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WORKSHOP ON ISSUES RELATED TO ARTICLES 5, 7 AND 8 OF THE KYOTO PROTOCOL

Bonn, 14-16 March 2000

Effects of recalculations of greenhouse gas inventories on assigned amounts and on emission limitation and reduction commitments of Annex I Parties

Working paper

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I. INTRODUCTION

A. Mandate

1. The Kyoto Protocol states, in Article 7.4, that the Conference of the Parties serving as the meeting of the Parties to the Protocol shall, prior to the first commitment period, decide upon modalities for the accounting of assigned amounts.
2. The subsidiary bodies, at their tenth sessions, endorsed the work programme on methodological issues related to Articles 5, 7 and 8 of the Kyoto Protocol (FCCC/SB/1999/2). One of the tasks in this work programme (Cluster D) addresses the issue of modalities for the accounting of assigned amounts under Article 7.4 of the Kyoto Protocol. In accordance with this work programme, one of the inputs for considering this issue is the preparation of a paper on the implications of recalculations of the greenhouse gas (GHG) inventories of the base and subsequent years on assigned amounts of Annex I Parties, to be available at the thirteenth session of Subsidiary Body for Scientific and Technological Advice (SBSTA) (FCCC/SB/1999/2, p.17).
3. The SBSTA, at its tenth session, requested the secretariat to organize a workshop on national systems and issues relating to adjustments, referred to in Article 5 of the Kyoto Protocol (FCCC/SBSTA/1999/6). It also requested, at its eleventh session, that the agenda of that workshop include the consideration of the methodological and technical aspects of guidelines related to Articles 7 and 8 of the Kyoto Protocol (FCCC/SBSTA/1999/14).

B. Background

4. The secretariat had prepared an informal paper, "Effects of recalculations of the GHG inventories of the base and subsequent years on assigned amounts and on emission limitation and reduction commitments of Annex I Parties" for the workshop on methodological issues related to GHG inventories, which was held in Bonn, from 9 to 11 December 1998. That paper was revised taking into account comments provided by experts from the roster, and reproduced as an official note for the tenth session of SBSTA (FCCC/SBSTA/1999/INF.3).
5. The above-mentioned document described the impact that recalculations of GHG inventories of the base and subsequent years could have on Parties' assigned amounts and on Parties' ability to meet commitments. The analysis provided in that paper was based on inventory data from the first and second national communications, referred to below as NC1 and NC2, which limited the availability of data¹ for the analysis.
6. Some Parties, in their submissions on Articles 5, 7 and 8 (FCCC/SBSTA/2000/MISC.1), included views on methodological and technical issues related to modalities for the accounting of assigned amounts, such as the establishment of initial assigned amounts, the relationship between

¹ Limitations in data were, for example, due to the fact that in the first national communications, inventories were reported only until the year 1993 or 1994, and only 13 Parties provided complete inventories for these years.

inventory time series and the assigned amounts if new inventory information becomes available, and rules for calculating the assigned amounts (both initial and recalculated assigned amount)². Some of them expressed the need for additional methodological and technical work on these issues in order to find solutions to them at an early stage.

C. Scope

7. The secretariat prepared this working paper for consideration by participants attending the SBSTA workshop on issues related to Articles 5, 7 and 8 of the Kyoto Protocol, to be held in Bonn, from 14 to 16 March 2000. It focuses on the influence that recalculations of inventories could have on assigned amounts and the ability to meet commitments. The secretariat hopes that the results provided in this paper might allow further consideration of the issues identified by Parties as noted in paragraph 6 above. It also hopes that these results might provide useful information to the participants in the workshop, and further to the SBSTA, on the linkages between recalculations of the base and subsequent years and the accounting of assigned amounts.

8. The secretariat recognizes that inventory recalculations could have implications for other aspects of the Kyoto Protocol, such as for how possible changes in assigned amounts due to inventory recalculations might influence the availability of parts of assigned amounts to be transferred and/or acquired under Article 17. In addition, the technical review process of GHG inventories could become more intensive if recalculations are allowed during a commitment period. These issues might deserve further consideration when Parties develop the modalities for the accounting of assigned amounts under Article 7.4.

9. Analysis provided in this paper is based on carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) emission estimates only. Emission estimates on hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) were not considered in the calculations, as reporting of these GHGs is not yet fully consistent among Parties. This paper does not provide information on emissions by sources and removals by sinks from the *land-use, land-use change and forestry* sector.

D. Possible action by the participants attending the workshop

10. Participants may wish to take note of the information in this paper and suggest what methodological issues, if any, should be further elaborated related to modalities for accounting of assigned amounts under Article 7.4 of the Protocol. Participants may wish to also have an initial exchange of views on:

- (a) How to determine or establish a Party's initial assigned amount³;

² Parties views on this issue are quoted in annex II to this paper.

³ It is assumed that "initial assigned amount" should be calculated in accordance with modalities for the accounting of assigned amounts under Article 7.4 and reported in accordance with guidelines under Article 7 to be adopted by COP/MOP. "Initial assigned amount" does not refer here to additions to, or subtractions from, assigned

(b) How recalculations of the base and subsequent years should be dealt with during a commitment period, including the question of whether initial assigned amounts and/or base year inventories should be fixed⁴.

Participants may wish to make recommendations on the process for further consideration of methodological issues mentioned above.

E. Approach

11. This paper was prepared in the same way as document FCCC/SBSTA/1999/INF.3. However, it is based on more data. It uses GHG inventory data reported by 18 Annex I Parties⁵ in their latest annual inventory submission⁶ and in their NC2s. Where appropriate, information from document FCCC/SBSTA/1999/INF.3, which considered inventory data from the NC1s, was included.

12. The approach applied in this paper assesses the effects of recalculations using actual inventory data reported by Parties. The purpose is to assess whether and how changes in methods/data could affect assigned amounts and the extent to which Parties could meet *simulated* commitments similar to those in the Kyoto Protocol. It was developed to enable potential methodological problems to be identified before the first commitment period.

13. Terms used in the Kyoto Protocol, such as assigned amounts, commitments and commitment period, were applied in this paper, for years and contexts other than those in the Protocol. The term “*simulated*” is used in the paper to denote this difference. The *simulated* assigned amounts and commitments were used in this paper only with the purpose of identifying potential methodological problems.

14. According to Article 7.4 of the Kyoto Protocol, the Conference of the Parties serving as the meeting of the Parties to the Protocol (COP/MOP) shall decide upon modalities for the accounting of assigned amounts. “*Simulated* assigned amount” as used in this paper is calculated in a manner similar to the assigned amount described in Article 3.7 of the Kyoto Protocol, although the COP/MOP has not decided yet upon modalities for such accounting.

amount under Article 3.3, 3.4, 3.10, 3.11 and 3.12 or additions to assigned amount in the next commitment period under Article 3.13.

⁴ If base year inventories are fixed, the question of how to ensure the consistency of inventory time-series may need to be addressed.

⁵ These Parties provided inventory data for the base year in both the latest annual inventory submission and the NC2. Fifteen of these also provided inventory data for a five-year period, 1991 to 1995. In section II B. below, “Effects of recalculations on *simulated* commitments”, only those Parties were considered that provided both the base year and the subsequent years’ data.

⁶ Annual inventory submissions referred to in this paper are those that were due by April 1999, or, where not available, those that were due by April 1998.

15. Parties have commitments under the Kyoto Protocol to limit their GHG emissions to their assigned amount within a five-year period. The term “*simulated* commitment” as used in this paper is intended to represent a “what if” situation, wherein the Parties might have agreed to their Kyoto Protocol commitments for the period 1991-1995 relative to a base year of 1990. The related *simulated* assigned amount was estimated for the five-year period 1991-1995.

16. In contrast to document FCCC/SBSTA/1999/INF.3, where differences in estimates between the NC1s and NC2s were influenced by a change in global warming potential (GWP) values, this paper only uses 1995 IPCC GWP values to estimate aggregate GHG emissions in CO₂ equivalent. Therefore, all recalculations of inventories referred to in this paper are only a consequence of changes in methods or data. No further changes in agreed GWP values are expected until the end of the first commitment period under the Kyoto Protocol, given the provisions of Article 5.3 which states that GWP values agreed upon by the Conference of the Parties at its third session⁷ shall be used for the duration of the first commitment period.

II ASSESSMENT OF THE EFFECTS OF RECALCULATION

A. Effects of recalculations on *simulated* assigned amounts

1. Recalculations

17. All Parties that provided a GHG inventory for a period of several years in their latest annual inventory submission, have recalculated their GHG inventories for the base and/or subsequent years since submitting their NC2s. This situation is similar to that observed between the NC1s and the NC2s, where GHG inventories were recalculated by all Parties (FCCC/SBSTA/1998/7, para. 24). These changes in estimates arose from the fact that Parties changed methods, emission factors, assumptions and activity data and/or added new sources. These kinds of changes, which are referred to in this paper as “changes in methods/data” are a result of new inventory information becoming available.

18. The magnitude of changes for CO₂, CH₄ and N₂O emission base year estimates and their effect on aggregate CO₂ equivalent emission estimates between the NC2s and the latest inventory submission is shown in table 1. The percentage change in aggregate GHG emissions between the NC1s and NC2s is also included in that table.

19. Recalculations of the base year carried out between the latest annual inventory submission and the NC2 were, for most Parties, higher than recalculations carried out between the NC1 and the NC2 (compare columns D and E of table 1). The average percentage change of the recalculations was also higher, 3.9 per cent compared to 3.2 per cent, respectively. This suggests that recalculations of GHG inventories due to increased availability of inventory information would continue under the current practice of inventory preparations as Parties seek to improve the quality and accuracy of their

⁷ Decision 2/CP. 3 reaffirms that Parties should use the 1995 IPCC GWP values based on the effects of the greenhouse gases over a 100-year time horizon (FCCC/CP/1997/7/Add.1).

inventories.

Table 1. Differences in base year (1990) GHG emission estimates due to changes in methods/data used

Percentage change of estimates of the latest inventory submission relative to those of the NC2					Percentage change of estimates of the NC2 relative to those of the NC1
Party	CO ₂	CH ₄	N ₂ O	Aggregate GHG (CO ₂ equivalent)	Aggregate GHG (CO ₂ equivalent)
	A	B	C	D	E
Australia	0.8	9.9	-6.2	2.8	-7.7
Austria	0.3	-21.7	-43.6	-5.3	6.1
Belgium	-1.8	-3.5	0.8	-1.8	2.0
Canada	-0.6	9.4	109.3	5.9	0.2
Czech Republic	-	-12.3	-	-1.2	-0.4
Finland	10.0	45.6	3.3	12.3	2.8
France	4.5	0.2	67.9	11.1	3.2
Germany	0.0	-2.0	-0.6	-0.2	0.4
Greece	0.8	-1.0	76.7	4.7	6.3
Japan	0.0	-2.0	-44.6	-1.3	-0.7
Netherlands	-3.7	17.1	24.8	0.8	0.5
New Zealand	-0.9	-1.9	-21.9	-5.5	3.3
Norway	-1.0	-26.6	13.3	-4.3	7.2
Spain	-	-	-	-	0.0
Sweden	0.0	-12.3	182.6	6.7	-10.3
Ukraine ^a	0.5	-0.5	147.7	1.5	
United Kingdom	0.1	-18.5	77.7	1.7	1.2
United States	-0.6	0.3	166.6	3.3	1.3

^a Values for Ukraine refer to estimates from the latest inventory submission compared to estimates from the NC1.

Note

Values given in this table denote the percentage change of the inventory estimates of the latest annual inventory submission relative to the inventory submitted in the NC2. Column E is reproduced from document FCCC/SBSTA/1999/INF.3 (table 1, p. 6) and shows the percentage change of aggregate GHG emission estimates of the NC2 relative to aggregate GHG emission estimates of the NC1 for the Parties considered in this table.

This table was prepared following the approach that was used to prepare table 11 of document FCCC/SBSTA/1998/7 (pp. 30-31). Information on how the percentage changes were calculated can be found in that document. Negative values denote that the latest submitted inventory has a lower figure. All figures are rounded.

2. Estimation of assigned amounts

20. *Simulated* assigned amounts presented in this paper were estimated in a manner similar to that

described in Article 3.7 of the Kyoto Protocol⁸. The following formula was used (see also annex I, figure 16):

$\text{Assigned amount} = 5 \times [\text{CO}_2 \text{ equivalent emission estimates of the base year}] \times [\text{quantified emission limitation or reduction commitment inscribed in Annex B of the Kyoto Protocol in per cent}] \times [0.01]$
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21. The *simulated* assigned amounts were calculated as aggregate GHG emissions expressed as CO₂ equivalent for the base year using data from the latest inventory submissions, the NC2s and the NC1s. A comparison between these *simulated* assigned amounts is shown in table 2. Absolute values of these amounts are given in columns A, B and C of the table. The differences between the NC2 and the latest inventory submission, and between the NC1 and the NC2, are presented as Gg of aggregate GHG emissions in terms of CO₂ equivalent in columns D and F and as percentages in columns E and G.

22. The percentage differences between *simulated* assigned amounts are identical to the percentage differences for the base year due to recalculations (compare column D of table 1 with column G of table 2, and column E of table 1 with column E of table 2⁹). For Parties with higher or lower CO₂ equivalent estimates in their latest submission than their NC2, their assigned amount was correspondingly higher or lower. This means that a change in the given value of the base year has a direct impact on the size of the assigned amount and hence the size of the assigned amount depends on changes in methods/data applied to the base year.

⁸ Article 3.7 defines the assigned amount as follows: "In the first ... commitment period, from 2008 to 2012, the assigned amount for each Party included in Annex I shall be equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A in 1990, or the base year or period determined in accordance with paragraph 5 above, multiplied by five. Those Parties included in Annex I for whom land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 shall include in their 1990 emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in 1990 from land-use change for the purposes of calculating their assigned amount".

⁹ Some differences between values in column E of table 1 and values in column E of table 2 are due to the fact that these were reproduced from document FCCC/SBSTA/1999/INF.3, where these differences were a consequence of rounding and a slight difference in the way of calculating the effect of changes in methods/data.

Table 2. Comparison between the *simulated* assigned amounts calculated using inventory data of the base year (1990) from the NC1s, NC2s and from the latest inventory submission

Party	<i>Simulated</i> assigned amounts for a 5-year-period using base year data from			Differences ^a between the <i>simulated</i> assigned amounts estimated using data from			
	NC1	NC2	Latest submission	NC2s and NC1s		Latest submissions and NC2s	
	[Gg]	[Gg]	[Gg]	B-A (D/A)*100		C-B	(F/B)*100
	(CO ₂ equivalent)			[Gg]	[per cent]	[Gg]	[per cent]
	A	B	C	D	E	F	G
Australia		2 189 986	2 251 469			61 483	2.8
Austria	336 416	357 944	339 146	21 528	6.4	-18 798	-5.3
Belgium	626 828	639 136	627 729	12 308	2	-11 407	-1.8
Canada	2 618 351	2 621 942	2 775 585	3 591	0.1	153 643	5.9
Czech Republic	887 864	883 797	873 248	-4 066	-0.5	-10 549	-1.2
Finland	303 655	296 912	333 436	-6 744	-2.2	36 524	12.3
France	2 217 793	2 291 110	2 546 449	73 315	3.3	255 339	11.1
Germany	5 514 880	5 536 270	5 525 138	21 390	0.4	-11 132	-0.2
Greece	430 330	456 466	478 042	26 137	6.1	21 577	4.7
Japan	5 645 330	5 594 175	5 522 604	-51 155	-0.9	-71 571	-1.3
Netherlands	946 795	950 368	958 214	3 574	0.4	7 845	0.8
New Zealand	362 415	380 172	359 447	17 755	4.9	-20 726	-5.5
Norway	233 583	248 793	238 001	15 211	6.5	-10 792	-4.3
Spain	1 387 369	1 386 584	1 386 584	-787	-0.1	-	-
Sweden	335 234	299 465	319 548	-35 770	-11	20 084	6.7
Ukraine		4 529 389	4 596 100			66 711	1.5
United Kingdom	3 246 386	3 287 579	3 342 555	41 193	1.3	54 977	1.7
United States	26 279 735	26 566 938	27 448 904	287 203	1.1	881 966	3.3

^a Negative values in the difference denote that the *simulated* assigned amounts calculated using the data of the latest submitted inventory are lower compared to those calculated using the data of the NC2, and, correspondingly, *simulated* assigned amounts calculated using the data of the NC2 are lower than those calculated using the data of the NC1.

Note

Information related to the NC1s (columns A, D and E) are reproduced from document FCCC/SBSTA/1999/INF.3. In that document, comparison of the percentage differences in the *simulated* assigned amounts with the percentage changes in the base year (column F of table 1, p. 6 and column D of table 2, p. 7) shows some differences which are a consequence of rounding and a slight difference in the way of calculating the effect of changes in methods/data. For this reason, slight differences in the percentage changes given in column E of table 1 compared to those given in column E of this table, can be observed.

B. Effects of recalculations on *simulated* commitments

23. The years 1991 to 1995 represent the *simulated* commitment period in this paper. To assess the extent to which a Party may go over or under its *simulated* assigned amount, the ratio between total actual emissions in the *simulated* commitment period and the *simulated* assigned amounts were calculated. This exercise was carried out for data from the NC2s and the latest annual inventory

submissions¹⁰. Comparisons allow for an assessment of the effects of recalculations of inventory data owing to changes in methods/data between submitted inventories in different years.

24. The results of this exercise are presented in table 3. Columns A and B show *simulated* assigned amounts for the *simulated* commitment period, expressed as CO₂ equivalent emissions using base year data from the NC2s and the latest inventory submission. Actual emission estimates for the period 1991-1995 according to the NC2s and the latest inventory submission are given in columns C and D. A comparison of the actual data with the *simulated* assigned amounts indicates the amount and the percentage by which Parties are under or over the *simulated* commitments in each inventory (columns E/ F and G/ H, respectively). The difference between those percentages is given in column I. It can be observed that in most cases the difference is lower than one percentage point¹¹.

¹⁰ For the ratio between total emissions in a *simulated* commitment period and *simulated* assigned amounts using data from the NC1s and NC2s please refer to table 3 of document FCCC/SBSTA/1999/INF.3.

¹¹ The difference between two percentages is expressed in percentage points.

Table 3. Possible impact of recalculations on *simulated* commitments

Party ^a	Simulated assigned amounts ^b (CO ₂ equivalent)		Total GHG emission estimates for 1991-1995 (CO ₂ equivalent)		Amount and percentage by which Parties are over/under <i>simulated</i> commitments				Differences between percentages over/under <i>simulated</i> commitments ^c	Differences between percentages over/under <i>simulated</i> commitments according to the NC2 and NC1 ^d
	NC2 [Gg]	Latest submission [Gg]	NC2 [Gg]	Latest submission [Gg]	NC2		Latest submission		H-F [percentage points]	[percentage points]
					C-A [Gg]	E/A*100 [per cent]	D-B [Gg]	G/B*100 [per cent]		
	A	B	C	D	E	F	G	H	I	J
Australia	2 189 986	2 251 469	2 081 055	2 129 167	-108 931	-5.0	-122 302	-5.4	-0.5	
Austria	357 944	339 146	387 537	368 122	29 593	8.3	28 976	8.5	0.3	
Belgium ^b	511 309	502 183	565 012	577 677	53 703	10.5	75 494	15.0	4.5	
Canada	2 621 942	2 775 585	2 885 548	3 062 220	263 606	10.1	286 635	10.3	0.3	-0.6
Czech Republic	883 797	873 248	797 918	786 647	-85 879	-9.7	-86 601	-9.9	-0.2	
France	2 291 110	2 546 449	2 508 625	2 767 944	217 515	9.5	221 495	8.7	-0.8	0.5
Germany	5 536 270	5 525 138	5 488 985	5 426 300	-47 285	-0.9	-98 838	-1.8	-0.9	0.5
Greece	456 466	478 042	510 395	530 937	53 930	11.8	52 895	11.1	-0.7	
Japan	5 594 175	5 522 604	6 213 137	6 136 060	618 962	11.1	613 456	11.1	0.0	0.3
Netherlands	950 368	958 214	1 082 201	1 080 666	131 833	13.9	122 452	12.8	-1.1	-0.7
New Zealand	380 172	359 447	378 232	361 621	-1 941	-0.5	2 174	0.6	1.1	-1.0
Norway	248 793	238 001	248 878	239 695	85	0.0	1 694	0.7	0.7	0.7
Spain ^b	1 109 268	1 109 268	1 220 759	1 227 403	111 492	10.1	118 135	10.6	0.6	
United Kingdom	3 287 579	3 342 555	3 399 096	3 449 803	111 517	3.4	107 248	3.2	-0.2	-1.0
USA	26 566 938	27 448 904	29 228 708	30 299 646	2 661 770	10.0	2 850 743	10.4	0.4	0.4

^a Finland, Sweden and Ukraine are not included in this table, as inventory data for 1991 to 1995 were not fully available.

^b These columns were reproduced from table 2 (columns B and C) of this document, except for Belgium and Spain. For these two Parties, a *simulated* assigned amount for a *simulated* commitment period of 4 years (1991-1994) was calculated, to allow comparison with total GHG emissions that were also calculated for that period due to lack of estimates for the year 1995 in the NC2s.

^c These values were calculated by subtracting the values of column F (percentage over/under *simulated* commitments calculated using data from the NC2s) from column H (percentage over/under *simulated* commitments calculated using data from the latest inventory submission). The difference between two percentages is expressed in percentage points.

^d These values represent the differences between percentages over/under *simulated* commitments based on data from the NC1s and NC2s. They were reproduced from document FCCC/SBSTA/1999/INF.3 and are given here for comparison purposes.

25. On the basis of the data presented in table 3, a number of figures were prepared to facilitate further understanding of effects of the recalculations on the commitments under the Kyoto Protocol. Three figures were prepared for each Party and can be found in annex I:

(a) The first figure (e.g., 1a) shows the trend of aggregate GHG emissions (CO₂, CH₄ and N₂O), expressed in CO₂ equivalent, for the years 1990 to 1994 or 1995, based on data from the NC1, the NC2 and the latest annual inventory submission;

(b) The second figure (e.g., 1b) shows in absolute terms the extent by which the Party either goes over or under a *simulated* commitment, given data in either the NC2 or the latest annual inventory submission. It shows the amount of CO₂ equivalent emissions by which the total GHG emissions of the *simulated* commitment period were higher (positive value) or lower (negative value) than the *simulated* assigned amounts. They correspond to the values given in columns E and G of table 3;

(c) The third figure (e.g., 1c) shows similar information, but in percentage terms. It represents the values given in columns F and H of table 3. For example, during the *simulated* commitment period, Austria exceeded its *simulated* assigned amount by 8.3 per cent according to data in its NC2 (column F of table 3) and by 8.5 per cent according to data in its latest annual inventory submission (column H of table 3). The percentage over or under this *simulated* commitment was altered by 0.3 percentage points (column I of table 3) as a consequence of recalculations.

26. In addition, figures 16 and 17 (annex I) were prepared to illustrate the understanding of the results presented in table 3 which were obtained using the calculations described in paragraphs 23, 24 and 25 (b) and (c).

27. The difference between the percentages by which Parties are over or under their *simulated* assigned amounts (table 3) when using data from the latest inventory submission relative to those of the NC2 is a consequence of both changes in the *simulated* assigned amounts due to recalculations of the base year, and recalculations of the inventories of the years constituting the *simulated* commitment period. Even if recalculations are applied consistently for an entire time series, they could have different impacts on the base year and the years of the commitment period when the shares of individual GHGs change over time. This is due to the fact that a change in methods/data would affect the base and subsequent years to different extents.

28. These differences by which Parties go over or under their *simulated* assigned amounts when using a recalculated inventory are in most cases lower than one percentage point and reflect the change in a Party's ability to meet its *simulated* commitment as a result of recalculations. These percentage point differences can be directly compared to the quantified emission limitation or reduction commitments (QELRC) listed in Annex B of the Kyoto Protocol.

III. CONCLUSIONS

29. Base year and subsequent years' inventory data can change significantly as a result of recalculations. Recalculations are expected under the current practice of preparing GHG inventories when new inventory information becomes available as Parties seek to improve the quality and accuracy of their inventories. Since the assigned amounts under the Kyoto Protocol in units of CO₂ equivalent are calculated using base year inventory data, these too change in the same percentage proportion as the change made to the base year.

30. A *simulated* assigned amount for a *simulated* commitment period (1991-1995) was estimated using 1990 inventory data in the NC2s and as recalculated in the latest annual inventory submission. The *simulated* assigned amounts were then compared to the actual emission estimates for the period 1991-1995 as reported in the NC2s and in the latest annual inventory submissions. Furthermore, the extent by which Parties either go over or under *simulated* commitments was estimated relative to the *simulated* assigned amount. The difference by which a Party goes over/under its *simulated* commitment when using a recalculated inventory can be directly compared to the quantified emission limitation or reduction commitments (QELRC) listed in Annex B of the Kyoto Protocol. For the Parties considered in this paper, recalculations of the base and subsequent years' inventories cause them to go over or under their *simulated* commitment by an additional +4.5 to -1.1 percentage points.

31. The results indicate that the absolute changes in assigned amounts used as a basis for the assessment of Parties' commitments may be significant, given a change in methods/data in the base year inventory when new inventory information becomes available. The overall effect of changes in methods/data, if applied consistently to emission estimates of the years within a commitment period, may be less significant¹². However, even such small changes may have implications for a Party in meeting its commitment.

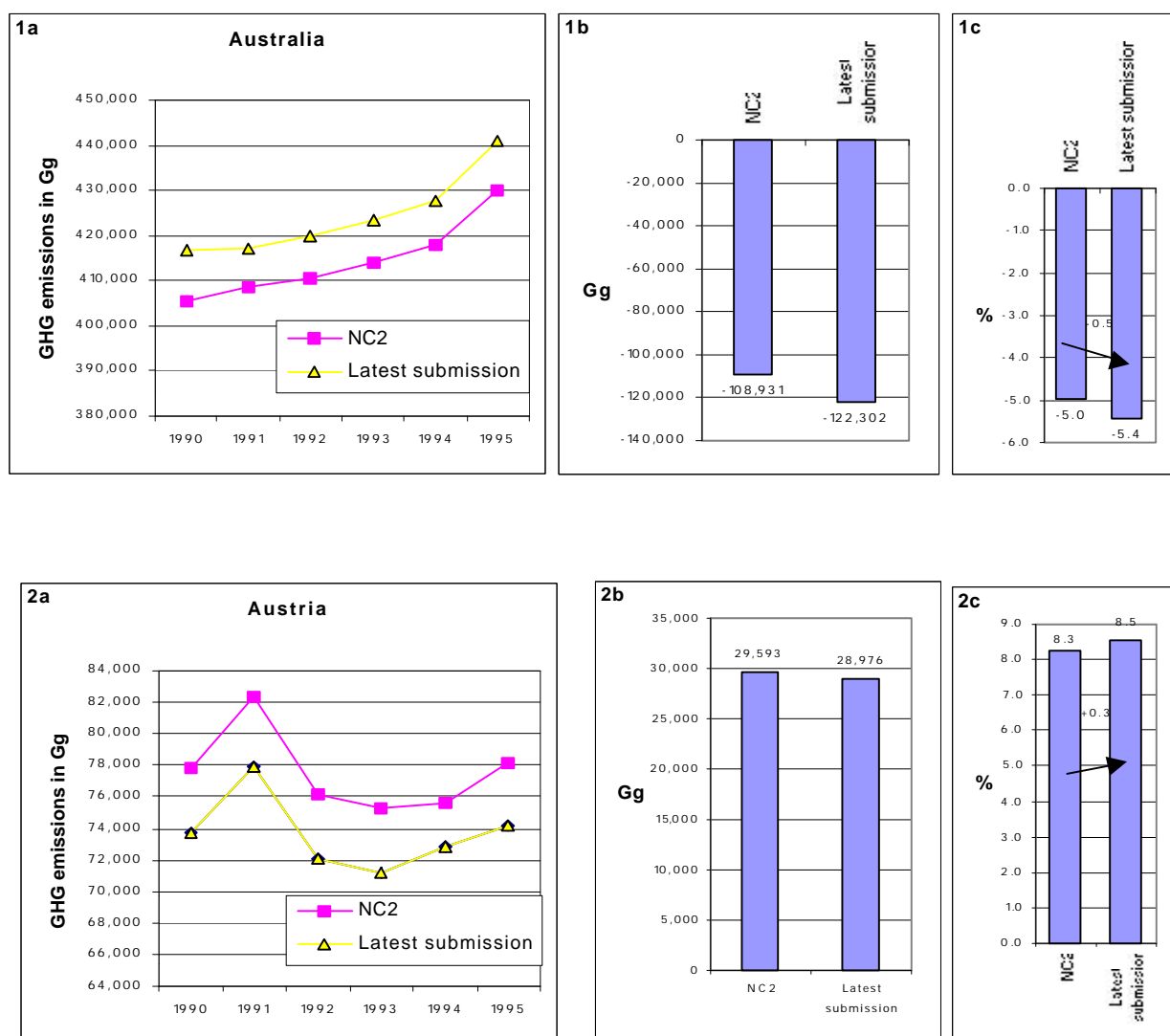
32. The issue of inventory recalculations of the base year and the years constituting a commitment period may need to be taken into account by Parties when considering modalities for the accounting of assigned amounts under Article 7.4 of the Protocol. The relation of these recalculations with other methodological issues related to the accounting of assigned amounts, and any implications for the review process and/or the mechanisms under Article 6, 12 and 17 of the Protocol, may deserve further analysis.

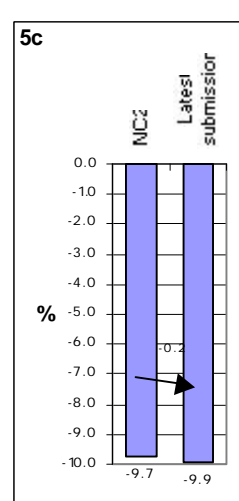
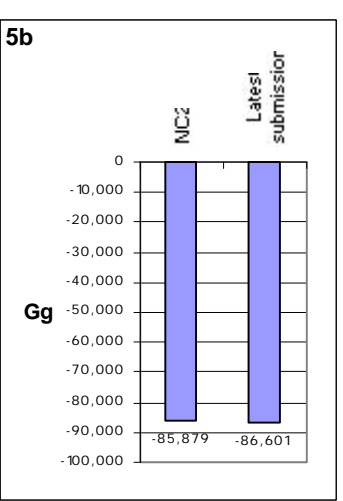
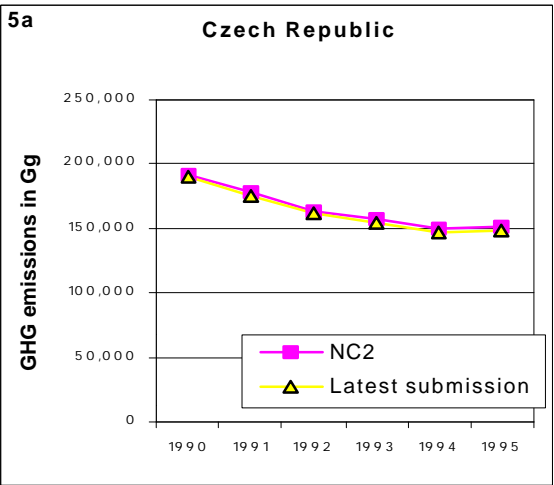
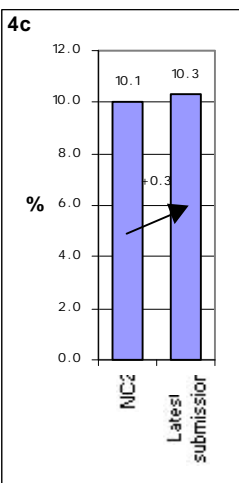
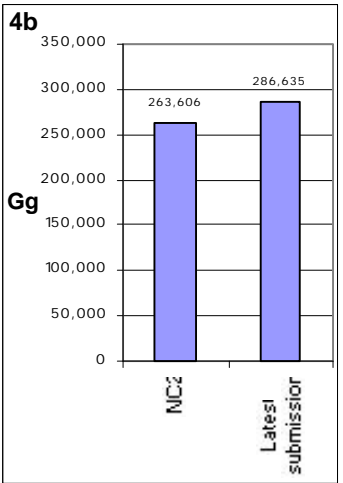
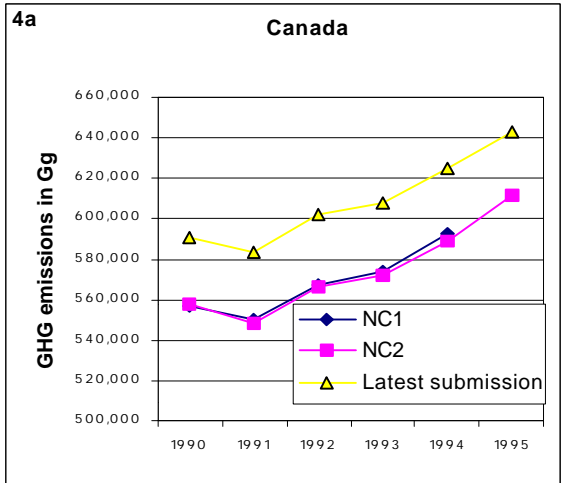
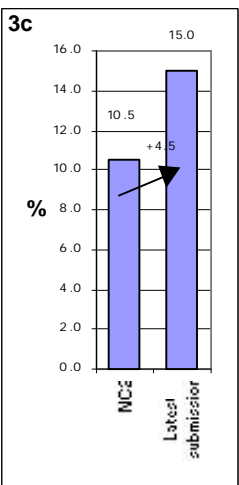
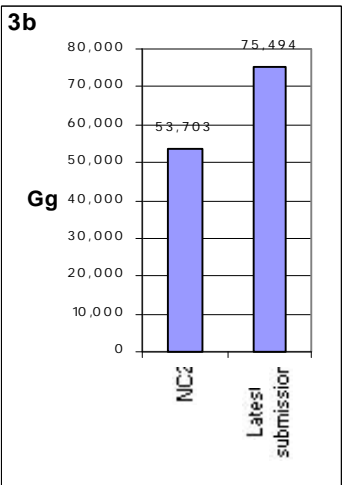
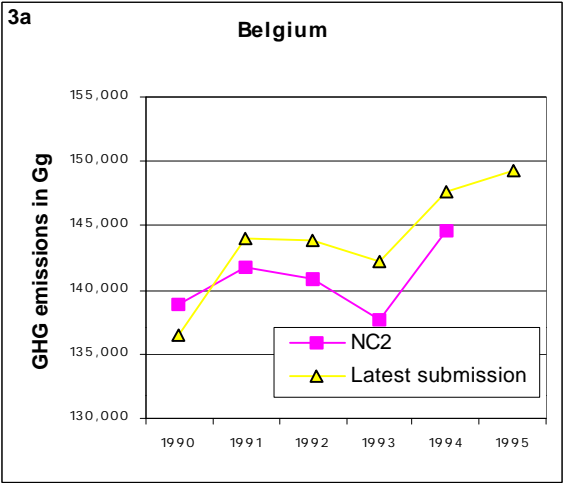
¹² However, even if recalculations are applied consistently for an entire time series, they could have different impacts on the base year and the years of the commitment period when the shares of individual GHGs change over time.

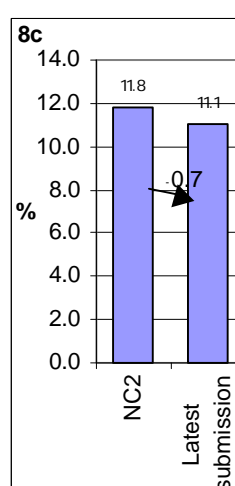
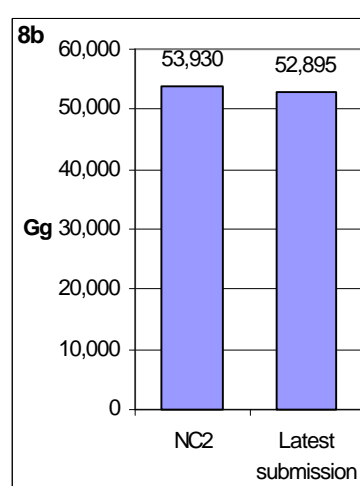
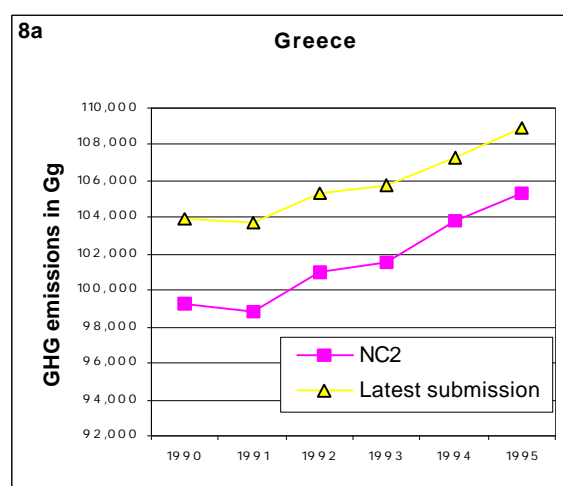
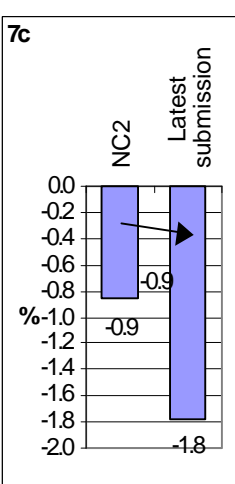
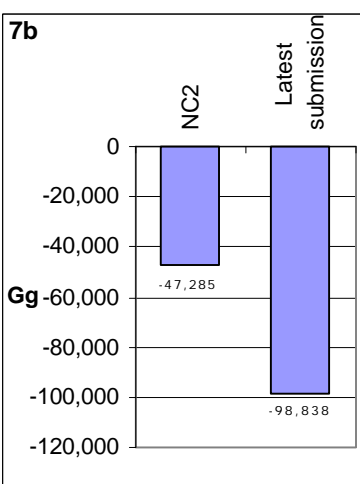
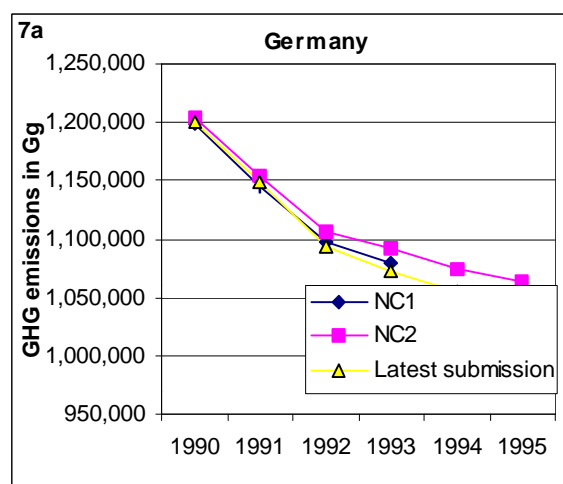
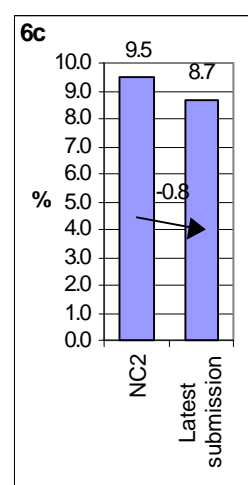
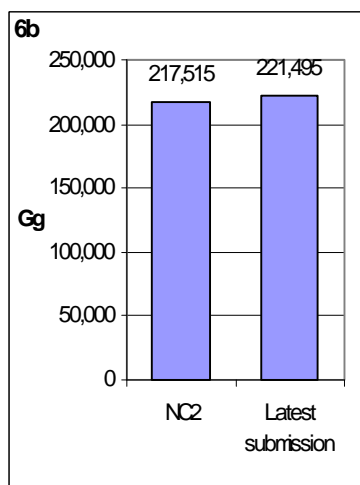
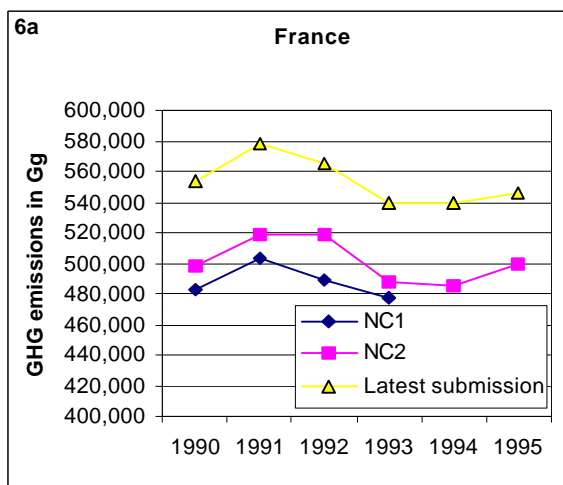
Annex I

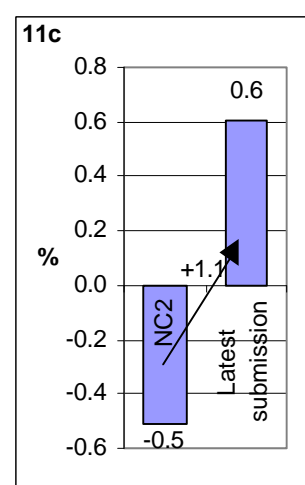
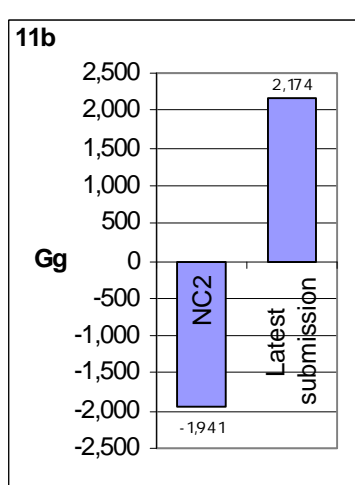
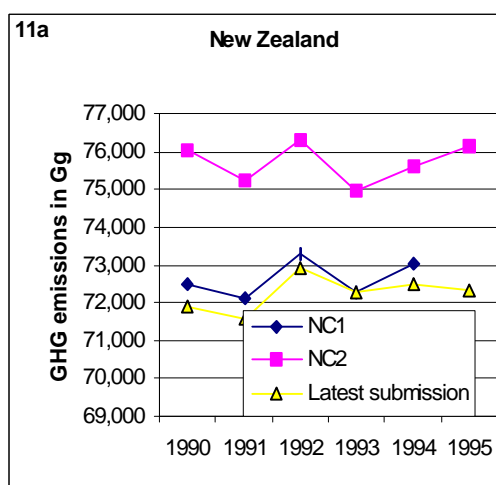
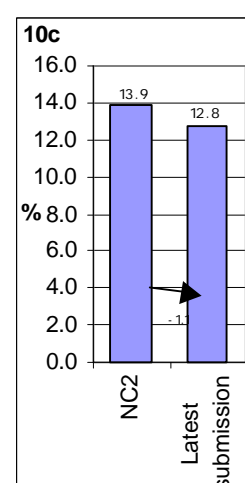
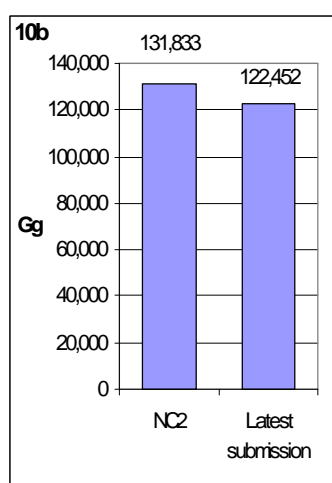
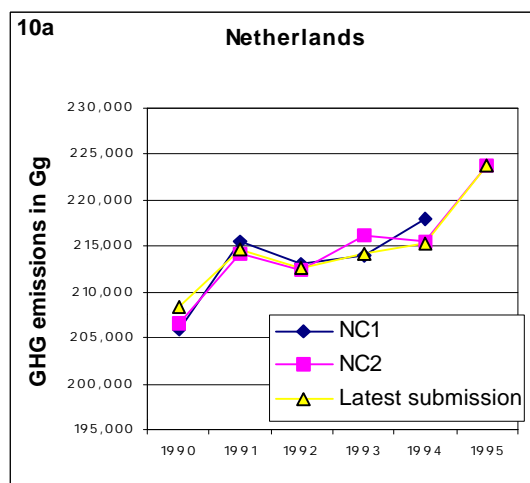
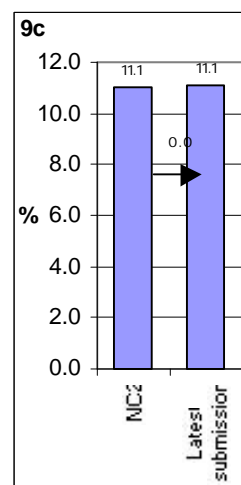
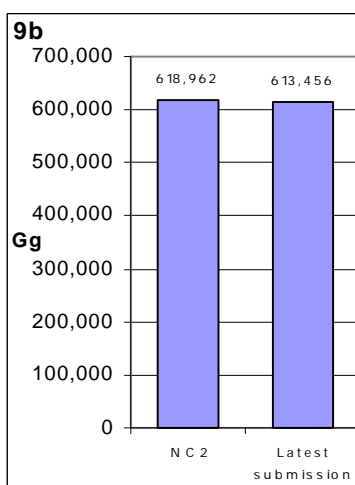
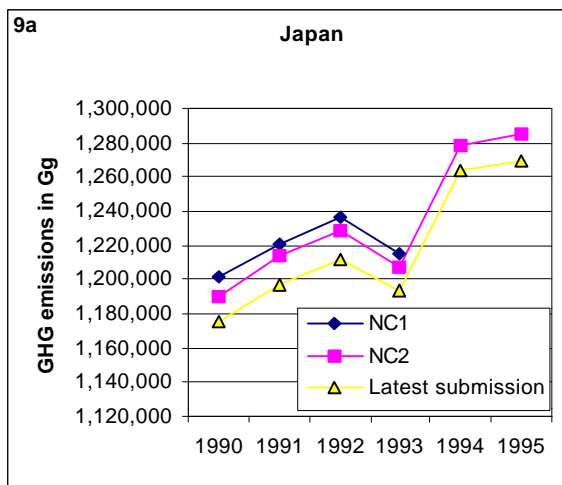
FIGURES

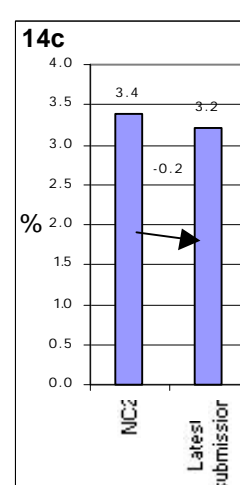
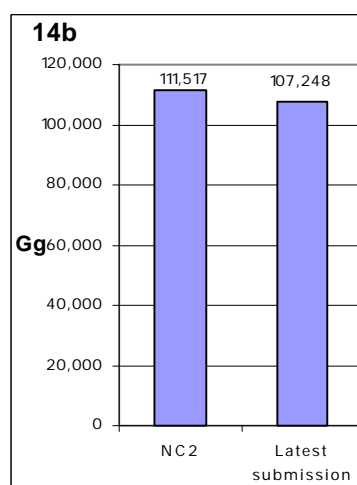
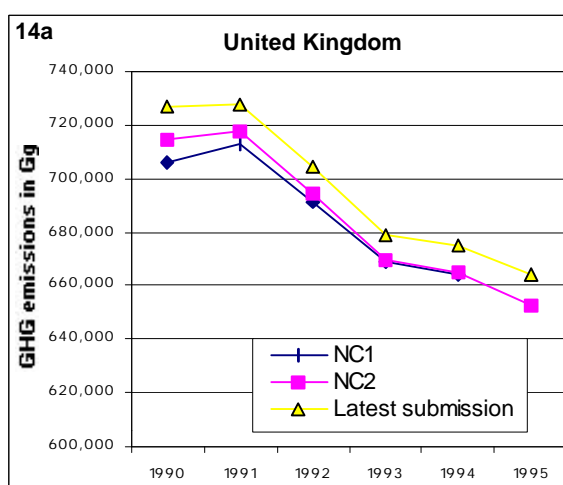
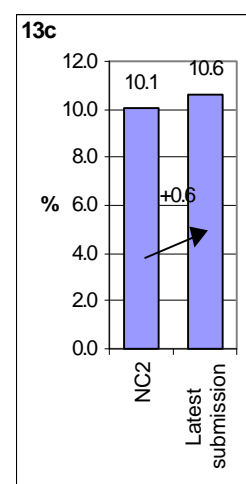
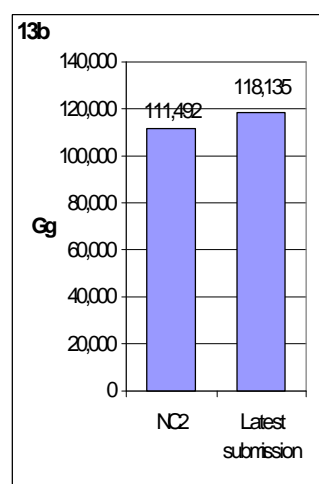
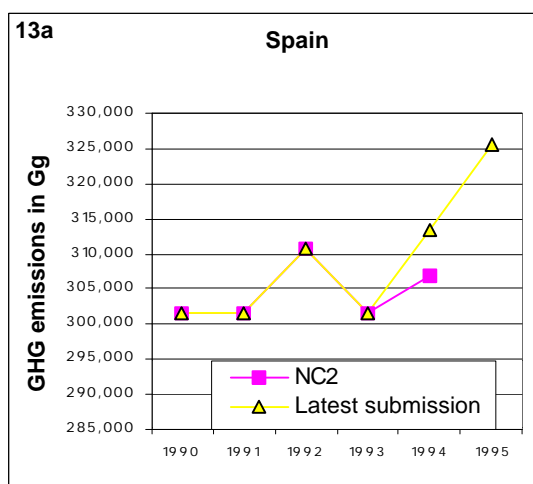
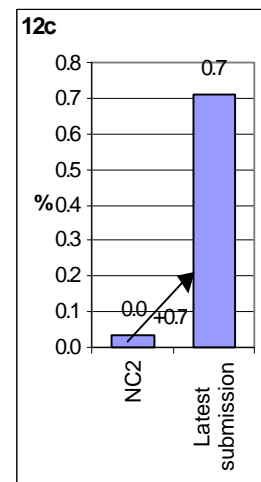
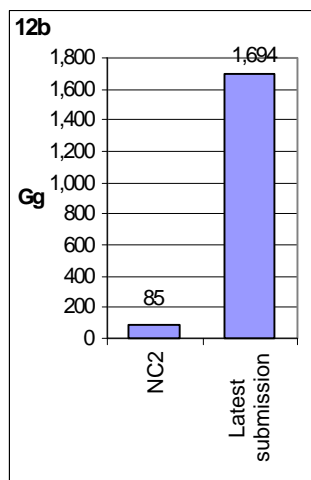
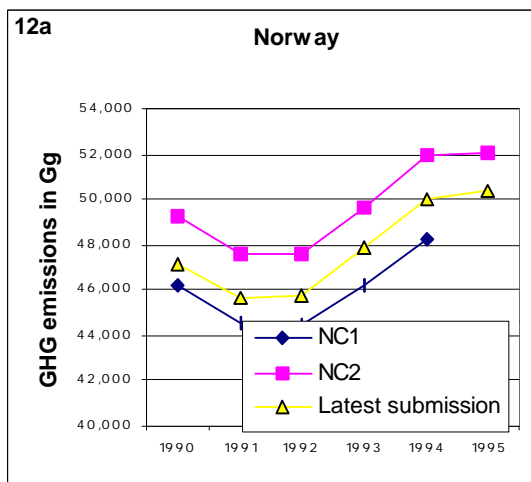
- Figures a - Trends in aggregate GHG emissions expressed in CO₂ equivalent (Gg) for the years 1990 to 1994 or 1995 as reported in national communications (NC1 and NC2) and the latest inventory submission.
- Figures b - Amount of aggregate GHG emissions by which the Party either over- or under-achieved its *simulated* commitment, given data in either the NC2 or the latest inventory submission (CO₂ equivalent in Gg).
- Figures c - Percentage over or under *simulated* commitments and differences between these levels (in percentage points).

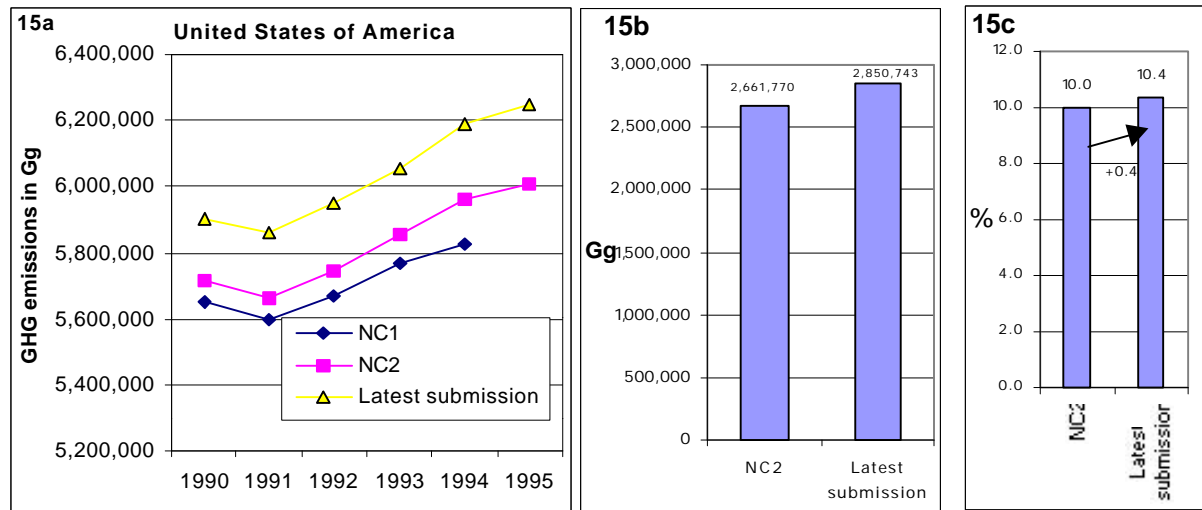












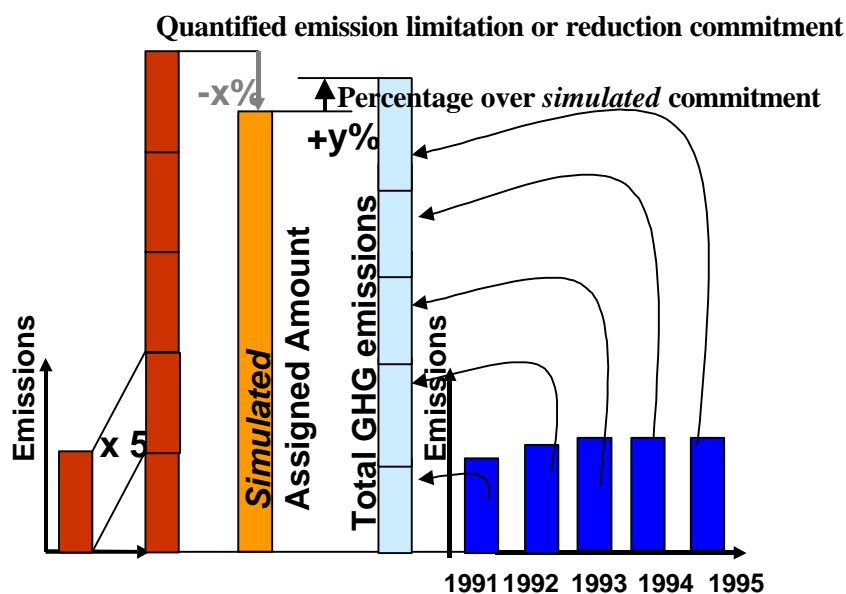


Figure 16. Illustration of the calculation of the *simulated* assigned amount and of the percentage by which Parties are under or over the simulated commitments.

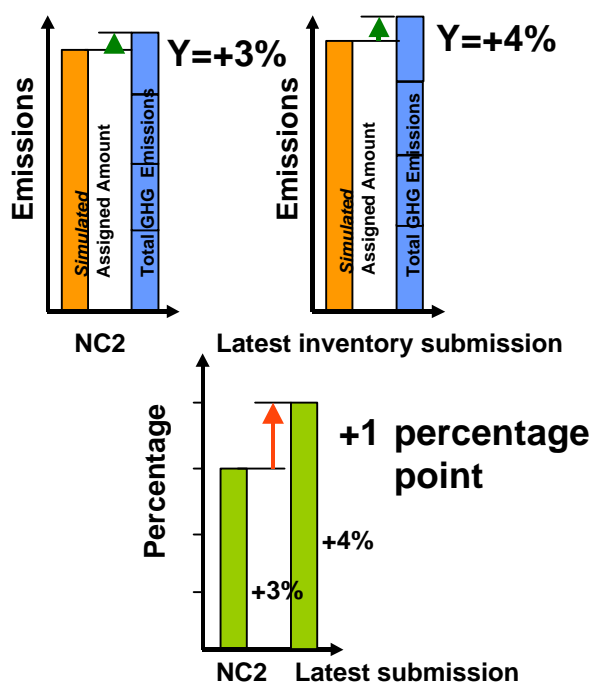


Figure 17. Illustration of the difference by which Parties are under or over the *simulated* commitments as a consequence of using data from the NC2 and the latest inventory submission.

Annex II

EXCERPTS FROM SUBMISSIONS BY PARTIES ON ARTICLES 5, 7 AND 8 OF THE KYOTO PROTOCOL¹³ RELATED TO THE MODALITIES FOR THE ACCOUNTING OF ASSIGNED AMOUNTS

Canada

Recalculation of assigned amount : Based on the initial assigned amount, which in turn would be based on the 1990 inventory, the recalculation of the assigned amount should incorporate any changes made to the initial assigned amount and the transfers and acquisition of units [assigned amount units (AAUs), certified emission reductions (CERs) and emission reduction units (ERUs)]. Such information is critical in order to anticipate potential compliance problems and to make publicly available the information on the amount of units a Party may have to sell. Canada would like the rules for calculating the assigned amounts (both initial and recalculated assigned amount) to be known fairly early in the process. This would assist Parties in developing their national programmes and potentially help them to ratify the Protocol.

New Zealand

Another issue is the process by which base-year inventories are scrutinized and potentially adjusted, and the timing for this process to be complete well in advance of the beginning of the commitment period as this is fundamental to determining Parties' initial assigned amount. In our view, base-year inventories would undergo a type of Article 8 review as part of this process.

Portugal on behalf of the European Community, its member States and Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia

Methodological and technical aspects related to article 7

7. Tables 1 and 2 above identify the articles of the Protocol for which supplementary information may be required, for inclusion either in the annual inventory or in the national communication. Methodological or technical work to define information requirements is already under way for Article 3.3, 3.4 and 3.7, and is unlikely to be needed for Articles 3.5, 3.8 and 2.1(a) and (b). The guidelines, modalities, rules and procedures being developed or planned in association with Articles 5, 6.2, 12.7 and 17 should also cover supplementary data needs associated with Articles 5, 3.10, 3.11 and 3.12, although it will be necessary to ensure that the relevant work plans cover reporting needs under Article 7.
8. This leaves the following articles for which additional methodological and technical work may be necessary:

¹³ For the full texts of Parties' submissions please refer to document FCCC/SBSTA/2000/MISC.1.

Table 3 – Methodological and technical aspects related to Article 7, which need further work

Article	Methodological or technical work required
3.1	Relationship between inventory time series and the assigned amount if new inventory information becomes available.

Review of assigned amounts

19. The review of assigned amounts will depend on the procedures for recalculations during the commitment period. If recalculations are allowed during the entire commitment period, the aggregate base year emissions may change every year. Such recalculations should be subject to thorough review by the expert review team in the context of the review of individual greenhouse gas inventories. If aggregate base year emissions are fixed or frozen with the start of the commitment period, the expert review team will only have to assess the base year estimate once at the beginning of the commitment period, but we will need to ensure that the methodologies used to produce the annual estimates have not become inconsistent with the base year estimate.

United States of America

Base-year review and establishment of initial assigned amount

In closing, we note that the inventory base-year merits special consideration. In the US view, the initial assigned amounts of Annex I Parties must be formally quantified to represent tonnes of carbon dioxide equivalent to provide certainty to countries regarding the level of their Article 3 targets. To enable establishment of initial assigned amounts, base-year inventories must be reviewed prior to the commitment period in conjunction with review of Parties' national systems. Parties should also be required to designate their selection of base-year for the high GWP gases at this time. This review would occur in accordance with the guidelines for the Article 8 review. Parties would have the opportunity to correct any inventory deficiencies, and would be subject to adjustments for any deficiencies that are not corrected. Once the base-year inventory has been reviewed and, as appropriate adjusted, the Party's initial assigned amount would be established in tonnes of carbon dioxide equivalent units. This number would be recorded in the secretariat official account for that Party. Prior to the commitment period, the Party would serialize its initial assigned amount in its national registry, and report this information to the secretariat. Although the base-year review and establishment of initial assigned amounts could potentially occur as late as 2007 (at which time Annex I Parties are required to have their national systems in place), we recommend that the decision allow Parties to voluntarily undergo the base-year review sooner, in order to have more time to prepare for the commitment period and to correct any inventory problems that may be identified.
