



**Report of the individual review of the annual submission of Slovenia  
submitted in 2011**

**Note by the secretariat**

The report of the individual review of the annual submission of Slovenia submitted in 2011 was published on 26 April 2012. 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/2011/SVN, 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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\* In the symbol for this document, 2011 refers to the year in which the inventory was submitted, and not to the year of publication.

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## I. Introduction and summary

### A. Overview

1. This report covers the centralized review of the 2011 annual submission of Slovenia, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 29 August to 3 September 2011 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. Bernd Gugele (European Union (EU)) and Mr. Newton Paciornik (Brazil); energy – Mr. Qiang Liu (China), Mr. Ole-Kenneth Nielsen (Denmark) and Ms. Kennie Tsui (New Zealand); industrial processes – Ms. Jolanta Merkeliene (Lithuania); agriculture – Mr. Tom Wirth (United States of America); land use, land-use change and forestry (LULUCF) – Mr. Toru Gomi (Japan) and Mr. Valentin Bellassen (France); and waste – Mr. Pavel Gavrilita (Republic of Moldova). In addition, Mr. Nielsen supported the review of the industrial processes and waste sectors. Mr. Gugele and Mr. Paciornik were the lead reviewers. The review was coordinated by Ms. Barbara Muik and Mr. Roman Payo (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 Slovenia, which made no comment on it.

### B. Emission profiles and trends

3. In 2009, the main greenhouse gas (GHG) in Slovenia was carbon dioxide (CO<sub>2</sub>), accounting for 82.4 per cent of total GHG emissions<sup>1</sup> expressed in CO<sub>2</sub> eq, followed by methane (CH<sub>4</sub>) (10.4 per cent) and nitrous oxide (N<sub>2</sub>O) (6.0 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>) collectively accounted for 1.2 per cent of the overall GHG emissions in the country. The energy sector accounted for 81.7 per cent of total GHG emissions, followed by the agriculture sector (10.3 per cent), the industrial processes sector (4.8 per cent), the waste sector (3.0 per cent) and the solvent and other product use sector (0.2 per cent). Total GHG emissions amounted to 19,435.75 Gg CO<sub>2</sub> eq and decreased by 3.3 per cent between the base year<sup>2</sup> and 2009.

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 and activity, respectively. In table 1, CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector.

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<sup>1</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified.

<sup>2</sup> “Base year” refers to the base year under the Kyoto Protocol, which is which is 1986 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The base year emissions include emissions from Annex A sources only.

Table 1  
**Greenhouse gas emissions by gas from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, base year to 2009<sup>a</sup>**

		<i>Gg CO<sub>2</sub> eq</i>								<i>Change</i>
		<i>Base year<sup>d</sup></i>	<i>1990</i>	<i>1995</i>	<i>2000</i>	<i>2005</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>Base year–2009 (%)</i>
<i>Greenhouse gas</i>										
Annex A sources	CO <sub>2</sub>	16 287.47	14 738.29	14 988.80	15 176.66	16 638.83	16 947.08	17 920.03	16 018.62	–1.7
	CH <sub>4</sub>	2 263.30	2 202.64	2 091.78	2 186.87	2 155.30	2 179.68	2 060.07	2 015.99	–10.9
	N <sub>2</sub> O	1 390.76	1 269.69	1 229.66	1 307.17	1 204.56	1 222.86	1 153.01	1 162.21	–16.4
	HFCs	31.76	0.00	31.76	40.00	148.03	188.91	196.45	217.32	584.2
	PFCs	106.48	257.44	106.48	105.61	132.73	90.87	20.91	7.43	–93.0
	SF <sub>6</sub>	12.72	10.30	12.72	15.74	18.84	16.90	15.64	14.17	11.5
KP-LULUCF	Article 3.3 <sup>b</sup>	CO <sub>2</sub>						146.33	328.44	
		CH <sub>4</sub>						NO	NO	
		N <sub>2</sub> O						1.08	2.99	
	Article 3.4 <sup>c</sup>	CO <sub>2</sub>	NA					–10 308.41	–10 296.78	NA
		CH <sub>4</sub>	NA					1.49	3.50	NA
		N <sub>2</sub> O	NA					0.27	0.63	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.

<sup>a</sup> “Base year” for Annex A sources refers to the base year under the Kyoto Protocol, which is 1986 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The “base year” for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1986.

<sup>b</sup> 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.

<sup>c</sup> 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 2009<sup>a</sup>**

		<i>Gg CO<sub>2</sub> eq</i>								<i>Change</i>	
		<i>Base year<sup>a</sup></i>	<i>1990</i>	<i>1995</i>	<i>2000</i>	<i>2005</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>Base year–2009</i> <i>(%)</i>	
	<i>Sector</i>										
Annex A	Energy	16 072.47	14 400.20	14 848.40	14 953.74	16 193.55	16 433.12	17 474.09	15 886.36	–1.2	
	Industrial processes	1 153.07	1 291.93	964.48	1 015.46	1 342.34	1 400.46	1 281.05	938.00	–18.7	
	Solvent and other product use	81.90	43.40	17.25	42.73	43.32	42.16	27.59	31.00	–62.2	
	Agriculture	2 218.06	2 140.00	2 046.47	2 137.30	2 006.50	2 078.36	1 964.60	1 996.27	–10.0	
	Waste	566.99	602.83	584.60	682.81	712.59	692.20	618.79	584.12	3.0	
	LULUCF	NA	–7 273.87	–7 295.87	–7 251.80	–8 458.90	–8 478.68	–8 482.72	–8 458.20	NA	
	<b>Total (with LULUCF)</b>	<b>NA</b>	<b>11 204.49</b>	<b>11 165.33</b>	<b>11 580.24</b>	<b>11 839.40</b>	<b>12 167.62</b>	<b>12 883.40</b>	<b>10 977.55</b>	<b>NA</b>	
	<b>Total (without LULUCF)</b>	<b>20 092.49</b>	<b>18 478.37</b>	<b>18 461.20</b>	<b>18 832.04</b>	<b>20 298.30</b>	<b>20 646.30</b>	<b>21 366.12</b>	<b>19 435.75</b>	<b>–3.3</b>	
	Other <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA	NA	
KP-LULUCF	Article 3.3 <sup>c</sup>	Afforestation & reforestation						NO	NO		
		Deforestation						147.41	331.43		
		<b>Total (3.3)</b>						<b>147.41</b>	<b>331.43</b>		
	Article 3.4 <sup>d</sup>	Forest management							–10 306.66	–10 292.65	
		Cropland management	NA						NA	NA	NA
		Grazing land management	NA						NA	NA	NA
		Revegetation	NA						NA	NA	NA
		<b>Total (3.4)</b>	<b>NA</b>						<b>–10 306.66</b>	<b>–10 292.65</b>	<b>NA</b>

*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, NO = not occurring.

<sup>a</sup> “Base year” for Annex A sources refers to the base year under the Kyoto Protocol, which is 1986 for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O, and 1995 for HFCs, PFCs and SF<sub>6</sub>. The “base year” for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1986.

<sup>b</sup> Emissions/removals reported in the sector other (sector 7) are not included in Annex A to the Kyoto Protocol and are therefore not included in the national totals.

<sup>c</sup> 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.

<sup>d</sup> 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<sub>2</sub> eq**

	<i>As reported</i>	<i>Revised estimates</i>	<i>Adjustment<sup>a</sup></i>	<i>Final<sup>b</sup></i>	<i>Accounting quantity<sup>c</sup></i>
<b>Commitment period reserve</b>	84 265 734			84 265 734	
<b>Annex A emissions for current inventory year</b>					
CO <sub>2</sub>	16 017 939	16 018 623		16 018 623	
CH <sub>4</sub>	2 015 987			2 015 987	
N <sub>2</sub> O	1 162 209			1 162 209	
HFCs	121 374	217 318		217 318	
PFCs	7 433			7 433	
SF <sub>6</sub>	14 175			14 175	
<b>Total Annex A sources</b>	<b>19 339 117</b>	<b>19 435 745</b>		<b>19 435 745</b>	
<b>Activities under Article 3, paragraph 3, for current inventory year</b>					
3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported	NO			NO	
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	332 862			331 431	
<b>Activities under Article 3, paragraph 4, for current inventory year<sup>d</sup></b>					
3.4 Forest management for current year of commitment period	-10 292 646			-10 292 646	
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 for base year					

*Abbreviation:* NO = not occurring.

<sup>a</sup> "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).

<sup>b</sup> "Final" includes revised estimates, if any, and/or adjustments, if any.

<sup>c</sup> "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, if any.

<sup>d</sup> 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 Party's 2011 annual inventory submission was submitted on 18 April 2011 and resubmitted on 12 May 2011; it contains a complete set of common reporting format (CRF) tables for the period 1986–2009 and a national inventory report (NIR). Slovenia 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 the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 14 April 2011. The annual submission was submitted in accordance with decision 15/CMP.1. The ERT noted that Slovenia submitted its annual submission slightly after the due date of 15 April but within the six-week period after which the consequences of late submission apply under decision 15/CMP.1. The ERT recommends that Slovenia take measures in order to ensure that its next annual inventory is submitted by 15 April 2012, including both the CRF tables and the NIR.

7. Slovenia officially submitted revised emission estimates for the industrial processes sector on 17 October 2011 in response to the list of potential problems and further questions raised by the expert review team (ERT) (see paras. 52, 53, 55, 57 and 58 below). The values in this report are based on the revised estimates submitted on 17 October 2011.

8. Where necessary, the ERT also used previous years' submissions during the review. 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.<sup>3</sup>

9. During the review, Slovenia 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 covers most source and sink categories for the period 1986–2009 and is complete in terms of years and geographical coverage. However, the ERT identified that emissions from some categories for which 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) provides estimation methodologies were not reported in the submission of 12 May 2011. These include: CO<sub>2</sub> emissions from limestone and dolomite used in bricks and ceramics production (see para. 51 below); emissions from HFCs other than HFC-134a from refrigeration and air-conditioning equipment (see para. 53 below); and HFC emissions from

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<sup>3</sup> 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 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.

aerosols/metered dose inhalers (see para. 58 below). In response to the list of potential problems and further questions raised by the ERT, Slovenia submitted estimates for these categories after the review week.

11. In its 2011 submission, in response to a recommendation in the previous review report, Slovenia has reported SF<sub>6</sub> emissions from the filling of soundproof windows for the period 1995–1997, and N<sub>2</sub>O emissions from the application of sewage sludge to agricultural soils for the period 2000–2009 for the first time. The ERT commends the Party for these improvements. However, the ERT recommends that Slovenia include estimates of N<sub>2</sub>O emissions from the application of sewage sludge to agricultural soils for the period prior to 2000 that are still missing (see para. 68 below). The ERT also recommends that the Party ensure the completeness of the time series for the reporting of feedstocks and non-energy use of fuels (see para. 33 below).

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

### Overview

12. Slovenia reported that there have been no changes to its national system since the previous annual submission. The ERT concluded that the national system continues to perform its required functions.

### Inventory planning

13. The NIR describes the national system for the preparation of the inventory. The Environmental Agency of the Republic of Slovenia is the single national entity with overall responsibility for the national inventory. Other organizations involved in the preparation of the inventory include the Slovenian Agricultural Institute and the Slovenian Forestry Institute, which assist in the estimation of emissions from the agriculture sector and the LULUCF sector, respectively. The Statistical Office of the Republic of Slovenia (SORS) and the Ministry of Environment and Spatial Planning are the main data sources for the inventory; some additional information on transport is provided by the Ministry of Transport, the Directorate of National Roads and the Ministry of Internal Affairs. Slovenia has established agreements with the organizations that participate in the preparation of the inventory and with SORS, in order to ensure that the data required are provided in a timely manner. The Ministry of Environment and Spatial Planning officially approves the inventory before it is submitted to the secretariat.

### Inventory preparation

#### *Key categories*

14. Slovenia has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2011 submission for the base year (1986) and for 2009, both with and without LULUCF. The Party describes in the NIR how the key category analysis is used to prioritize inventory improvements. The key category analysis performed by the Party and that performed by the secretariat<sup>4</sup> produced similar results. The key category analysis was

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<sup>4</sup> The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance for LULUCF. 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

generally performed in accordance with 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). However, the ERT encourages Slovenia to further disaggregate CO<sub>2</sub> emissions from stationary combustion by fuel type. The Party did not report a tier 2 level analysis in its 2011 submission, as it had provided in its 2010 submission. Further, it did not provide a tier 2 trend analysis, as planned for the 2011 submission. The ERT encourages Slovenia to report a key category tier 2 analysis, both level and trend assessment, in addition to the key category tier 1 analysis in its next annual submission.

15. Slovenia identified deforestation under Article 3, paragraph 3, of the Kyoto Protocol as well as forest management under Article 3, paragraph 4, of the Kyoto Protocol as key categories. The results of the key category analysis are presented in KP-LULUCF CRF table NIR-3 and in the NIR, but the rationale for the identification of the key categories is not presented in the NIR. The ERT encourages Slovenia to improve the description of the key category analysis in the NIR, in order to enhance the transparency of its reporting.

#### *Uncertainties*

16. Slovenia has provided a tier 1 uncertainty analysis in its 2011 submission, both including and excluding LULUCF. The uncertainty estimate for total GHG emissions with LULUCF was 30 per cent for 2009 while the uncertainty estimate for the trend since 1986 was 4 per cent. The uncertainty estimate for total GHG emissions without LULUCF was 7 per cent for 2009. The Party did not report an uncertainty estimate of the trend without LULUCF, neither did it provide the calculation table for the uncertainty estimates without LULUCF in annex 7 to the NIR. The ERT encourages Slovenia to include the calculation table without LULUCF in annex 7 to the NIR and the full results of the uncertainty estimates in the NIR, in order to increase transparency.

17. Slovenia has included in the 2011 NIR information on how and why the uncertainty of total GHG emissions has decreased since the base year as recommended in the previous review report. The ERT commends the Party for this improvement in transparency. The results show that the uncertainty of total GHG emissions including LULUCF decreased from 40 per cent in 1986 to 30 per cent in 2009, mainly due to the reduction in uncertainty in the energy and LULUCF sectors.

18. As recommended in the previous review report, Slovenia has improved the description of the uncertainty calculations for the energy and agriculture sectors, and has re-evaluated the uncertainty of the activity data (AD) for the energy categories and the uncertainty of the AD and emission factors (EFs) for the aluminium production category. The ERT commends the Party for these improvements. However, Slovenia did not provide specific uncertainty estimates for the KP-LULUCF activities (see para. 94 below) and the ERT recommends that the Party include these uncertainty estimates in its next annual submission.

#### *Recalculations and time-series consistency*

19. Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that the recalculations reported by the Party have been undertaken mainly to take into account new AD, EFs and parameters and in response to the previous review report (see paras. 32, 47, 64, 70 and 85 below). The rationale for these recalculations is provided in the NIR and in CRF table 8(b). The impact of the recalculations on estimated total GHG emissions excluding LULUCF was a change of 0 per

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analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

cent for the base year and an increase in emissions of less than 0.01 per cent for 2008. The magnitude of the impact on total GHG emissions including LULUCF was an increase of 3.5 per cent in net emissions for the base year (1986) and an increase of 0.4 per cent for 2008, mainly due to the use of new AD and the reporting of emissions from settlements for the first time.

20. The emission estimates are generally consistent over the time series. However, the ERT identified some time-series inconsistencies due to methodological changes (see para. 88 below). In addition, some of the recalculations have not been applied throughout the time series, resulting in inconsistencies (see paras. 36 and 68 below)

#### *Verification and quality assurance/quality control approaches*

21. Slovenia has in place a quality assurance/quality control (QA/QC) plan, which details the QA/QC processes for gathering data, calculating emission estimates and reporting. The NIR provides a description of the Party's QA/QC and verification procedures, which follow the tier 1 approach of the IPCC good practice guidance. However, this description is identical to the one in the previous annual submission and refers to planned activities for 2010 (e.g. no information is provided about the QA activities for the waste sector that were planned for 2010). The ERT recommends that Slovenia update, on an annual basis, the information on QA/QC procedures, including a follow-up of the planned activities reported in previous submissions and the new activities, together with a schedule for their implementation.

22. In response to the previous review report, Slovenia has slightly improved the information on the category-specific QC checks by reporting on comparison checks of country-specific EFs with IPCC default EFs carried out for the agriculture sector (see para. 63 below), but the information is still very limited throughout the report. The ERT reiterates the recommendation in the previous review report that Slovenia improve the information on how the category-specific QC checks are implemented.

23. The ERT identified a number of inconsistencies in the NIR, between the CRF tables and the NIR, and in the use of notation keys (see paras. 34, 40, 43, 45, 71, 73, 79, 80, 86 and 100 below). The ERT also noted that some errors and inconsistencies derive from the incorrect update of the text of the 2010 NIR. The ERT recommends that the Party improve its QC procedures in order to minimize these inconsistencies and ensure that the text included in the NIR reflects the information related to the current submission.

#### *Transparency*

24. Slovenia has increased the overall transparency of the NIR as part of its inventory improvement plan and in response to previous review reports, by increasing the transparency of the information on the descriptions of many categories (see paras. 50, 65, 67, 71, 84 and 93 below). The ERT recommends that the Party continue to improve the transparency of the information provided in its next annual submission, in particular for the categories referred to in the sectoral parts of this report (for the energy sector, see paras. 41, 42 and 44 below; for the industrial processes sector, see paras. 59 and 60 below; for the agriculture sector, see para. 67 below; for the LULUCF sector, see paras. 78, 80, 81 and 82 below; for the waste sector, see para. 89 below; and for the KP-LULUCF activities, see para. 92 below).

#### Inventory management

25. Slovenia has a centralized archiving system, which includes the archiving of all supporting data and references together with the annual inventory submissions. Information is stored in electronic format or in hard copy at the Environmental Agency of the Republic

of Slovenia. The Party did not describe in the NIR if the archived information also includes internal documentation on QA/QC procedures, external and internal reviews, and documentation on annual key categories and key category identification and planned inventory improvements. The ERT recommends that Slovenia include detailed information on how this documentation is archived in its next annual submission.

26. The Party states in the NIR that a process to convert all hard copy documentation into an electronic format was planned for 2010, but it did not provide information on the progress made with regard to the implementation of this plan. The ERT recommends that Slovenia provide this information in its next NIR.

### **3. Follow-up to previous reviews**

27. Slovenia has made improvements in its 2011 inventory submission by implementing many of the recommendations made in the previous review report. The Party has also continued to improve the transparency of the NIR. The recommendations implemented by the Party from the 2010 review report are included in table 10.2.1 of the NIR. The ERT commends Slovenia for this transparent approach. Some of the recommendations from the previous review report have not yet been implemented, including: the provision and use of new data for fuel use in the residential subcategory; the revision of the EFs used to estimate emissions from domestic refrigeration, stationary air-conditioning and mobile air-conditioning; and the revision of the estimates of HFC emissions from foam blowing and fire extinguishers.

### **4. Areas for further improvement**

#### Identified by the Party

28. The 2011 NIR identifies several areas for improvement following the recommendations from the previous review report, including:

- (a) The performance of a peer review for selected sectors;
- (b) The use of new data for fuel use in the residential sector following the results of a data survey;
- (c) The investigation of the availability of more accurate data for consumption of halocarbons, in order to improve the accuracy of the emission estimates;
- (d) The estimation of uncertainties for the KP-LULUCF categories.

#### Identified by the expert review team

29. During the review, the ERT identified cross-cutting issues for improvement. These are listed in paragraph 123 below.

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 Slovenia. In 2009, emissions from the energy sector amounted to 15,886.36 Gg CO<sub>2</sub> eq, or 81.7 per cent of total GHG emissions. Since 1986, emissions have decreased by 1.2 per cent. The key driver for the fall in emissions is the reduction in emissions from manufacturing industries and construction, which decreased by 56.5 per cent between 1986 and 2009. Within the sector,

38.3 per cent of the emissions were from energy industries, followed by 33.6 per cent from transport, 13.8 per cent from other sectors and 12.1 per cent from manufacturing industries and construction. Fugitive emissions from solid fuels accounted for 2.1 per cent and fugitive emissions from oil and natural gas accounted for 0.2 per cent.

32. The Party has made minor recalculations for the energy sector between the 2010 and 2011 submissions, some of which were performed in response to the 2010 review report. The impact of these recalculations on the energy sector is an increase in emissions of less than 0.01 per cent for 2008. The main recalculations took place in the following categories:

- (a) Civil aviation due to the reallocation of emissions from military aviation to other (mobile);
- (b) Fugitive emissions from oil and natural gas due to corrected EFs and updated AD;
- (c) Other sectors due to the inclusion of GHG emissions from flaring of landfill gas.

33. The inventory for the energy sector is generally complete. In a few instances, data that have been reported to the International Energy Agency (IEA) have not been reported in the CRF tables. For example, data for other kerosene, lubricants, bitumen, naphtha, refinery feedstocks and other oil are not reported in the CRF tables for years before 2004. In response to a question raised by the ERT during the review, the Party indicated that data are not available for the years before 2004. However, data for these fuels have been reported to IEA and to the Statistical Office of the EU (Eurostat) via the Joint Energy Questionnaires for the reporting period 1990–2009. Slovenia has reported small amounts of white spirit to Eurostat but the ERT noted that these are reported as not occurring (“NO”) in CRF table 1.A(b). The ERT recommends that Slovenia investigate the differences described above, review its use of the notation keys and improve the completeness and time-series consistency of its reporting.

34. The information in the NIR and the CRF tables on the energy sector is generally correct and accurate. However, the ERT noted that there are some small data discrepancies between the CRF tables and the NIR (e.g. the data on fugitive emissions from natural gas distribution for the years 2007–2009 reported in the NIR are different from those reported in the CRF tables), and some errors in the NIR (e.g. the net calorific values for other bituminous coal and coke in table 3.2.26, the EFs for diesel in tables 3.2.14, 3.2.15 and 3.2.27) and in the CRF tables (e.g. the physical unit for natural gas and the conversion factor for bitumen in CRF table 1.A(b)). The ERT further noted that some descriptions in the NIR are not transparent (e.g. unclear information on whether solid fuels are used in railways). The ERT recommends that Slovenia investigate the discrepancies above and correct the errors in the NIR and in the CRF tables in order to ensure that the information provided is consistent, and make additional efforts to improve the accuracy of the data and the transparency of the information provided in the NIR and in the CRF tables in its next annual submission.

35. The ERT noted that no improvements are planned for the key categories manufacturing industries and construction and other sectors, where IPCC default EFs are used, with the only exception being lignite and gas. Slovenia has recently carried out a survey on fuel use in the residential sector. The Party also mentioned in the NIR that it will obtain data on the chemical composition of natural gas for the period 1997–2009 and that it will update the EF for natural gas for the years 1997–2009 (in its 2011 submission, the EF for 1996 is used for all of the years during that period). Both this survey and the updated EF data should significantly improve the accuracy of the emission estimates. The ERT recommends that Slovenia provide further information on this survey and on the new EF for natural gas for the years 1997–2009 and make the relevant recalculations in its next

annual submission. The ERT also recommends that the Party develop country-specific CO<sub>2</sub> EFs for fuels which have a significant share in the fuel mix for each key category and encourages the Party to develop higher-tier methods for the estimation of emissions from non-CO<sub>2</sub> gases, where possible, as recommended in the IPCC good practice guidance.

36. In response to a recommendation in the previous review report, Slovenia has reallocated emissions from jet kerosene used by the military and the police from international aviation to other (mobile) in its 2011 submission. However, the ERT noted that this reallocation has been implemented for 2008 only. In response to a question raised by the ERT during the review, Slovenia explained that it had been very difficult to reach an agreement with the military/police that these data will be provided for use in the national inventory from 2008 onwards, while the historical data set has been impossible to obtain. Nevertheless, the ERT still recommends that the Party make additional efforts to reallocate these emissions for the entire time series and report them under other (mobile) in its next annual submission, in order to ensure time-series consistency.

## 2. Reference and sectoral approaches

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

37. The difference between the estimates of CO<sub>2</sub> emissions calculated using the reference approach and the sectoral approach is –0.26 per cent for 2009. During the review, a few discrepancies in the way in which the reference approach is reported were detected (e.g. gas biomass has not been reported (see para. 43 below), nor has white spirit (see para. 33 above)). The ERT recommends that Slovenia report the reference approach in accordance with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) in its next annual submission.

38. The ERT noted that the apparent consumption reported in Slovenia's annual submission generally corresponds to that reported to IEA; however, the data on some individual fuels are still not consistent (e.g. natural gas imports and stock changes, and imports of gas/diesel oil and residual fuel oil). In response to the questions raised by the ERT during the review, Slovenia explained the possible reason for the discrepancy regarding the imports of gas/diesel oil and residual fuel oil and agreed to resolve this discrepancy in its next annual submission. The ERT recommends that Slovenia also investigate the discrepancies regarding natural gas imports and stock changes and improve the completeness and time-series consistency of the reporting in its next annual submission.

39. The *Statistical Yearbook* of Slovenia presents an energy balance for 2009 in kilotonnes of oil equivalent. A comparison of the data from the *Statistical Yearbook* with the data reported in the CRF tables reveals some differences. In response to a question raised by the ERT during the review, the Party provided more information to clarify the differences for solid and gaseous fuels but the explanation of the differences for liquid fuels was considered not to be sufficient. Both the total consumption of liquid fuels and the individual consumption by liquid fuel type varied in the CRF tables and in the energy balance table. The ERT recommends that Slovenia improve its QC checks of these discrepancies, elaborate on the reasons for the discrepancies and make the necessary corrections and reallocations in its next annual submission.

### *Feedstocks and non-energy use of fuels*

40. The ERT found that there are a few inconsistencies in CRF tables 1.A(d) and 1.A(c) regarding feedstocks and non-energy use of fuels. CRF table 1.A(d) reports approximately 6.7 PJ of liquid fuels for non-energy purposes. However, in CRF table 1.A(c) the fuel consumption of liquid fuels excluding non-energy purposes is only approximately 4.5 PJ

lower than the fuel consumption of liquid fuels including non-energy purposes. The ERT also noted that some fuels used for feedstock and for non-energy use are still allocated under the energy sector (e.g. lubricants and petroleum coke) and some fuels used for non-energy purposes are not reported properly in CRF table 1.A(d) (e.g. white spirit used for non-energy purposes). The ERT further noted that the additional information on the allocation of feedstocks and non-energy use of fuels contained in CRF table 1.A(d) is not complete and accurate. For example, some stored carbon from natural gas and gas/diesel fuel oil are reported as being subtracted from manufacturing industries and construction – chemicals, but in the allocation table they are indicated as “NO”. According to the Revised 1996 IPCC Guidelines, all feedstock and non-energy fuel use should be reallocated to the industrial processes sector and not included under the energy sector. The ERT recommends that the Party exclude all fuels used as feedstock and for non-energy purposes from the energy sector and report, in CRF tables 1.A(b) and 1.A(d), all feedstocks and non-energy use of fuels (as identified in the national energy balance), the associated CO<sub>2</sub> emissions and the category/sector under which they are allocated in the inventory.

### 3. Non-key categories

#### Stationary combustion: liquid fuels – CH<sub>4</sub>

41. Slovenia uses a CH<sub>4</sub> EF for liquefied petroleum gas (LPG) of 2 kg/TJ as presented in tables 3.2.7–3.2.11 of the NIR. During the review, the Party explained that the default value for oil (3 kg/TJ) from the Revised 1996 IPCC Guidelines is not appropriate for LPG, so it uses a value of 2 kg/TJ instead, which corresponds to the average of the default value from the Revised 1996 IPCC Guidelines and the default value from the *2006 IPCC Guidelines for National Greenhouse Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) (1 kg/TJ). The ERT recommends that Slovenia provide more information on why it considers this EF to be more appropriate to the national circumstances in its next NIR, in order to improve the transparency of its reporting.

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

42. The ERT noted that there are different categories of biomass fuels, including wood, sludge/biogas from wastewater treatment, biogas and landfill gas used in energy industry, which was confirmed by Slovenia in response to the questions raised by the ERT during the review. However, except for a description of the EFs for wood use, there is no other information on these categories of biomass fuels in the 2011 NIR. The ERT recommends that Slovenia report additional information on the AD and EFs for all categories of biomass, in order to improve the transparency of its reporting.

43. In response to the questions raised by the ERT during the review, Slovenia mentioned that some gaseous biomass fuels (including landfill gas and biogas) are used in energy industries, manufacturing industries and construction and other sectors. However, the ERT noted that gaseous biomass is reported as “NO” in CRF table 1.A(b). The ERT recommends that the Party investigate these differences and review its use of the notation keys.

#### Stationary combustion: other fuels – CO<sub>2</sub> and N<sub>2</sub>O

44. CO<sub>2</sub> and N<sub>2</sub>O emissions are reported from other fuels under public electricity and heat production. No information is provided in the NIR regarding the nature of the fuels included in this category or the choice of EFs. In response to a question raised by the ERT during the review, Slovenia explained that this category includes waste incinerated in a heating plant and provided information on the AD and EFs used. The ERT recommends that the Party include this information in its next NIR.



Civil aviation: liquid fuels – CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O

45. Slovenia has reported in the NIR that a very small amount of jet kerosene is consumed in this category. The ERT recommends that the Party use the notation key “IE” (included elsewhere) (i.e. included under other mobile), rather than the notation key “NO” in CRF table 1.A.(a) and make this correction in its next annual submission.

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

### 1. Sector overview

46. In 2009, emissions from the industrial processes sector amounted to 938.00 Gg CO<sub>2</sub> eq, or 4.8 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 31.00 Gg CO<sub>2</sub> eq, or 0.2 per cent of total GHG emissions. Since the base year, emissions have decreased by 18.7 per cent in the industrial processes sector, and decreased by 62.2 per cent in the solvent and other product use sector. The key driver for the fall in emissions in the industrial processes sector is the decrease in PFC emissions from aluminium production (in 1991 and 2007) and due to the global economic recession in 2009, leading, in particular, to a decrease in emissions from mineral products and metal production activities. Within the industrial processes sector, 64.9 per cent of the emissions were from mineral products, followed by 24.7 per cent from consumption of halocarbons and SF<sub>6</sub>, 9.9 per cent from metal production and 0.6 per cent from chemical industry.

47. Slovenia has made many recalculations for the industrial processes sector between the 2010 and 2011 submissions, mostly in response to the 2010 annual review report and due to changes in AD. The impact of these recalculations on the industrial processes sector is an increase in emissions of 1.2 per cent for 2008. The main recalculations took place in the following categories:

- (a) CO<sub>2</sub> emissions from cement production for the period 1999–2004 were recalculated due to the use of year-specific EFs;
- (b) CO<sub>2</sub> emissions from iron and steel production were recalculated due to the inclusion of emissions from total input material for the period 2005–2008;
- (c) CO<sub>2</sub> emissions from anode burn-off emissions were reallocated from the category aluminium production to the category other (metal production);
- (d) Perfluoromethane (CF<sub>4</sub>), perfluoroethane (C<sub>2</sub>F<sub>6</sub>) and CO<sub>2</sub> emissions in aluminium production for the period 2005–2008 were recalculated due to the availability of new AD from the producer;
- (e) SF<sub>6</sub> emissions from the filling of soundproof windows for the years 1995–1997 were included;
- (f) SF<sub>6</sub> emissions from electrical equipment were recalculated for the period 2006–2008;
- (g) HFC emissions from mobile air-conditioning for the period 2006–2008 were recalculated due to the availability of new AD.

48. The ERT commends Slovenia for these numerous improvements, which have increased the completeness and transparency of reporting of emissions from the industrial processes sector.

49. Slovenia’s inventory for the industrial processes sector is generally complete. However, during the review, the ERT noted that the Party did not report CO<sub>2</sub> emissions from limestone and dolomite used in bricks and ceramics production (see para. 51 below)

and did not report emissions other than HFC-134a from refrigeration and air-conditioning equipment (see para. 53 below). Further, HFC emissions from aerosols/metered dose inhalers were reported as “NO” without relevant justification in the NIR (see para. 58 below) and HFC emissions from foam blowing and fire extinguishers were kept constant from 1999 onwards (see paras. 55 and 57 below).

50. Slovenia has implemented most of the recommendations from the previous review report, except for the recommendation to review the EFs used to estimate emissions from domestic refrigeration, stationary air-conditioning and mobile air-conditioning and the revision of the estimates of HFC emissions from foam blowing and fire extinguishers. The ERT acknowledges the Party’s efforts to improve the transparency of the industrial processes sector in the NIR. The ERT notes that Slovenia has addressed all of the recommendations in the previous review report related to the transparency of the descriptions of the cement, lime, aluminium, ferroalloys production and soda ash consumption subcategories.

## 2. Key categories

### Limestone and dolomite use – CO<sub>2</sub>

51. Slovenia has reported CO<sub>2</sub> emissions from the use of limestone and dolomite in iron and steel production and for the reduction of sulphur dioxide (SO<sub>2</sub>) emissions from stationary combustion. Other possible limestone and dolomite uses were not taken into account. During the review, in response to questions raised by the ERT, Slovenia informed the ERT that there is a certain amount of limestone and dolomite used in bricks and ceramics production, these emissions are not included in the inventory. The ERT considered that this issue results in an underestimation of emissions. In response to the list of potential problems and further questions raised by the ERT, Slovenia provided estimates of CO<sub>2</sub> emissions from limestone and dolomite used in bricks and ceramics production which were collected under the European Union emissions trading scheme for the years 2005–2009. The ERT agreed with these estimates. The overall impact of this revision is an increase in emissions of 0.7 Gg CO<sub>2</sub> eq for 2009, equivalent to 0.1 per cent of emissions from the industrial processes sector. The ERT recommends that Slovenia estimate CO<sub>2</sub> emissions from limestone and dolomite used in bricks and ceramics production for the complete time series and transparently document the methodologies, EFs and AD used for the calculations in its next annual submission.

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

52. Slovenia has used the tier 2 method to estimate the actual emissions of HFCs from consumption of halocarbons and SF<sub>6</sub>. The EFs for all subcategories, except for mobile air-conditioning, were taken from research conducted by the Chamber of Commerce and Industry of Slovenia in 1999. As already noted in the previous review report, some of the EFs may be too high, and the ERT reiterates the recommendation that Slovenia review the EFs used, in particular for domestic refrigeration, stationary air-conditioning and mobile air-conditioning, and justify or recalculate them as appropriate.

53. Slovenia has reported emissions of HFC-134a from refrigeration and air-conditioning equipment only, while other HFC emissions are reported as “NO”. In response to a question raised by the ERT during the review, Slovenia presented data on the total import of some fluorinated gas (F-gas) blends (e.g. R-407c, R-410a, R-404a) obtained from the customs office under the recently adopted legislation. Although these data are not ascribed to individual categories, the ERT noted that these F-gas blends are usually used as refrigerants. Slovenia also informed the ERT that it is in contact with individual industries

to obtain further data. Taking into account this information, the ERT noted that the estimation of HFC emissions from refrigeration is incomplete.

54. In response to the list of potential problems and further questions raised by the ERT, after the review week Slovenia provided revised estimates of HFC emissions from stationary air-conditioning, and industrial and commercial refrigeration, which include HFC-32, HFC-125, HFC-143a. The ERT agreed with these estimates. The AD were obtained from the industrial companies (manufacturing data) and from the F-gas database, which was established on the basis of Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases (the EU F-gas Regulation), and contains data on the use of F-gases. As a result of this revision, emissions increased by 88.38 Gg CO<sub>2</sub> eq for 2009, equivalent to 9.4 per cent of emissions from the industrial processes sector. The ERT recommends that Slovenia continue to use data on blends containing F-gases from the recently established F-gas database or other relevant data sources to estimate HFC emissions in its future annual submissions and transparently document the methodologies, EFs and AD used in its NIR.

55. Slovenia has reported a constant value for HFC emissions from foam blowing since 1999. According to the NIR, this value is obtained from a research project conducted by the Chamber of Commerce and Industry of Slovenia in 1999. In response to questions raised by the ERT during the review on the progress in implementing the recommended methods from the IPCC good practice guidance, such as trend extrapolation using a proxy, the Party stated that actual data remain unavailable. In addition, the NIR states that imported products do not contain HFCs. In response to a question raised by the ERT during the review, asking for the source of this information, Slovenia stated that the assumption is also based on the research project conducted by the Chamber of Commerce and Industry of Slovenia in 1999, and, since there is no current information available, this assumption was applied for the recent years of the time series as well. The ERT noted that the market situation for HFCs in foams might have changed significantly since 1999 and that keeping the emissions constant could thus lead to an underestimation of actual emissions.

56. In response to the list of potential problems and further questions raised by the ERT, Slovenia provided additional information which confirmed that all uses of HFCs in foam blowing are included in the inventory. Nevertheless, in its submission of revised estimates, Slovenia changed the methodology used for the estimation of HFC emissions from hard foams, where the use of HFCs occurred during the period 1993–1995. In the inventory, it was assumed that all emissions would occur after disposal (the product life factor (PLF) equals zero). The Party provided revised estimates of HFC emissions from hard foams using a PLF of 4.5 per cent as recommended in the IPCC good practice guidance. The ERT agreed with the emission estimates. The overall impact of this recalculation is an increase in emissions of 1.63 Gg CO<sub>2</sub> eq for 2009, equivalent to 0.2 per cent of emissions from the industrial processes sector. The ERT recommends that Slovenia transparently document the methodologies, EFs and AD used for the calculations in its next annual submission.

57. Slovenia has reported a constant value for HFC emissions from fire extinguishers since 1999. According to the NIR, this value is obtained from a research project conducted by the Chamber of Commerce and Industry of Slovenia in 1999. In response to questions raised by the ERT during the review, Slovenia stated that actual data remain unavailable. The ERT noted that the market situation for HFCs in fire extinguishers might have changed significantly since 1999 and that keeping the emissions constant could thus lead to an underestimation of actual emissions. In response to the list of potential problems and further questions raised by the ERT, the Party provided revised estimates for HFC emissions from fire extinguishers, assuming that all chlorofluorocarbons in fire extinguishers have been replaced with HFCs. The ERT agreed with the estimates. As a result of this revision, HFC emissions increased by 1.07 Gg CO<sub>2</sub> eq for 2009, equivalent to

0.1 per cent of emissions from the industrial processes sector. The ERT recommends that Slovenia transparently document the methodologies, EFs and AD used for the calculations in its next annual submission.

58. Slovenia has reported HFC emissions from aerosols/metered dose inhalers as “NO” without providing a relevant justification in the NIR. During the review, the Party explained that the emissions had not been calculated due to the unavailability of data. The ERT considered that Slovenia did not provide sufficient information to justify that this emission source does not exist in the country. In response to the list of potential problems and further questions raised by the ERT, the Party provided estimates of HFC emissions from aerosols/metered dose inhalers using Austria’s HFC-134a emissions from aerosols/metered dose inhalers per capita data. The ERT agreed with the estimates. The overall impact of this revision is an increase in emissions of 4.87 Gg CO<sub>2</sub> eq for 2009, equivalent to 0.5 per cent of emissions from the industrial processes sector. The ERT recommends that Slovenia collect national data on the use of aerosols/metered dose inhalers containing HFCs for its next annual submission and transparently document the methodologies, EFs and AD used for the calculations.

59. Slovenia states in the NIR that SF<sub>6</sub> emissions from electrical equipment for the years 2006–2009 were recalculated using trend extrapolation, since there were no new data available after 2005. However, during the review, the ERT noted that the emissions were decreasing after 2005 although the emissions trend was increasing until 2005 and no explanation was provided for the trend in the NIR. In response to questions raised by the ERT during the review, Slovenia explained that data on SF<sub>6</sub> emissions for 2009 were obtained directly from the power plants and electrical distribution companies, which have reported the amount of SF<sub>6</sub> used and the leakage rate during product life. The emissions in the other years were calculated by interpolation between 2005 and 2009. The ERT recommends that Slovenia transparently describe the methodologies, EFs and AD used for the calculations of SF<sub>6</sub> emissions from electrical equipment in its next annual submission.

### **3. Non-key categories**

#### Glass production – CO<sub>2</sub>

60. The NIR states that CO<sub>2</sub> emissions from glass production are calculated taking into account the consumption of all carbonates in glass production. The AD on carbonate use in glass production were obtained from the glass producers and IPCC default EFs have been used to estimate the CO<sub>2</sub> emissions. However, during the review, the ERT noted that this method has been used for the years 1999–2009; for the years 1986–1998 the average implied emission factor (IEF) (for the years 1999–2007) is multiplied with the glass production data to calculate the CO<sub>2</sub> emissions. The ERT concluded that two different methods had, therefore, been used over the time series, and that they are not clearly described in the NIR. The ERT recommends that Slovenia provide further details on the EFs, AD and methods used to calculate CO<sub>2</sub> emissions from glass production for the whole time series and on how it has ensured time-series consistency in its next NIR, in order to enhance transparency.

## **D. Agriculture**

### **1. Sector overview**

61. In 2009, emissions from the agriculture sector amounted to 1,996.27 Gg CO<sub>2</sub> eq, or 10.3 per cent of total GHG emissions. Since the base year, emissions have decreased by 10.0 per cent. The key driver for the fall in emissions is the decline in the livestock population, particularly cattle. Within the sector, 37.2 per cent of the emissions were from

agricultural soils, followed by 33.8 per cent from enteric fermentation and 29.1 per cent from manure management.

62. The inventory for the agriculture sector is complete in terms of categories and gases; rice cultivation, savanna burning and field burning of agricultural residues do not occur in the country. The transparency of the inventory is generally sufficient and the Party has responded to the encouragements of the previous ERT, by including, for example, additional information on the application of fertilizers to soils and an explanation for the large decreases in emissions between 2007 and 2008, which were a result of the fall in fertilizer sales due to price increases, and outreach efforts to farmers that encouraged more efficient fertilizer application practices.

63. The ERT noted that Slovenia has made several improvements to its sector-specific QA/QC procedures. This includes comparing the country-specific enteric CH<sub>4</sub> EFs for cattle and swine with IPCC default EFs; comparing country-specific manure management CH<sub>4</sub> EFs for cattle and swine with IPCC default EFs and EFs used in other European countries with similar climates; and comparing the nitrogen (N) excretion (Nex) values for cattle against the IPCC default values. The ERT commends Slovenia for these additional QA/QC measures and encourages the Party to make further efforts in this area.

64. Slovenia has made recalculations for the agriculture sector between the 2010 and 2011 submissions following changes in AD. The impact of these recalculations on the agriculture sector is a decrease in emissions of 0.7 per cent for 2008. The main recalculations took place in the following categories:

(a) Enteric fermentation: minor updates to the 2008 fat content of milk resulted in changes to the enteric CH<sub>4</sub> estimates for dairy cows for 2008;

(b) Manure management: new data on the use of anaerobic digesters resulted in a very small decrease in CH<sub>4</sub> and N<sub>2</sub>O emissions;

(c) Agricultural soils: the inclusion of sewage sludge emissions for the years 2000–2003 resulted in very small increases in N<sub>2</sub>O emissions for those years.

## 2. Key categories

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

65. Slovenia uses the tier 2 approach to estimate enteric CH<sub>4</sub> emissions from cattle. For swine, the tier 1 approach with the IPCC default EF was applied for commercial farms; however, for animals on family farms, a country-specific EF was used because of the unique characteristics of these animals, mainly resulting from the differences in live weight. For all other animal categories, the IPCC tier 1 default EFs were used. The 2010 review report recommended that the Party provide additional information in its NIR on the livestock characterization in order to improve the transparency of its methodology, AD and EFs. A review of the 2011 submission shows that additional information on the characterization for cattle (e.g. milk production) as well as information on the references used to estimate the emissions has been provided. The ERT commends Slovenia for these efforts and encourages the Party to continue to provide further details in the NIR to assist reviewers in evaluating the approach used to estimate enteric emissions from the different livestock categories.

### Manure management – CH<sub>4</sub> and N<sub>2</sub>O

66. Slovenia uses the tier 2 approach to estimate CH<sub>4</sub> emissions from manure management systems. The Party's CH<sub>4</sub> IEF for dairy cattle (55.9 kg/head/year) is much higher than the IPCC default value for Eastern Europe and cool climate regions

(6.0 kg/head/year). Also, the CH<sub>4</sub> IEF for non-dairy cattle (21.6 kg/head/year) is much higher than the IPCC default value for Eastern Europe and cool climate regions (4.0 kg/head/year). The relatively high IEFs per head can be explained by the fact that Slovenia uses the methane conversion factor (MCF) of 39 per cent for liquid systems from the IPCC good practice guidance, which is much higher than the 10 per cent value provided in the Revised 1996 IPCC Guidelines. Slovenia has indicated in the NIR that, as its base year is calculated using the higher 39 per cent value, it believes that it would not be appropriate to switch to the lower 10 per cent value until after the end of the first commitment period of the Kyoto Protocol. If revisions to this category are carried out, the ERT encourages Slovenia to use the more appropriate MCF.

67. Nex rates for cattle and swine are estimated using country-specific methods, while for other animals the IPCC default methods are used. Previous review reports have recommended that the Party include additional information to improve the transparency of these country-specific methods. A review of the 2011 NIR shows that additional information has been provided by Slovenia to improve the transparency of the NIR and justify the use of a country-specific approach for estimating Nex rates for dairy cattle (e.g. milk production by year). However, the ERT recommends that Slovenia include additional supporting data, such as a comparison of the Nex rates for swine with other countries with similar management practices, in order to verify the use of the country-specific Nex rates for swine.

#### Agricultural soils – N<sub>2</sub>O

68. The 2010 review report identified that Slovenia had not estimated the direct and indirect N<sub>2</sub>O emissions associated with the use of sewage sludge on agricultural soils and the ERT recommended that the Party estimate emissions for this subcategory for the entire time series and describe the data used and the method applied. In response to that recommendation, Slovenia has submitted estimates for this subcategory for the period 2004–2008 and has provided the ERT with information on the data used and the method applied. The Party applied the methods from the IPCC good practice guidance and the sewage N content from research conducted in Austria. The 2010 review report concluded that the estimate was acceptable and had been transparently documented. However, the ERT recommended that Slovenia include the methodological information and relevant justifications in the NIR of its next annual submission, together with estimates for the entire time series. In its 2011 submission, Slovenia has provided estimates of direct and indirect N<sub>2</sub>O emissions from sewage sludge for the period 2000–2009. The ERT reiterates the recommendation from the previous review report that, for the years prior to 2000, the Party use methods to estimate the AD, such as those outlined in the IPCC good practice guidance, in order to ensure time-series consistency. The ERT also encourages Slovenia to use a country-specific parameter for the sewage N content rather than the Austrian value.

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

### **1. Sector overview**

69. In 2009, net removals from the LULUCF sector amounted to 8,458.20 Gg CO<sub>2</sub> eq. Since 1986, net removals have increased by 10.0 per cent. The key driver for the rise in removals is the increase in CO<sub>2</sub> removals from forest land remaining forest land. In 2009, net removals of 11,023.27 Gg CO<sub>2</sub> eq were from forest land. Cropland, settlements and grassland were net sources of emissions and accounted for 1,615.34 Gg CO<sub>2</sub> eq, 606.69 Gg CO<sub>2</sub> eq and 343.04 Gg CO<sub>2</sub> eq, respectively.

70. The Party has made recalculations for the LULUCF sector between the 2010 and 2011 submissions due to methodological changes and updated AD and EFs, and as a result

of the reporting of emissions from settlements for the first time. The impact of these recalculations on the LULUCF sector is an increase in net removals of 0.5 per cent for 2008. The main recalculations took place in the following categories:

- (a) Grassland: CO<sub>2</sub> emissions;
- (b) Cropland: CO<sub>2</sub> emissions.

71. The inventory for the LULUCF sector is generally complete, incorporating estimates for all required categories, gases and pools. Slovenia does not estimate emissions from the voluntary reporting categories wetlands remaining wetlands, settlements remaining settlements and other land remaining other land. The ERT noted that small areas of land conversion to and from wetlands, settlements and other land are reported in the CRF tables, but that the associated carbon stock changes are reported as not applicable (“NA”) or “NO”. Slovenia explained in the NIR that, based on expert judgement, these land conversions do not actually occur in the country. The non-existing small areas are reported to ensure a consistent land area representation throughout the time series. The ERT commends Slovenia for providing the explanation in the NIR and reiterates the previous recommendation that the Party provide this information in the documentation boxes of the relevant CRF tables, including a cross reference to the detailed explanation in the NIR for the cases in which AD exist but the corresponding emissions are not estimated. The ERT also encourages Slovenia to explore the possibility of not reporting non-existing small areas, but rather of using the area of other land to ensure land-area consistency.

72. Net CO<sub>2</sub> emissions and removals from forest land, cropland, grassland and settlements show large fluctuations between 2000 and 2001. During the review, the Party explained that the fluctuations are due to the use of data from the National Forest Inventory (NFI) from 2000 and 2007. However, the ERT considers that, at least for forest land remaining forest land, the fluctuation is not justified by the use of NFI data from 2000 and 2007. Slovenia uses the stock-change method to estimate the carbon stock change in living biomass. Since the annual rate of growing stock used to estimate the carbon stock changes between 1986 and 2007 is the same for the 2000 and 2007 NFI data, and the increase in the area of forest land remaining forest land is constant between 1986 and 2009, the carbon stock changes in living biomass are not expected to show large fluctuations. Dead organic matter and soil organic matter contribute only a small amount to emissions and removals. The ERT recommends that Slovenia investigate the fluctuations and report corrected values, or provide a clear explanation of the fluctuations in the next annual submission.

73. The transparency of the LULUCF chapter of the NIR has been improved since the Party’s 2010 submission. Nevertheless, the ERT identified some errors and gaps in the NIR, including inconsistencies in the reporting of the land area among different tables in the NIR, and between the NIR and the CRF tables, despite Slovenia having corrected most of the errors identified in the previous review report. The ERT reiterates the previous recommendation that the Party improve its QC procedures by reviewing the NIR and the CRF tables prior to their submission and that it correct any identified errors in its next annual submission.

74. According to the NIR, Slovenia plans to provide detailed information on the Agricultural Land-Use Maps (ALUMs), which are used for land representation, in the next annual submission. The ERT strongly reiterates the recommendation from the previous review report that the Party provide more information on ALUMs, including information on data processing and analysis, and an assessment of their accuracy in the next annual submission.

## 2. Key categories

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

75. The carbon stock changes in dead wood in each year are estimated by multiplying the ratio of dead wood stock:growing stock from the 2007 NFI (5.69 per cent) with the growing stock in each year. The ERT considers that this method is not scientifically sound. During the review, Slovenia explained that reliable information on the carbon stock changes in dead wood will become available in the 2012 NFI because the dead wood stock will be measured and assessed with the same methodology as in the 2007 NFI. The ERT recommends that the Party report the carbon stock changes in dead wood for the years 2007–2012 applying equation 3.2.12 of the IPCC good practice guidance for LULUCF using data from the 2012 NFI in the NIR of the 2014 submission, provide information on the availability of data from the 2012 NFI in its next annual submission, and explore more accurate methodologies for the estimation of the carbon stock changes in dead wood for the years prior to 2007.

### Land converted to forest land – CO<sub>2</sub>

76. Slovenia has reported the carbon stock changes in dead organic matter as “NA”, applying the tier 1 method from the IPCC good practice guidance for LULUCF, which assumes that the net change is equal to zero. As land converted to forest land is a key category, the ERT recommends that Slovenia report the emissions and removals using a higher-tier method.

77. Slovenia has not reported the carbon stock changes in organic soils. During the review, the Party explained the difficulty of interpreting the description regarding the definition of organic soils on page 3.38 of the IPCC good practice guidance for LULUCF. The ERT recommends that Slovenia set the Party’s definition of organic soils in reference to page G.14 (annex A) of the IPCC good practice guidance for LULUCF and report the carbon stock changes in organic soils in the next annual submission.

### Cropland remaining cropland – CO<sub>2</sub>

78. Slovenia has estimated the carbon stock changes associated with perennial woody crops, the conversion of annual crops to perennial crops, mineral soils and the cultivation of organic soils using tier 2 methods. During the review, the Party provided the ERT with data on the carbon stock changes associated with perennial woody crops, the conversion of annual crops to perennial crops and vice versa, and the associated carbon stock changes. The ERT reiterates the recommendation of the previous review report that Slovenia report the areas of perennial and annual crops and the associated carbon stock changes as separate subcategories in CRF table 5.B, in order to increase transparency.

### Land converted to cropland – CO<sub>2</sub>

79. The ERT commends Slovenia for correcting the errors identified in the previous review report. However, the ERT still identified some errors in the 2011 NIR, including the description of growing stock instead of carbon stock in forest land on page 211 of the NIR (the carbon stocks in biomass immediately before conversion to cropland ( $C_{\text{before}}$ ), equation 18) and the reference to equation 3.4.8 instead of equation 3.3.3 of the IPCC good practice guidance for LULUCF for the calculation of the carbon stock changes in mineral soils on page 212 (equation 21). The ERT reiterates the recommendation from the previous review report that Slovenia correct these errors and improve its QC procedures for its next annual submission.



Grassland – CO<sub>2</sub>

80. Slovenia reports that the area of organic soils in grassland is included in the area of organic soils in cropland. The notation keys “NA” and “IE” are used for the area of organic soils in land converted to grassland and grassland remaining grassland, respectively. The carbon stock changes in organic soils in grassland remaining grassland and land converted to grassland are reported as “NA” in the CRF tables, although the methodology for estimating the carbon stock changes in grassland remaining grassland is presented in the NIR. The ERT recommends that Slovenia, in its next annual submission, provide information on the area and carbon stock changes of organic soils in land converted to grassland, and clear information on the estimated carbon stock changes in organic soils in grassland remaining grassland in the NIR and the related CRF documentation box.

Land converted to settlements – CO<sub>2</sub>

81. Slovenia has estimated the emissions and removals from this category using the tier 2 method from the IPCC good practice guidance for LULUCF. The Party has not provided information on the values used for the carbon stocks in living biomass immediately before conversion to settlements ( $C_{\text{before}}$ ) in its 2011 NIR. The ERT recommends that Slovenia provide information on these values in its next annual submission.

**3. Non-key categories**N<sub>2</sub>O emissions from disturbance associated with land-use conversion to cropland – N<sub>2</sub>O

82. In response to the recommendation in the previous review report, in its 2011 NIR Slovenia has provided for the first time an estimate of N<sub>2</sub>O emissions from disturbance associated with land-use conversion to cropland using the tier 1 methodology from the IPCC good practice guidance for LULUCF. The emissions for this category are reported in CRF table 5(III) as 0.0087 Gg N<sub>2</sub>O. The ERT commends the Party for this improvement in completeness. However, the ERT notes that the annual emissions from this category were reported as 0.271 Gg N<sub>2</sub>O in the NIR, which is different from the value reported in the CRF table. Also, the areas of grassland and forest land converted to cropland are different between the NIR (table 7.4.4) and CRF table 5(III). Further, Slovenia uses a carbon:nitrogen (C:N) ratio of 15.6 based on expert judgement, which is different from the default value of 15.0, but no further information on the basis for the expert judgement was provided in the NIR. The ERT recommends that Slovenia correct these inconsistencies and provide further information on the choice of the C:N ratio in its next annual submission.

**F. Waste****1. Sector overview**

83. In 2009, emissions from the waste sector amounted to 584.12 Gg CO<sub>2</sub> eq, or 3.0 per cent of total GHG emissions. Since the base year, emissions have increased by 3.0 per cent. The key driver for the rise in emissions is the 20.9 per cent increase in emissions from solid waste disposal on land as a result of the increased disposal of municipal waste. Within the sector, 61.8 per cent of the emissions were from solid waste disposal on land, followed by 37.4 per cent from wastewater handling and 0.8 per cent from waste incineration.

84. Slovenia has improved the transparency of its reporting on the waste sector by providing additional information on waste management methods; and the recovery of methane from solid waste disposal sites (SWDS) and from domestic wastewater treatment. However, the ERT encourages the Party to provide additional information on waste flows in order to further improve transparency in its next annual submission.

85. The Party has made recalculations for N<sub>2</sub>O emissions from human sewage for the period 2005–2008 due to new data on protein consumption from the statistical database of the Food and Agriculture Organization of the United Nations (FAOSTAT) for the period 2005–2007. There are no data for the year 2008 and, therefore, updated data for 2007 were applied for 2008. The impact of these recalculations on the waste sector is a decrease in emissions of 0.2 per cent for 2008.

## 2. Key categories

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

86. Slovenia uses the first order decay method (tier 2) and country-specific degradable organic carbon values to estimate CH<sub>4</sub> emissions from solid waste disposal on land. The Party considers its SWDS as managed since 1986 and well-managed since 2008, when all SWDS which did not correspond to required standards were closed. The Party uses an oxidation factor of 0.1 for 2008 onwards and the notation key “NO” for the years prior to 2008. In response to questions raised by the ERT during the review, Slovenia explained that the notation key “NO” has been used instead of the figure “0”. The ERT recommends that the Party report using the figure “0” instead of the notation key “NO”.

### Wastewater handling – CH<sub>4</sub>

87. Slovenia uses the IPCC default methodology to estimate CH<sub>4</sub> emissions from municipal and industrial wastewater. The ERT noted considerable inter-annual changes in the CH<sub>4</sub> emissions from industrial wastewater and sludge. During the review, the Party explained that the emissions mainly follow the trends in industrial production. The ERT encourages the Party to include AD on industrial wastewater in its next NIR, in order to enhance transparency.

88. In the previous review report, the ERT noted that the CH<sub>4</sub> IEF for industrial wastewater and sludge showed a considerable inter-annual change between 2003 and 2004, which was due to the different methodologies applied for the period 1986–2003 and 2004–2009. It was further noted that the two methods may not have produced consistent estimates of emissions from wastewater. The ERT reiterates the recommendation from the previous review report that Slovenia review the data for the period 1986–2003 and recalculate them, if necessary, using methods such as the surrogate method, as outlined in chapter 7 of the IPCC good practice guidance, to ensure a consistent time series. Any recalculations should be described in detail in the NIR.

## 3. Non-key categories

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

89. Slovenia uses default EFs from the IPCC good practice guidance to estimate CO<sub>2</sub> emissions from the incineration of hazardous waste that is not allowed to be disposed. The ERT reiterates the recommendation of the previous review report that the Party increase the transparency of its reporting by including more information on the method applied and data used in the relevant section of the NIR.

## **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. Slovenia has provided general, land-specific and activity-specific information on KP-LULUCF activities in line with the requirements of the annex to decision 15/CMP.1.

91. Slovenia has reported deforestation under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, of the Kyoto Protocol. Afforestation and reforestation are reported as "NO".

92. In response to recommendations from the previous review report, Slovenia has reported that information on deforestation is maintained in the forestry spatial information system managed by the Slovenian Forest Service (SFS) for forest management purposes. However, the Party has not provided detailed information on whether the system covers the whole deforested land area for the entire time series. The ERT recommends that Slovenia provide this information in its next annual submission.

93. Slovenia has reported detailed information on the methods used including the AD and EFs used for the estimation of GHG emissions and removals from KP-LULUCF activities, as recommended in the previous review report. The ERT commends the Party for the improvement in transparency.

94. Slovenia has performed a key category analysis in accordance with the IPCC good practice guidance for LULUCF as recommended in the previous review report and has identified all the KP-LULUCF activities as key categories. Slovenia has not reported on uncertainty assessments or sector-specific QA/QC procedures applied in relation to KP-LULUCF activities. The Party explained in the NIR that the uncertainty assessment for forest land remaining forest land also applies to forest management activity. The ERT notes that, because the area data used for forest management and for forest land remaining forest land are different, the uncertainty of the two should also be different. The ERT reiterates the recommendation from the previous review report that the Party report information on these issues in the next annual submission.

95. Slovenia has reported that ALUMs are used to estimate the area of land for each land-use change under the Convention, but the SFS database is used to estimate the area of land for land transition between activities under the Kyoto Protocol. For 2009, the area of forest land under the Convention (1,243.43 kha) is different to the forest management area under the Kyoto Protocol (1,186.10 kha). During the review, Slovenia explained that one reason for the difference is the different data used for the estimates. The ERT believes that the two values should be similar, although a small difference is expected. The ERT recommends that the Party harmonize the discrepancy of the estimated area between the Convention and the Kyoto Protocol in its next annual submission.

96. The Party has made recalculations for the KP-LULUCF activities between the 2010 and 2011 submissions due to methodological changes and updated AD and EFs. The impact of these recalculations on each KP-LULUCF activity for 2008 is as follows:

- (a) Deforestation: a decrease in net emissions by 2,308.46 Gg CO<sub>2</sub> eq (or 94.0 per cent);
- (b) Forest management: a decrease in net removals by 0.92 Gg CO<sub>2</sub> eq (or 0.01 per cent).

Activities under Article 3, paragraph 3, of the Kyoto Protocol*Afforestation and reforestation – CO<sub>2</sub>*

97. Slovenia reports that natural afforestation of abandoned agricultural land does occur in the country and uses the notation key “NO” in the CRF tables. Any increase in the forest area is therefore covered under forest management. The ERT again acknowledges that this is a conservative approach and that it will not result in an overestimation of removals.

*Deforestation – CO<sub>2</sub>*

98. Slovenia has provided the methods and data sources used to estimate the carbon stock changes in living biomass in the NIR as recommended in the previous review report. The ERT commends the Party for the improvement in transparency.

99. The difference in net CO<sub>2</sub> emissions in all carbon pools from deforestation between 2008 (146.33 Gg CO<sub>2</sub> eq) and 2009 (328.44 Gg CO<sub>2</sub> eq) is quite significant. During the review, the Party explained that the issue would be further examined and re-checked. The ERT welcomes this plan and recommends that Slovenia investigate this issue and report the revised values in the next annual submission, if appropriate.

100. Slovenia has reported in CRF table 5(KP-I)A.2.1 a deforested area of 0.68 kha as the unit of land otherwise subject to elected activities under Article 3, paragraph 4, of the Kyoto Protocol. The ERT notes that the area under this category should be reported as “NA” since the Party only elected forest management for activities under Article 3, paragraph 4, which does not include areas under deforestation. The ERT recommends that the Party report correctly in CRF table KP(K-I)A.2.1 in its next annual submission.

101. In CRF table 5(KP-I)A.2, Slovenia has reported net carbon stock changes in above-ground biomass for forest land converted to cropland and grassland of between 30.68 and 35.57 Mg C/ha. The ERT considers it unlikely that these deforested areas lose above-ground biomass of around 30 Mg C/ha during one inventory year. The ERT reiterates the previous recommendation that Slovenia check the AD and EFs used and revise the estimates and report thereon in its next annual submission, if appropriate.

Activities under Article 3, paragraph 4, of the Kyoto Protocol*Forest management – CO<sub>2</sub>*

102. Slovenia reports that the carbon stock changes in dead wood are estimated using the tier 2 method, which is the same as the method used for forest land remaining forest land under the Convention as recommended by the previous ERT. The ERT commends Slovenia for the improvement.

103. The net carbon stock changes in litter and mineral soils on areas under forest management are estimated as zero using the tier 1 methodology from the IPCC good practice guidance for LULUCF. Slovenia is currently conducting research on the trend of carbon stock in litter and mineral soils. In its NIR, the Party explained that preliminary results show relatively stable carbon stocks in forest mineral soils and litter during the period 1996–2006 and that further research will be conducted for a final conclusion. The ERT believes that demonstrating the stable carbon stock in litter and forest mineral soils is not sufficient to meet the requirement of paragraph 6(e) of the annex to decision 15/CMP.1 and paragraph 21 of the annex to decision 16/CMP.1, which require verifiable information which demonstrates that a pool is not a net source. The ERT strongly recommends that Slovenia estimate and report the carbon stock changes in litter and mineral soils on areas under forest management in the next annual submission, or provide verifiable information, as required in paragraph 6(e) of the annex to decision 15/CMP.1, which demonstrates that

these pools are not net sources in line with section 4.2.3.1 of the IPCC good practice guidance for LULUCF. The ERT encourages the Party to reinvestigate the current research objective, taking into account the above-mentioned requirement of decisions 15/CMP.1 and 16/CMP.1 and the necessity of providing verifiable information that these pools are not net sources during the first commitment period, if not accounted.

## 2. Information on Kyoto Protocol units

### Standard electronic format and reports from the national registry

104. Slovenia 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.<sup>5</sup> 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.

105. Information on the accounting of Kyoto Protocol 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. The national registry has adequate procedures in place to minimize discrepancies.

### National registry

106. 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. The national registry also has adequate security, data safeguard and disaster recovery measures in place and its operational performance is adequate. The Party is encouraged to select, implement and report, in its next annual submission, any changes made to its registry database, infrastructure and/or procedures to support a user authentication mechanism as suggested by the ITL Administrator's Change Advisory Board.

### Calculation of the commitment period reserve

107. Slovenia has reported its commitment period reserve in its 2011 annual submission. The Party reported that its commitment period reserve has not changed since the initial report review (84,265,734 t CO<sub>2</sub> 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

108. Slovenia reported that there have been no changes to its national system since the previous annual submission. The ERT concluded that the Party's national system continues

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<sup>5</sup> 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.

to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

#### **4. Changes to the national registry**

109. Slovenia provided information on the changes to its national registry since its previous annual submission. The Party reported that the national registry has performed testing of new Greta software. Slovenia also stated that, in response to the previous review report, more detailed information on discrepancies and test results were included in the 2011 NIR. The ERT concluded that, taking into account the confirmed changes to the national registry, Slovenia'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 decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP).

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

110. Slovenia did not provide information on changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol in its 2011 submission. However, the ERT identified that Slovenia has increased and improved the information provided, as recommended in the previous review report.

111. Slovenia included a description of the principles taken into account under its Operational Programme for Reduction of Greenhouse Gas Emissions in order to minimize the adverse impacts on developing countries, in particular in relation to carbon leakage prevention. The Party also included a general description of the actions taken under the EU Action Plan on Climate Change. The ERT concluded that, taking into account the confirmed changes in the reporting, the information provided is complete, although the transparency of the reporting could still be improved, and recommends that Slovenia include more information in the next annual submission on the most relevant actions taken and their potential adverse impacts. The ERT also recommends that the Party, in its next annual submission, report any change(s) in its information provided under Article 3, paragraph 14, in accordance with chapter I.H of the annex to decision 15/CMP.1.

### **III. Conclusions and recommendations**

112. Slovenia made its annual submission on 18 April 2011 and resubmitted it on 12 May 2011. 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 the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol). This is in line with decision 15/CMP.1.

113. The ERT concludes that the inventory submission of Slovenia 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 1986–2009 and an NIR; these are complete in terms of geographical coverage, years and sectors, as well as generally complete in terms of categories and gases. Slovenia has not reported the carbon stock changes in organic soils in land converted to forest land, and gaps in the time series of emissions for some categories still remain (see para. 11 above).

114. 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.

115. The Party's inventory is generally in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The ERT commends Slovenia for the improved transparency in the NIR since the previous annual submission.

116. The Party has made recalculations for the inventory between the 2010 and 2011 submissions in response to the 2010 annual review report due to changes in AD and EFs and in order to rectify identified errors. These recalculations had no significant impact on the national total GHG emissions excluding LULUCF for 2008. The impact on the national total GHG emissions including LULUCF is an increase of 0.4 per cent for 2008. The main recalculations took place in the following sectors/categories:

(a) CO<sub>2</sub> emissions from the LULUCF sector, particularly for the grassland and cropland categories, due to methodological changes and the revision of AD and EFs;

(b) CO<sub>2</sub> emissions from iron and steel production due to the inclusion of emissions from total input material for the period 2005–2008;

(c) CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub> and CO<sub>2</sub> emissions from aluminium production for the period 2005–2008 due to the availability of new AD from the producer;

(d) CH<sub>4</sub> and N<sub>2</sub>O emissions from swine manure management due to new data on the use of anaerobic digesters.

117. Slovenia provided information related to activities under Article 3, paragraph 3, and Article 3, paragraph 4, as set out in paragraphs 5–9 of the annex to decision 15/CMP.1 and consistent with decision 16/CMP.1. However, the ERT identified areas that need improvement in relation to the estimation of land areas and carbon stocks (see paras. 95, 99 and 101 above).

118. The Party has made recalculations for the KP-LULUCF activities between the 2010 and 2011 submissions following changes in methodologies, AD and EFs. The impact of these recalculations on each KP-LULUCF activity for 2008 is as follows:

(a) Deforestation: a decrease in net emissions by 2,308.46 Gg CO<sub>2</sub> eq (or 94.0 per cent);

(b) Forest management: a decrease in net removals by 0.92 Gg CO<sub>2</sub> eq (or 0.01 per cent).

119. Slovenia 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.

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

121. 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 CMP decisions.

122. Slovenia has reported information under 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 2011 annual submission. The ERT identified that this information has been reported in accordance with paragraphs 23 and 25 of the annex to decision 15/CMP.1 and is complete and generally transparent and was submitted on time.

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

- (a) The maintenance of time-series consistency when performing recalculations due to methodological improvements;
- (b) The improvement of QC procedures in order to minimize inconsistencies in the CRF tables and the NIR, and between them;
- (c) The further improvement of the transparency of the NIR (see para. 24 above).

124. In the course of the review, the ERT formulated a number of recommendations to improve the information presented in Slovenia's annual submission relating to methodological improvements, the collection of AD and the development of EFs. The key recommendations are that Slovenia:

- (a) Develop country-specific CO<sub>2</sub> EFs for fuels that have a significant share for each of the fuel combustion key categories;
- (b) Revise the values of the EFs used for domestic refrigeration, stationary air-conditioning and mobile air-conditioning;
- (c) Develop and document estimates for the entire time series for foam blowing, fire extinguishers and aerosols/metered dose inhalers;
- (d) Develop estimates for N<sub>2</sub>O emissions from the use of sewage sludge in agricultural soils for the years prior to 2000;
- (e) Investigate the discrepancies and harmonize the land estimates between the LULUCF sector and the KP-LULUCF activities;
- (f) Estimate and report the carbon stock changes in litter and mineral soils on areas under forest management;
- (g) Provide specific quantified uncertainty estimates for the KP-LULUCF activities.

#### **IV. Questions of implementation**

125. 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 Slovenia 2011. Available at <<http://unfccc.int/resource/docs/2011/asr/svn.pdf>>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2011. Available at <<http://unfccc.int/resource/webdocs/sai/2011.pdf>>.

FCCC/ARR/2010/SVN. Report of the individual review of the annual submission of Slovenia submitted in 2010. Available at <<http://unfccc.int/resource/docs/2011/arr/svn.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](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 Ms. Tajda Mekinda Majaron (Environmental Agency of the Republic of Slovenia), including additional material on the methodologies and assumptions used.

## Annex II

### Acronyms and abbreviations

AD	activity data
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
CRF	common reporting format
EF	emission factor
ERT	expert review team
EU	European Union
F-gas	fluorinated gas
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs and SF <sub>6</sub> 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
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
kg	kilogram (1 kg = 1,000 grams)
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
MCF	methane conversion factor
Mg	megagram (1 Mg = 1 tonne)
N	nitrogen
NA	not applicable
NE	not estimated
Nex	N excretion rate
NIR	national inventory report
N <sub>2</sub> O	nitrous oxide
NO	not occurring
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10 <sup>15</sup> joule)
QA/QC	quality assurance/quality control
SEF	standard electronic format
SF <sub>6</sub>	sulphur hexafluoride
SIAR	standard independent assessment report
SO <sub>2</sub>	sulphur dioxide
SWDS	solid waste disposal sites
TJ	terajoule (1 TJ = 10 <sup>12</sup> joule)
UNFCCC	United Nations Framework Convention on Climate Change