

Highlights from

KEY GHG

DATA

**Greenhouse Gas (GHG)
Emissions Data for 1990 - 2003**

**submitted to the United Nations
Framework Convention on Climate Change (UNFCCC)**

I. INTRODUCTION

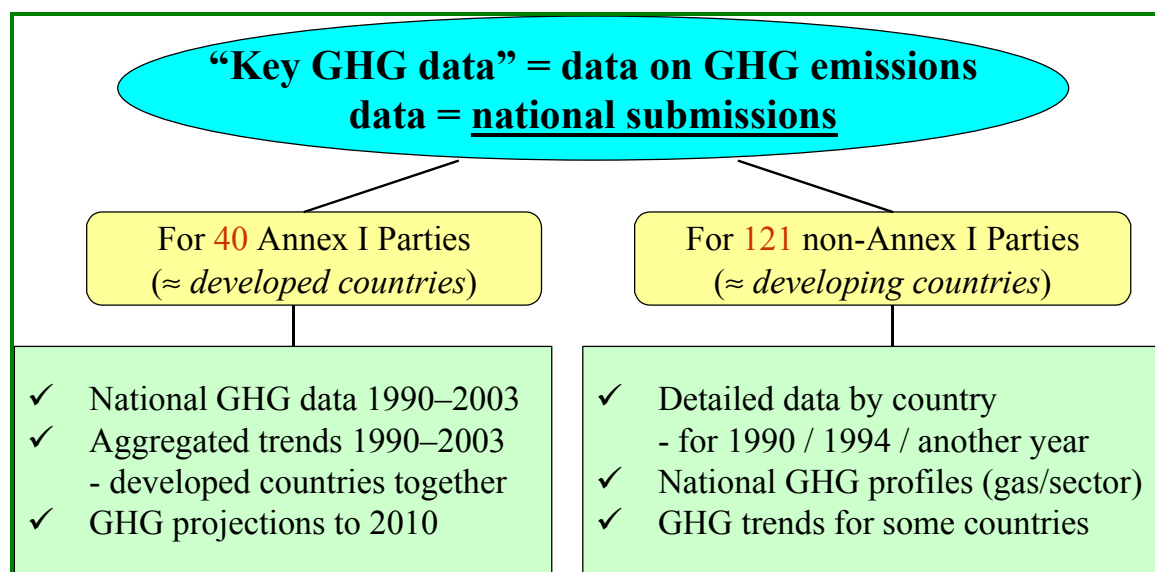
1. “Key GHG data” is the first publication by the United Nations Climate Change secretariat that presents greenhouse gas (GHG) data collected under the United Nations Framework Convention on Climate Change (UNFCCC) since 1994 in their entirety. Under the UNFCCC, Parties have committed themselves to submitting such data. Unlike many other studies, which are based on the estimates done by their authors, this is a collection of data officially submitted by Parties to the Convention and, in case of industrialized (Annex I) Parties, reviewed and checked by international teams of experts. The publication covers the following GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). Greenhouse gas data are presented in “CO₂ equivalent” – calculated as the sum of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ weighed with the corresponding values of the global warming potential (GWP).

II. DATA OVERVIEW

2. The guidelines and the amount of reported GHG data are different for the two major country groups under the Convention: Parties included in Annex I to the Convention (Annex I Parties) and Parties not included in Annex I to the Convention (non-Annex I Parties). Annex I Parties (often referred to as ‘developed countries’) report GHG data in their national GHG inventories that they submit annually; non-Annex I Parties (often referred to as ‘developing countries’) report GHG data in their national communications submitted in accordance with the timeframe decided by the Conference of the Parties (COP).

3. Figure 1 shows what data are available in “Key GHG data”. For most Annex I Parties, data are available for all years from 1990 to 2003. For most non-Annex I Parties, data are available for one or two years, usually either 1990 or 1994, although some communications contain GHG data for several years.

Figure 1. “Key GHG data”– data overview



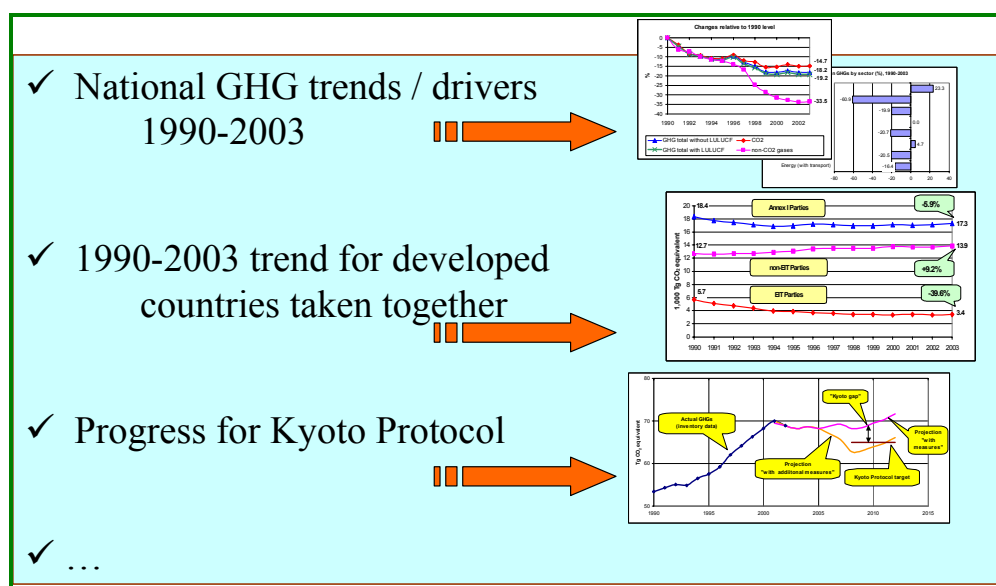
4. “Key GHG data” contains a wealth of information. This booklet shows only a few examples, or ‘highlights’, in order to illustrate how data on GHG emissions can be read and understood.

III. EXAMPLES: ANNEX I (DEVELOPED) PARTIES

5. For Annex I Parties, “Key GHG data” presents, for example, the following (see figure 2):

- *National GHG trends in 1990–2003* as well as information on changes in sectoral emissions, which helps to see not only the trends but their drivers as well
- Some aggregated data such as *1990–2003 trends in GHG emissions from Annex I Parties* taken together
- Current and projected GHG emissions in *comparison with the national targets under the Kyoto Protocol*

Figure 2. Examples of the data for Annex I Parties



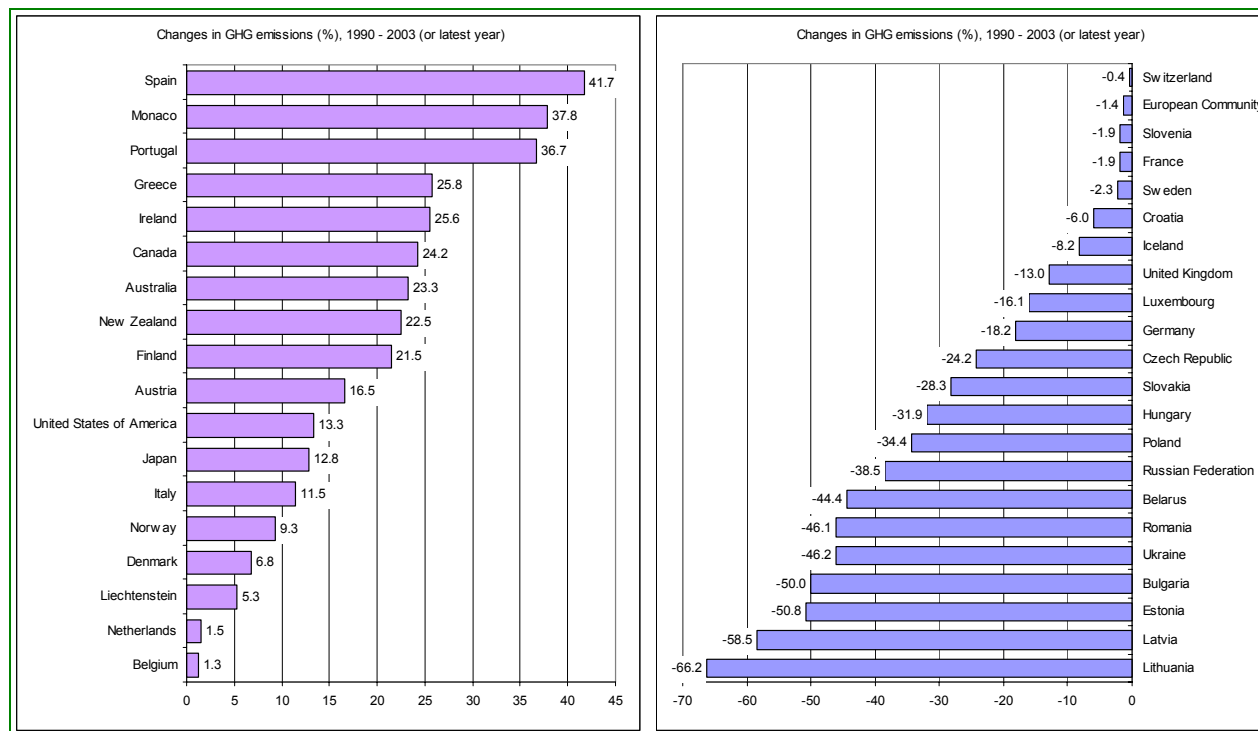
A. National GHG trends in 1990–2003

6. By country, changes in GHG emissions from 1990 to 2003 vary greatly: from a decrease of 66.2 per cent (Lithuania) to an increase by 41.7 per cent (Spain), see figure 3. Given the diversity of national GHG trends, “Key GHG data” provides detailed GHG data for individual Annex I countries. Appendix 1 shows how such detailed data are presented, using Germany and Spain as examples. Similar graphs are provided in “Key GHG data” for all Annex I countries.

B. 1990–2003 trends in GHG emissions from Annex I Parties

7. From 1990 to 2003, GHG emissions (without considering emissions/removals from the LULUCF¹ sector) from Annex I Parties taken together decreased by 5.9 per cent, from 18.4 billion tonnes CO₂ equivalent in 1990 to 17.3 billion tonnes CO₂ equivalent in 2003 (figure 4).

Figure 3. Changes in GHG emissions from Annex I Parties, 1990–2003



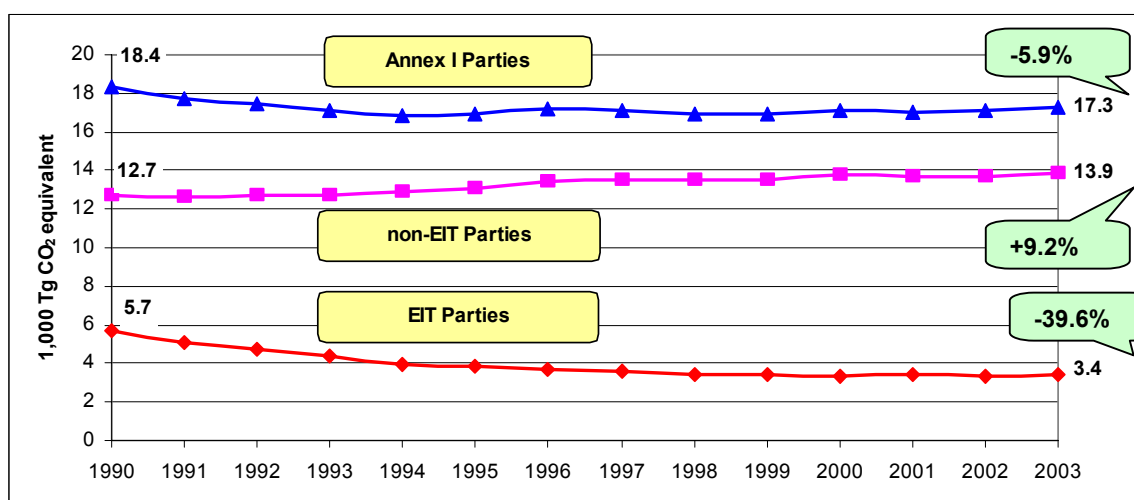
8. For Annex I Parties with economies in transition (EIT Parties²), GHG emissions decreased from 5.7 billion tonnes CO₂ equivalent in 1990 to 3.4 billion tonnes CO₂ equivalent in 2003 – a decrease by 39.6 per cent. For the non-EIT Annex I Parties,³ GHG emissions increased from 12.7 billion tonnes CO₂ equivalent in 1990 to 13.9 billion tonnes CO₂ equivalent in 2003 – an increase by 9.2 per cent. The decrease in GHG emissions from EIT countries in the early 1990s contributed considerably to the overall decrease for Annex I Parties taken together and to the GHG reduction below the 1990 level by 2000 as stipulated in Article 2(a) of the UNFCCC. Since the late 1990s GHG emissions from both EITs and non-EITs have been relatively stable.

¹ LULUCF stands for “Land use, land-use change and forestry”. This sector can be a net source or a net sink for GHG emissions. For simplicity, everywhere in this booklet GHG emissions do not include emissions or removals from LULUCF. Data for emissions with LULUCF are available in “Key GHG data”.

² There are 14 EIT Parties: Belarus, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovakia, Slovenia, and Ukraine.

³ There are 27 non-EIT Parties: Australia, Austria, Belgium, Canada, Denmark, European Community, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Liechtenstein, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. Turkey is not covered in this document because of the absence of data.

Figure 4. GHG emissions from Annex I, EIT and non-EIT Parties, 1990–2003



C. Comparison with the national targets under the Kyoto Protocol

9. Table 1 shows the 1990–2003 changes in GHG emissions for those Annex I Parties that are Parties to the Kyoto Protocol, along with their emission reduction targets under the Kyoto Protocol. The table indicates that while many EIT countries have already reduced their emissions below the Kyoto Protocol targets, for several Annex I countries achieving the targets appear to be a challenge that may require further efforts.

Table 1. Changes in GHG emissions from 1990 to 2003 for Annex I Parties to the Kyoto Protocol

Party	Change in GHG emissions without LULUCF, 1990-2003 (%)	National emission reduction target under the Kyoto Protocol ^{a, b} (%)	Party	Change in GHG emissions without LULUCF, 1990-2003 (%)	National emission reduction target under the Kyoto Protocol ^{a, b} (%)
Austria	16.5	-8 (-13)	Liechtenstein	5.3	-8
Belgium	1.3	-8 (-7.5)	Lithuania	-66.2	-8
Bulgaria	-50.0	-8	Luxembourg	-16.1	-8 (-28)
Canada	24.2	-6	Netherlands	1.5	-8 (-6)
Czech Republic	-24.2	-8	New Zealand	22.5	0
Denmark	6.8	-8 (-21)	Norway	9.3	1
Estonia	-50.8	-8	Poland	-34.4	-6
European Community	-1.4	-8	Portugal	36.7	-8 (+27)
Finland	21.5	-8 (0)	Romania	-46.1	-8
France	-1.9	-8 (0)	Russian Federation	-38.5	0
Germany	-18.2	-8 (-21)	Slovakia	-28.3	-8

Party	Change in GHG emissions without LULUCF, 1990-2003 (%)	National emission reduction target under the Kyoto Protocol ^{a, b} (%)	Party	Change in GHG emissions without LULUCF, 1990-2003 (%)	National emission reduction target under the Kyoto Protocol ^{a, b} (%)
Greece	25.8	-8 (+25)	Slovenia	-1.9	-8
Hungary	-31.9	-6	Spain	41.7	-8 (+15)
Iceland	-8.2	+10	Sweden	-2.3	-8 (+4)
Ireland	25.6	-8 (+13)	Switzerland	-0.4	-8
Italy	11.5	-8 (-6.5)	Ukraine	-46.2	0
Japan	12.8	-6	United Kingdom of Great Britain and Northern Ireland	-13.0	-8 (-12.5)
Latvia	-58.5	-8			

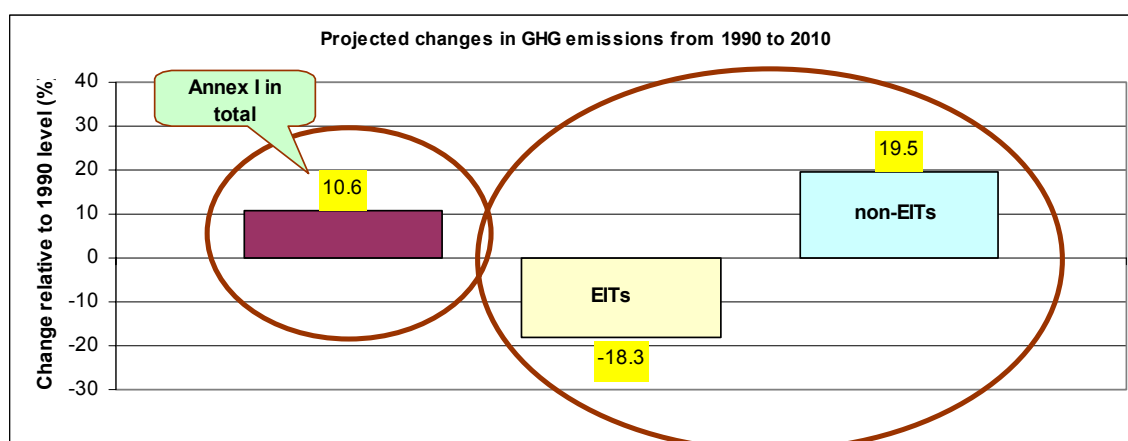
^a The national reduction targets as per the “burden-sharing” agreement of the European Community are shown in parentheses.

^b The national reduction targets relate to the first commitment period under the Kyoto Protocol, which is from 2008 to 2012.

Note: the table includes only those Annex I Parties that were Parties to the Kyoto Protocol at the time this publication was prepared.

10. Progress in emission reductions could be also seen with national GHG projections, which show what levels of GHG emissions countries expect to have in the future. The figure shows a summary of national emission projections from Annex I Parties taken together, expressed as projected changes to the 1990 level of emissions.

Figure 5. The “with measures” projections for Annex I, EIT and non-EIT Parties, 1990–2010



Note: these projections include all Annex I Parties (with projections available), including those that are not Parties to the Kyoto Protocol.

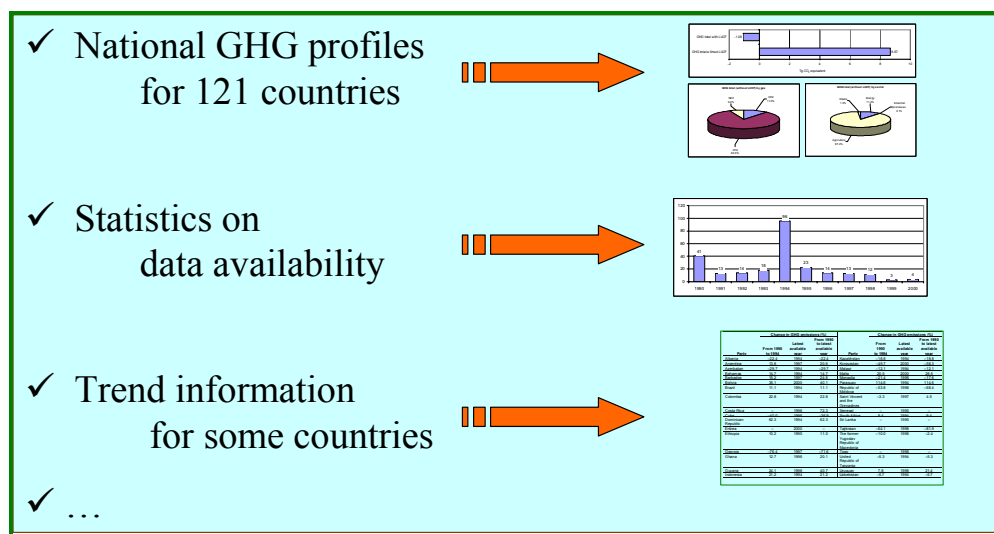
11. Figure 5 shows that after being relatively stable in the 1990s, GHG emissions are expected to increase under the “with measures”⁴ scenario up to 10.6 per cent above the 1990 level by 2010. After 2000, the emissions are projected to increase both in EIT and in non-EIT Parties. By 2010, total GHG emissions from EIT Parties are projected to be 18.3 per cent below the 1990 level and total GHG emissions from non-EIT Parties are projected to be 19.5 per cent above the 1990 level.

IV. EXAMPLES: NON-ANNEX I (DEVELOPING) PARTIES

12. For non-Annex I Parties, “Key GHG data” presents the following (see figure 6):

- **National GHG profiles** for 121 countries for the latest available year, including the contributions of individual gases and economic sectors to the national GHG total
- **Summary of data availability** from non-Annex I Parties showing, for each of the 121 countries, what data are available and for what years.
- **Information on GHG trends** for some non-Annex I Parties.

Figure 6. Examples of the data for non-Annex I Parties



⁴ “With measures” means that the projections include national GHG-related policies and measures implemented or adopted by the time when the projections were prepared. Planned policies and measures are not taken into account.

A. National GHG profiles

13. In addition to extensive data in a tabular format, “Key GHG data” provides graphical illustrations of the profiles (by gas and sector) of GHG emissions from individual non-Annex I Parties. For each non-Annex I Party, the following is presented for the latest year for which data are available: total GHG emissions with and without LUCF,⁵ the contributions of individual gases to GHG total and sectoral profiles of GHG emissions. Such information is indispensable for understanding GHG sources in a country.

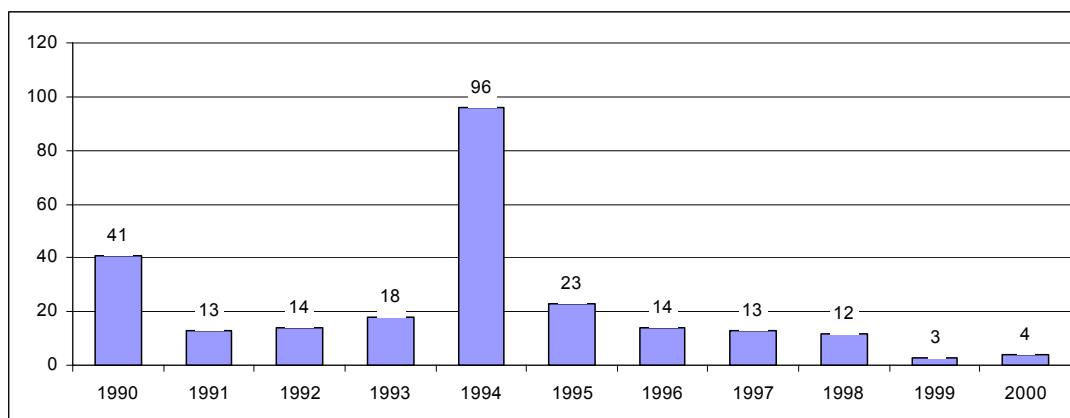
14. Appendix 2 contains examples of such graphs for Bolivia and Kyrgyzstan. These and similar figures in “Key GHG data” help seeing how different non-Annex I Parties are in terms of GHG emissions. For most non-Annex I Parties, CO₂ is the dominating GHG but for some it is CH₄ or N₂O. For many countries, energy is the largest GHG source whereas for some others it is agriculture. The LUCF sector can be either a net sink of GHG emissions or a net source. In some non-Annex I Parties, GHG removals through LUCF fully offset national GHG emissions, so that such countries are net GHG sinks.

B. Availability of GHG data for non-Annex I Parties

15. According to the relevant reporting guidelines, non-Annex I Parties need to report, in their initial national communications, data for 1994 or 1990. However, quite a few non-Annex I Parties estimated their GHG emissions for more than one year. As a result, data for more years are available now than just for 1990 or 1994. Figure 7 illustrates the availability of data for non-Annex I countries.

16. Preparation of a national GHG inventory requires a large amount of background data, profound technical knowledge, and a considerable organization effort by the country. The fact that so many non-Annex I countries successfully completed their inventories, sometimes providing even more information than required, shows that the efforts of these countries to implement the Convention are bringing tangible results.

Figure 7. Number of non-Annex I Parties with GHG data available, by year



⁵ LUCF stands for “Land-use change and forestry”. This sector is defined somewhat differently than the LULUCF sector that Annex I Parties use in their reporting.

C. GHG trends for some non-Annex I countries

17. Table 2 shows changes in GHG emissions (without LUCF) for those non-Annex I Parties that reported data for more than one year. Such reporting is not required under the UNFCCC but quite a few non-Annex I countries provided GHG data for two or several years.

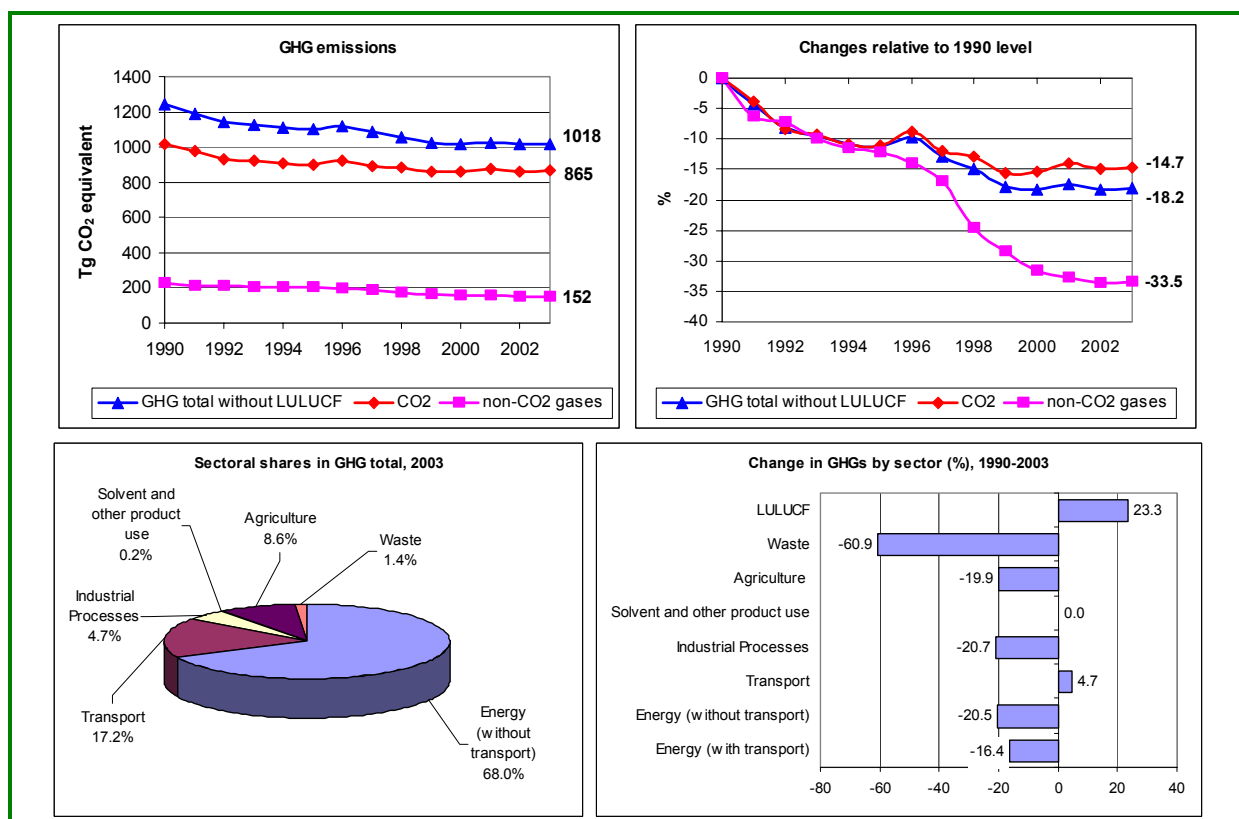
Table 2. Changes in GHG emissions (without LUCF) from non-Annex I Parties, 1990, 1994 and the latest available year

Party	Change in GHG emissions (%)			Party	Change in GHG emissions (%)		
	From 1990 to 1994	Latest available year	From 1990 to latest available year		From 1990 to 1994	Latest available year	From 1990 to latest available year
Albania	-22.4	1994	-22.4	Kazakhstan	-18.8	1994	-18.8
Argentina	13.8	1997	20.6	Kyrgyzstan	-49.7	2000	-58.3
Azerbaijan	-29.7	1994	-29.7	Malawi	-12.1	1994	-12.1
Bahamas	14.7	1994	14.7	Malta	20.5	2000	28.5
Barbados	15.2	1997	24.6	Mongolia	-21.4	1998	-17.6
Bolivia	35.1	2000	40.1	Paraguay	114.6	1994	114.6
Brazil	11.1	1994	11.1	Republic of Moldova	-53.8	1998	-68.4
Colombia	22.8	1994	22.8	Saint Vincent and the Grenadines	-3.3	1997	4.5
Costa Rica	-	1996	72.3	Senegal	-	1995	-
Cuba	-40.0	1996	-36.9	South Africa	9.4	1994	9.4
Dominican Republic	62.3	1994	62.3	Sri Lanka	-	1995	-
Eritrea	-	2000	-	Tajikistan	-64.1	1998	-81.9
Ethiopia	10.2	1995	11.0	The former Yugoslav Republic of Macedonia	-10.0	1998	-2.4
Georgia	-76.4	1997	-71.6	Togo	-	1998	-
Ghana	12.7	1996	20.1	United Republic of Tanzania	-5.3	1994	-5.3
Guyana	24.1	1998	40.7	Uruguay	7.8	1998	21.4
Indonesia	21.2	1994	21.2	Uzbekistan	-5.7	1994	-5.7

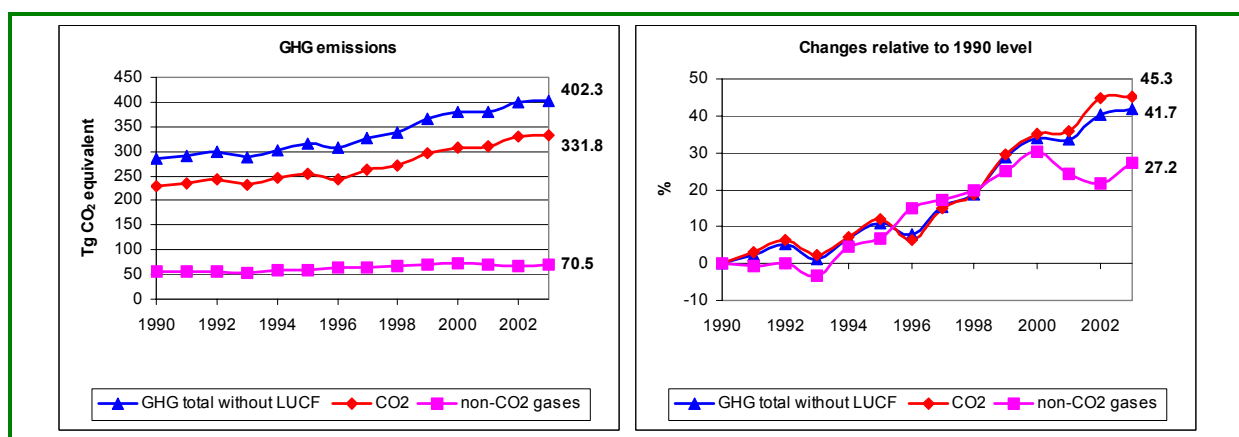
18. According to table 2, GHG changes from 1990 to 1994 can be calculated for 29 Parties; in 14 of these Parties, GHG emissions decreased from 1990 to 1994 whereas in 15 Parties the emissions increased. For 30 Parties, GHG changes from 1990 to the latest available year (which varies from 1994 to 2000) can be calculated; in 13 of these Parties, GHG emissions decreased between 1990 and the latest available year whereas in 17 Parties emissions increased.

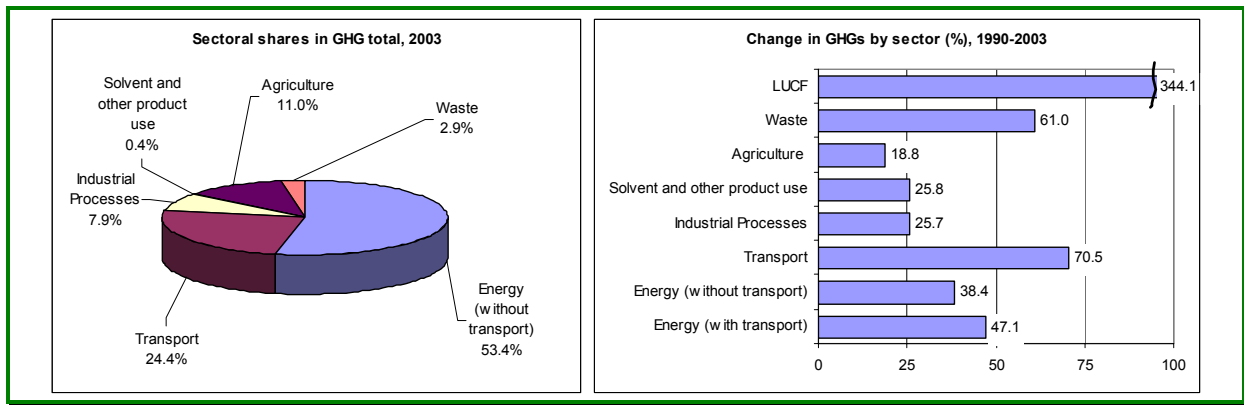
Appendix 1: Examples of Annex I country-level data

Germany, 1990–2003



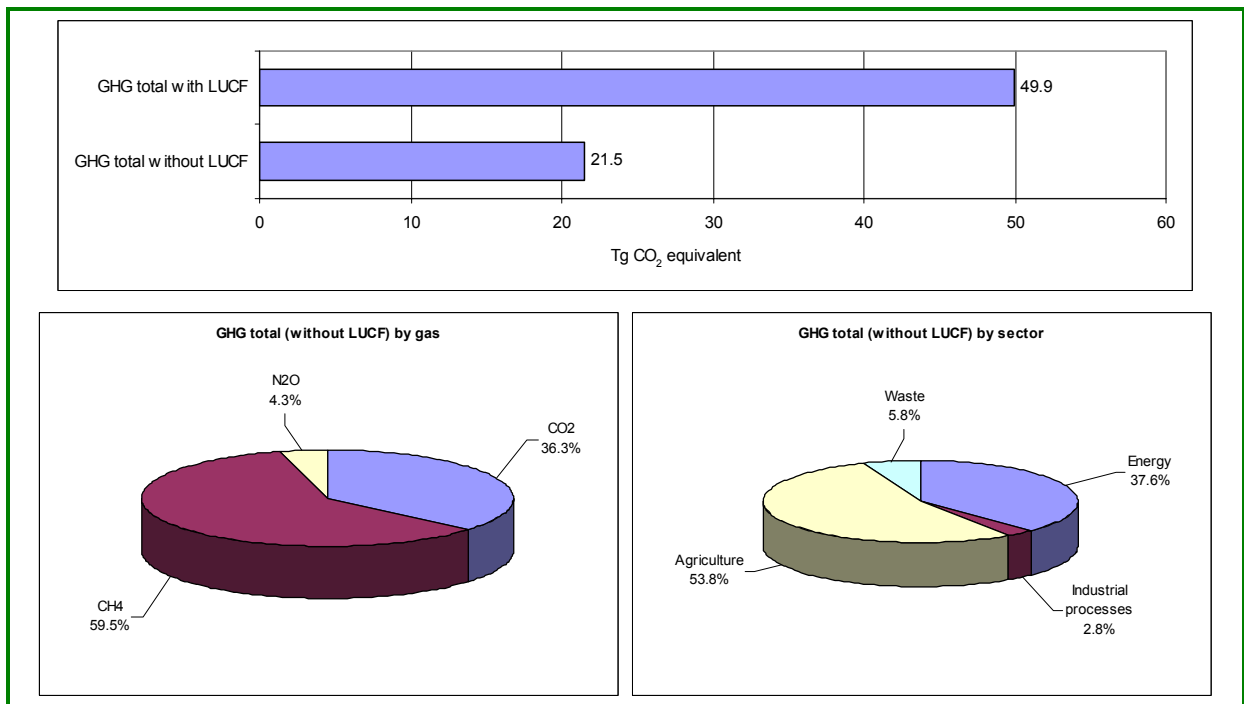
Spain, 1990–2003





Appendix 2: Examples of non-Annex I country-level data

Bolivia, 2000



Kyrgyzstan, 2000

