GHG DATA 2006

Highlights from Greenhouse Gas (GHG) Emissions Data for 1990–2004 for Annex I Parties

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

SUMMARY

Every year Parties included in Annex I to the United Nations Framework Convention on Climate Change (UNFCCC), which are often called Annex I Parties or "industrialized countries", submit their greenhouse gas (GHG) emissions data to the UNFCCC secretariat, which then publishes an annual report on the latest available data on GHG emissions from Annex I Parties.

This booklet presents some findings from the GHG data reported by Annex I Parties in 2006, both for all Annex I Parties and for those Annex I Parties that are Parties to the Kyoto Protocol. The key findings are:

- For all Annex I Parties taken together, GHG emissions in 2004 were 3.3 per cent below the 1990 level. The overall decrease is composed of a 36.8 per cent decrease for Parties with economies in transition (EITs) and an 11.0 per cent increase for non-EIT Parties. In 22 Annex I Parties GHG emissions decreased from 1990 to 2004 whereas in 19 Parties the emissions increased.
- Since 2000, the emissions have increased slightly, in both EIT and non-EIT Parties. Also, the number of Parties with emission decreases has declined considerably since 2000: between 1990 and 2000 more than a half of Annex I Parties (23 out of 41) decreased emissions, but between 2000 and 2004 decreases occurred in only 7 Parties.
- Changes in GHG emissions from 1990 to 2004 vary greatly from country to country, from a decrease by 60.4 per cent (Lithuania) to an increase by 72.6 per cent (Turkey).
- For Annex I Parties that are Parties to the Kyoto Protocol, GHG emissions in 2004 were 15.3 per cent per cent below the 1990 level. The emissions from these Parties were 11.8 billion tonnes CO₂ equivalent in 1990 compared with 18.6 billion tonnes for all Annex I Parties to the Convention (10.0 and 17.9 billion tonnes, respectively, in 2004).
- In all EIT Parties except Slovenia the emissions are now much below the targets under the Kyoto Protocol. For the non-EIT Parties, some Parties (such as France, Germany, Greece, Iceland, Monaco, Sweden and the United Kingdom of Great Britain and Northern Ireland) are currently relatively close to their targets; other Parties require substantial additional reductions or need to use the international flexibility mechanisms under the Kyoto Protocol.
- For all Annex I Parties taken together, sectoral emissions decreased from 1990 to 2004, with the greatest decreases in agriculture (-20.0 per cent) and industrial processes (-13.1 per cent). The decrease was in the energy sector (-0.4 per cent). Within the energy sector, GHG emissions increased in energy industries and transport, whereas in the other subsectors the emissions decreased. The greatest increase occurred for transport: 23.9 per cent from 1990 to 2004, which is higher than the similar estimate last year (when the 1990–2003 growth was estimated at 20.7 per cent).

In general, the message from the 2006 data is that **industrialized countries will need to intensify their efforts to reduce greenhouse gas emissions**. Transport remains a sector where emission reductions are needed but seem to be especially difficult to achieve. But **the challenge is well understood, and the Kyoto Protocol, which is now firmly in place, is guiding Annex I Parties in identifying and implementing policy options, including the flexibility mechanisms, for meeting their targets under the Protocol**. The GHG emissions data submitted by Annex I Parties under the Climate Change Convention are a reliable basis for assessing progress in emission reductions.

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I. INTRODUCTION

Every year Parties included in Annex I to the United Nations Framework Convention on Climate Change (UNFCCC), which are often called Annex I Parties or "industrialized countries", submit their greenhouse gas (GHG) emissions data to the UNFCCC secretariat. The submitted data are then published in an annual UNFCCC report (the "GHG data report"). This year's GHG data report¹ will be presented at the forthcoming session of the Conference of the Parties (COP) to be held in Nairobi, Kenya, from 6 to 17 November 2006. The report includes data for all 41 Annex I Parties, with data for Turkey being published for the first time and full data for the Russian Federation being available for the first time since 2000 (the data for Russia are preliminary).

This booklet presents some findings from the GHG data from 1990 to 2004 as reported by Annex I Parties in 2006, both for all Annex I Parties and for those Annex I Parties that are Parties to the Kyoto Protocol.² Unless otherwise indicated, the emissions data do not include emissions/removals from land use, land-use change and forestry (LULUCF).³

¹ The official full title of the document is "National greenhouse gas inventory data for the period 1990–2004 and status of reporting. Note by the secretariat", UNFCCC document FCCC/SBI/2006/26.

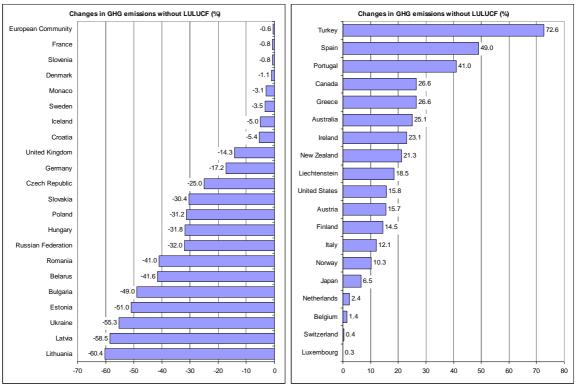
² Document FCCC/SBI/2006/26 does not present separately the data for those Annex I Parties that are Parties to the Kyoto Protocol.

³ Data for emissions with LULUCF can be found in the full GHG data report, see FCCC/SBI/2006/26.

II. Highlights/findings from the latest GHG data

1. Changes in GHG emissions from individual countries

- Changes in GHG⁴ emissions from 1990 to 2004 vary greatly from country to country, from a decrease by 60.4 per cent (Lithuania) to an increase by 72.6 per cent (Turkey) (see figure 1). Specific national data, including the national circumstances involved, should be analyzed to understand the trend for a given country.
- Altogether, in 22 Annex I Parties GHG emissions decreased from 1990 to 2004 whereas in 19 Parties the emissions increased.





Note: Base year data are used here instead of 1990 data (in accordance with decisions 9/CP.2 and 11/CP.4) for Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

⁴ Unless otherwise indicated, the data on GHG emissions are presented in "CO₂ equivalent" – as a sum of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) weighted with the corresponding values of the global warming potential (GWP).

2. Trends for all Annex I Parties

- For all Annex I Parties taken together, GHG emissions decreased by 3.3 per cent during the period 1990–2004, from 18.6 to 17.9 billion tonnes⁵ CO₂ equivalent (figure 2).
- For Annex I Parties with economies in transition (EIT Parties⁶), GHG emissions decreased from 1990 to 2004 by 36.8 per cent (from 5.6 to 3.5 billion tonnes CO₂ equivalent). This contributed considerably to the overall decrease in GHG emissions from Annex I Parties.
- For the non-EIT Annex I Parties,⁷ GHG emissions increased from 1990 to 2004 by 11.0 per cent (from 13.0 to 14.4 billion tonnes CO₂ equivalent).

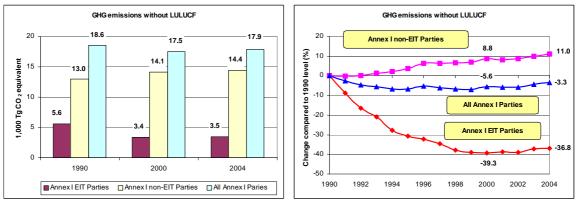


Figure 2. GHG emissions from Annex I Parties, 1990–2004

Note: Base year data are used here instead of 1990 data (in accordance with decisions 9/CP.2 and 11/CP.4) for Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

⁵ In UNFCCC documents, emissions data are usually given in gigagrams (Gg). One Gg equals one thousand tonnes; one billion (10^9) tonnes equals one million Gg or one thousand teragram (Tg).

⁶ The Annex I EIT Parties to the Convention are Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovenia, Slovakia, and Ukraine.

⁷ The Annex I non-EIT Parties to the Convention are Australia, Austria, Belgium, Canada, Denmark, European Community, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Liechtenstein, Luxembourg, Monaco, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

- From 2000, the emissions increased slightly for both EIT and in non-EIT Parties, as well as for all Annex I Parties taken together (table 1).
- The number of Parties with emission decreases has declined considerably since 2000:

 between 1990 and 2000, more than a half of Annex I Parties (23 out of 41) decreased emissions;
 between 2000 and 2004, decreases occurred in only 7 Parties.
- For most EIT Parties, the emissions have grown since 2000, although some EITs have kept the growth low or decreased emissions slightly between 2000 and 2004.

	Changes in emissions (%)								
Party	1990–2004	1990–2000	2000–2004						
Australia	25.1	19.2	5.0						
Austria	15.7	2.9	12.4						
Belarus	-41.6	-45.2	6.6						
elgium	1.4	1.1	0.3						
Bulgaria	-49.0	-51.4	5.1						
anada	26.6	21.1	4.6						
roatia	-5.4	-18.8	16.5						
zech Republic	-25.0	-24.0	-1.4						
enmark	-1.1	-1.2	0.1						
stonia	-51.0	-54.8	8.4						
uropean Community	-0.6	-2.9	2.4						
inland	14.5	-1.6	16.4						
France	-0.8	-1.0	0.2						
ermany	-17.2	-16.6	-0.7						
ireece	26.6	21.2	4.5						
ingary	-31.8	-33.5	2.5						
celand	-5.0	8.2	-12.2						
eland	23.1	23.6	-0.4						
aly	12.1	6.7	5.0						
apan	6.5	5.8	0.7						
atvia	-58.5	-61.7	8.2						
echtenstein	18.5	11.8	6.0						
thuania	-60.4	-59.1	-3.1						
ixembourg	0.3	-23.6	31.3						
onaco	-3.1	8.9	-11.0						
etherlands	2.4	0.7	1.7						
ew Zealand	21.3	13.6	6.8						
orway	10.3	7.4	2.7						
bland	-31.2	-31.6	0.5						
ortugal	41.0	37.1	2.9						
omania	-41.0	-49.7	17.3						
ussian Federation	-32.0	-34.6	4.1						
lovakia	-30.4	-32.7	3.3						
llovenia	-0.8	-6.9	6.6						
pain	49.0	33.8	11.4						
weden	-3.5	-5.5	2.1						
witzerland	0.4	-2.2	2.6						
urkey	72.6	63.9	5.3						
kraine	-55.3	-57.3	4.6						
nited Kingdom	-14.3	-13.4	-1.0						
Inited States	15.8	14.3	1.3						
nnex I EIT Parties	-36.8	-39.3	4.1						
Annex I non-EIT Parties	11.0	8.8	2.0						
II Annex I Parties together	-3.3	-5.6	2.4						

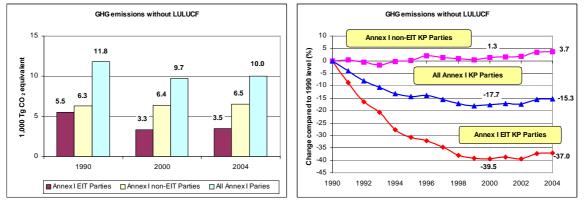
Table 1. Changes in GHG emissions for Annex I Parties

Note: Base year data are used here instead of 1990 data (in accordance with decisions 9/CP.2 and 11/CP.4) for Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

4. Trends for Annex I Parties that are Parties to the Kyoto Protocol

- From 1990 to 2004, GHG emissions from those Annex I Parties that are also Parties to the Kyoto Protocol decreased by 15.3 per cent, from 11.8 to 10.0 billion tonnes CO₂ equivalent (figure 3).
- For EIT Parties to the Kyoto Protocol, GHG emissions decreased from 1990 to 2004 by 37.0 per cent (from 5.5 to 3.5 billion tonnes CO₂ equivalent in 2004).
- For non-EIT Parties to the Kyoto Protocol, GHG emissions increased by 3.7 per cent (from 6.3 to 6.5 billion tonnes CO₂ equivalent).
- The emissions from the Annex I Parties that are Parties to the Kyoto Protocol were 11.8 billion tonnes CO₂ equivalent in 1990 compared with 18.6 billion tonnes for all Annex I Parties (10.0 and 17.9 billion tonnes, respectively, in 2004).

Figure 3. GHG emissions from Annex I Parties that are Parties to the Kyoto Protocol, 1990–2004



Note: Base year data are used here instead of 1990 data (in accordance with decisions 9/CP.2 and 11/CP.4) for Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986). These are base year data under the Climate Change Convention and not base year data under the Kyoto Protocol, which will be defined by Parties in their initial reports under the Kyoto Protocol to be submitted by 1 January 2007.

5. Trends 1990–2004 in relation to Kyoto Protocol targets for 2008–2012

- All EIT Parties except Slovenia have much lower emission levels than the targets under the Kyoto Protocol (table 2).
- For the non-EIT Parties, several Parties (such as France, Germany, Greece, Iceland, Monaco, Sweden and the United Kingdom) are relatively close to their targets under the Kyoto Protocol; other Parties need to achieve substantial additional reductions or to use the international flexibility mechanisms under the Kyoto Protocol in addition to domestic emission reductions.

Table 2. The 1990–2004 changes in GHG emissions from Annex I Parties and GHG reduction targets
for the Annex I Parties that are Parties to the Kyoto Protocol

		issions withou tonnes CO ₂ eq			ges in ons (%)	Emission reduction target under the Kyoto Protocol ^{a, b}		
Party	1990	2000	2004	1990-2004	2000-2004	(%)		
Australia	423.1	504.2	529.2	25.1	5.0	_c		
Austria	78.9	81.3	91.3	15.7	12.4	-8 (-13)		
Belarus	127.4	69.8	74.4	-41.6	6.6	no target yet		
Belgium	145.8	147.4	147.9	1.4	0.3	-8 (-7.5)		
Bulgaria	132.3	64.3	67.5	-49.0	5.1	-8		
Canada	598.9	725.0	758.1	26.6	4.6	6		
Croatia	31.1	25.3	29.4	-5.4	16.5	_c		
Czech Republic	196.2	149.2	147.1	-25.0	-1.4	8		
Denmark	70.4	69.6	69.6	-1.1	0.1	-8 (-21)		
Estonia	43.5	19.7	21.3	-51.0	8.4	-8		
European Community	4252.5	4129.3	4228.0	-0.6	2.4	-8		
Finland	71.1	70.0	81.4	14.5	16.4	-8 (0)		
France	567.1	561.4	562.6	-0.8	0.2	-8 (0)		
Germany	1226.3	1022.8	1015.3	-17.2	-0.7	-8 (-21)		
Greece	108.7	131.8	137.6	26.6	4.5	-8 (+25)		
Hungary	123.1	81.9	83.9	-31.8	2.5	-6		
Iceland	3.28	3.54	3.11	-5.0	-12.2	+10		
Ireland	55.6	68.7	68.5	23.1	-0.4	-8 (+13)		
Italy	519.6	554.6	582.5	12.1	5.0	-8 (-6.5)		
Japan	1272.1	1345.5	1355.2	6.5	0.7	-6		
Latvia	25.9	9.9	10.7	-58.5	8.2	-8		
Liechtenstein	0.229	0.256	0.271	18.5	6.0	-8		
Lithuania	50.9	20.8	20.2	-60.4	-3.1	-8		
Luxembourg	12.7	9.7	12.7	0.3	31.3	-8 (-28)		
Monaco	0.108	0.117	0.104	-3.1	-11.0	-0 (-20) -8		
Netherlands	213.0	214.4	218.1	2.4	1.7	-		
	61.9	70.3				-8 (-6)		
New Zealand	49.8		75.1 54.9	21.3 10.3	6.8 2.7	0+1		
Norway		53.5	388.1	-31.2	0.5	+1		
Poland	564.4	386.2		• • • =		÷		
Portugal	60.0	82.2	84.5	41.0	2.9	-8 (+27)		
Romania	262.3	131.8	154.6	-41.0	17.3	-8		
Russian Federation	2974.9	1944.8	2024.2	-32.0	4.1	0		
Slovakia	73.4	49.4	51.0	-30.4	3.3	-8		
Slovenia	20.2	18.8	20.1	-0.8	6.6	-8		
Spain	287.2	384.2	427.9	49.0	11.4	-8 (+15)		
Sweden	72.4	68.4	69.9	-3.5	2.1	-8 (+4)		
Switzerland	52.8	51.7	53.0	0.4	2.6	-8		
Turkey	170.2	278.9	293.8	72.6	5.3	_0 _^		
Ukraine	925.4	395.1	413.4	-55.3	4.6	0		
United Kingdom	776.1	672.2	665.3	-14.3	-1.0	-8 (-12.5)		
United States	6103.3	6975.9	7067.6	15.8	1.3	_c		
Annex I EIT Parties	5551.0	3366.9	3506.0	-36.8	4.1	_		
Annex I non-EITParties	13000.5	14147.7	14425.6	11.0	2.0	_		
All Annex I Parties	18551.5	17514.6	17931.6	-3.3	2.4	_		
Annex I Parties that are Parties to the Kyoto Protocol	11823.8	9730.3	10011.5	-15.3	2.9	-5		

^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.

^c A Party to the Climate Change Convention but not a Party to the Kyoto Protocol.

Note: base year data (under the Climate Change Convention) are used here instead of 1990 data (in accordance with decisions 9/CP.2 and 11/CP.4) for Bulgaria (1988), Hungary (average of 1985–1987), Poland (1988), Romania (1989) and Slovenia (1986).

6. Sectoral changes in GHG emissions

- For all Annex I Parties taken together, sectoral emissions decreased from 1990 to 2004 (see figure 4), with the greatest decreases in agriculture (-20.0 per cent) and industrial processes (-13.1 per cent). The smallest decrease was in the energy sector (-0.4 per cent). Net GHG removals by LULUCF increased by 24.8 per cent.
- Within the energy sector (figure 5), GHG emissions increased for energy industries and transport, but decreased in all other subsectors. The greatest increase occurred for transport: 23.9 per cent from 1990 to 2004.

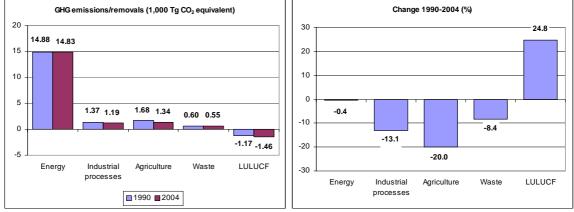
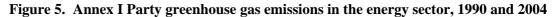
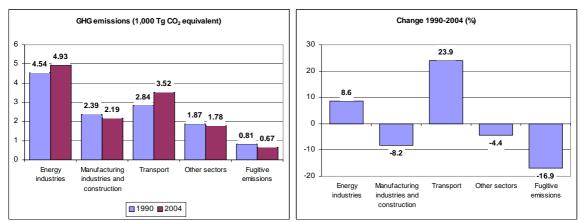


Figure 4. Annex I Party greenhouse gas emissions/removals by sector, 1990 and 2004

Note: LULUCF = land use, land-use change and forestry.





Note 1: Fugitive emissions are GHG emissions from the production, processing, transport and non-energy use of coal, oil and natural gas; GHG emissions from the combustion of these fuels are not included in this category. *Note 2*: Except for fugitive emissions, data for the Russian Federation are not included here because the Russian Federation reported the emissions from energy subsectors only with notation keys.

7. Changes in GHG emissions from international transport

- GHG emissions from fuels sold for use by international aviation increased by 52.0 per cent from 1990 to 2004 (figure 6).
- The emissions relating to fuels sold for use by international marine transportation increased by 3.4 per cent between 1990 and 2004.
- Despite the considerable increases, the emissions from fuels sold for use by international transportation are small compared with total GHG emissions from Annex I Parties (see figures 2, 4 and 6).

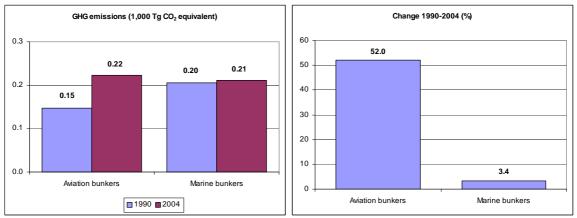


Figure 6. Annex I Party greenhouse gas emissions from bunker fuels, 1990 and 2004

Note 1: For aviation bunker fuels, data for Estonia, Liechtenstein, Lithuania, Monaco, Poland, Romania, the Russian Federation, Slovakia, Turkey and Ukraine are not included because of their unavailability or incompleteness, or because the emissions were reported with notation keys for some years in the period 1990–2004.

Note 2: For marine bunker fuels, data for Estonia, Lithuania, Luxembourg, Poland, Romania, Russian Federation and Turkey are not included because of their unavailability or incompleteness, or because the emissions were reported with notation keys for some years in the period 1990–2004.

8. Some indicators: 1990, 2000, 2004

- For Annex I Parties taken together, GHG emissions per capita decreased by 9.4 per cent from 1990 to 2004 (table 3): from 15.8 to 14.3 tonnes CO₂ equivalent per year. This is largely owing to a 34.1 decrease in EIT Parties. Between 2000 and 2004, GHG emissions per capita increased slightly in EIT Parties but decreased in non-EIT Parties.
- For Annex I Parties taken together, GHG emissions per GDP decreased by 28.0 per cent from 1990 to 2004 (table 3): from 0.84 to 0.60 kg CO₂ equivalent per dollar of GDP. The decrease in GHG emissions per GDP was considerable in both EIT (-39.4 per cent) and non-EIT (-19.9 per cent) Parties. GHG emissions per GDP decreased both before and after 2000, for both EIT and non-EIT Parties.

		Value		Change (%)								
Indicator	1990	2000	2004	1990–2000	2000-2004	1990–2004						
All Annex I Parties												
GHG emissions without LULUCF, billion tonnes CO ₂ equivalent	18.6	17.5	17.9	-5.6	2.4	-3.3						
Population, million	1175	1234	1253	5.1	1.5	6.7						
Gross domestic product (GDP), billion of 2000 dollars ^a	22089	26985	29644	22.2	9.9	34.2						
GHG emissions per capita, tonnes/year	15.8	14.2	14.3	-10.2	0.8	-9.4						
GHG emissions per GDP, kg CO ₂ equivalent/dollar	0.84	0.65	0.60	-22.7	-6.8	-28.0						
Annex I EIT Parties												
GHG emissions without LULUCF, billion tonnes CO ₂ equivalent	5.6	3.4	3.5	-39.3	4.1	-36.8						
Population, million	321	314	308	-2.2	-1.9	-4.1						
Gross domestic product (GDP), billion of 2000 dollars ^a	2815	2360	2934	-16.2	24.3	4.2						
GHG emissions per capita, tonnes/year	17.3	10.7	11.4	-38.0	6.2	-34.1						
GHG emissions per GDP, kg CO ₂ equivalent/dollar	1.97	1.43	1.20	-27.6	-16.2	-39.4						
	Annex	<mark>c I non-EIT Pa</mark>	rties									
GHG emissions without LULUCF, billion tonnes CO ₂ equivalent	13.0	14.1	14.4	8.8	2.0	11.0						
Population, million	853	920	945	7.8	2.7	10.8						
Gross domestic product (GDP), billion of 2000 dollars ^a	19274	24625	26710	27.8	8.5	38.6						
GHG emissions per capita, tonnes/year	15.2	15.4	15.3	0.9	-0.7	0.2						
GHG emissions per GDP, kg CO ₂ equivalent/dollar	0.67	0.57	0.54	-14.8	-6.0	-19.9						

Table 3. Some GHG-related indicators for Annex I Parties

Note 1: Data for population and GDP are from the World Bank (www.worldbank.org); emissions data are from the UNFCCC.

Note 2: For GDP, the Czech Republic and Slovenia are not included because of the absence of World Bank data for 1990.

Note 3: For Bulgaria, Hungary, Poland, Romania and Slovenia, the emissions are taken for their specific base years instead of 1990, but population and GDP data are for 1990, which leads to some inconsistency in the values of GHG emissions per capita and per GDP.

^a Estimated, by the World Bank, in international constant 2000 dollars using purchasing power parities (PPP).

9. 2006 findings in relation to 2005 findings: what has changed in one year?

- The findings from 2006 data for trends in total GHG emissions are consistent with the findings from 2005 data published by the UNFCCC secretariat a year ago (see table 4). Explanations for the changes in the estimates are given in table 4.
- The 2006 estimates for changes in sectoral emissions are also consistent with the 2005 estimates. However, the 1990–2004 decrease for the energy sector is more modest than the 1990–2003 decrease estimated in 2005 (-0.4 compared with -4.2 per cent). One of the reasons is the continued growth in the emissions from transport: the 1990–2004 change in the emissions from transport is 23.9 per cent whereas the 1990–2003 growth estimated in 2005 was 20.7 per cent.

Table 4. Comparison of the 2005 and 2006 estimates for total aggregate GHG emissions without LULUCF from Annex I Parties in 1990

	-		
	2006 estimate (FCCC/SBI/2006/26)	2005 estimate (FCCC/SBI/2005/17)	Explanation for the difference between the 2006 and 2005 estimates
Total aggregate GHC	G emissions without LULU	CF in 1990 (1,000 Tg CO ₂ e	equivalent)
All Annex I Parties	18.6	18.4	Changes for EIT and non-EIT Parties, see below.
EIT Parties	5.55	5.68	Inventory recalculations, in particular for Belarus, Bulgaria, Croatia, the Russian Federation and Ukraine.
Non-EIT Parties 13.0		12.7	The inclusion of Turkey into the 2006 data set (about 0.17 thousand Tg CO_2 equivalent in 1990); inventory recalculations, in particular for Ireland, Japan, and the United Kingdom.
Changes in total ago	gregate GHG emissions wi	thout LULUCF from 1990 t	to the latest available year (%)
All Annex I Parties	-3.3	-5.9	Changes for EIT and non-EIT Parties, see below.
EIT Parties	-36.8	-39.6	Inventory recalculations, in particular for the Russian Federation and Ukraine; the difference between the extrapolated (in 2005) and real (in 2006) latest year data for the Russian Federation.
Non-EIT Parties	11.0	9.2	The inclusion of Turkey into the 2006 data set (with a higher emission growth from 1990 to 2004 than for the other non-EIT Parties); an increase in emissions from 2003 to 2004 in some Parties (e.g., in Spain and the United States).

Note: The explanations are intended to indicate only the major reasons for the changes. As the behaviour of emissions is driven by many parameters, it is not possible to list all possible reasons.

Table 5. Comparison of the 2005 and 2006 estimates for changes in sectoral GHG emissions

		2006 estimate	2005 estimates
Energy sector (including transport)	All Annex I Parties	-0.4 (23.9)	-4.2 (20.7)
	EIT Parties	-36.9 (-2 <i>0.3</i>) ^a	-39.4 (-14.1)
	Non–EIT Parties	15.1 (<i>27.1</i>)	12.4 (22.3)
Industrial processes	All Annex I Parties	-13.1	-9.6
	EIT Parties	-24.0	-26.4
	Non–EIT Parties	-7.9	-4.0
Agriculture	All Annex I Parties	-20.0	-15.7
	EIT Parties	-52.7	-52.1
	Non–EIT Parties	-3.1	-2.6
Waste	All Annex I Parties	-8.4	-15.3
	EIT Parties	-6.7	-18.9
	Non–EIT Parties	-8.8	-14.3

^a The addition of data for Belarus in 2006 has played a role for the change in this estimate.

10. What else is behind the numbers: additional insights

The 2006 emissions data show that:

- For all Annex I Parties taken together, GHG emissions in 2004 were 3.3 per cent below the 1990 level. The decrease is composed of a 36.8 per cent decrease for Parties with economies in transition (EITs) and an 11.0 per cent increase for non-EIT Parties. In 22 Annex I Parties GHG emissions decreased from 1990 to 2004 whereas in 19 Parties the emissions increased.
- Since 2000, the emissions have increased slightly, both in EIT and in non-EIT Parties. Also, the number of Parties with emission decreases has declined considerably since 2000: between 1990 and 2000 more than a half of Annex I Parties (23 out of 41) decreased emissions, but between 2000 and 2004 decreases occurred in only 7 Parties.
- Changes in GHG emissions from 1990 to 2004 vary greatly from country to country, from a decrease by 60.4 per cent (Lithuania) to an increase by 72.6 per cent (Turkey).
- For Annex I Parties that are Parties to the Kyoto Protocol, GHG emissions in 2004 were 15.3 per cent below the 1990 level. The emissions from the Annex I Parties that are Parties to the Kyoto Protocol were 11.8 billion tonnes CO₂ equivalent in 1990 compared with 18.6 billion tonnes for all Annex I Parties (10.0 and 17.9 billion tonnes, respectively, in 2004).
- In all EIT Parties except Slovenia the emissions are now much below the targets under the Kyoto Protocol. For the non-EIT Parties, some Parties (such as France, Germany, Greece, Iceland, Monaco, Sweden and the United Kingdom) are currently relatively close to their targets; other Parties require substantial additional reductions or need to use the international flexibility mechanisms under the Kyoto Protocol.
- For all Annex I Parties taken together, sectoral emissions decreased from 1990 to 2004, with the greatest decreases in agriculture (-20.0 per cent) and industrial processes (-13.1 per cent). The smallest decrease was in the energy sector (-0.4 per cent). Within the energy sector, GHG emissions increased in energy industries and transport, whereas in the other subsectors the emissions decreased. The greatest increase occurred for transport: 23.9 per cent from 1990 to 2004, which is higher than the similar estimate in 2005 (when the 1990–2003 growth was estimated at 20.7 per cent).
- The findings from the 2006 data are consistent with the findings from the UNFCCC data published in 2005. One of the few changes to note is the change in the values for the energy sector, to a large extent due to the continued growth of emissions in transport.

All this means that:

- Annex I Parties have so far succeeded in keeping their emissions under the 1990 level; but
- The challenge of keeping the emissions low has not become easier; industrialized countries will need to intensify their efforts to reduce greenhouse gas emissions.
- Transport remains a sector where emission reductions are needed but seem to be especially difficult to achieve.

To understand the data correctly, it should be also remembered that:

- Additional policies and measures for GHG mitigation are either being developed or have already been implemented, in particular in the Annex I Parties that are Parties to the Kyoto Protocol. Earlier policy actions have already shown, or are showing their impact on emissions; for recent policies, there is still time before the first commitment period under the Kyoto Protocol (2008–2012) for the policies to take effect.
- Annex I Parties are in the process of determining the relative contribution of domestic measures, credits from the use of GHG sinks (LULUCF) and international flexibility mechanisms under the Kyoto Protocol to the overall effort to comply with Kyoto Protocol targets.
- The use of the clean development mechanism is becoming a promising option for meeting the Kyoto Protocol targets in many Annex I Parties. In the countries that are members of the European Union (EU), the use of the EU emissions trading scheme is growing in importance.
- The emissions data for 1990–2004 are historical data; to estimate the likely situation in the period 2008–2012, data on national GHG projections should be used as well. Such data have been submitted by Annex I Parties as part of their fourth national communications under the Convention and the reports on demonstrable progress under the Kyoto Protocol; the UNFCCC secretariat will summarize these data in 2007 within the planned "Compilation and synthesis reports".

This means that:

- The challenge of emission reduction is well understood in Annex I Parties;
- The Kyoto Protocol is firmly in place and it is guiding Annex I Parties in identifying and implementing policy options for meeting their targets under the Protocol; the use of flexibility mechanisms, of the CDM in particular, is becoming a promising option;
- The effects of GHG mitigation policies are already identifiable; we can expect to see the impact of additional policies and measures for emission mitigation in the coming years;
- The GHG data submitted under the Climate Change Convention are a reliable basis for assessing progress in emission reductions.

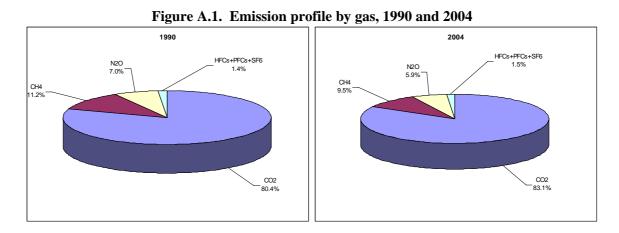
When/where more information can be found:

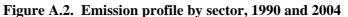
- More detailed GHG emissions data can be found on the UNFCCC website http://unfccc.int>.
- Such data as descriptions of policy packages and GHG projections are available in the fourth national communications of Annex I Parties under the Climate Change Convention and in the recent national reports demonstrating progress achieved by 2005 under the Kyoto Protocol.⁸
- At the end of 2007, the UNFCCC secretariat will publish a report with the synthesis of information from the fourth national communications of Annex I Parties; this document will include a review of national policies and measures and a summary of most recent GHG projections from Annex I Parties.
- Submissions of national GHG inventories in 2007 will be summarized by the UNFCCC secretariat and a check against the 2006 findings will be conducted.

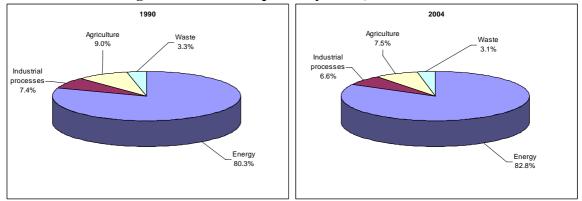
⁸ See <http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/3625.php>.

⁹ See also UNFCCC report FCCC/SBI/2006/INF.2 at <<u>http://unfccc.int/resource/docs/2006/sbi/eng/inf02.pdf</u>>.

Appendix A. Annex I emissions profiles: 1990 and 2004







Note: Data for the sectors of "Solvent and other product use", "Other", "Land use, land-use change and forestry (LULUCF)" are not included.

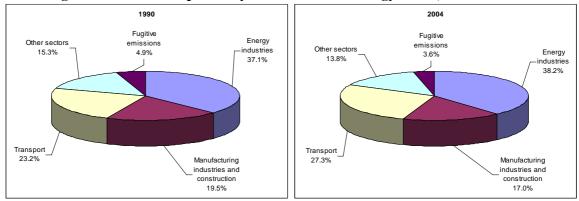


Figure A.3. Emission profile by subsector in the energy sector, 1990 and 2004

Note: Data for the Russian Federation are not included here because the emissions from subsectors in the energy sectors were reported with notation keys (except for fugitive emissions).

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Poland**a 564 408 417 349 386 181 382 787 370 239 3 Portugal 59 954 71 263 82 178 83 728 88 198 3 Romania*a 262 281 176 670 131 842 136 569 142 672 1 Russian Federation* 2 974 863 2 173 890 1 944 767 1 974 872 1 961 415 2 0 Slovakia* 73 360 53 347 49 378 52 499 50 516 3 Slovenia*a 20 220 18 543 18 822 19 746 19 939 3 Spain 287 152 317 941 384 246 384 552 402 060 4 Sweden 72 361 73 894 68 389 69 067 70 073 3 Switzerland 52 826 51 029 51 655 52 506 51 493 3 Turkey** 170 187 220 864 278 924 260 963 268 849 2 Jkraine* 925 362 521 149 395 095 398 950 400 47	75 606	5 75 088	21.3							
Portugal 59 954 71 263 82 178 83 728 88 198 3 Romania*a 262 281 176 670 131 842 136 569 142 672 1 Russian Federation* 2 974 863 2 173 890 1 944 767 1 974 872 1 961 415 2 0 Slovakia* 73 360 53 347 49 378 52 499 50 516 3 Slovenia*a 20 220 18 543 18 822 19 746 19 939 3 Spain 287 152 317 941 384 246 384 552 402 060 4 Sweden 72 361 73 894 68 389 69 067 70 073 3 Switzerland 52 826 51 029 51 655 52 506 51 493 3 Turkey** 170 187 220 864 278 924 260 963 268 849 2 Ukraine* 925 362 521 149 395 095 398 950 400 479 4	54 332	2 54 931	10.3							
Romania*a 262 281 176 670 131 842 136 569 142 672 1 Russian Federation* 2 974 863 2 173 890 1 944 767 1 974 872 1 961 415 2 0 Slovakia* 73 360 53 347 49 378 52 499 50 516 3 Slovenia*a 20 220 18 543 18 822 19 746 19 939 3 Spain 287 152 317 941 384 246 384 552 402 060 4 Sweden 72 361 73 894 68 389 69 067 70 073 3 Switzerland 52 826 51 029 51 655 52 506 51 493 3 Turkey** 170 187 220 864 278 924 260 963 268 849 2 Ukraine* 925 362 521 149 395 095 398 950 400 479 4	382 639	388 063	-31.2							
Russian Federation* 2 974 863 2 173 890 1 944 767 1 974 872 1 961 415 2 0 Slovakia* 73 360 53 347 49 378 52 499 50 516 3 Slovenia* ^a 20 220 18 543 18 822 19 746 19 939 3 Spain 287 152 317 941 384 246 384 552 402 060 4 Sweden 72 361 73 894 68 389 69 067 70 073 3 Switzerland 52 826 51 029 51 655 52 506 51 493 3 Turkey** 170 187 220 864 278 924 260 963 268 849 2 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	83 682	84 546	41.0							
Slovakia* 73 360 53 347 49 378 52 499 50 516 50 516 Slovenia* ^a 20 220 18 543 18 822 19 746 19 939 Spain 287 152 317 941 384 246 384 552 402 060 44 Sweden 72 361 73 894 68 389 69 067 70 073 70 Switzerland 52 826 51 029 51 655 52 506 51 493 34 Turkey** 170 187 220 864 278 924 260 963 268 849 24 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	148 622	154 626	-41.0							
Slovenia* ^a 20 220 18 543 18 822 19 746 19 939 Spain 287 152 317 941 384 246 384 552 402 060 4 Sweden 72 361 73 894 68 389 69 067 70 073 7 Switzerland 52 826 51 029 51 655 52 506 51 493 3 Turkey** 170 187 220 864 278 924 260 963 268 849 2 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	2 021 587	2 024 229	-32.0							
Spain 287 152 317 941 384 246 384 552 402 060 4 Sweden 72 361 73 894 68 389 69 067 70 073 7 Switzerland 52 826 51 029 51 655 52 506 51 493 3 Turkey** 170 187 220 864 278 924 260 963 268 849 2 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	51 091	51 025	-30.4							
Sweden 72 361 73 894 68 389 69 067 70 073 Switzerland 52 826 51 029 51 655 52 506 51 493 51 Turkey** 170 187 220 864 278 924 260 963 268 849 22 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	19 666	20 059	-0.8							
Switzerland 52 826 51 029 51 655 52 506 51 493 Turkey** 170 187 220 864 278 924 260 963 268 849 24 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	408 169	427 905	49.0							
Turkey** 170 187 220 864 278 924 260 963 268 849 26 Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	70 907		-3.5							
Ukraine* 925 362 521 149 395 095 398 950 400 479 4 United Kingdom 776 142 714 321 672 195 679 700 659 243 6	52 529	53 019	0.4							
United Kingdom 776 142 714 321 672 195 679 700 659 243 6	284 135	293 810	72.6							
	416 017		-55.3							
United States 6 103 283 6 477 148 6 975 929 6 886 890 6 909 407 6 9	664 471		-14.3							
	6 952 561	7 067 570	15.8							
Decrease in emissions by more than 1 per cent (<i>,</i>	19							
Change in emissions within 1 per cent (Increase in emissions by more than 1 per cent (<i>,</i>	<u> </u>							

Appendix B. GHG emissions from Annex I Parties; 1990, 1995, 2000-2004

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

^b Emission estimates of the European Community are reported separately from those of its member States.

* A Party undergoing the process of transition to a market economy (an EIT Party). ** Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place Turkey in a situation different from that of other Parties included in Annex I to the Convention.

							Gg (CO₂ equivale	nt						
Party	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
United States	6 103 283	6 066 323	6 140 485	6 327 120	6 370 859	6 477 148	6 678 309	6 703 780	6 767 132	6 808 241	6 975 929	6 886 890	6 909 407	6 952 561	7 067 570
Russian Federation*	2 974 863	2 922 851	2 677 045	2 552 996	2 260 137	2 173 890	2 113 767	2 032 448	1 960 864	1 941 887	1 944 767	1 974 872	1 961 415	2 021 587	2 024 229
Japan	1 272 095	1 286 355	1 299 798	1 293 170	1 364 422	1 342 084	1 356 034	1 349 318	1 306 016	1 327 418	1 345 531	1 320 588	1 352 996	1 358 324	1 355 175
Germany	1 226 296	1 181 654	1 131 441	1 118 119	1 100 092	1 094 740	1 115 750	1 080 127	1 054 287	1 023 345	1 022 798	1 034 912	1 018 644	1 024 377	1 015 273
Ukraine*	925 362	809 165	712 599	640 781	575 080	521 149	472 699	451 450	410 056	408 020	395 095	398 950	400 479	416 017	413 411
United Kingdom	776 142	780 480	755 583	735 606	724 963	714 321	736 837	713 432	706 291	672 459	672 195	679 700	659 243	664 471	665 330
Canada	598 911	592 047	609 190	610 569	630 929	648 685	666 523	680 128	686 372	698 385	725 048	718 819	725 547	753 751	758 067
France	567 094	589 332	582 493	557 374	552 834	561 765	577 979	570 494	584 585	568 023	561 436	561 660	556 084	561 093	562 635
Poland ^a *	458 944	437 447	439 105	429 619	438 968	417 349	437 384	427 238	403 512	401 582	386 181	382 787	370 239	382 639	388 063
Italy	519 600	521 003	518 623	512 978	505 382	532 642	525 575	531 782	543 001	549 237	554 611	561 290	561 790	577 411	582 520
Australia	423 074	424 314	429 738	434 113	436 854	450 243	456 180	467 267	482 047	492 629	504 196	517 407	520 073	520 199	529 230
Spain	287 152	293 134	300 912	289 550	305 784	317 941	310 540	331 324	341 618	369 927	384 246	384 552	402 060	408 169	427 905
Romania ^a *	230 066	181 667	174 521	173 963	169 269	176 670	181 369	161 884	145 111	129 326	131 842	136 569	142 672	148 622	154 626
Netherlands	212 963	217 563	216 620	222 028	221 754	225 070	233 036	226 046	227 573	215 447	214 433	216 206	214 932	215 697	218 086
Czech Republic*	196 205	183 085	165 616	160 057	153 533	154 463	155 724	159 865	150 081	142 009	149 165	149 497	144 090	147 583	147 111
						Change	from the pre	vious vear (º	()						ange from 10 to 2004
Party	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	(%)
United States	-0.6	1.2	3.0	0.7	1.7	3.1	0.4	0.9	0.6	2.5	-1.3	0.3	0.6	1.7	15.8
Russian Federation*	-1.7	-8.4	-4.6	-11.5	-3.8	-2.8	-3.8	-3.5	-1.0	0.1	1.5	-0.7	3.1	0.1	-32.0
Japan	1.1	1.0	-0.5	5.5	-1.6	1.0	-0.5	-3.2	1.6	1.4	-1.9	2.5	0.4	-0.2	6.5
Germany	-3.6	-4.2	-1.2	-1.6	-0.5	1.9	-3.2	-2.4	-2.9	-0.1	1.2	-1.6	0.6	-0.9	-17.2
Ukraine*	-12.6	-11.9	-10.1	-10.3	-9.4	-9.3	-4.5	-9.2	-0.5	-3.2	1.0	0.4	3.9	-0.6	-55.3
United Kingdom	0.6	-3.2	-2.6	-1.4	-1.5	3.2	-3.2	-1.0	-4.8	0.0	1.1	-3.0	0.8	0.1	-14.3
Canada	-1.1	2.9	0.2	3.3	2.8	2.7	2.0	0.9	1.8	3.8	-0.9	0.9	3.9	0.6	26.6
France	3.9	-1.2	-4.3	-0.8	1.6	2.9	-1.3	2.5	-2.8	-1.2	0.0	-1.0	0.9	0.3	-0.8
Poland ^a *	-22.5	0.4	-2.2	2.2	-4.9	4.8	-2.3	-5.6	-0.5	-3.8	-0.9	-3.3	3.3	1.4	-31.2
Italy	0.3	-0.5	-1.1	-1.5	5.4	-1.3	1.2	2.1	1.1	1.0	1.2	0.1	2.8	0.9	12.1
Australia	0.3	1.3	1.0	0.6	3.1	1.3	2.4	3.2	2.2	2.3	2.6	0.5	0.0	1.7	25.1
Spain	2.1	2.7	-3.8	5.6	4.0	-2.3	6.7	3.1	8.3	3.9	0.1	4.6	1.5	4.8	49.0
Romania ^a *	-30.7	-3.9	-0.3	-2.7	4.4	2.7	-10.7	-10.4	-10.9	1.9	3.6	4.5	4.2	4.0	-41.0
Netherlands	2.2	-0.4	2.5	-0.1	1.5	3.5	-3.0	0.7	-5.3	-0.5	0.8	-0.6	0.4	1.1	2.4
Czech Republic*	-6.7	-9.5	-3.4	-4.1	0.6	0.8	2.7	-6.1	-5.4	5.0	0.2	-3.6	2.4	-0.3	-25.0

Appendix C. Data for 15 Parties with greatest GHG emissions in 1990¹⁰

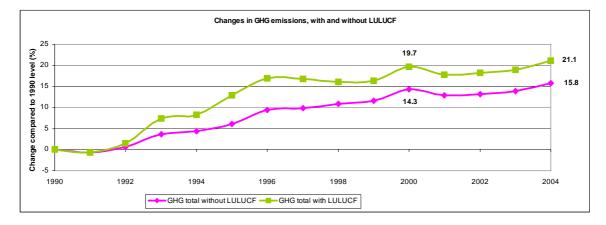
^a Data for the base year defined by decisions 9/CP.2 and 11/CP.4 (Bulgaria (1988), Hungary (average of 1985 to 1987), Poland (1988), Romania (1989), Slovenia (1986)) are used for this Party instead of 1990 data.

^b The change from the latest reported year, 1999, is shown. In 1999, the emissions were 1,872,775 Gg CO₂ equivalent.

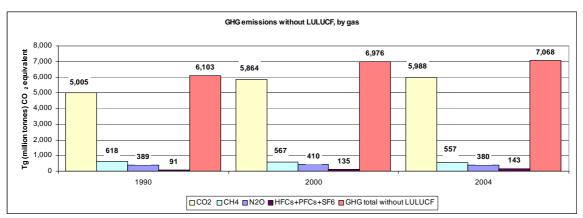
* A Party undergoing the process of transition to a market economy (an EIT Party).

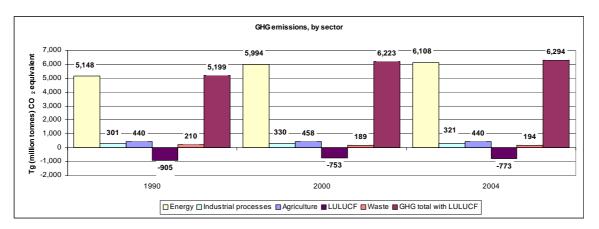
¹⁰ The 15 Annex I Parties listed here accounted for 91.2 per cent of total GHG emissions from Annex I Parties in 1990 and for 91.0 per cent in 2004.

Appendix D. Trends at a country level¹¹



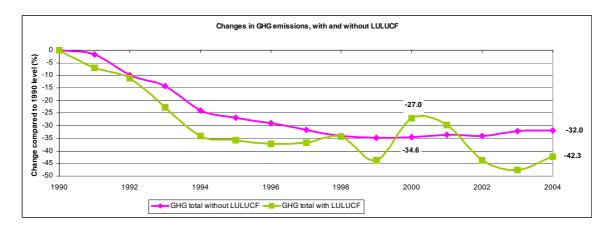
D.1. United States of America

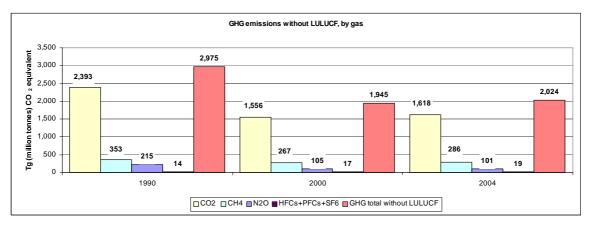


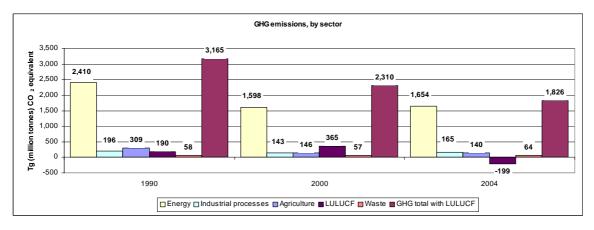


¹¹ This appendix covers the 5 individual Parties that had the largest GHG emissions among Annex I Parties in 2004 (the United States of America, the Russian Federation, Japan, Germany and Canada); the European Community (with 15 member States), which is a second largest emitter in Annex I if compared with Parties that are individual States; and Turkey, for which GHG inventory data were submitted for the first time in 2006.

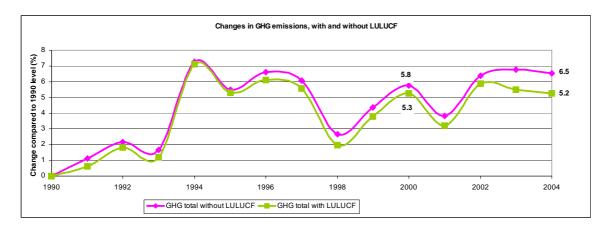
D.2. Russian Federation

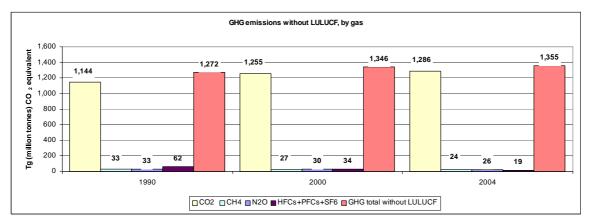


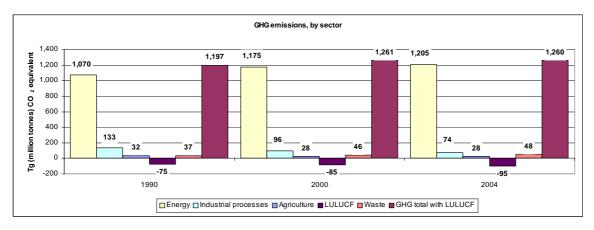




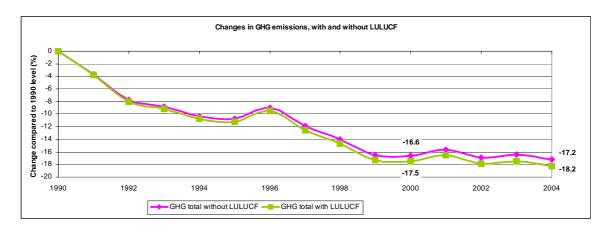
D.3. Japan

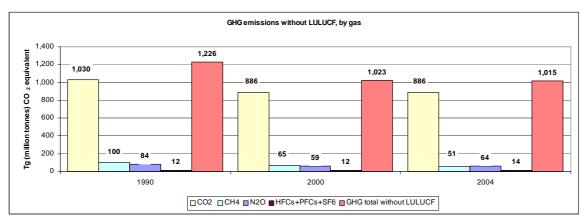


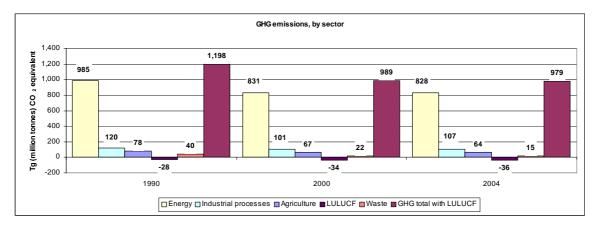




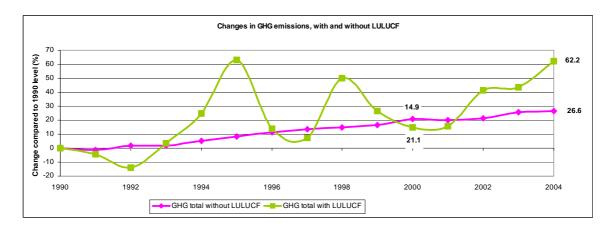
D.4. Germany

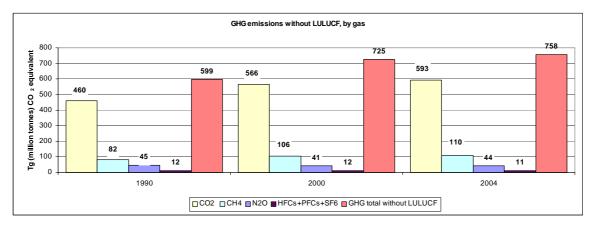


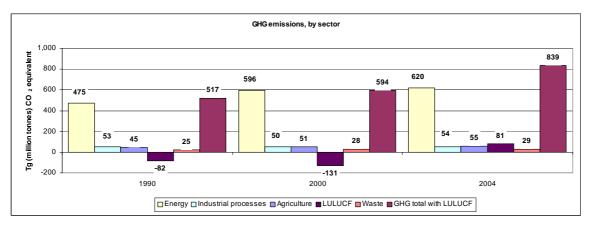




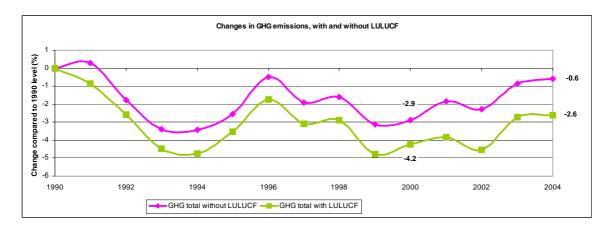
D.5. Canada

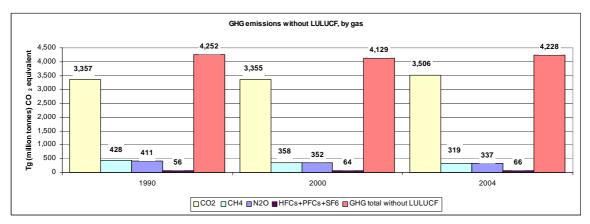


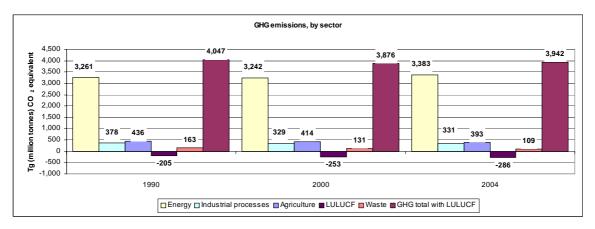




D.6. European Community¹²

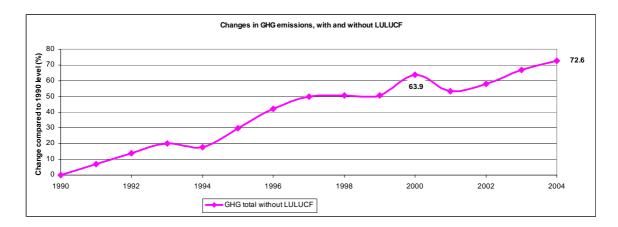


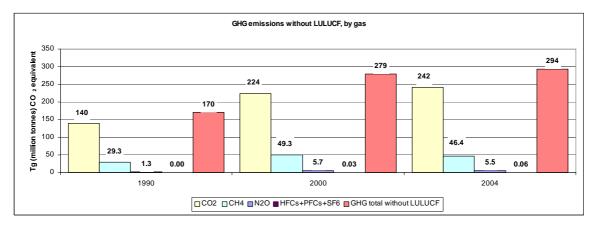


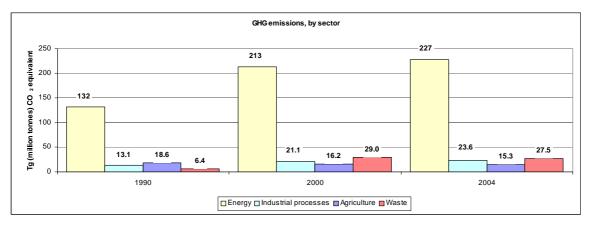


¹² The data for the European Community (EC) presented here cover 15 EU member States (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom of Great Britain and Northern Ireland); data for the 10 new EU member States (Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovenia and Slovakia) are not taken into account.

D.7. Turkey¹³







- - - - -

¹³ Turkey ratified the Climate Change Convention on 24 February 2004. Decision 26/CP.7 invited Parties to recognize the special circumstances of Turkey, which place Turkey in a situation different from that of other Annex I Parties.