Advance Version

COMPLIANCE COMMITTEE

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# Report of the individual review of the annual submission of Belgium submitted in 2010

**Note by the secretariat**

The report of the individual review of the annual submission of Belgium submitted in 2010 was published on 4 April 2011. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2010/BEL, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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# Report of the individual review of the annual submission of Belgium submitted in 2010*

* In the symbol for this document, 2010 refers to the year in which the inventory was submitted, and not to the year of publication.

# Contents

# I. Introduction and summary

## A. Overview

1. This report covers the centralized review of the 2010 annual submission of Belgium, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 6 to 11 September 2010 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Riccardo de Lauretis (Italy) and Mr. Teemu Oinonen (Finland); energy – Ms. Ana Carolina Avzaradel (Brazil), Mr. Javier González Vidal (Spain) and Ms. Chia Ha (Canada); industrial processes – Mr. Stanford Mwakasonda (South Africa) and Ms. Detelina Petrova (Bulgaria); agriculture – Ms. Junko Akagi (Japan) and Ms. Janka Szemesova (Slovakia); land use, land-use change and forestry (LULUCF) – Ms. Oksana Butrym (Ukraine), Mr. Aquiles Neuenschwander (Chile) and Mr. Atsushi Sato (Japan); and waste – Mr. Qingxian Gao (China), Mr. Pavel Gavrilita (Republic of Moldova) and Ms. Zivile Paskauskaite (Lithuania). Mr. de Lauretis and Mr. Mwakasonda were the lead reviewers. The review was coordinated by Ms. Barbara Muik and Ms. Astrid Olsson (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. Emission profiles and trends

3. In 2008, the main greenhouse gas (GHG) in Belgium was carbon dioxide ($CO_2$), accounting for 87.9 per cent of total GHG emissions[1] expressed in carbon dioxide equivalent ($CO_2$ eq), followed by nitrous oxide ($N_2O$) (5.7 per cent) and methane ($CH_4$) (4.9 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride ($SF_6$) collectively accounted for 1.5 per cent of the overall GHG emissions in the country. The energy sector accounted for 82.0 per cent of total GHG emissions, followed by the industrial processes sector (9.8 per cent), the agriculture sector (7.3 per cent), the waste sector (0.8 per cent) and the solvent and other product use sector (0.2 per cent). Total GHG emissions amounted to 133,253.79 Gg $CO_2$ eq and decreased by 7.8 per cent between the base year[2] and 2008.

4. Tables 1 and 2 show GHG emissions from Annex A sources, emissions and removals from the LULUCF sector under the Convention and emissions and removals from activities under Article 3, paragraph 3, and, if any, Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), by gas and by sector, respectively. In table 1 $CO_2$, $CH_4$ and $N_2O$ emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector.

[1] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of $CO_2$ eq excluding LULUCF, unless otherwise specified.

[2] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for $CO_2$, $CH_4$ and $N_2O$, and 1995 for HFCs, PFCs and $SF_6$. The base year emissions include emissions from Annex A sources only.

Table 1

**Greenhouse gas emissions from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by gas, base year to 2008**[a]

| | | | *Gg $CO_2$ eq* | | | | | | | | *Change* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Greenhouse gas* | *Base year* | *1990* | *1995* | *2000* | *2005* | *2006* | *2007* | *2008* | *Base year–2008 (%)* |
| Annex A sources | | $CO_2$ | 118 687.81 | 118 687.81 | 123 376.91 | 123 796.20 | 123 537.57 | 119 217.54 | 113 947.62 | 117 175.81 | –1.3 |
| | | $CH_4$ | 10 012.81 | 10 012.81 | 9 522.38 | 8 295.29 | 6 822.92 | 6 684.33 | 6 643.71 | 6 505.52 | –35.0 |
| | | $N_2O$ | 10 860.29 | 10 860.29 | 11 684.49 | 11 133.67 | 9 384.22 | 8 500.78 | 7 590.39 | 7 547.93 | –30.5 |
| | | HFCs | 438.96 | 438.96 | 438.96 | 946.97 | 1 495.68 | 1 601.02 | 1 775.69 | 1 743.67 | 297.2 |
| | | PFCs | 2 335.24 | 1 753.32 | 2 335.24 | 360.90 | 140.97 | 152.21 | 172.29 | 194.55 | –91.7 |
| | | $SF_6$ | 2 205.16 | 1 642.97 | 2 205.16 | 111.52 | 83.85 | 74.88 | 80.98 | 86.30 | –96.1 |
| KP-LULUCF | Article 3.3[b] | $CO_2$ | | | | | | | | 68.83 | |
| | | $CH_4$ | | | | | | | | NO | |
| | | $N_2O$ | | | | | | | | NO | |
| | Article 3.4[c] | $CO_2$ | NA | | | | | | | NA | NA |
| | | $CH_4$ | NA | | | | | | | NA | NA |
| | | $N_2O$ | NA | | | | | | | NA | NA |

*Abbreviations*: KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NO = not occurring.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for $CO_2$, $CH_4$ and $N_2O$, and 1995 for HFCs, PFCs and $SF_6$. The "base year" for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1990.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation the base year and the inventory years of the commitment period must be reported.

Table 2
**Greenhouse gas emissions by sector and activity, base year to 2008**

| | | | *Gg $CO_2$ eq* | | | | | | | | *Change* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Sector* | *Base year*[a] | *1990* | *1995* | *2000* | *2005* | *2006* | *2007* | *2008* | *Base year–2008 (%)* |
| Annex A | | Energy | 112 462.94 | 112 462.94 | 115 854.96 | 116 126.12 | 114 960.52 | 110 668.60 | 105 462.94 | 109 269.94 | –2.8 |
| | | Industrial processes | 16 841.13 | 15 697.03 | 18 730.71 | 15 180.07 | 15 162.29 | 14 426.90 | 13 668.00 | 13 051.48 | –22.5 |
| | | Solvent and other product use | 246.25 | 246.25 | 239.57 | 252.07 | 247.42 | 246.71 | 246.80 | 246.58 | 0.1 |
| | | Agriculture | 11 586.97 | 11 586.97 | 11 708.53 | 10 778.57 | 9 737.36 | 9 682.28 | 9 720.02 | 9 670.78 | –16.5 |
| | | Waste | 3 402.97 | 3 402.97 | 3 029.37 | 2 307.74 | 1 357.63 | 1 206.27 | 1 112.91 | 1 015.01 | –70.2 |
| | | Other | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | LULUCF | NA | –2 746.83 | –1 935.34 | –1,626.87 | –1 697.16 | –1 187.79 | –1 253.82 | –1 275.41 | NA |
| | | **Total (with LULUCF)** | NA | 140 649.33 | 147 627.79 | 143 017.69 | 139 768.06 | 135 042.97 | 128 956.85 | 131 978.39 | NA |
| | | **Total (without LULUCF)** | **144 540.26** | **143 396.16** | **149 563.13** | **144 644.56** | **141 465.22** | **136 230.76** | **130 210.67** | **133 253.79** | **–7.8** |
| KP-LULUCF | Article 3.3[b] | Afforestation & reforestation | | | | | | | | –399.35 | |
| | | Deforestation | | | | | | | | 468.18 | |
| | | **Total (3.3)** | | | | | | | | **68.83** | |
| | Article 3.4[c] | Forest management | | | | | | | | NA | |
| | | Cropland management | NA | | | | | | | NA | NA |
| | | Grazing land management | NA | | | | | | | NA | NA |
| | | Revegetation | NA | | | | | | | NA | NA |
| | | **Total (3.4)** | **NA** | | | | | | | **NA** | **NA** |

*Abbreviations*: LULUCF = land use, land-use change and forestry; KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable.

[a] "Base year" for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for $CO_2$, $CH_4$ and $N_2O$, and 1995 for HFCs, PFCs and $SF_6$. The "base year" for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1990.

[b] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

[c] Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation the base year and the inventory years of the commitment period must be reported.

5. Table 3 provides information on the most important emissions and removals and accounting parameters that will be included in the compilation and accounting database.

Table 3
**Information to be included in the compilation and accounting database in t $CO_2$ eq**

| | *As reported* | *Adjustment*[a] | *Final*[b] | *Accounting quantity*[c] |
|---|---|---|---|---|
| **Commitment period reserve** | 606 595 975 | | 606 595 975 | |
| **Annex A emissions for current inventory year** | | | | |
| $CO_2$ | 117 175 815 | | 117 175 815 | |
| $CH_4$ | 6 505 136 | | 6 505 520 | |
| $N_2O$ | 7 547 436 | | 7 547 929 | |
| HFCs | 1 743 674 | | 1 743 674 | |
| PFCs | 194 553 | | 194 553 | |
| $SF_6$ | 86 303 | | 86 303 | |
| **Total Annex A sources** | 133 252 917 | | 133 253 794 | |
| **Activities under Article 3, paragraph 3, for current inventory year** | | | | |
| 3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported | –399 349 | | –399 349 | |
| 3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported | NO | | NO | |
| 3.3 Deforestation for current year of commitment period as reported | 468 184 | | 468 184 | |
| **Activities under Article 3, paragraph 4, for current inventory year**[d] | | | | |
| 3.4 Forest management for current year of commitment period | | | | |
| 3.4 Cropland management for current year of commitment period | | | | |
| 3.4 Cropland management for base year | | | | |
| 3.4 Grazing land management for current year of commitment period | | | | |
| 3.4 Grazing land management for base year | | | | |
| 3.4 Revegetation for current year of commitment period | | | | |
| 3.4 Revegetation in base year | | | | |

*Abbreviation*: NO = not occurring.

[a] "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or more adjustments.

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

[c] "Accounting quantity" is included in this table only for Parties that chose annual accounting for activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol, if any.

[d] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

# II. Technical assessment of the annual submission

## A. Overview

### 1. Annual submission and other sources of information

6. The 2010 annual inventory submission was submitted on 15 April 2010; it contains a complete set of common reporting format (CRF) tables for the period 1990–2008 and a national inventory report (NIR). Belgium also submitted information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, accounting of Kyoto Protocol units, changes in the national system and in the national registry, and minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 15 April 2010.The annual submission was submitted in accordance with decision 15/CMP.1.

7. Belgium officially submitted revised emission estimates on 22 October 2010 in response to questions raised by the expert review team (ERT) during the course of the centralized review. Belgium submitted revised data and information regarding the estimation methodology used for the emissions from agriculture in the Brussels-Capital Region from 1990 to 2008. The values in this report are those submitted by the Party on 22 October 2010. Where necessary, the ERT also used previous years' submissions during the review.

8. In addition, the ERT used the standard independent assessment report (SIAR), parts I and II, to review information on the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and on the national registry.[3]

9. During the review, Belgium provided the ERT with additional information and documents which are not part of the annual submission but are in many cases referenced in the NIR. The full list of information and documents used during the review is provided in annex I to this report.

Completeness of inventory

10. The inventory is complete in terms of years and geographical coverage. Belgium improved the completeness of the inventory by reporting the land-use change matrix for the first time. The ERT notes that inventory completeness could be further improved by including estimates from non-$CO_2$ emissions from the mandatory reporting categories in the LULUCF sector under the Convention and the Article 3, paragraph 3 activities under the Kyoto Protocol.

11. For the category consumption of halocarbons and $SF_6$, Belgium has reported potential emissions of PFCs, but actual emissions are not provided. Also for this category, actual emissions of $SF_6$ are reported, but potential emissions are not. The ERT encourages Belgium to report both actual and potential emissions of PFCs and $SF_6$ in its 2011 submission, in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC

[3] The SIAR, parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5 (a), 6 (c) and 6 (k)), under the auspices of the international transaction log (ITL) administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry.

reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines).

12. CRF tables were provided for the years 1990–2008, with the exception of tables 7 (key categories) and 8(b) (recalculation explanations). However, information on key categories was reported in the NIR. In response to a question during the review, Belgium stated that these tables will be provided in the 2011 submission. The ERT recommends that the Party include tables 7 and 8 in its 2011 submission, in accordance with the UNFCCC reporting guidelines.

## 2. A description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

Overview

13. The ERT concluded that the national system continued to perform its required functions.

Inventory planning

14. The NIR and additional information submitted by the Party during the review described the national system for the planning and preparation of the inventory. The Interregional Cell for the Environment (IRCEL-CELINE) has the overall responsibility for the national inventory. Before submission, the inventory is officially approved by the National Climate Commission. Although IRCEL-CELINE acts as the national inventory compiler, the preparation of the inventory reflects the federal structure of the country. Each of the three regions – Flemish Region, Walloon Region and Brussels-Capital Region – prepare their own inventories, which are then aggregated as the national inventory. The regional organisations responsible for the selection of methods, emission factors (EFs) and activity data (AD), are: the Department of Air, Environment and Communication of the Flemish Environment Agency (VMM); the Walloon Agency for Air and Climate (AWAC); and Brussels Environment (BIM-IBGE). Each of the regions has its own legal and institutional arrangements, and also has complete regional responsibility for setting up their inventories. Because of this devolved structure, the setting of priorities, for example in inventory improvement, is first made by regional experts. The work of the regions is coordinated by the Coordination Committee for International Environmental Policy (CCIEP) and its working group on emissions. The overall responsibility of the cross-cutting aspects of the inventory, such as quality management and key category analysis, also rests with this committee.

15. The unique arrangements which follow from the federal structure of the country are reflected in Belgium's inventory. For instance, Belgium faces challenges in providing complete CRF tables (see para. 12), harmonising methods across regions (paras. 45, 84 and 89) and transparent reporting (paras. 23–24).

Inventory preparation

*Key categories*

16. Belgium has reported a tier 1 key category analysis, both level and trend assessment, as part of its 2010 submission. However, the analysis was not 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). Specifically, the analysis had not been carried out by first excluding the LULUCF sector from the assessment. Due to this, the key category analysis performed by the Party and that performed by the secretariat[4] produced different results and three non-LULUCF key categories were not identified in the analysis by the Party.

17. According to a resubmitted key category analysis, by Belgium, these three categories are: $CO_2$ from glass production; $N_2O$ from solid storage and dry lot; and $N_2O$ from domestic and commercial wastewater handling. The ERT recommends that Belgium assess whether this affects the choice of methodology for these newly identified key categories. The ERT noted that the key category analysis required further improvements, and recommends that Belgium: improve the analysis by taking note of guidance given in the IPCC good practice guidance for LULUCF; report the results of the key category analysis both excluding and including LULUCF; use the categorization of table 5.4.1 in the IPCC good practice guidance for LULUCF (distinguish between fuel types in the energy sector); conduct a key category analysis for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, following the methodology given in chapter 5.4.4 of the IPCC good practice guidance for LULUCF; and ensure that reported information is consistent between the NIR and the CRF.

*Uncertainties*

18. Belgium provided a tier 1 uncertainty analysis, with an overview in chapter 1.7 of the NIR, and the required reporting table in annex 2 of the NIR. The NIR states that all sectors are included in the analysis. However, the ERT noted that the totals for emissions and removals differ for both 1990 and 2008 between the CRF summary 2 table and the uncertainty reporting table in annex 2 of the NIR, suggesting that all categories are not included in the uncertainty analysis. The ERT recommends that Belgium check that all categories are covered and revise its uncertainty analysis accordingly in its next annual submission.

*Recalculations and time-series consistency*

19. Belgium has undertaken recalculations to take into account improvements in AD (for the energy, agriculture and waste sectors), EFs (for the energy, agriculture and waste sectors) and inclusion of categories that were previously not estimated ("NE") (in the LULUCF and waste sectors). The major changes, and the magnitude of the impact, include: an increase in 1990 (0.1 per cent) and a decrease in 2007 (0.8 per cent). The rationale for these recalculations is provided in the NIR, and in a separately submitted table that contains recalculation information, but does not cover all recalculations and all years. The table was submitted in a separate file in conjunction with the NIR and the CRF tables.

20. Recalculations have been performed, but they have not been reported in accordance with the UNFCCC reporting guidelines. The ERT noted that recalculations reported by the Party in the NIR affected the entire time series from 1990 to 2007, as well as all the sectors. Belgium did not report any justification for recalculations in CRF table 8(b), but provided explanations in the NIR. The ERT recommends that Belgium ensure that information on recalculations is provided in both the NIR and the CRF tables.

[4] 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 or period. 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.

*Verification and quality assurance/quality control approaches*

21. Belgium provided an elaborated quality assurance/quality control (QA/QC) plan as part of its inventory submission. During the review, the ERT also requested documentation to show that QC measures are implemented according to the plan. Belgium provided results of QC checks made during the preparation of the inventory for the agriculture sector in the Flemish Region and the Walloon Region and also provided the results of QC checks made when compiling the three regional inventories. However, the ERT also found evidence suggesting that QC checks are not applied to all regions and sectors. The ERT recommends that Belgium ensure that mandatory tier 1 QC checks are applied. Also, in cases where corrective actions cannot be applied before submission, the ERT recommends that the Party report this transparently in the NIR.

22. The ERT noted that the NIR contains no information on category-specific (tier 2) QC procedures. The QA/QC plan (updated in 2010) states that these procedures still have to be applied on a case-by-case basis, at the national and regional level, focusing on key categories, or categories where significant methodological or data revisions have taken place. The ERT noted the details provided in the NIR on QA, and encourages Belgium to implement tier 2 QC procedures in line with the IPCC good practice guidance.

Transparency

23. In general, the organization of the NIR follows the structure outlined in the UNFCCC reporting guidelines, as elaborated by the annotated outline of the NIR. However, the executive summary has not been provided, and some of the recommended annexes, such as "$CO_2$ reference approach and comparison with sectoral approach" and "Assessment of completeness", have not been provided. The ERT recommends that Belgium include this information in its next annual submission.

24. Belgium has improved the NIR by describing the drivers behind trends in the beginning of the sectoral chapters. The category-specific sections of the text, entitled "Uncertainty and time-series consistency", discuss uncertainties only; no information on time-series consistency is provided. The ERT encourages Belgium to improve transparency by documenting measures to ensure consistent estimates over the whole time series.

Inventory management

25. Over the last four years, previous ERTs have encouraged Belgium to centralize its archiving system to a single location. However, the archiving system remains decentralized in the regions, with only the CRF files of the regional and national submissions archived at IRCEL-CELINE. While the ERT did not observe any functionality problems due to the decentralised archiving system during the review, the ERT reiterates the encouragement to Belgium to establish a centralized system for archiving.

## 3. Follow-up to previous reviews

26. During the 2009 review, the ERT concluded that Belgium did not have the capacity to identify areas of land use or areas of land-use change, as required by paragraph 20 of the annex to decision 16/CMP.1, or the capacity to report on LULUCF activities under Article 3, paragraph 3, of the Kyoto Protocol in accordance with paragraphs 5–9 of the annex to decision 15/CMP.1. The Belgian Gembloux Agro Bio Tech University carried out a study in 2009–2010 to fulfil this reporting requirement and the present ERT noted that the national system generally functions for estimating, reporting and accounting of Article 3, paragraph 3 activities.

27. As a follow up to previous reviews, Belgium improved the transparency of its reporting in the industrial processes sector, but the ERT noted that the reporting on $CO_2$

emissions from iron and steel still need to be further improved (see para. 53). Also, the ERT identified a number of recommendations that have not yet been addressed by Belgium. These include providing information on accounting of manure exports in importing countries and improving transparency of the reporting of $CH_4$ emissions from solid waste disposal. The ERT also reiterates the encouragement for Belgium to translate important documents, included in the annex of the NIR, into English and if that is not possible to provide a summary in English.

## 4. Areas for further improvement

Identified by the Party

28. The 2010 NIR identifies several areas for improvement. Belgium indicates the following planned improvements:

(a) The improvement of emission estimates from mobile combustion in the energy sector;

(b) The assessment of the differences between data reported under the European Union emissions trading scheme (EU ETS) and in energy balances for the Flemish Region;

(c) The improvement of emission estimates from limestone use in the industrial processes sector;

(d) The improvement of area estimates of the land-use matrix in the LULUCF sector, and also in the KP-LULUCF inventory;

(e) The potential revision of $CH_4$ emissions from solid waste disposal in the Flemish Region.

Identified by the expert review team

29. The ERT identifies the following cross-cutting issues for improvement:

(a) The improvement of the key category analysis by reporting results both excluding and including the LULUCF sector;

(b) The assessment of how the implementation of improvements to the key category analysis (above) affects the selection of methodologies for the new key categories that result (see para. 17);

(c) The improvement of transparency through the inclusion of CRF tables summary 7 and 8(b) (see para. 12), and discussion of time-series consistency in the NIR;

(d) The further implementation of existing tier 1 QC measures and confirmation that they are implemented across all regions and sectors (see para. 21);

(e) The inclusion of a transparent explanation of the comments included in the CRF tables which follow from the use of the CRF aggregator software;

(f) The inclusion of a key category analysis of KP-LULUCF activities and of all KP-LULUCF reporting elements, in accordance with the annex to decision 15/CMP.1.

30. Recommended improvements relating to specific categories are presented in the relevant sector chapters of this report.

## B. Energy

### 1. Sector overview

31. The energy sector is the main sector in the GHG inventory of Belgium. In 2008, emissions from the energy sector amounted to 109,269.94 Gg $CO_2$ eq, or 82.0 per cent of total GHG emissions. Since the base year, emissions have decreased by 2.8 per cent. The key drivers for the fall in emissions are the manufacturing industries and construction subsector (–19.6 per cent or 6,485 Gg $CO_2$ eq), followed by energy industries (–17.6 per cent or 5,395.67 Gg $CO_2$ eq). Other fuel combustion and fugitive emissions also contributed to the fall of emissions, whereas emissions from transport and other sectors, including residential, commercial and agriculture, increased considerable, by 35.0 per cent (7,161 Gg $CO_2$ eq) and 7.5 per cent (2,061 Gg $CO_2$ eq) respectively. Within the sector in 2008, other sectors is the leading source of GHG emissions (29,599 Gg $CO_2$ eq or 27.1 per cent), followed by transport (27,637 Gg $CO_2$ eq or 25.3 per cent), manufacturing industries and construction (26,669 Gg $CO_2$ eq or 24.4 per cent), energy industries (24,796 Gg $CO_2$ eq or 22.7 per cent), fugitive emissions (506 Gg $CO_2$ eq or 0.5 per cent) and other fuel combustion (62 Gg $CO_2$ eq or 0.1 per cent).

32. The main source of emissions for the energy industries is public electricity and heat production, which accounted for 80 per cent of sectoral emissions in 2008. Petroleum refining and manufacture of solid fuels and other energy industries accounted for 19 per cent and 1 per cent, respectively. In the manufacturing industries and construction, primary energy consumption decreased by 4.4 per cent between 1990 and 2008, which can be attributed to various drivers.

33. Tier 1 QC checks have been performed for the energy sector in Belgium. During the review, the Party indicated that regional controls are performed, in addition to the quality procedures for secondary energy data which are performed by the responsible institutions mentioned in section 1.6.1 of the NIR. These regional controls include the recalculation of the emissions using EU ETS data and comparison of AD from the regional CRF Reporter with the regional energy balance. The ERT recommends that the Party include this information in the section on QA/QC under the energy sector in its next annual submission.

34. All reported energy data in the Belgian NIR are an aggregation of the regional data (energy balances), as described in paragraph 14, above. Consequently, the national energy consumption data as reported in the NIR are different from the national energy balance. The national energy balance is used as the input to perform the reference approach. The comparison of the aggregation of regional data with the national energy balance could be a useful QC activity. The ERT encourages the Party to report in its NIR specific differences that arise from the comparison between the national energy balance and the aggregation of the regional data and to explain the divergences identified.

### 2. Reference and sectoral approaches

Comparison of the reference approach with the sectoral approach and international statistics

35. The comparison of the reference approach with the sectoral approach shows differences between –4.3 per cent (in 2002) and +4.0 per cent (in 2000). However, since 2005 the difference has remained under 2.0 per cent, reaching 1.3 per cent in 2008. The main reasons for the differences between the reference and sectoral approaches are that the reference approach was performed using the national energy balance while the sectoral approach used regional energy balances. This explains the differences found in the comparison of the two approaches for naphtha, for instance. This explanation, and other reasons, have been addressed in the NIR. Belgium has established a working group on energy balances under the National Climate Commission to improve harmonization of the

regional and national energy balances for the future. Consultations have taken place on different areas and adaption of the legislation may still be required in some cases. The ERT welcomes the Party's efforts in trying to harmonize the regional and national energy balances and encourages Belgium to continue improving the work in this regard. The ERT also recommends that the Party provide detailed information in the NIR about the impact of the measures already implemented that aim to reduce the differences between the reference and sectoral approaches.

*International bunker fuels*

36. Information about the international bunkers originates from both the regional and the national energy statistics. No international bunker activities take place in the Brussels-Capital Region. For the airports in the Flemish Region, the reported kerosene fuel is assigned to bunker fuels and all gasoline for air transport is allocated to domestic air transport. In the Walloon Region, the bunker fuel consumption for international air transport is given directly by the two Walloon airports. Data on landing and take-off cycles and fuel consumption come from the statistics of the two main airports, which divide the statistics into domestic and international activities.

37. Regarding marine bunkers, the Flemish Region is the only coastal region of Belgium, and two subcategories are distinguished: navigation on Flemish territory and navigation which is allocated to the international bunkers. $CO_2$ emissions are calculated in the Flemish Region by using EFs from the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and the AD from the Flemish energy balance. For the first time, in the 2010 submission, the emissions of $CO_2$ from international sea fishing are added to the emissions from marine bunkers. The NIR uses the term "local bunkering", which can be confusing. The ERT recommends that Belgium replace the term local bunkering with international bunkers.

38. Regarding aviation bunkers, the figures in the NIR for 2008 differ from data from the International Energy Agency (IEA) for jet kerosene: 58,002 TJ and 85,484 TJ, respectively. From 2008 onwards, the regional airports have been included in the new oil balance, which was not the case for the previous years. The Party has argued that the 2008 figures cannot be accurately compared with 2007 or previous years, given the change in collecting data in 2008. The Party also stated that temporary figures were reported in the 2010 submission and that corrections will be reported for the 2011 submission. Furthermore, the Party stated that the inclusion of the regional airports in the national balance does not impact domestic aviation figures, as these are collected on a regional level and consequently are already included in the regional balances. Figures from previous years are not much different from 2008 (i.e. 53,499 TJ for 2007 and 52,047 TJ for 2008) and therefore it is not possible to isolate and analyse the impact of the inclusion of regional airports. During the review, Belgium explained that it had contacted the administration responsible for the national energy balance in order to clarify this discrepancy for the year 2008. The ERT recommends that Belgium clarify this issue and report on the results in its next annual submission.

*Feedstocks and non-energy use of fuels*

39. Emissions from non-energy use of fuels and related emissions (emissions from recovered fuels from processes) are allocated to the categories manufacturing industries and construction, ammonia production and other (chemical industry). For coal oils and tars (from coking coal), gas/diesel oil and residual fuel oil the notation key "NE" has been used in the CRF tables, but no explanation has been provided on table 9(a). According to the Party, non-energy use of fuel is relevant for natural gas and other fuels only. The ERT recommends that the Party apply notation keys adequately in the CRF tables; specifically,

the notation key "NE" should be replaced by the notation key "not occurring" ("NO") for coal oils, gas/diesel oil and residual fuel oil.

### 3. Key categories

Stationary combustion: liquid – $CO_2$

40. The ERT noted that the inter-annual change (–6.7 per cent) in the $CO_2$ implied emission factor (IEF) for petroleum refining between 2007 (66.44 t/TJ) and 2008 (61.99 t/TJ) was unusually large compared with other years. The Party has stated that the reported figures for 2008 were temporary figures in the 2010 submission and that updated figures will be provided in the 2011 submission. This will result in an IEF for $CO_2$, which deviates from the 2007 value by less than 0.1 per cent. The AD for petroleum refining are taken from the Flemish energy balance, because Belgium's refineries are exclusively located in Flanders. $CO_2$ emissions are reported to the responsible authorities by the Belgian Petroleum Federation and the petroleum refining companies. Since 2005 (i.e. emissions for 2004), these emissions have been reported by the companies on an obligatory basis. However, in the NIR, there is no information on the methodology used for these calculations and no indication of whether it is in line with the IPCC good practice guidance. The ERT recommends that, in its next annual submission, the Party correct the overestimation of emissions and consumption which have been reported and that the Party provide detailed information on the methodology and EF used for the calculation of $CO_2$ emissions.

41. The ERT noted that the $CO_2$ IEF for other fuels for 2007 (70.74 t/TJ) for other (manufacturing industries and construction) is the lowest of the whole time series (70.74-82.54 t/TJ). In response to questions raised during the review, the Party stated that the energy consumption data reported for 2007 in the Flemish Region were incorrect in the 2010 submission and corrected energy consumption data will be reported in the 2011 submission. The energy consumption data originate from the regional energy balances of the three regions. $CO_2$ emissions were calculated by using default EFs from the Revised 1996 IPCC Guidelines. The ERT recommends that the Party correct this error in its next annual submission.

Stationary combustion: gaseous – $CO_2$

42. The $CO_2$ IEF for other (manufacturing industries and construction) has been detected by the ERT as being unusually large for the years of 2006 and 2007. According to the Party, incorrect AD were reported in 2006 and 2007 in the Walloon Region and the corrected data will be reported in the 2011 submission. The energy consumption data originate from the regional energy balances of the three regions. $CO_2$ emissions were calculated by using default EFs from the Revised 1996 IPCC Guidelines. The ERT recommends that the Party report the corrected data in its next annual submission.

### 4. Non-key categories

Navigation: gas/diesel oil – $CO_2$

43. The ERT noted an unusually high $CO_2$ IEF for gas/diesel oil in 2008 (74.46 t/TJ) for navigation. The Party has stated that the high IEF for 2008 is because temporary figures have been used in the Flemish Region in the 2010 submission and that updated figures for 2008 will be used in the 2011 submission. The ERT recommends that the Party provide updated figures in its next annual submission.

Road transportation: biomass – $CH_4$ and $N_2O$

44. $CH_4$ and $N_2O$ emissions from biomass in road transportation were reported as "NE" because they were considered to be negligible. During the review the Party stated that it will take this issue in consideration in its next annual submission. In the Flemish Region, biomass emissions are estimated using the MIMOSA model, but it is not possible to separate these emissions in the output emission files of MIMOSA (because this program handles a mix with standard fuels). $CO_2$ biomass emissions are reported separately from emissions from liquid fuels. The ERT encourages the Party to report $CH_4$ and $N_2O$ emissions from biomass, even though they are considered negligible.

Road transportation: liquid – $CH_4$ and $N_2O$

45. Belgium reported in the NIR on recalculations of non-$CO_2$ transport emissions due to switching the COPERT III-based methodology to COPERT IV. This change in method was performed in the Flemish region for the entire time series, in the Walloon region for the years 2007 and 2008, but was not performed in the Brussels-Capital Region. The ERT noted that these recalculations resulted in a significant decrease of $N_2O$ emissions between 2006 and 2007. The ERT commends Belgium for its efforts in switching to an improved version of the COPERT model. However, the ERT recommends that Belgium use the same emission methodology for non-$CO_2$ emissions from road transportation for all regions and for the entire time series in order to maintain consistency and the same level of accuracy in its next annual submission.

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

### 1. Sector overview

46. In 2008, emissions from the industrial processes sector amounted to 13,051.48 Gg $CO_2$ eq, or 9.8 per cent of total GHG emissions, and emissions from the solvent and other product use amounted to 246.58 Gg $CO_2$ eq, or 0.2 per cent of total GHG emissions. Since the base year, emissions have decreased by 22.5 per cent in the industrial processes sector, and increased by 0.1 per cent in the solvent and other product use sector. The key driver for the fall in emissions in the industrial processes sector is attributable to the sharp decrease in emissions from the production of HFCs due to the installation of a gas incinerator with a fluoride recuperation unit, as well as a decrease in emissions from metal production. Measures introduced by nitric acid plants to reduce emissions from their processes have also contributed to the decrease in emissions from industrial processes. Within the industrial processes sector, 42.7 per cent of the emissions were from mineral products, followed by 29.9 per cent from chemical industry, 14.0 per cent from the consumption of halocarbons and $SF_6$ and 11.8 per cent from metal production. Production of halocarbons and $SF_6$ accounted for 1.5 per cent.

47. The inventory for the industrial processes and solvent and other product use sectors is generally complete, appropriately addressing recalculations, uncertainties, time-series consistency and planned improvements. The ERT noted from the NIR that Belgium reports on general QA and sector-specific QC procedures, and encourages the Party to enhance its explanation of category-specific QC details in the sectoral chapters of its next annual submission.

48. Following the recommendations of previous review reports, Belgium made improvements in the NIR by providing more detailed information on the methods, EFs and AD used to estimate emissions from several categories (e.g. ammonia production and electrical equipment). The ERT commends Belgium for this improvement, and encourages Belgium to further improve the structuring of category reporting into clear, distinctive and numbered sections rather than the current general aggregation of subcategories without

clear differentiation between them. The ERT further recommends that Belgium follow up other previous recommendations, as explained below.

## 2. Key categories

Cement production – $CO_2$

49. The ERT noted from the NIR that the EF for cement production is calculated on the basis of calcium oxide (CaO) only. The response provided by Belgium to a question on this issue raised by the ERT during the review did not give a clear indication of whether magnesium oxide (MgO) content is incorporated in the EF used. The ERT recommends that Belgium revisit this issue and provide clear details on the estimation of its $CO_2$ EFs for cement in its next annual submission.

Ammonia production – $CO_2$

50. In the NIR, Belgium mentions issues of confidentiality on ammonia production, while at the same time it provides AD and EFs for ammonia production in the CRF tables. The ERT recommends that Belgium reconsider this inconsistency between the NIR and the CRF tables and report clearly what exactly is confidential about its data in its next annual submission.

51. Belgium uses an oxidation factor of 99.5 per cent in calculating $CO_2$ emissions from ammonia production, in the process involving catalytic steam reforming of natural gas. In its response to a question raised by the ERT, Belgium indicated that the methodology used is plant specific. The ERT recommends that Belgium provide clearer details on the methodology, including a justification for the oxidation factor applied, in its next annual submission.

Nitric acid production – $N_2O$

52. The ERT noted that, since 1996, there had been a consistent decrease in the EFs used for estimating emissions from nitric acid production. The reasons for such decreases were not clearly stated in the NIR and the ERT sought elaboration from Belgium during the review week. Belgium stated that this is due to the use of catalysts to reduce emissions. The ERT recommends that Belgium include this explanation in its next annual submission.

Iron and steel production – $CO_2$

53. The description in the NIR of the method used to estimate iron and steel emissions is not transparent. The ERT reiterates the recommendation of the previous review report that Belgium improve the transparency of its reporting by enhancing the description of the method, AD and EFs, and include a discussion of the time-series consistency of the emission estimates in its next annual submission.

Consumption of halocarbons and $SF_6$ – HFCs

54. The ERT noted that Belgium does not include HFC emissions from the disposal of domestic refrigeration equipment, as recommended by the previous review report. Responding to a question of clarification, Belgium indicated that emissions of HFC-134a from the disposal of household refrigerators are mistakenly reported as "NE" instead of 0, because the use of refrigerators with that gas only started in 1995, and lifetime of the equipment is not yet over. The ERT recommends that Belgium explain this in its next NIR and change the notation key in the CRF tables accordingly.

### 3. Non-key categories

Glass production – $CO_2$

55. The NIR does not provide clear information on whether the estimates of emissions from glass production take into account the use of recycled glass. In response to a question from the ERT during the review, Belgium indicated that recycled glass is part of the AD used. The ERT recommends that Belgium provide clear details in its next annual submission about the exclusion of recycled glass in calculating the emissions from glass production.

56. The ERT noted that, starting in 2003, the IEF for glass wool significantly decreased compared with previous years, from an average of 150 kg $CO_2$/t in the period 1990–2002 to 87.8 kg $CO_2$/t from 2003 to 2008. Responding to a question raised by the ERT on this potential time-series inconsistency, Belgium indicated that the main problem was unavailability of data before 2003 and that such a recalculation will be incorporated in its next annual submission. The ERT recommends that Belgium address the issue of time-series inconsistency in the data in the next annual submission, including an explanation of how the EF of 150 kg $CO_2$/t for the 1990–2002 period was derived.

Solvent and other product use – $N_2O$

57. Belgium reports a national EF for $N_2O$ emissions from anaesthesia which has a high associated uncertainty because it is based on one survey in hospitals. Responding to a question from the ERT, Belgium indicated that the survey was carried out in several hospitals in 1996 and performed by a consultant, and that further research to try to improve this factor is ongoing. The ERT commends Belgium for its effort and encourages Belgium to include any updates in its next annual submission.

## D. Agriculture

### 1. Sector overview

58. In 2008, emissions from the agriculture sector amounted to 9,670.78 Gg $CO_2$ eq, or 7.3 per cent of total GHG emissions. Since the base year, emissions have decreased by 16.5 per cent. The key drivers for the fall in emissions are a decrease in the number of cattle, a shift from dairy cattle to non-dairy cattle in the country, and smaller quantities of nitrogen (N) from mineral fertilizer being applied to soil. Within the sector, 39.0 per cent of the emissions were from agricultural soils, followed by 36.4 per cent from enteric fermentation and 24.6 per cent from manure management. $CH_4$ is the dominant GHG, accounting for 52.9 per cent of the sectoral emissions, while $N_2O$ accounted for the remaining 47.1 per cent.

59. Belgium did not report GHG emissions from one of the Belgian regions (Brussels-Capital Region) in the original 2010 submission, the Party stated in the NIR that this was because these emissions did not exceed 0.02 per cent of total GHG emissions. However, the ERT considered that this was not in line with the principle of completeness in terms of geographical coverage; therefore, during the review, the ERT requested the Party to provide emissions data for the Brussels-Capital Region. In response to the request, Belgium submitted a new set of CRF tables on 22 October which included the Brussels-Capital Region's emissions data for all relevant categories (enteric fermentation, manure management and agricultural soils), a Word file and a calculation spreadsheet which showed the background information for the new estimates. In order to calculate the Brussels-Capital Region's emissions, the Party used AD which came from the Directorate-general Statistics and Economic Information (STATBEL) and IEFs derived from the data for the Flemish and Walloon Regions. As a result, $CH_4$ and $N_2O$ emissions for this sector

increased by 0.018 Gg and 0.002 Gg, respectively. The ERT recommends that the Party include all relevant information for the new estimates for the Brussels-Capital Region in its next NIR. The ERT also encourages the Party to improve EFs for the Brussels-Capital Region to the extent possible.

60. The agriculture sector of the inventory has been improved since the 2009 annual submission in terms of a revision of the NIR structure, which is now in line with the UNFCCC reporting guidelines, and of the application of the tier 2 method to calculate $CH_4$ emissions from swine manure management in the Walloon Region. The ERT welcomes the continuous efforts of Belgium to improve its reporting. However, the transparency of the reporting still needs to be improved, for example, in relation to the non-English language of important documents contained in the annex to the NIR. The ERT encourages Belgium to make efforts, as far as possible, to translate such information into English or to provide a summary in English for its next annual submission.

61. Belgium implemented tier 1 QC procedures and provided the checklists for the different regions in response to the ERT's request during the review. The ERT acknowledges the Party's activity and the quality of documentation of the QC activities.

## 2. Key categories

Enteric fermentation – $CH_4$

62. Until the 2009 submission, Belgium used the number of livestock provided by the National Statistics Institute (NIS) for both the Flemish and Walloon Regions for the whole time series. In the 2010 submission, however, the Flemish Region changed its data source for 2000 and onward from the NIS to the Manure Bank of the Flemish Land Agency (VLM). This replacement resulted in lower emissions from this category (on average, 4 per cent) for the Flemish Region. The ERT found this update of AD reasonable, because the VLM data collected directly from farms were more detailed and should reflect the situation of the Flemish Region better than the NIS data, which are collected at the municipality level. The ERT noted that there may be room for improvement in terms of time-series consistency of this applied AD from 2000 onwards. The ERT recommends that Belgium explore the possibility of updating such data for years before 2000.

Manure management – $CH_4$

63. The update of AD for the Flemish Region for 2000 and onward (see para. 62 above) affected $CH_4$ emissions from manure management. The revision resulted in lower emissions (on average, 2 per cent) from this category between 2000 and 2008. In addition, during the review, Belgium gave an explanation for the change in emission trends for this category before and after 2000. According to this explanation, the change was mainly associated with the decrease in the number of swine in the Flemish Region, due to the subsidized cull of livestock. The ERT recommends that Belgium include this information in its next annual submission, because the change in the emission trend for this category is significant.

64. In 2009 the Party used the tier 2 method for the estimation of $CH_4$ emissions from swine manure management in the Flemish Region, but not for the Walloon Region, even though it was a key category. In 2009 the ERT had therefore recommended that the Party use the tier 2 method for the Walloon Region as well. In response to this request, the Party had used the tier 2 method for both the Flemish and Walloon Regions in its 2010 submission. The ERT welcomes this improvement.

65. Belgium stated during the review that the category other livestock concerned rabbits for breeding and fur-bearing animals. $N_2O$ emissions for this category were reported in

CRF table 4.B(b); while $CH_4$ emissions were not reported, because no $CH_4$ EFs were available. The ERT recommends that Belgium correct the information provided in the documentation box of 4.B(a), because the Party acknowledged during the review that the information was not correct.

Agricultural soils – $N_2O$

66. The ERT noted a reduction in emissions for nitrogen-fixing crops of 26 per cent between 1999 and 2000. Belgium explained that this reduction was due to a change in the cultivated area in the Walloon Region. The areas between 1990 and 1999 were calculated in a study but the ERT noted that these seem too high when compared with the areas in the agricultural census. During the review, Belgium could not explain the origin of this difference and stated that it would correct the areas and emissions for 1990–1999 in its next annual submission. The ERT recommends that Belgium check the data thoroughly, recalculate emissions accordingly and provide the justification for the recalculation clearly in its next NIR.

67. The ERT in 2009 recommended that Belgium provide documentation on how emissions from exported manure were 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. During the current review, Belgium explained that the exported manure from the Flemish Region was not regarded as a source of direct $N_2O$ emissions for Belgium; whereas imports were regarded as a source. Belgium further stated that it did not know how the countries importing manure from the Flemish Region takes this N fraction into account. The ERT considers that the way the Party handles the N fraction in the inventory may result in double counting or an underestimation of emissions and reiterates the recommendation of the previous ERT that Belgium investigate this issue and provide this information transparently in the NIR.

68. The ERT in 2009 pointed out that the value for N excretion on pasture, range and paddock reported in CRF table 4.B(b) continues to differ from the value reported in CRF table 4.D. The ERT welcomes the fact that Belgium has resolved this inconsistency in its 2010 submission.

### 3. Non-key categories

Other– $N_2O$

69. Belgium reported emissions originating from coniferous, deciduous and market gardening as "NE" in CRF table 4. In response to questions raised by the ERT during the review, the Party explained that these emissions are included in emissions from fertilizer reported under direct soil emissions. The ERT recommends that Belgium confirm that these emissions are included elsewhere and, if so, use the notation key included elsewhere ("IE") rather than "NE".

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

### 1. Sector overview

70. In 2008, net removals from the LULUCF sector amounted to 1,275.41 Gg $CO_2$ eq. Since the base year, net removals have decreased by 53.6 per cent. The key driver for the fall in removals is carbon stock change in soil under land converted to cropland and land converted to settlement. Within the sector, removals of 3,581.53 Gg were from forest land remaining forest land, followed by emissions of 1,354.76 Gg from land converted to cropland, emissions of 899.20 Gg from land converted to settlement and emissions of

805.51Gg from cropland remaining cropland. Land converted to grassland accounted for removals of 759.91 Gg and land converted to forest land accounted for removals of 399.28 Gg. The remaining net emissions of 405.85 Gg were from other land use categories.

71. Belgium has implemented a number of improvements to the inventory for the LULUCF sector since the previous submission. A land-use matrix and emissions and removals under land conversion categories are reported for the first time. The ERT welcomes this effort made by Belgium. However, some emissions by sources and removals by sinks, including non-$CO_2$ emissions for mandatory reporting categories under the Convention, have not been estimated. The ERT recommends that Belgium implement the planned improvements identified by the Party and recommends that the Party report a complete inventory that covers all mandatory carbon pools and GHGs in its next annual submission.

72. Belgium uses "since 1990" for dividing remaining land and converted land in each land-use category under the Convention. This land information has been developed based on geo-referenced sampling survey data on land use in order to satisfy the mandatory reporting of LULUCF activities under Article 3, paragraph 3, of the Kyoto Protocol. The ERT noted that this classification results in an underestimation of converted land areas in the past years and creates an increase, over time, in the area of converted lands. This results in an incorrect trend of emissions and removals in the LULUCF sector, especially in the estimates of carbon stock changes in soil in the converted land areas. The Party informed the ERT that the land conversion data of the past 20 years will be reviewed during 2011, with a view to improving this issue in the 2012 submission. The ERT recommends that, as soon as possible, the Party develop a land classification system for reporting under the Convention in line with the land representation scheme in the IPCC good practice guidance for LULUCF which uses "past 20 years" as a default for dividing remaining land and converted land.

73. The ERT noted that the land-use definitions for settlements and other land were not provided in the NIR, although the definitions of these two land-use categories were explained by the Party during the review week. The ERT also noted that the area of the Brussels-Capital Region was not included in the CRF tables. The ERT recommends that the Party report these land-related data in its next annual submission.

74. Belgium reported many carbon stock changes as "NO" in the LULUCF sector. However, little information is provided in the NIR and the ERT considers that "NE" may be the suitable notation key for some carbon pools. The ERT recommends that Belgium clearly state that these carbon pools are estimated based on the IPCC good practice guidance tier 1 methodology or are recorded as "NE" because of a lack of data; furthermore the ERT recommends that the Party report these carbon pools with numerical values or the correct notation keys in its next annual submission.

75. Belgium indicated during the review that there are some areas of organic soil under forest land and cropland; however, the scientific knowledge to calculate GHG emissions from those soils is very limited. The ERT encourages Belgium to clarify the status of management in those soil areas, including the applicability of tier 1 methods or expert judgement for emission estimation and also recommends that Belgium confirm whether this potential emission source exists in the units of land under Article 3, paragraph 3, of the Kyoto Protocol, activities.

76. The NIR did not provide all the necessary information on key assumptions, data sources and methods. The ERT recommends that the Party document all methods, data sources, procedures of calculation, the rationale for using each notation key and assumptions applied for the whole time series in its next NIR. If the Party applies different

methodologies for the Walloon, Flemish and Brussels-Capital Regions, the ERT recommends that the Party also include each region-specific methodology in the NIR.

77. Carbon stock changes in litter and dead wood pools, which were reported for the activities under Article 3, paragraph 3, of the Kyoto Protocol, were not reported for the corresponding categories under the Convention. The ERT recommends that Belgium ensure consistent reporting between the Kyoto Protocol and the Convention.

78. According to the information provided in the NIR, QA/QC procedures and uncertainty analysis were only partly conducted for the LULUCF sector. The ERT recommends that the Party improve documentation of QA/QC procedures and uncertainty analysis in its next annual submission.

## 2. Key categories

Forest land remaining forest land – $CO_2$

79. Belgium applies independent estimation for the Walloon and Flemish Regions to determine carbon stock changes in living biomass in forest land remaining forest land. In the Walloon Region, the estimation is based on the stock change method for the full time series using the set of forest inventory data. The Party informed the ERT during the review that in the Flemish Region the estimation is based on the stock change method using linear interpolation for the 1990–2000 period and a modelled method for the 2001–2008 period, as stated in the previous NIR submitted in 2009. This results in a time-series inconsistency in the emission estimation which was already noted in the previous review report. The Party also indicated that it is planning to use a stock change approach for the full time series in the Flemish Region as soon as the most recent results of the forest inventory become available. The ERT reiterates the recommendation of the previous review that Belgium apply the stock change method consistently at the national level by incorporating the latest data from the Regional Forest Inventories in the LULUCF inventory.

80. Belgium estimated carbon stock changes in dead wood in forest land remaining forest land for the first time in 2010 by using country-specific data which were prepared for the Forest Resource Assessment 2010 published by the Food and Agriculture Organization of the United Nations (FAO). In its NIR Belgium provided a detailed definition and procedure describing how it obtained data for this carbon pool. The ERT welcomes this effort made by Belgium. In response to a question raised by the ERT during the review, Belgium provided details on the method and the assumptions applied for the calculation of carbon stock changes in this pool and also informed the ERT that it would assume no carbon stock change between 1990 and 2000, as the value for 2000 was used as a proxy for the year 1990. The ERT recommends that Belgium reassess the calculation for the whole time series and include information on the methods used and assumptions for the estimation of this pool in its next NIR.

Land converted to settlements – $CO_2$

81. Belgium reported carbon stock changes under land converted to settlements and to other land for the first time in its 2010 submission. In response to a question raised by the ERT during the review, Belgium informed the ERT that the reported soil carbon stock of 30 t C/ha in those land-use categories is based on expert judgement and that the Party plans to reassess those values in its next annual submission. The ERT welcomes the effort made by the Party and encourages Belgium to implement this plan.

# F. Waste

## 1. Sector overview

82. In 2008, emissions from the waste sector amounted to 1,015.01 Gg $CO_2$ eq, or 0.8 per cent of total GHG emissions. Since the base year, emissions have decreased by 70.2 per cent. The key driver for the fall in emissions is the decrease of municipal solid waste disposed of on landfills and, in more recent years, the recovery of biogas by flaring or for energy purposes from landfills. Within the sector, 47.5 per cent of the emissions were from solid waste disposal on land, 39.1 per cent were from wastewater handling, 8.9 per cent were from waste incineration and the remaining 4.5 per cent were from compost production reported under other (waste).

83. Regarding recommendations in the previous review report, the Party improved its reporting by providing a description of sector-specific QC procedures and by including a description of time-series consistency and uncertainty for each category. The ERT encourages the Party to improve its reporting on sector-specific QC procedures by giving more details on the implemented tier 1 QC checks and providing information on category-specific QC procedures, if any, in its next annual submission.

## 2. Key categories

Solid waste disposal on land – $CH_4$

84. Emissions from this category were estimated using two models, the multiphase and first order decay (FOD) model for the Flemish Region, and the FOD model for the Walloon Region. To improve transparency and understanding of the differences of the models used, the ERT recommends that, in the NIR of its next annual submission, Belgium list the parameters from each FOD model and the multiphase model in a single table by using the same terminology.

85. In its NIR, Belgium described the different models used to calculate emissions. Nevertheless, the ERT noted a lack of transparency concerning the key parameters used in the models. In response to questions raised by the ERT during the review, Belgium provided more explanations and documentation on key parameters. The ERT welcomes this additional information and recommends that Belgium improve the transparency of its NIR by including the parameters from each region and model in a single table in its next annual submission, as already recommended in the previous review.

## 3. Non-key categories

Wastewater handling – $CH_4$

86. Belgium estimates $CH_4$ emissions from domestic and commercial wastewater from municipal wastewater treatment plants and from septic tanks. Emissions from septic tanks are reported for the Walloon and the Flemish Regions. With regard to wastewater treatment plants, no emissions are reported for the Walloon and Brussels-Capital Regions, because the wastewater is either treated aerobically or all $CH_4$ generated is recovered for energy purposes. In response to questions raised by the ERT during the review, Belgium provided quantitative information on emissions recovery and information on the categories of the energy sector in which these emissions are accounted for.

87. Belgium reports $CH_4$ emissions from industrial wastewater handling as "NE". The NIR states that, in the Walloon Region, $CH_4$ emissions from the anaerobic treatment of industrial wastewater are recovered for energy purposes and that emissions are thus negligible or none. In response to questions raised by the ERT during the review, Belgium

explained that emissions from the anaerobic treatment of industrial wastewater in the Brussels-Capital Region are also recovered. The Party further explained how the emissions resulting from recovered $CH_4$ are included in the energy sector. Belgium also explained that the Flemish Region has made attempts to calculate emissions based on the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines), but the necessary data were not available.

88. The ERT considers that the information provided in the NIR is not sufficient to fully assess the assumptions made and the allocation of emissions for the different regions. The explanations provided by the Party during the review clarified many issues and the ERT strongly recommends that Belgium include these explanations, especially on the amount and fate of recovered $CH_4$ emissions, in a transparent way in its next annual submission. The ERT also recommends that Belgium investigate further potential emissions from industrial wastewater in the Flemish Region and clarify, in its next annual submission, whether these emissions occur, by clearly identifying whether aerobic or anaerobic treatment is applied and, if so, whether these emissions are recovered, as they are in the other regions.

Waste incineration – $CO_2$ and $N_2O$

89. Each of the Party's regions estimates $CO_2$ emissions from waste incineration and applies its own specific methodology based on available AD in line with the IPCC good practice guidance. In the Flemish Region, emissions from flaring activities in the chemical industry are reported in the industrial processes sector under the category other (chemical industry), whereas the Walloon Region reports these emissions under waste incineration. The ERT reiterates the recommendation of the previous review report that Belgium should ensure that its reporting of waste incineration activities is consistent and transparent between regions, in particular regarding the sector in which emissions are reported, in its next annual submission.

## G. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

### 1. Information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Overview

90. Belgium reported emissions and removals from afforestation, reforestation and deforestation activities under Article 3, paragraph 3, of the Kyoto Protocol, for the year 2008. This is in accordance with the reporting guidelines under Article 7 (decision 15/CMP.1) as Belgium did not select any activities under Article 3, paragraph 4, of the Kyoto Protocol. Belgium did not report a key category analysis for Article 3, paragraph 3, activities. The key category analysis conducted by the secretariat identified as key categories the following corresponding land-use change categories under the Convention: land converted to forest land and land converted to cropland, grassland and settlement. Consequently, afforestation, reforestation and deforestation activities are considered key categories. The ERT recommends that the Party include a key category analysis of its KP-LULUCF activities in its next annual submission.

91. The Party reported most of the required information set out in paragraphs 5–9 of the annex to decision 15/CMP.1 in its annual submission. However, information on the following paragraphs of the annex to decision 15/CMP.1 was not fully covered in the NIR: 6(a), how inventory methodologies have been applied taking into account the IPCC good practice guidance for LULUCF and decision 16/CMP.1; 6(e), carbon pools that are not

accounted for; and 8(c), emissions/removals from lands harvested during the first commitment period following afforestation and reforestation on these units of land since 1990. In response to questions raised by the ERT during the review, the Party provided the missing information. The ERT recommends that Belgium include all reporting elements in its next annual submission.

92. Belgium has developed the land classification system based on approach 3 of the IPCC good practice guidance for LULUCF with sampling using several thematic layers. This approach includes the use of land and land cover maps for detecting whether those afforestation, reforestation and deforestation activities have occurred since 1990. The ERT considers that units of land under Article 3, paragraph 3, of the Kyoto Protocol are identifiable under this system and that all numerical values of forest definition, as defined by the Party in accordance with paragraphs 1(a) and 3 of the annex to decision 16/CMP.1, are properly taken into account by this approach. Belgium informed the ERT of its plan to further develop the land classification system with more intensive sampling plots. The ERT welcomes this improvement and recommends that Belgium recalculate emissions and removals of Article 3, paragraph 3, activities based on the updated land classification system in its next annual submission.

93. In general, Belgium uses the same methodologies and data for estimating emissions and removals under the Convention as under the Kyoto Protocol. However, the description of the LULUCF sector in chapter 7 of the NIR does not always provide clear information on all the methodologies applied and data used for calculating the emissions and removals of Article 3, paragraph 3, activities. The Party provided additional information on the methodologies applied and data used during the review, in response to questions raised by the ERT. The ERT recommends that the Party ensure that all methodologies are clearly stated in its NIR to satisfy the mandatory reporting element of paragraph 6(a) of the annex to decision 15/CMP.1.

94. In general, Belgium's national system for LULUCF activities under the Kyoto Protocol functions for estimating, reporting and accounting of Article 3, paragraph 3, activities. However, the ERT recommends that Belgium improve its KP-LULUCF inventory by estimating $CH_4$ and $N_2O$ emissions, implementing QA/QC activities, and performing key category and uncertainty analyses.

Activities under Article 3, paragraph 3, of the Kyoto Protocol

*Afforestation and reforestation – $CO_2$*

95. Belgium reported the carbon stock change in the dead wood pool under afforestation and reforestation as "NO", which is justified when applying the tier 1 method in its estimation. Nevertheless, Belgium did not provide an explanation to show that this pool is not a net source. During the review, the Party explained that the carbon stock of dead wood in forest land is higher than in any other land use in Belgium. The ERT considered that this explanation holds in a general sense. The ERT recommends that, in its next annual submission, Belgium include information which demonstrates that this carbon pool is not a net source of emissions – preferably with scientific or practical evidence if the Party continues reporting this carbon pool as "NO" – to satisfy the mandatory reporting element of paragraph 6(e) of the annex to decision 15/CMP.1.

*Deforestation – $CO_2$*

96. Belgium reported all carbon stock changes in each carbon pool under the deforestation activity with numerical values. The ERT noted that information on the data source for litter is not provided in the NIR and recommends that the Party include this information in its next annual submission. With reference to the planned improvements

concerning reassessment of soil carbon stocks in settlement and other land, the ERT recommends that Belgium also recalculate carbon stock changes in mineral soil by incorporating these results in its next annual submission.

97. Belgium has not reported the increase of carbon stock in living biomass that might occur in a deforestation area after deforestation. During the review, the Party informed the ERT that this increase is not estimated for the time being. The ERT recommends that the Party estimate this carbon stock change in its next annual submission.

## 2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

98. Belgium has reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. The ERT took note of the findings included in the SIAR on the SEF tables and the SEF comparison report.[5] The SIAR was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10. The ERT reiterated the main findings contained in the SIAR.

99. Information on the accounting of Kyoto units has been prepared and reported in accordance with chapter I.E of the annex to decision 15/CMP.1, and reported in accordance with decision 14/CMP.1 using the SEF tables. This information is consistent with that contained in the national registry and with the records of the international transaction log (ITL) and the clean development mechanism registry and meets the requirements set out in paragraph 88 (a–j) of the annex to decision 22/CMP.1. The transactions of Kyoto Protocol units initiated by the national registry are in accordance with the requirements of the annex to decision 5/CMP.1 and the annex to decision 13/CMP.1. No discrepancy has been identified by the ITL and no non-replacement has occurred.

National registry

100. The ERT took note of the SIAR and its finding that the reported information on the national registry is complete and has been submitted in accordance with the annex to decision 15/CMP.1. The ERT further noted from the SIAR and its finding that the national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

Calculation of the commitment period reserve

101. Belgium has reported its commitment period reserve in its 2010 annual submission. Belgium reported that its commitment period reserve has not changed since the initial report review (606,595,975 t $CO_2$ eq) as it is based on the assigned amount and not the most recently reviewed inventory. The ERT agrees with this figure.

## 3. Changes to the national system

102. Belgium reported that there are no changes in its national system since the previous annual submission. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

[5] The SEF comparison report is prepared by the ITL administrator and provides information on the outcome of the comparison of data contained in the Party's SEF tables with corresponding records contained in the ITL.

### 4. Changes to the national registry

103. Belgium reported that there are no changes in its national registry since the previous annual submission, except the upgrade of the registry software which provided a structural solution for the shortcomings in the public reports module. The software passed all the mandatory test procedures. The public reports can now be consulted directly at the national registry web address as the list of legal entities. The ERT concluded that, taking into account the confirmed changes, the Party's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions.

### 5. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

104. Belgium has included information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, as requested in chapter I.H of the annex to decision 15/CMP.1, in its 2010 annual submission. The reported information is considered complete and transparent.

105. Belgium reported that, in the framework of the Kyoto Protocol, it has taken a range of different actions in order to implement its commitment while minimizing adverse social, environmental and economic impacts on developing country parties. In particular:

(a) The implementation of measures aiming to reduce GHG emissions through energy savings and the promotion of renewable energy sources contributing to the reduction of adverse impacts of potential climate changes on developing countries;

(b) The implementation of policies and measures addressing not only fossil fuel combustion but also emissions of all gases covered by the Kyoto Protocol, such as $CH_4$ and $N_2O$ from agriculture and waste management, or fluorinated gases (F-gases) in refrigeration systems, thus ensuring a balanced distribution of efforts and limiting the potential impact of single overly specific measures;

(c) The implementation of European directives such as the liberalisation of the electricity and natural gas markets and the EU ETS, with the aim of addressing market imperfections and to better reflect externalities in energy/$CO_2$ prices;

(d) The suppression of subsidies supporting the use of coal and other fossil fuels for energy production;

(e) The development of a common policy for agriculture which tends to support quality products and environmental respect instead of large volumes of production, with the aim of creating market conditions that are more accessible to products from developing countries;

(f) The participation in clean development mechanism projects, typically designed with the aim of improving capacity building and implementing technology transfer in developing countries through mitigation and adaptation projects and, specifically, the selection of such projects which apply sustainability criteria based on the internationally recognized 'Gold Standards', addressing environmental aspects (including biodiversity), social sustainability and development, quality of life and labour, and techno-economic aspects including employment and technological autonomy.

# III. Conclusions and recommendations

106. Belgium made its annual submission on 15 April 2010. The annual submission contains the GHG inventory (comprising CRF tables and an NIR) and supplementary information under Article 7, paragraph 1, of the Kyoto Protocol (information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, Kyoto Protocol units, changes to the national system and the national registry and minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol). This is in line with decision 15/CMP.1

107. The ERT concludes that the inventory submission of Belgium has been prepared and reported in accordance with the UNFCCC reporting guidelines. The inventory submission is complete and the Party has submitted a complete set of CRF tables for the years 1990–2008 and an NIR; these are generally complete in terms of geographical coverage, years and sectors, as well as complete in terms of categories and gases, with the exception of CRF tables 7 (key categories) and 8(b) (recalculation explanations), which were not provided. Concerning geographical coverage, during the review Belgium provided updated estimates for emissions from the agriculture sector, including the activities in the Brussels-Capital Region. Some of the categories, particularly in the energy sector (road transportation: biomass – $CH_4$ and $N_2O$), the LULUCF sector (non-$CO_2$) and the waste sector (industrial wastewater handling – $CH_4$) were reported as "NE".

108. The submission of information required under Article 7, paragraph 1, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1. However, information on paragraphs 6(a), 6(e) and 8(c) of the annex to decision 15/CMP.1 was not fully covered in the NIR. The Party provided the missing information during the review.

109. The Party's inventory is in line with the UNFCCC reporting guidelines, and generally in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. However, the ERT recommends that Belgium develop a land classification system in line with the land representation scheme in the IPCC good practice guidance for LULUCF which uses "past 20 years" as a default for dividing remaining land and converted land. Furthermore, the ERT recommends that the Party includes in its NIR information on the method used for calculating $CO_2$ emissions from petroleum refining and whether it is in line with the IPCC good practice guidance. The ERT commends Belgium for improving the completeness of the inventory by reporting the land-use matrix for the first time, and for improving the NIR by describing the drivers behind trends in the beginning of the sectoral chapters.

110. Belgium did not report a key category analysis for Article 3, paragraph 3, KP-LULUCF activities. The Party has developed the land classification system based on approach 3 of the IPCC good practice guidance for LULUCF with sampling using several thematic layers.

111. Belgium has reported information on its accounting of Kyoto Protocol units in accordance with chapter I.E of the annex to decision 15/CMP.1, and used the required reporting format tables as required by decision 14/CMP.1.

112. The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1.

113. The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP).

114. Belgium has reported the information requested in chapter I.H of the annex to decision 15/CMP.1, "Minimization of adverse impacts in accordance with Article 3, paragraph 14" as part of its 2010 annual submission. The information was provided on 15 April 2010. The ERT considers the information complete and transparent.

115. In the course of the review, the ERT formulated a number of recommendations relating to the completeness of the annual submission (including Article 7, paragraph 1, information) and the transparency of the information presented in Belgium's annual submission. The key recommendations are that Belgium:

(a) Include CRF tables 7 (key categories) and 8(b) (recalculation explanations) at least for the base year, the latest inventory year and the latest recalculated inventory year, in accordance with the UNFCCC reporting guidelines, and provide information on recalculations;

(b) Carry out a key category analysis in accordance with IPCC good practice guidance for LULUCF, by first excluding the LULUCF sector from the assessment and then include the LULUCF sector;

(c) Ensure that mandatory tier 1 QC checks are applied and improve the reporting on its QA/QC activities in the sectoral chapters;

(d) Provide detailed information in the NIR on measures implemented to diminish the difference between the reference and sectoral approaches;

(e) Provide detailed information on the methodology and EFs used for petroleum industry $CO_2$ emissions;

(f) Improve the transparency in reporting iron and steel emissions by enhancing the description of methods, AD and EFs, and include a discussion of the time-series consistency of the emission estimates;

(g) Provide documentation that explains how emissions from exported manure were accounted for in the national inventories of importing countries;

(h) Clarify whether $CH_4$ emissions from industrial wastewater handling occur and, if so, estimate them;

(i) Ensure consistency of reporting on LULUCF under the Convention and under the Kyoto Protocol;

(j) Include a key category analysis of its KP-LULUCF activities and all KP-LULUCF reporting elements, in accordance with the annex to decision 15/CMP.1;

(k) Develop a land classification system for reporting under the Convention in line with the land representation scheme in the IPCC good practice guidance for LULUCF which uses "past 20 years" as a default for dividing remaining land and converted land;

(l) Provide land-use definitions of settlements and other land in the NIR, as explained during the review week;

(m) Incorporate the latest data from the National Forest Inventory in its LULUCF inventory.

# IV. Questions of implementation

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

# Annex I

## Documents and information used during the review

### A. Reference documents

Intergovernmental Panel on Climate Change. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

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/gpglulucf/gpglulucf.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 2010. Available at <http://unfccc.int/resource/docs/2008/asr/bel.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2010. Available at <http://unfccc.int/resource/webdocs/sai/2010.pdf>.

FCCC/ARR/2009/BEL. Report of the individual review of the greenhouse gas inventory of Belgium submitted in 2009. Available at <http://unfccc.int/resource/docs/2009/arr/bel.pdf>.

UNFCCC. *Standard Independent Assessment Report*, Parts I and II. Available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

## B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Olivier Biernaux (IRCEL-CELINE), including additional material on the methodologies and assumptions used. The following documents[1] were also provided by Belgium:

A revised key category assessment contained in an electronic file.

Examples of Tier 1 QC checklists in the agriculture sector.

[1] Reproduced as received from the Party.

# Annex II

## Acronyms and abbreviations

| | |
|---|---|
| AD | activity data |
| CaO | calcium oxide |
| $CH_4$ | methane |
| $CO_2$ | carbon dioxide |
| $CO_2$ eq | carbon dioxide equivalent |
| CRF | common reporting format |
| EF | emission factor |
| ERT | expert review team |
| EU ETS | European Union emission trading scheme |
| F-gas | fluorinated gas |
| FOD | first order decay |
| GHG | greenhouse gas; unless indicated otherwise, GHG emissions are the sum of $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs and $SF_6$ without GHG emissions and removals from LULUCF |
| HFCs | hydrofluorocarbons |
| IE | included elsewhere |
| IEA | International Energy Agency |
| IEF | implied emission factor |
| IPCC | Intergovernmental Panel on Climate Change |
| ITL | international transaction log |
| kg | kilogram (1 kg = 1,000 grams) |
| KP-LULUCF | land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol |
| LULUCF | land use, land-use change and forestry |
| MgO | magnesium oxide |
| Mt | million tonnes |
| N | nitrogen |
| NA | not applicable |
| NE | not estimated |
| NO | not occurring |
| $N_2O$ | nitrous oxide |
| NIR | national inventory report |
| PFCs | perfluorocarbons |
| QA/QC | quality assurance/quality control |
| SEF | standard electronic format |
| $SF_6$ | sulphur hexafluoride |
| SIAR | standard independent assessment report |
| TJ | terajoule (1 TJ = $10^{12}$ joule) |
| UNFCCC | United Nations Framework Convention on Climate Change |