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Reporting and review of information submitted by Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol
Compilation and synthesis of supplementary information incorporated in fourth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol

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Note by the secretariat

Summary

This document contains a compilation and synthesis of supplementary information incorporated in the fourth national communications submitted to the secretariat by Parties included in Annex I to the Convention in accordance with Article 7, paragraph 2, of the Kyoto Protocol. It provides information on a range of issues relating to the implementation of the Kyoto Protocol, such as national systems and registries under the Kyoto Protocol; policies and measures in accordance with Article 2 of the Kyoto Protocol; greenhouse gas inventories; projections and evaluation of the aggregated effect of policies and measures; domestic and regional legislative arrangements and enforcement and administrative procedures to meet commitments under the Kyoto Protocol; and information under Articles 10 and 11 of the Kyoto Protocol.

CONTENTS

I. Mandate and approach

1. Article 7, paragraph 2, of the Kyoto Protocol requires each Party included in Annex I to the Convention that is also a Party to the Kyoto Protocol (hereinafter referred to as an Annex I Party)[1] to incorporate in its national communication, submitted under Article 12 of the Convention, the supplementary information necessary to demonstrate compliance with its commitments under the Protocol, in accordance with the relevant reporting guidelines.

2. The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP), by its decision 15/CMP.1, adopted the "Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol" (hereinafter referred to as the reporting guidelines). These guidelines request each Annex I Party to include the necessary supplementary information, to demonstrate compliance with its commitments under the Protocol in its national communication submitted under Article 12 of the Convention, with the time frames for the obligations established by the Kyoto Protocol and with the relevant decisions of the Conference of the Parties (COP) and the CMP.

3. The COP, by its decision 4/CP.8, requested Annex I Parties to submit to the secretariat, in accordance with Article 12, paragraphs 1 and 2, a fourth national communication (NC4) under the Convention by 1 January 2006.

4. The CMP, by its decision 22/CMP.1, provided the secretariat with a mandate to prepare a report on the compilation and synthesis of national communications for all Annex I Parties in accordance with decisions of the CMP. More specifically, the CMP requested the secretariat by its decision 26/CMP.1 to prepare the compilation and synthesis of supplementary information incorporated in the NC4 submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol by Annex I Parties for its consideration at its third session.

5. This document contains information compiled and synthesized from the NC4 of the 36 Annex I Parties that submitted their NC4 by 31 June 2007.[2] Since the reporting guidelines were adopted by the CMP in December 2005 and the NC4 were due by 1 January 2006, most of the NC4 do not contain a separate section on the required supplementary information. Several Parties, including the Netherlands, New Zealand and the United Kingdom of Great Britain and Northern Ireland, provided references to the information in their NC4 and reports demonstrating progress under the Kyoto Protocol (RDPs). The RDPs were also to be submitted by Annex I Parties on 1 January 2006, in accordance with decisions 22/CP.7 and 25/CP.8. Similar references were provided in the individual review reports for the 16 Parties whose NC4 had been subject to individual in-depth review.[3]

6. The secretariat has structured this report in line with the main elements stipulated by the reporting guidelines, taking into account the approaches taken by Parties (see para. 5 above). In most cases, the report summarizes information reported by Annex I Parties in their NC4; this information is also compiled and synthesized in documents FCCC/SBI/2007/INF.6 and Add. 1 and 2, which draw on all Annex I Parties to the Convention. In addition, this document contains a table with references to the information reported following the requirements under the Kyoto Protocol and relevant sections of the NC4 and the RDPs.

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[1] All references to Parties in this document are to Annex I Parties that are also Parties to the Kyoto Protocol, unless otherwise indicated.

[2] For completeness reasons, some chapters of this report also contain information on Italy and Luxembourg, although they did not submit their NC4 by 31 June 2007. This information was taken from the report demonstrating progress under the Kyoto Protocol of Italy and from the 2006 annual inventory submissions of these two Parties.

[3] See <http://unfccc.int/national_reports/annex_i_natcom/idr_reports/items/2711.php>.

II. National systems and registries under the Kyoto Protocol

A. National systems

7. National systems (NS) under Article 5, paragraph 1, of the Kyoto Protocol are of critical importance for the implementation of the Kyoto Protocol since they enable Parties to prepare robust assessments of emissions by sources and removals by sinks, and to produce greenhouse gas (GHG) inventories of high quality. All Annex I Parties have elaborated on their NS or its elements in their RDPs. Some Parties dedicated a separate section on their NS, while others provided information on their NS in the section on GHG inventories. In addition, three Parties provided an overview of their NS in the NC4 (Denmark, Finland and Japan) (see also table 4 in chapter VIII below).

8. For most Parties setting up a NS is seen as a prerequisite for the planning, preparation and management of inventories, and includes design and operation of quality assurance and quality control (QA/QC) systems, workplans and establishing groups for inventory preparation (Lithuania, Norway, Romania, Slovakia, Sweden and Switzerland). Considerable efforts have been made and financial resources have been allocated for building NS (Slovakia).

9. Most Parties made noticeable progress in **institutionalizing their NS**. Relevant legislation was introduced (Austria, Portugal, Russian Federation and Ukraine) and roles and responsibilities for institutions involved in this system were formalized and consolidated (Canada, Ireland, France and Slovenia). Two Parties have compiled their national GHG inventories in accordance with national laws (Greece and Romania) and many Parties indicated that their NS should also comply with international mechanisms for inventory preparation and reporting (EC decision 280/2004/EC).

10. A number of Parties advanced their efforts in **establishing QA/QC procedures for their emissions inventories**. Some Parties reported improvements in QA/QC activities, such as the certification of the institution responsible for inventories as an inspection body in accordance with the International Organization for Standardization standard 14020 (Austria). Germany has made plans for the integration of other national authorities and non-governmental organizations within its NS. Japan set up a committee for studying the possible improvements to the emissions inventory.

11. **A single national entity (SNE) has been designated** by most Parties. This entity is usually entrusted with the production, quality and timeliness of emissions estimates and reporting (overall management). It is also entrusted with the strategic development of the inventory, including formal consideration and approval of data, and providing financial and personnel capacity for its activities. The SNEs comprise institutions and experts with substantial experience in the preparation, coordination and review of inventories (Czech Republic, Denmark, Netherlands and United Kingdom).

12. **Monitoring of the performance of the NS** is reported by many Parties. The Czech Republic has implemented its NS with the aim of having a functional system that can operate without substantial changes for a long period of time. Other Parties set up advisory boards or steering committees that decide on the changes in the NS and supervise and monitor activities related to development and reporting of inventories (Finland and United Kingdom).

13. A number of Parties have created **permanent working groups of inventory experts** or delegated the responsibility of national or sectoral GHG inventories to national organizations or regional inventory agencies expected to become the core of the SNE under the NS (Belgium, Czech Republic, Lithuania and Romania). The mandate of these groups centres on the elaboration of the national GHG inventories in collaboration with organizations responsible for collecting and managing data and/or the discussion of methodologies, experiences, information and improvements related to inventories. These groups usually work under guidance of the government, inter-institutional committees or ministries, which consider and approve the inventory submissions (in particular the National Inventory Report (NIR)).

B. National registries

14. In addition to the NS, national registries are another system of critical importance for the implementation of the Kyoto Protocol. They allow Parties to track their holdings and transactions of Kyoto Protocol units and hence help in assessing compliance with Kyoto targets. Parties documented their progress made in establishing their registries in various reports. Several Parties (Austria, Belgium, Japan and the Netherlands) elaborated on the registry in their NC4. A number of Parties provided a separate section in their RDP on the registry (Italy, New Zealand and Ukraine), others integrated the information under the description of the GHG inventory (Liechtenstein) (see also table 4 in chapter VIII below).

15. Many Parties reported on the steps taken to **institutionalizing the registry**. Steps include establishing management structure for registries (New Zealand), establishing a legal basis to operationalize their registries (Bulgaria) and allocating funds and purchasing hardware (Ukraine).

16. Most member States of the European Community (EC) reported on their initial experiences with the registries to support the European Union emission trading scheme (EU ETS), which became operational in 2005. This enabled administrators of these registries to gain experience in registry operation and management that is relevant to the operation of the national registries under the Kyoto Protocol. The United Kingdom led the development of a technical software tool (GRETA) to help create a national emissions registry and since the beginning of 2006 this tool has been licensed in 16 countries in addition to the United Kingdom.

III. Policies and measures in accordance with Article 2 of the Kyoto Protocol

17. This chapter outlines the climate change policies and measures reported by the 36 Annex I Parties in their NC4 and RDPs. The policies and measures cover a wide range of planned, adopted and implemented activities, across all levels of government – regional, national, state/provincial and municipal. Since the Annex I Parties that are also Parties to the Kyoto Protocol implement broadly the same set of policies and measures under both the Convention and the Kyoto Protocol, this chapter essentially provides a summary of the relevant chapter of the compilation and synthesis of NC4 with a particular focus on Parties to the Kyoto Protocol. (FCCC/SBI/2007/INF.6/Add.1, see chapter IV).

A. Overview

1. Introduction

18. Annex I Parties reported a great variety of policies and measures, reflecting the absence of a known ‘silver bullet’ policy instrument or technical measure for mitigating GHG emissions and the need to initiate many different actions in many sectors.

19. Quantitative estimates of the effects of individual policies and measures in reducing emissions are not reported in all NC4. Even when reported, the estimates are not necessarily consistent among Parties in terms of categorization systems, baseline assumptions (‘without measures’ or ‘with measures’) and modelling procedures. There are also methodological difficulties relating to policy synergies and interactions. As a consequence, this chapter provides a mostly qualitative overview of the key individual policies, based on how frequently they are used by Parties (frequency of use) is their effectiveness, as estimated through the resulting emission reductions.

2. General trends

20. Parties have continued to develop and implement climate change strategies and action plans that contain broad portfolios of diverse policies and policy approaches. They span a wide range of government activities, economic sectors, actors and institutions within and outside governments. Despite

the diversity and complexity of the climate change strategies, with regard to policies and measures, five general trends are apparent:

(a) Parties are **increasingly relying on more stringent approaches (e.g. economic and regulatory instruments) rather than softer approaches (e.g. voluntary agreements) to elicit emission reductions**. Quotas and tradable certificates systems (i.e. regulations with an element of economic flexibility) are among the newest and fastest growing measures, aiming at attaching a price to GHG emissions. Emissions trading is the biggest and most visible form of tradable certificate systems, but green certificates (renewable energy sources), white certificates (energy efficiency) and landfill allowance trading schemes are growing as well. Recently, Canada has taken action to regulate the industrial emitters directly. Regulation is also widely used in the high perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) emitting sectors as well as in the buildings sector;

(b) **A growing number of policies and measures are climate-led policies, for example emission trading systems and carbon taxes**. An increasing number of Parties are enacting specific climate laws (or GHG mitigation laws) that often encompass a national emission reduction target and the related measures based on regulatory instruments, as well as administrative procedures, for example for monitoring and evaluation. There are also many measures that aim to add and integrate climate change elements into existing policy and institutional frameworks, where climate change mitigation may not necessarily be the primary goal. An increasing portion of emission reductions can be expected from climate-led policies, but major reductions can also be expected from measures that are not climate-led (e.g. reforms in energy and agricultural markets);

(c) **Parties are continuing to build policymaking capacity to deal with climate change**. The greater numbers and greater stringency of measures require increased policymaking efforts (e.g. planning, consultation, analysis, coordination, rule-making, administration and investment). The greater use of multilevel governance further expands the policymaking requirements;

(d) Parties are making **extensive use of relatively low-cost (i.e. more cost-effective) options, including those that address non-carbon dioxide (CO_2) emissions** (i.e. methane (CH_4), nitrous oxide (N_2O) and fluorinated gases (F-gases)). The majority of emission reduction effects are expected to result from policies and measures that address non-CO_2 gases. Other low-cost options include a fuel shift from coal to natural gas for the production of heat and electricity, in combination with the modernization of stationary power plants;

(e) There is **greater use of international bilateral and multilateral cooperation to further climate-friendly technology development and deployment**, such as the International Partnership for the Hydrogen Economy, the Carbon Sequestration Leadership Forum, the Renewable Energy and Energy Efficiency Partnership and the Methane to Markets Partnership.

3. Sector context

21. The policies and measures are implemented by Annex I Parties in all emissions sectors, but mitigation effects have been achieved, and are projected to be realized, unequally across sectors. Between 1990[4] and 2004, emissions declined in all sectors except transport (which recorded an increase of 240 $TgCO_2$ eq). The greatest absolute decreases were both reported in the land use, land-use change

[4] In this document, references to base year (and 1990 sums and totals) always refer to the Kyoto Protocol base year.

and forestry (LULUCF) sector and agriculture sectors (340 $TgCO_2$ eq), followed by industrial energy use (250 $TgCO_2$ eq), energy supply (220 $TgCO_2$ eq) and industrial processes (210 $TgCO_2$ eq).[5]

22. Absolute emissions have declined most in Annex I Parties with economies in transition (EIT). Their total emissions excluding LULUCF declined 37 per cent from 1990 to 2004, and are projected to be 27.5 per cent below the base year level in the period 2008–2012 under the 'with measures' scenario (see chapters IV and V below). Most of their emission reductions appear to have come, not from explicit climate change policies and measures, but from the economic policies and market forces that shaped the economic restructuring in the early to mid-1990s.

23. The non-EIT Annex I Parties have implemented many more policies and measures than the EIT Parties, but these were not sufficient to offset the growth in emissions in most sectors – their total emissions excluding LULUCF increased 3.7 per cent from 1990 to 2004, and are projected to be 3.8 per cent above the base year level in the period 2008–2012 under the 'with measures' scenario and 1.2 per cent below the base year level under the 'with additional measures' scenario (see chapters IV and V below). There were emission increases in the transport and electricity production sectors, and emission decreases in all other sectors, most notably in industrial processes, waste, energy use in industry, fugitive emissions and agriculture.

4. Cross-cutting issues relating to policies and measures and choice of policy instruments

24. A wide variety of policies and measures is used to influence the purchases, investments and behaviour of individuals and organizations in order to mitigate GHG emissions. The policies also vary by the sectors they target: tradable emissions allowances and voluntary sectoral commitments are used widely in energy-intensive industrial sectors; information (labels on appliances), regulations (standards) and carbon taxes are used extensively for appliances, devices and equipment in the residential, commercial and public sectors; economic incentives (e.g. beneficial feed-in tariffs) are often used to promote the use of renewables in electricity generation; and economic incentives (e.g. subsidies) are frequently used to encourage measures in the agriculture and land-use change and forestry sectors.

25. The major types of policies and measures applicable in the first commitment period under the Kyoto Protocol are:

(a) **Emissions pricing mechanisms**, such as carbon taxes and tradable emissions allowances, which seek to send pervasive signals and consistent incentives throughout the economy to elicit the many types of investment and behaviour modification needed to reduce GHG emissions;

(b) **Barrier reduction policies**, which aim to overcome the information, financial and market barriers to the development and implementation of climate-friendly technologies to levels consistent (from rational individual, corporate and social viewpoints) with the prevailing energy prices. These policies include: (i) energy market reform; (ii) framework targets on technologies, fuels and efficiency levels; (iii) information dissemination and awareness-raising in the form of ratings, labels, auditing, advice, and so on; (iv) models and demonstrations; (v) voluntary enterprise challenges and partnerships; (vi) voluntary sectoral commitments; (vii) regulations in the form of rules, standards, permitting, and so on; (viii) market instruments in the form of quota and certificate programmes; (ix) fiscal and economic incentives in the form of taxes, usage fees, subsidies, and so on; (x) government operations; (xi) public infrastructure and resource management; and (xii) systems approaches.

[5] All figures exclude data from the Russian Federation because its emissions in some energy subsectors were reported with notation keys.

B. Implementation of policies and measures by sector

1. Cross-cutting instruments and policies

26. Parties reported some policies and measures that cover multiple emissions sectors. The most inherently cross-sectoral are carbon and energy taxes, tradable permits and energy market reform. None of these policies, however, is used by any Party on an economy-wide scale. Even carbon and energy taxes and tradable permits, which are conceptually universal in scope, are applied only to selected sectors.

27. **Carbon and climate-oriented energy taxes** are used by 10 Parties. These taxes have been a cornerstone of climate policies in Denmark, Finland, the Netherlands, Norway and Sweden since the early 1990s. More recently, they have been introduced in Germany, Liechtenstein, Slovenia, Switzerland and the United Kingdom. The rates of the taxes are typically EUR 7–13 per tonne of CO_2, but can be as high as EUR 42 per tonne of CO_2 in some cases.

28. As currently applied, carbon taxes influence most directly the electricity generation sector and the residential, commercial and public sectors. These are sectors where compliance costs are either relatively low or can be passed on to consumers, and thus the taxes do not greatly influence the sectors' international competitiveness. For the industrial sector, especially energy-intensive subsectors exposed to trade, the influence of carbon and energy taxes is more indirect. Unconditional exemptions, exemptions tied to emission reduction performance or opportunities to obtain subsidies for emission reduction projects are often accorded to the industrial sector. In some Parties, the threat of being assessed for taxes leads industrial firms to participate in voluntary sectoral commitments in order to reduce their emissions (United Kingdom Climate Change Agreements); in other Parties, the taxes are recycled back to industry as subsidies for emission reduction measures (Denmark).

29. Carbon taxes tend to be weaker in the transport sector because they are not applied at their full rate owing to relatively high pre-existing fuel taxes, and their influence is muted by inelastic demand caused by consumers' heavy dependence on private cars. As yet, carbon taxes are not applied to non-energy sources of GHG emissions. Carbon taxes account for significant portions of the expected emission reductions of Parties where they are used (Denmark, CO_2 tax, 1.5 $TgCO_2$, 6.5%; Norway, offshore and onshore CO_2 tax, 4.3 $TgCO_2$, 34.7–46.3%; United Kingdom, Climate Change Levy, 13.6 $TgCO_2$, 12.7%; United Kingdom, motor fuel tax escalator, 7.0 $TgCO_2$, 6.5%; Denmark, higher fuel taxes for transport, 1.2 $TgCO_2$, 5.2%; France, special tax rates for biofuels, 9.4 $TgCO_2$, 8.6%; Germany, ecological tax reform, 12.0 $TgCO_2$, 5.7%; Sweden, motor fuel taxes, 1.6–3.4 $TgCO_2$, 10.0–19.1%).[6]

30. **Tradable emissions allowances**, used primarily in the EC member states, are currently the premier instrument for reducing CO_2 emissions from energy production and use. The EU ETS is the centrepiece of the strategy of the EC to meet its emissions commitment under the Kyoto Protocol. In its first trading period, 2005–2007, the EU ETS covers the CO_2 emissions of about 11,000 installations, which account for about 47 per cent of total CO_2 emissions from the EC. The second phase and subsequent five-year trading periods may include additional sectors and non-CO_2 GHGs. The EC has proposed including aviation in EU ETS as from 2011. Norway has established an emissions trading system, which has for the most part the same features as the EU scheme. Emissions trading systems are also under consideration in Canada, Japan, New Zealand and Switzerland. (Finland, EU ETS, 5.9 $TgCO_2$, 34.4%; France, EU ETS, 3.2 $TgCO_2$, 2.9%; Netherlands, EU ETS, 1.4 $TgCO_2$, 15.5%; Slovakia, EU ETS, 0.8 $TgCO_2$, 76.2%; United Kingdom, EU ETS, 11.0–29.3 $TgCO_2$, 10.3–23.2%.)

[6] Throughout this report, such information will be listed in brackets to indicate the name of the Party, name of the policy, estimated emission reduction of the particular policy by 2010 and its share in the Party's estimated total reduction from all existing, adopted and planned (if reported) domestic policies and measures. The shares for EC policies could be overestimates, because the effects of some policies are not quantified in the NC4, meaning that the total effects of all existing and adopted policies could be underestimated.

31. Energy **market reform** measures were reported by the EC, and are well advanced in the United Kingdom. They are expected to influence most directly the electricity generation sector (via more distributed generation and increased use of renewable energy sources) and the residential, commercial, public and industrial sectors (via energy performance contracting and third-party financing). These measures are expected to generate large emissions reductions in the Parties that adopt them. (EC, reform of electricity and gas markets, 80–120 $TgCO_2$, 7.4–11.8%.) The EC reported a high mitigation potential for its policy to promote bioenergy production and the subsequent replacement of fossil fuels in the context of the reform of the EU-wide common agricultural policy (CAP) (EC, CAP reform: bio-energy production and the replacement of fossil fuels, 200–600 TgCO2 eq, 19.1–57.2%).

2. Energy supply

32. The predominant focus of policies and measures in the energy supply sector is on **electricity and heat** generation. Policies aimed at reducing **fugitive emissions at oil, gas and coal facilities** were reported by only a few Parties.[7] Policies to increase the use of natural gas (in lieu of more carbon-intensive energy sources) were reported by the EC, Greece, Japan and Portugal (Greece, promotion of natural gas, 22.1 $TgCO_2$ eq, 56.3%).

Electricity and heat

33. Policies and measures directed at electricity and heat generation in the first commitment period under the Kyoto Protocol seek to achieve several objectives:

(a) Increased share of energy generated from less carbon-intensive energy sources (i.e. renewables, natural gas and nuclear energy);

(b) Increased generation efficiency through combined heat and power (CHP) and other means;

(c) Increased use of distributed (i.e. small-scale) generation;

(d) Implementation of non-specified (i.e. industry chosen) energy efficiency and emission reduction measures.

34. The most important policies, in terms of frequency of use and emission reduction effects, to address these objectives are: tradable emissions allowances; framework targets and fiscal incentives; and regulations.

35. **Tradable emissions allowances** are used to reduce CO_2 emissions at power plants throughout the EU. About 7,000 of the 11,000 EU ETS installations qualify because the rated thermal inputs of their energy combustion operations are greater than 20MW. These installations include power generation plants, CHP facilities and heat plants. These 7,000 installations are estimated to account for 34 per cent of EU CO_2 emissions. The trading system is designed to give companies running installations or plants flexibility in meeting their targets; therefore no preferred emissions reduction method is specified. Installation companies may undertake to improve generation efficiency, substitute lower carbon fuels, buy allowances from other entities or capture and store emissions in the longer term.

36. The EC uses **framework targets** to advance the use of renewable energy sources in the electricity and heat sectors. The Renewable Electricity Directive aims to have a 21 per cent proportion of electricity produced from renewable energy sources in the member States that formed the EU in 2004 (EU-25) by 2010. In addition, it stipulates specific indicative renewables share targets for each member State. The Directive does not specify how member States are to meet their targets. The EC is also planning a Renewable Heat Directive to increase the share of heat produced from renewable energy

[7] Policies on transport fuels, such as those aimed at increased use of biofuels, are discussed in the transport section.

sources. The principal policies that member States are using to comply with the Renewable Electricity Directive targets are **fiscal incentives** (feed-in tariffs and tax incentives and investment grants) and **market incentives** (quotas and tradable green certificates). (Germany, Renewable Energies Act, Biomass Ordinance, research, development and demonstration, and ecological tax reform, 13.5 $TgCO_2$ eq, 6.5%; France, Renewables Tariffs and Purchase Obligations, 5.5–7.0 $TgCO_2$ eq, 5.0–6.4%; United Kingdom, Renewables Obligations, 9.2 $TgCO_2$ eq, 8.6%). The Russian Federation has established targets for increasing the share of renewable energy from 0.1 per cent of the total primary energy supply in 2006 to 0.3 per cent in 2010; and also targets to reduce the fuel use per unit of electricity production by 8 per cent in 2008 from 2004 levels.

37. **Fiscal incentives** are used to promote electricity from renewable energy sources in Canada (tax incentives) and to promote nuclear power in Japan (public funding for spent nuclear fuel reprocessing).

38. **Regulations** are also used to advance specific technologies (e.g. CHP and nuclear power), increase the share of low-carbon fuel sources and set emissions intensity benchmarks. The EU Cogeneration Directive requires member States to report annual CHP statistics, to analyse and report national potentials for high-efficiency CHP and to facilitate access to the electricity grid for CHP. Finland used permitting approval to promote the construction of a nuclear power plant (Finland, nuclear plant permitting, 8.0 $TgCO_2$ eq, 46.7%). In Japan there are regulations to ensure power transmission capacity, so that long-term and stable nuclear power generation is feasible and economically attractive.

Fugitive emissions at oil, gas and coal facilities

39. Policies and measures directed at fugitive emissions at oil, gas and coal facilities seek the capture and use or flaring of CH_4 emissions at oil, gas and coal production and distribution facilities.

40. The most important policies in Annex I Parties, in terms of frequency of use and emission reduction effects, to effect these changes are regulations and voluntary sectoral commitments. **Regulations** are used to reduce (capture) the GHG precursors at offshore oil facilities in Norway. **Voluntary sectoral commitments** (environmental covenants) are used in the Netherlands to reduce CH_4 emissions from the oil and gas sector. Also, in the Russian Federation, the largest natural gas producer and supplier agreed to reduce its fugitive CH_4 emissions to save around 75 $TgCO_2$ eq. by 2012.

3. Energy consumption

41. The focus of policies and measured aimed at energy consumption is on the **industry** and the **residential commercial and public** sectors. Policies aimed at **transport** were reported to a lesser extent. Most of the policies focus on improving energy efficiency (as opposed to fuel switching or demand management), and are generally sector-specific or even more narrowly targeted. There are, however, several broader policies being pursued, such as **systems-oriented policies** (e.g. urban design) in Japan and **energy market reforms** in the EU, which could lead to a greater role for commercial energy service providers.

Residential, commercial and public

42. Policies and measures directed at energy use in the residential, commercial and public sectors seek:

(a) Increased energy efficiency of new and existing residential and commercial buildings (via designing, building, renovating and purchasing);

(b) Increased energy efficiency of household appliances, home entertainment devices and office equipment (via manufacturing, retailing and purchasing);

(c) Increased energy efficiency of all types of energy use through carbon taxes;

(d) Use of less carbon-intensive space and water heating in buildings.

43. The most important policies, in terms of frequency of use and emission reduction effects, to effect these changes are: framework targets; regulations; information dissemination; and government operations, carbon taxes and fiscal incentives.

44. The EU Energy End-use Efficiency and Energy Services Directive, a **framework target**, calls on States to adopt general national targets of annual 1 per cent cumulative energy savings, and to ensure that the public sector in each member State sets a good example with indicative national targets of annual 1.5 per cent cumulative savings. Some member States are using emerging instruments, such as **market instruments** (white certificates in quota and certificate programmes) to comply with the Directive (France, white certificates, 2.4 $TgCO_2$, 2.2%; United Kingdom, Energy Efficiency Commitment, 5.9 $TgCO_2$, 5.5%).

45. **Regulations** (mandatory standards) are widely used for buildings, appliances, devices and equipment. The EU Energy Performance of Buildings Directive requires member States to adopt energy performance standards for new buildings and large existing buildings that are subject to major renovation (EC, Energy Performance of Buildings Directive, 20 $TgCO_2$, 1.8–2.1%; Germany, heating and insulation regulations, 5.2 $TgCO_2$, 2.5%; United Kingdom, building regulations, 7.7 $TgCO_2$, 7.2%; Netherlands, Energy Performance of New and Existing Buildings, 2.1 $TgCO_2$, 8.0%). Voluntary standards are also used in Canada.

46. For equipment (household appliances, home entertainment devices and office equipment), regulations (mandatory standards) are used by all Annex I Parties, although by some Parties (Canada, Japan and New Zealand) more than others (EC) (EC, Directive on Boilers, 22 $TgCO_2$, 2.0–2.3%). Japan's Top Runner standards programme, covering 18 types of equipment including automobiles, is unique, in that it institutionalizes continuous improvement through automatic, periodic recalibration of equipment. Top Runner sets standards for products in the future based on the most energy-efficient model on the current market, and when an agreed date is reached, the process repeats itself.

47. **Information** dissemination programmes (labels, ratings and certifications) are used widely for appliances, devices and equipment, and increasingly for buildings as well. Auditing and advice programmes are also widespread, and in the United Kingdom they are tied to **fiscal incentives** (based on expected allowances generated) (EC, Labelling and Minimum Energy Efficiency Requirements for Household Appliances, 54 $TgCO_2$, 4.8–5.5%).

48. There are also regulations mandating certain market conditions and setting energy service company obligations. The EU Energy End-use Efficiency and Energy Services Directive (EC, 40–55 $TgCO_2$, 4.1–4.9%) contains, in addition to the framework targets mentioned in paragraph 44 above, **regulatory** provisions (in line with EU **energy market reform** measures) that call for removing barriers and providing credible information for companies to offer energy services and energy-efficiency programmes, and ensuring that retail suppliers or distributors of electricity, natural gas, fuel oil and district heating offer and actively promote energy services and/or energy audits.

49. Government owned and managed public buildings (e.g. offices, police stations, military facilities, libraries and post offices) often make up a significant portion of the building stock. Where governments manage their own buildings and equipment there are direct opportunities to improve energy efficiency and reduce carbon emissions. Canada reported programmes to make such improvements. Other measures include: **fiscal incentives** (subsidies) for energy efficiency improvements for low income households in the United Kingdom; fiscal incentives (tax incentives) for solar water heating in Portugal; fiscal incentives (low interest financing) for energy-efficient buildings in Germany (Germany, low interest financing, 8.4 $TgCO_2$, 4.0%; United Kingdom, Carbon Trust, 4.0 $TgCO_2$, 3.8%).

Transport

50. Policies and measures directed at energy use in transport in the first commitment period under the Kyoto Protocol can be broadly divided into:

(a) Technical measures aimed at improving the energy efficiency of the vehicle fleet and the carbon intensity of the fuel mix, for example through increasing the production and use of lower-carbon transport fuels such as gasoline and diesel fuel blended with bioethanol and biodiesel;

(b) Non-technical policies and measures addressing transport activity and structure through transport demand management, push-and-pull incentives for modal shifts towards less polluting forms of transport, and traffic flow improvements and spatial planning.

51. The most important policies, in terms of frequency of use and emission reduction effects, to effect these changes are: regulations; voluntary sectoral commitments; fiscal and economic incentives; reporting; information; and framework targets. They are often implemented as subnational measures.

52. Automobile fuel economy standards, implemented via **regulations** or **voluntary sectoral commitments**, are the highest impact transport measure. Three distinct programmes, with different implementation rules and targets, exist among Annex I Parties:

(a) Canada – a Motor Vehicle Fuel Efficiency Initiative, which sets voluntary sectoral commitments;

(b) Europe – EU Voluntary Agreements with European, Japanese and Korean car manufacturers to increase the fuel efficiency of new passenger cars in order to achieve total new passenger car fleet average CO_2 emissions of 140 g CO_2/km by 2012. (EC, agreements with ACEA, JAMA and KAMA, 75–80 $TgCO_2$, 6.7–8.2%; France, Automotive agreements, 8.0–10.0 $TgCO_2$, 7.3–9.1%; United Kingdom, Automotive Agreements, 8.8 $TgCO_2$, 8.4%);

(c) Japan – the Top Runner standards programme for automobiles, with its built-in system for continuous improvement.

53. There are **fiscal incentives**, such as differentiated vehicle taxes and fees used in Austria, Belgium, Denmark, France, Germany, Italy, Luxembourg, the Netherlands, Portugal, Sweden and the United Kingdom, and the 'climate cent' fuel tax in Switzerland that funds mitigation projects (Germany, ecological tax reform, 5.0 $TgCO_2$, 2.4%). **Mandatory labels** are used in the EU, giving consumers information about the fuel economy and CO_2 emissions of new cars in order to encourage them to buy fuel-efficient models. In Canada, there are **government operations** programmes to increase the energy efficiency of and reduce CO_2 emissions from government vehicle fleets. Japan is promoting **systems approaches** to emissions reductions in transportation and shipping/distribution. **Tradable emissions allowances** are expected to be applied to aviation in the EU beginning in 2011.

54. **Fiscal incentives** (usage fees) in the form of road pricing or infrastructure charging are used in Austria and Germany, and are being considered in the United Kingdom. Mileage-based road tolls for heavy goods vehicles are in force in Austria and Germany. Motorists already pay a congestion charge to drive in certain parts of central London, and the United Kingdom is examining how pricing could be used to manage congestion and reduce emissions on a wider scale. The EC is working to modernize the existing charging system for all modes of transport, and reports that this measure could reduce emissions by 40–60 $TgCO_2$ per year beyond 2010. This measure would include amending the EU Eurovignette Directive to enable member States to recover the total costs of infrastructure through road charges.

55. Policies and measures directed at the supply of transport fuels primarily seek increased production of liquid fuels from renewable sources (biofuels). These policies are expected to result in substantial emission reductions.

56. The EC uses a **framework target** to advance biofuels as a transport fuel. The Biofuels Directive aims to increase the share of biofuels to 5.75 per cent of the transport fuels used in EU-25 by 2010, and stipulates indicative biofuels share targets for each member State. The Directive requires conventional transport fuels to be substituted by biofuels derived from agricultural crops, notably biodiesel and bioethanol. The member States' policies being used to comply with the Biofuels Directive are **fiscal incentives** (tax reductions or exemptions for biofuels) and **regulations** (biofuel obligations, requiring fuel suppliers to meet a minimum proportion of their sales with biofuels) (see para. 31 above for the role of market reforms in promoting biofuels) (Germany, promotion of biofuels, 3.0 $TgCO_2$, 1.4%; United Kingdom, Renewable Transport Fuel Obligation, 5.9 $TgCO_2$, 5.5%).

57. In Canada, **fiscal incentives** are used to increase the purchase and use of biofuels (consumer tax exemptions) and to increase production of biofuel (capacity construction loan guarantees).

58. A number of Parties reported on the steps taken to promote and/or implement any decisions by the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) in order to limit or reduce GHG emissions from aviation and marine bunker fuels (see chapter III. C below).

Industry

59. Policies and measures directed at energy use in industry in the first commitment period under the Kyoto Protocol seek:

(a) Increased implementation of non-specified (i.e. industry chosen) energy efficiency and emissions reduction measures in **energy-intensive industries** (e.g. iron and steel, non-ferrous metals, cement and other building materials, chemicals and petrochemicals, and pulp and paper);

(b) Increased implementation of energy-efficient equipment (e.g. motors, boilers and lighting) and methods (e.g. energy management systems) in **less energy-intensive industries**, especially small and medium-sized enterprises (SMEs).

60. Most of the reported policies and measures focus on energy-intensive industries. The most important policies, in terms of frequency of use and emission reduction effects, to effect these changes are: tradable emissions allowances; voluntary sectoral commitments; regulations; reporting; voluntary enterprise challenges and partnerships; and information dissemination.

61. **Tradable emissions allowances**, as implemented by the EU, are focused on energy-intensive industry and electricity generators. In its first trading period, 2005–2007, the EU ETS covers the CO_2 emissions of about 11,000 installations, of which about 4,000 are mineral oil refineries, coke oven plants, metal ore roasting and sintering plants or iron, steel, cement, lime, glass, brick, ceramic, pulp and paper production facilities. These 4,000 installations are estimated to account for 14 per cent of total CO_2 emissions in the EU. In the first trading period, the national allocation plans allow for an increase of 3.5 per cent in emissions from the covered facilities above 2003 emission levels, which is an estimated decline of 3.4 per cent below expected 'business as usual' emissions.

62. Initially, until tradable emissions allowance schemes began, **voluntary sectoral commitments** were the most important measure aimed at industrial sector emissions reductions and energy efficiency. Though they have been overshadowed by tradable emissions allowance schemes in some Parties (most notably the EC), voluntary commitments still have considerable influence. There is a variety of agreements and arrangements involving firms or industry associations and different levels of government.

They range from covenants with strict, binding targets and severe repercussions for not meeting them (e.g. loss of exemptions from current taxes and regulations or threat of future taxes and regulations) to agreements with mostly aspirational targets, with mild consequences for failure to attain them. In their NC4, Parties report very little on new voluntary agreements in the industry sector.

63. **Benchmarking and best practice programmes** are referred to in many Parties' plans. Benchmarking is a tool to help plant managers to establish how energy-efficient or carbon-intensive their plants are compared with others of similar configuration and age, and consequently how much energy and carbon might be saved. Best practice programmes, which can include auditing and promotion of energy management systems, offer companies, especially SMEs information and advice on the most efficient ways to run their operations. Examples include motor systems, steam systems, foundry practice and maintenance (EC, Motor Challenge Programme, up to 30 $TgCO_2$, 3.1%). Benchmarking and best practice programmes can be stand-alone **information programmes** or **voluntary enterprise challenges and partnerships** (e.g. the Canadian Industry Program for Energy Conservation, which help industry reduce its emissions via awareness-raising, emissions benchmarking, energy efficiency audits and improved energy/emissions tracking and reporting) or can be integrated into **voluntary sectoral commitments** or **regulations** (e.g. the EU Integrated Pollution Prevention and Control Directive). The auditing and energy management elements of best practice programmes can also be offered through energy performance contracting, something that **energy market reform** seeks to promote.

64. **Regulations** aimed at emission reductions and energy efficiency are used in only a few special circumstances in the industrial sector, because of the diversity of industrial processes and equipment. Canada reported its intention to regulate industrial emissions, and recently imposed mandatory targets on industry to achieve a goal of an absolute reduction of 150 $TgCO_2$ eq of GHG emissions by 2020. Japan has requirements that industrial plants over a certain size have an appointed energy manager. Canada and New Zealand have implemented energy efficiency standards for electric motors, which are augmented by **information** labels, to make buyers more aware of the energy, climate and cost consequences of their purchases. The EU Integrated Pollution Prevention and Control Directive and the EU Motor Challenge Programme contain requirements that industry use energy efficiently. In addition, the EU Integrated Pollution Prevention and Control Directive and the EU Motor Challenge Programme contain stronger requirements concerning N_2O, CH_4 and F-gases. **Information** measures (audits) especially for SMEs are used in the EU.

4. Non-energy sectors

65. The focus of reported policies and measured aimed at non-energy sectors is on the **waste** and **industrial processes** sectors. Policies aimed at **agriculture and land-use change and forestry** were reported to a lesser extent.

Industrial processes

66. Policies and measures directed at industrial processes seek:

(a) To set limitations (bans in specific applications) on the use of HFCs and PFCs used as substitutes for ozone-depleting substances;

(b) To improve the manufacturing, handling, use and end-of-life recovery of fluorine-containing gases used as substitutes for ozone-depleting substances;

(c) To reduce PFC, HFC and SF_6 emissions in semiconductor manufacture, PFC emissions in aluminium production, SF_6 emissions in electric power systems and magnesium production, and HFC and SF_6 emissions from miscellaneous sources;

(d) To reduce CO_2 emissions through improved operations in cement, lime and ammonia production;

(e) To reduce N_2O emissions through improved operations in adipic and nitric acid production.

67. The most frequently reported measures with high mitigation potential in the industrial processes sector are those directed at F-gases. Those aimed at industrial CO_2 and N_2O emissions generally receive less attention, although in France N_2O emission reductions feature as prominently as those of F-gases. The most important policies, in terms of frequency of use and emission reduction effects, to effect these changes are: regulations; voluntary enterprise challenges and partnerships; and voluntary sectoral commitments.

68. The EC uses **regulations** to pursue these objectives. The EU Directive on Fluorinated Gases (EC, 23 $TgCO_2$ eq, 2.1–2.4%) contains mandates for the containment and recovery of F-gases; requirements for the training and certification of personnel involved in maintaining equipment containing F-gases; restrictions on the marketing and use of specific F-gases in specified applications; and provisions to strengthen the monitoring of emissions through reporting requirements. The EU Mobile Air Conditioning Directive prohibits the use of certain HFCs in mobile air conditioning systems in new vehicles. The EU Integrated Pollution Prevention and Control Directive stipulates that pollution issues be integrated into the plant permitting procedures and that best available techniques be applied.

69. **Voluntary enterprise challenges and partnerships** are used in Iceland for the management of PFCs from aluminium production. **Voluntary sectoral commitments** are used in a few instances to reduce industrial process emissions. An industry-led initiative seeks to reduce PFCs emissions in aluminium production worldwide, and there are also national-level aluminium initiatives in the Netherlands and Norway. In France, the agreements of the French Association of Companies for the Reduction of Greenhouse Gases (AERES) seek reductions in industrial emissions of all GHGs, with strong emphasis on N_2O and F-gases (Netherlands, Low PFC aluminium production 1.1 $TgCO_2$ eq, 4.2%; Norway, climate change agreement with the aluminium industry, 1.4–4.1 $TgCO_2$ eq, 14.4–34.2%; France, AERES N_2O agreements and regulations, 25.7 $TgCO_2$ eq, 23.4%; France, other industrial process agreements, 12.2 $TgCO_2$ eq, 11.1%).

Waste

70. Policies and measures directed at the waste sector seek CH_4 reductions via:

(a) Waste minimization through reduced packaging and increased product and packaging reusability and recyclability;

(b) Waste reuse through implementation of waste separation and recycling;

(c) Waste minimization through processing and incineration;

(d) Landfill management with CH_4 capture or flaring.

71. The most important policies, in terms of frequency of use and emission reduction effects, to effect these changes are: framework targets; regulations; fiscal incentives; public infrastructure and resource management; and voluntary enterprise challenges and partnerships. The local nature of landfills means that many measures are implemented at the subnational level.

72. The EU uses **framework targets** and **regulations** to pursue these objectives:

(a) The Landfill Directive (41 $TgCO_2$ eq, 3.7–4.2%) regulates waste acceptance procedures and technical configurations of landfills (**regulation**) and sets **targets** for reducing the amount of biodegradable municipal waste put in landfills;

(b) The Waste Incineration Directive (3 $TgCO_2$ eq, 0.3%) sets stringent operational conditions, technical requirements and emission limits for waste incineration (**regulation**);

(c) The Packaging and Packaging Waste Directive sets **targets** for the amount of packaging waste to be recovered or incinerated at waste incineration plants;

(d) The Waste Electrical and Electronic Equipment (WEEE) Directive prescribes extended producer responsibilities (**regulation**);

(e) The End-of-Life Vehicles Directive **regulates** the acceptance of used vehicles and recovery by their producers.

73. To meet the EU Landfill Directive targets, member States are using **fiscal incentives** (landfill taxes and price supports for electricity from waste incineration), **regulations** (landfill quotas and tradable landfill allowances; waste acceptance standards; green certificates for electricity from waste incineration; and operating permits for landfills and compliance enforcement, including the closure of illegal sites) and **public infrastructure and resource management** (construction of collection facilities, incinerators and municipal waste treatment plants) (France, landfill regulations, 14.4 $TgCO_2$ eq, 13.1%; Netherlands, landfill policy, 4.0 $TgCO_2$ eq, 15.2%; Sweden, landfill regulations, 1.4 $TgCO_2$ eq, 7.9–8.8%). To meet the waste packaging targets, member States are using **fiscal incentives** (deposit-return systems) and **regulations** (producer responsibility schemes). To meet the WEEE Directive targets, member States are using **regulations** (producer responsibility for product take-back from collection facilities), **public infrastructure and resource management** (to establish public collection facilities) and **fiscal incentives** (visible fees to fund collections and management of older wastes). **Landfill regulations** are also used in New Zealand. **Voluntary enterprise challenges and partnerships** are used in Japan.

Agriculture

74. Policies and measures directed at agriculture seek:

(a) Reduction of N_2O emissions through manure management;

(b) Reduction of N_2O emissions through curtailed nitrogen fertilizer use;

(c) Reduction of CH_4 emissions through changes in livestock management.

75. Parties reported relatively few policies and measures aimed at the agriculture sector.[8] The most important policies, in terms of frequency of use and emissions reduction effects, to effect the changes are fiscal incentives (either direct or within the context of agricultural market reform) and, to a lesser extent, regulations (e.g. EU Nitrates Directive, EC, up to 10 $TgCO_2$ eq, 0.9–1.0%). In the EU, **economic incentives** (i.e. subsidy reorientation), taken within the context of the CAP is the principal instrument used to pursue these objectives. The CAP has already considerably reduced the GHG emissions from agriculture, mainly as a result of an increase in livestock productivity, a decrease in livestock population and changes in livestock types and agricultural practices. The new CAP, adopted in 1999, includes a number of measures relevant to GHG emission mitigation, including support schemes for sustainable rural development, investment in agricultural holdings and training for farmers. In 2003 and 2004, common rules were adopted for direct support schemes under the CAP, including setting up of support schemes for farmers (carbon credit for energy crops) and a support scheme for rural development through the European Agricultural Guarantee Fund and the European Agricultural Fund for Rural Development

[8] Parties classified some policies and measures as agricultural, when they should have reported elsewhere. For example, policies concerned with agricultural energy should be classified under energy consumption, energy crops should be classified under energy supply and sinks from shifts in planting should be classified under land-use change and forestry.

(EC, CAP market policies and rural development support (non-sinks), 12 $TgCO_2$ eq, 1.1–1.2%). While the primary goals of these policies are economic efficiency and improved environmental quality of water and soil, they are nevertheless relevant to the climate as they lead to emission reductions.

76. Other, more climate-focused policies include **voluntary enterprise challenges and partnerships** which promote reduced GHG emissions at farms in Canada, and **models and demonstrations** in New Zealand.

Land use, land-use change and forestry

77. Policies and measures directed at the LULUCF sector seek to increase CO_2 sinks through:

(a) Prevention of forest fires;

(b) Forest, grassland, wetland and cropland management;

(c) Afforestation and reforestation;

(d) Urban greening.

78. As with agriculture, Parties reported relatively few policies and measures aimed at land-use change and forestry. The most important policies, in terms of frequency of use and emissions reduction effects, to effect these changes are economic measures (subsidies) and regulations (environmental codes) for private lands, and public infrastructure and resource management rules and procedures for public lands. The measures tend to be part of larger policy strategies aimed at rural development, agricultural reform, environmental stewardship and biodiversity, rather than being focused solely on climate.

79. The EU Forestry Strategy provides for **economic incentives** (grants) and **public infrastructure and resource management** (public lands management schemes) (EC, 33 $TgCO_2$, 124 $TgCO_2$ beyond 2010, 3.0–3.4%). In addition, the market and rural development policies of the CAP provide economic incentives for actions that effect sinks in agricultural soils (EC, CAP market policies and rural development support (sinks), up to 60–70 $TgCO_2$, 5.4–7.1%). Slovakia uses **regulations** for sustainable forest management. New Zealand's Permanent Forest Sink Initiative provides **economic incentives** (awarded emission units) through binding covenants under which landowners who establish permanent forest sinks receive emission units in proportion to the carbon sequestered in their forests. New Zealand's East Coast Forestry Project provides for **economic incentives** (grants) for afforestation. Japan reported using **regulations** and various other measures to encourage better management of existing forests, the establishment of new forests, the use of timber and wood biomass and the creation of urban green spaces.

C. Limitation of emissions from aviation and marine bunker fuels

80. A number of Parties (e.g. Denmark, Finland, Netherlands, New Zealand, Sweden, Switzerland and United Kingdom) reported on the **steps taken to promote and/or implement any decisions by the ICAO and the IMO in order to limit or reduce GHG emissions from aviation and marine bunker fuels**. The Netherlands noted the progress made by the ICAO and the IMO to this end and reported on its efforts to integrate such emissions into a future climate change regime. The United Kingdom reported on its support for proposals to bring aviation into the EU ETS and for the development and implementation of emissions trading at the international level. New Zealand has a specific programme on aviation and maritime transport.

81. Sweden initiated action through the ICAO and the IMO to include aviation and shipping in a global climate regime after 2012. It promoted regional seminars, which helped to inform the aviation industry about technology and processes for more fuel-efficient procedures for air-traffic control and flights. It also helped the ICAO to draw up a manual titled *Operational Opportunities to Minimize Fuel Use and Reduce Emissions* (ICAO, 2004). Switzerland initiated action through the ICAO to implement

internationally coordinated measures to limit and reduce GHG emissions from aviation. Finland and Denmark also participated actively in the work of the ICAO and the IMO with the aim of preparing mechanisms to reduce GHG emissions from international aviation and shipping.

D. Ways to minimize adverse effects of the implementation of policies and measures under Article 2 of the Kyoto Protocol

82. **Implementation of policies and measures to address climate change may reduce the demand for some energy products and hence affect the economies of some countries**, in particular developing countries, that rely significantly on the export of energy products. Two Parties had initiated research and methodological work to define the possible extent of such impacts at this early stage of the implementation of the Kyoto Protocol (France and United Kingdom).

83. Most Parties, including Austria, Denmark, EC, Greece, Italy and Portugal, reported that the implementation of certain elements of the Kyoto Protocol may help to minimize adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on international trade, as well as adverse impacts from response measures on developing countries. These elements encompass: (a) inclusion of all six GHGs (i.e. not just CO_2) and all sectors; (b) inclusion of the Kyoto mechanisms and measures to enhance sinks; (c) provisions for technology transfer elements involved in the CDM and joint implementation (JI), by which mitigation efforts can bring benefits to developing countries; and d) the specific obligations in Articles 10 and 11 of the Kyoto Protocol for cooperation in technology transfer, research, capacity-building and financial support.

84. The United Kingdom stressed that it implements its policies and measures in a way that takes into account the impact from response measures. It referred to its use of the Kyoto mechanisms, the continued liberalization of its energy market and the implementation of a diverse portfolio of policies and measures, including those targeting non-CO_2 emissions, promoting carbon sinks and encouraging carbon capture and storage. Similarly, Norway reported on cost-effective policies that would minimize the unintended effects of response measures on its economy, which benefits from oil and gas production and export. However, it acknowledged that its own demand for energy imports is so small that it may not significantly affect the international energy market.

85. The Netherlands concluded that, because it has implemented all the elements of the Kyoto Protocol (i.e. address all gases and sectors, include sinks and use the Kyoto mechanisms) it is minimizing any adverse effect that might result from its mitigation activities. All these features ensured the distribution and sharing of efforts to reduce emissions across various fields of action, thereby limiting the strength of any specific effect of a particular measure targeting a specific gas and sector.

86. Denmark and New Zealand reported that any domestic emissions reduction is assisting the global effort to minimize the impacts of climate change.

IV. Trends in greenhouse gas emissions in the period 1990–2004

A. Objective and scope

87. This chapter presents GHG emission trends and patterns for the Annex I Parties, based on GHG data reported by these Parties in their 2006 inventory submissions. These are consistent with the data sources used by most Annex I Parties in their NC4 and the GHG emissions data presented in document FCCC/SBI/2006/26.

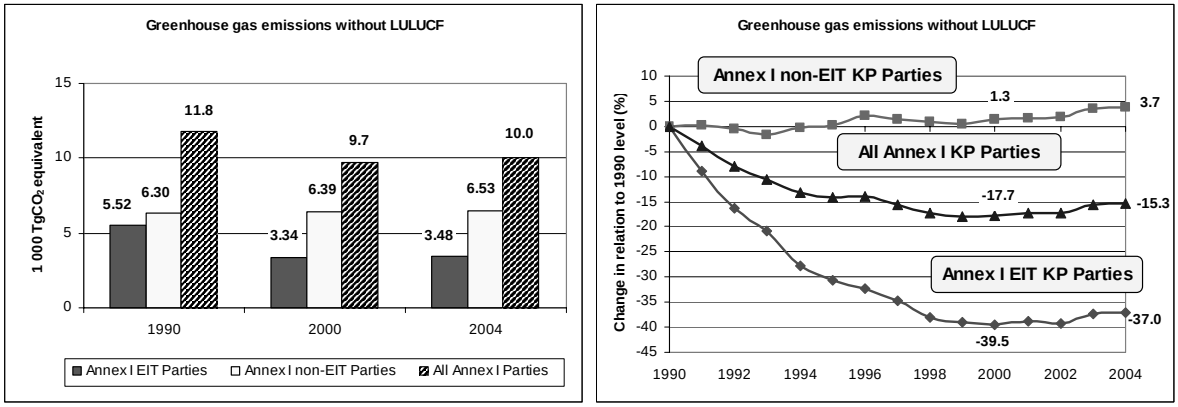
88. For all Annex I Parties, including those that are not Parties to the Kyoto Protocol, information on GHG emission trends is summarized in document FCCC/SBI/2007/INF.6/Add.1, chapter III. To avoid repetition, this report contains only total aggregate GHG emissions for all Annex I Parties, emissions by sector and emission trends for individual Parties.

89. The changes in GHG emissions shown in this chapter should not be interpreted as accurate indicators of Parties' future compliance with their targets under the Kyoto Protocol. At the time when the NC4 were prepared, not all Annex I Parties had made their final selection of the base year for HFCs, PFCs and SF_6. Also, emission trends may change during the period 2005–2012, and the effects of activities under Articles 3, paragraphs 3 and 4, and Articles 6, 12 and 17, have the potential to change the overall picture for individual Parties.

B. Total aggregate greenhouse gas emissions

90. From 1990–2004,[9] total aggregate GHG emissions[10] from Annex I Parties taken together decreased by 15.3 per cent, from 11.8 thousand to 10.0 thousand $TgCO_2$ eq (figure 1).[11] Emissions have been increasing since 2000, with a rise of 2.9 per cent in the period 2000–2004 mainly driven by the increase in emissions from the EIT Parties.

Figure 1. Greenhouse gas emissions from Annex I Parties, 1990, 2000 and 2004



Abbreviations: LULUCF = land use, land-use change and forestry, EIT = economy in transition.

91. For EIT Parties, total aggregate GHG emissions decreased from 5.52 thousand $TgCO_2$ eq in 1990 to 3.48 thousand $TgCO_2$ eq in 2004 – a decrease of 37.0 per cent. For the period 2000–2004, GHG emissions from these Parties increased by 4.0 per cent. For the non-EIT Annex I Parties, total aggregate GHG emissions increased from 6.3 thousand $TgCO_2$ eq in 1990 to 6.53 thousand $TgCO_2$ eq in 2004 – an increase of 3.7 per cent. For the period 2000–2004, GHG emissions from these Parties increased by 2.3 per cent.

C. Emissions data by sector

92. For all Annex I Parties taken together, **emissions in all sectors decreased** from 1990 to 2004, with the greatest decreases in agriculture (–29.7 per cent), industrial processes (–20.8 per cent), waste (–15.1 per cent) and energy (–13.0 per cent). Net removals from LULUCF increased almost twofold.

93. Within the **energy sector,** major increases were observed in transport (18.6 per cent), whereas decreases in emissions were observed in fugitive emissions (–18.3 per cent), manufacturing industries and construction (–16.9 per cent), other sectors (residential and commercial) (–10.2 per cent) and energy

[9] In this chapter, unless specified otherwise, Convention base year data are used in sums and totals instead of 1990 data (in accordance with decisions 9/CP.2 and 11/CP.4). The following EIT Parties have selected a base year other than 1990: Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986). Base years under the Kyoto Protocol may be slightly different because of the possible use of 1995 as the base year for HFCs, PFCs and SF_6 and because of the inclusion of emissions from deforestation under article 3, paragraph 7.

[10] Unless specified otherwise, all GHG emissions in this chapter are without emissions/removals from LULUCF.

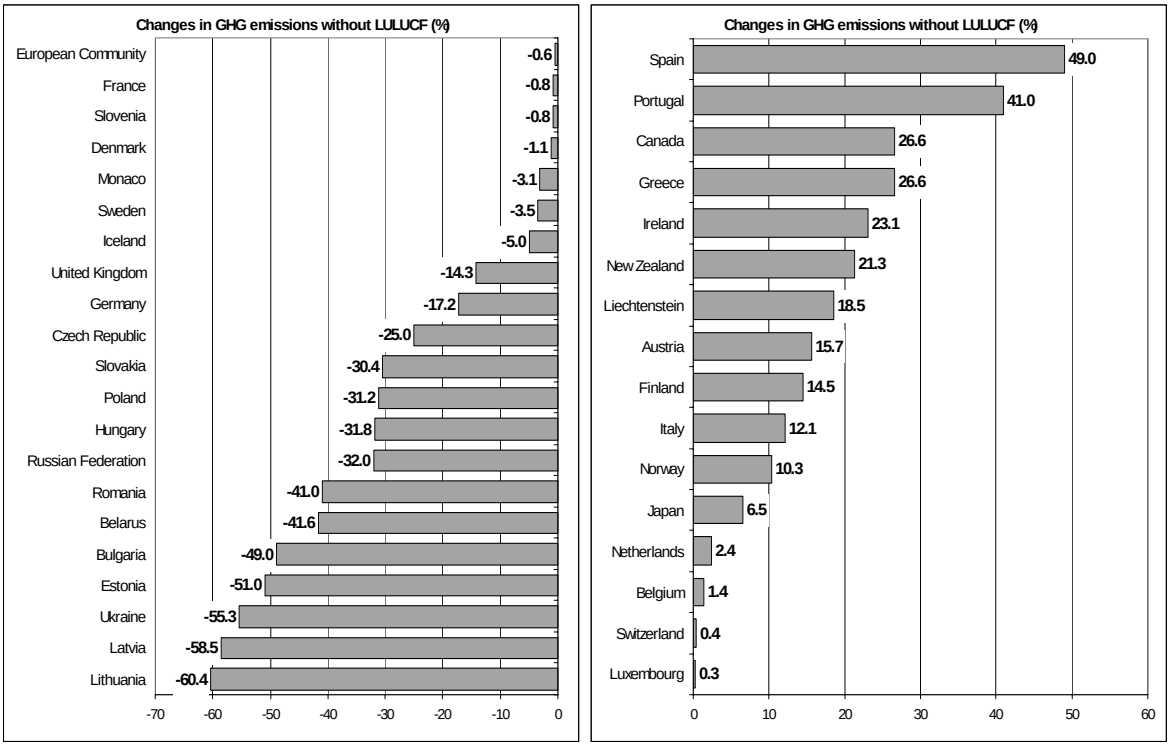
[11] In these and other figures interpolation was used for some Parties to fill in the missing data for some years; this did not have a noticeable impact on the totals and trends.

industry (–8.7 per cent). The decrease in emissions in all sectors other than transport sub-sector could be attributed at least in part to policies addressing emissions from these sectors (see chapter III above).

D. Emissions data for individual Annex I Parties

94. By Party, changes in total aggregate GHG emissions from 1990 to 2004 varied greatly: from a decrease of 60.4 per cent (Lithuania) to an increase of 49.0 per cent (Spain) (figure 2 and table 1).

Figure 2. Changes in total aggregate greenhouse gas emissions of individual Annex I Parties, 1990–2004



Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

95. Figure 2 presents total aggregate anthropogenic GHG emissions for individual Annex I Parties excluding LULUCF.[12] It shows that the **aggregate anthropogenic GHG emissions in 2004 remained below the 1990 levels for the EIT Parties and a number of non-EIT Parties (Denmark, EC, France, Germany, Iceland, Monaco, Sweden and United Kingdom)**. Emissions for the remaining non-EIT Annex I Parties remained above the 1990 levels.

[12] Data from individual national submissions of GHG inventories from Annex I Parties can be found at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/3734.php>.

Table 1. Total aggregate emissions excluding emissions/removals from land use, land-use change and forestry between 1990 and 2004 by Party

	$GgCO_2$ eq					Change from 1990 to 2004	Kyoto Protocol reduction target[a]
Party	**1990**	**1995**	**2000**	**2003**	**2004**	**(%)**	**(%)**
Austria	78 944	80 218	81 263	92 511	91 299	15.7	–13
Belarus[b]	127 361	72 938	69 788	69 815	74 364	–41.6	–8[c]
Belgium	145 766	152 339	147 411	147 530	147 873	1.4	–7.5
Bulgaria[b,d]	132 303	83 022	64 254	67 731	67 511	–49.0	–21
Canada	598 911	648 685	725 048	753 751	758 067	26.6	–6
Croatia[b]	31 124	21 913	25 268	29 192	29 432	–5.4	–5
Czech Republic[b]	196 205	154 463	149 165	147 583	147 111	–25.0	–8
Denmark	70 416	77 423	69 585	75 541	69 620	–1.1	–21
Estonia[b]	43 491	22 287	19 662	21 387	21 322	–51.0	–8
European Community[e]	4 252 461	4 144 433	4 129 317	4 216 469	4 228 006	–0.6	–8
Finland	71 093	71 470	69 965	85 660	81 435	14.5	0
France	567 094	561 765	561 436	561 093	562 635	–0.8	0
Germany	1 226 296	1 094 740	1 022 798	1 024 377	1 015 273	–17.2	–21
Greece	108 742	113 195	131 756	137 284	137 633	26.6	25
Hungary[b,d]	123 145	84 360	81 875	84 334	83 924	–31.8	–6
Iceland	3 277	3 080	3 545	3 459	3 112	–5.0	10
Ireland	55 614	58 923	68 729	68 361	68 460	23.1	13
Italy	519 600	532 642	554 611	577 411	582 520	12.1	–6.5
Japan	1 272 095	1 342 084	1 345 531	1 358 324	1 355 175	6.5	–6
Latvia[b]	25 893	12 184	9 929	10 705	10 746	–58.5	–8
Liechtenstein	229			264	271	18.5	–8
Lithuania[b]	50 934			17 224	20 193	–60.4	–8
Luxembourg	12 688	9 977	9 688	11 433	12 722	0.3	–28
Monaco	108	115	117	111	104	–3.1	–8
Netherlands	212 963	225 070	214 433	215 697	218 086	2.4	–6
New Zealand	61 893	64 535	70 315	75 606	75 088	21.3	0
Norway	49 792	49 895	53 500	54 332	54 931	10.3	1
Poland[b,d]	564 408	417 349	386 181	382 639	388 063	–31.2	–6
Portugal	59 954	71 263	82 178	83 682	84 546	41.0	27
Romania[b,d]	262 281	176 670	131 842	148 622	154 626	–41.0	–8
Russian Federation[b]	2 974 863	2 173 890	1 944 767	2 021 587	2 024 229	–32.0	0
Slovakia[b]	73 360	53 347	49 378	51 091	51 025	–30.4	–8
Slovenia[b,d]	20 220	18 543	18 822	19 666	20 059	–0.8	–8
Spain	287 152	317 941	384 246	408 169	427 905	49.0	25
Sweden	72 361	73 894	68 389	70 907	69 854	–3.5	4
Switzerland	52 826	51 029	51 655	52 529	53 019	0.4	–8
Ukraine[b]	925 362	521 149	395 095	416 017	413 411	–55.3	0
United Kingdom	776 142	714 321	672 195	664 471	665 330	–14.3	–12.5
Decrease in emissions by more than 1 per cent (number of Parties)[f]						**19**	
Change in emissions within 1 per cent (number of Parties)[f]						**5**	
Increase in emissions by more than 1 per cent (number of Parties)[f]						**14**	

Note: (1) Blank spaces in tables indicate that either no data were available by the time this document was prepared, or the emissions were reported, using the relevant notation keys, as not occurring (NO), not estimated (NE), not applicable (NA), included elsewhere (IE) or confidential (C); (2) The changes in emissions from 1990 to 2004 were calculated using the exact (not rounded) values and they may differ from a ratio calculated with the rounded numbers provided in the tables; (3) Due to a page limitation on this report, data are presented only for 1990, 1995, 2000 and 2003–2004. More detailed data for all reported years, including disaggregated data by gas and by sector, can be found on the GHG Emissions Data page at the UNFCCC website <http://unfccc.int>.

[a] For the European Community member States, the targets are those under the European Union burden-sharing agreement.

[b] A Party undergoing the process of transition to a market economy.

[c] An amendment to Annex B of the Kyoto Protocol concerning the emission reduction target for Belarus was adopted by decision 10/CMP.2; at the time of the preparation of this report, this amendment had not yet entered in force.

[d] Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986)) are used for this Party instead of 1990 data.

[e] Emission estimates of the European Community are reported separately from those of its member States.

[f] The 1 per cent boundary is arbitrary and was selected only as a way to provide a simple, transparent statistical summary.

V. Projections and evaluation of the aggregated effect of policies and measures

A. Greenhouse gas projections

96. This chapter presents GHG emissions projections for Annex I Parties, as reported by 36 Parties in their NC4 and/or RDPs. For Italy, the NC4 was not available at the time when this report was prepared but GHG projections were reported in the RDP; these projections are used here. GHG projections are not available for two Parties: for Luxembourg because the NC4 and RDP were not available at the time when this report was prepared; and for Monaco because the NC4 does not contain quantitative GHG projections and the RDP was not available at the time when this report was prepared.[13]

97. According to the UNFCCC reporting guidelines Part II,[14] all Annex I Parties shall report a 'with measures' scenario, and may report 'without measures' and 'with additional measures' scenarios; the projections should be provided for 2005, 2010, 2015 and 2020. The 'with measures' scenario embodies the effects of the policies and measures that are either implemented or adopted, whereas the 'with additional measures' scenario also includes the effects of planned policies and measures. The 'without measures' scenario shows what would have happened if some or all (depending on the definition) existing policies and measures had not been implemented.

98. Thirty-six Parties reported quantitative GHG projections under the mandatory 'with measures' scenario, 22 reported 'with additional measures' scenarios and 13 reported 'without measures' scenarios. Twenty-seven Parties projected their GHG emissions until 2020; one Party projected to 2025; three Parties projected until 2030; and five Parties projected to 2010. Nine Parties reported quantitative estimates for the expected use of credits from LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (also known as removal units (RMUs)), and 11 Parties reported quantitative estimates for the expected use of the Kyoto mechanisms.

99. For all Annex I Parties, including those that are not Parties to the Kyoto Protocol, information on GHG projections is presented in document FCCC/SBI/2007/INF.6/Add.1, chapter V. To avoid repetition, this report contains only those GHG data that relate to Annex I Parties that are also Parties to the the Kyoto Protocol, such as projections of total aggregate GHG emissions for Annex I Parties, the effect of the expected use of LULUCF activities and the Kyoto mechanisms, sectoral projections and emission trends for individual Annex I Parties.

100. For GHG projections for Annex I Parties, emissions are given for the following years/periods:

(a) For the Kyoto Protocol base year as defined by Parties in the projections chapter of their NC4 (note that the value of Kyoto Protocol base year emissions in the projections studies can differ from the Convention base year emissions in the annual inventory data[15]);

(b) For the annual average in the period 2008–2012 (note that for most Parties the 2010 values are used as an estimate for a 2008–2012 average).

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[13] The NC3 of Monaco also did not contain quantitative GHG projections. The latest available communication of Luxembourg is its NC1 submitted in 1996; although that communication contained GHG projections, they are considered outdated and therefore not included in this report.

[14] "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (FCCC/CP/1999/7, paras. 27–48).

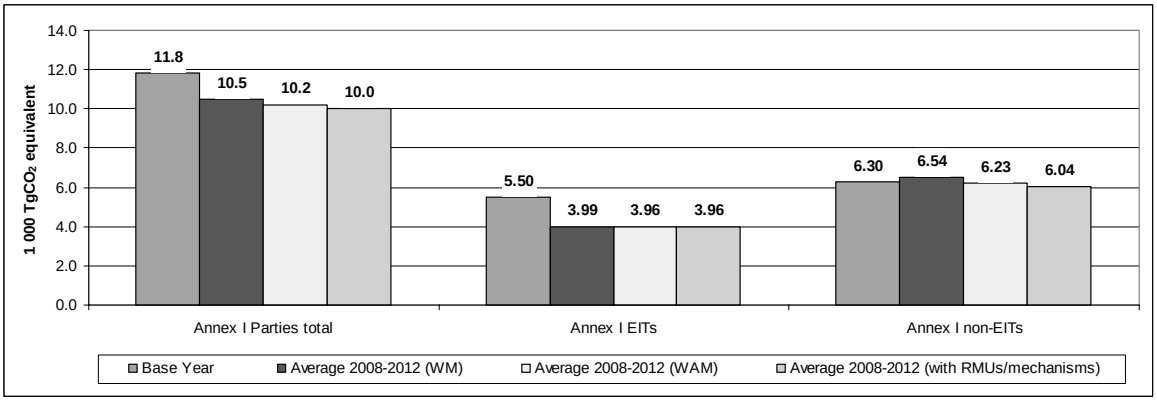
[15] The typical reasons for such differences are the use of inventory data from an earlier inventory submission and the different definition of the base year for the F-gases.

B. Projected total aggregated greenhouse gas emissions

101. Figures 3 and 4 show projected changes in GHG emissions from Annex I Parties from the base year under the Kyoto Protocol to the 2008–2012 period on average. These figures provide GHG emissions (without LULUCF) under the 'with measures' scenario, GHG emissions (without LULUCF) under the 'with additional measures' scenario, and the difference between the GHG emissions under the 'with additional measures' scenario (or under the 'with measures' scenarios in the cases when the 'with additional measures' scenario is not available) and the sum of the expected credits from LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and the expected acquisition of Kyoto units to comply with the Kyoto Protocol targets.

102. Figures 3 and 4 show that for all reporting Annex I Parties taken together, GHG emissions in the 2008–2012 period are projected to be 10.8 per cent below the Kyoto Protocol base year level (10.5 thousand $TgCO_2$ eq in 2008–2012 on average annually compared with 11.8 thousand $TgCO_2$ eq in in the base year). If additional (planned) measures are taken into account, the projected annual average for 2008–2012 decreases to 10.2 $TgCO_2$ eq, or 13.7 per cent below the base year level. If, in addition to the additional measures, the Kyoto mechanisms and credits from LULUCF activities are taken into account, the projected annual average for 2008–2012 decreases further to 10.0 $TgCO_2$ eq (15.3 per cent below the base year level). Hence, **according to the current projections Annex I Parties as a group are projected to meet the overall reduction target of 5 per cent below the 1990 level inscribed in Article 3, paragraph 1, of the Kyoto Protocol**. **This target would be achieved even without the use of additional measures and without the use of LULUCF activities and Kyoto mechanisms.**

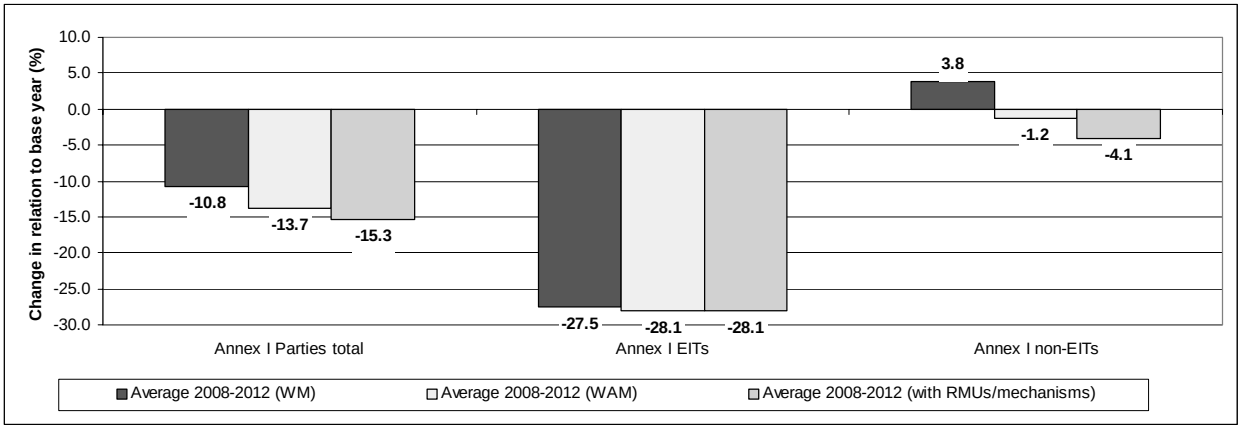
Figure 3. Projected total aggregated greenhouse gas emissions from Annex I Parties



Abbreviations: EIT = economy in transition, WM = 'with measures', WAM = 'with additional measures', RMU = removal units.

Note: (1) For the Parties that have not reported the scenario 'with additional measures', it is assumed in this figure that the emissions under the scenario 'with additional measures' are the same as under the scenario 'with measures'. The scenario with the use of RMUs and the Kyoto mechanisms is derived from the scenario 'with additional measures' by deducting, if applicable, the reported values for the use of RMUs and Kyoto mechanisms; (2) The base year data used by Parties in their projections are not always consistent with the base year data reported in the annual GHG inventories. Therefore, the base year level in the projections may differ from the base year level estimated with the inventory data; (3) For most Parties, the 2010 value is used as an estimate for an average value in the 2008–2012 period.

Figure 4. Projected changes in total aggregated greenhouse gas emissions from Annex I Parties



Abbreviations: EIT = economy in transition, WM = 'with measures', WAM = 'with additional measures', RMU = removal units.

Note: (1) For the Parties that have not reported the scenario 'with additional measures', it is assumed in this figure that the emissions under the scenario 'with additional measures' are the same as under the scenario 'with measures'. The scenario with the use of removal units (RMUs) and the mechanisms is derived from the scenario 'with additional measures' by deducting, if applicable, the reported values for the use of RMUs and mechanisms; (2) The base year data used by Parties in their projections are not always consistent with the base year data reported in the annual GHG inventories. Therefore, the base year level in the projections may differ from the base year level estimated with the inventory data; (3) For most Parties, the 2010 value is used as an estimate for an average value in the 2008–2012 period.

103. For EIT Parties, average annual emissions in the 2008–2012 period are projected to be 27.5 per cent below the base year level under the 'with measures' scenario. For the 'with additional measures' scenario, the projected decrease is 28.1 per cent, which may reflect the fact that only a few EIT Parties have reported this scenario. The use of credits from LULUCF activities and the Kyoto mechanisms[16] is projected to be very small for EIT Parties.

104. For the non-EIT Annex I Parties, average annual emissions in the 2008–2012 period are projected to be above the base year level by 3.8 per cent. However, the use of additional measures would help to reduce the emissions to 1.2 per cent below the base year level. The use of credits from LULUCF activities and the Kyoto mechanisms would further reduce the distance to the base year level to 4.1 per cent compared to the base year emissions levels.

C. Projected changes in sectoral greenhouse gas emissions

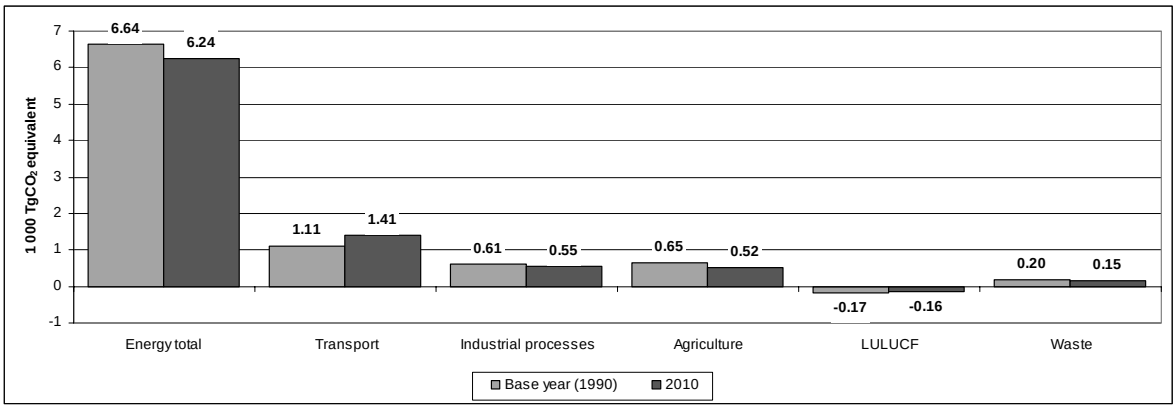
105. Figures 5 and 6 illustrate projected trends in aggregate GHG emissions from Annex I Parties by sector. For all Parties taken together,[17] **sectoral emissions are projected to decrease between 1990 and 2008–2012**[18] **in all sectors**: in the energy sector by 6.1 per cent, in industrial processes by 9.8 per cent, in agriculture by 20.4 per cent and in the waste sector by 26.3 per cent. However, within the energy sector, **considerable growth is projected for transport**: 26.8 per cent between 1990 and 2008–2012. Net GHG removals by LULUCF are projected to decrease by 7.3 per cent.

[16] Within the context of this report, only expected purchases of emission reduction units are considered; the possible sales of such units are not included into the projection estimates. Many EIT Parties have reported that they intend to participate in the flexibility mechanisms as the hosts of JI projects or as a selling partner in emissions trading. Such activities are not quantified here.

[17] Note that detailed projections data by sector are not available for Iceland, the Russian Federation or Spain. Therefore, the sectoral values provided here do not include the data for these Parties. For some Parties, projections are available only for some sectors.

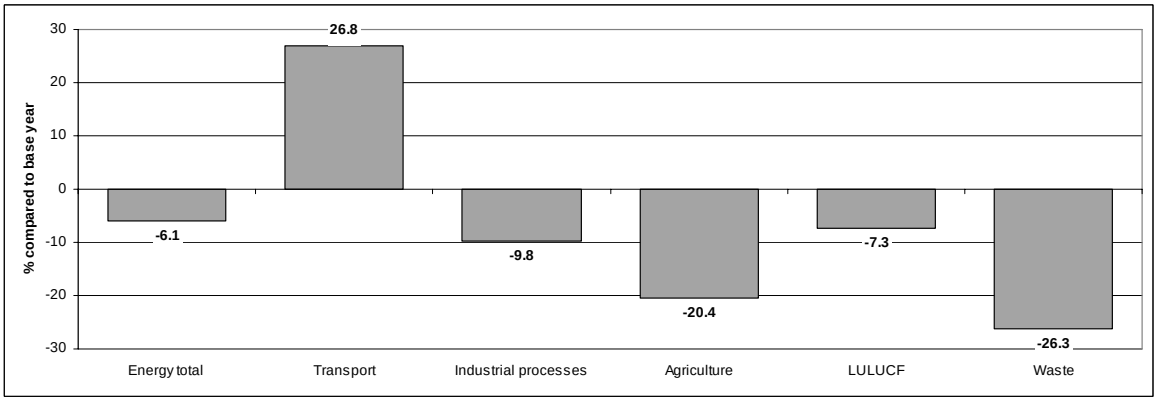
[18] Sectoral data for 2010 are taken here as an estimate for the average 2008–2012 emissions.

Figure 5. Projected greenhouse gas emissions/removals from Annex I Parties by sector



Abbreviation: LULUCF = land use, land-use change and forestry.
Note: The data for 'Energy total' include data for transport; 'Transport' is also shown separately.

Figure 6. Projected changes in greenhouse gas emissions/removals from Annex I Parties by sector



Abbreviation: LULUCF = land use, land-use change and forestry.
Note: The data for 'Energy total' include data for transport; 'Transport' is also shown separately.

D. Projections data for individual Annex I Parties

106. Figure 7 presents the projected changes in GHG emissions for individual Annex I Parties from the base year to the 2008–2012 period on average. Two scenarios are presented: the 'with measures' scenario, and the 'with additional measures' scenario including the expected use of credits from LULUCF activities and the Kyoto mechanisms. More detailed data for both scenarios can be found in table 2.

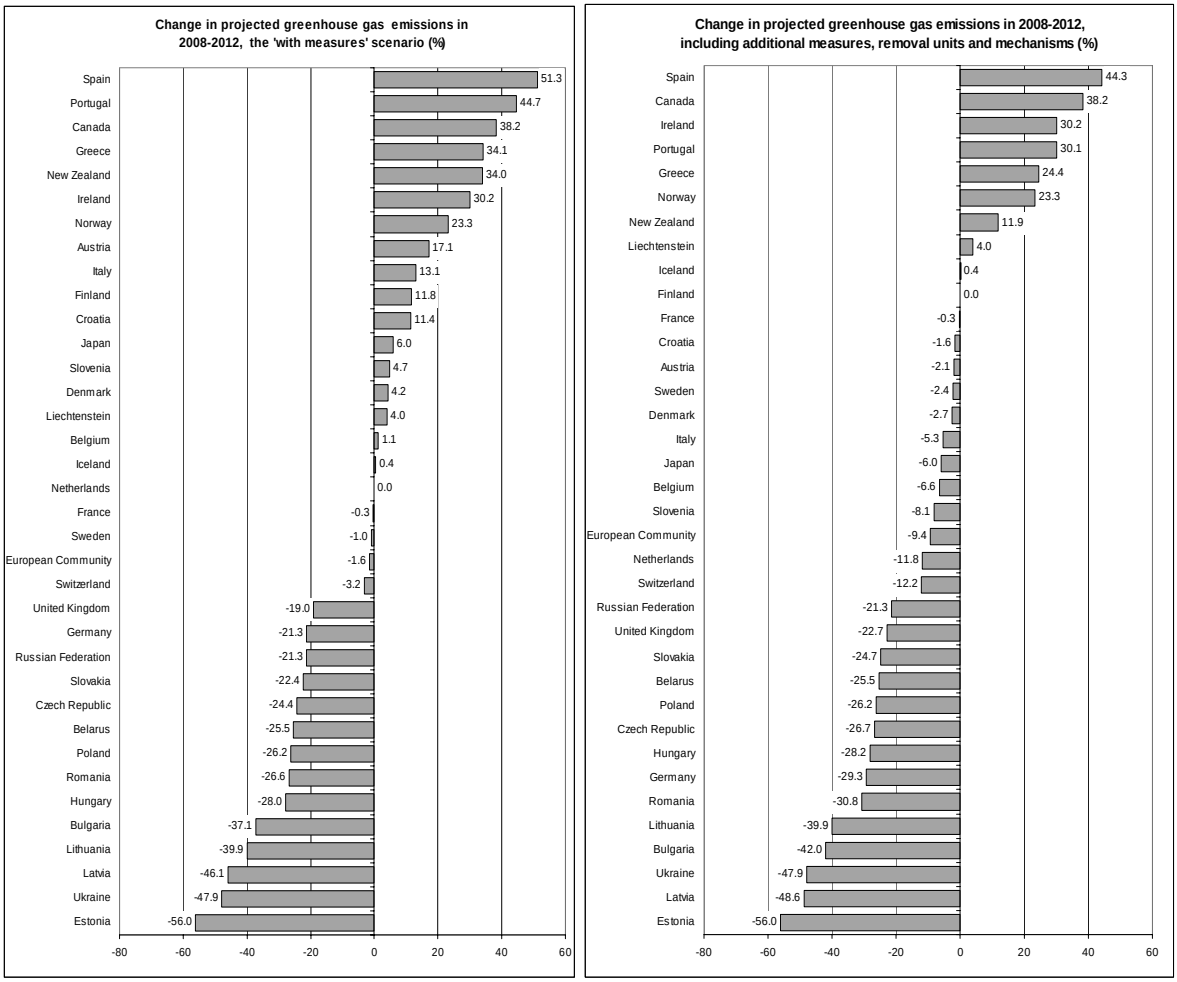
107. Projected changes in GHG emissions vary greatly from country to country: from a decrease of 56.0 per cent (Estonia) to an increase of 51.3 per cent (Spain) under the 'with measures' scenario, and from a decrease of 56.0 per cent (Estonia) to an increase of 44.3 per cent (Spain) under the 'with additional measures' scenario including the effect from the expected use of credits from LULUCF activities and the Kyoto mechanisms. For a number of Parties (e.g. Austria, Belgium, Croatia, Denmark, Finland, Italy, Japan, Netherlands and Slovenia) the use of additional measures, and in most cases the use of LULUCF activities and the Kyoto mechanisms, considerably reduces the distance[19] between the projected GHG emissions levels and the Kyoto Protocol target levels.

[19] The term "distance to target" is used here as the difference between projected emission levels and the Kyoto target levels in 2010.

108. Table 2 indicates that about **half of Annex I Parties (17 of the 36 reporting Parties) expect to meet their Kyoto Protocol targets under the 'with measures' scenario**. These are **mostly EIT Parties** (Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovakia and Ukraine), but also **some non-EIT Annex I Parties** (France, Germany, Iceland, Sweden and United Kingdom). **Greece expects to meet its target using additional measures**. A number of Parties expect to **meet the Kyoto Protocol targets with additional measures and by using LULUCF activities and Kyoto mechanisms (EC, Finland, Japan, Netherlands, Slovenia and Switzerland**). Slovenia is among the few EIT Parties that include the acquisition of Kyoto units in their plans to achieve the Kyoto Protocol targets.

109. **A few Parties may need to implement further measures or plan further use of the Kyoto mechanisms and LULUCF activities to attain the Kyoto Protocol targets (e.g. Austria, Belgium, Canada, Croatia, Denmark, Italy, New Zealand, Portugal and Spain**). A number of these Parties have mentioned in their NC4 and RDP that they plan to meet the Kyoto Protocol target using additional measures, LULUCF activities and Kyoto mechanisms, but not all of them have provided the relevant quantitative estimates in the context of the GHG projections.

Figure 7. Projected changes in greenhouse gas emissions and use of Kyoto mechanisms for individual Annex I Parties



Note: (1) For the Parties which have not reported the scenario 'with additional measures', it is assumed in this figure that the emissions under the scenario 'with additional measures' are the same as under the scenario 'with measures'. The scenario with the use of removal units (RMUs) and the Kyoto mechanisms is derived from the scenario 'with additional measures' by deducting, if applicable, the reported values for the use of RMUs and Kyoto mechanisms; (2) For most Parties, the 2010 value is used as an estimate for an average value in the 2008–2012 period.

Table 2. Projected total aggregate anthropogenic greenhouse gas emissions,excluding emissions/removals from land use, land-use change and forestry

Party	Base year (Kyoto Protocol)	Emissions ($TgCO_2$ eq)				Contribution of RMUs and mechanisms ($TgCO_2$ eq)				Kyoto Protocol target (%)
		With measures		With additional measures						
		2008–2012 average	Change relative to base year (%)	2008–2012 average	Change relative to base year (%)	Expected LULUCF credits (RMUs)	Expected use of Kyoto mechanisms	Emissions minus expected RMUs and credits from mechanisms	Change relative to base year (%)	
Austria	78.9	92.4	17.1	78.0	–1.2	0.7	–	77.3	–2.1	–13.0
Belarus	105.4	78.6	–25.5	–	–	–	–	–	–	–8.0
Belgium	146.8	148.5	1.1	145.7	–0.8	–	8.6	137.1	–6.6	–7.5
Bulgaria	138.4	87.1	–37.1	80.2	–42.0	–	–	–	–	–21.0
Canada	599.0	828.0	38.2	–	–	–	–	–	–	–6.0
Croatia	30.1	33.6	11.4	29.6	–1.6	–	–	–	–	–5.0
Czech Republic	192.1	145.3	–24.4	140.8	–26.7	–	–	–	–	–8.0
Denmark	69.6	72.5	4.2	–	–	0.3	4.5	67.8	–2.7	–21.0
Estonia	37.5	16.5	–56.0	16.5	–56.0	–	–			–8.0
European Community	4 145.0	4 080.0	–1.6	3 862.0	–6.8	–	106.8	3 755.2	–9.4	–8.0
Finland	71.5	79.9	11.8	73.0	2.1	–0.9	2.4	71.5	0.0	0.0
France[a]	564.8	562.9	–0.3	–	–	–	–	–	–	0.0
Germany	1 275.0	1 003.0	–21.3	901.0	–29.3	–	–	–	–	–21.0
Greece	112.1	150.4	34.1	139.5	24.4	–	–	–	–	25.0
Hungary	122.2	88.1	–28.0	87.8	–28.2	–	–	–	–	–6.0
Iceland[b]	3.28	3.29	0.4	–	–	–	–	–	–	10.0
Ireland	55.5	72.3	30.2	–	–	–	–	–	–	13.0
Italy	519.5	587.3	13.1	524.0	0.9	16.2	16.0	491.8	–5.3	–6.5
Japan	1 237.0	1 311.0	6.0	1 231.0	–0.5	48.0	20.0	1 163.0	–6.0	–6.0
Latvia	25.4	13.7	–46.1	13.0	–48.6	–	–	–	–	–8.0
Liechtenstein	0.25	0.26	4.0	–	–	–	–	–	–	–8.0
Lithuania	41.2	24.8	–39.9	–	–	–	–	–	–	–8.0
Netherlands	215.8	215.7	0.0	210.3	–2.5	–	20.0	190.3	–11.8	–6.0
New Zealand	61.5	82.4	34.0	–	–	13.6	–	68.9	11.9	0.0
Norway	50.1	61.8	23.3	–	–	–	–	–	–	1.0
Poland	568.8	420.0	–26.2	–	–	–	–	–	–	–6.0
Portugal	60.8	88.0	44.7	85.6	40.8	3.4	1.9	79.0	30.1	27.0
Romania	262.3	192.5	–26.6	181.4	–30.8	–	–	–	–	–8.0
Russian Federation	2 961.0	2 329.0	–21.3	–	–	–	–	–	–	0.0
Slovakia	71.9	55.8	–22.4	54.1	–24.7	–	–	–	–	–8.0
Slovenia	20.2	21.2	4.7	19.9	–1.6	1.3	–	18.6	–8.1	–8.0
Spain	288.4	436.3	51.3	–	–	–	20.0	416.3	44.3	25.0
Sweden	72.2	71.5	–1.0	–	–	–	1.0	70.5	–2.4	4.0
Switzerland	52.5	50.8	–3.2	49.5	–5.7	1.8	1.6	46.1	–12.2	–8.0
Ukraine	925.4	482.4	–47.9	–	–	–	–	–	–	0.0
United Kingdom	768.1	622.1	–19.0	597.5	–22.2	4.1	–	593.4	–22.7	–12.5

Abbreviations: LULUCF = land use, land-use change and forestry, RMU = removal unit.

Note: For most Parties, the 2010 value is used as an estimate for an average value in the 2008–2012 period.

[a] The report demonstrating progress under the Kyoto Protocol (RDP) contains quantitative data for one scenario only, which is used here as a 'with measures' scenario; however, by the relative change from the base year to 2010, this 'with measures' scenario of the RDP is close to the 'with additional measures' scenario of the fourth national communication

[b] This projection for Iceland does not include the emissions that fall under decision 14/CP.7.

E. Total effect of policies and measures for individual Annex I Parties

110. The total effects of policies and measures for Annex I Parties were assessed as the difference between a 'without measures' and 'with measures' projections for the implemented and adopted policies, and as the difference between 'with measures' and 'with additional measures' for the planned policies. For the group of Parties that reported a 'without measures' projection as a group of Parties, **the total estimated effect of implemented and adopted measures in 2010 (taken as an average between 2008 and 2012) is equal to 11 per cent of the base year emissions** , which is higher than the effects reported under the Convention of 8 per cent (see chapter V. D of document FCCC/SBI/2007/INF.6/Add.1). Such a comparison provides only an indication of the aggregated effect of policies and measures, owing to the small number of Parties that reported scenarios other than a 'with measures' scenario and the difference in scenario definitions across Parties.

111. For individual Parties, seven reported that the estimated effects of implemented and adopted policies are equal to at least 10 per cent of their base year emissions by 2010 (Bulgaria, Denmark, France, Lithuania, Netherlands, Poland and Spain). As for planned policies, four Parties (Austria, Croatia, Finland and Greece) reported that their estimated effects are equal to at least 10 per cent of their base year emissions, and a larger group (Bulgaria, EC, France, Germany, Italy, Japan, Portugal, Romania and Slovenia) reported estimated effects of 4–8 per cent.

VI. Domestic and regional legislative arrangements and enforcement and administrative procedures to meet commitments under the Kyoto Protocol

112. Since the Kyoto Protocol entered into force, governments have been turning their attention to the assessment of progress to date to achieve the Kyoto Protocol targets. In some cases this has led to a **rise in the level of political attention** given to the issue of climate change. For example, the United Kingdom reported that the coordination of the national climate change programme rests with the Department for Environment, Food and Rural Affairs (DEFRA), but the lead on political decisions relating to climate change has been recently shifted into the Prime Minister's Office.

113. Information reported in the NC4 and RDPs suggests that **significant progress has been made in organizing 'all of government' efforts** by Annex I Parties to address climate change. All reporting Parties have by now adopted national climate change strategies with mitigation programmes that span many, if not all, parts of the energy and energy-using sectors. Parties have also advanced noticeably in **establishing national systems for inventory preparation and national registries to support implementation of the Kyoto Protocol** (see chapter II above). Thus, action on climate change is manifested through **a variety of legislative arrangements and administrative procedures**, spanning a wide range of government activities, sectors, actors and institutions within and outside governments.

114. Breaking down the national target under the Kyoto Protocol into concrete sectoral and cross-sectoral policies and measures appeares to have been a challenge to many Parties. They have addressed this challenge in different ways. For example, some governments have set **sector targets or objectives** that pertain to climate change and placed the responsibility for achieving agreed targets directly with sector ministries (e.g. Germany, Netherlands, Switzerland on energy, the United Kingdom's climate strategy for vehicles). In other countries, such as

Japan, there is more central oversight of sector targets. In Belgium, regional targets exist to guide climate policies at a regional scale. The responsibility for attaining and enforcing these sector targets rests with the relevant governmental authority; an integrated (cross-sectoral) policy approach thus raises a number of governance issues. **Inter-departmental committees** have been established in many countries to guide the implementation of integrated climate change strategies at the national level.

115. A recent trend is the **emergence of multilevel governance on climate change issues**. Multilevel governance operates vertically across different levels of government (e.g. local to national) and horizontally across governmental departments as well as non-governmental. Leadership from municipalities or local government and other subnational governmental authorities is increasingly influencing GHG emission trends and is also playing an essential role in adaptation planning. A number of Parties reported policies to work more closely with local and regional governments on mitigation strategies (Austria, Czech Republic, EC, Finland, Hungary, Japan, Netherlands, Sweden, Switzerland, Romania and Russian Federation).

116. In Sweden, for example, local investment programmes are providing municipalities with financial incentives to identify and develop energy saving and other climate-friendly opportunities at city and regional level – Sweden's local investment programme and later its Climate Investment Programmes – with total funding over roughly 10 years of EUR 582 million. Finland is also using 'intention agreements' between the national government, municipalities and local councils to reduce GHG emissions; other countries have similar arrangements. In addition, in some countries the federal systems oblige national governments to work in a highly decentralized manner with regional government authorities (e.g. Belgium and Switzerland). In the United Kingdom, national climate policy must also coordinate and encourage action across England and with the devolved national administrations in Scotland, Wales and Northern Ireland. In Spain there is also strong authority at the community level over many transport and industry activities relevant to GHG mitigation. For example, a recent Spanish national transport and infrastructure strategic plan aims to work with local authorities to reduce emissions from this sector by 30 $TgCO_2$ by 2020 .

117. Many mitigation initiatives are also increasingly led not only by local and regional governments but also through **formal and informal partnerships with non-governmental entities and the private sector**, such as environmental organizations, corporations or business organizations. Links with non-governmental stakeholders are increasingly evident in institutional structures designed to provide advice and insights to governments on next steps in climate policy, demonstrated in the EU European Climate Change Programme or the Climate Forum of Finland. Some governments have created partnerships with the private sector to deliver important elements of their climate strategies, as in the Climate Trust of the United Kingdom or the 'climate cent tax' to fund the Climate Cent Foundation of Switzerland (see para. 53 above). Another example is the "Energy City" label in Switzerland. These institutions and partnerships demonstrate the increasingly active role played by non-governmental actors in the design and implementation of climate policy.

A. Institutional arrangements and decision-making procedures to coordinate activities relating to participation in the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol

118. Many Parties reported on their **plans to use the Kyoto mechanisms**, including JI, the clean development mechanism (CDM) and international emissions trading under Article 17 of the Kyoto Protocol. Austria, Belgium, the Czech Republic, Denmark, the EC, Estonia, Finland,

Greece, Japan, Ireland, Italy, the Netherlands, Portugal, Slovenia, Spain and Sweden are among the Parties that have made progress in preparing for the use of the Kyoto mechanisms.

119. The **project-based Kyoto mechanisms, the CDM and JI, are seen by Parties as tools to achieve the dual objective** of delivering emission reductions at a lower cost than would be the case through domestic measures only and playing a part in international cooperation to mitigate climate change. In Finland and Denmark, for example, costs of domestic GHG reductions are among the highest in the EC, hence the use of the Kyoto mechanisms is contributing to the cost-effectiveness of national mitigation strategies. At the same time the Kyoto mechanisms are seen as a tool to strengthen the cooperation within Annex I Parties (through JI) and between Annex I Parties and Parties not included in Annex I to the Convention (non-Annex I Parties) (through the CDM) by transferring knowledge, experience and technologies relating to climate change mitigation. The CDM is also seen as a tool to contribute to sustainable development in developing countries.

120. Many countries have already put in place the relevant **legislative arrangements to make operational the use of the Kyoto mechanisms** (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Spain, Sweden and United Kingdom). Although the United Kingdom expects to meet its commitments through current domestic measures, it recognizes the importance of the Kyoto mechanisms not only for the first, but also for the subsequent, commitment periods and the need for an institutional and accounting framework to facilitate the use of such mechanisms.

121. Many Parties have also allocated **responsibilities for the management of the Kyoto mechanisms among various institutions and many of them have already designated a national authority** to deal with the implementation of these mechanisms. In Finland, for example, the Ministry of Trade and Industry has assumed responsibility for coordinating JI projects, while the Ministry for Foreign Affairs is responsible for CDM. In Japan, the authorization to provide government approval for CDM and JI projects was reorganized in 2005 with a view to replacing the existing coordination mechanism with the Council for Promotion and Utilization of the Kyoto Mechanisms. The new Council will involve the participation of all Japanese ministries with competencies in the area of Kyoto mechanisms. The United Kingdom appointed DEFRA as the national entity responsible for JI and the CDM. Importantly, **all Parties are furthering efforts to establish their national registries** as a basic requirement to make transfers and acquisitions of Kyoto units (see paras. 14–16 above).

122. Most of the non-EIT Annex I Parties have also concluded **specific agreements to implement both JI and the CDM**. This includes having **planned and allocated financial resources for acquisition of emission credits from these mechanisms**.[20] Estimates on the use of credits generated through the CDM and JI to achieve Kyoto commitments vary widely among Parties included in Annex II to the Convention (Annex II Parties). The EC estimates that the member States that formed the EU in 1997 (EU-15), for example, will use credits amounting to 100 Tg CO_2 annually, and reports that currently allocated financial resources amount to around EUR 2.7 billion over the five-year commitment period.

[20] Emission reductions resulting from project-based activities (certified emission reductions resulting from the CDM, emission reduction units resulting from JI and removal units resulting from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol) are called **credits**. The assigned amount units, which make up a part of the overall assigned amount for a particular Party, are allocated in advance, based on base year emissions, and are available for trading. They are also known as **quotas** or **allowances**. Altogether, allowances and credits comprise the **Kyoto units**.

123. The Netherlands has prepared memorandums of understanding with 14 developing countries to implement the CDM projects and with seven Annex I Parties to implement JI projects. Altogether, it plans to use credits amounting to 20 $TgCO_2$ eq annually over the commitment period under the Kyoto Protocol to work together with domestic actions to achieve its target (see table 3). It has allocated EUR 606 million (EUR 204 million for JI and EUR 402 million for the CDM). Denmark has allocated 1,130 million Danish kroner for purchasing emission credits (500 million Danish kroner for the CDM and the rest for JI). Similarly, Spain has concluded 16 such memorandums and invested EUR 205 million to acquire credits amounting to 40 $TgCO_2$ eq from the World Bank and through the Latin American Carbon Initiative.

124. In 2005 the Federal Belgian Government and the Flemish Government launched tenders for JI and the CDM, and the Walloon and Brussels-Capital regions in Belgium invested in the Community Development Carbon Fund (CDCF) of the World Bank. The largest share of the EC financial allocation to date is from Italy (EUR 1,320 million); the EC also reports that Austria has allocated EUR 288 million to Kyoto mechanism projects. Ireland has made an initial provision of EUR 20 million for the purchase of credits, which will be supplemented, as necessary, up to and throughout the commitment period. Portugal intends to reduce the distance to the Kyoto target of 3.7 $TgCO_2$ eq per year under a 'with additional measures' scenario by acquiring Kyoto units of 1.86 $TgCO_2$ eq annually, leaving to the operators of the EU ETS an emission reduction effort of 1.87 $TgCO_2$ eq per year.

125. While the Government of the United Kingdom does not allocate funds for acquiring emission credits, it estimated that around EUR 1 billion is available in private finance funds for such acquisitions. Table 3 provides a summary of the planned use of Kyoto mechanisms, including credits generated through the CDM and JI and allocated financial resources as reported by Parties.

126. At the international level, most of the Annex I Parties have supported the setting up of **regional and global carbon funds and facilities** to acquire carbon credits from Kyoto mechanisms. Examples include the Prototype Carbon Fund, the Pan-European Carbon Fund and the Green Investment Scheme of the World Bank, the CDCF and the European Carbon Fund as well as the Baltic Sea Region Energy Co-operation (BASREC) testing ground for JI.

127. Non-EIT Annex I Parties are at **different stages of preparation for using the Kyoto mechanisms** to meet their emission reduction commitments. A few Parties that expect to use such mechanisms to meet a considerable part of their emission reduction commitments; (Austria Ireland, Japan, the Netherlands, Portugal and Spain), are at an advanced stage of implementation. Japan for example stressed the need to initiate activities relating to the utilization of the Kyoto mechanisms as early as 2005 to ensure the necessary quantity of Kyoto units and the environmental quality of the CDM and JI projects. Other Parties, Belgium for example, are in the process of initiating relevant activities. Canada reported that it does not currently have a plan to include international purchases under the Kyoto mechanisms in its efforts to reduce GHGs.

Table 3. Planned use of Kyoto mechanisms and allocated financial resources

Party	Planned annual use of Kyoto units, $TgCO_2$ eq	Allocated financial resources for 2008–2012	Comment
Austria	7.0	EUR 289 million	
Belgium	8.59	NA	Estimate includes use of all the Kyoto mechanisms
Canada	NA	NA	The Government of Canada does not currently have a plan to include international purchases under the Kyoto mechanisms
Denmark	4.5	EUR 152 million (1 130 million Danish kroner)	Financial resources are allocated for 2003–2008
EC	106	EUR 2.7 billion	Includes financial resources allocated by the EU member States and estimated amount of credits
Finland	2.4	NA	The Government of Finland is prepared to finance acquisition of up to 10 $TgCO_2$ eq Kyoto units between 2008 and 2012
France	15.7	NA	France gives a clear preference to domestic measures. Plans to use the CDM and JI and to acquire around 16Mt Kyoto units
Ireland	3.7	EUR 20 million	An initial provision of EUR 20 million for the purchase of credits has been made by the Government of Ireland and will be supplemented, as necessary, up to and throughout the commitment period
Italy	16–20	EUR 1 320 million	The target for government use of the project-based mechanisms is 100 $TgCO_2$ eq over the 2008–2012 commitment period. Credits from additional JI/CDM project activities: 16 $TgCO_2$ eq per year
Japan	20	NA	Plans mainly refer to the use of credits from JI and the CDM
Liechtenstein	NA	NA	The distance to the Kyoto target is currently about 0.025 $TgCO_2$ eq annually, or about 0.125 $TgCO_2$ eq for the period 2008–2012
Monaco	NA	NA	
Netherlands	20	EUR 606 million	Plans cover the use of credits from the CDM and JI, and allowances under Article 17. Further domestic measures could reduce planned use of Kyoto mechanisms
New Zealand	NA	NA	The exact balance between domestic action and the Kyoto mechanisms use was not known at the time of NC4 preparation
Norway	10	NA	Indicated an intention to use the Kyoto mechanisms
Portugal	1.86		Included 1.86 $TgCO_2$ eq per year for acquisitions of Kyoto units, and another 1.87 $TgCO_2$ eq per year through the EU ETS
Slovenia	NA	NA	Slovenia will achieve its Kyoto Protocol target by implementing domestic measures, through using the Kyoto mechanisms and by including the CO_2 removals through an increase of wood biomass
Spain	20	EUR 205 million	Created the Ibero-American Climate Change Bureau Network. Plans to invest in projects located in Latin America and 15 memorandums of understanding have been already signed with Latin American countries and Morocco. The largest share of funds has been invested in World Bank carbon funds and The Spanish Carbon Fund
Sweden	1	EUR 19 million (174 million Swedish kronor)	Sweden can meet its Kyoto goal without the use of the Kyoto units. Yet it has already allocated resources for the first commitment period for acquisition of Kyoto units through the Swedish International Climate Investment programme, as well as EUR 4 million in the Testing Ground Facility and EUR 10 million in the World Bank PCF
Switzerland	1.6	NA	The Kyoto mechanisms are considered as an instrument primarily for the private sector. The major buyer of certificates in Switzerland is expected to be the Climate Cent Foundation

Abbreviations: CDM = clean development mechanism, JI = joint implementation, NC4 = fourth national communication, EU-15 = the 15 member States of the European Union before 2004, EU ETS = European Union emission trading scheme.
Note: (1) All Annex I Parties not included in this table, as well as Sweden and France expect to meet their Kyoto Protocol target without the use of the Kyoto mechanisms; (2) Data from several Parties including Italy are from the EC NC4.

128. A number of non-EIT Annex I Parties that are projected to meet their targets with currently implemented domestic measures (France, Germany, Iceland, Sweden and the United Kingdom*)* or with additional domestic measures (Greece) are also preparing to participate in the Kyoto mechanisms. In the interest of advancing international cooperation, Sweden has already contributed 350 million Swedish kronor between 1997 and 2004 for relevant activities,

including CDM activities, JI and activities implemented jointly (AIJ). The United Kingdom has decided not to adopt domestic JI programme, but has already approved participation in the CDM for a range of United Kingdom companies. The United Kingdom emphasizes afforestation and reforestation projects under the CDM as a means to contribute to sustainable development in developing countries. Greece is exploring possibilities to use JI and the CDM, but has not yet committed financial resources for related activities.

129. Most of the **EIT Parties reported on advancing their efforts in preparing JI projects**, which in many cases, for example the Czech Republic, build upon the experience of the pilot phase of AIJ. The early experience with AIJ and JI helped Parties to build capacity to implement these projects. This includes finding ways to address the administrative and financial barriers for these projects and to minimize the transaction costs especially for small-scale JI projects. Priority areas for implementation of JI projects in EIT countries usually correspond to the areas where significant mitigation potential has been identified through national climate change programmes, including the use of renewable energy, development of energy savings in buildings and industry, and utilization of landfill gas for energy and sustainable transport. Most of the EIT Parties reported on their progress in setting up the regulatory framework to implement JI projects and emissions trading under Article 17, for example Bulgaria, Romania, the Russian Federation and Ukraine.

130. In terms of expected emission reductions from JI, the Russian Federation reported on 27 JI projects being at an early stage of implementation in 2006 with an expected emission reduction of 32.5 $TgCO_2$ eq between 2008 and 2012, which represents 0.3 per cent of the annual emissions of the Russian Federation. Ukraine identified a number of possibilities for JI that could reduce emissions by 80 $TgCO_2$ eq annually and would require total investments of EUR 15 billion. Romania reported that 15 JI projects are being approved which will lead to an emission reduction of 8.8 $TgCO_2$ eq between 2008 and 2012. The Czech Republic reported on 78 project plans being registered in the Ministry of the Environment, which promise emission savings estimated at 1 $TgCO_2$ eq annually.

131. Most countries stressed that the allocation for their emission trading schemes, including **emission trading under Article 17 of the Kyoto Protocol**, was yet to be decided at the time when the NC4 was prepared (1 January 2006). EU member States are required to submit proposed national allocation plans for the Kyoto commitment period by mid-2006 and the EC is expected to rule on these by the end of the year. In many cases, no clear distinction in terms of contribution to the Kyoto Protocol target was made between current emissions trading programmes, where the allocations for the second period of 2008–2012 are yet to be decided, and emissions trading by governments and legal entities under Article 17 of the Kyoto Protocol.

132. The United Kingdom referred to the continuity between its domestic emissions trading scheme implemented between 2002 and 2006 and its ongoing participation in the EU ETS. The EU ETS was seen as the most effective cost-efficient way to reduce emissions, as it allows reconciliation of the achievement of environmental objectives with the need to maintain competitiveness in the global market. In the Czech Republic concrete plans for participation in emissions trading during the commitment period have not yet been finalized, but in 2005 options to recycle the revenue from the sales by the Government of emission allowances into climate-friendly projects were under consideration.

B. National legislative arrangements and administrative procedures for the contribution of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

133. LULUCF activities envisaged under the Kyoto Protocol include: activities under Article 3, paragraph 3, (afforestation, reforestation and deforestation) and activities that Parties may elect under Article 3, paragraph 4, (forest management, cropland or grazing-land management and re-vegetation). Information on the contribution of the activities under Article 3, paragraphs 3 and 4, to meeting the Kyoto Protocol targets were provided by several Parties, such as Austria, Belgium, Denmark, the EC, Italy, Ireland, Japan, the Netherlands, New Zealand, Portugal, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

134. In several Parties the decision to use activities under Article 3, paragraphs 3 and 4, was yet to be taken at the time when the NC4 was published. For example, Japan plans to use around 48 $TgCO_2$ in net removals resulting from forest management activities (which accounts for 3.9 per cent of its base year emissions) to meet its Kyoto target. Norway noted considerable uncertainties associated with the reporting on activities under Article 3, paragraph 3, and estimated zero effect from these activities in its current scenario. In Sweden, activities under Article 3, paragraph 3, are expected to result in a net source of emissions; however, when the effect of elected activities under Article 3, paragraph 4, are added to the effect of those under Article 3, paragraph 3, the overall effect is a net sink.

135. Switzerland aims to achieve a maximum contribution from forest management of up to 1.8 $TgCO_2$ annually to meeting the Kyoto Protocol target, but no specific estimates of such a contribution were provided. The United Kingdom decided not to use activities other than forest management under Article 3, paragraph 4, for its Kyoto Protocol accounting in view of the high uncertainties associated with them.[21]

136. The afforestation programme of Ireland will play an important role in carbon sequestration during the first and any subsequent carbon reporting periods under the Kyoto Protocol. The average rate of sequestration for the first commitment period under Article 3, paragraph 3, is expected to be around 2.074 $TgCO_2$ per annum. Italy plans to use forest management and expects significant emission removal thereof. Portugal intends to consider forest management, cropland management and grazing land management activities under Article 3, paragraph 4, of the Kyoto Protocol and estimates the sinks capacity from these activities at about 1.3 $TgCO_2$ in 2010.

137. Most Parties referred to the role of government policies and programmes in the **promotion of sustainable forest and agricultural activities**. For example, Latvia, through the goals defined in its forest policy, plans to increase its share of forest land to up to 48–52 per cent of Latvia's territory within the next 20–25 years, corresponding to an increase in CO_2 removals. In Germany, assistance is provided for a number of forestry measures designed to increase the stability of forests; such activities have resulted in an increase in the net removal of GHGs from –28.2 $TgCO_2$ (1990) to –35.8 $TgCO_2$ (2004).

138. **Several Parties did not provide information on the use of LULUCF activities or did not estimate possible effects**, e.g. Greece and Hungary. The Netherlands noted that the implementation of activities under Article 3, paragraph 3, contributes to the conservation of

[21] The United Kingdom intends to use all CO_2 emissions from the LULUCF sector to account for the progress made in achieving its domestic goal (20 per cent reduction in emissions in the first commitment period relative to 1990).

biodiversity and the sustainable use of natural resources, but did not quantify the impact. Belgium does not expect net removal from activities under Article 3, paragraph 3.

C. Domestic policies and measures as a significant part of the overall effort to attain the Kyoto Protocol target (supplementarity)

139. Many Parties stressed their commitment to ensuring that **domestic policies and measures, including activities aimed at enhancing removals by sinks, comprise a significant part of their overall effort to meet the Kyoto Protocol target**. This approach is in line with the general rule that domestic effort should constitute a significant element of the effort made by each Party to achieve its Kyoto Protocol target, also known as the principle of supplementarity.

140. **The Parties approach the principle of supplementarity in two different ways**. The first one is based on the difference between projected emissions in 2010 (representing the average emission levels for the first commitment period) and emission levels according to their Kyoto Protocol targets. The second is based on the difference between the base year emissions and the Kyoto Protocol target. In both cases, Parties considered how this difference, sometimes called 'the Kyoto shortfall' or 'distance to the Kyoto target', is expected to be covered by domestic measures, acquisition of Kyoto units and credits from LULUCF activities.

141. After the EU Linking Directive which came into force in 2004, the precise determination of the contribution of the domestic effort in the overall effort to attain the Kyoto Protocol target by Parties became more difficult. This Directive gives EU member States access through the EU ETS to emission credits from the CDM and JI to be used for compliance purposes. The requirement to set an upper limit on the use of credits from project-based mechanisms for the second phase of the EU ETS may help Parties ensure that the principle of supplementarity to balance the use of the Kyoto mechanisms with domestic action is fully taken into account.

142. In addition, as noted by Switzerland, companies covered by the national climate change law (CO_2 Act) are given the possibility to comply with the target that is allocated to them through the national and international carbon market, with a national cap for the use of the Kyoto units set at 0.4 Mt annually.[22] This also adds an element of uncertainty to the precise determination of how significant the domestic effort is to the overall effort to attain the Kyoto Protocol target.

143. Notwithstanding these uncertainties, **practically all Parties that will use Kyoto mechanisms expect domestic policies to contribute significantly to the overall effort to attain the Kyoto Protocol target.** Japan, for example, expects that according to its recent 'with measures' scenario, the difference between projected emission levels and the Kyoto Protocol target will be 12 per cent. It expects that additional measures will bring the emissions down by 6.5 per cent, activities under Article 3, paragraphs 3 and 4, will contribute another 3.9 per cent and the remaining 1.6 per cent will be covered by acquisitions of Kyoto units. Altogether, Japan expects that domestic policies and measures, including LULUCF activities, will contribute to 86 per cent of its mitigation effort, which is a significant percentage of its overall effort to achieve the target.

144. The Netherlands expects that according to its 'without measures' scenarios (in fact it includes measures implemented before 2000 with a total effect of 26 $TgCO_2$ eq), the difference

[22] Companies are also restricted in the amount they can acquire externally.

between projected emission levels and the Kyoto Protocol target will be around 40 $TgCO_2$ eq or around 20 per cent of the base year emissions. It expects measures implemented since 2000[23] according to the 'with measures' scenario to bring emissions down by around 10 per cent and an additional 2.5 per cent to come from additional measures (see table 2). The Netherlands has already allocated financial resources to acquire around 20 $TgCO_2$ eq Kyoto units annually; this will more than offset the 15 $TgCO_2$ eq or 7.5 per cent that remains to reach the Kyoto Protocol target. The Russian Federation and Ukraine also mentioned that the emission reductions to be achieved through domestic measures are far greater than the expected emission reductions coming from JI projects.

145. Looking across reporting Parties to take into account the effect of measures already implemented, **the effect stemming from domestic measures outweighs the effect of possible acquisition of Kyoto units in the overall effort to meet the Kyoto Protocol target**. In the near term, maintaining the pressure for domestic emission reduction could also be important in keeping prices on the Kyoto market stable.

VII. Information under Articles 10 and 11 of the Kyoto Protocol

A. Transfer of technology and capacity-building

146. According to the reporting guidelines, Annex I Parties shall report on the steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention, in order to facilitate the implementation of Article 10 of the Kyoto Protocol. The following focuses on the provisions of Article 10 relating to technology transfer and capacity-building.

1. Technology transfer

147. All the reporting Annex II Parties provided information on steps taken to promote, facilitate and finance the transfer of environmentally-sound technologies (EST) and know-how to developing countries. Almost all Annex II Parties provided examples of technology transfer programmes and projects. The majority of these programmes and projects were in the **energy sector**, particularly in the areas of **energy efficiency improvement and utilization of renewable energy sources**.

148. **Partnerships between key stakeholders** are increasingly being seen by many Parties as a centrepiece for enhancing the transfer of technologies. Some of the **multilateral partnerships** reported by the Parties aim to increase the deployment of technologies through capacity-building, removing barriers and the use of innovative financial instruments. Other multilateral partnerships try to foster international cooperation in the accelerated development and diffusion of technologies and practices. **Bilateral partnerships** reported by the Parties focus on technology development and deployment at regional, national and municipal levels, and also at sectoral and technology-specific levels (for examples see FCCC/SBI/2007/INF.6/Add.2).

149. Few Parties reported on policies and programmes for the transfer of ESTs that are publicly owned or in the public domain. In this context some Parties referred to **joint research**

[23] The Netherlands associates measures implemented after 2000 with its effort to implement commitments under the Kyoto Protocol. This allows a clear distinction to be made between the effects attributed to measures implemented under the Convention (measures before 2000) and those under the Protocol (after 2000).

and development programmes as a way to enhance the transfer of publicly owned technologies to developing countries.

2. Role of the private sector in technology transfer

150. Many Annex II Parties highlighted the **important role of the private sector** in enhancing the transfer of technologies to developing countries. Many Annex II Parties provided information on policies and programmes aimed at providing **market incentives to involve the private sector** in projects and programmes relating to the transfer of technologies to developing countries (for examples, see FCCC/SBI/2007/INF.6/Add.2).

151. Among the initiatives reported by the Parties in **facilitating private sector participation** in the transfer of ESTs, the following categories can be identified: public–private partnerships; financial incentives for projects and programmes (grants, soft loans, export credit guarantees, equity investments and venture capital); financing and business development services in developing countries; networking and matchmaking between enterprises in industrialized countries and enterprises in developing countries; support for investment promotion activities (market studies, feasibility studies and on-the-job training); promoting technology transfer to developing countries (clean energy information systems, and trade missions); and assistance to governments in developing countries in creating enabling environments to ensure that private businesses can operate in a regulated market.

3. Capacity-building

152. For many Parties capacity-building forms an **integral part of climate change policies and programmes**. Almost all Parties included a separate section on capacity-building in their NC4 and other Parties reported capacity-building in their bilateral projects (for examples see FCCC/SBI/2007/INF.6/Add.1).

153. The fields of activity which received most support are: **human and institutional development** (exchange of information on methodological aspects and strengthening of administrative capacity, particularly with regard to the preparation of national adaptation programmes of action (NAPAs), GHG inventories, projects to be submitted to the Global Environment Facility (GEF) and CDM projects, and strengthening the capacity of the host countries to participate in the carbon market); **environmental management and policy development** (implementation of new legislation and systems for environmental inspection and statistics; preparation and implementation of national environmental strategies and plans; and mainstreaming climate change into national strategies); **training and education** (energy planning; promotion of energy efficiency, renewable energy and sustainable agriculture and forest management; climate change risk management; environmental administration; planning and land use; and hydrological and meteorological services); **adaptation to climate change** (disaster prevention; water resources management; forest resources management; river management and national land development); **research and scientific technological cooperation (**climate change monitoring and response programmes); and **knowledge sharing** (support for participation of representatives from Parties not included in Annex I to the Convention in conferences, meetings and workshops).

154. Most Parties helped to: develop in the host countries the institutions required for CDM and JI implementation, including the establishment and enhancement of CDM **designated national authorities** to provide support for the development of the required legal frameworks for the CDM and JI and advise on drawing up national CDM and JI strategies; develop human capacity of potential project developers through training and workshops; facilitate the sharing

of experiences in methodological aspects of CDM projects; and conduct CDM and JI feasibility studies.

155. One example of such a capacity-building activity is the Capacity Development for the Clean Development Mechanism (**CD4CDM**) programme, implemented by the United Nations Environment Programme with the support of the Government of the Netherlands. It aims at generating broad understanding of the opportunities offered by the CDM and developing the institutional and human capabilities to implement CDM projects. Twelve countries, in four developing regions, participated in the project.

B. Provision of financial resources

156. Article 11 of the Kyoto Protocol requires the developed country Parties and other developed Parties included in Annex II to the Convention to provide in accordance with the provisions of Article 4, paragraph 3, and Article 11 of the Convention:

(a) **New and additional financial resources** to meet the agreed full costs incurred by developing country Parties in advancing the implementation of existing commitments under Article 4, paragraph 1(a), of the Convention that are covered in Article 10, subparagraph (a), of the Kyoto Protocol;

(b) Financial resources, including for the **transfer of technology**, which are needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention, that are covered by Article 10 of the Kyoto Protocol.

157. These financial resources for the implementation of Article 10 of the Kyoto Protocol could be provided through **bilateral, regional and other multilateral channels**. Given the cross-reference between Article 4 of the Convention and Article 10 of the Protocol, Parties do not necessarily make a clear distinction between the financial support provided under the Convention and under the Kyoto Protocol; in compiling information, the secretariat has followed the approach taken by Parties. This chapter of the report provides an overview of the information reported by Parties; more detailed information can be found in document FCCC/SBI/2007/INF.6/Add.2.

158. All reporting Annex II Parties provided information on financial assistance provided to developing countries. This includes information on their financial contribution to **multilateral institutions** (such as regional development banks and intergovernmental organizations) and programmes and on **bilateral and regional financial contribution**. Most Parties (Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom) reported on their contributions to the **GEF**. Several Parties have also reported on their contributions to the **Special Climate Change Fund** (SCCF) (Ireland, Italy, Norway, Portugal, Sweden and Switzerland) and the **Least Developed Country Fund** (LDCF) (Denmark, Finland, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden and Switzerland).

159. Several Annex II Parties declared at the seventh session of the COP that they would collectively contribute USD 410 million a year in extra funding for developing countries by 2005, with this level to be reviewed in 2008. Many Parties (Finland, France, Ireland, Netherlands, New Zealand, Norway, Portugal, Sweden and Switzerland) emphasized that they have provided financial assistance to developing countries in accordance with this commitment, but only some of them provided exact amounts. However, owing to the differences in reporting

information on financial assistance, it is difficult to discern clear trends in the overall amounts of new and additional financial resources provided for climate change.

160. Financial assistance has been provided in a variety of **sectors** to support adaptation and mitigation activities as well as cross-cutting issues such as strengthening of institutional capacity and environment protection.

161. In the area of **mitigation**, support was provided for projects and programmes aimed primarily at promoting renewable energy technologies and supply, followed by transport, energy efficiency in industry and efficient building practices.

162. In the area of **adaptation**, support was provided mainly for the preparation of adaptation strategies and plans and raising awareness on adaptation, followed by water management, disaster preparedness, climate observation and warning systems. Some Parties also referred to projects relating to the protection of marine coastal areas and flood control (Finland) and adaptation in semi-arid areas (Switzerland). Assistance for forestry and agriculture activities (Belgium, EC, Finland and Netherlands) and land-use planning and monitoring (Czech Republic and Slovakia) are examples of cross-cutting support for both adaptation and mitigation.

163. Several Parties also reported **on support specifically aimed at facilitating the implementation by developing countries of the Kyoto Protocol**, in particular financial assistance provided for the promotion of and participation in the CDM (France, Ireland and Italy). A number of Annex II Parties (Greece, Netherlands, Switzerland and United Kingdom) also provided information about assistance to the EIT Parties, in particular to enable these Parties to participate in the Kyoto Protocol, and particularly in JI.

164. Parties also reported on financial assistance for other issues relating to climate change, such as the protection of the environment (Belgium, Canada, EC, Italy, Japan, and Spain), economic infrastructure and services (EC), regional cooperation among decision makers (Spain) and funding for participants at sessions of the COP, the CMP and the subsidiary bodies of the UNFCCC (Belgium, Denmark, Norway, Sweden, Switzerland and United Kingdom).

165. In providing information on financial assistance for climate change activities, most Parties stressed the need to consider climate change in the broader context of development assistance. In particular, they referred to the challenge of considering resources provided for climate change purposes in isolation from general development assistance, given that (i) it is difficult to track the share of the contribution to multilateral institutions and programmes allocated to climate change related activities and programmes and (ii) bilateral and regional financial contributions are increasingly provided to sectors such as health, education and agriculture, or directly to a government's central budget through direct budget support.

C. Information on other commitments under Article 10, of the Kyoto Protocol

166. A few Parties explicitly referred to supplementary information under Article 7, paragraph 2, of the Kyoto Protocol on other commitments under Article 10, such as commitments relating to cooperation on research and systematic observation, and on education and training. In most of these cases, Parties made references to the relevant sections in the NC4 and RDP.

167. As indicated in document FCCC/SBI/2007/INF.6 and Add.2, almost all Parties participate actively in and contribute to joint international and/or regional research programmes, projects or networks on climate change. Monitoring of climate change and related

parameters is also firmly embedded in international activities for the majority of Parties, including the sharing of data internationally with relevant centres under the World Meteorological Organization and related networks, and maintenance of observation networks. A number of Parties explicitly highlighted how they contribute to observation systems and research capacity in climate change in developing countries.

168. Some Parties reported on their international and cooperative activities in the area of education, training and public awareness at the regional and international levels. Activities mentioned include funding of bilateral and regional activities that focus on capacity-building; providing financial and technical support to programmes encompassing activities in education; initiating and participating in information networks; and research and training.

VIII. References to the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

169. All reporting Parties have provided **supplementary information under Article 7, paragraph 2**, in accordance with decision 15/CMP.1. Most of this information was provided in the RDPs; however, information on both policies and measures in accordance with Article 2 and financial resources was provided in more detail in the NC4s. Table 4 indicates where this supplementary information was reported by individual Parties, including RDPs, NC4 and NIRs. Providing a reference to the source of reported information is an approach that is similar to the one followed in conducting reviews of the RDPs and NC4 of individual Parties.

170. Many Parties have provided some information on their **national systems** and **national registries**. However, at the time of publication of the NC4 and RDPs, the registry systems under the Kyoto Protocol were still under development. Therefore, most Parties provided detailed information on their national registries only in their initial reports under the Kyoto Protocol that were due by 1 January 2007 (see also chapter II above).

171. All reporting Parties provided information on how the **use of the mechanisms is supplemental to domestic action**, and how their domestic action thus constitutes a significant element of the efforts made to meet the Kyoto Protocol targets. A few Parties, such as Switzerland, explicitly made reference to the concept of supplementarity. Most of the Parties provided an analysis of the contribution of domestic policies and measures and the use of the Kyoto mechanisms (see also chapter VI. C).

172. All Parties reported detailed information on their **domestic policies and measures** to mitigate GHG emissions under Article 2 (see chapter III above). Information on steps taken to limit emissions from aviation and marine bunker fuels and on ways to minimize of adverse effects of the implementation of policies and measures under Article 2 was mostly included in the sections on policies and measures (see also chapter III. C above).

173. Supplementary information on **financial resources, technology transfer and capacity-building** was provided by all reporting Annex II Parties. The Czech Republic and Poland also provided information on their development assistance in the context of climate change.

Table 4. Location of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, as reported by Parties

Parties	National system	National registry[a]	Supplementarity[b]	Article 2 policies and measures	Domestic programmes and arrangements	Article 10 information	Financial resources
Austria	RDP (4.1)	NA	RDP(3)	RDP(1, 3), NC4(4)	RDP(1)	RDP(4)	RDP(4.7), NC4(7)
Belarus	RDP (5.1), NC4 (2.2)	NA	RDP(4)	RDP(2), NC4(3)	RDP(2)	RDP(5)	EIT
Belgium	RDP (4)	NA	RDP(3)	RDP(1, 3), NC4(4)	RDP(1)	RDP(4)	RDP(4), NC4(7)
Bulgaria	RDP (4)	NA	RDP(3)	RDP(1, 3), NC4(4)	RDP(1)	RDP(4)	EIT
Canada	RDP (4)	NA	RDP(3)	RDP(1, 3), NC4(4)	RDP(1)	RDP(4)	RDP(4), NC4(7)
Czech Republic	RDP (5.1)	NA	RDP(4)	RDP(2), NC4(4)	RDP(2)	RDP(5)	RDP(5.6), NC4(7)
Denmark	RDP (5), NC4 (3.4)	NC4(4.6)	RDP(4), NC4(4.6)	RDP(2), NC4(4, 4.6)	RDP(2.1), NC4(4.6)	RDP(5), NC4(4.6)	RDP(5), NC4(7)
Estonia	NA	NA	RDP(3)	RDP(1, 3), NC4(4)	RDP(1)	RDP(4)	EIT
European Community	RDP (A.4.1)	NA	RDP(A.3)	RDP(A.1.2), NC4(3)	RDP(A.1)	RDP(A.4)	RDP(A.4.4), NC4(6)
Finland	RDP(5.1), NC4 (3.1)	NA	RDP(4)	RDP(2), NC4(4)	RDP(2.1)	RDP(5)	NC4(7)
France	RDP(4.1)	NA	RDP(3)	RDP(1, 3), NC4(3)	RDP(1)	RDP(4)	RDP(4.5), NC4(6)
Germany	RDP(5.1)	NA	RDP(4)	RDP(2), NC4(4)	RDP(2)	RDP(5)	RDP(5.5), NC4(7)
Greece	RDP(5.1)	NA	RDP(4)	RDP(2, 4), NC4(3)	RDP(2)	RDP(5)	RDP(5.3), NC4(6)
Hungary	RDP(5.1)	NA	RDP(4)	RDP(2, 4), NC4(5)	RDP(2)	RDP(5)	EIT
Iceland	RDP(4.1)	NA	RDP(3)	RDP(1, 3), NC4(3)	RDP(1)	RDP(4)	RDP(4.3), NC4(6)
Ireland	RDP(4.4)	NA	RDP(3)	RDP(1, 3), NC4(3)	RDP(1)	RDP(4)	RDP(4.3), NC4(6)
Italy (no NC4)	RDP(4.2)	RDP(4.3)	RDP(3)	RDP(1)	RDP(1.1)	RDP(4)	RDP(4.8)
Japan	RDP(4.1), NC4 (2)	NC4(3.3)	RDP(3), NC4(4)	RDP(1), NC4(3)	RDP(4.2), NC4(3)	RDP(4), NC4(6)	RDP(4.3), NC4(6)
Latvia	RDP(5.1)	NA	RDP(4)	RDP(2), NC4(4)	RDP(2.1)	RDP(5)	EIT
Liechtenstein	RDP(5.1)	RDP(3.7)	RDP(4)	RDP(2), NC4(4)	RDP(2.1, 5.2)	RDP(5)	RDP(5.4), NC4(7)
Lithuania	RDP(5.1)	NA	RDP(4)	RDP(2), NC3&4(4)	RDP(2.1, 5.2)	RDP(5)	EIT
Netherlands	RDP(4.1)	NA	RDP(3)	RDP(1), NC4(5)	RDP(1.2)	RDP(4), NC4(7)	RDP(4), NC4(7)
New Zealand	NC4 (Annex C)	NC4(Annex C)	RDP(3), NC4(Annex C)	RDP(1), NC44, Annex C)	RDP(1), NC4 (Annex C)	RDP(4), NC4(8)	RDP(4), NC4(7)
Norway	RDP(5.1)	RDP(2.2)	RDP(4)	RDP(2), NC4(4)	RDP(2.1,2.10)	RDP(5), NC4(8)	RDP(5), NC4(8)
Poland	RDP(4.1)	NA	RDP(3)	RDP(1), NC4(4)	RDP(4.2)	RDP(4), NC4(7.2)	RDP(4.5), NC4(7.1)
Portugal	RDP(3.1)	NA	RDP(2.3)	RDP(1), NC4(3)	RDP(1.1)	RDP(3), NC4(6)	RDP(3.4), NC4(6)
Romania	RDP(4)	RDP(4)	RDP(3)	RDP(1), NC4(4)	RDP(4)	RDP(4)	EIT
Russian Federation	NC4(4.3), RDP(4.1)	NC4(4.4), RDP(4.2)	NC4(4.2), RDP(3.3)	NC4(4), RDP(3)	NC4(4.1), RDP(3.3)	NC4(7), RDP(4)	EIT
Slovakia	RDP(4.1)	NA	RDP(3)	RDP(1.2), NC4(4)	RDP(1)	RDP(4)	EIT
Slovenia	RDP(4.1)	NA	RDP(3)	RDP(1), NC4(4)	RDP(1.1, 4.1)	RDP(4)	EIT
Spain	RDP(5.1)	NA	RDP(4)	RDP(2), NC4(4)	RDP(5.2)	RDP(5), NC4(7)	RDP(5.5), NC4(7)
Sweden	RDP(5.1)	NA	RDP(4)	RDP(2), NC4(4)	RDP(5.2)	RDP(5), NC4(7)	RDP(5.7), NC4(7)
Switzerland	RDP(4.1)	RDP(4.3)	RDP(3.4)	RDP(1), NC4(4)	RDP(4)	RDP(4), NC4(7)	RDP(4), NC4(7)
Ukraine (NC2)	NC2(3.1), RDP(1.1)	NC2(4.1), RDP(1.1)	NC2 (4.1), RDP(3),	NC2(4), RDP(1)	RDP(4)	NC2(7), RDP(4)	EIT
United Kingdom	RDP(4), NIR	NA	RDP(3.9), NC4(3)	RDP(1), NC4(3,6)	RDP(3)	RDP(4), NC4(6)	RDP(4), NC4(6)

Abbreviations: RDP = report demonstrating progress under the Kyoto Protocol, NC2 = second national, NC4 = fourth national communication, communication, NA = not available.
Note: (1) Information given in brackets after the source indicates the chapter or annex number; (2) Croatia and Monaco became Parties to the Kyoto Protocol on 28 August 2007 and 28 May 2006, respectively, and therefore did not have an obligation to report on supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in their NC4 (submission due date: 1 January 2006); (3) The abbreviation EIT in the column on financial resources indicates that the relevant Party with an economy in transition does not have an obligation to provide financial resources to developing countries under the Convention and the Kyoto Protocol.

[a] At the time of publication of NC4 and RDPs, the registry system under the Kyoto Protocol was still under development. Therefore, most Parties provided detailed information on their national registries only in their initial reports under the Kyoto Protocol that were due by 1 January 2007.

[b] Analysis of the contribution of domestic policies and measures and the use of Kyoto mechanisms.

IX. Conclusions

174. The Kyoto Protocol has been a major driver in **raising political attention** and in **enlarging and focusing government effort** on the early steps needed to address climate change in all Annex I Parties. **Significant progress has been made in organizing 'all of government' efforts** to address climate change: all reporting Parties have by now adopted **national climate change strategies with mitigation programmes** that span many, if not all, emission sources and sectors. Parties have also advanced noticeably in **establishing national systems for inventory preparation and national registries to support the implementation of the Kyoto Protocol**. Thus, action on climate change is manifested through **a variety of legislative arrangements and administrative procedures**, spanning a wide range of activities, sectors, actors and institutions within and outside governments.

175. As the first Kyoto Protocol commitment period draws nearer, and the pressure to counter upward pressure of economic growth on emissions trends intensifies, Parties have strengthened their national policy frameworks and extended the scope and stringency of their **climate and climate-related policies**. In their efforts to meet their targets, Parties are increasingly relying on harder (regulatory and economic) instruments over softer (voluntary) instruments, and on new and innovative instruments such as emissions trading to elicit needed emission reductions. Parties are also continuing to make extensive use of the relatively low-cost (i.e. more cost-effective) options of mitigating non-CO_2 emissions, and as a result, a relatively high proportion of emission reduction effects (relative to total emissions) are expected from policies and measures that address non-CO_2 gases.

176. In 2004, **overall emissions of Annex I Parties that are also Parties to the Kyoto Protocol were 15 per cent below 1990 levels**, as a result of a decline in emissions mostly in Annex I Parties with economies in transition, but also in some non-EIT Annex I Parties. However, emissions have been rising since 2000, as a result of more stable economic conditions, which might continue in the near future. **Policies and measures that were implemented in the 1990s and 2000s are already delivering substantial emission reductions**, most notably for non-CO_2 emissions from the industrial processes, waste and agriculture sectors, and for CO_2 emissions from energy supply and use in all sectors except for transport. These emission reductions helped to keep the growth of the overall emissions of Annex I Parties since 2000 at a moderate level of 2.9 per cent. Reversing the emission trends in the transport sector remains the main challenge for Annex I Parties. Significantly, more emission reductions are expected in the longer term by 2012 and beyond from policies that attach price to carbon and use market forces to ensure a shift towards more environmentally-friendly investments, in particular in the energy sector. The scale of these reductions will depend to a large extent on how effective the existing, adopted and planned policies will be in ensuring that the key technologies such as renewable energy, energy efficiency and advanced nuclear power increase market share.

177. Although emissions have been rising since 2000, **emission projections suggest that Annex I Parties as a group are expected to meet the overall reduction target of 5 per cent under the Kyoto Protocol** with existing measures. The overall Kyoto Protocol target is expected to be met even without the use of additional measures, LULUCF activities or the Kyoto mechanisms. More specifically, emissions in 2008–2012 are projected to be 10.8 per cent below the Kyoto Protocol base year levels with the current measures, and 13.6 per cent below these levels 'with additional measures'.

178. **As to the individual Annex I Parties,** about half of them, mostly EITs, but also five non-EIT Annex I Parties, have projected that they expect to meet their Kyoto Protocol targets under the 'with measures' scenario. One Party expects to meet its target using 'additional measures', and several Parties expect to meet the Kyoto Protocol targets 'with additional measures' and by using credits from LULUCF activities and Kyoto Protocol units.

179. **Some Annex I Parties face challenges in complying with their Kyoto Protocol targets**. To meet their targets, these Parties may further intensify their domestic emission reductions efforts and/or acquire more Kyoto units. Most of these and other Parties that are planning to use the Kyoto Protocol mechanisms are expecting to **adhere to the principle of supplementarity**. Consequently, they are expecting that domestic action will constitute the predominant element of the overall mitigation effort to comply with the Kyoto Protocol targets. EU-15 member States alone have already allocated financial resources of EUR 2.7 billion for the purchase of Kyoto units.

180. In implementing the Kyoto Protocol, **Annex I Parties have made the necessary legislative arrangements and put in place the relevant systems and administrative procedures**. In particular, to monitor and verify their compliance with Kyoto Protocol commitments, they have established **national systems** for preparing emission inventories and have advanced setting up **national registries** for tracking holdings and transactions of Kyoto units. They have also created a large portion of the **international institutions and rules** to implement the Kyoto mechanisms, emissions trading, JI and CDM activities, and the **market for Kyoto units is growing rapidly**. The creation of an emissions trading market within the EU has provided a valuable experience for the setting up of the international carbon market under the Kyoto Protocol.

181. **Annex I Parties have reported on their progress on a range of activities relating to the implementation of Articles 10 and 11 of the Kyoto Protocol, including on strengthening their cooperation with developing countries** on a number of issues, such as implementing measures to mitigate climate change and facilitate adaptation; development and transfer of ESTs; supporting capacity-building; promoting scientific and technical research and systematic observation; and advancing education, training and public awareness. This was substantiated by a number of examples provided by Annex II Parties on technology transfer programmes and projects. The majority of these programmes and projects were in the energy sector, particularly in the areas of energy efficiency improvement and utilization of renewable energy sources. Many Annex II Parties highlighted the important role of the private sector in enhancing the transfer of technologies to developing countries.

182. **Annex I Parties are also providing financial resources to the developing country Parties to advance the implementation of existing commitments** under Article 4, paragraph 1, of the Convention and Article 10 of the Kyoto Protocol, through the GEF, the Special Climate Fund and the LDCF. As with the financial support provided by Annex II Parties under the Convention, the Annex I Parties that are also Parties to the Kyoto Protocol stressed the need to consider climate change in the broader context of development assistance in order to foster the capacity of developing countries to attain their social and economic development objectives.

183. Supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol was reported by all Annex I Parties for the first time in their NC4. Since the reporting guidelines were adopted by the CMP in December 2005 and the NC4 were due by 1 January 2006, most of the NC4 do not contain a separate section on the required supplementary information. Some Parties enhanced transparency of their reporting by providing references to the required supplementary information under the Kyoto Protocol in their NC4, RDPs and NIRs.

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