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**Report of the individual review of the greenhouse gas inventories of Belgium  
submitted in 2007 and 2008\***

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\* In the symbol for this document, 2008 refers to the year in which the inventory was submitted, and not to the year of publication.

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## I. Overview

### A. Introduction

1. This report covers the centralized review of the 2007 and 2008 greenhouse gas (GHG) inventory submissions of Belgium, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. In accordance with the conclusions of the twenty-seventh session of the Subsidiary Body for Implementation, the focus of the review is on the most recent (2008) submission.<sup>1</sup> The review took place from 1 to 6 September 2008 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Ms. Barbara Muik (Austria) and Ms. Kristina Saarinen (Finland); energy – Ms. Maria Liden (Sweden) and Mr. Christo Christov (Bulgaria); industrial processes – Ms. Karin Kindbom (Sweden) and Ms. Sina Wartmann (Germany); agriculture – Ms. Anna Romanovskaya (Russian Federation) and Ms. Fatou Gaye (Gambia); land use, land-use change and forestry (LULUCF) – Mr. Rizaldi Boer (Indonesia) and Mr. Giacomo Grassi (Italy); and waste – Ms. Medea Inashvili (Georgia) and Mr. Faouzi Senhaji (Morocco). Ms. Romanovskaya and Mr. Senhaji were the lead reviewers. The review was coordinated by Mr. Matthew Dudley (UNFCCC secretariat).

2. In accordance with the “Guidelines for review under Article 8 of the Kyoto Protocol” (decision 22/CMP.1), a draft version of this report was communicated to the Government of Belgium, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

### B. Inventory submission and other sources of information

3. The 2008 inventory was submitted on 15 April 2008; it contains a complete set of common reporting format (CRF) tables for the period 1990–2006 and a national inventory report (NIR). This is in line with decision 15/CMP.1. The Party indicated that the 2008 submission is also its voluntary submission under the Kyoto Protocol.<sup>2</sup> In its 2007 submission, Belgium included a complete set of CRF tables for the period 1990–2005 and an NIR. Belgium officially submitted revised emission estimates for its 2008 submission on 20 October 2008 in response to questions raised by the expert review team (ERT) during the course of the centralized review, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The revised GHG emission estimates resulted in a revision of the 2006 inventory from 136,970.02 Gg CO<sub>2</sub> eq, as reported originally by the Party, to 136,543.78 Gg CO<sub>2</sub> eq (a decrease of 0.3 per cent). These revised values are based on revisions of methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) emissions from other transportation (see paras. 12 and 33 below), and CH<sub>4</sub> emissions from manure management (see para. 57 below). Where needed the ERT also used previous years’ submissions, additional information provided during the review and other information. The full list of materials used during the review is provided in the annex to this report.

### C. Emission profiles and trends

4. In 2006 (as reported in the 2008 annual inventory submission), the main GHG in Belgium was carbon dioxide (CO<sub>2</sub>), accounting for 87.2 per cent of total GHG emissions<sup>3</sup> expressed in CO<sub>2</sub> eq, followed by N<sub>2</sub>O (6.6 per cent) and CH<sub>4</sub> (4.9 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>) collectively accounted for 1.3 per cent of the overall GHG emissions in the country. The energy sector accounted for 81.2 per cent of the total GHG emissions,

<sup>1</sup> FCCC/SBI/2007/34, paragraph 104.

<sup>2</sup> Parties may start reporting information under Article 7, paragraph 1, of the Kyoto Protocol from the year following the submission of the initial report, on a voluntary basis (decision 15/CMP.1).

<sup>3</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified.

followed by industrial processes (10.6 per cent), agriculture (7.1 per cent), waste (0.9 per cent), and solvent and other product use (0.2 per cent). Total GHG emissions amounted to 136,543.78 Gg CO<sub>2</sub> eq and decreased by 5.5 per cent between the base year<sup>4</sup> and 2006. In 2005 (as contained in the 2007 inventory submission), total GHG emissions amounted to 143,848.37 Gg CO<sub>2</sub> eq. The shares of gases and sectors in 2006 (2008 annual inventory submission) were similar to those of 2005 (2007 inventory submission).

5. Tables 1 and 2 show GHG emissions by gas and by sector, respectively.

#### **D. Key categories**

6. Belgium has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2008 submission. The key category analysis performed by the Party and that performed by the secretariat<sup>5</sup> produced similar results. Belgium has included the LULUCF sector in its key category analysis, which was performed in accordance with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). Fugitive emissions (fluorinated gases) – PFCs was identified in the 2008 submission as a key category but not in the 2007 submission and stationary combustion – liquid fuel (N<sub>2</sub>O) became a key category in the 2008 submission. The ERT recommends that Belgium report, in its next annual submission, a key category analysis for 1990 that does not include the Kyoto base year (1995) for fluorinated gases (F-gases).

#### **E. Main findings**

7. The inventory is generally in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC good practice guidance, and the IPCC good practice guidance for LULUCF. More specifically, the ERT found that the Party has submitted an inventory that is generally complete and covers all sectors, most categories, and all years of the inventory time series. The reporting is in accordance with the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories” (hereinafter referred to as the UNFCCC reporting guidelines). The ERT concluded that the inventory is generally consistent and comparable with inventories of other Parties.

8. The ERT found that Belgium has made significant improvements to the NIR with regard to addressing transparency issues that arise from national circumstances (i.e. the national inventory and the aggregation of regional inventories). However, the ERT found that the NIR still lacks compiled information at the national level on the completeness of the inventory, methodologies, inventory improvements and recalculations (see para. 14 below).

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<sup>4</sup> Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

<sup>5</sup> The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the Intergovernmental Panel on Climate Change *Good Practice Guidance for Land Use, Land-use Change and Forestry*. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year. Where the Party performed a key category analysis, the key categories presented in this report follow the Party’s analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

**Table 1. Greenhouse gas emissions by gas, 1990–2006<sup>a</sup>**

Greenhouse gas emissions	Gg CO <sub>2</sub> eq								Change base year–2006 (%)
	Base year <sup>b</sup>	1990	1995	2000	2003	2004	2005	2006	
CO <sub>2</sub>	118 817.43	118 817.43	123 688.21	123 779.63	127 129.86	126 775.95	123 499.52	119 107.18	0.2
CH <sub>4</sub>	9 889.89	9 889.89	9 339.90	8 293.26	7 144.98	7 031.83	6 843.00	6 659.32	–32.7
N <sub>2</sub> O	10 774.49	10 774.49	11 661.96	11 532.99	9 799.42	10 008.85	9 851.42	8 954.85	–16.9
HFCs	438.68	438.68	438.68	951.67	1 466.36	1 508.18	1 494.48	1 595.35	263.7
PFCs	2 335.24	2 433.54	2 335.24	360.90	208.68	306.19	140.97	152.21	–93.5
SF <sub>6</sub>	2 205.16	1 662.49	2 205.16	111.52	99.91	84.34	83.85	74.88	–96.6

<sup>a</sup> After the review week, Belgium submitted revised emission estimates on 20 October 2008 for the period 1990–2006.

<sup>b</sup> Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

**Table 2. Greenhouse gas emissions by sector, 1990–2006<sup>a</sup>**

Sectors	Gg CO <sub>2</sub> eq								Change base year–2006 (%)
	Base year <sup>b</sup>	1990	1995	2000	2003	2004	2005	2006	
Energy	112 736.78	112 736.78	116 350.63	116 388.36	119 258.62	118 589.39	115 229.67	110 860.58	–1.7
Industrial processes	16 845.69	16 401.32	18 736.44	15 195.34	14 584.93	15 318.11	15 171.61	14 457.63	–14.2
Solvent and other product use	246.11	246.11	240.18	253.37	249.65	249.53	249.45	248.85	1.1
Agriculture	11 236.89	11 236.89	11 324.06	10 870.78	10 049.90	9 983.68	9 847.04	9 755.73	–13.2
LULUCF	NA	–1 431.14	–1 385.89	–1 550.32	–1 716.87	–1 173.41	–370.10	–1 060.89	NA
Waste	3 395.41	3 395.41	3 017.84	2 322.12	1 706.11	1 574.62	1 415.49	1 221.00	–64.0
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total (with LULUCF)</b>	NA	142 585.38	148 283.26	143 479.65	144 132.34	144 541.93	141 543.15	135 482.90	NA
<b>Total (without LULUCF)</b>	144 460.89	144 016.52	149 669.16	145 029.97	145 849.21	145 715.34	141 913.25	136 543.78	–5.5

*Abbreviations:* LULUCF = land use, land-use change and forestry, NA = not applicable.

<sup>a</sup> After the review week, Belgium submitted revised emission estimates on 20 October 2008 for the period 1990–2006.

<sup>b</sup> Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

9. The ERT identified potential underestimations that were brought to the attention of the Party during the review week (see paras. 33 and 63 below). In response to questions raised by the ERT during the course of the review, Belgium submitted revised estimates for the category other transportation (see paras. 12 and 33 below) and manure management (see para. 57 below).

10. The ERT concluded that the quality assurance/quality control (QA/QC) plan has been prepared and implemented in accordance with the IPCC good practice guidance (see para. 22 below), as recommended by the previous ERT.

## **F. Cross-cutting issues**

### **1. Completeness**

11. The ERT concluded that Belgium submitted an inventory that is generally complete and covers all sectors, most categories and all years of the inventory time series, and is complete in terms of geographic coverage. Emissions by sources or removals by sinks that are not reported by the Party are explained in the NIR and are mainly attributed to a lack of activity data (AD). However, the ERT found that the list of emissions by sources or removals by sinks is not exhaustive for all categories (e.g. carbon stock change in wetlands). The ERT found that the use of notation keys in the CRF tables is an issue that still has to be resolved by the Party (e.g. CRF table 5.D). The ERT reiterates the recommendations from previous reviews regarding the completeness of the inventory and requests that Belgium resolve this problem and report on it in its next annual inventory submission. Belgium is encouraged to explore simple and reasonable approaches, utilizing expert judgement as necessary, to estimate emissions for categories that are currently reported as not estimated (“NE”), even if the Party considers these emissions to be minor.

12. In response to questions raised by the ERT during the review week regarding the completeness of the inventory, Belgium submitted emission estimates for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions for the category other transportation (see para. 33 below), which were not reported for the Walloon Region and the Brussels-Capital Region, and CH<sub>4</sub> emissions from manure management (see para. 57 below).

13. The ERT identified gaps in the reporting of emissions data and/or information in the following CRF tables: carbon stock change in wetlands (table 5.D), methods and emissions factors (EFs) (summary table 3), key category analysis (table 7), explanations for recalculations (table 8(b)), and completeness (table 9(a)). The ERT reiterates the recommendation from previous reviews regarding the completeness of the inventory submission and requests that Belgium resolve this problem and report on it in its next annual inventory submission.

### **2. Transparency**

14. The ERT found that the transparency of the inventory has improved since the previous submission. This is, in part, a consequence of structuring the NIR so that it is largely consistent with the UNFCCC reporting guidelines. However, the ERT considers that further improvements could be made by the Party to enhance the transparency and the comparability of the reported information and/or data, and to enhance consistency with the data and information provided in the CRF. The ERT recommends that Belgium provide comprehensive information (e.g. tables, discussion, etc.) in the NIR at the national level and that the Party provide regional information on completeness, methodologies, EFs, country-specific parameters, inventory improvements and recalculations. In addition, the ERT recommends that Belgium:

- (a) Implement the consolidation of regional information in the relevant sections of the NIR (e.g. methods/EFs within category chapters);
- (b) Further improve information reported in the NIR at the regional level (e.g. AD);

- (c) Further improve descriptions of methodologies and information on EFs and/or other parameters (e.g. fuel allocation methods in the energy sector may differ between regions, but this is not clearly explained in the NIR).

### 3. Recalculations and time-series consistency

15. The ERT noted that recalculations reported by the Party for the time series 1990–2005 have been undertaken to take into account recommendations from previous reviews and improvements identified by the Party. However, explanations for these recalculations are not reported in CRF table 8. The ERT strongly recommends that Belgium report the explanations for all recalculations in the CRF table.

16. Major changes reported by Belgium in response to the identified improvements include a revision of emissions of F-gases for the period 1995–2006. The rationale for these recalculations is provided in the NIR. Major changes reported by Belgium in response to recommendations from the previous expert review include:

- (a) The harmonization of non-CO<sub>2</sub> EFs in manufacturing industries and construction;
- (b) The use of COPERT III methodology for non-CO<sub>2</sub> emissions from road transportation;
- (c) The revision of non-CO<sub>2</sub> EFs in other sectors (within the energy sector);
- (d) The revision of methods to estimate emissions from domestic and international aviation and navigation;
- (e) The inclusion of coal mining and handling (underground mines) in the inventory for the period 1990–1992;
- (f) The removal of emissions from the non-energy use of fuel reported under category other (2.G);
- (g) The resolution of double counting in glass and enamel production, and in fertilizer use;
- (h) The inclusion of emissions from ceramic production;
- (i) The implementation of a tier 2 method to estimate CH<sub>4</sub> emissions from cattle;
- (j) The revision of the methane conversion factor (MCF) for grazing animals;
- (k) The harmonization of models that underpin the estimation of CH<sub>4</sub> and N<sub>2</sub>O emissions from enteric fermentation and manure management;
- (l) The harmonization of EFs for wastewater treatment.

17. The ERT noted that Belgium has used national or regional specific EFs or IPCC default factors in its inventory. The ERT recommends that Belgium develop and use higher-tier methods, particularly for key categories, in line with the IPCC good practice guidance. In addition, the ERT recommends that Belgium ensure that these higher-tier methods and EFs are harmonized, to the extent possible, across the regions, and that Belgium document clearly the justification for any regional difference in a given method or EF.

18. In response to questions raised by the ERT during the course of the review, Belgium submitted revised estimates to the ERT for all years of the inventory time series.

19. The ERT recommends that Belgium further harmonize AD and EFs across all sectors of the inventory between regions and that the Party report on any recalculations undertaken in its next annual inventory submission.



#### 4. Uncertainties

20. Belgium has reported an IPCC tier 1 uncertainty estimate at the national and the category level using table 6.1 of the IPCC good practice guidance and in accordance with the UNFCCC reporting guidelines. However, the ERT found that this analysis excludes LULUCF and the ERT found that the 1990 uncertainty estimate includes the Kyoto base year data (1995) for F-gases. The ERT recommends that Belgium include LULUCF in its uncertainty analysis and encourages the Party not to include the Kyoto base year for F-gases in the 1990 analysis.

21. The ERT recommends that Belgium further improve the documentation of assumptions in the NIR.

#### 5. Verification and quality assurance/quality control approaches

22. The ERT concludes that the QA/QC plan has been prepared and implemented in accordance with the IPCC good practice guidance. In response to questions raised by the ERT during the course of the review, Belgium submitted a revised QA/QC plan that clarified:

- (a) The roles and responsibilities of elements within the national system, particularly at the national level, with respect to the implementation of QA/QC activities;
- (b) The schedule of activities that is implemented during inventory development;
- (c) The additional resources that are made available in order to manage the implementation of the QA/QC plan at the national level.

23. The ERT recommends that Belgium include in its next annual inventory submission a change to its national system that reflects this QA/QC plan and its implementation. The ERT also recommends that Belgium explore the development of an inventory improvement plan that is linked to its key category and uncertainty analysis.

#### 6. Follow-up to previous reviews

24. Belgium has performed numerous recalculations in response to recommendations from the previous expert review (see para. 16 above). In addition, Belgium has:

- (a) Further improved the transparency of the inventory by preparing an NIR that is consistent with the structure in the UNFCCC reporting guidelines;
- (b) Taken significant steps towards harmonizing methods and EFs across regions.

25. The ERT concluded that Belgium has not implemented all of the recommendations from the previous expert review. In particular, the Party has not:

- (a) Established a centralized archiving system;
- (b) Reported in the NIR whether or not a national inventory improvement plan has been created or if the Party has implemented a formal process for carrying out improvements in the national inventory at the regional and national levels.

### **G. Areas for further improvement**

#### 1. Identified by the Party

26. The 2008 NIR identifies areas for improvement following recommendations from the previous expert review and inventory improvements identified by the Party. Belgium indicated that it is working to improve:

- (a) The harmonization of methods and EFs across the regions (energy, industrial processes, agriculture);
- (b) The recalculation of railway and navigation emissions;
- (c) The reporting of non-methane volatile organic compound emissions from solvent and other product use;
- (d) The reporting of non-CO<sub>2</sub> emissions from outdoor manure storage (including determining uncertainty).

## 2. Identified by the expert review team

27. The ERT identifies the following cross-cutting issues for improvement:
- (a) The improvement of the completeness of the inventory with regard to its coverage of emissions by sources and removals by sinks, CRF tables and the use of notation keys within these tables;
  - (b) The further improvement of documentation in the NIR in order to improve the transparency and understanding of the national inventory (which is compiled from three regional inventories) with respect to methods, EFs and other region- or country-specific data, recalculations, and inventory improvement. The further improvement of documentation in the NIR in order to ensure the data and information contained within it is consistent with the data and information contained in the CRF;
  - (c) The improvement of the transparency of the inventory with regard to the reporting in the CRF on explanations on the use of the notation keys “NE” and included elsewhere (“IE”), recalculations, and methods and EFs used;
  - (d) The improvement of the transparency of the estimates of uncertainty with respect to the documentation in the NIR of the underlying assumptions used for these estimates;
  - (e) The establishment of a centralized archiving system;
  - (f) The further development of harmonized methods and EFs between regions with a specific focus on higher-tier EFs (as opposed to using IPCC defaults);
  - (g) The full implementation of the QA/QC plan;
  - (h) The further consideration of QA and verification activities, and the incorporation of these activities into the QA/QC plan;
  - (i) The development of an inventory improvement plan that takes into account, inter alia, output from key category and uncertainty analysis in order to prioritize improvements in the regional and national inventories.
28. Recommended improvements relating to specific source/sink categories are presented in the relevant sector chapters of this report.

## **II. Energy**

### **A. Sector overview**

29. In 2006, the energy sector amounted to 110,860.58 Gg CO<sub>2</sub> eq, or 81.2 per cent of total GHG emissions. Emissions from the sector decreased by 3.8 per cent between 2005 and 2006, and by 1.7 per cent in the period 1990–2006. Key drivers for the fall in emissions between 1990 and 2006 were the 16.9 per cent decrease in emissions from manufacturing industries and construction, and the

8.2 per cent decrease in emissions from energy industries. In 2006, most of the emissions came from the other sectors category, which accounted for 26.0 per cent of sectoral emissions, while energy industries accounted for 25.0 per cent, manufacturing industries and construction for 24.9 per cent, transport for 23.5 per cent, and fugitive emissions from oil and natural gas for 0.5 per cent. A major change since the 2007 submission is the increase in emissions from the other sectors category, which is a result of the recalculations carried out following the harmonization of CH<sub>4</sub> and N<sub>2</sub>O EFs across regional inventories in both the other sectors and manufacturing industries and construction categories. CO<sub>2</sub> is the dominant GHG, accounting for 98.3 per cent of sectoral emissions, while N<sub>2</sub>O and CH<sub>4</sub> accounted for 1.0 and 0.6 per cent of sectoral emissions, respectively.

30. The ERT concluded that the reporting of the energy sector is generally complete in terms of categories and years, and that the emission estimates have generally been prepared and reported in accordance with the IPCC good practice guidance. However, the ERT found gaps in the CRF tables (data, and methods and EFs) and recommends that Belgium use the appropriate notation key or provide information in these tables in its next annual inventory submission.

31. The ERT noted that Belgium has not fully implemented the recommendation from the previous expert review that the Party report tables of energy consumption for each region individually and a table of energy consumption at the national level. The ERT requested that Belgium report fuels and categories at the level used in the calculations, and that Belgium include a comparison of fuel consumption data at the regional and national levels. The ERT reiterates the recommendation from the previous expert review and requests that Belgium include this information in its next annual inventory submission.

32. The ERT noted that Belgium has undertaken recalculations in response to a recommendation from the previous expert review in order to harmonize methods and EFs across the regions. These recalculations have been performed in line with the IPCC good practice guidance. However, explanations for these recalculations are not provided in the CRF tables.

33. In response to a question raised by the ERT during the course of the expert review regarding a potential underestimation of emissions, Belgium submitted revised estimates for the category other transportation that were not reported for the Walloon Region or the Brussels-Capital Region in the 2008 annual inventory submission.

34. The ERT recommends that Belgium further improve the documentation in the NIR of category descriptions, and methods and EFs used at the regional level, and recommends that Belgium present this information in a consolidated form.

## **B. Reference and sectoral approaches**

### 1. Comparison of the reference approach with the sectoral approach and international statistics

35. In 2006, the reported difference in CO<sub>2</sub> emissions between the reference and sectoral approaches is -0.27 per cent. The difference varies from -4.1 to 4.0 per cent over the time series and the Party provides explanations for each difference in the NIR. The ERT encourages Belgium to include these explanations in the CRF documentation box.

36. The ERT noted that the production of natural gas is reported as not applicable (“NA”) in the reference approach, but emissions data are reported for this activity. The ERT recommends that Belgium correct this inconsistency in its reporting.

37. The ERT found that the reference approach data reported are generally consistent with corresponding data from the International Energy Agency. A notable exception is international bunker fuels (see para. 39 below).

## 2. International bunker fuels

38. The ERT concluded that appropriate methods used to differentiate between international bunkers and domestic activities have been applied in all regional inventories. However, the ERT identified an exception concerning jet kerosene in the period 1995–2006, in which data for this fuel is aggregated with aviation gasoline. The ERT recommends that Belgium explore other data sources for the Flemish Region in order to differentiate between AD and emissions in domestic and international aviation.

39. In response to questions raised by the ERT during the review week, Belgium confirmed errors in the reporting of data for international bunkers. The ERT recommends that Belgium correct these errors and report on them in its next annual inventory submission.

## 3. Feedstocks and non-energy use of fuels

40. The ERT noted that apparent energy consumption excluding non-energy use and feedstocks is reported as “NA”, although the required data appear to be available in the CRF reference approach table and in the CRF table on feedstocks and non-energy use. The ERT recommends that Belgium report apparent energy consumption excluding non-energy use and feedstocks in its next annual inventory submission.

### C. Key categories

#### 1. Stationary combustion: solid fuel – CO<sub>2</sub>

41. The ERT noted an issue regarding the time-series consistency of iron and steel energy data for the Flemish Region for the period 1991–1993. The ERT recommends that Belgium resolve this issue in its next annual inventory submission.

42. In response to questions raised by the ERT during the review, Belgium indicated that it intends to review the CO<sub>2</sub> EF for coke and the calorific value for anthracite, which the ERT considered to be high. The ERT recommends that Belgium report the outcome of this review and any subsequent recalculations in its next annual inventory submission.

#### 2. Stationary combustion: gaseous fuel – CO<sub>2</sub>

43. The ERT recommends that Belgium correct the error in the reporting of emissions data in the CRF table for the manufacture of solid fuels and other energy industries for the year 2003.

### D. Non-key categories

#### Stationary combustion: biomass – CH<sub>4</sub>, N<sub>2</sub>O

44. The ERT encourages Belgium to explore the ways in which it may be able to collect appropriate AD on biomass consumption for all regions in order to estimate non-CO<sub>2</sub> emissions from stationary combustion.

## III. Industrial processes and solvent and other product use

### A. Sector overview

45. In 2006, the industrial processes sector amounted for 14,457.63 Gg CO<sub>2</sub> eq, or 10.6 per cent of total GHG emissions. Emissions from the industrial processes sector decreased by 4.7 per cent between 2005 and 2006 and by 14.2 per cent in the period 1990–2006. The key driver for the fall in emissions between 1990 and 2006 is the 96.6 per cent (4,285.1 Gg CO<sub>2</sub> eq) decrease in emissions from the production of halocarbons and SF<sub>6</sub>. In 2006, most of the emissions came from mineral products, accounting for 39.8 per cent of sectoral emissions, while the chemical industry accounted for 36.0 per cent, metal production for 11.6 per cent, the consumption of halocarbons and SF<sub>6</sub> for

11.6 per cent, and the production of halocarbons and SF<sub>6</sub> for 1.1 per cent. CO<sub>2</sub> is the dominant GHG, accounting for 69.3 per cent of sectoral emissions, while N<sub>2</sub>O accounted for 17.7 per cent, HFCs for 11.0 per cent, PFCs for 1.1 per cent, SF<sub>6</sub> for 0.5 per cent and CH<sub>4</sub> for 0.4 per cent. Emissions from solvent and other product use accounted for 0.2 per cent of total GHG emissions in 2006.

46. The ERT concluded that reporting of the industrial processes sector is generally complete in terms of categories and years, and in general emission estimates have been prepared and reported in accordance with the IPCC good practice guidance. Belgium does not report CO<sub>2</sub> emissions from asphalt roofing or from road paving due to a lack of AD. Belgium is encouraged to explore simple and reasonable approaches, using expert judgement when necessary, to estimate emissions for categories that are currently reported as “NE”, even if the Party considers these emissions to be minor.

47. The ERT noted that the transparency of the inventory could be further improved. The ERT recommends that Belgium:

- (a) Explore how to incorporate information on data reported by companies into the NIR and how to employ methods to estimate these emissions (e.g. in the chemical industry);
- (b) Provide more detailed information on the methods used to estimate emissions from the consumption of halocarbons and SF<sub>6</sub> (see para. 54 below);
- (c) Add value to the methodology section of the NIR by adding quantitative information to the largely qualitative information that is currently reported by the Party;
- (d) Provide documentation in the NIR and the CRF on the IPCC method tier and EF used, as the NIR currently only indicates that the approaches taken were generally in line with the IPCC good practice guidance;
- (e) Address gaps in the CRF by using the appropriate notation keys.

48. The ERT noted that there is an issue concerning the internal consistency of the inventory. Currently, separate methods are used to estimate emissions for numerous categories in the Flemish and Walloon Regions, which lead to a different EF for the same activity (e.g. glass production (see para. 55 below)). The ERT recommends that Belgium explore ways in which it can develop, to the extent possible, consistent higher-tier methods and EFs across the regions, and recommends that Belgium document clearly the justification for any regional difference in a given method or EF.

49. Belgium has reported on the recalculations undertaken in response to recommendations from the previous review. The recalculations that have been undertaken include: the correction of the EFs used to estimate CO<sub>2</sub> emissions from other mineral products (glass and enamel) and the reallocation of these emissions to limestone and dolomite use; the inclusion of additional installations that produce ceramics; and the removal from the inventory of emissions associated with the storage of carbon in lubricants and solvents. The ERT identified an issue regarding the change in methodology used to estimate emissions from iron and steel production that may affect time-series consistency (see para. 52 below).

50. The ERT noted that uncertainty estimates are derived from the IPCC tier 1 analysis. These estimates are based largely on expert judgement (mineral products, chemical industry, (in part) consumption of halocarbons and SF<sub>6</sub>, and solvent and other product use), plant-specific data (metal production), error propagation analysis (production of halocarbons and SF<sub>6</sub>) and sensitivity analyses (consumption of halocarbons and SF<sub>6</sub>).

## **B. Key categories**

### **1. Ammonia production – CO<sub>2</sub>**

51. CO<sub>2</sub> emissions from this category are calculated in the Walloon Region based on natural gas use and the IPCC default EF for natural gas. The previous ERT concluded that emissions from this category

in the Walloon Region were overestimated, as they included both combustion and process emissions. The ERT noted that Belgium created a ratio (not an average) of natural gas used for combustion and for industrial processes using data for the period 2002–2006. This ratio was used to derive the combustion portion that was subsequently allocated to the energy sector. In the Flemish Region, annual surveys provide information on CO<sub>2</sub> emissions (on a confidential basis) undertaken by the Flemish Institute for Technological Research (VITO). Belgium informed the ERT that the AD time series in the Flemish Region were missing in the national AD and that it intends to review this anomaly before the next annual submission.

## 2. Iron and steel – CO<sub>2</sub>

52. The ERT found that Belgium reports emissions from iron and steel production, including process emissions from lime and dolomite use. The ERT noted that Belgium, and more specifically the Walloon Region, has reported CO<sub>2</sub> emissions data obtained from reporting under the European Union Emissions Trading Scheme (EU ETS) since 2005, but a tier 2 method that used CO<sub>2</sub> EFs was reported for the period 1990–2004. This may affect time-series consistency. The ERT recommends that Belgium provide information on and an explanation for the time-series consistency of this emission estimate in its next annual submission.

53. The ERT noted that CO<sub>2</sub> emissions from sinter production are not reported consistently between the regions. In the Walloon Region, these emissions are attributed to steel, whereas in the Flemish Region these emissions are attributed to iron and steel under the energy sector. The ERT recommends that Belgium harmonize its reporting of emissions from sinter production in its next annual submission.

## 3. Consumption of halocarbons and SF<sub>6</sub> – HFCs

54. The ERT found that emissions are estimated using a mass balance approach, which uses data provided by industry, studies and the IPCC default EFs. The ERT found that the method used to estimate emissions appears to be comprehensive. However, the ERT could not confirm this, as the NIR does not provide sufficiently detailed information on the method used (e.g. in the case of refrigeration and air conditioning equipment, the NIR does not state whether or not all of the phases of the life cycle are covered for all activities). The ERT recommends that Belgium further improve the transparency of the methods used by providing detailed methodological information and the assumptions used in the NIR. In addition, the ERT recommends that Belgium improve the reporting of background data and quantitative explanations in the CRF.

## C. Non-key categories

### Other (chemical industry) – CO<sub>2</sub>

55. The ERT concluded that the estimation of emissions from glass production is not internally consistent. The ERT established that emissions are calculated in the Walloon Region using the core inventory of air emissions (CORINAIR) EFs, whereas in the Flemish Region measurement data are used with either EU ETS data or a default value reported by the glass federation (when other company data are not available) to estimate emissions. The EF for the Flemish Region is 17 per cent lower than the highest CORINAIR EF. The ERT recommends that Belgium harmonize the methods and data used across the regions in order to maintain consistency in the national inventory.

## IV. Agriculture

### A. Sector overview

56. In 2006, the agriculture sector amounted to 9,775.73 Gg CO<sub>2</sub> eq, or 7.1 per cent of total GHG emissions. Emissions from this sector decreased by 0.9 per cent between 2005 and 2006, and by 13.2 per cent in the period 1990–2006. Key drivers for the fall in emissions between 1990 and 2006 are the reduction in the population of cattle, swine and sheep, and the decrease in synthetic fertilizer

consumption. In 2006, most of the emissions came from agricultural soils, accounting for 39.9 per cent of total sectoral emissions, while enteric fermentation accounted for 36.2 per cent and manure management accounted for 23.9 per cent. CH<sub>4</sub> is the dominant GHG, accounting for 51.6 per cent of sectoral emissions, while N<sub>2</sub>O accounted for the remaining 48.4 per cent.

57. The ERT concluded that the reporting of the agriculture sector is generally complete in terms of categories and years, and that emission estimates have generally been reported in accordance with the IPCC good practice guidance. Belgium did not report emissions for the Brussels-Capital Region due to extremely small animal populations and cropland area. Belgium is encouraged to explore simple and reasonable approaches, using expert judgement when necessary, to estimate emissions from categories that are currently reported as “NE”, even if the Party considers these emissions to be minor. In response to questions raised by the ERT during the review, Belgium submitted revised estimates for manure management based on revisions made to gross energy and the MCF. The ERT found that Belgium imports manure from the Netherlands. However, the emissions from this imported manure are not reported in the inventory. The ERT encourages Belgium to explore all manure imports/exports in the country with a view to reporting corresponding GHG emissions in the next annual submission, if feasible.

58. The ERT concluded that the transparency of the NIR has been further improved in response to recommendations from the previous review. Belgium has provided improved explanatory information on the methodologies, AD and EFs contained in the NIR, along with a selection of spreadsheets that have been provided in the annex to the NIR. Belgium has improved the completeness of the CRF submission. This has significantly improved the transparency of reporting of the agriculture sector. However, the ERT found that some data are still not reported in the NIR (e.g. the NIR lacks complete information on EFs for CH<sub>4</sub> emissions from manure management in the Walloon Region, AD for synthetic fertilizers, etc.). The ERT strongly recommends that Belgium further improve the transparency of the inventory by including all AD and EFs used in calculations (by region) and for the whole time series in its next annual submission.

59. The ERT concluded that the inventory is not always internally consistent. The ERT reiterated recommendations from the previous review regarding the need to harmonize, to the extent possible, AD, EFs and other parameters across regions. The ERT requests that Belgium resolve this problem, report on it and clearly document the justification for any regional difference in a given method and/or EF in its next annual submission.

60. Belgium has reported on recalculations undertaken in response to recommendations from the previous expert review and as a result of improvements in the inventory. The recalculations undertaken in response to recommendations from the previous expert review include: the development of tier 2 EFs for enteric fermentation (cattle); a change to the MCF for grazing animals; and the exclusion of N<sub>2</sub>O emissions from the category other. The recalculations undertaken as a result of improvements in the inventory include: the reallocation of brood cows from the dairy cattle category to the non-dairy cattle category; the revision of the CH<sub>4</sub> model for manure management in the Flemish Region; the revision of data on the allocation of animal waste management systems; the correction made to poultry population figures in 2005; and the incorporation of the results of the domestic ammonia (NH<sub>3</sub>) policy in manure management. The ERT noted that some AD (e.g. livestock population) are collected on 1 May each year for that same year. The ERT encourages Belgium to ensure that these AD correspond to the annual mean population of animals for each calendar year and to provide explanatory information on this in its next annual submission.

61. No category-specific QA/QC procedures have been implemented. Planned improvements include the initiation of a study to estimate NH<sub>3</sub>, N<sub>2</sub>O and CH<sub>4</sub> emissions from outdoor manure storage, and a revision of the NH<sub>3</sub> emission model in the Flemish Region.

## B. Key categories

### 1. Enteric fermentation – CH<sub>4</sub>

62. The ERT found that the EFs for goats differ between the regions by almost a factor of three: 5.0 kg CH<sub>4</sub>/head in the Flemish Region and 14.2 kg CH<sub>4</sub>/head in the Walloon Region (table 6.6 in the NIR). Belgium considers the EFs for the Flemish Region to be a country-specific value. The ERT reiterated a recommendation from the previous expert review regarding the harmonization of EFs across regions. The ERT requests that Belgium resolve this problem, report on it and clearly document the justification for any regional difference in a given method and/or EF used in its next annual submission.

### 2. Manure management – CH<sub>4</sub>

63. The ERT found that Belgium reported a constant EF for dairy cattle. However, the ERT noted that milk production has increased in the period 1990–2006 and therefore the assumption of a constant EF may lead to an underestimation of emissions for the latest years of the inventory time series. Belgium informed the ERT that it has developed tier 2 EFs for dairy and non-dairy cattle for the period 1990–2006, and that it submitted revised estimates to the ERT during the course of the review. The ERT recommends that Belgium report these new EFs in its next annual submission.

64. The ERT found that the transparency of information in the NIR and the CRF on the MCF could be improved. The ERT recommends that Belgium further improve the transparency of the information in the NIR on this matter and that Belgium verify that the reporting of the MCF is correct. In its 2006 submission, Belgium reported a MCF of 39 per cent for liquid systems. However, in the 2008 submission the MCF is 20 per cent for liquid systems. The ERT noted that this may lead to an underestimation of emissions from liquid systems. Using the IPCC good practice guidance methodology, the ERT estimated the CH<sub>4</sub> EF for dairy cattle to be 1.5 times higher than that reported by the Party. In response to questions raised by the ERT, Belgium provided revised MCF estimates based on recognized international scientific literature (19 per cent (pit storage), 2 per cent (solid storage) and 0.1 per cent (daily spread)). The recalculations resulted in a 22.2 per cent decrease in CH<sub>4</sub> emissions from manure management (from 1 923.8 Gg CO<sub>2</sub> eq to 1 497.2 Gg CO<sub>2</sub> eq) for 2006. The ERT noted that the revision is supported by most recent scientific data, but is not consistent with the parameters used for the calculation of assigned amounts and thus resulted in lower estimations.

### 3. Direct soil emissions – N<sub>2</sub>O

65. The ERT found that Belgium excludes the amount of animal manure exported to neighbouring countries from its calculation of emissions from animal manure applied to soils. The IPCC good practice guidance states that all manure produced by livestock in the country should be estimated in the national inventory. However, animal manure that is imported or exported is not mentioned in the IPCC good practice guidance. The ERT recommends that Belgium provide documentation on how emissions from exported manure are accounted for in the national inventories of importing countries or that the Party recalculate relevant agricultural emissions to include emissions from all manure produced in the country.

### 4. Indirect emissions – N<sub>2</sub>O

66. The ERT found that the Frac<sub>LEACH</sub> value reported is not internally consistent across the regional inventories. During the course of the review, Belgium informed the ERT that the Walloon and Flemish Regions have different Frac<sub>LEACH</sub> values of 0.18 and 0.07, respectively. In addition, the ERT found that the Frac<sub>LEACH</sub> value reported in the NIR is 0.17, whereas it is 0.07 in annex IV to the NIR and in the CRF. The ERT recommends that Belgium, to the extent possible, harmonize the data used to calculate emissions and recommends that the Party clearly document why there are differences in data between regions. The ERT encourages Belgium to implement QC checks in order to ensure consistency between information reported the NIR and in the CRF.



### C. Non-key categories

#### Pasture, range and paddock manure – N<sub>2</sub>O

67. The ERT found in the Walloon Region that manure N excreted during grazing was corrected for NH<sub>3</sub> volatilization. This is not in line with the IPCC good practice guidance. The ERT recommends that Belgium recalculate N<sub>2</sub>O emissions from this category in the Walloon Region for all years of the inventory time series.

## V. Land use, land-use change and forestry

### A. Sector overview

68. In 2006, the LULUCF sector was a net sink of 1,060.89 Gg CO<sub>2</sub> eq. The LULUCF sector has been a net sink for all years in the inventory time series. The net sink increased by 186.6 per cent between 2005 and 2006, and decreased by 25.9 per cent in the period 1990–2006. In 1990, the rate of carbon removal for this sector was reported to be –1,431.14 Gg CO<sub>2</sub> eq and the rate of carbon removal was relatively constant until the year 2000. In 2001, the carbon removal rate increased very sharply to 2,797.73 Gg CO<sub>2</sub> eq, but then decreased rapidly to 370.10 Gg CO<sub>2</sub> eq in 2005 before it increased again to 1,060.89 Gg CO<sub>2</sub> eq in 2006. The key driver for the trend between the base year and 2006 is the trend in the carbon removal from forest land.

69. The ERT noted with concern that Belgium only reported land remaining land for forest land, cropland remaining cropland, and grassland remaining grassland under the LULUCF sector under the Convention. This may lead to major problems with the reporting of mandatory activities under Article 3, paragraph 3, of the Kyoto Protocol in the 2010 submission. During the review, the ERT reminded the Party that the land areas subject to LULUCF activities under Article 3, paragraph 3, of the Kyoto Protocol should be identifiable in the national system. The ERT recommends that Belgium report a complete inventory for the LULUCF sector under the Convention, address effectively the issues relating to activities under Article 3, paragraph 3, of the Kyoto Protocol in the national system, and that Belgium report on this in its next annual inventory submission.

70. The ERT concluded that the LULUCF sector is complete in terms of years, but is incomplete in terms of gases. Belgium has not estimated emissions of non-CO<sub>2</sub> gases and instead reports these as either not occurring (“NO”) or “NE”. Belgium is encouraged to explore simple and reasonable approaches, using expert judgement when necessary, to estimate emissions for categories that are currently reported as “NE”, even if the Party considers these emissions to be minor.

71. The ERT reiterated the recommendation from the previous expert review regarding distinguishing between carbon stock change in mineral and organic soils, and requests that Belgium resolve this problem and report on it in its next annual inventory submission.

72. The ERT found inconsistencies in the AD time series, for example the sum of all reported land uses is 1,969 kha in 1992, but it is 2,000 kha in 1994. The ERT recommends that Belgium verify all of the areas reported and that the Party report areas under different land uses (and land-use changes), including other land (5F), so that the total land area identified is equal to the country’s land area.

73. The NIR states that Belgium used forest mapping for forest land and Landsat images for cropland and grassland. The Party did not provide a detailed description of these methods or information on how gaps or double mapping were avoided. The ERT recommends that Belgium describe its plans for the improvement of land-use representation in its next annual inventory submission. This improvement is crucial, as consistent and complete reporting of activities under Article 3, paragraph 3, of the Kyoto Protocol and reporting that is in line with the reporting standards stipulated in the IPCC good practice guidance for LULUCF will be mandatory for the 2010 submission onwards.

74. The ERT found that Belgium applied dynamic models when preparing its LULUCF inventory. The reference for this model is provided in the NIR. The ERT reiterated the recommendation from the previous expert review regarding the provision of the key model parameters in the NIR, and requests that Belgium resolve this transparency issue and report on it in its next annual inventory submission.

75. The ERT reiterated the recommendation from the previous expert review regarding the use of terminology consistent with the IPCC good practice guidance for LULUCF and requests that Belgium report on this in its next annual inventory submission.

## **B. Key categories**

### **1. Forest land remaining forest land – CO<sub>2</sub>**

76. The ERT identified an inconsistency between the NIR and the CRF in the reporting of forest land area. The total forest area reported in the NIR is 605.4 kha and is based on data from the National Institute of Statistics and the Belgian Regional Forest Inventory 2000. The value given in the CRF is 624.2 kha. In the NIR, Belgium states that its forestry definition is fully consistent with the official Food and Agriculture Organization of the United Nations definition reported in the Forest Resources Assessment (FRA) 2005. The forest area reported in the FRA 2005 was 667 kha for the year 2000. The ERT recommends that Belgium verify the forest area and ensure consistency in the reporting of forest area in its next annual inventory submission.

77. The ERT noted that the forest land area in Belgium changes from year to year. The forest land area reported in the CRF decreases from 640 kha in 1990 to 620 kha in 2001 with the exception of the year 1994 when there is a sudden increase in the forest land area. The forest land area remains constant after 2001. The rate of decrease in forest land area in the period 1990–2001 is about 2,000 ha per year. The ERT recommends that Belgium explain these trends and provide information in the NIR and the CRF on the conversion of forest land to other uses that occurred during this period.

78. The ERT found that the rate of carbon removal in this category remained relatively constant between 1996 and 2000 (approximately 3,000 Gg CO<sub>2</sub> per year). The carbon removal rate increased sharply to 4,500 Gg CO<sub>2</sub> in 2001 and then decreased rapidly to about 2,000 Gg in 2005. In response to questions from the previous expert review, Belgium indicated that this trend was a result of a change in the methodology used, and that it intended to recalculate the entire time series after it received data from the latest National Forest Inventory (NFI), which were due to be published in 2008. However, these recalculations have not been reported. The ERT recommends that Belgium incorporate data from the latest NFI into its next annual inventory submission.

79. The ERT identified another inconsistency in the inventory submission regarding the net carbon stock change in soils. Belgium has reported an implied EF of 0.04 Mg C/ha, but the NIR shows a 10-fold increase in forest soil carbon. During the course of the review, Belgium indicated that the CRF provides the correct value, as it was calculated using direct measurements taken in Belgium.

### **2. Grassland remaining grassland – CO<sub>2</sub>**

80. The ERT noted a rapid decrease in grassland area from 580 kha in 1990 to 480 kha in 1994 (i.e. 20,000 ha per year) and then a steady increase. The trend was more pronounced in the Flemish Region. In the Walloon Region, the grassland area decreased at a rate of about 1,700 ha per year, with the exception of 1994. The ERT recommends that Belgium explain these trends and provide information in the NIR and the CRF on the conversion of grassland to other uses that occurred during this period.

81. The ERT noted from CRF table 5C that the rate of decrease in grassland soil carbon was constant for all years in the time series at a rate of 0.5 Mg C/ha for the Flemish Region and 0.81 Mg C/ha for the Walloon Region. In the Walloon Region, the value changed from 0.81 Mg C/ha to 1.0 Mg C/ha in 1996. The ERT recommends that Belgium verify this information in its next annual inventory submission.

## VI. Waste

### A. Sector overview

82. In 2006, the waste sector amounted for 1,221.00 Gg CO<sub>2</sub> eq, or 0.9 per cent of total GHG emissions. Emissions from this sector decreased by 13.7 per cent between 2005 and 2006, and by 64.0 per cent in the period 1990–2006. The key driver for the fall in emissions between 1990 and 2006 was the increase in the capture of biogas from landfills. In 2006, most emissions came from solid waste disposal on land, accounting for 55.7 per cent of sectoral emissions, while wastewater handling accounted for 33.3 per cent, waste incineration for 7.7 per cent and the category other for 3.2 per cent. CH<sub>4</sub> is the dominant GHG, accounting for 69.9 per cent of sectoral emissions, while N<sub>2</sub>O accounted for 23.7 per cent and CO<sub>2</sub> for 6.4 per cent.

83. The ERT concluded that the waste sector is generally complete in terms of categories and years, and that emission estimates have generally been prepared and reported in accordance with the IPCC good practice guidance. Belgium reports CH<sub>4</sub> and N<sub>2</sub>O emissions from industrial wastewater as “NE”. Belgium is encouraged to explore simple and reasonable approaches, using expert judgement when necessary, to estimate emissions for categories that are currently reported as “NE”, even if the Party considers these emissions to be minor.

84. In response to recommendations from the previous expert review, Belgium has reported recalculations. Recalculations of emissions from wastewater treatment (septic tanks) in the Flemish Region were carried out in an attempt to harmonize EFs across all regions.

85. The ERT encourages Belgium to further harmonize its waste sector inventory across all regions. In addition, the ERT encourages Belgium to provide an overview of the sector in the form of a flowsheet with a mass balance for the solid waste and wastewater categories.

### B. Key categories

#### 1. Solid waste disposal on land – CH<sub>4</sub>

86. Emissions from this category were estimated using two models (multiphase and first order decay (FOD) model) in the Flemish Region and using the FOD model in the Walloon Region. The ERT found that documentation in the NIR and CRF on the terminology, descriptions and values of parameters used in these models (e.g. degradable organic carbon, fraction of degradable organic carbon dissimilated, etc.) could be improved by providing information using the terminology in the IPCC good practice guidance (instead of the FOD model) and by complimenting this information with terminology and values from the multiphase model.

#### 2. Waste incineration – CO<sub>2</sub>

87. The Walloon Region reported CO<sub>2</sub> emissions from flaring in the chemical industry under waste incineration, whereas the Flemish Region has allocated these emissions to the chemical industry category in the industrial processes sector. The ERT reiterates the recommendation from the previous expert review regarding the inconsistent reporting between regions (and years) of CO<sub>2</sub> emissions from flaring activity associated with the chemical industry and requests that Belgium resolve this issue and report on it in its next annual inventory submission.

## VII. Other issues

### 1. Changes to the national system

88. Belgium reported on a change to its national system in the 2008 submission. The change was the further elaboration of a QA/QC plan, as recommended by the previous ERT. In response to questions raised during the course of this expert review, Belgium submitted a revised QA/QC plan on

20 October 2008 (see para. 22 above). The ERT considers these changes to be broadly in accordance with the requirements of national systems as defined in decision 19/CMP.1. The Party should implement this QA/QC plan fully at both the national and the regional level, and should designate a national QA/QC manager. The ERT encourages the Party to report on these improvements/changes in its next annual submission under the Kyoto Protocol.

## 2. Changes to the national registry

89. Belgium reported on changes to its national registry in the 2008 submission. The changes include moving the national registry from the Brussels Data Centre to Berlin in January 2008, and changing over from Seringas software to the Community Registry software (CRS) in February 2008. Belgium informed the ERT that the CRS was accredited by both the international transaction log administrator in October 2007 and the European Union transaction log administrator in June 2008. The ERT considers these changes to be in accordance with the requirements of national registries as defined in decision 13/CMP.1. The ERT encourages Belgium to report on these improvements/changes in its next annual submission under the Kyoto Protocol.

## 3. Commitment period reserve

90. Belgium has not reported its commitment period reserve in the 2008 submission. In response to questions raised by the ERT during the review, Belgium reported that its commitment period reserve has remained unchanged since the initial report review (606,595,975 t CO<sub>2</sub> eq). The ERT agrees with this figure. The ERT recommends that Belgium include information on its commitment period reserve in its next annual submission.

# VIII. Conclusions and recommendations

91. The ERT concluded that Belgium has prepared its inventory generally in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, and has reported the inventory generally in accordance with the UNFCCC reporting guidelines. The inventory is generally complete in terms of its coverage of all sectors, most categories, and all years, gases and territories. However, the ERT found that the completeness of the inventory could be significantly improved, particularly in the LULUCF sector.

92. The ERT concluded that the inventory is generally consistent, but it requires further harmonization across the regions with regard to higher-tier methods, AD, EFs and other parameters. The ERT concluded that there might be underestimations in the inventory (see paras. 33 and 63 above).

93. The ERT concluded that Belgium has made significant improvements to the NIR, as it has addressed issues relating to transparency that arise from national circumstances (i.e. the national inventory and the aggregation of regional inventories).

94. The ERT concluded that the QA/QC plan has been prepared and implemented in accordance with the IPCC good practice guidance (see para. 22 above), as recommended during the previous expert review.

95. The key recommendations are that Belgium:

- (a) Develop and use higher-tier methods, particularly for key categories. The Party should ensure that these higher-tier methods and EFs (and other parameters) are harmonized, to the extent possible, across the regions, and should document clearly the justification for any regional difference in a given method or EF. The Party should harmonize the reporting of categories across regions (e.g. sinter production);

- (b) Implement the QA/QC plan, including by designating a national QA/QC coordinator/manager, developing an inventory improvement plan that is linked to the key category and uncertainty analyses, and establish a centralized archiving system;
- (c) Establish capacity in order to identify and report areas of land use and land-use change in accordance with the IPCC good practice guidance for LULUCF and reporting requirements under the Kyoto Protocol, and address issues regarding the representation of land areas in the LULUCF sector;
- (d) Improve the documentation in the NIR of compiled information at the national level on the completeness of the inventory, methodologies, inventory improvements and recalculations, and correct identified errors in and/or inconsistencies between, the NIR and the CRF;
- (e) Further improve the completeness of the inventory by reporting emissions by sources and removals by sinks for activities that occur in the country, especially in the LULUCF sector;
- (f) Further improve the transparency of the inventory by providing detailed information in the NIR on methods and data, particularly for those that differ from region to region, as well as by using the appropriate notation keys in the CRF tables and by providing explanations in CRF table 9;
- (g) Resolve issues regarding time-series consistency that have been identified in the industrial processes sector.

## **IX. Questions of implementation**

96. No questions of implementation were identified by the ERT during the review.

Annex

**Documents and information used during the review**

**A. Reference documents**

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <<http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Available at <<http://www.ipcc-nggip.iges.or.jp/public/gp/english/>>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <<http://www.ipcc-nggip.iges.or.jp/public/gp/landuse/gp/landuse.htm>>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories”. FCCC/SBSTA/2006/9. Available at <<http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>>.

“Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention”. FCCC/CP/2002/8. Available at <<http://unfccc.int/resource/docs/cop8/08.pdf>>.

“Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol”. Decision 19/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Decision 15/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Decision 22/CMP.1. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>>.

Status report for Belgium 2007. Available at <<http://unfccc.int/resource/docs/2007/asr/bel.pdf>>.

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**B. Additional information provided by the Party**

Responses to questions during the review were received from Mr. André Guns and Ms. Isabelle Higuët (General Directorate for Natural Resources and Environment), Ms. Miet D'heer (Flemish Environmental Agency) and Mr. Etienne Hannon (Federal Public Service for Health, Food Chain Safety and the Environment), including additional material on the methodology and assumptions used.

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