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### Reports on other activities

**Report on the implementation of domestic action by Parties included in Annex I, as defined in Article 1, paragraph 7, of the Kyoto Protocol, based on the information reported in their national communications**

## **Report on the implementation of domestic action by Parties included in Annex I, as defined in Article 1, paragraph 7, of the Kyoto Protocol, based on the information reported in their national communications**

### Note by the secretariat

#### *Summary*

This report contains information relating to decision 5/CP.6, annex, chapter VI.1, paragraph 4, and is based on information contained in the sixth national communications from Parties and other relevant sources. More specifically, it contains information on the implementation of domestic action in accordance with national circumstances and on the progress in reducing emissions in a manner conducive to narrowing per capita differences between developed and developing country Parties while working towards the achievement of the ultimate objective of the Convention.

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## I. Introduction

### A. Mandate

1. In decision 15/CMP.1, paragraph 4, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) requested the secretariat to prepare a report relating to decision 5/CP.6, annex, chapter VI.1, paragraph 4, based on information contained in national communications from Parties and other relevant sources, for consideration by the Subsidiary Body for Scientific and Technological Advice. This report is to be prepared each time that the review process under Article 8 of the Kyoto Protocol relating to national communications and supplementary information from Parties included in Annex I is completed.

2. By decision 5/CP.6, annex, chapter VI.1, paragraph 4, the Conference of the Parties agreed that Parties included in Annex I shall implement domestic action in accordance with national circumstances and with a view to reducing emissions in a manner conducive to narrowing per capita differences between developed and developing country Parties while working towards the achievement of the ultimate objective of the Convention.

### B. Scope and approach

3. This report was prepared in response to the above-mentioned mandate. Parties covered in this report include both Parties included in Annex I, as defined in Article 1, paragraph 7, of the Kyoto Protocol,<sup>1</sup> and Parties not included in Annex I to the Convention that are also Parties to the Kyoto Protocol (Parties not included in Annex I).<sup>2</sup> Chapter II discusses the trends in total aggregate greenhouse gas (GHG) emissions of Parties included in Annex I as well as relevant factors underlying these trends, including the effects of domestic action. Chapter III provides an overview of domestic action implemented by Parties included in Annex I in accordance with their national circumstances. Although the relevant paragraph of decision 5/CP.6 refers to domestic action only, this paragraph is in a section on mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol. Therefore, chapter III also provides an overview of domestic action in the broader context of Kyoto Protocol targets, which includes the use of Kyoto Protocol mechanisms. Chapter IV compares trends in per capita carbon dioxide (CO<sub>2</sub>) emissions of Parties included in Annex I and Parties not included in Annex I.<sup>3</sup> The annex contains background information based

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<sup>1</sup> For Kazakhstan, the Kyoto Protocol entered into force on 17 September 2009. In accordance with Article 1, paragraph 7, of the Kyoto Protocol, Kazakhstan is considered a Party included in Annex I for the purposes of the Kyoto Protocol (FCCC/KP/CMP/2009/21, para. 91).

<sup>2</sup> Decision 5/CP.6, annex, chapter VI.1, paragraph 4, refers to per capita differences in emissions between developed and developing countries. As definitions or lists of such countries are not available, this report uses the lists of Parties included in Annex I and Parties not included in Annex I for that purpose.

<sup>3</sup> Owing to data limitations, the report does not cover the following Parties not included in Annex I: Antigua and Barbuda, Bahamas, Barbados, Belize, Bhutan, Burkina Faso, Cabo Verde, Central African Republic, Chad, Comoros, Cook Islands, Djibouti, Dominica, Equatorial Guinea, Fiji, Gambia, Grenada, Guinea, Guinea-Bissau, Guyana, Kiribati, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Marshall Islands, Mauritania, Micronesia (Federated States of), Nauru, Niger, Niue, Palau, Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Sao Tome and Principe, Seychelles, Sierra Leone, Solomon Islands, Somalia, Suriname, Swaziland, Timor-Leste, Tonga, Tuvalu, Uganda and Vanuatu.

on the GHG inventories submitted in 2014 by Parties included in Annex I<sup>4</sup> and on International Energy Agency (IEA) statistical data.<sup>5</sup>

4. Information sources used include the 42<sup>6</sup> sixth national communications (NC6s) submitted by March 2015 and their respective in-depth review (IDR) reports. Data used for reporting the most recent total aggregate GHG emission trends and CO<sub>2</sub> emission trends of Parties included in Annex I are from the 2014 national GHG inventory submission. When comparing per capita CO<sub>2</sub> emissions of Parties included in Annex I and Parties not included in Annex I, the data of the IEA were used for both population and CO<sub>2</sub> emissions data.<sup>7</sup>

## II. Greenhouse gas emission trends of Parties included in Annex I and relevant factors underlying these trends

5. This chapter examines the GHG emission trends of Parties included in Annex I as well as trends in CO<sub>2</sub> emissions from fuel combustion. In addition, it discusses some of the effects of the implementation of domestic measures on GHG emissions.

### A. Total aggregate greenhouse gas emission trends

6. The information included in this section is based on data reported by Parties included in Annex I in their 2014 national GHG inventory submissions,<sup>8,9</sup> which contain GHG emissions data up to and including 2012. Figure 1 presents the total aggregate GHG emission trends of Parties included in Annex I excluding and including emissions and removals from land use, land-use change and forestry (LULUCF), as well as the disaggregation of these trends into trends in GHG emissions excluding LULUCF from Parties included in Annex I that have economies in transition<sup>10</sup> (EIT Parties) and those that do not have economies in transition (non-EIT Parties). It also shows the total CO<sub>2</sub> emissions from fuel combustion of Parties included in Annex I.

7. **From 1990 to 2012, total aggregate GHG emissions excluding emissions/removals from LULUCF for all Parties included in Annex I decreased by 18.6 per cent,<sup>11</sup> from 12,454.49 to 10,143.84 Mt of carbon dioxide equivalent (CO<sub>2</sub> eq). Total aggregate GHG emissions including LULUCF decreased by 26.0 per cent, from 12,228.77 to 9,050.83 Mt CO<sub>2</sub> eq. During the same period, the total aggregate GHG emissions excluding LULUCF of EIT Parties decreased by 36.3 per cent, while those of**

<sup>4</sup> Available at <<http://unfccc.int/8108.php>>.

<sup>5</sup> International Energy Agency web data services. Available at <<http://data.iea.org/IEASTORE/DEFAULT.ASP>>.

<sup>6</sup> This includes Turkey, which submitted its fifth national communication on 17 December 2013.

<sup>7</sup> International Energy Agency web data services. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <<http://data.iea.org/IEASTORE/DEFAULT.ASP>>.

<sup>8</sup> The greenhouse gas emission data presented in this report differ slightly from those presented in the 2014 compilation and synthesis of supplementary information incorporated in sixth national communications from Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol (FCCC/SBI/2014/INF.21) since they were retrieved a year later, in 2015.

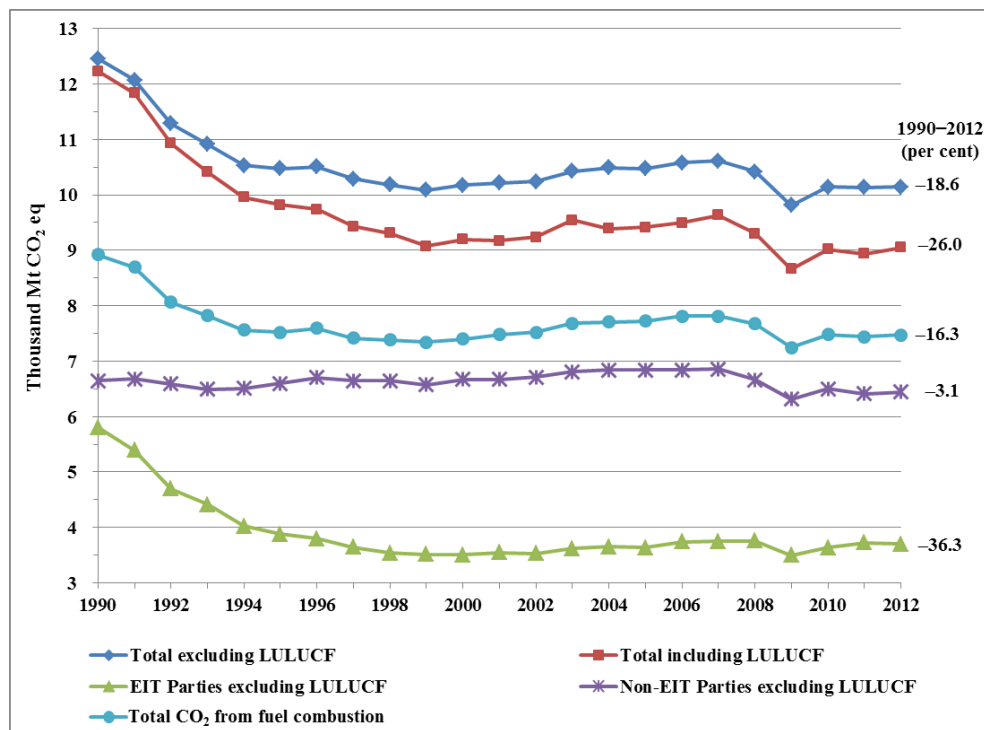
<sup>9</sup> Individual Party data were retrieved from <<http://unfccc.int/8108.php>> on 5 May 2015. See also document FCCC/SBI/2014/20.

<sup>10</sup> Under the Kyoto Protocol, Parties with economies in transition include Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Romania, the Russian Federation, Slovakia, Slovenia and Ukraine.

<sup>11</sup> All percentage changes in emissions given in this chapter were calculated using exact (not rounded) values and may therefore differ from the ratios calculated with rounded numbers provided elsewhere in this report.

non-EIT Parties decreased by 3.1 per cent. More information on individual non-EIT Parties is provided in figure 3.

Figure 1  
Greenhouse gas emissions from Parties included in Annex I



Source: National greenhouse gas inventory submissions for 2012. Available at <[http://unfccc.int/ghg\\_data/ghg\\_data\\_unfccc/items/4146.php](http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php)>.

Abbreviations: EIT Parties = Parties with economies in transition, LULUCF = land use, land-use change and forestry, non-EIT Parties = Parties that do not have economies in transition.

8. **Four phases can be identified from figure 1** in the total aggregate GHG emissions trends excluding and including LULUCF: 1990–1999, 1999–2007, 2007–2009 and 2009–2012. **Decreases in GHG emissions essentially occurred during 1990–1999**, with a 19.0 per cent decrease excluding LULUCF and a 25.8 per cent decrease including LULUCF. These decreases were mainly due to the significant drop in GHG emissions (excluding LULUCF) from EIT Parties (39.5 per cent), largely reflecting a drop in CO<sub>2</sub> emissions from fuel combustion, which can in turn be attributed to the decline in economic output in the early to mid-1990s, followed by economic restructuring and replacement of a number of carbon-intensive technologies by more energy-efficient technologies. Over the 1990–1999 period, the gross domestic product (GDP) of EIT Parties and non-EIT Parties changed by -27.9 per cent and 18.8 per cent, respectively. Altogether, the GDP of Parties included in Annex I grew by 8.7 per cent.

9. **Between 1999 and 2007, total aggregate GHG emissions from Parties included in Annex I increased by 5.2 per cent and 6.1 per cent excluding and including LULUCF, respectively**, while GDP of Parties included in Annex I grew by 26.5 per cent throughout this **period of economic expansion**. Over the same period, EIT Parties and non-EIT Parties increased their GHG emissions (excluding LULUCF) by 6.8 per cent and 4.3 per cent, respectively. In their NC6s and updated in IDR reports, most Parties included in Annex I reported that, despite having started to implement mitigation policies and

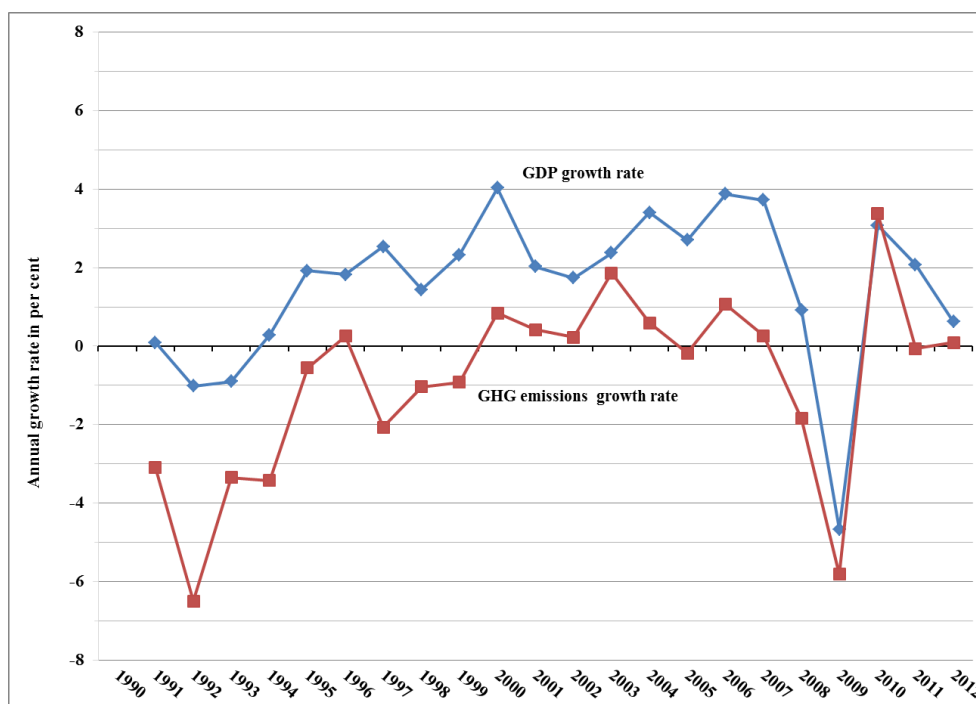
measures (PaMs), GHG emissions increased as a result of sustained economic growth based on the use of fossil fuels as the primary energy source.

10. The **mid-2007 global financial crisis** caused most Parties included in Annex I to enter into an economic recession the year after, which for many lasted until late 2009. From 2007 to 2009, Parties included in Annex I saw their annual GDP growth rate decrease from 3.7 per cent to -4.7 per cent. With a significant slowdown in economic activities, which for the most part were still relying on fossil fuel use, **GHG emissions of Parties included in Annex I excluding and including LULUCF dropped by 7.5 per cent and 10.1 per cent, respectively**, over the period 2007–2009. GHG emissions (excluding LULUCF) decreased as a result of the recession for both EIT Parties (6.8 per cent from 2008 to 2009) and non-EIT Parties (8.0 per cent from 2007 to 2009).

11. **From 2009 to 2012, GDP grew by 5.9 per cent as most Parties included in Annex I slowly regained economic momentum, leading to increases in total aggregate GHG emissions of 3.4 per cent excluding LULUCF and 4.5 per cent including LULUCF.** Over this period, EIT Parties experienced a 5.8 per cent increase in GHG emissions along with a 2.1 per cent growth in non-EIT Parties’ emissions. Figure 2 presents the **trends in the annual growth rates of GDP and GHG emissions**, and highlights the correlation between **these two growth rates over time**.

Figure 2

**Changes in annual growth rates in gross domestic product and greenhouse gas emissions from Parties included in Annex I between 1990 and 2012**



Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*.

Available at <<http://wds.iaea.org/WDS/Common/Login/login.aspx>>.

Abbreviations: GHG = greenhouse gas, GDP = gross domestic product.

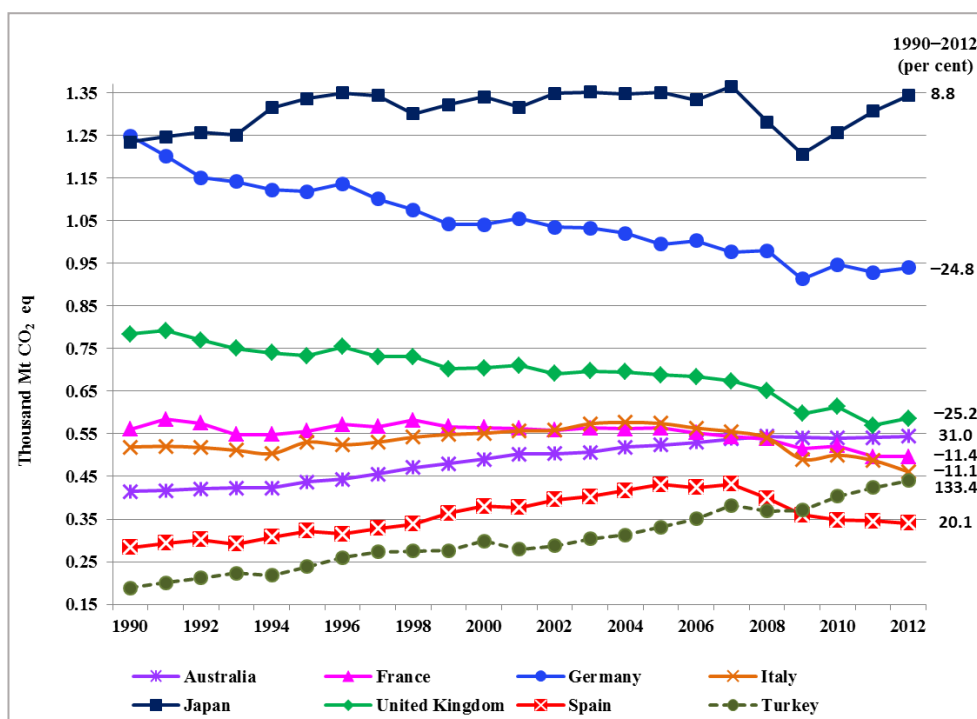
12. In 1990, **CO<sub>2</sub> emissions from the fuel combustion** of Parties included in Annex I amounted to 71.6 per cent of total GHG emissions excluding LULUCF, a share that increased to 73.7 per cent in 2005 and varied little until 2012 (73.6 per cent). One important factor behind this increase in share, although CO<sub>2</sub> emissions decreased by about 16.3 per

cent between 1990 and 2012, is the fact that GHG emission reductions that occurred in other sectors outpaced the reduction of CO<sub>2</sub> emissions from fuel combustion. More specifically, the largest GHG emission reductions took place in agriculture (31.6 per cent), followed by industrial processes (23.9 per cent) and waste (7.4 per cent). Altogether, emissions of methane and nitrogen dioxide decreased accordingly (by 24.1 per cent and 38.3 per cent, respectively), leading to an overall increased share of CO<sub>2</sub> emissions in total GHG emissions.

13. Finally, figure 1 shows that the changes in total CO<sub>2</sub> emissions from the fuel combustion of Parties included in Annex I follow, very closely, the changes in total aggregate GHG emissions. This correlation, outlined in the analysis above, also indicates that CO<sub>2</sub> emissions from fuel combustion represent a reliable indicator for total aggregate GHG emissions excluding LULUCF wherever full data sets are not available.

14. Figure 3 below shows GHG emission trends excluding LULUCF of non-EIT Parties with the highest share of GHG emissions among Parties included in Annex I. Together, the emissions of these seven Parties account for about 52 per cent of total aggregate GHG emissions of Parties included in Annex I. While some Parties increased their GHG emissions substantially (Turkey by 133.4 per cent, Australia by 31.0 per cent, Spain by 20.1 per cent and Japan by 8.8 per cent), others experienced a decrease in emissions (Germany by 24.8 per cent, United Kingdom of Great Britain and Northern Ireland by 25.2 per cent, France by 11.4 per cent and Italy by 11.1 per cent). This led to an overall decrease in GHG emissions between 1990 and 2012 by non-EIT Parties as a group (3.1 per cent).

Figure 3  
Greenhouse gas emissions excluding land use, land-use change and forestry of Parties included in Annex I that do not have economies in transition and that have the largest contribution to total aggregate emissions



Source: 2014 national greenhouse gas inventory submissions. Available at <[http://unfccc.int/ghg\\_data/ghg\\_data\\_unfccc/items/4146.php](http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php)>.

*Note:* The joint emissions of 15 member States that formed the European Community at the time of ratification of the Kyoto Protocol (EU-15) are not included since total aggregate greenhouse gas (GHG) emissions of Parties included in Annex I are calculated based on the contributions of the 15 individual member States. Adding EU-15 GHG emissions to the total aggregate GHG emissions of Parties included in Annex I would lead to double counting of emissions.

15. The **GHG emission data and trends reported by Parties** in their annual inventory submissions **do not necessarily distinguish the causes of observed changes in emission levels** or quantify the effects attributable to factors such as the global economic recession, autonomous energy efficiency improvements (not directly related to mitigation PaMs) and mitigation PaMs. To some extent, such factors have been addressed in the NC6s and IDR reports. Most of the emission reductions that occurred in EIT Parties have been attributed to the economic decline and restructuring in the early to mid-1990s and not to explicit mitigation PaMs, which is consistent with these Parties reporting fewer PaMs than non-EIT Parties. On the other hand, the considerable number of PaMs reported in the NC6s and updated in the IDR reports give an indication of the sizeable total effects that PaMs were expected to have on emission levels in 2020 (see paras. 59–61 below). Information on GHG emissions during the first commitment period of the Kyoto Protocol is presented in box 1.

Box 1

**Decrease in GHG emissions from Parties included in Annex I during the first commitment period of the Kyoto Protocol**

The average total GHG emissions level excluding LULUCF from 2008 to 2012 by Parties included in Annex I (10,128.86 Mt CO<sub>2</sub> eq) is 18.7 per cent below the 1990 level, which goes beyond the GHG emission reduction target of at least 5 per cent below the 1990 level over the period 2008–2012 set out in Article 3, paragraph 1, of the Kyoto Protocol. Concurrently, under the Convention, the 2008–2012 average level of GHG emissions excluding LULUCF of Annex I Parties (17,330.32 Mt CO<sub>2</sub> eq) was 8.9 per cent below the 1990 level of 19,264.92 Mt CO<sub>2</sub> eq.

## B. Effect of implementation of domestic measures on greenhouse gas emissions

16. **Parties included in Annex I have reported an increasing and, ultimately, large number of implemented mitigation PaMs.** These PaMs, together with global and national macroeconomic drivers as well as other national circumstances (demographics, the pattern of total primary energy use) and endogenous technological progress, have driven the trend in total aggregate GHG emissions over the period 1990–2012. The decisive factors in the trend over the period 1990–2009 have been discussed in paragraphs 8–11 above. However, although the economic recession of the late 2000s and the path to recovery have been the dominant drivers of the 2007–2012 trend, the extent to which all the implemented PaMs reported by Parties contributed an absolute reduction in total emissions over the period is more difficult to determine. While Parties reported implementing many **PaMs for substituting fossil fuels with renewable and less carbon-intensive sources of energy**, as well as **PaMs for reducing energy use** through increased energy efficiency, the rates of fossil fuel substitution and efficiency gains have not been sufficient so far to clearly decouple GDP growth from growth in emissions for all Parties included in Annex I taken together (see figure 2 above).

17. In their NC6s and during IDRs, Parties reported on the effects of their PaMs for 2020 (see paras. 60–61 below), but did not do so consistently for the preceding years. In order to analyse the changes in GHG emissions over the 1990–2012 period, the effects of PaMs would have to be statistically disentangled from other effects, such as



decreases in population or economic recessions, technological progress that would take place anyway and price effects that are not the result of PaMs. For this report, a simpler approach is taken in order to examine changes over the 1990–2012 period, using economy-wide indicators, namely GHG emissions per capita and GHG emissions per unit of GDP (emissions intensity of an economy), as well as indicators specific to the energy sector, namely changes in the share of renewable energy sources (RES) in total primary energy supplied (TPES), GHG emissions from TPES in an economy (carbon intensity of energy use) and TPES per unit of GDP (energy intensity of an economy) (see figure 4 below).

18. The levels of **GHG emissions per unit of GDP (emission intensity of the economy) and GHG emissions per capita have continued their downward trend**, but vary significantly across Parties included in Annex I; the rate of decline of both indicators also varies significantly across Parties. In general, these indicators have higher values for Parties that still rely on energy-intensive resource-based industries, and the production and export of energy resources (e.g. Australia, Russian Federation), than for Parties with similar geographic, demographic and climatic conditions but with relatively lighter and less energy-intensive industries (e.g. Finland and Sweden). Information on economy-wide indicators is presented in box 2.

Box 2

**Decline in economy-wide GHG emission indicators of Parties included in Annex I**

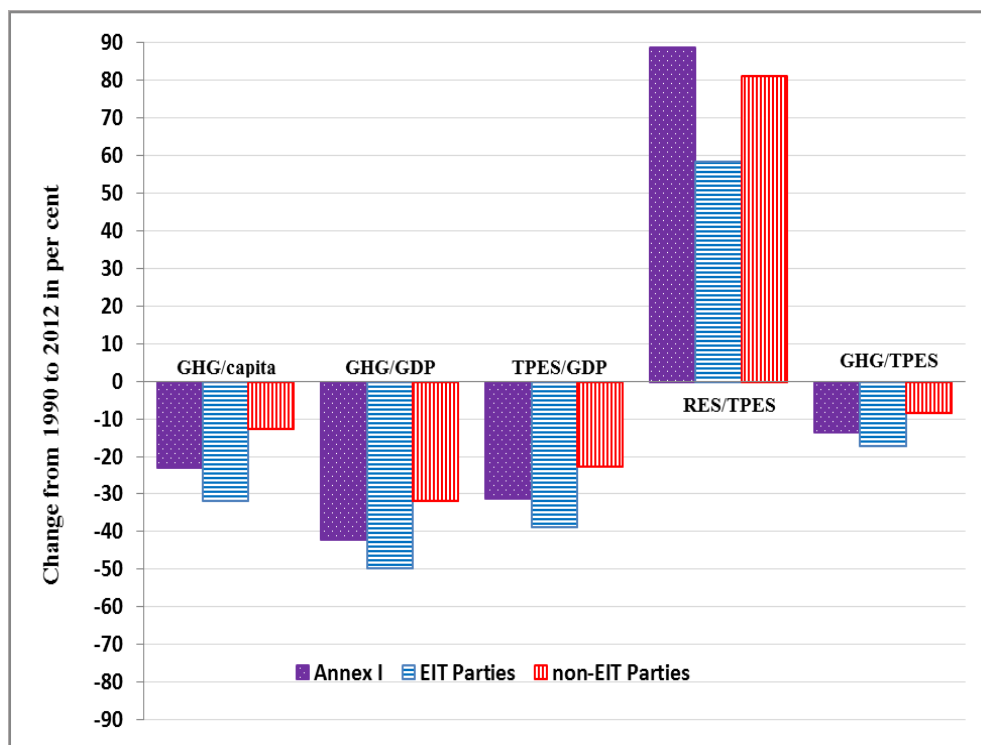
During the 1990–2012 period, while the total emissions of Parties included in Annex I (excluding LULUCF) fell by 18.6 per cent, population and GDP grew by 5.6 per cent and 40.1 per cent, respectively. This resulted in **decreases in GHG emissions per capita and GHG emissions per unit of GDP in Parties included in Annex I over that period of 22.9 per cent and 41.9 per cent, respectively**. The decrease in the values of GHG emissions per capita and GHG emissions per unit of GDP was greater for EIT Parties (31.8 per cent decline in emissions per capita and 49.5 per cent decline in emission intensity), although some improvements for non-EIT Parties also occurred (12.5 per cent decline in emissions per capita and 31.7 per cent decline in emission intensity).

Significantly, some non-EIT Parties have managed to reduce emissions despite strong economic growth. Belgium, Denmark, Finland, France, Germany, Luxembourg, the Netherlands, Sweden and the United Kingdom of Great Britain and Northern Ireland succeeded in keeping their total GHG emissions (excluding LULUCF) in 2012 below their 1990 levels while experiencing GDP growth of over 38 per cent. Of those non-EIT Parties, Denmark, Germany, Sweden and the United Kingdom succeeded in reducing their emissions by at least 20 per cent below their 1990 levels while experiencing a non-negligible growth in population between 1990 and 2012 (Denmark: 8.8 per cent; Germany: 3.2 per cent; Sweden: 11.2 per cent; and the United Kingdom: 11.3 per cent). Though various factors contributed to this result, considerable credit is due to the implementation of effective PaMs, which mainly promote energy efficiency, the use of RES and switching to fossil fuels that are less carbon intensive.

19. With regard to **energy sector-related indicators** (use of RES and energy efficiency indicators), the **share of RES in TPES of Parties included in Annex I increased by 88.8 per cent over the period 1990–2012**, from 4.3 per cent to 8.1 per cent (see also para. 38 below). For EIT Parties, the share of RES in TPES increased from 2.4 per cent in 1990 to 3.8 per cent in 2012, a 58.5 per cent increase over the period. For non-EIT Parties, the share of RES in TPES increased from 5.8 per cent to 10.6 per cent between 1990 and 2012, an increase of 81.3 per cent. Consequently, between 1990 and 2012, the **carbon intensity of**

energy use (energy-related GHG emissions<sup>12</sup> divided by TPES) of Parties included in Annex I decreased by 13.5 per cent. In 1990, the energy use of EIT Parties was 22.6 per cent more carbon-intensive than that of non-EIT Parties, while in 2012 the carbon intensity of energy use of EIT Parties (2,554.28 kg CO<sub>2</sub> eq per tonne of oil (toe)) and non-EIT Parties (2,309.80 kg CO<sub>2</sub> eq/toe) differed by 10.6 per cent.

Figure 4  
**Changes in economic and energy indicators of Parties included in Annex I**



Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <<http://wds.iaea.org/WDS/Common/Login/login.aspx>>.

Abbreviations: EIT = Parties included in Annex I with economies in transition, GHG = greenhouse gas, GDP = gross domestic product, non-EIT Parties = Parties included in Annex I that do not have economies in transition, RES = renewable energy sources, TPES = total primary energy supply.

20. Finally, between 1990 and 2012, **TPES in Parties included in Annex I decreased by 3.6 per cent and TPES per unit of GDP (energy intensity of the economy) dropped by 31.2 per cent**, from 0.20 toe per USD 1,000 in 1990 to 0.14 toe per USD 1,000 in 2012 (see also para. 41 below). For EIT Parties, TPES per unit of GDP dropped by 38.7 per cent over the period 1990–2012 (from 0.42 to 0.26 toe per USD 1,000). For non-EIT Parties, TPES per unit of GDP dropped by 22.6 per cent over the same period (from 0.14 to 0.11 toe per USD 1,000).

21. In summary, changes in the values of per capita and per unit of GDP emissions and energy use discussed above are consistent with the expected effects of PaMs that Parties reported implementing in order to increase the efficiency and sustainability of energy use (see paras. 37–47 below). Apart from PaMs, other factors that may have contributed to these improvements include autonomous technological changes and price signals that are not the result of PaMs.

<sup>12</sup> Here, “energy-related GHG emissions” means emissions from the energy sector as reported in the 2014 national inventory submissions.

### III. Domestic action implemented in accordance with national circumstances

22. This chapter provides an overview of domestic action implemented by Parties included in Annex I in accordance with their national circumstances. In addition, it also provides an overview of domestic action in the broader context of action undertaken to meet the Kyoto Protocol targets, which includes the use of Kyoto Protocol mechanisms.

#### A. Overview of domestic action implemented in accordance with national circumstances

23. In their NC6s and during IDRs, Parties included in Annex I provided information on their national circumstances, which provided the context for their GHG emissions and removals levels and trends and underpinned their approach to national climate change PaMs. The information suggests that **most Parties continue to view climate change as a prominent policy concern**, with all Parties having national climate change strategies, action plans and programmes including mitigation PaMs.

24. Parties included in Annex I have **continued enhancing their comprehensive approaches to addressing climate change**, strengthening the coordination and monitoring of national efforts, and advancing the implementation of national climate change strategies. Stable institutional frameworks and well-established coordination among involved government departments, commissions and committees on climate change were reported to have led to the widening in scope and strengthening of climate policy.

25. Some important PaMs have been added to the portfolios for climate change mitigation, but Parties mostly have worked at **strengthening and refining their existing PaMs in accordance with their national circumstances** – implementing more stringent features, achieving wider coverage and increasing resource expenditure. Accordingly, the **general mix of PaMs** – economic and fiscal instruments, regulations, voluntary/negotiated agreements, framework targets, information, education and awareness programmes, research and development (R&D), and other instruments – has **remained broadly the same** since the early years when the Kyoto Protocol entered into force.

26. Overall, Parties included in Annex I reported in their NC6s and elaborated in IDR reports on more than **1,200 implemented, adopted and planned mitigation PaMs**, with highly diverse scopes and expected emission impacts. They are used at all levels of governmental jurisdiction – regional, national, state/provincial and municipal – in order to influence the investments, purchases and behaviours of numerous individuals and institutions involved in a myriad of activities related to energy supply, energy end-use and non-energy emissions.

27. The reported PaMs are either sector specific or cover multiple sectors. Some **1,000 PaMs were** based on a single policy type **aimed at individual sectors**, while the remaining were classified as **cross-sectoral** and/or using multiple policy types. Among the reported PaMs, the most commonly targeted sectors were energy and transport. The paragraphs below provide a summary of the most commonly used PaMs in the different sectors.

##### 1. Cross-sectoral policies and measures

28. Emissions trading schemes (ETSs) continue to be the most widely used cross-cutting instruments, owing to the certainty that they provide in remaining within the regulated emission levels and their flexibility in terms of actions to reduce costs. In many cases, ETSs

have been enhanced in stringency and coverage (e.g. the EU Emissions Trading System (EU ETS) third phase reforms).

29. As at August 2015, there were seven active ETSs in Parties to the Kyoto Protocol: in the EU, Kazakhstan, New Zealand, Norway, Switzerland, Japan and the United Kingdom. Of the 42 Parties included in Annex I, 35 have either a national ETS or participate in a multinational ETS, and another Party (Japan) has a subnational ETS within its borders (Tokyo). While ETSs vary in scope, most are aimed at reducing CO<sub>2</sub> emissions from electricity and heat generation, transport fuel supply and demand and industrial energy use. They tend to expand to cover additional sectors and gases as they mature.

30. **Energy taxes** (e.g. ad valorem and excise taxes) greatly influence energy use and GHG emissions and are used by all Parties included in Annex I. The primary purposes of energy taxes have historically been revenue generation and oil security. However, Parties are increasingly using their energy taxes to further their emission reduction goals by differentiating rates to favour RES (e.g. tax exemption for biofuels).

31. **Carbon taxes** are used at the national level by 10 Parties, mostly in northern Europe. These taxes have been a cornerstone of climate policies in Denmark (CO<sub>2</sub> tax), Finland (CO<sub>2</sub> tax), the Netherlands (energy tax), Norway (CO<sub>2</sub> tax) and Sweden (CO<sub>2</sub> tax) since the early 1990s. More recently, they have been introduced in Germany (ecological tax), Ireland (CO<sub>2</sub> tax), Liechtenstein (CO<sub>2</sub> levy), Slovenia (CO<sub>2</sub> environmental tax), Switzerland (CO<sub>2</sub> levy) and the United Kingdom (climate change levy).

32. Since the early 2000s, there has been much less policy effort directed at introducing new carbon taxes than at developing ETSs. However, carbon taxes have still been put forward as an alternative carbon pricing mechanism during policy deliberations in some countries, especially when the complexities and shortcomings (e.g. price levels and price stability) of emission allowance systems are discussed. Furthermore, some Parties (e.g. Norway and the United Kingdom) are treating carbon taxes and ETSs as complementary measures, with the latter aimed at energy-intensive sectors, such as power generation and industry, and the former focused on the residential and commercial sectors. Where they are used, carbon taxes are typically applied to a wider range of sectors (e.g. electricity generation, transport, residential, commercial, public, less energy-intensive industrial sectors and sometimes more energy-intensive industries as well) than ETSs, but they are not yet applied to non-energy sources of GHG emissions.

33. **Framework targets** establish legally binding (i.e. mandatory) or indicative (i.e. voluntary) goals for GHG emissions (carbon budgets), technology shares, fuel shares and efficiency, followed up by measurement, reporting and verification procedures to ensure compliance. They are intermediate PaMs used by Parties to focus the direction and stringency of their operational PaMs or to partially shift responsibility for mitigation to lower levels of government, which must then implement their own operational PaMs (e.g. economic incentives and market instruments) to achieve the targets.

34. Framework targets are used mostly in the areas of electricity and heat generation, transport fuel supply and emissions from landfills. They are used most heavily by the EU, most notably in the EU climate and energy package of specific targets for 2020, but other Parties use them as well.<sup>13</sup> They involve setting goals (e.g. to achieve a 20 per cent RES

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<sup>13</sup> The EU climate and energy package encompasses: (1) a target to reduce GHG emissions by at least 20 per cent compared to 1990 by 2020, with a commitment to increase that target to 30 per cent in the event of a satisfactory international agreement being reached; (2) a target to achieve a 20 per cent RES share of the total EU gross final energy consumption), supplemented by a target to achieve a minimum share of 10 per cent for renewable transport fuel; and (3) a reiteration of the commitment to save 20 per cent of total primary energy consumption by 2020, compared with a 'business as usual' baseline.

share of the final energy consumption by 2020), but leaving the development and implementation of specific measures to the EU member States. Ireland and the United Kingdom have introduced carbon budgets that set legally binding limits on the total GHG emissions allowed in successive time periods, which are further broken down into carbon budgets for each government department. Other Parties devolve responsibility through funding mechanisms.

35. **R&D** efforts are intended to improve the technical capacity to reduce emissions and also to improve Parties' competitive position in the potential markets for new technologies. R&D activities were reported by Australia, Denmark, the EU, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Switzerland and the United Kingdom. Many other Parties reported contributions to joint international research efforts. All emission reduction technologies can benefit from additional R&D, but the ones offering the largest potential emission reductions and facing the biggest technological challenges are: CO<sub>2</sub> capture and storage, hydrogen networks, fuel cells, cellulosic biofuels and solar power options. Owing to the long-term nature of R&D efforts, Parties are rarely able to estimate the specific effects of these efforts on emissions.

36. **Direct project funding** has grown recently, owing to the greater responsibility for mitigation actions given to lower-level governments (via framework targets) and to increases in funding (from ETS revenues and other sources) and have been reported by Australia and the EU. **Urban and regional development** seeks to gain efficiencies and emission reductions through tighter integration among the components of large systems and networks. Japan has measures in place to make urban design, transport networks, power networks and industrial parks more climate-friendly.

## 2. Policies and measures in the energy sector

37. Most Parties rely mainly on two major policy levers in order to reduce their GHG emissions in the energy sector, which are to increase their use of RES and to improve the energy efficiency of their domestic economic activities.<sup>14</sup>

38. Encouraging the **use of RES in electricity generation** is a prominent part of the efforts of many Parties included in Annex I to reduce emissions from electricity and heat generation. This is done through framework targets (EU and Russian Federation), green certificates (Australia) and tariff premiums (Ukraine). Most EU member States reported meeting their RES-based electricity targets through feed-in tariffs (fiscal incentives), while others, such as Poland, Romania and Sweden, use green certificates (other market instruments), and still others, such as Belgium, Italy and the United Kingdom, use both feed-in tariffs and green certificates. Furthermore, some EU member States use additional investment grants, tax exemptions and fiscal incentives to promote RES-based electricity generation.

39. The success of these PaMs, based on targets and economic incentives, is reflected in the rapid growth in renewable energy production and use in recent years (see para. 19 above). This growth has contributed to emission reductions, and many Parties included in Annex I are working towards still higher renewable energy targets in the 2020 time frame. In addition, the cost of renewable energy fell, and in many cases renewable energy is now competitively priced, and some of the incentives introduced at the early stages of technology development are no longer needed.

40. Other PaMs to tackle GHG emissions from **electricity generation** include regulations and economic incentives to increase the use of natural gas in electricity generation (Australia (Queensland), Greece, Japan and Portugal); blue certificate

<sup>14</sup> Other levers include nuclear energy and natural gas.

programmes to promote electricity production from combined heat and power (Netherlands, Poland and the Flemish Region, Belgium); and regulations to promote the construction of nuclear power plants (Finland) or to ensure power transmission capacity (Japan), while some other Parties have decided to re-examine the viability of their use of nuclear power in the light of the Fukushima Daiichi nuclear power plant accident and, in some cases, have even decided to phase it out (e.g. Germany and Switzerland).

41. Parties included in Annex I also implemented mitigation PaMs in all of the **major energy end-use sectors**: residential, commercial and public, industry, and transport. Most of the PaMs focus on improving **energy efficiency** (as opposed to fuel switching) (see para. 20 above). Although Parties continue to promote mitigation through PaMs traditionally associated with energy efficiency goals, they are increasingly drawing attention to the emission reduction aspects of those PaMs through standards and labelling.

42. While most energy consumption related PaMs are sector specific or even more narrowly targeted, the EU has implemented a multisector, multi-PaM policy package aimed at energy efficiency. The EU energy efficiency directive, first reported in its NC6, is a package comprising framework targets, market reforms, regulations, public facilities management, and information and awareness, aimed at improving energy efficiency in all sectors so as to achieve the EU target of a 20 per cent reduction of primary energy consumption by 2020.

43. Regarding the **residential, commercial and public sectors**, Parties included in Annex I reported the continued use of regulations (Australia, EU and Japan), fiscal incentives (Australia, Ireland, Portugal, Switzerland and United Kingdom), framework targets, information, public facilities management and carbon taxes in order to increase: the energy efficiency of new and existing residential, commercial and public buildings, including their space heating, cooling and ventilation, water heating and lighting services (via designing, building, renovating and purchasing); the energy efficiency of household appliances, home entertainment devices, office equipment (via manufacturing, retailing and purchasing) and lamps; and the use of alternative energy supplies. Many Parties are beginning (or planning) the wide-scale deployment of smart meters and associated information and energy management services, which will enable households and businesses to be more aware of their energy consumption patterns and to make behavioural and investment decisions accordingly.

44. Regarding the **industry sector**, Parties included in Annex I aim to increase energy efficiency and general emission reductions (i.e. not targeting specific equipment and processes) in energy-intensive industries; increase the implementation of energy-efficient methods (e.g. energy management systems); increase the use of energy-efficient equipment (e.g. motors, boilers and lighting), particularly, but not exclusively, in small and medium-sized enterprises; and promote long-term R&D of carbon dioxide capture and storage by energy-intensive industries. To achieve these aims they continued to use ETSSs, regulations, voluntary sectoral commitments (Japan), voluntary enterprise partnerships (EU), information and long-term R&D.

45. Most Parties included in Annex I reported further increases in their transport activities since their NC5s, driven by economic growth and in some cases by changes in transport patterns, and identified the **transport sector** as the largest energy consumer. In terms of GHG emissions, transport remained the sector with the fastest growth in emissions in virtually all Parties included in Annex I, with EIT Parties experiencing the fastest growth, and many of these Parties identified increasing emissions from transport as the main challenge in their climate change mitigation policies. A few Parties, including France, Germany, Japan and Portugal, had reported in their NC5s a stabilization of fuel consumption by 2008 in the transport sector, owing mainly to the optimization of engines,

increased fuel efficiency in new vehicles and, to a lesser extent, PaMs targeting transport activities and the shift to transport modes with lower emissions (modal shift).

46. Parties included in Annex I reported on the continued use of framework targets (delivered through economic incentives and other market instruments), regulations, other market instruments and long-term R&D to reduce the carbon intensity of the **transport fuel supply** immediately through the increased use of liquid RES fuels (biofuels), but, in the long term, also through the use of electricity, fuel cells and hydrogen.

47. To address **transport fuel demand**, Parties included in Annex I continued to use regulations, voluntary sectoral commitments, ETSs, fiscal incentives, information programmes and long-term R&D in order to increase the efficiency and effectiveness of transport services and to promote non-motorized modes of transport. Road vehicle fuel economy and CO<sub>2</sub> emission standards, implemented increasingly via mandatory regulations (replacing voluntary approaches), have the highest mitigation impact of all transport-related measures.

### 3. Policies and measures in the non-energy sectors

48. To reduce emissions from **industrial processes**, Parties included in Annex I reported the new use of ETSs (EU) and information, and the continued use of their previous regulations (Australia, EU, Iceland and Switzerland), reporting, voluntary sectoral commitments (Belgium, France, Japan, Netherlands, Norway and Spain), fiscal incentives (Denmark, Japan, Norway and Slovenia) and research so as to limit (ban) the use of certain hydrofluorocarbons and perfluorocarbons (fluorinated gases) and to improve the manufacturing, handling, use and end-of-life recovery of fluorinated gases; to reduce fluorinated gas emissions from semiconductor manufacture, aluminium production, electric power transmission and distribution, magnesium production and miscellaneous sources; and to reduce CO<sub>2</sub> and nitrous oxide emissions through improved operations in cement, lime, ammonia, and adipic and nitric acid production.

49. Building on the success of reducing emissions from the **waste sector** in many Parties, owing to PaMs that tackle emissions throughout the whole waste life cycle, Parties included in Annex I continued to use framework targets (EU), regulations (EU, New Zealand and Switzerland), fiscal incentives (EU), voluntary enterprise partnerships (Japan) and resource management (EU) to promote: waste minimization through reduced packaging and increased product and packaging reusability and recyclability; waste reuse through the implementation of waste separation and recycling; minimization of landfilled waste through processing and incineration; and landfill management with capture or flaring of methane.

50. The policy portfolios to reduce emissions in the **agriculture sector** have remained broadly the same since the NC5s. Parties included in Annex I reported the continued use of their previous fiscal incentives (either directly or within the context of agricultural market reform) and regulations (e.g. the EU nitrates directive), as well as a new carbon offset programme (Australia's Carbon Farming Initiative) to reduce nitrous oxide emissions through manure management and optimized use of nitrogen fertilizer; and to reduce methane emissions through changes in livestock management. Other climate-focused policies include long-term R&D in Australia, and the use of models and demonstrations in New Zealand.

51. As with agriculture, Parties reported relatively few PaMs aimed at reducing emissions or enhancing removals from the **LULUCF sector**. While most of the measures tend to be part of larger policy strategies aimed at rural development, agricultural reform, environmental stewardship and biodiversity, some Parties use voluntary emission offset schemes that are primarily climate focused. Parties included in Annex I reported the continued use of their previous fiscal measures (subsidies) and regulations (environmental

codes) for private land, and public infrastructure and resource management rules and procedures for public land in order: to promote sustainable forest management, taking into account the need to enhance GHG removals through forest sinks and to maintain and enhance biodiversity; to prevent forest fires; to afforest, reforest and manage forests, grassland, wetlands and cropland; and to increase green urban areas.

## **B. Domestic action and the use of mechanisms in the context of the efforts made to meet the commitments under the Kyoto Protocol**

52. The information reported in the NC6s and subsequently highlighted in the IDRs, suggests that implemented mitigation PaMs – along with some autonomous technology improvements, behavioural changes and economic and demographic shifts – have contributed to the achievement of commitments by Parties with commitments inscribed in Annex B to the Kyoto Protocol (Annex B Parties) by reducing GHG emissions, or in some cases by limiting their growth (see also paras. 16–21 above).

53. For the purposes of fulfilling commitments under Article 3, paragraph 1, of the Kyoto Protocol, Parties may make use of the Kyoto Protocol mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol. The transfer and acquisition of emission reduction units, certified emission reductions, assigned amount units and removal units can continue throughout the **true-up period**, a 100-day period after the date set by the CMP, which will end on 18 November 2015. **The exact data on use of units under Articles 6, 12 and 17 of the Kyoto Protocol** for compliance under the first commitment period will become available after the review of the relevant true-up period reports, which are to be submitted 45 days after the end of the period, on 2 January 2016.<sup>15</sup>

54. Nevertheless, Parties included in Annex I reported in their NC6 and further elaborated in IDRs information on their plans to use the Kyoto Protocol mechanisms. This information, together with data on GHG emissions and removals for the period 2008–2012, including data on emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol,<sup>16</sup> suggests that **many Parties** (Australia,<sup>17</sup> Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland,<sup>18</sup> Ireland, Italy, Latvia, Lithuania, Monaco, Netherlands, New Zealand, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Sweden, Ukraine and United Kingdom) **appear to be on track to achieve their emission reduction targets** for the first commitment period of the Kyoto Protocol **by means of domestic actions, without the use of the Kyoto Protocol mechanisms.**

55. This means that, according to the information reported in the NC6s and the latest GHG inventory information reported from Parties, **participation in the Kyoto Protocol mechanisms could be essential for several Parties to meet their Kyoto Protocol targets**, namely Austria, Denmark, Japan, Liechtenstein, Luxembourg, Norway, Spain and Switzerland. Several other Parties appear to participate in the clean development

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<sup>15</sup> The true-up period information report published by the secretariat on 30 September 2015 shows that as at this date the cumulative GHG emissions during the first commitment period are higher than the total quantity of units held in the retirement and holding accounts in the case of two Parties: Iceland and Italy. The report is available at <<http://unfccc.int/9044.php>>.

<sup>16</sup> Data refer to the Kyoto Protocol data reported in the national GHG inventories submitted in 2014. Available at <[http://unfccc.int/ghg\\_data/ghg\\_data\\_unfccc/items/4357.php](http://unfccc.int/ghg_data/ghg_data_unfccc/items/4357.php)>.

<sup>17</sup> For Australia, this includes reduced deforestation between the base year and the first commitment period of the Kyoto Protocol.

<sup>18</sup> Emissions from aluminium production are excluded during the first commitment period of the Kyoto Protocol according to decision 14/CP.7.



mechanism and joint implementation primarily for capacity-building and technology transfer purposes.

56. The eight Parties listed in paragraph 55 reported in their NC6s, or provided an **indication therein, on how the use of the Kyoto Protocol mechanisms is supplemental** to their domestic actions to reduce GHG emissions and how domestic action thus constitutes a significant element of the effort made to meet their Kyoto Protocol targets. This information was further clarified and elaborated during the reviews. Table 1 provides an overview, based on the information in NC6s and further elaborated in IDRs, of the expected use of the Kyoto Protocol mechanisms and information on the supplementarity of the use of the mechanisms for the Parties that are expected to rely on the mechanisms to achieve their targets.

57. Parties define supplementarity in different ways, expressing it either quantitatively or qualitatively. The supplementarity criteria, which are discussed by Parties in their NC6s, are often based on their assessment of the effect of domestic actions and a comparison of that with the overall effort needed to attain their Kyoto Protocol target. The information reported in the NC6s and further elaborated in the IDR reports broadly suggests that **Parties** that are using the Kyoto Protocol mechanisms in order to meet their Kyoto Protocol targets **are striving to adhere to their supplementarity criteria**.

58. Several Parties that allow the use of the Kyoto Protocol mechanisms in their domestic ETSs expect that the cancellation of units by participants will include credits from the Kyoto Protocol mechanisms. Thus, the **private sector could contribute to the meeting of a Party's Kyoto Protocol target by purchasing Kyoto Protocol units**. Table 1 does not include the expected use of the Kyoto Protocol mechanisms by the private sector, unless stated otherwise.

Table 1

**Information on the use of the Kyoto Protocol mechanisms by Annex B Parties to meet their targets under the Kyoto Protocol for the first commitment period and how that use is supplemental to domestic action**

<i>Party</i>	<i>Expected use of the Kyoto Protocol mechanisms annually at the government level (Mt CO<sub>2</sub> eq)</i>	<i>Information on supplementarity</i>
Austria	14.2	The JI/CDM programme is only one of the many elements of the Austrian Kyoto Protocol strategy. The contribution of the JI/CDM programme is significantly lower than the estimated effect of domestic measures (more than 20 Mt CO <sub>2</sub> eq in 2010)
Denmark <sup>a</sup>	2.2	The use of mechanisms is one of various instruments, including sinks (1.8 Mt CO <sub>2</sub> eq/year) and domestic efforts (15.6 Mt CO <sub>2</sub> eq/year), and contributes less than 50 per cent of the difference between the projected 'business as usual' emissions and the Kyoto Protocol target
Japan <sup>b</sup>	74.5 <sup>c</sup>	In 2007, total GHG emissions were 8.2 per cent above the base year level. The 2008–2012 average annual emission level after accounting for LULUCF and units from Kyoto Protocol mechanisms would be at 16.6 per cent below the 2007 emissions level. Given that the use of units from the Kyoto Protocol mechanisms can contribute a 5.9 per cent decrease from the base year level, which is about a third of the total 16.6 per cent decrease from the 2007 emission level, Japan considers that its use of units from the Kyoto Protocol mechanisms is supplemental to its

<i>Party</i>	<i>Expected use of the Kyoto Protocol mechanisms annually at the government level (Mt CO<sub>2</sub> eq)</i>	<i>Information on supplementarity</i>
Liechtenstein	0.05 <sup>d</sup>	domestic action Domestic actions are a crucial element of the efforts made by Liechtenstein to meet its quantified limitation and reduction commitment. In order to ensure that the use of mechanisms is supplemental to domestic action, its parliament incorporated a respective regulation within its Emissions Trading Act in 2007
Luxembourg <sup>e</sup>	3.0	All use of the Kyoto Protocol mechanisms is supplemental to domestic action
Norway	4.2	Norway will meet its Kyoto Protocol target for the period 2008–2012 without any need for government purchase of Kyoto Protocol units, but voluntarily decided to overachieve its target. The emission level in 2010 would have been around 10 Mt CO <sub>2</sub> eq higher than the actual emissions in the absence of domestic PaMs and the removal units to be issued under Article 3, paragraph 4, of the Kyoto Protocol (1.5 Mt CO <sub>2</sub> eq) will not be used for compliance
Spain	31.8	Spain compares its Kyoto Protocol target (15 per cent emission increase) with the estimated average increase in emissions without PaMs (73 per cent increase) in the period 2008–2012 compared with the base year level. Of that increase, 36 per cent is expected to be compensated by domestic efforts, 2 per cent by accounting of LULUCF activities and the remaining 20 per cent by the use of the Kyoto Protocol mechanisms
Switzerland	3.1	The effect of domestic measures in 2010 (3.9–5.3 Mt CO <sub>2</sub> eq) is estimated to be greater than the total use of the Kyoto Protocol mechanisms (3.1 Mt CO <sub>2</sub> eq/year) and thus Switzerland considers the use of the mechanisms to be supplemental to domestic action

*Abbreviations:* CDM = clean development mechanism, GHG = greenhouse gas, JI = joint implementation, LULUCF = land use, land-use change and forestry, PaMs = policies and measures.

<sup>a</sup> Information was partly provided during the in-depth review of the sixth national communication (NC6) of Denmark (as reported in document FCCC/IDR.6/DNK).

<sup>b</sup> Information was provided during the in-depth review of the NC6 of Japan (as reported in document FCCC/IDR.6/JPN).

<sup>c</sup> Of which 19.5 Mt CO<sub>2</sub> eq per year were acquired by the government through the Kyoto Mechanisms Credit Acquisition Program and 55 Mt CO<sub>2</sub> eq per year were acquired by the Federation of Electric Power Companies of Japan (according to the Environmental Action Plan by the Japanese Electric Utility Industry).

<sup>d</sup> According to the latest information provided during the in-depth review of the NC6 of Liechtenstein (as reported in document FCCC/IDR.6/LIE), only 0.02 Mt CO<sub>2</sub> eq are estimated to be needed for Liechtenstein to fulfil its target for the first commitment period of the Kyoto Protocol.

<sup>e</sup> Information was partly provided during the in-depth review of the NC6 of Luxembourg (as reported in FCCC/IDR.6/LUX).

59. The Parties that had commitments inscribed in Annex B for the first commitment period of the Kyoto Protocol have agreed on quantified emission reduction targets for the second commitment period (2013–2020), with the exception of Canada, Japan, New Zealand and the Russian Federation. Two other Parties have agreed on such targets, namely Belarus and Kazakhstan. To meet those commitments, Parties have mostly strengthened and refined their existing PaMs – to further reduce emissions, cut costs, diminish the administrative burden, etc. – as lessons are learned, and market and technological conditions evolve. They are also implementing new PaMs and are increasingly using

framework targets, sometimes coupled with project funding, to devolve partial responsibilities for mitigation to lower levels of government (e.g. EU member States and states/provinces).

60. In that context, Parties included in Annex I provided in their NC6, and further elaborated during the reviews, estimated **mitigation impacts by 2020** for 587 of the reported PaMs. The total estimated quantitative impact of the PaMs of Parties included in Annex I for 2020 is **1,202 Mt CO<sub>2</sub> eq of avoided emissions** relative to a scenario without those PaMs being implemented. The sectors projected to experience the highest impact are the **energy sector** (748 Mt CO<sub>2</sub> eq) and the **transport sector** (319 Mt CO<sub>2</sub> eq). More specifically, regulations applied in the energy and transport sectors seem to have the largest expected mitigation impact.

61. Three quarters of the reported PaMs (accounting for 69 per cent of the total estimated mitigation impact) have already been implemented and 14 per cent of the PaMs (accounting for 24 per cent of the total estimated mitigation impact) have been adopted, but not yet implemented. About half of the reported PaMs were aimed solely at achieving CO<sub>2</sub> emission reductions and accounted for 54 per cent of the total estimated mitigation impact. Some 38 per cent of the PaMs are aimed at reducing the emissions of multiple GHGs.

#### **IV. Trends in per capita emissions across Parties included in Annex I and Parties not included in Annex I**

62. This chapter examines the extent to which Parties included in Annex I and Parties not included in Annex I to the Kyoto Protocol managed to narrow their per capita emissions differences, while working towards the achievement of the ultimate objective of the Convention. In order to perform a sound comparison, the per capita emission trends of Parties included in Annex I and Parties not included in Annex I should be based on data sets that are comparable across Parties. This raises some challenges because full time-series data for GHG emissions are incomplete for most Parties not included in Annex I.

63. Data from the IEA were used to compare the trend in per capita emissions of Parties included in Annex I with that of emissions of Parties not included in Annex I. However, the IEA database did not include full time-series data of total GHG emissions both for Parties included in Annex I and for Parties not included in Annex I. It does nonetheless provide full data sets for CO<sub>2</sub> emissions from fuel combustion. The full datasets were selected for the purposes of this report because they are complete for most Parties included in Annex I and Parties not included in Annex I (see para. 13 above).<sup>19</sup>

64. Figure 5 presents CO<sub>2</sub> emissions from fuel combustion for Parties included in Annex I and Parties not included in Annex I.<sup>20, 21</sup> **Between 1990 and 2012, Parties included in Annex I decreased their CO<sub>2</sub> emissions by –12.1 per cent while, over the same period,**

<sup>19</sup> UNFCCC and International Energy Agency (IEA) CO<sub>2</sub> emissions from fuel combustion data sets are closely correlated with a maximum difference observed for 2011, where the IEA emissions are 4.2 per cent higher than the UNFCCC emissions. While both sources report data for Intergovernmental Panel on Climate Change (IPCC) category 1.A (fuel combustion) using the sectoral approach, the IEA emissions are calculated using the IPCC tier 1 for all Parties. The UNFCCC data are calculated by each Party using methods that, in many cases, correspond to higher tiers (IPCC tier 2 or tier 3) or country-specific methods, which are more accurate than the IEA approach. In this context, using lower tier methods is known to lead to estimates that are more conservative and result in higher values than more accurate methods.

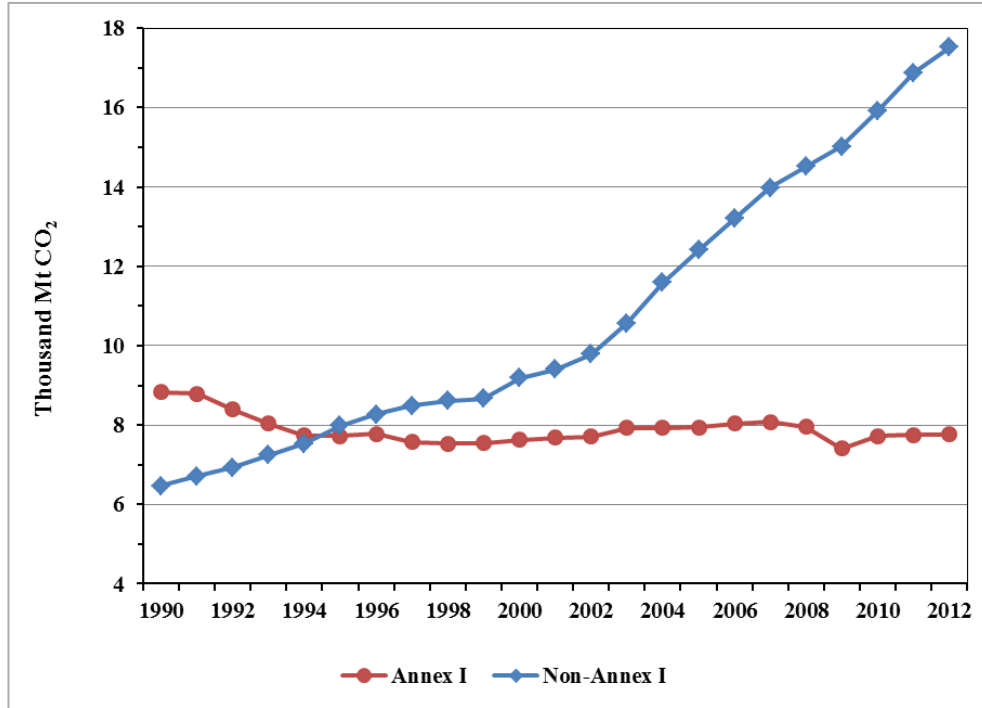
<sup>20</sup> IEA data for 2013 were not available for all Parties at the time of publication.

<sup>21</sup> Kazakhstan is not an Annex I Party under the Convention but is a Party included in Annex I to the Kyoto Protocol; Canada and the United States are not Annex I Parties to the Kyoto Protocol.

Parties not included in Annex I increased their CO<sub>2</sub> emissions by 170.4 per cent, principally after 2002.

Figure 5

**Carbon dioxide emissions from fuel combustion for Parties included in Annex I and Parties not included in Annex I**



Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <<http://wds.iea.org/WDS/Common/Login/login.aspx>>.

Abbreviations: Annex I = Parties included in Annex I, Non-Annex I = Parties not included in Annex I.

65. IEA data (based on World Bank data) were also used for the populations of Parties included in Annex I and Parties not included in Annex I in order to calculate per capita CO<sub>2</sub> emissions. The resulting **1990–2012 trends in per capita CO<sub>2</sub> emissions from fuel combustion for Parties included in Annex I and Parties not included in Annex I** are illustrated in figure 6. A description of these trends is presented in box 3.

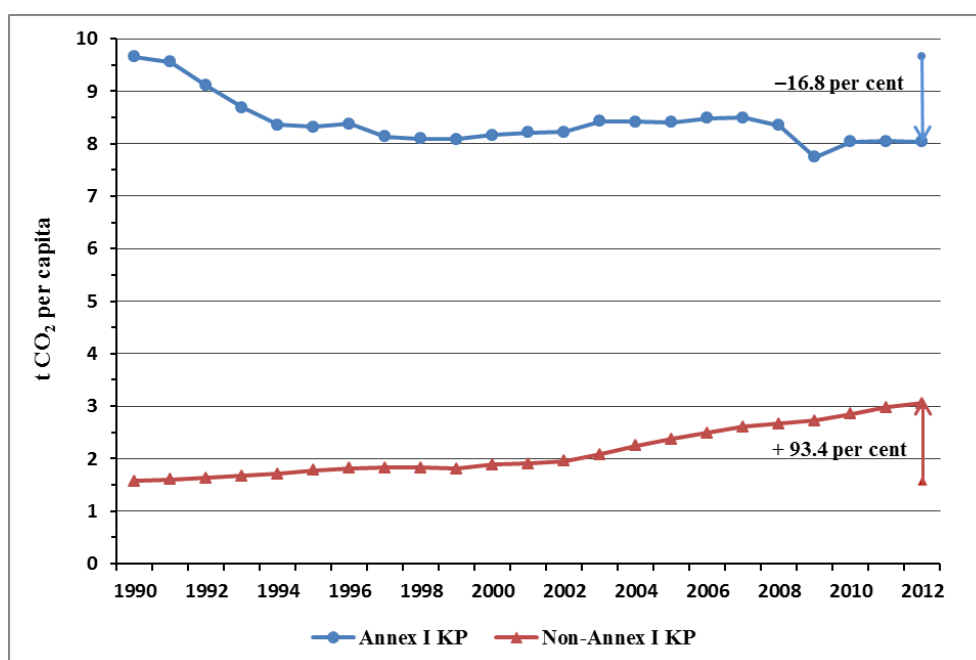
## Box 3

**Convergence in per capita carbon dioxide emissions of Parties included in Annex I and Parties not include in Annex I**

Overall, Parties included in Annex I decreased their average per capita carbon dioxide (CO<sub>2</sub>) emissions by 16.8 per cent between 1990 and 2012, with a marked increase between 2009 and 2010 as the world economy started recovering from the recession of the late 2000s, but remained constant between 2010 and 2012. On the other hand, the average per capita emissions of Parties not included in Annex I steadily grew from very low levels, resulting in an increase of 93.4 per cent. **The initial gap of 8.08 t CO<sub>2</sub> per capita that existed in 1990 between Parties included in Annex I and Parties not included in Annex I narrowed to 4.99 t CO<sub>2</sub> per capita in 2012.**

These trends, which include the effect of the implementation of domestic action in accordance with national circumstances, suggest that progress in reducing emissions while working towards the achievement of the ultimate objective of the Convention can be realized in such a manner as to narrow per capita CO<sub>2</sub> emission differences between Parties included in Annex I and Parties not included in Annex I.

Figure 6

**Per capita carbon dioxide emissions of Parties included in Annex I and Parties not included in Annex I**

Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <<http://wds.iaea.org/WDS/Common/Login/login.aspx>>.

Abbreviations: Annex I KP = Parties included in Annex I, Non-Annex I KP = Parties not included in Annex I.

## Annex

## Data used in the figures presented in this report

Table 2

**Total aggregate anthropogenic greenhouse gas emissions excluding emissions/removals from land use, land-use change and forestry of Parties included in Annex I**(Mt CO<sub>2</sub> eq)

	1990	1995	2000	2005	2007	2009	2011	2012
Australia	414.97	436.86	489.81	523.48	537.93	541.18	541.54	543.65
Austria	78.09	79.74	80.28	92.58	86.97	80.15	82.76	80.06
Belarus	139.15	82.84	79.17	84.17	87.31	87.86	87.50	89.28
Belgium	142.95	150.33	145.86	142.07	133.44	123.21	120.15	116.52
Bulgaria	109.82	76.00	59.67	63.86	68.59	57.91	66.21	61.26
Croatia	31.98	23.54	26.68	30.73	32.79	29.43	28.58	26.45
Cyprus	6.09	7.52	8.90	9.89	10.38	10.30	9.68	9.26
Czech Republic	196.15	151.77	146.33	145.97	147.25	134.22	135.28	131.47
Denmark	70.02	77.28	69.95	65.59	68.92	62.51	58.05	53.12
Estonia	40.63	20.07	17.16	18.42	20.95	16.19	20.49	19.19
EU-15	4 266.83	4 177.10	4 167.29	4 193.23	4 102.64	3 725.65	3 653.96	3 622.92
Finland	70.33	70.77	69.19	68.62	78.25	66.00	66.86	60.97
France	560.38	556.88	564.60	563.58	542.72	514.38	495.98	496.40
Germany	1 248.05	1 117.58	1 040.37	994.46	976.58	912.61	928.69	939.08
Greece	104.94	109.73	126.59	135.32	134.65	124.12	114.74	110.99
Hungary	97.60	78.47	76.50	78.38	75.65	66.98	66.03	61.98
Iceland	3.54	3.32	3.90	3.86	4.62	4.78	4.44	4.47
Ireland	55.25	58.90	68.22	69.66	68.37	62.31	57.75	58.53
Italy	519.05	530.33	551.24	574.26	555.09	490.39	487.48	461.19
Japan	1 234.37	1 335.94	1 340.57	1 350.35	1 364.28	1 205.69	1 306.54	1 343.14
Kazakhstan	357.60	216.93	171.98	226.34	257.06	262.13	277.95	283.55
Latvia	26.21	12.50	9.99	11.06	11.98	10.85	11.14	10.98
Liechtenstein	0.23	0.23	0.25	0.27	0.24	0.24	0.22	0.23
Lithuania	48.72	22.07	19.63	23.32	26.12	20.43	21.68	21.62
Luxembourg	12.90	10.18	9.77	13.10	12.37	11.69	12.13	11.84
Malta	1.99	2.42	2.55	2.98	3.09	2.99	3.03	3.14
Monaco	0.11	0.12	0.12	0.11	0.10	0.10	0.09	0.09
Netherlands	211.85	223.16	213.02	209.45	204.20	197.79	195.06	191.67
New Zealand	60.64	64.46	70.90	78.29	76.22	73.10	74.39	76.05
Norway	50.47	50.31	54.12	54.54	56.08	51.88	53.32	52.76
Poland	466.37	441.10	396.10	398.83	415.45	387.70	405.74	399.27
Portugal	60.86	71.51	84.23	87.80	80.39	74.95	69.41	68.85
Romania	247.69	175.29	134.10	141.34	142.83	119.94	121.54	118.79
Russian Federation	3 367.78	2 209.68	2 055.53	2 137.57	2 208.28	2 132.27	2 286.44	2 297.15
Slovakia	73.60	53.47	49.12	50.46	48.55	44.81	44.97	43.12
Slovenia	18.44	18.55	18.95	20.31	20.67	19.37	19.46	18.91
Spain	283.75	322.11	380.00	431.39	432.11	359.66	345.89	340.81
Sweden	72.73	74.17	68.57	66.92	65.24	59.10	60.76	57.61
Switzerland	53.00	51.68	51.82	54.27	51.96	52.42	50.03	51.49
Turkey	188.43	238.82	298.09	330.74	382.38	371.15	424.09	439.87
Ukraine	944.35	516.71	413.84	428.51	446.34	370.09	409.52	402.67
United Kingdom	783.41	732.72	704.44	688.26	673.80	596.93	569.27	586.36

	1990	1995	2000	2005	2007	2009	2011	2012
<b>Total Annex I Kyoto Protocol</b>	<b>12 454.49</b>	<b>10 476.06</b>	<b>10 172.11</b>	<b>10 471.11</b>	<b>10 610.20</b>	<b>9 809.81</b>	<b>10 134.88</b>	<b>10 143.84</b>
<b>Total Annex I Convention</b>	<b>19 264.92</b>	<b>17 712.80</b>	<b>17 969.08</b>	<b>18 435.23</b>	<b>18 647.24</b>	<b>17 141.44</b>	<b>17 553.08</b>	<b>17 330.32</b>

Source: National greenhouse gas inventory submissions for 2014. Available at <[http://unfccc.int/ghg\\_data/ghg\\_data\\_unfccc/items/4146.php](http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php)>.

Note: The joint emissions of 15 member States that formed the European Community at the time of ratification of the Kyoto Protocol (EU-15) are not included in the total greenhouse gas emissions reported at the bottom of this table.

Table 3

**Total aggregate anthropogenic greenhouse gas emissions including emissions/removals from land use, land-use change and forestry of Parties included in Annex I**

(Mt CO<sub>2</sub> eq)

	1990	1995	2000	2005	2007	2009	2011	2012
Australia	545.50	455.24	513.03	548.43	621.60	557.96	480.89	558.81
Austria	68.21	68.26	65.05	84.96	86.22	76.24	78.89	76.22
Belarus	110.58	51.62	48.26	57.96	59.75	57.93	58.27	63.78
Belgium	142.12	149.67	145.26	140.89	132.28	121.96	118.98	115.14
Bulgaria	96.32	63.43	51.33	55.08	61.64	49.45	57.81	53.05
Croatia	24.80	13.71	18.96	22.10	25.07	21.13	21.58	19.91
Cyprus	5.95	7.37	8.75	9.82	10.44	10.17	9.61	9.24
Czech Republic	192.71	144.83	139.05	139.54	146.79	127.69	128.26	124.21
Denmark	75.30	80.95	73.19	70.07	71.48	65.56	55.31	52.28
Estonia	31.81	9.55	18.97	13.43	13.33	10.15	17.60	17.24
EU-15	4 129.84	4 010.32	3 985.82	4 025.60	3 948.20	3 517.72	3 464.85	3 435.22
Finland	56.65	58.00	50.02	40.06	53.97	27.22	42.75	35.11
France	531.76	526.69	539.10	522.76	498.77	474.18	456.28	452.14
Germany	1 223.53	1 093.25	1 016.40	1 003.58	986.40	907.52	924.61	935.60
Greece	102.82	106.84	124.58	132.64	133.71	121.44	111.81	108.13
Hungary	95.64	72.96	75.89	73.37	72.20	63.13	62.39	57.57
Iceland	4.71	4.43	4.92	4.77	5.49	5.61	5.19	5.17
Ireland	52.93	57.53	67.38	67.44	65.67	57.82	54.11	55.39
Italy	515.45	506.63	534.26	544.72	549.35	462.71	468.34	442.63
Japan	1 167.55	1 256.53	1 254.92	1 261.02	1 281.85	1 133.19	1 230.95	1 268.07
Kazakhstan	350.59	208.89	149.19	209.93	240.99	244.91	256.95	260.03
Latvia	6.35	-6.09	-4.10	-2.34	-2.78	-3.52	-0.69	-1.32
Liechtenstein	0.22	0.22	0.24	0.26	0.23	0.24	0.21	0.22
Lithuania	44.43	18.56	10.25	18.48	22.51	9.76	11.11	13.55
Luxembourg	13.23	9.92	9.36	12.70	12.09	11.26	11.69	11.40
Malta	1.99	2.41	2.54	2.97	3.08	2.99	3.02	3.13
Monaco	0.11	0.12	0.12	0.11	0.10	0.10	0.09	0.09
Netherlands	214.86	226.00	215.39	211.73	206.44	201.00	198.47	195.20
New Zealand	23.39	32.46	38.55	48.24	49.26	40.87	44.80	49.45
Norway	40.32	36.91	30.22	29.39	29.63	22.75	25.71	26.08
Poland	440.87	426.81	365.50	353.94	384.59	358.06	370.12	367.41
Portugal	60.92	66.19	77.59	86.07	67.26	60.73	55.50	58.21
Romania	223.43	148.24	108.45	115.81	118.08	94.46	98.52	98.27
Russian Federation	3 532.35	2 079.17	1 649.03	1 631.41	1 699.12	1 553.52	1 713.01	1 755.14
Slovakia	64.59	43.67	39.37	45.85	41.66	38.61	38.77	35.02
Slovenia	16.96	17.07	13.60	15.04	16.22	14.95	15.06	14.56
Spain	260.44	298.16	348.82	399.21	397.26	326.42	312.20	307.28

	1990	1995	2000	2005	2007	2009	2011	2012
Sweden	34.03	36.27	26.06	36.01	30.52	23.82	25.17	22.19
Switzerland	51.08	48.54	51.83	52.33	50.20	51.61	48.13	50.36
Turkey	144.36	191.25	248.03	281.01	330.18	314.80	363.26	380.06
Ukraine	874.62	467.96	363.01	390.08	392.43	351.83	403.03	375.43
United Kingdom	785.29	734.21	702.34	682.59	667.26	589.99	561.79	579.38
<b>Total Annex I Kyoto Protocol</b>	<b>12 228.77</b>	<b>9 814.43</b>	<b>9 194.71</b>	<b>9 413.46</b>	<b>9 632.34</b>	<b>8 660.22</b>	<b>8 939.55</b>	<b>9 050.83</b>
<b>Total Annex I Convention</b>	<b>18 150.78</b>	<b>16 459.44</b>	<b>16 279.40</b>	<b>16 425.76</b>	<b>16 757.51</b>	<b>15 023.31</b>	<b>15 490.26</b>	<b>15 336.62</b>

Source: National greenhouse gas inventory submissions for 2014. Available at [http://unfccc.int/ghg\\_data/ghg\\_data\\_unfccc/items/4146.php](http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php).

Note: The joint emissions of 15 member States that formed the European Community at the time of ratification of the Kyoto Protocol (EU-15) are not included in total greenhouse gas emissions reported at the bottom of this table.

Table 4  
**Total aggregate anthropogenic carbon dioxide emissions from fuel combustion of Parties included in Annex I**  
(Mt CO<sub>2</sub>)

	1990	1995	2000	2005	2007	2009	2011	2012
Australia	260.46	285.96	335.35	371.92	386.28	395.19	388.32	386.27
Austria	56.41	59.35	61.66	74.63	70.03	63.96	67.68	64.73
Belarus	124.80	61.70	58.47	61.78	63.50	61.46	65.60	71.12
Belgium	107.95	115.21	118.83	113.22	105.95	100.77	110.46	104.56
Bulgaria	74.94	53.27	42.36	46.30	50.84	42.19	49.12	44.30
Croatia	21.51	15.80	17.66	20.73	22.05	19.76	18.77	17.19
Cyprus	3.86	5.03	6.27	6.99	7.36	7.44	6.95	6.46
Czech Republic	148.80	124.98	122.41	120.15	122.42	110.26	112.87	107.77
Denmark	50.63	58.14	50.76	48.41	51.53	46.88	42.07	37.13
Estonia	35.76	16.04	14.63	16.87	19.26	14.67	17.50	16.35
EU-15	3 082.76	3 063.09	3 145.00	3 255.97	3 193.74	2 885.01	2 840.47	2 827.15
Finland	54.36	55.98	55.22	55.12	64.21	54.54	55.38	49.41
France	352.81	354.24	378.68	388.20	373.06	348.64	328.65	333.89
Germany	949.66	867.81	825.04	799.62	779.33	730.42	742.23	755.27
Greece	70.13	75.82	87.43	95.04	97.84	90.22	82.84	77.51
Hungary	66.40	57.31	54.20	56.37	54.12	48.16	47.39	43.55
Iceland	1.89	1.95	2.15	2.19	2.30	2.06	1.85	1.84
Ireland	30.56	33.02	41.13	43.92	44.24	39.20	34.93	35.55
Italy	397.36	409.41	426.04	460.81	447.27	389.92	393.00	374.77
Japan	1 056.75	1 136.67	1 170.60	1 208.09	1 229.02	1 085.24	1 183.39	1 223.30
Kazakhstan	236.42	167.52	113.00	157.05	187.08	199.23	230.92	225.78
Latvia	18.65	8.85	6.82	7.57	8.34	7.17	7.34	7.01
Liechtenstein <sup>a</sup>								
Lithuania	33.11	14.17	11.19	13.48	14.42	12.43	13.28	13.33
Luxembourg	10.36	8.05	8.00	11.38	10.61	9.99	10.43	10.22
Malta	2.29	2.35	2.11	2.71	2.73	2.45	2.47	2.52
Monaco <sup>b</sup>								
Netherlands	155.85	170.94	172.09	180.11	180.96	176.14	174.89	173.77
New Zealand	22.32	25.27	30.90	33.88	32.83	31.17	30.36	32.14
Norway	28.29	32.81	33.56	36.36	37.99	37.07	37.80	36.19
Poland	342.14	331.13	290.92	292.94	303.75	288.61	300.82	293.77
Portugal	39.42	48.22	59.20	62.78	55.85	53.36	47.55	45.89
Romania	167.50	117.49	87.04	94.47	94.06	78.56	81.64	78.97



	1990	1995	2000	2005	2007	2009	2011	2012
Russian Federation	2 178.84	1 558.73	1 496.72	1 511.83	1 566.35	1 478.37	1 653.23	1 659.03
Slovakia	56.73	40.83	37.37	38.10	36.89	33.46	33.86	31.88
Slovenia	13.35	14.03	14.09	15.59	15.83	15.00	15.25	14.63
Spain	205.22	232.69	283.92	339.45	343.71	282.45	270.41	266.58
Sweden	52.79	57.61	52.71	50.34	46.35	41.79	43.44	40.42
Switzerland	41.59	41.84	42.45	44.62	42.26	42.36	39.86	41.26
Turkey	126.91	152.66	200.56	216.36	265.00	256.31	285.73	302.38
Ukraine	687.86	392.78	291.96	305.59	313.93	252.50	285.39	281.07
United Kingdom	549.25	516.60	524.29	532.94	522.80	456.73	436.51	457.45
<b>Total Annex I Kyoto Protocol</b>	<b>8 833.93</b>	<b>7 722.26</b>	<b>7 627.79</b>	<b>7 937.91</b>	<b>8 072.35</b>	<b>7 406.13</b>	<b>7 750.18</b>	<b>7 765.26</b>
<b>Total Annex I Convention</b>	<b>13 894.37</b>	<b>13 154.35</b>	<b>13 741.51</b>	<b>14 103.49</b>	<b>14 216.55</b>	<b>12 909.28</b>	<b>13 344.35</b>	<b>13 147.36</b>

Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <<http://wds.iea.org/WDS/Common/Login/login.aspx>>.

Note: The joint emissions of 15 member States that formed the European Community at the time of ratification of the Kyoto Protocol (EU-15) are not included in total greenhouse gas emissions reported at the bottom of this table.

<sup>a</sup> Included in Switzerland's emissions.

<sup>b</sup> Included in France's emissions.

Table 5

**Total aggregate anthropogenic carbon dioxide emissions from fuel combustion of Parties not included in Annex I (Mt CO<sub>2</sub>)**

	1990	1995	2000	2005	2007	2009	2011	2012
Albania	6.25	1.86	3.05	3.97	3.85	3.64	4.13	3.83
Algeria	52.73	56.72	63.52	79.37	86.60	96.39	103.88	114.35
Angola	4.01	3.96	5.08	6.46	9.76	14.08	15.73	16.46
Argentina	99.86	119.83	141.85	152.61	168.61	171.85	183.70	188.51
Armenia	20.46	3.42	3.40	4.12	4.79	4.26	4.66	5.42
Azerbaijan	55.01	33.90	27.88	30.81	26.85	24.79	26.79	29.27
Bahrain	12.44	15.39	17.81	22.49	24.74	26.97	28.06	28.81
Bangladesh	13.57	20.25	25.06	35.10	40.59	46.66	55.52	59.55
Benin	0.25	0.22	1.41	2.65	3.75	4.15	4.70	4.95
Bolivia (Plurinational State of)	5.15	6.89	7.13	9.43	11.19	12.75	15.25	16.32
Bosnia and Herzegovina	23.65	3.24	13.51	15.63	18.16	19.74	22.81	21.22
Botswana	2.77	3.15	3.98	4.22	4.28	4.05	4.54	4.47
Brazil	192.38	235.57	303.58	322.68	342.59	338.31	408.00	440.24
Brunei Darussalam	3.25	4.49	4.43	4.82	6.84	7.42	8.27	8.40
Cambodia	NA	1.47	1.96	2.64	3.39	3.64	4.03	4.17
Cameroon	2.67	2.50	2.79	2.93	4.11	4.79	5.19	5.42
Chile	30.81	38.66	52.06	58.18	65.38	65.28	76.02	77.77
China	2 244.86	3 021.63	3 310.07	5 403.09	6 316.44	6 792.94	7 954.79	8 205.86
Colombia	46.23	58.41	59.18	58.05	58.42	60.86	67.87	67.35
Congo	0.62	0.47	0.50	0.83	1.06	1.53	2.06	2.18
Costa Rica	2.60	4.40	4.45	5.69	6.59	6.28	6.68	6.75
Côte d'Ivoire	2.72	3.27	6.32	5.80	5.54	5.91	5.84	7.83
Cuba	33.79	22.41	27.31	25.29	26.49	32.52	28.57	28.82
Democratic People's Republic of Korea	114.01	74.86	68.57	73.82	62.00	68.48	45.16	45.42

	1990	1995	2000	2005	2007	2009	2011	2012
Democratic Republic of the Congo	2.96	1.14	0.85	1.28	1.51	1.70	2.30	2.42
Dominican Republic	7.40	11.18	16.14	17.33	18.25	18.15	19.16	19.81
Ecuador	13.38	17.03	19.27	24.52	26.67	29.89	31.66	33.10
Egypt	79.50	84.15	102.48	150.29	170.30	182.26	190.46	196.85
El Salvador	2.23	4.63	5.21	6.27	6.93	6.17	6.03	6.15
Eritrea	NA	0.77	0.61	0.58	0.49	0.44	0.51	0.54
Ethiopia	2.21	2.38	3.25	4.55	5.47	6.07	7.00	7.93
Gabon	0.90	1.33	1.47	1.73	1.93	2.14	2.47	2.47
Georgia	33.26	8.08	4.61	4.33	5.54	5.36	6.27	6.81
Ghana	2.71	3.31	5.07	6.51	8.48	9.19	11.03	12.81
Gibraltar	0.17	0.32	0.39	0.46	0.48	0.53	0.52	0.53
Guatemala	3.21	5.81	8.46	10.55	11.37	11.13	10.38	10.49
Haiti	0.94	0.90	1.41	1.98	2.31	2.23	2.13	2.07
Honduras	2.16	3.54	4.44	7.08	8.03	7.32	7.63	8.16
Hong Kong, China	32.88	36.02	40.23	41.17	43.92	46.18	45.60	44.99
India	580.47	772.48	978.10	1 191.10	1 404.10	1 675.46	1 828.76	1 954.02
Indonesia	146.05	214.38	272.84	335.71	367.51	379.10	400.30	435.48
Iran (Islamic Republic of )	178.69	251.37	315.13	421.64	488.39	515.11	525.77	532.15
Iraq	53.42	97.46	70.29	74.90	65.59	89.69	108.15	118.98
Israel	33.54	46.27	55.18	59.86	64.11	63.74	67.24	73.27
Jamaica	7.18	8.34	9.72	10.19	11.66	7.46	7.27	7.09
Jordan	9.24	12.19	14.36	18.02	19.23	19.32	19.80	21.70
Kenya	5.51	5.76	7.80	7.54	8.47	10.65	11.55	10.64
Kuwait	28.72	36.11	49.12	70.13	70.13	81.50	84.74	91.26
Kyrgyzstan	22.45	4.43	4.40	4.88	5.95	6.50	7.20	9.51
Lebanon	5.46	12.85	14.12	14.48	12.01	19.34	18.49	21.03
Libya	27.35	35.12	39.50	45.27	41.09	49.10	35.30	44.20
Malaysia	50.41	85.34	117.75	157.49	179.24	172.45	192.36	195.89
Mauritius	1.15	1.53	2.40	2.92	3.35	3.37	3.60	3.69
Mexico	265.26	296.95	349.55	385.77	410.10	399.94	432.50	435.79
Mongolia	12.66	10.05	8.81	9.48	11.06	11.65	12.98	14.22
Montenegro	NA	NA	NA	1.95	2.08	1.70	2.50	2.30
Morocco	19.64	25.99	29.42	39.45	41.50	42.80	50.22	51.84
Mozambique	1.08	1.14	1.32	1.51	1.97	2.19	2.79	2.60
Myanmar	4.05	6.85	9.37	10.59	10.20	7.36	8.26	11.65
Namibia	NA	1.77	1.92	2.33	2.43	2.86	3.01	3.18
Nepal	0.88	1.74	3.06	3.03	2.54	3.41	4.35	4.89
Nicaragua	1.83	2.50	3.52	4.03	4.36	4.17	4.48	4.30
Nigeria	29.00	33.80	44.05	57.86	48.65	45.19	61.82	64.56
Oman	10.14	14.66	20.10	25.92	38.77	53.71	65.68	67.63
Pakistan	58.60	79.52	99.23	120.50	141.48	139.50	136.39	137.44
Panama	2.57	4.11	4.94	6.82	7.05	8.08	9.67	9.88
Paraguay	1.91	3.46	3.25	3.44	3.83	4.13	4.91	5.06
Peru	19.21	23.72	26.49	28.87	30.92	38.25	44.68	45.82
Philippines	37.93	56.89	67.44	70.59	68.11	70.50	76.65	79.46
Qatar	14.28	18.82	23.97	36.40	46.64	54.00	67.06	75.78
Republic of Korea	229.30	358.65	437.72	469.12	490.43	515.62	589.93	592.92
Republic of Moldova	30.18	11.81	6.50	7.68	7.35	7.31	7.88	7.62
Saudi Arabia	151.06	192.56	236.26	299.31	332.22	378.61	429.76	458.80
Senegal	2.13	2.47	3.56	4.65	4.97	5.35	5.75	5.64

	1990	1995	2000	2005	2007	2009	2011	2012
Serbia	61.40	43.99	42.51	49.15	49.65	45.33	49.78	44.09
Singapore	30.25	39.10	44.40	42.72	44.79	44.07	50.33	49.75
South Africa	253.65	274.49	297.06	329.45	355.67	365.50	361.51	376.12
Sri Lanka	3.64	5.40	10.42	13.26	12.81	11.47	14.45	15.86
Sudan	5.50	4.56	5.80	10.24	13.71	15.14	14.58	14.46
Syrian Arab Republic	28.16	32.79	39.78	54.90	61.59	57.24	53.33	40.05
Tajikistan	10.90	2.44	2.17	2.34	3.10	2.29	2.39	2.74
Thailand	80.41	140.20	154.74	210.78	217.43	216.78	241.69	256.65
The former Yugoslav Republic of								
Macedonia	8.52	8.18	8.41	8.78	9.22	8.40	9.27	8.69
Togo	0.57	0.57	0.94	0.98	0.90	2.26	1.88	1.62
Trinidad and Tobago	11.37	12.27	18.21	30.96	36.49	35.46	37.92	37.09
Tunisia	12.08	14.22	18.02	20.19	21.15	21.51	21.88	23.04
Turkmenistan	44.47	33.17	36.56	47.82	55.50	49.67	61.55	63.82
United Arab Emirates	51.88	69.64	85.59	109.08	125.10	147.51	158.46	170.97
United Republic of								
Tanzania	1.71	2.52	2.63	5.08	5.27	5.20	7.36	8.89
Uruguay	3.75	4.52	5.26	5.29	5.80	7.66	7.39	8.39
Uzbekistan	119.83	101.58	118.03	108.57	110.94	102.55	109.21	111.14
Venezuela (Bolivarian Republic of)	105.09	118.29	126.74	147.94	135.77	168.82	160.64	178.28
Viet Nam	17.20	27.79	44.01	79.75	91.32	113.78	134.32	142.85
Yemen	6.43	9.34	13.21	18.65	19.80	21.90	19.87	19.97
Zambia	2.60	2.05	1.70	2.09	1.42	1.68	2.11	2.76
Zimbabwe	16.00	14.85	13.10	10.12	9.47	8.04	9.54	9.98
<b>Total non-Annex I</b>	<b>6 463.86</b>	<b>7 981.54</b>	<b>9 180.53</b>	<b>12 412.43</b>	<b>13 986.65</b>	<b>15 021.23</b>	<b>16 874.35</b>	<b>17 513.46</b>

Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <http://wds.iea.org/WDS/Common/Login/login.aspx>.

Note: The total presented for Parties not included in Annex I is not the sum of those presented in this table. It was obtained directly from the database of the International Energy Agency as a memo item.

Abbreviation: NA = not available.

Table 6  
**Population trends of Parties included in Annex I**  
(millions)

	1990	1995	2000	2005	2006	2007	2008	2009
Australia	17.17	18.19	19.27	20.54	21.26	22.13	22.76	23.15
Austria	7.68	7.95	8.01	8.23	8.30	8.34	8.39	8.43
Belarus	10.19	10.19	10.01	9.66	9.56	9.51	9.47	9.46
Belgium	9.97	10.14	10.25	10.47	10.62	10.79	10.98	11.05
Bulgaria	8.72	8.41	8.17	7.74	7.55	7.44	7.35	7.31
Croatia	4.78	4.67	4.43	4.44	4.44	4.43	4.28	4.27
Cyprus	0.57	0.65	0.69	0.73	0.76	0.80	0.84	0.86
Czech Republic	10.36	10.33	10.27	10.23	10.32	10.49	10.50	10.51
Denmark	5.14	5.23	5.34	5.42	5.46	5.52	5.57	5.59
Estonia	1.62	1.48	1.40	1.36	1.34	1.34	1.33	1.33
EU-15	366.08	372.81	378.17	388.79	393.36	397.37	400.42	401.83
Finland	4.99	5.11	5.18	5.25	5.29	5.34	5.39	5.41
France	58.23	59.50	60.87	63.13	63.97	64.66	65.30	65.61
Germany	79.36	81.66	82.19	82.46	82.26	81.88	81.78	81.92

	1990	1995	2000	2005	2006	2007	2008	2009
Greece	10.34	10.63	10.92	11.09	11.16	11.19	11.12	11.09
Hungary	10.37	10.33	10.21	10.09	10.06	10.02	9.97	9.92
Iceland	0.26	0.27	0.28	0.30	0.31	0.32	0.32	0.32
Ireland	3.51	3.60	3.80	4.16	4.40	4.54	4.58	4.59
Italy	56.72	56.84	56.94	58.19	58.79	59.58	60.06	60.34
Japan	123.61	125.44	126.83	127.76	127.98	128.03	127.83	127.55
Kazakhstan	16.35	15.82	14.88	15.15	15.48	16.09	16.56	16.79
Latvia	2.66	2.49	2.37	2.24	2.20	2.14	2.06	2.03
Liechtenstein <sup>a</sup>								
Lithuania	3.70	3.63	3.50	3.32	3.23	3.16	3.03	2.99
Luxembourg	0.38	0.41	0.44	0.47	0.48	0.50	0.52	0.53
Malta	0.35	0.37	0.38	0.40	0.41	0.41	0.42	0.42
Monaco <sup>b</sup>								
Netherlands	14.95	15.46	15.92	16.32	16.38	16.53	16.69	16.75
New Zealand	3.37	3.69	3.87	4.15	4.24	4.33	4.42	4.44
Norway	4.24	4.36	4.49	4.62	4.71	4.83	4.95	5.02
Poland	38.03	38.28	38.26	38.16	38.12	38.15	38.53	38.53
Portugal	10.00	10.03	10.29	10.50	10.54	10.57	10.56	10.52
Romania	23.20	22.68	22.44	21.32	20.88	20.37	20.15	20.08
Russian Federation	148.29	148.14	146.30	143.15	142.10	141.91	142.96	143.53
Slovakia	5.30	5.36	5.40	5.39	5.40	5.42	5.40	5.41
Slovenia	2.00	1.99	1.99	2.00	2.02	2.04	2.05	2.06
Spain	39.01	39.39	40.26	43.66	45.24	46.37	46.74	46.77
Sweden	8.56	8.83	8.87	9.03	9.15	9.30	9.45	9.52
Switzerland	6.80	7.08	7.21	7.50	7.62	7.80	7.91	8.00
Turkey	55.12	59.76	64.25	68.57	70.22	72.05	73.95	74.90
Ukraine	51.89	51.51	49.18	47.11	46.51	46.05	45.71	45.59
United Kingdom	57.24	58.03	58.89	60.41	61.32	62.26	63.29	63.71
<b>Total Annex I</b>								
<b>Kyoto Protocol</b>	<b>915.04</b>	<b>927.92</b>	<b>934.25</b>	<b>944.73</b>	<b>950.07</b>	<b>956.64</b>	<b>963.16</b>	<b>966.31</b>
<b>Total Annex I</b>								
<b>Convention</b>	<b>1 176.56</b>	<b>1 208.00</b>	<b>1 232.45</b>	<b>1 257.81</b>	<b>1 269.18</b>	<b>1 281.41</b>	<b>1 292.97</b>	<b>1 298.51</b>

Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <http://wds.iea.org/WDS/Common/Login/login.aspx>.

<sup>a</sup> Included in Switzerland's data.

<sup>b</sup> Included in France's data.

Table 7  
**Population trends of Parties not included in Annex I**

(millions)

	1990	1995	2000	2005	2007	2009	2011	2012
Albania	3.45	3.36	3.31	3.20	3.17	3.15	3.15	3.16
Algeria	26.24	29.32	31.72	33.96	35.10	36.38	37.76	38.48
Angola	10.33	12.11	13.93	16.54	17.71	18.93	20.18	20.82
Argentina	32.63	34.83	36.90	38.65	39.33	40.02	40.73	41.09
Armenia	3.55	3.22	3.08	3.02	2.99	2.97	2.96	2.97
Azerbaijan	7.16	7.69	8.05	8.39	8.58	8.95	9.17	9.30
Bahrain	0.50	0.56	0.67	0.88	1.03	1.19	1.29	1.32
Bangladesh	107.39	119.87	132.38	143.14	146.46	149.50	152.86	154.70
Benin	5.00	5.99	6.95	8.18	8.71	9.24	9.78	10.05

	1990	1995	2000	2005	2007	2009	2011	2012
Bolivia (Plurinational State of)	6.79	7.64	8.50	9.36	9.68	9.99	10.32	10.50
Bosnia and Herzegovina	4.53	3.52	3.83	3.88	3.87	3.85	3.84	3.83
Botswana	1.38	1.58	1.76	1.88	1.92	1.95	1.99	2.00
Brazil	149.65	161.89	174.51	186.14	190.00	193.49	196.94	198.66
Brunei Darussalam	0.26	0.30	0.33	0.37	0.38	0.39	0.41	0.41
Cambodia	NA	10.77	12.22	13.36	13.75	14.14	14.61	14.87
Cameroon	12.07	13.93	15.93	18.14	19.10	20.10	21.16	21.70
Chile	13.18	14.40	15.40	16.27	16.60	16.93	17.25	17.40
China	1 135.19	1 204.86	1 262.65	1 303.72	1 317.89	1 331.26	1 344.13	1 350.70
Colombia	33.31	36.57	39.90	43.18	44.50	45.80	47.08	47.70
Congo	2.38	2.72	3.13	3.54	3.76	4.00	4.23	4.34
Costa Rica	3.08	3.48	3.93	4.32	4.46	4.60	4.74	4.81
Côte d'Ivoire	12.12	14.22	16.13	17.39	17.95	18.60	19.39	19.84
Cuba	10.60	10.93	11.14	11.29	11.30	11.29	11.28	11.27
Democratic People's Republic of Korea	20.19	21.76	22.84	23.81	24.11	24.37	24.63	24.76
Democratic Republic of the Congo	34.91	42.01	46.95	54.03	57.19	60.49	63.93	65.71
Dominican Republic	7.25	7.98	8.66	9.34	9.62	9.88	10.15	10.28
Ecuador	10.12	11.32	12.53	13.78	14.27	14.76	15.25	15.49
Egypt	56.34	61.17	66.14	71.78	74.23	76.78	79.39	80.72
El Salvador	5.34	5.75	5.96	6.07	6.12	6.18	6.26	6.30
Eritrea	2.76	3.41	3.94	4.85	5.21	5.56	5.93	6.13
Ethiopia	48.04	57.02	66.02	76.17	80.44	84.84	89.39	91.73
Gabon	0.95	1.08	1.23	1.38	1.45	1.52	1.59	1.63
Georgia	4.80	4.73	4.42	4.36	4.39	4.41	4.48	4.49
Ghana	14.63	16.76	18.83	21.38	22.53	23.69	24.82	25.37
Gibraltar	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Guatemala	8.89	9.98	11.20	12.68	13.32	13.99	14.71	15.08
Haiti	7.11	7.84	8.58	9.26	9.51	9.77	10.03	10.17
Honduras	4.90	5.59	6.24	6.90	7.18	7.47	7.78	7.94
Hong Kong, China	5.71	6.16	6.67	6.81	6.92	6.97	7.07	7.16
India	868.89	955.80	1 042.26	1 127.14	1 159.10	1 190.14	1 221.16	1 236.69
Indonesia	178.63	194.11	208.94	224.48	230.97	237.49	243.80	246.86
Iran (Islamic Republic of)	56.36	60.47	65.91	70.15	71.81	73.54	75.42	76.42
Iraq	17.52	20.36	23.80	27.38	28.74	30.16	31.76	32.58
Israel	4.66	5.55	6.30	6.96	7.22	7.48	7.76	7.91
Jamaica	2.39	2.48	2.59	2.64	2.66	2.68	2.70	2.71
Jordan	3.17	4.20	4.80	5.41	5.66	5.92	6.18	6.32
Kenya	23.45	27.42	31.29	35.79	37.75	39.83	42.03	43.18
Kuwait	2.06	1.59	1.91	2.30	2.56	2.85	3.13	3.25
Kyrgyzstan	4.39	4.56	4.90	5.16	5.27	5.38	5.52	5.61
Lebanon	2.70	3.03	3.24	3.99	4.14	4.25	4.38	4.43
Libya	4.26	4.75	5.18	5.59	5.78	5.96	6.10	6.16
Malaysia	18.21	20.73	23.42	25.84	26.81	27.79	28.76	29.24
Mauritius	1.06	1.12	1.19	1.24	1.26	1.28	1.29	1.29
Mexico	87.07	94.49	100.90	107.15	109.79	112.85	115.68	117.05
Mongolia	2.18	2.30	2.40	2.53	2.60	2.67	2.75	2.80
Montenegro	NA	NA	NA	0.62	0.62	0.62	0.62	0.62

**FCCE/SBSTA/2015/INF.4**

	1990	1995	2000	2005	2007	2009	2011	2012
Morocco	24.68	26.83	28.71	30.13	30.67	31.28	32.06	32.52
Mozambique	13.57	15.98	18.28	21.01	22.17	23.36	24.58	25.20
Myanmar	42.12	45.33	48.45	50.18	50.83	51.54	52.35	52.80
Namibia	1.42	1.65	1.90	2.03	2.08	2.14	2.22	2.26
Nepal	18.11	20.59	23.18	25.29	25.95	26.55	27.16	27.47
Nicaragua	4.14	4.66	5.10	5.46	5.60	5.74	5.91	5.99
Nigeria	95.62	108.43	122.88	139.59	147.19	155.38	164.19	168.83
Oman	1.81	2.16	2.19	2.52	2.57	2.66	3.03	3.31
Pakistan	111.09	126.69	143.83	157.97	163.93	170.09	176.17	179.16
Panama	2.49	2.76	3.06	3.37	3.49	3.62	3.74	3.80
Paraguay	4.25	4.80	5.35	5.90	6.13	6.35	6.57	6.69
Peru	21.77	23.94	26.00	27.72	28.33	28.93	29.62	29.99
Philippines	61.95	69.61	77.65	85.82	88.88	91.89	95.05	96.71
Qatar	0.48	0.50	0.59	0.82	1.15	1.56	1.91	2.05
Republic of Korea	42.87	45.09	47.01	48.14	48.60	49.18	49.78	50.00
Republic of Moldova	3.70	3.68	3.64	3.60	3.58	3.57	3.56	3.56
Saudi Arabia	16.21	18.57	20.15	24.69	25.92	26.80	27.76	28.29
Senegal	7.51	8.71	9.86	11.27	11.91	12.59	13.33	13.73
Serbia	10.06	10.38	8.13	7.44	7.38	7.32	7.26	7.22
Singapore	3.05	3.53	4.03	4.27	4.59	4.99	5.18	5.31
South Africa	35.20	39.12	44.00	47.64	48.91	50.22	51.58	52.28
Sri Lanka	17.02	18.14	19.10	19.64	20.04	20.45	20.87	20.33
Sudan	25.77	29.96	34.38	39.63	41.96	44.37	46.81	48.03
Syrian Arab Republic	12.45	14.34	16.37	18.17	19.56	21.03	21.96	22.40
Tajikistan	5.30	5.78	6.19	6.81	7.11	7.45	7.82	8.01
Thailand	56.58	58.98	62.34	65.56	66.08	66.28	66.58	66.79
The former Yugoslav Republic of Macedonia	2.01	1.97	2.05	2.09	2.10	2.10	2.10	2.11
Togo	3.79	4.28	4.87	5.54	5.84	6.14	6.47	6.64
Trinidad and Tobago	1.22	1.26	1.27	1.30	1.31	1.32	1.33	1.34
Tunisia	8.15	8.96	9.56	10.03	10.23	10.44	10.67	10.78
Turkmenistan	3.67	4.19	4.50	4.75	4.86	4.98	5.11	5.17
United Arab Emirates	1.81	2.35	3.03	4.15	5.80	7.72	8.93	9.21
United Republic of Tanzania	25.49	29.94	34.02	38.82	41.12	43.64	46.36	47.78
Uruguay	3.11	3.22	3.32	3.33	3.34	3.36	3.38	3.40
Uzbekistan	20.51	22.79	24.65	26.17	26.87	27.77	29.34	29.78
Venezuela (Bolivarian Republic of)	19.74	22.09	24.41	26.73	27.66	28.58	29.50	29.96
Viet Nam	66.02	72.00	77.63	82.39	84.22	86.03	87.84	88.77
Yemen	11.79	15.02	17.52	20.14	21.18	22.23	23.30	23.85
Zambia	7.85	8.84	10.10	11.47	12.11	12.83	13.63	14.08
Zimbabwe	10.46	11.64	12.50	12.71	12.74	12.89	13.36	13.72
<b>Total non-Annex I</b>	<b>4 097.63</b>	<b>4 485.58</b>	<b>4 862.21</b>	<b>5 224.79</b>	<b>5 369.37</b>	<b>5 515.81</b>	<b>5 664.69</b>	<b>5 739.50</b>

Source: International Energy Agency. Beyond 2020 data portal, downloaded on 5 July 2015. Available at <http://wds.iea.org/WDS/Common/Login/login.aspx>.

Note: The total presented for Parties not included in Annex I is not the sum of those presented in this table. It was obtained directly from the database of the International Energy Agency as a memo item.

Abbreviation: NA = not available.

Table 8  
**Per capita total aggregate anthropogenic carbon dioxide emissions from fuel combustion of Parties included in Annex I**

(t CO<sub>2</sub> per capita)

	1990	1995	2000	2005	2006	2007	2008	2009
Australia	15.17	15.72	17.40	18.11	18.17	17.86	17.06	16.69
Austria	7.35	7.47	7.70	9.07	8.44	7.67	8.07	7.68
Belarus	12.25	6.05	5.84	6.39	6.64	6.46	6.92	7.51
Belgium	10.83	11.36	11.59	10.81	9.98	9.34	10.06	9.46
Bulgaria	8.60	6.34	5.18	5.98	6.74	5.67	6.68	6.06
Croatia	4.50	3.38	3.99	4.67	4.97	4.46	4.38	4.03
Cyprus	6.74	7.80	9.09	9.54	9.71	9.34	8.27	7.49
Czech Republic	14.36	12.10	11.92	11.74	11.86	10.51	10.75	10.25
Denmark	9.85	11.12	9.51	8.93	9.44	8.49	7.55	6.64
Estonia	22.07	10.84	10.45	12.40	14.37	10.95	13.16	12.29
EU-15	8.42	8.22	8.32	8.37	8.12	7.26	7.09	7.04
Finland	10.89	10.95	10.66	10.50	12.14	10.21	10.27	9.13
France	6.06	5.95	6.22	6.15	5.83	5.39	5.03	5.09
Germany	11.97	10.63	10.04	9.70	9.47	8.92	9.08	9.22
Greece	6.78	7.13	8.01	8.57	8.77	8.06	7.45	6.99
Hungary	6.40	5.55	5.31	5.59	5.38	4.81	4.75	4.39
Iceland	7.27	7.22	7.68	7.30	7.42	6.44	5.78	5.75
Ireland	8.71	9.17	10.82	10.56	10.05	8.63	7.63	7.75
Italy	7.01	7.20	7.48	7.92	7.61	6.54	6.54	6.21
Japan	8.55	9.06	9.23	9.46	9.60	8.48	9.26	9.59
Kazakhstan	14.46	10.59	7.59	10.37	12.08	12.38	13.95	13.45
Latvia	7.00	3.56	2.88	3.38	3.79	3.35	3.56	3.45
Liechtenstein <sup>a</sup>								
Lithuania	8.95	3.90	3.20	4.06	4.46	3.93	4.39	4.46
Luxembourg	27.26	19.63	18.18	24.21	22.10	19.98	20.06	19.28
Malta	6.47	6.35	5.54	6.71	6.71	5.95	5.94	6.01
Monaco <sup>b</sup>								
Netherlands	10.42	11.06	10.81	11.04	11.05	10.66	10.48	10.37
New Zealand	6.62	6.85	7.98	8.16	7.74	7.20	6.87	7.24
Norway	6.67	7.53	7.47	7.87	8.07	7.67	7.64	7.21
Poland	9.00	8.65	7.60	7.68	7.97	7.57	7.81	7.62
Portugal	3.94	4.81	5.75	5.98	5.30	5.05	4.50	4.36
Romania	7.22	5.18	3.88	4.43	4.50	3.86	4.05	3.93
Russian Federation	14.69	10.52	10.23	10.56	11.02	10.42	11.56	11.56
Slovakia	10.70	7.62	6.92	7.07	6.83	6.17	6.27	5.89
Slovenia	6.68	7.05	7.08	7.80	7.84	7.35	7.44	7.10
Spain	5.26	5.91	7.05	7.77	7.60	6.09	5.79	5.70
Sweden	6.17	6.52	5.94	5.57	5.07	4.49	4.60	4.25
Switzerland	6.12	5.91	5.89	5.95	5.55	5.43	5.04	5.16
Turkey	2.30	2.55	3.12	3.16	3.77	3.56	3.86	4.04
Ukraine	13.26	7.63	5.94	6.49	6.75	5.48	6.24	6.16
United Kingdom	9.60	8.90	8.90	8.82	8.53	7.34	6.90	7.18
<b>Total Annex I Kyoto Protocol</b>	<b>9.65</b>	<b>8.32</b>	<b>8.16</b>	<b>8.40</b>	<b>8.50</b>	<b>7.74</b>	<b>8.05</b>	<b>8.04</b>
<b>Total Annex I Convention</b>	<b>11.81</b>	<b>10.89</b>	<b>11.15</b>	<b>11.21</b>	<b>11.20</b>	<b>10.07</b>	<b>10.32</b>	<b>10.12</b>

Source: International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <<http://wds.iea.org/WDS/Common/Login/login.aspx>>.

<sup>a</sup> Included in Switzerland's data.

<sup>b</sup> Included in France's data.

Table 9

**Per capita total aggregate anthropogenic carbon dioxide emissions from fuel combustion of Parties not included in Annex I**

(t CO<sub>2</sub> per capita)

	1990	1995	2000	2005	2007	2009	2011	2012
Albania	1.81	0.55	0.92	1.24	1.21	1.16	1.31	1.21
Algeria	2.01	1.93	2.00	2.34	2.47	2.65	2.75	2.97
Angola	0.39	0.33	0.36	0.39	0.55	0.74	0.78	0.79
Argentina	3.06	3.44	3.84	3.95	4.29	4.29	4.51	4.59
Armenia	5.76	1.06	1.10	1.36	1.60	1.43	1.57	1.82
Azerbaijan	7.68	4.41	3.46	3.67	3.13	2.77	2.92	3.15
Bahrain	24.88	27.48	26.58	25.56	24.02	22.66	21.75	21.83
Bangladesh	0.13	0.17	0.19	0.25	0.28	0.31	0.36	0.38
Benin	0.05	0.04	0.20	0.32	0.43	0.45	0.48	0.49
Bolivia (Plurinational State of)	0.76	0.90	0.84	1.01	1.16	1.28	1.48	1.55
Bosnia and Herzegovina	5.22	0.92	3.53	4.03	4.69	5.13	5.94	5.54
Botswana	2.01	1.99	2.26	2.24	2.23	2.08	2.28	2.24
Brazil	1.29	1.46	1.74	1.73	1.80	1.75	2.07	2.22
Brunei Darussalam	12.50	14.97	13.42	13.03	18.00	19.03	20.17	20.49
Cambodia	NA	0.14	0.16	0.20	0.25	0.26	0.28	0.28
Cameroon	0.22	0.18	0.18	0.16	0.22	0.24	0.25	0.25
Chile	2.34	2.68	3.38	3.58	3.94	3.86	4.41	4.47
China	1.98	2.51	2.62	4.14	4.79	5.10	5.92	6.08
Colombia	1.39	1.60	1.48	1.34	1.31	1.33	1.44	1.41
Congo	0.26	0.17	0.16	0.23	0.28	0.38	0.49	0.50
Costa Rica	0.84	1.26	1.13	1.32	1.48	1.37	1.41	1.40
Côte d'Ivoire	0.22	0.23	0.39	0.33	0.31	0.32	0.30	0.39
Cuba	3.19	2.05	2.45	2.24	2.34	2.88	2.53	2.56
Democratic People's Republic of Korea	5.65	3.44	3.00	3.10	2.57	2.81	1.83	1.83
Democratic Republic of the Congo	0.08	0.03	0.02	0.02	0.03	0.03	0.04	0.04
Dominican Republic	1.02	1.40	1.86	1.86	1.90	1.84	1.89	1.93
Ecuador	1.32	1.50	1.54	1.78	1.87	2.03	2.08	2.14
Egypt	1.41	1.38	1.55	2.09	2.29	2.37	2.40	2.44
El Salvador	0.42	0.81	0.87	1.03	1.13	1.00	0.96	0.98
Eritrea	NA	0.23	0.15	0.12	0.09	0.08	0.09	0.09
Ethiopia	0.05	0.04	0.05	0.06	0.07	0.07	0.08	0.09
Gabon	0.95	1.23	1.20	1.25	1.33	1.41	1.55	1.52
Georgia	6.93	1.71	1.04	0.99	1.26	1.22	1.40	1.52
Ghana	0.19	0.20	0.27	0.30	0.38	0.39	0.44	0.50
Gibraltar	5.67	10.67	13.00	15.33	16.00	17.67	17.33	17.67
Guatemala	0.36	0.58	0.76	0.83	0.85	0.80	0.71	0.70
Haiti	0.13	0.11	0.16	0.21	0.24	0.23	0.21	0.20
Honduras	0.44	0.63	0.71	1.03	1.12	0.98	0.98	1.03
Hong Kong, China	5.76	5.85	6.03	6.05	6.35	6.63	6.45	6.28
India	0.67	0.81	0.94	1.06	1.21	1.41	1.50	1.58
Indonesia	0.82	1.10	1.31	1.50	1.59	1.60	1.64	1.76
Iran (Islamic Republic of)	3.17	4.16	4.78	6.01	6.80	7.00	6.97	6.96
Iraq	3.05	4.79	2.95	2.74	2.28	2.97	3.41	3.65



	1990	1995	2000	2005	2007	2009	2011	2012
Israel	7.20	8.34	8.76	8.60	8.88	8.52	8.66	9.26
Jamaica	3.00	3.36	3.75	3.86	4.38	2.78	2.69	2.62
Jordan	2.91	2.90	2.99	3.33	3.40	3.26	3.20	3.43
Kenya	0.23	0.21	0.25	0.21	0.22	0.27	0.27	0.25
Kuwait	13.94	22.71	25.72	30.49	27.39	28.60	27.07	28.08
Kyrgyzstan	5.11	0.97	0.90	0.95	1.13	1.21	1.30	1.70
Lebanon	2.02	4.24	4.36	3.63	2.90	4.55	4.22	4.75
Libya	6.42	7.39	7.63	8.10	7.11	8.24	5.79	7.18
Malaysia	2.77	4.12	5.03	6.09	6.69	6.21	6.69	6.70
Mauritius	1.08	1.37	2.02	2.35	2.66	2.63	2.79	2.86
Mexico	3.05	3.14	3.46	3.60	3.74	3.54	3.74	3.72
Mongolia	5.81	4.37	3.67	3.75	4.25	4.36	4.72	5.08
Montenegro	NA	NA	NA	3.15	3.35	2.74	4.03	3.71
Morocco	0.80	0.97	1.02	1.31	1.35	1.37	1.57	1.59
Mozambique	0.08	0.07	0.07	0.07	0.09	0.09	0.11	0.10
Myanmar	0.10	0.15	0.19	0.21	0.20	0.14	0.16	0.22
Namibia	NA	1.07	1.01	1.15	1.17	1.34	1.36	1.41
Nepal	0.05	0.08	0.13	0.12	0.10	0.13	0.16	0.18
Nicaragua	0.44	0.54	0.69	0.74	0.78	0.73	0.76	0.72
Nigeria	0.30	0.31	0.36	0.41	0.33	0.29	0.38	0.38
Oman	5.60	6.79	9.18	10.29	15.09	20.19	21.68	20.43
Pakistan	0.53	0.63	0.69	0.76	0.86	0.82	0.77	0.77
Panama	1.03	1.49	1.61	2.02	2.02	2.23	2.59	2.60
Paraguay	0.45	0.72	0.61	0.58	0.62	0.65	0.75	0.76
Peru	0.88	0.99	1.02	1.04	1.09	1.32	1.51	1.53
Philippines	0.61	0.82	0.87	0.82	0.77	0.77	0.81	0.82
Qatar	29.75	37.64	40.63	44.39	40.56	34.62	35.11	36.97
Republic of Korea	5.35	7.95	9.31	9.74	10.09	10.48	11.85	11.86
Republic of Moldova	8.16	3.21	1.79	2.13	2.05	2.05	2.21	2.14
Saudi Arabia	9.32	10.37	11.73	12.12	12.82	14.13	15.48	16.22
Senegal	0.28	0.28	0.36	0.41	0.42	0.42	0.43	0.41
Serbia	6.10	4.24	5.23	6.61	6.73	6.19	6.86	6.11
Singapore	9.92	11.08	11.02	10.00	9.76	8.83	9.72	9.37
South Africa	7.21	7.02	6.75	6.92	7.27	7.28	7.01	7.19
Sri Lanka	0.21	0.30	0.55	0.68	0.64	0.56	0.69	0.78
Sudan	0.21	0.15	0.17	0.26	0.33	0.34	0.31	0.30
Syrian Arab Republic	2.26	2.29	2.43	3.02	3.15	2.72	2.43	1.79
Tajikistan	2.06	0.42	0.35	0.34	0.44	0.31	0.31	0.34
Thailand	1.42	2.38	2.48	3.22	3.29	3.27	3.63	3.84
The former Yugoslav Republic of Macedonia	4.24	4.15	4.10	4.20	4.39	4.00	4.41	4.12
Togo	0.15	0.13	0.19	0.18	0.15	0.37	0.29	0.24
Trinidad and Tobago	9.32	9.74	14.34	23.82	27.85	26.86	28.51	27.68
Tunisia	1.48	1.59	1.88	2.01	2.07	2.06	2.05	2.14
Turkmenistan	12.12	7.92	8.12	10.07	11.42	9.97	12.05	12.34
United Arab Emirates	28.66	29.63	28.25	26.28	21.57	19.11	17.74	18.56
United Republic of Tanzania	0.07	0.08	0.08	0.13	0.13	0.12	0.16	0.19
Uruguay	1.21	1.40	1.58	1.59	1.74	2.28	2.19	2.47
Uzbekistan	5.84	4.46	4.79	4.15	4.13	3.69	3.72	3.73
Venezuela (Bolivarian Republic of)	5.32	5.35	5.19	5.53	4.91	5.91	5.45	5.95
Viet Nam	0.26	0.39	0.57	0.97	1.08	1.32	1.53	1.61

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	<i>1990</i>	<i>1995</i>	<i>2000</i>	<i>2005</i>	<i>2007</i>	<i>2009</i>	<i>2011</i>	<i>2012</i>
Yemen	0.55	0.62	0.75	0.93	0.93	0.99	0.85	0.84
Zambia	0.33	0.23	0.17	0.18	0.12	0.13	0.15	0.20
Zimbabwe	1.53	1.28	1.05	0.80	0.74	0.62	0.71	0.73
<b>Non-Annex I</b>	<b>1.58</b>	<b>1.78</b>	<b>1.89</b>	<b>2.38</b>	<b>2.60</b>	<b>2.72</b>	<b>2.98</b>	<b>3.05</b>

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*Source:* International Energy Agency. *CO<sub>2</sub> Emissions from Fuel Combustion, 2014 Edition*. Available at <http://wds.iea.org/WDS/Common/Login/login.aspx>.

*Abbreviation:* NA = not available.