCC recommended methodology, the reference year for the inventory was 1990, and emissions from international aviation and marine fuel bunkers were indicated separately and not included in national totals. Emissions were not aggregated using global warming potentials (GWPs). Subsequent inventory information will continue to be compiled on a yearly basis.

29. Denmark has applied a correction for the trade of electricity to its inventory data. For the base year 1990, emission data were corrected for a net import of electricity, with all six GHGs being affected. The adjustments are based upon the assumption that this amount of electricity would have been generated in Denmark, if the import had not occurred. An emission is calculated as if the net amount of electricity imported was produced under average conditions in Danish coal-fired power plants. The team noted that the correction for import/export of electricity is indicated in the communication in a transparent manner. Although this method of calculation was not transparent in the communication, it was clearly explained to the review team during the country visit.

30. In Denmark, fuel combustion is the dominant source of carbon dioxide emissions. These arise mainly in the energy and transformation industries. The electricity import/export correction amounts to approximately 11 per cent of total gross CO_2 emissions in 1990, which totalled 58,400 Gg. A high level of confidence in CO_2 emission figures for the energy sector was indicated, with uncertainties of 1-2 per cent. To supplement the CORINAIR methodology, a computer programme, CORENBAL, was used to compare apparent fuel consumption with national energy balance statistics. Good agreement between the two sets of data suggests that CO_2 emissions from fuel combustion estimated with the IPCC and CORINAIR methodologies are largely comparable. The review team also confirmed that any apparent anomalies that did exist between the national energy balance and fuel consumption were due to the different methods of fuel aggregation, the main differences being that the national balance includes emissions from aviation bunker fuels, but not emissions from flaring. In accordance with the IPCC recommended methodology, the data were not corrected for the diesel and gasoline that is sold to private consumers across borders. This amount was felt to be significant by Danish experts, and a correction has been applied to the national energy balance, although not in the data reported in the communication.

31. CO_2 emissions from the combustion of refuse and biomass were not included in the inventory on the grounds that the associated practices were sustainable, although emissions other than CO_2 arising from these sources were included, as recommended by the IPCC guidelines. The inventory does not include data on CO_2 emissions from plastics in refuse, as the relative percentages of these substances is not known.

32. Carbon sequestration from land-use change and forestry was estimated to be about 2,600 Gg of CO_2. Owing to the poor quality of associated statistics, the uncertainty is believed to be rather high. This value is therefore reported, but not included in the national total of CO_2 emissions. Denmark is currently improving data quality for this source category. Furthermore, in the next national communication, all forests are likely to be classified as managed.

33. Anthropogenic emissions of methane in 1990 amounted to 406.3 kilotonnes, with 64 per cent occurring in the agricultural sector (mainly from enteric fermentation and animal waste) and 30 per cent from waste (mainly from landfills and waste water). A small amount was emitted from the energy sector, from fugitive sources and fuel combustion. CH_4 emissions from processed waste were not included. Agricultural soils constitute the single largest source of anthropogenic emissions of nitrous oxide, contributing 81 per cent of the total of 10.5 kilotonnes in 1990. Fuel combustion sources, comprising mainly power generation, road transport, the residential and commercial sectors and industrial combustion, were also relevant. Uncertainty factors for these emissions were high, at about 8-9.

34. Of the total of 293.3 kilotonnes of nitrogen oxides emitted in 1990, the major part occurred in the energy sector, including road transport, power plants and off-road vehicles, but also in the fisheries sector and industrial combustion. A small amount comes from the production of nitric acid. In 1990, 165.1 kilotonnes of NMVOCs were emitted mainly in the transport sector, while some emissions occurred from solvent use or took the form of fugitive fuel emissions. The 770 kilotonnes of carbon monoxide emitted in 1990 originated entirely in the energy sector, mostly from fuel combustion and some fugitive fuel emissions. Although the use of hydrofluorocarbons (HFCs) was marginal in 1990, it rose to 300 tonnes in 1993, and is estimated at 500 tonnes for 1994.

III. POLICIES AND MEASURES

A. Overview

35. As noted in chapter I, policies and measures affecting climate change have been implemented since the first oil price shock, motivated largely by the pursuit of energy supply security and local environmental concerns. These policies and measures had a favourable effect on the mitigation of CO_2 emissions before the base year of 1990. The GHG issue was first addressed in the Danish Government's Action Plan on Environment and Development of 1988, and was followed by the development, in 1990, of sectoral action plans for energy (Energy 2000) and for transport. After 1993, sectoral action plans were enhanced by follow-up strategies, including Follow-up to Energy 2000, Traffic 2005 and the Action Plan for Waste and Recycling 1993-1997, which were approved by the Danish parliament with the explicit aim of reaching national CO_2 emission reduction targets under the Convention. Owing to the considerable energy-saving measures implemented prior to the signature of the Convention, the potential for achieving additional reductions in, for instance, the heating of dwellings was viewed as limited. Since 1990, energy policy has had a strong emphasis on

the reduction of CO_2 emissions, mainly through increased efficiency in the end-use of energy, increased overall efficiency of the supply and conversion systems, and use of cleaner fuels and energy sources, including renewable energy sources. The range of policies and measures implemented by Denmark is not restricted to "no regrets" measures; at present, the maximum permissible cost of CO_2 reduction stands at DKr 210 per tonne of CO_2.

36. The projected development in emissions of CO_2 has constantly been monitored, and new measures have been implemented in several rounds, as part of action plans or as independent initiatives, to secure the national 20 per cent target. For example, in 1995, a new CO_2 and energy tax scheme was introduced for the industrial sector to close a projected gap of 5 per cent in relation to the 2005 target. In 1995, the Government published a report for public debate, *Danish Energy Futures*, which outlined possible paths for CO_2 emissions until 2030, spanning a range of a 65 per cent reduction below 1990 emissions, in the accelerated policies case, to an increase of about 10 per cent, in the case of no new measures and strong economic growth. The report discusses the possible evolution in developed and developing country emissions, and concludes that consideration of the concept of environmental space would necessitate industrial country reductions to about one tenth of 1990 levels by the year 2100, and rapid transfer of technology to developing countries, in order to stabilize the concentration of CO_2 in the atmosphere at 450 ppmv. In 1996, a new action plan, Energy 21, was prepared, containing additional measures to reduce CO_2 emissions, motivated by higher economic growth estimates and the desire to continue to work towards the target in 2005. The action plan also examines possible development until 2030.

37. Policies and measures were described in detail in the national communication in accordance with the guidelines for the preparation of communications by Annex I Parties; they covered the main GHGs, CO_2, CH_4 and N_2O, as required, but also considered the precursors. In the national communication, emphasis was placed on major emission sectors, such as power and heating, transport, industry and the commercial and residential sectors and public service, reflecting the structure of the CO_2 emissions inventory.

38. Full information was not available, however, on monitoring mechanisms to assess the implementation of the measures, neither in the national communication nor in the supplementary documents provided during the in-depth review. The household sector is an exception where the monitoring of electricity demand is well described. Nevertheless it was evident to the team that the implementation of policies and measures is being monitored, as this is an important consideration in deciding whether to introduce additional measures, for example, in follow-up programmes in the energy sector.

B. Energy

39. In 1990, the Danish parliament approved the energy action plan Energy 2000, the measures of which were estimated to lead to a 28 per cent reduction in CO_2 emissions in 2005 compared to the 1988 level for the energy sector, excluding transport. A sequential

energy action plan was drawn up, Follow-up to Energy 2000, in November 1993. A new comprehensive action plan is under preparation.

40. The national communication details over 50 individual policies and measures, stating the objectives of the measures, type of policy instruments and some key quantitative data. In addition, during the review, more detailed information on the effect of individual policies and measures was provided to the team. The aggregated effect of measures on emissions from the energy sector excluding transport, compared to the "without measures" baseline projection, is estimated to be a reduction in emissions of CO_2 of 18.8 megatonnes in 2005, or about 36 per cent of the projected base year emissions.

41. Energy and carbon taxes on fossil fuels and on electricity have been applied in Denmark for a long time. Declining international fuel prices in the mid-1980s were offset by increasing taxes, thus maintaining high energy prices in support of a strong long-term energy policy. Until recently, broad exemptions have insulated domestic industry and services from possible negative impacts on international competitiveness, with households and the public sector facing the highest effective tax rates. The tax reforms of 1992 resulted in price increases for oil, coal and gas, of DKr 100 per tonne of CO_2 and a CO_2 tax of DKr 0.10 per kWh was imposed on electricity. Exemptions were nevertheless granted for certain categories of industry, compensation was given to ships, air transport and coaches and to all enterprises according to the financial burden of the tax, and a partial refund was made to VAT-registered enterprises. Residual tax reimbursements, except for a non-refundable base amount of DKr 10,000, were granted to heavily-burdened enterprises conditional on an energy survey being carried out. Overall, the effective tax rate for industry has been estimated at DKr 35 per tonne of CO_2. The tax reforms of 1993 established a gradual increase in the energy component of taxation on fuels and electricity for households.

42. In May 1995, the Danish parliament approved a series of new taxes, which comprise extension of the coverage of the CO_2 and energy tax to include natural gas at a rate equal to the increase in the general CO_2 tax, thus raising the level of taxes on energy for all heating to the level faced by households, which is equal to an average of about DKr 500 per ton of CO_2, and, lastly, a gradual increase over the next five years in the level of the CO_2 tax on energy used by industry and the commercial sector. The latter change still avoids loss of international competitiveness by establishing two rates for different categories of industry, including a virtually vanishing rate for energy-intensive processes. Reimbursement for both categories is subject to the enterprise carrying out an energy survey and implementing certain energy-saving measures. Additional revenue from the tax on heating and the increased level of the CO_2 tax will also be recycled to the private sector, through a general lowering of employers' social contributions - which will simultaneously stimulate employment - and through increased grants for investments in energy savings. This elaborate "green tax" system has been devised to prevent loss of competitiveness in the absence of an EU-wide CO_2 and energy tax. There are no taxes on flaring. Instead, negotiations have been initiated with the oil and gas industry, aiming at a voluntary agreement on emissions limitations.

43. Electricity grids are divided into two parts, the eastern part linked to Scandinavia and the western part to the European mainland. Direct current (DC) connections exist from the western area to Norway and Sweden, and from the eastern area to Sweden and Germany. A DC connection between the two parts is planned on the Great Belt bridge, which is under construction. Electricity produced in these two independent markets is subject to a carbon tax, which is also applied to imported electricity, even though in some cases the imported electricity has been generated in hydroelectric or nuclear power plants. Two new thermal power plants are under construction, which are much more efficient than the older ones. The very high efficiency of up to 47 per cent in coal-fired power plants has partially offset the negative effect on CO_2 emissions caused by the switch from oil to coal since 1973. All new plants are constructed as CHP plants, with much improved marginal efficiency of district heat production, attaining values between produced and marginal fuel used for heat of about 300 per cent. It is assumed that additional plant capacity that will be added after 2000 will be natural gas- or biomass-fired, although no decision has been taken on this yet. The power companies have agreed to use 1.4 megatonnes of biomass fuel (straw and forest residues) by the year 2000, and have recently been obliged to install a total wind power capacity of 1,500 MW by 2005, including offshore wind farms, with 200 MW to be constructed in the next four years. Electricity savings are considered to be a cornerstone of future action. Measures implemented to pursue such savings include, for example, incorporation of integrated resource planning in power supply legislation, labelling of appliances, informative electricity billing, and energy consultancy schemes, as well as economic incentives created by taxes and investment grants.

44. Exploration for natural gas began in the 1970s, and the gas was first used in the 1980s. The objective is to connect as many consumers as possible within the areas covered by the grid. Local and regional heating plans during the 1980s aimed, where feasible, at the establishment or enlargement of natural gas or district heating grids, which resulted in a large expansion of the areas covered by one or the other of these supply options. Almost all grids for natural gas and district heating are in place, although not all households are connected. The spring 1995 tax changes also include a small tax on natural gas.

45. Some municipalities have used the option identified in national legislation of making connection compulsory when major parts of the existing heat installation need replacement, or at the latest after nine years. In general, there is a ban on the establishment of electrical heating in areas supplied by gas or district heating. By the year 2005, only 10 per cent of households will remain to be connected within district heating areas, and 30 per cent will remain to be connected to gas in gas areas. Special subsidy schemes assist thousands of households in replacing oil-based space heating with district heating.

46. A number of measures to promote the use of renewable energy are in place, including subsidies of up to 30 per cent on initial investments, funded, to some extent, by revenues from carbon and energy taxes. The share of wind energy out of total energy production is high compared to other countries, at 3 per cent. With advanced technologies coupled with strong incentives, Denmark believes that a share of 10 per cent could be achieved by 2005.

The team also noted the importance of biomass utilization at the municipal level. According to information received during the review concerning renewable energy supplied through district heating systems, 18 villages and towns are currently supplied by centralized biogas plants, 61 are supplied by straw-fired plants, 34 by wood-chip-fired plants and 7 by straw/wood CHP plants.

47. Increased use of CHP in district heating systems, industry, greenhouses and larger buildings is a central element in the Danish strategy. Plans foresee that by 2010 almost all electricity that is not produced by wind power will be produced by CHP, thus virtually minimizing the heat losses in power production. The resulting system will have almost all electricity production tied either to heat demand or to wind availability. Further, the Danish experts were of the opinion that the expected gradual increase in the ratio of power to heat in CHP, not matched by a similar shift in the demand for power and heat, would fit well with the planned introduction, in the medium term, of geothermal heat in the district heating systems, which has thus received increased priority in the latest plan, Energy 21.

C. Transport

48. The Danish transport action plan for environment and development of January 1991 sets a national target of stabilizing CO_2 emissions by 2005 at the 1988 level, and then reducing them by 25 per cent by 2030 compared to 1988. This plan was followed by the Government's "White Paper" on transport and the traffic plan "Traffic 2005" of December 1993. Electrification of major sections of the rail system is ongoing.

49. The public transport system is well developed; the total number of trains has increased with the addition of several new ones, some of which are intercity trains. The semi-private Danish train company receives support in the form of subsidies, as do the several bus companies. The number of rail passengers is increasing again after a period of decline but has not yet reached the peak level of 10 years ago.

50. The number of private cars is increasing, possibly because of the economic upturn. A range of policies is nevertheless in place. The purchase tax on private vehicles is set at the very high rate of 250 per cent. To replace the large number of old cars in the fleet, a scheme for compensating owners who turn in vehicles that are over 13 years old was introduced, but has now been discontinued owing to the undesirable side-effect of an increase in the overall sales. The team was particularly impressed with the high usage of bicycles and the road infrastructure for exclusive use by cyclists.

51. A gasoline and diesel tax was introduced as a result of a decision taken in 1992. The fuel tax increased by DKr 1.1 in 1993, and in 1995 the total tax stood at more than DKr 3. A CO_2 excise duty on gasoline was introduced in May 1993 and stands at an average of about 27 ore/litre.

52. The construction of bridges is planned to connect the domestic transport system and to link Denmark to Sweden and Germany, across the Great Belt, Øresund and the Femern Belt,

respectively. These bridges could succeed in diverting traffic to rail, but may have negative effects too, depending, *inter alia*, on the relative prices of ferries compared to tolls on the bridges.

53. Some 30 additional measures to reduce CO_2 emissions from the transport sector are being evaluated by an interministerial committee, including higher fuel prices, higher registration fees, road pricing, an urban travel tax, improving competitiveness of public transport, improving driving behaviour, use of biofuels and higher parking fees. Additional policies and measures will be selected from this group based on the cost of achieving CO_2 reductions, as well as other environmental gains, such as reductions in NO_x, sulphur dioxide (SO_2) and noise pollution. In the recent plan Energy 21, it is assumed that the target in the transport sector of stabilizing emissions at 1988 levels by 2005 will be met, although necessary measures have not yet been implemented.

D. Waste

54. Waste management is covered in the action plan 1993-1997, in which targets are set to reduce the overall amount of waste, to reduce the amount of waste entering landfills to 21 per cent of the overall amount of waste, to reduce waste incineration by 25 per cent and to recycle 54 per cent of total waste.

55. Of the total amount of 1,200,000 tonnes of domestic waste from the household sector, 30,000 tonnes of organic waste are treated biologically per year. Goals will be achieved by recycling a larger part of organic household waste, and by eliminating the disposal of combustible waste in landfills.

56. Currently, out of a total of 10 million tonnes of solid waste per year, 2.2 million tonnes are incinerated and used for heating. This amount is expected to remain stable, as recycling is expected to increase. The technology is being changed to combined heat and power, with all 14 incineration plants to be converted by 1996. Under a law passed in 1995 and scheduled to come into effect in 1997, municipalities are required to separate combustible and non-combustible waste, with all combustible materials being sent for incineration. Further negotiation with the municipalities will be necessary on the implementation of this law.

57. The team was informed that about ten landfill sites utilize CH_4 emissions to generate electricity, and, in several cases, district heat, with CH_4 being converted to CO_2, which has a lower GWP, although no information was provided on the oxidation process.

58. Aluminium cans for beverages are not permitted; instead there is a highly effective deposit-refund scheme for glass bottles, each bottle being used an estimated average of 33 times before being recycled. The energy saving from glass recycling is in the process of being calculated. Development of a common waste management policy at EU level could,

however, affect this scheme. Some paper and plastic is recycled instead of going to incinerators. Only a small amount of polyethylene terephthalate (PET) is recycled, however.

IV. PROJECTIONS AND EFFECTS OF POLICIES AND MEASURES

59. The national communication includes projections for emissions of the direct (CO_2, CH_4, N_2O) and indirect (CO, NO_x, NMVOC) GHGs up to the year 2000, on a gas-by-gas basis, disaggregated by sector, as recommended in the guidelines. Data for the year 2005 are also provided. Removals of CO_2 by sinks are included in the projections, but listed separately. Although the coverage of GHGs is comprehensive, based on the communication alone, the projections analysis was not completely transparent; it was possible, however, to gain a qualitative understanding of the different models used. During the in-depth review, the Government made every effort possible to provide supplementary information, enabling the team to gain a better insight into the projection methodologies and the key parameters used in the analysis.

60. As a result of the electricity trade correction the 1990 inventory figures for all gases have been corrected. It is to these figures that targets apply and to which projected figures are compared. Until now model projections in Denmark have concentrated on the gas contributing most significantly to global warming (CO_2) but, because of uncertainties of emissions of other gases from other sectors (e.g. CH_4 from landfills and animals, N_2O from traffic and soil), which contributed about 17 per cent to the total GWP in 1990 (using IPCC 1995 GWP values), the net effect of projected emissions is slightly uncertain for the 2000 and post-2000 period. The Danish Government is fully aware of these issues and is focusing its efforts on developing better models, particularly in transport where the greatest changes are expected.

61. As indicated below, major uncertainties about future emissions arise from the ongoing process of European integration. An increase in road transport, the liberalizing of trade in electricity, developments in waste and energy policy, the introduction of carbon taxes and efficiency standards on appliances may all have important impacts.

A. Carbon dioxide

62. The national communication indicates that CO_2 emissions in 2000 will be approximately 8 per cent lower than the electricity-trade corrected 1990 levels and 11 per cent lower in 2005. Updated information, which includes the effects of the new CO_2 and SO_2 taxes on industry introduced in the spring of 1995, indicates that CO_2 emissions in 2000 are expected to be 10 per cent lower than electricity-trade corrected 1990 levels, and 15 per cent lower in 2005. If the projection for the trade-corrected emissions were to be realized, actual emissions in 2000 and 2005 would be lower or higher according to whether the fluctuating trade would result in import or export of electricity in those years. If electricity trade continues to follow the pattern observed from 1975 to 1993, the most likely level will be about 2.5 megatonnes below the trade-corrected level. Actual emissions in 2000 and 2005

would then be respectively about 4 per cent and 10 per cent below actual 1990 emissions, ± 5 per cent.

63. For the energy sector, several projections are presented in Denmark's national communication, each reflecting different "with measures" policy options. The first of these projections was based on the policies and measures already implemented in 1990, in the action plan Energy 2000. Later, in 1993, when it was felt that more stringent policies were needed to meet national CO_2 reduction targets, a follow-up to Energy 2000 was introduced, and a second series of projections was then computed according to this action plan. When the national communication was prepared in 1994, however, the later transport action plan, TR 2005, prepared in 1993, as well as revised estimates for oil and gas extraction were incorporated, with the effect of revising the estimates for the emissions in the transport sector from stabilization to a 15 per cent increase by 2005, and the overall gap with regard to the energy including transport target of 20 per cent reduction from 2 per cent to 5 per cent.

64. In a more recent paper (May 1995), Denmark presents additional measures approved in spring 1995, and the corresponding projections suggest that the national target of reduction of CO_2 emissions from energy including transport by 20 per cent in 2005 compared to their 1988 levels is achievable. In April 1996, in the most recent plan, Energy 21, projections were revised again, to incorporate the effect of increased economic growth estimates, and the realization that an important measure - standards on appliances - although already decided in national legislation - would not be implemented as efficiently and as fast as originally expected, due to the slow pace and lower ambition level in the EU standardization work. Another measure - the conversion of electrically heated buildings to gas and district heating - is also being implemented at a slower pace than expected. As a result, new measures were introduced in Energy 21, some of which require parliamentary approval, which have the effect of closing the revised gap of 8-9 per cent in relation to the 20 per cent target by 2005. Some of the new measures, especially in the transport sector, will still be dependent on progress at the EU level. High levels of energy savings have already been obtained in the heating of dwellings and with technological improvements in the production sector as a result of the carrot-and-stick measures implemented in 1995 (involving CO_2 taxes, energy audits and investment subsidies), further gains in energy efficiency are expected in the near future. By 2005, savings in the private and public sectors, along with cogeneration and district heating, are expected to account for about 60 per cent of CO_2 reductions, with renewable (biomass and wind) energy playing an increasingly important role. Synergies between policies and measures have been considered, and information was provided on costs of policies.

65. Denmark has developed a good understanding of CO_2 emissions from the energy sector. Models are based on historical factors and projections are used as a policy tool rather than to predict absolute emissions. For CO_2 projections based on electricity end-use, three models are used for the industrial, service and household sectors. Emissions from individual model runs are aggregated. Given the high level of sectoral detail and frequent data surveys for the (bottom-up) household model, Denmark has a high level of confidence in these

sectoral projections. The uncertainty of about 5-10 per cent is due mainly to changes in production rather than in economic growth for a relatively mature economy such as Denmark's.

66. The team was informed that, in general, policies and measures in this sector are being implemented as planned, with two exceptions: firstly, the introduction of energy efficiency standards for appliances, which is linked to the pace of progress in the EU on this issue, and secondly, the conversion of electrically heated buildings to central heating by gas or district heating. Together these measures account for 3 per cent of the anticipated CO_2 emission reductions by 2005.

67. For the industry sector model, the key parameters are economic growth, fuel consumption and prices. In the household model, electrical appliances (and thus energy consumption and frequency of use), type of dwellings, economic forecasts and population are the key parameters. Although the three models in the energy sector yield satisfactory results, Denmark has also developed a single model using a mixture of top-down and bottom-up methodologies to simplify projections. This work was completed in 1995, and was used for the elaboration of the latest plan, Energy 21, published in April 1996.

68. The main factors affecting the uncertainties of post-2000 projections in the energy sector arise from the move of the EU towards a stronger free-market economy, in particular the impact of free competition in the electricity market on certain aspects of Denmark's energy policy such as combined heat and power production.

69. In the national communication, the same projection is used for the "without measures" and "with measures" scenarios for the transport sector, reflecting the fact that most measures proposed for that sector have not yet been implemented. The missing reduction in 2005 compared to the target of 20 per cent reduction for energy including transport is mainly due to the projected inability of the transport sector, with the measures implemented presently, to meet its target of stabilizing at 1988 levels in 2005. Projected CO_2 emissions in this sector in 2000 are 5 per cent higher than 1990 levels, and 11 per cent higher in 2005. In the Government's White Paper on transport and in the Traffic Plan (1993), passenger transport is expected to increase by 25 per cent and goods transport by 40 per cent by 2005. As a number of policy instruments are already in place to discourage the use of road vehicles in the private sector, the Government considers that additional reductions of CO_2 emissions may be difficult to achieve. The bridge links between Sweden and Denmark, which were not taken into account in the projection, offer the possibility of combined transport, but at the same time run the risk of increasing CO_2 emissions through higher volumes of traffic, including transit traffic between Sweden and Germany. This project could double the flow of road traffic between Sweden and Denmark by the next century, although the ratio of rail to road transport is expected to increase in favour of rail transportation, which is cleaner.

70. Denmark feels that the COPERT (European) transport model provides reasonable projected emission estimates for a range of GHGs and is at a sufficient level of sophistication from a technological viewpoint. For instance, COPERT takes into account an increase in the

number of catalytic converters in Denmark, and a corresponding decrease and increase of NMVOC and N_2O emissions, respectively.

71. For the projections presented in the national communication, a linear model was used, some of the key parameters being economic growth rates, interest rates, fuel consumption, size and type of fleet of road and domestic air and ship transport. Projections for three scenarios of low, medium and high (1.5, 2.25 and 3.5 per cent) GDP growth are modelled but the Government considers the uncertainties of these projections to be high. The middle growth scenario was reported in the national communication, which assumed GDP and factor price growth of 2.25 per cent and 2.75 per cent respectively. An energy efficiency improvement of 15 per cent between 1988 and 2010 was assumed. The weaknesses of the transport model are recognized by Denmark, which is developing new modelling capacities taking into account other factors such as cold starts. No new projection has been carried out since the 1993 study, but Denmark hopes to carry out yearly projections in the transport sector. Additional policies and measures are under discussion, but have not yet been agreed upon.

72. Transport is the second most important sector from the point of view of emissions. However, it does not seem as though there are policies in place to modify the already mentioned increasing tendency by the year 2000 and 2005 (respectively about 5 and 10 per cent increase in this sector), suggesting that considerable additional gains would have to be achieved in the energy sector if the joint target is to be met.

73. Carbon sequestration from afforestation will also have an impact upon CO_2 projections, but removals are currently estimated to be stable up to 2005. The necessity of improving forestry statistics in order to be able to handle projections of carbon sequestration is recognized.

B. Methane

74. CH_4 emissions are projected to decrease by 13 per cent in 2000 compared to 1990 levels. Projected emissions from landfills are modelled in a simple manner, and are estimated as the potential emissions in the next 40 years from the total amount of waste entering landfills in 1990. CH_4 emissions from waste are projected to decrease by approximately half in 2000 compared to 1990 levels, while emissions from enteric fermentation are expected to be stable up to the year 2005. CH_4 measurements made by the Danish Agricultural Laboratory, however, are about twice as high as anticipated, suggesting that projected emissions might be too low. This could be offset by a possible decrease in the number of cattle in the future.

C. Nitrous oxide

75. N_2O emissions are projected to increase by about 10 per cent in 2000 compared to 1990 levels. Like CH_4, N_2O emissions from agricultural soils are projected to be stable over

time but the uncertainties of emission rates are considered high. N_2O emissions from the transport sector are projected to increase slightly by 2000, but actual emissions could be higher with the expected growth in the transport sector.

V. PROJECTED PROGRESS IN GREENHOUSE GAS MITIGATION

76. Additional policies and measures to mitigate GHGs have been described in chapters III and IV, and include, *inter alia*, additional measures in the transport sector. The new taxes mentioned in the national communication have now been implemented, and result in an estimated additional 2.7 per cent reduction in CO_2 emissions in 2005. In the most recent plan, Energy 21, additional measures have been introduced, some of which require parliamentary approval, including new measures in the transport sector, which the Government intends to implement in order to achieve the 2005 target. Some of these measures are dependent on progress at the EU level.

VI. EXPECTED IMPACTS OF CLIMATE CHANGE

77. The national communication followed recommendations for reporting on expected impacts of climate change contained in the Intergovernmental Negotiating Committee guidelines. An entire chapter is devoted to a discussion of this issue, which is itself based on an extensive study of impacts in Denmark. While Denmark has a long coastline and harbours and low-lying areas are regarded as vulnerable, it was felt that the impacts of sealevel rise could be controlled by management.

VII. ADAPTATION MEASURES

78. There is no specific discussion of adaptation measures under way in the Danish national communication. *Possible* adaptation measures, such as the construction in the future of higher dykes, are mentioned in the context of expected impacts of climate change. Denmark feels that the immediate consequences of climate change can be managed through planned adjustment supported by technological development, with the possible exception of certain ecosystems where there may be impacts on plant and animal species.

VIII. FINANCIAL ASSISTANCE AND TECHNOLOGY TRANSFER

79. The information in the communication on financial assistance and technology transfer was not sufficiently detailed to satisfy the recommendations in the guidelines. Some of the missing information was provided during the in-depth review.

80. Denmark participates actively in international cooperation. Its ODA increased from DKr 7,900 to 9,000 million over the period 1991 to 1994, equivalent to an increase from

0.97 to 1.01 as a percentage of its GDP. Nearly half of its assistance is provided through multilateral channels. A new strategy is being implemented, putting more emphasis on specific sectors and policies, including energy use and climate change. Projects could include cooperation for adaptation to climate change. Denmark contributed US$ 22.8 million to the core fund of the pilot phase of the Global Environment Facility and US$ 35.1 million to its replenishment. It intends to enter into cofinancing agreements with the implementing agencies.

81. Denmark encourages partner countries to propose projects for funding, and finds, in that context, that existing capacities in developing countries are sometimes a limiting factor to the generation of climate-related projects.

82. The new international environment and development fund (DANCED) mentioned in the national communication has so far not focused on climate issues. Considerable support is provided to the UNEP on various climate change activities, including the development of guidelines for vulnerability assessment. The Danish Government also supports climate change activities such as country studies through the UNEP Collaborating Centre on Energy and Environment at the Risø National Laboratory. Denmark has also been one of the main contributors to UNFCCC funds. The Danish contribution to the IPCC amounted to US$ 283,000 in 1995.

83. Training is provided in the areas of research and observations, *inter alia*, through training at the Meteorological Institute and through the Global Change System for Analysis, Research and Training (START) of UNESCO.

84. Denmark is also engaged in cooperation on a range of environmental issues with countries with economies in transition, through a specialized office of the Ministry of Environment and Energy.

85. Denmark would need an agreed definition of transfer of technology before including information on that matter in its communication. During the country visit, however, the team found evidence of flows of technology to developed and developing countries alike, including the export of Danish windmills.

IX. RESEARCH AND SYSTEMATIC OBSERVATION

86. The team was satisfied that the recommendations of the guidelines for reporting on research and systematic observation were met. There is a long tradition of research in Denmark, especially in meteorology, with current efforts being well integrated into international activities. Denmark's participation in the Greenland Ice Core Project is also noteworthy. Denmark is actively involved in the work of the IPCC.

X. EDUCATION, TRAINING AND PUBLIC AWARENESS

87. Although there is no specific section or chapter in the national communication devoted to education, training and public awareness, a number of examples of this are mentioned in the sections on policies and measures. Additional information was provided during the country visit. To increase public awareness, in 1992, a report was produced by the Ministry of Environment and Energy on the greenhouse effect and the impacts of climate change in Denmark. For several years now, climate change issues have held particular interest for journalists of the leading newspapers in Denmark. Government officials have delivered lectures on climate change at various Danish universities. The television medium is used to convey information on energy savings in households.

88. The national communication does not report on public involvement in the formulation of the national sectoral action plans and in the process of drafting the national communication, but the team confirmed that the non-governmental community has been well informed of and is closely involved in the climate change negotiations process. Further, the team were informed that a continuing intensive debate on energy policy issues, strategies and measures takes place in the Danish newspapers and electronic media. The team was informed that the acceptance of the need for GHG mitigation is almost universal , although the extent, means and ways are intensively discussed. Danish government officials felt that public awareness in Denmark is exceptionally high, which was ascribed by them to the side-effects of the many mitigation measures and taxes that have been introduced in Denmark, as well as the active work of non-governmental organizations.

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