Advance Version

COMPLIANCE COMMITTEE **CC/ERT/ARR/2013/31**
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Report of the individual review of the annual submission of the Netherlands submitted in 2012

Note by the secretariat

The report of the individual review of the annual submission of the Netherlands submitted in 2012 was published on 6 August 2013. 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/2012/NLD, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the individual review of the annual submission of the Netherlands submitted in 2012*

* In the symbol for this document, 2012 refers to the year in which the inventory was submitted, and not to the year of publication.

Contents

I. Introduction and summary

1. This report covers the centralized review of the 2012 annual submission of the Netherlands, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 17 to 22 September 2012 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. Mikhail Gytarsky (Russian Federation) and Ms. Batimaa Punsalmaa (Mongolia); energy – Ms. Veronika Ginzburg (Russian Federation) and Mr. Glen Whitehead (Australia); industrial processes – Mr. Vladimir Danielik (Slovakia) and Ms. Detelina Petrova (Bulgaria); agriculture – Ms. Yauheniya Bertosh (Belarus) and Ms. Sumaya Zakieldeen (Sudan); land use, land-use change and forestry (LULUCF) – Mr. Vladimir Korotkov (Russian Federation) and Mr. Yusuf Serengil (Turkey); and waste – Mr. Gábor Kis-Kovács (Hungary) and Mr. Davor Vešligaj (Croatia). Mr. Gytarsky and Ms. Punsalmaa were the lead reviewers. The review was coordinated by Ms. Inkar Kadyrzhanova (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 the Netherlands, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.[1]

3. In 2010, the main greenhouse gas (GHG) in the Netherlands was carbon dioxide (CO_2), accounting for 86.3 per cent of total GHG emissions[2] expressed in carbon dioxide equivalent (CO_2 eq), followed by methane (CH_4) (8.0 per cent) and nitrous oxide (N_2O) (4.5 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 1.3 per cent of the overall GHG emissions in the country. The energy sector accounted for 84.7 per cent of total GHG emissions, followed by the agriculture sector (7.9 per cent), the industrial processes sector (5.0 per cent), the waste sector (2.4 per cent) and the solvent and other product use sector (0.1 per cent). The LULUCF sector was a net source of 3,001.37 Gg CO_2 eq (1.4 per cent of total GHG emissions). Total GHG emissions without LULUCF amounted to 210,053.02 Gg CO_2 eq and decreased by 1.5 per cent between the base year[3] and 2010. The overall emissions trend is mainly driven by the increase in CO_2 emissions in the energy sector (due to increased emissions from energy industries and transport); the decrease in CH_4 emissions from the agriculture sector (due to reduced livestock populations) and the waste sector (due to enhanced waste recovery and recycling); and the decrease in N_2O emissions from the industrial processes sector (due to improved emissions abatement for nitric acid production) and the agriculture sector (due to reduced organic and synthetic fertilizer use). The ERT finds the emission trends reasonable and well justified by the changes in the activity data (AD) for Annex A sources.

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_2, CH_4 and N_2O emissions included in the rows under Annex A sources do not include

[1] The 2012 annual report of the Netherlands was published after the submission of the 2013 annual submission.

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

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

emissions and removals from the LULUCF sector, and also do not include the emissions from deforestation that were included in the Netherlands' initial report under the Kyoto Protocol for the base year and subsequently used for the calculation of the assigned amount.

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

Table 1

Greenhouse gas emissions from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by gas, base year[a] to 2010

			Gg CO_2 eq								*Change (%)*
		Greenhouse gas	*Base year[a]*	*1990*	*1995*	*2000*	*2005*	*2008*	*2009*	*2010*	*Base year–2010*
Annex A sources		CO_2	159 249.26	159 249.26	170 726.62	169 935.96	175 942.79	175 188.69	169 895.26	181 191.43	13.8
		CH_4	25 693.61	25 693.61	24 315.60	19 910.57	17 362.25	17 166.62	17 065.95	16 793.81	–34.6
		N_2O	20 162.15	20 162.15	20 100.81	17 583.91	15 629.35	9 857.19	9 591.87	9 392.39	–53.4
		HFCs	6 018.69	4 432.03	6 018.69	3 891.89	1 523.11	1 921.60	2 039.62	2 282.42	–62.1
		PFCs	1 937.81	2 264.48	1 937.81	1 581.54	266.20	251.07	167.97	208.86	–89.2
		SF_6	286.78	218.28	286.78	296.72	240.00	183.79	170.38	184.10	–35.8
KP-LULUCF	Article 3.3[b]	CO_2						357.82	344.85	361.80	
		CH_4						NE, NO	NE, NO	NE, NO	
		N_2O						0.50	0.53	0.56	
	Article 3.4[c]	CO_2	NA					NA	NA	NA	NA
		CH_4	NA					NA	NA	NA	NA
		N_2O	NA					NA	NA	NA	NA

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

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

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

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

Table 2
Greenhouse gas emissions by sector and activity, base year[a] to 2010

		Gg CO_2 eq								*Change*
	Sector	*Base year[a]*	*1990*	*1995*	*2000*	*2005*	*2008*	*2009*	*2010*	*Base year–2010 (%)*
Annex A	Energy	153 972.32	153 972.32	165 905.57	164 909.60	171 224.46	171 703.20	166 765.42	177 818.94	15.5
	Industrial processes	23 520.99	22 192.49	23 543.17	20 264.04	15 764.17	10 233.49	9 925.29	10 431.85	–55.6
	Solvent and other product use	541.19	541.19	439.85	306.94	212.99	206.57	203.33	170.48	–68.5
	Agriculture	22 529.49	22 529.49	22 191.98	18 830.84	16 939.62	16 757.09	16 696.28	16 623.89	–26.2
	Waste	12 784.32	12 784.32	11 305.74	8 889.18	6 822.46	5 668.62	5 340.75	5 007.86	–60.8
	LULUCF	NA	2 999.95	2 850.39	2 924.29	3 037.33	3 048.48	2 865.47	3 001.37	NA
	Total (with LULUCF)	**NA**	**215 019.75**	**226 236.70**	**216 124.88**	**214 001.02**	**207 617.44**	**201 796.53**	**213 054.39**	NA
	Total (without LULUCF)	**213 348.30**	**212 019.81**	**223 386.31**	**213 200.59**	**210 963.70**	**204 568.96**	**198 931.06**	**210 053.02**	**–1.5**
	Other[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA
KP-LULUCF	Article 3.3[c] Afforestation and reforestation						–404.69	–442.19	–450.88	
	Article 3.3[c] Deforestation						763.01	787.56	813.24	
	Total (3.3)						**358.32**	**345.38**	**362.35**	
	Article 3.4[d] Forest management						NA	NA	NA	
	Article 3.4[d] Cropland management	NA					NA	NA	NA	NA
	Article 3.4[d] Grazing land management	NA					NA	NA	NA	NA
	Article 3.4[d] Revegetation	NA					NA	NA	NA	NA
	Total (3.4)	**NA**					**NA**	**NA**	**NA**	**NA**

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

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

[b] 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.

[c] 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.

[d] 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 3
Information to be included in the compilation and accounting database in t CO_2 eq for the year 2010, including the commitment period reserve

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	901 135 927			901 135 927
Annex A emissions for current inventory year				
CO_2	181 191 432			181 191 432
CH_4	16 793 814			16 793 814
N_2O	9 392 388			9 392 388
HFCs	2 282 424			2 282 424
PFCs	208 856			208 856
SF_6	184 102			184 102
Total Annex A sources	**210 053 016**			**210 053 016**
Activities under Article 3, paragraph 3, for current inventory year				
3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported	–450 883			–450 883
3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported	NA, NE, NO			NA, NE, NO
3.3 Deforestation for current year of commitment period as reported	813 236			813 236
Activities under Article 3, paragraph 4, for current inventory year[c]				
3.4 Forest management for current year of commitment period				
3.4 Cropland management for current year of commitment period				
3.4 Cropland management for base year				
3.4 Grazing land management for current year of commitment period				
3.4 Grazing land management for base year				
3.4 Revegetation for current year of commitment period				
3.4 Revegetation in base year				

Abbreviations: NA = not applicable, NE = not estimated, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).

[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 4
Information to be included in the compilation and accounting database in t CO_2 eq for the year 2009

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2009				
CO_2	169 895 260			169 895 260
CH_4	17 065 953			17 065 953
N_2O	9 591 869			9 591 869
HFCs	2 039 625			2 039 625
PFCs	167 974			167 974
SF_6	170 383			170 383
Total Annex A sources	**198 931 065**			**198 931 065**
Activities under Article 3, paragraph 3, for 2009				
3.3 Afforestation and reforestation on non-harvested land for 2009 as reported	–442 188			–442 188
3.3 Afforestation and reforestation on harvested land for 2009 as reported	NA, NE, NO			NA, NE, NO
3.3 Deforestation for 2009 as reported	787 564			787 564
Activities under Article 3, paragraph 4, for 2009[c]				
3.4 Forest management for 2009				
3.4 Cropland management for 2009				
3.4 Cropland management for base year				
3.4 Grazing land management for 2009				
3.4 Grazing land management for base year				
3.4 Revegetation for 2009				
3.4 Revegetation in base year				

Abbreviations: NA = not applicable, NE = not estimated, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] Activities under Article 3, paragraph 4, are relevant only for Parties that elected one or more such activities.

Table 5
Information to be included in the compilation and accounting database in t CO_2 eq for the year 2008

	As reported	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2008				
CO_2	175 188 688			175 188 688
CH_4	17 166 616			17 166 616
N_2O	9 857 194			9 857 194
HFCs	1 921 601			1 921 601
PFCs	251 071			251 071
SF_6	183 791			183 791
Total Annex A sources	**204 568 960**			**204 568 960**
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2008 as reported	–404 689			–404 689
3.3 Afforestation and reforestation on harvested land for 2008 as reported	NA, NE, NO			NA, NE, NO
3.3 Deforestation for 2008 as reported	–763 008			–763 008
Activities under Article 3, paragraph 4, for 2008[c]				
3.4 Forest management for 2008				
3.4 Cropland management for 2008				
3.4 Cropland management for base year				
3.4 Grazing land management for 2008				
3.4 Grazing land management for base year				
3.4 Revegetation for 2008				
3.4 Revegetation in base year				

Abbreviations: NA = not applicable, NE = not estimated, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.
[c] 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 2012 annual inventory submission was submitted on 14 April 2012; it contains a complete set of common reporting format (CRF) tables for the period 1990–2010 and a national inventory report (NIR). The Netherlands 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 in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were submitted on 20 March 2012. The annual submission was submitted in accordance with decision 15/CMP.1.

7. The expert review team (ERT) also used the 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.[4]

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

Completeness of inventory

9. The inventory covers most mandatory[5] source and sink categories for the period 1990–2010 and is complete in terms of gases and geographical coverage. The ERT notes that although the Netherlands uses the notation key "NO" (not occurring) to report CH_4 emissions from manure management for mules and assess, in response to questions raised by the ERT during the review, the ERT learned that the emissions were not estimated owing to the low population numbers (see para. 75 below). In addition, the ERT noted that in its 2012 annual submission, the Netherlands has reported the following emissions, for which methodologies exist in the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and/or the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), using the notation key "NE" (not estimated): potential emissions of fluorinated gases (F-gases); CO_2, CH_4 and N_2O emissions from biomass

[4] The SIAR, parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5(a), and 6(c) and (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.

[5] Mandatory source and sink categories under the Kyoto Protocol are all source and sink categories for which the Intergovernmental Panel on Climate Change (IPCC) *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* provide methodologies and/or emission factors to estimate GHG emissions.

burning for all subcategories, except for forest land and cropland remaining cropland; and N_2O emissions from disturbance associated with land-use conversion to cropland (see paras. 55, 86 and 87 below). The ERT recommends that the Netherlands obtain the data, calculate the emissions for these categories and include them in its next annual submission. The ERT also noted that the Netherlands has reported the emissions from the following categories using the notation key "NE", for which methods and emission factors (EFs) are not available in the IPCC good practice guidance and/or the Revised 1996 IPCC Guidelines: fugitive CO_2 and CH_4 emissions from distribution of oil products; fugitive CO_2 emissions from other leakage (natural gas); CO_2 emissions from asphalt roofing and from road paving with asphalt; and CH_4 emissions from sludge application on land under agricultural soils (see paras. 37, 65, and 77 below). The ERT encourages the Netherlands to make efforts to estimate and report these emissions in order to improve completeness of its reporting in the next annual submission.

10. The CRF tables provided by the Netherlands are complete, except for some blank cells in CRF Summary table 3, where information on the estimation method and EFs used to calculate CO_2 emissions from cropland is missing for all years of the time series. To enhance the completeness of its reporting, the ERT recommends that the Netherlands fully complete CRF Summary table 3 for the entire time series in its next annual submission.

11. The ERT notes that the 2012 annual submission of the Netherlands was generally prepared in line with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines). In most cases, the notation keys have been consistently used throughout the Netherlands' 2012 annual submission.

12. In its 2012 annual submission, the Netherlands has used the notation key "IE" (included elsewhere) to report several subcategories, such as HFC emissions from foam blowing; information on weight, feeding situation, milk yield, work, pregnancy and digestibility of feed for rabbits, fur-bearing animals and dairy and non-dairy cattle; and nitrogen (N) excretion per animal waste management system for rabbits, fur-bearing animals and poultry for anaerobic lagoons, daily spread, and pasture range and paddock (see paras. 56 and 70 below). However, the explanations provided in the NIR and in the documentation boxes of the relevant CRF tables on the allocation of the emission estimates were not sufficiently clear to allow the ERT to track the emissions in the CRF tables. The ERT recommends that the Netherlands explain the allocation of the emission estimates reported as "IE" in the NIR and in the CRF tables in the next annual submission.

13. In its 2012 annual submission, the Netherlands has documented the choice of methods and the selection of EFs in the CRF tables, but has not provided the descriptions, references and sources of the information, assumptions, EFs and AD used in the NIR, as required by the UNFCCC reporting guidelines. In response to a question raised by the ERT during the review, the Netherlands explained that information on the descriptions of the methods and EFs used was provided in the Monitoring Protocols, which are available on the website of the NL Agency.[6] The ERT reviewed the Monitoring Protocols and noted that they did not always contain a transparent description of the higher-tier methods and country-specific EFs used for the emission estimates (see paras. 38, 58 and 72 below). In accordance with the UNFCCC reporting guidelines, the ERT recommends that the Netherlands include, in the NIR of its next annual submission, the descriptions of the methods and parameters used, particularly for the higher-tier methods and country-specific parameters.

[6] <http://www.agentschapnl.nl/en/programmas-regelingen/monitoring-protocols>.

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

Overview

14. The ERT concluded that the national system continues to perform its required functions.

15. The Netherlands reported that there were no changes to the national system since the previous annual submission.

Inventory planning

16. The NIR and additional information provided by the Netherlands in response to the questions raised by the ERT during the review described the national system for the preparation of the inventory. The Netherlands Ministry of Infrastructure and the Environment (IenM) has overall responsibility for climate change issues, including the preparation of the national inventory. IenM designated the NL Agency as the single national entity responsible for the maintenance of the national system, inventory coordination, the development and implementation of the overall inventory quality assurance/quality control (QA/QC) activities, the submission of the national inventory to the secretariat and the provision of support to the review process. The NL Agency is currently operating under the Dutch Ministry of Economic Affairs, Agriculture and Innovation.[7] Other institutions involved in the preparation of the national inventory include the National Institute for Public Health and the Environment (RIVM), the Netherlands Environmental Assessment Agency (PBL), Netherlands Statistics (CBS), the Netherlands Organization for Applied Scientific Research (TNO), the Centre for Water Management, Deltares and the Wageningen University and Research Centre (WUR). Each institution performs specific functions under the national system, such as data provision, inventory calculations and storage. The description of the national system in the NIR is generally in line with the requirements of decision 19/CMP.1.

17. According to the NIR, the AD are obtained from various sources, including CBS, the Ministry of Agriculture, Nature and Food Quality, PBL, TNO, WUR, individual companies and experts, which operate under inter-agency agreements and individual contracts. The GHG emissions are calculated by the designated experts at RIVM, TNO, Deltares, WUR and other institutions contracted by the NL Agency and RIVM. Some GHG data (e.g. for the industrial processes sector) are obtained from direct measurements at the company level. Most of these activity and emissions data are collected, processed and stored at the Pollutants Emission Register and Inventories (PRTR) database, which is operated by RIVM. In addition, the Netherlands reported in the NIR that the PRTR database is a multifunctional system, which has been designed for reporting under the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. As indicated above, the ERT noted that some emissions were not estimated due to the unavailability of data; however, according to the UNFCCC reporting guidelines, Parties should make efforts to report all GHG sources and sinks. Therefore, the ERT recommends that the Netherlands further enhance the functionality of its national system and report, in its next annual submission, emissions from all categories for which IPCC methodologies and EFs are available and encourages the Netherlands to make further efforts to report emissions from all other categories for which IPCC methodologies are not available.

[7] <http://www.agentschapnl.nl/en/organisatie/about-nl-agency>.

18. As indicated in the NIR, the Netherlands' reporting on the LULUCF sector under the Convention and the supplementary information provided under the Kyoto Protocol (KP-LULUCF) are based on spatially explicit land-use maps, which form the basis for the compilation of the land-use change matrix (see para. 101 below). The ERT noted that according to the information provided in the NIR, the production of the next land-use map is planned for 1 January 2013. The ERT reiterates the recommendation in the previous review report that the Netherlands ensure that sufficient resources and planning are put in place in order to ensure that this map is produced on time.

Inventory preparation

Key categories

19. The Netherlands has reported key category tier 1 and tier 2 analyses, both level and trend assessment, as part of its 2012 annual submission. The Netherlands has included the LULUCF sector in its key category analysis, which was 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). The key category analyses performed by the Netherlands and that performed by the secretariat[8] produced different results owing to the different level of disaggregation used and the different structure of the key categories applied by the Netherlands.

20. In the NIR, the Netherlands has included the results of the key category analysis for 2010 only. In CRF table 7, the Netherlands has provided information on 1990, 1995 (information on F-gases only), 2008, 2009 and 2010 and has not included information on the other years of the time series. To enhance the completeness of the reporting and the consistency between the NIR and the CRF tables, the ERT encourages the Netherlands to fill in CRF table 7 for the entire time series in its next annual submission.

21. In response to questions raised by the ERT during the review, the Netherlands explained that it uses the results of the key category analysis to prioritize the inventory improvements. The Netherlands informed the ERT that it has a national inventory improvement plan, which is prepared annually on the basis of the results of the key category analysis, the QA/QC procedures and the recommendations in the previous review reports. However, the ERT noted that this information has not been included in the NIR, even though the use of the results of the key category analysis for the prioritization of the inventory improvements has been consistently raised in recommendations in the previous review reports. The ERT reiterates the recommendation in the previous review report that, in its next annual submission, the Netherlands describe, in the NIR, how the results of the key category analysis have been used for the improvement of the inventory.

Uncertainties

22. The Netherlands has performed a tier 1 uncertainty analysis in accordance with the IPCC good practice guidance and the default uncertainty data. In the 2012 annual submission, the uncertainties of the total GHG emissions without LULUCF estimated using the tier 1 method are 3.0 per cent for the level assessment and 3.3 per cent for the trend assessment, and are 2.0 per cent lower than the estimates in the 2011 annual submission.

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

The reasons for the difference in the uncertainty estimates were not clearly explained in the NIR. Furthermore, it is still unclear from the NIR how the results of the uncertainty assessment have been used to prioritize the improvement of the inventory, even though this issue has been consistently raised in the previous review reports. The ERT recommends that the Netherlands explain the difference in the uncertainty estimates for the consecutive annual submissions. The ERT further reiterates the recommendation from the previous review reports that the Netherlands document, in its next annual submission, how the results of the uncertainty analysis have been used for the improvement of the inventory.

Recalculations and time-series consistency

23. Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that the recalculations reported by the Netherlands of the time series 1990–2009 have been undertaken to take into account: the inclusion of missing estimates (energy and waste sectors); the correction of errors (agriculture sector); improvements in AD and methods (energy and industrial processes sectors); the correction of errors and the reallocation of emissions between categories (agriculture sector); the implementation of the 2009 land-use map (LULUCF sector); and recommendations from the previous review reports (waste sector) (see paras. 35, 53, 67, 80 and 89 below). The impact of the recalculations is an increase in estimated total GHG emissions without LULUCF of 14.76 Gg CO_2 eq, or 0.01 per cent, for 1990 and a decrease of 141.51 Gg CO_2 eq, or 0.1 per cent, for 2009. The explanatory information, including the justification for these recalculations and the methods used, has been adequately documented and provided in the NIR and explanations have also been provided in CRF table 8(b). Time-series consistency has been maintained for all recalculated categories.

Verification and quality assurance/quality control approaches

24. The Netherlands conducts the tier 1 QA/QC procedures and verification in line with the IPCC good practice guidance. The QA/QC procedures are supervised by the NL Agency, while the verification is coordinated by RIVM. The sector-specific QC checks are implemented by the experts from the institutions responsible for specific parts of the inventory. These are applied to supporting AD, parameters and emission estimates as part of the inventory preparation cycle. The ERT also noted that cross-checks between the emissions data in the NIR, the European Union emissions trading scheme (EU ETS) and the national energy statistics are applied to avoid data inconsistencies. The QA procedures include an annual peer review of the draft inventory report prior to its submission to the UNFCCC secretariat and the implementation of recommendations made in the previous review reports. The QA/QC plan, along with its specific activities and responsible institutions, is described in the NIR. The national inventory verification is performed through cross-checks of historical data and emission trends and at special workshops, where the inventory outcomes are considered. However, the ERT noted that the recommendation in the previous review report that the Netherlands improve the transparency of the QC checks for plant-specific data in the energy sector has not been addressed (see para. 43 below). However, the ERT noted that additional efforts should be undertaken to enhance the functionality of the Netherlands' national system. Further, the ERT noted the inconsistent reporting of emissions in the NIR and in the CRF tables (see para. 64 below) and the need to enhance the QA/QC procedures (see paras. 43, 50 and 57 below). The ERT further noted that the same issue has been raised for the industrial processes sector (see para. 58 below). The ERT reiterates the recommendation in the previous review report that the Netherlands improve the QC checks applied to plant-specific data and describe them in its next annual submission.

Transparency

25. The descriptions of the data sources, methods and parameters used to calculate the emissions for most sectors were provided in the stand-alone Monitoring Protocols uploaded onto the NL Agency website. These protocols are listed in annex 6 to the NIR as information that should be considered as part of the NIR of this annual submission. The ERT noted inconsistencies between the Monitoring Protocols, the NIR and the CRF tables for the energy sector (see para. 38 below). Further, the planned improvements for road transportation were described in the NIR, but were not included in the relevant Monitoring Protocols (12–006 Road Transport CO_2 and 12–007 Road Traffic) (see para. 49 below). The ERT further noted that the lack of transparency regarding the description of the calculation methods was raised in the previous review report. The ERT recommends that the Netherlands strengthen the arrangements under the national system, in order to ensure complete, updated and transparent descriptions of the methods used to calculate the emissions in the NIR and in the Monitoring Protocols.

26. The Netherlands reported the AD and implied emission factors (IEFs) used to calculate the N_2O emission estimates for nitric acid production, and production and consumption of halocarbons and SF_6 as "C" (confidential). Although the NIR (page 30) states that the confidential information would be made available during the review, the Netherlands did not provide sufficient explanations of the methods, parameters and underlying data used for the inventory estimates in response to the questions raised by the ERT during the review (see paras. 56, 58 and 62 below). Although the ERT understands the importance of confidentiality issues for the Party, the ERT recommends that in order to improve the transparency of the next annual submission, the Netherlands elaborate on alternative ways for reporting the data, methods and parameters used for the estimation of emissions in line with the UNFCCC reporting guidelines and without violating existing country-specific rules on confidentiality.

27. The ERT identified several cases where the notation keys "NE", "IE" and "NO" (not occurring) were incorrectly used. For example, the notation key "IE" should be used instead of the notation key "NE" to report CO_2 emissions from other leakage (natural gas), in order to correct the error identified by the ERT during the review (see para. 50 below).

Inventory management

28. According to the NIR, the Netherlands has established an archiving system, which includes information on the disaggregated EFs and AD, and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. The archived information also includes internal documentation on QA/QC procedures and verification, documentation on annual key categories and key category identification and planned inventory improvements. The archiving is performed by RIVM as part of the PRTR database. The ERT noted that the Netherlands has developed a software application for the electronic transfer of AD and emission estimates from the PRTR database to the CRF tables in order to reduce random errors and avoid inconsistencies. The ERT further noted that the LULUCF and KP-LULUCF data, parameters and emission/removal estimates are archived by WUR, but are nevertheless treated as part of the PRTR database in accordance with the agreement between RIVM and WUR. In response to a question raised by the ERT during the review, the Netherlands provided the ERT with the requested additional archived information on the QA/QC procedures and inventory improvements.

3. Follow-up to previous reviews

29. The Netherlands has implemented a set of inventory improvements in response to the recommendations made in the previous review reports. These are described in a

separate section of and in an overview table in the NIR, which allow the ERT to track the relevant changes in the emission estimates. The major inventory improvements include:

(a) The improvement of the description of the inventory planning process in the NIR;

(b) The provision of missing estimates, including: CH_4 emissions from charcoal production and use; CO_2, CH_4 and N_2O emissions from compressed natural gas used in road transportation; fugitive CO_2 emissions from natural gas transmission; CO_2 emissions from iron and steel production; CH_4 emissions from enteric fermentation; and N_2O emissions from septic tanks under wastewater handling;

(c) Updates of the uncertainty analysis and documentation thereof in the NIR;

(d) The enhancement of the description of the recalculations and QA/QC procedures undertaken for the national inventory;

(e) The enhancement of the estimation methods for the LULUCF sector and the KP-LULUCF activities due to the use of data from the new land-use change map, and the estimation of the carbon stock changes for deforestation and for lands converted to grassland and cropland.

30. However, not all of the recommendations made in the previous review reports have been addressed by the Netherlands, including:

(a) Documenting in the NIR how the results of the key category and uncertainty analyses have been used for the improvement of the inventory;

(b) Documenting the QC procedures applied to the data submitted by the individual companies to the PRTR database;

(c) Enhancing the Monitoring Protocols to reflect the calculation methods used in the inventory preparation process.

31. The sector-specific recommendations which have not yet been addressed by the Netherlands are discussed in the relevant sector chapters of this report. The ERT recommends that the Netherlands address the pending recommendations from the previous review reports in its next annual submission.

4. Areas for further improvement identified by the expert review team

32. During the review, the ERT identified a number of areas for improvement. These are listed in table 6 below.

33. The recommended improvements relating to specific categories are presented in the relevant sector chapters of this report and in table 6 below.

B. Energy

1. Sector overview

34. The energy sector is the main sector in the GHG inventory of the Netherlands. In 2010, emissions from the energy sector amounted to 177,818.94 Gg CO_2 eq, or 84.7 per cent of total GHG emissions. Since 1990, emissions have increased by 15.5 per cent, with a 6.6 per cent increase occurring between 2009 and 2010. The key drivers for the rise in emissions are the increase in the consumption of natural gas in public electricity and heat production, reflecting the increased demand for electricity (including as a result of the colder weather conditions in 2010) and the increase in diesel oil consumption in road transportation, reflecting the increase in the vehicle fleet. The emission trends for the

energy sector are variable and are impacted by temperature patterns and the amount of electricity imported from other countries. For example, the relatively high level of emissions from the energy sector in 1996 is mainly explained by a very cold winter, which increased energy use for space heating in the residential sector. Conversely, the relatively low level of emissions from the energy sector in 1999 was due to a decrease in emissions from energy industries owing to an increase in imported electricity and a shift from the use of coal to residual chemical gas and natural gas. Within the sector, in 2010, 37.5 per cent of the emissions were from energy industries, followed by 25.8 per cent from other sectors, 19.7 per cent from transport and 15.4 per cent from manufacturing industries and construction. Fugitive emissions from oil and natural gas accounted for 1.0 per cent and fugitive emissions from solid fuels accounted for 0.6 per cent. The remaining 0.2 per cent were from the category other (energy).

35. The Netherlands has made recalculations for the energy sector between the 2011 and 2012 annual submissions for the years 1990–2009 following changes in AD and EFs and in order to rectify identified errors. For example, the EFs for motorcycles and mopeds were updated after the completion of a study and the AD for other (energy) were corrected for the years 2007–2009 following the collection of updated data from the Ministry of Defence. The net impact of these recalculations on the energy sector is a decrease in emissions of 4.2 Gg CO_2 eq, or 0.003 per cent, for 1990 and of 1.5 Gg CO_2 eq, or 0.001 per cent, for 2009. The main recalculations took place in the following categories:

(a) CO_2 emissions from other (mobile) and other (manufacturing industries and construction), due to updated AD from the Ministry of Defence and from a research project on the load factor for diesel forklift trucks (an increase in emissions of 32.95 Gg CO_2 eq, or 0.7 per cent);

(b) CH_4 emissions from road transportation, due to updated EFs for mopeds and motorcycles derived from an updated model for two-wheeled vehicles in the Netherlands which is based on international literature and a vehicle fleet model developed using fleet and sales data from CBS (a decrease in emissions of 0.22 Gg CO_2 eq, or 8.0 per cent).

36. The ERT considers that these recalculations are consistent with the methodologies contained in the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. The recalculations have generally been documented in the NIR and in the associated Monitoring Protocols, with the exception of the recalculations of fugitive CH_4 emissions from oil refining. In response to a question raised by the ERT during the review, the Netherlands confirmed that the recalculations were performed in order to correct calculation errors made during the submission of the revised emission estimates in response to the 2011 annual review report. The ERT accepts these recalculations and recommends that the Netherlands improve the transparency of its reporting by providing documentation on all recalculations in the NIR and in the CRF tables, including any changes to the AD, EFs or methods applied, in its next annual submission.

37. The Netherlands' reporting of emissions is complete in terms of categories and gases, years and geographical coverage and the emission estimates have been prepared and reported in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. The ERT noted that some categories were reported using the notation key "NE", such as fugitive CH_4 and CO_2 emissions from distribution of oil products and from other (oil); and fugitive CO_2 emissions from other leakage (natural gas). The ERT further noted that IPCC methods and/or EFs are not available for these categories. The ERT encourages the Netherlands to explore options for reporting the missing emission estimates in its next annual submission when the necessary data become available.

38. The inventory for the energy sector is transparent. Additional information was provided in the documentation published on the website of the NL Agency. The ERT noted

some inconsistencies in the information reported both in the Monitoring Protocols and in the NIR; for example, Monitoring Protocol 12–002 (Stationary Combustion Fossil) incorrectly identifies the method used to estimate N_2O emissions from stationary combustion as tier 2, while the NIR (pages 50, 55 and 66) and CRF Summary table 3 correctly identify the method as tier 1. The ERT recommends that the Netherlands ensure that all information is consistently reported in the NIR, the CRF tables and other national inventory documentation, such as the Monitoring Protocols, in its next annual submission.

39. The ERT noted that the Netherlands has not addressed all of the recommendations in the previous review report, such as those related to: the reporting of the apparent consumption in CRF table 1.A(c); the reallocation of combustion-related emissions from coke production in iron and steel plants from the iron and steel category to the manufacture of solid fuels and other energy industries category; and the transparency of the category-specific QC procedures. In response to questions raised by the ERT during the review, the Netherlands indicated that these recommendations have been reviewed and will be addressed in its next annual submission. The ERT recommends that the Netherlands address all pending recommendations relating to the energy sector made in the previous review reports in its next annual submission.

40. The Netherlands has performed a tier 1 uncertainty assessment for the energy sector. The ERT noted that the Netherlands used expert judgement to derive the uncertainty estimates for many categories in the energy sector (e.g. transport and fugitive emissions from oil and natural gas). The information sources used for the expert judgement include: the default uncertainty estimates provided by the IPCC good practice guidance, uncertainty data provided by the national experts and data from the RIVM fact sheets on calculation methodologies and data uncertainty.

41. The Netherlands maintains and publishes a national fuels list which is available as a link on the website of the NL Agency, and the key fuels and EFs are reproduced in annex 2 to the NIR. The list contains a mix of country-specific and IPCC default EFs which are used in the inventory. Some of the EFs are estimated annually (e.g. waste and natural gas), while others are used throughout the time series. As part of the QA/QC system for the national inventory, the NIR states that this list will be evaluated every three years. The latest update of the list was published in 2011. Since 2009, a country-specific EF has been included for the incineration of waste for energy purposes. The ERT recommends that the Netherlands review the appropriateness of the IPCC default EFs used, with the aim of calculating more country-specific EFs, particularly for fuels associated with a large proportion of emissions from fuel combustion.

42. The Netherlands has implemented a number of category-specific QA/QC procedures and activities in the energy sector; these procedures are described in the NIR and in the Monitoring Protocols. The Netherlands uses EU ETS data to verify the inventory data for QC purposes. Each year, the Netherlands commissions a report to compare the data reported under the EU ETS with the company data included in the national energy statistics. The latest report (de Ligt, 2011)[9] provided to the ERT during the review concludes that the two data sets are largely consistent. Significant differences are explained by variations in the coverage of reporting (e.g. the reporting of biomass is not included in the EU ETS data, and industrial processes are not reported under the EU ETS for certain categories). The ERT welcomes this verification activity and recommends that the Netherlands continue to perform this activity at regular intervals.

43. For stationary combustion, the AD used for the estimation of emissions from fuel combustion are derived from the national energy statistics published by CBS (plant-specific

[9] De Ligt TJ. 2011. *Analyse Verschillen CO_2-eq.-Emissies EU-ETS en MJV-Rapportages 2010 t.b.v. NIR 2012*. Utrecht.

energy data are available for the major emitters). QC checks and procedures are conducted on the emission estimates and certain company data may be rejected and revised. In response to a question raised by the previous ERT, the Netherlands indicated that the gaps in data (emissions) of individual companies are due to the rejection of PRTR data during the first round of QC checks (the local authority review) and the inability to resubmit the revised emission estimates in time for the compilation of the inventory. In cases where PRTR data are rejected, the country-specific EFs are used to calculate the emissions from these companies (using data from the national energy statistics and, where possible, plant-specific energy data). This situation only occurs as an exception and the emissions are recalculated when the data from these companies become available. However, the ERT notes that this process is not transparently reported in the NIR. The ERT reiterates the recommendation in the previous review report that the Netherlands improve the transparency of its reporting by including, in the NIR of its next annual submission, a more transparent description of the QC procedures performed for the plant-specific data.

2. Reference and sectoral approaches

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

44. The Netherlands has calculated CO_2 emissions from fuel combustion using the reference and sectoral approaches for all years of the time series. For 2010, the CO_2 emissions calculated using the reference approach are 3.3 per cent higher than those estimated using the sectoral approach. The differences between the two approaches range across the time series from –7.7 per cent to 4.2 per cent and have been transparently explained in annex 4 to the NIR. The ERT welcomes the transparent description of the recalculation explanations provided and the feedstock component in the reference approach included in the NIR. However, as noted in the previous review report, in CRF table 1.A(c), the apparent energy consumption excluding feedstocks and non-energy use of fuels has been reported as not applicable ("NA") for liquid, solid and gaseous fuels and "0" has been reported for other, which leads to an overestimation of the difference between the reference and the sectoral approaches. In response to a question raised by the ERT during the review, the Netherlands confirmed that the reporting of the apparent consumption in CRF table 1.A(c) is scheduled for the next annual submission. The ERT reiterates the recommendation made in the previous review report that the Netherlands report this information in its next annual submission.

International bunker fuels

45. Emissions from aviation and marine bunkers are estimated using tier 2 methodologies based on the national energy statistics published by CBS. For navigation, the distinction between national and international navigation based on t/km travelled by ships is achieved through the use of the Dutch Emission Monitor Shipping system. For aviation, domestic fuel consumption is estimated based on an internal study from 2000, while international fuel consumption is derived from the national energy statistics. The ERT concluded that the emissions from international bunker fuels were calculated in accordance with the IPCC good practice guidance and the Revised 1996 IPCC Guidelines.

Feedstocks and non-energy use of fuels

46. The ERT noted that the reporting of feedstocks and non-energy use of fuels is in accordance with the Revised 1996 IPCC Guidelines. The ERT noted the Netherlands' planned improvement to account for feedstocks and non-energy use of fuels in the reference approach, as outlined in paragraph 44 above.

3. Key categories

Stationary combustion: solid, liquid and gaseous fuels – CO_2, CH_4 and N_2O[10]

47. The IEF used by the Netherlands for stationary combustion of liquid fuels in public electricity and heat production (61.56 t CO_2/TJ in 2010) is lower than for all other reporting Parties (70.95 t CO_2/TJ – 254.39 t CO_2/TJ in 2010) and is unstable throughout the time series, decreasing by 19.7 per cent between 1990 and 2010. The NIR provides a limited explanation for this trend, noting only the increased consumption of chemical waste gas. In response to a question raised by the ERT during the review, the Netherlands provided detailed information on the fuels combusted and their respective EFs throughout the time series. The major driver for the low IEF was the company-specific chemical waste gas EFs. In many cases, the values of these EFs were significantly lower than the values of the country-specific EFs published in the Netherlands' national fuel list. The ERT recognizes that the emission estimates for chemical waste gas are based on company data and that confidentiality constraints will need to be considered when implementing the recommendations to increase transparency. To improve the transparency of its reporting, the ERT recommends that the Netherlands provide a more transparent description, including additional information on the AD and EFs, to justify the low value of the IEF reported, in the next annual submission.

48. The ERT noted that the Netherlands has reported CO_2, CH_4 and N_2O emissions from stationary combustion from on-site coke production in iron and steel plants under iron and steel production. This allocation of emissions is not consistent with the Revised 1996 IPCC Guidelines, which require these emissions to be reported under manufacture of solid fuels and other energy industries. In response to a question raised by the ERT during the review, the Netherlands confirmed that this issue is currently under investigation. The ERT reiterates the recommendation made in the previous review report that the Netherlands correctly allocate these emissions in its next annual submission.

Road transportation: liquid fuels – CO_2 and N_2O[11]

49. In the planned improvements section of the NIR, the Netherlands has outlined two planned improvements with regard to road transportation. First,, the Netherlands is planning to undertake a study to update the N_2O EFs. The ERT noted that the N_2O EFs used for road transportation have not been updated since 2003 and may not accurately reflect the emissions from the current vehicle fleet. Additionally, the Netherlands is planning to verify the appropriateness of the current CO_2 EFs for diesel oil and gasoline, which were last reviewed in 2004. The ERT welcomes both of these planned improvements and recommends that the Netherlands report on the progress made in that regard in its next annual submission. The ERT noted that these planned improvements are listed in the NIR; however, they are not listed in the Monitoring Protocols (12–006 Road Transport CO_2 and 12–007 Road Traffic). The ERT recommends that the Netherlands ensure the consistency in the reporting between the NIR and other inventory documentation in its next annual submission.

[10] Not all emissions related to all gases under this category are key categories, particularly CH_4 emissions from solid and liquid fuels and N_2O emissions from solid, liquid and gaseous fuels. However, since the calculation procedures for issues related to this category are discussed as whole, the individual gases are not assessed in separate sections.

[11] Not all emissions related to all gases under this category are key categories, particularly N_2O emissions. However, since the calculation procedures for issues related to this category are discussed as whole, the individual gases are not assessed in separate sections.

4. Non-key categories

Natural gas – other leakage: CO_2

50. The Netherlands has used the notation key "NE" to report fugitive CO_2 emissions from other leakage (natural gas). In response to questions raised by the ERT during the review, the Netherlands confirmed that the notation key used was incorrect and that the notation key "IE" should be used instead, as CO_2 emissions from other leakage (natural gas) are included under natural gas distribution. The ERT recommends that the Netherlands review the use of the notation keys in its next annual submission, correct the identified error and improve the QC procedures related to the information provided in the CRF tables.

C. Industrial processes and solvent and other product use

1. Sector overview

51. In 2010, emissions from the industrial processes sector amounted to 10,431.85 Gg CO_2 eq, or 5.0 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 170.48 Gg CO_2 eq, or 0.1 per cent of total GHG emissions. Since the base year, emissions have decreased by 55.6 per cent in the industrial processes sector and decreased by 68.5 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 N_2O emissions from nitric acid production due to the installation of emission abatement equipment, which led to a 94.6 per cent reduction in emissions during the period 2006–2010. The other major contributors to the decrease in emissions from the industrial processes sector are related to the production of HCFC-22 and the corresponding HFC-23 emissions, which decreased by 94.2 per cent during the period 1998–2010 due to the installation of a thermal afterburner, and to aluminium production and the corresponding PFC emissions, which have decreased by 97.0 per cent since the base year due to the switch from side-feed to point-feed technology during the period 1998–2003.

52. Within the industrial processes sector, in 2010, 49.1 per cent of the emissions were from chemical industry, followed by 20.5 per cent from consumption of halocarbons and SF_6, 12.0 per cent from mineral products, 10.1 per cent from metal production, 4.6 per cent from production of halocarbons and SF_6 and 3.4 per cent from other (industrial processes). The remaining 0.3 per cent were from the other production.

53. The Netherlands has made recalculations for the industrial processes sector between the 2011 and 2012 annual submissions following changes due to the use of new AD. The impact of these recalculations on the industrial processes sector is an increase in emissions of 0.96 Gg CO_2 eq, or 0.004 per cent, for 1990 and an increase of 19.24 Gg CO_2 eq, or 0.2 per cent, for 2009. The main recalculations took place in the following categories:

(a) N_2O emissions from nitric acid production, due to the use of AD from the EU ETS verified reports for 2009 (an increase in emissions of 45.52 Gg CO_2 eq, or 4.3 per cent);

(b) HFC emissions (for 1995–2009) and SF_6 emissions (for 1990–2009) from consumption of halocarbons and SF_6, due to the provision of new AD (a decrease in emissions of 26.09 Gg CO_2 eq, or 1.3 per cent, for 2009).

54. The Netherlands has made recalculations for the solvent and other product use sector between the 2011 and 2012 annual submissions following changes due to the use of new AD for 2009 for the categories paint application and other (solvent and other product use). The impact of these recalculations on the solvent and other product use sector is an increase

in emissions of 7.98 Gg CO_2 eq, or 4.1 per cent, for 2009 and no changes in the emissions for 1990.

55. The inventory for the industrial processes sector is complete in terms of geographical coverage, gases, years and categories. However, the ERT noted that potential HFC, PFC and SF_6 emissions under consumption of halocarbons and SF_6 were reported as "NE". The ERT noted that there are IPCC methodologies available to estimate these emissions (see para. 63 below). The ERT further notes that CO_2 emissions from asphalt roofing and from road paving with asphalt were reported using the notation key "NE" (see para. 65 below). The ERT encourages the Netherlands to estimate these emissions in its next annual submission.

56. With regard to the transparency of the reporting in the NIR, the methods and data used to calculate the emissions are generally explained and referenced to the specific background information provided in the Monitoring Protocols. However, the ERT considers that the transparency of the inventory continues to be affected by the use of the notation key "C" to report the AD and EFs for categories such as ammonia production, nitric acid production, silicon carbide production and ethylene and caprolactam production, and by the use of the notation key "IE" to report the confidential HFC emissions from aerosols and foam blowing and the SF_6 emissions from semiconductor manufacture and electrical equipment reported under the subcategory other (consumption of halocarbons and SF_6). The ERT recommends that the Netherlands find alternative ways to report the AD, EFs and emission estimates referred to above without violating the existing country-specific rules on confidentiality, in order to improve the transparency of the reporting in its next annual submission.

57. The ERT noted that the Netherlands has applied general QC procedures to the inventory for the industrial processes sector, which are described in the Monitoring Protocols. For N_2O emissions from nitric acid production, the EU ETS data are used for verification. The ERT commends the Netherlands for this effort. However, for confidential categories (e.g. emissions from HCFC-22 production) only information on the emissions reported in the annual environmental reports to the PRTR database is transferred to the relevant inventory expert. The ERT recommends that the Netherlands further improve the category-specific QC activities and verification procedures, in cases where the AD and EFs are confidential, and to include information on the results in the NIR of its next annual submission.

2. Key categories

Nitric acid production – N_2O

58. The Netherlands has applied a tier 2 approach based on a plant-specific EF of 7.4 kg N_2O/t nitric acid produced to estimate N_2O emissions from nitric acid production for the period 1990–1998. The plant-specific EF is based on measurements taken in 1998 and 1999, which were used to determine a country-specific EF for the period 1990–1998. From 1999 onwards, the emission estimates are based on the measurements taken annually. The Netherlands could not provide the ERT with the relevant information on the measurements taken in 1998 and 1999 due to the confidentiality of the business information. Therefore, the emissions for the period 1990–1998 and the time-series consistency could not be assessed by the ERT. The ERT reiterates the recommendation in the previous review report that the Netherlands retrieve the results of the measurements taken in 1998 and 1999 in order to demonstrate time-series consistency in the next annual submission. The ERT further recommends that the Netherlands archive all measurement results properly, and make that information available for review by the ERT.

Iron and steel production – CO_2

59. In response to questions raised by the ERT during the review, the Netherlands clarified information on the emissions from electric arc furnaces in the iron and steel industry by providing a detailed carbon mass balance for 2009 showing all the inputs and outputs in the iron and steel production processes and how these carbon flows are accounted for in the energy and industrial processes sectors. The ERT was satisfied with the explanation provided by the Netherlands. The ERT reiterates the recommendation in the previous review report that the Netherlands include this information on the carbon mass balance for iron and steel production in the NIR of its next annual submission.

Production of halocarbons and SF_6 – HFCs

60. The reporting of this category is based on emissions documented in the annual environmental reports provided by the local authorities. The ERT notes that the companies are not obliged to report the relevant AD and EFs in the annual environmental reports and that the information can be difficult to collect due to confidentiality reasons. The quality of the emission estimates and measurements in the reports is ensured by the companies and the local authorities. However, the Netherlands has not provided information in the NIR on the relevant QC procedures carried out by the companies and the local authorities on the emission estimates. The ERT was therefore unable to assess the quality, completeness and consistency of the emission estimates for the entire time series. In response to a question raised by the ERT during the review, the Netherlands explained that, during the verification of the annual environmental reports in March 2012, in addition to the competent authorities, the industrial processes expert from the inventory team also had access to reliable and accurate information from the companies. The ERT recommends that the Netherlands enhance the category-specific QA/QC procedures to verify the plant-specific information provided by the companies, in accordance with the IPCC good practice guidance, and provide the results in the NIR of its next annual submission.

Consumption of halocarbons and SF_6 – HFCs

61. The calculations of HFC emissions from stationary refrigeration are based on a stock model and assumptions are used for the average lifetime, leakage rate and dismantling losses. These are consistent with the tier 2 top-down method from the IPCC good practice guidance. The ERT noted a lack of transparency in the reporting both in the NIR and in the CRF tables due to the assumption used by the Netherlands whereby all appliances are combined into one group with one average lifetime. The ERT noted that Monitoring Protocol 12-020 mentions that studies have been conducted on whether it would be possible to obtain actual estimates per appliance type for refilling existing and filling new and dismantled installations. However, the results of the studies are not yet complete for all appliance types. Given that the Netherlands has access to information generated as a result of the new obligations within the European Union F-gas directive (*Leidraad koudemiddelenregistratie*), the ERT encourages the Netherlands to consider the available information so as to estimate and separate the emissions according to the different cooling applications in the different categories, in order to improve the accuracy of the estimates and increase the transparency of the reporting in its next annual submission.

62. The ERT noted that confidential HFCs emissions from aerosols and foam blowing are reported under the subcategory other (consumption of halocarbons and SF_6). Confidential SF_6 emissions from semiconductor manufacture and electrical equipment are also included under the subcategory other (consumption of halocarbons and SF_6). In response to a question raised by the ERT during the review, the Netherlands explained that confidentiality should be guaranteed to the companies, in accordance with the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access

to Justice in Environmental Matters (only emissions data are public, unless a company does not object to their publication, while production data are confidential). Although the ERT understands the rules and regulations applied in the Netherlands regarding public access to information, it considers that the confidentiality of this information hinders the transparency of the reporting and hampers the ERT in fully assessing the quality of the estimates for these subcategories. Therefore, the ERT recommends that the Netherlands report the emissions of F-gases across all categories, as appropriate, in order to enhance the transparency of the reporting in its next annual submission.

63. Potential HFC emissions from consumption of halocarbons and SF_6 have been reported as "NE" for all years of the time series, although the aggregated estimates of potential emissions from stationary refrigeration and mobile air-conditioning have been reported in the NIR but not in the CRF tables. The NIR states that the potential emissions cannot be calculated at the level of disaggregation required for the CRF tables due to the confidentiality of the consumption data. The ERT encourages the Netherlands to make efforts to complete and report the potential emissions for the entire time series, in accordance with the UNFCCC reporting guidelines, in order to ensure the completeness of the reporting in the next annual submission.

3. Non-key categories

Soda ash production and use – CO_2

64. The ERT found that emissions from soda ash production and use have been reported using the notation key "NO" for the period 1996–1998, even though AD for these years exist in the CRF tables. In response to a question raised by the ERT during the review, the Netherlands explained that the emissions for the years 1996–1998 have been incorrectly reported using the notation key "NO"; the correct notation key should be "IE". The reason for this error is due to a change in the definition or aggregation of non-energy use of coke in the energy statistics, which led to a different allocation of emissions. Since 1999, the use of coke in limestone production has been included in the energy statistics; the allocation of emissions is therefore correct for the years after 1999. The ERT noted that CO_2 emissions associated with the use of coke in soda ash production should be accounted for separately and those emissions associated with the non-energy use of coke should be subtracted from the total emissions in the energy sector. The ERT recommends that the Netherlands verify the plant-specific data on the non-energy use of coke, in order to ensure that double counting is avoided, and clearly indicate this in the NIR and use the correct notation keys in the CRF tables in its next annual submission.

Asphalt roofing and road paving with asphalt – CO_2

65. CO_2 emissions from asphalt roofing and road paving with asphalt have been reported using the notation key "NE". However, the Netherlands explained in annex 5 to the NIR that AD for the period 1990–2002 are available and that CO_2 emissions from road paving with asphalt have been estimated as amounting to approximately 0.5 kt CO_2 for 2010. The Netherlands stated in its list of planned inventory improvements in the NIR that it will make efforts to obtain the necessary AD for this category. The ERT encourages the Netherlands to make efforts to finalize the collection of the relevant data/information in order to complete and report the entire time series of CO_2 emissions from road paving with asphalt and asphalt roofing in its next annual submission.

D. Agriculture

1. Sector overview

66. In 2010, emissions from the agriculture sector amounted to 16,623.89 Gg CO_2 eq, or 7.9 per cent of total GHG emissions. Since 1990, emissions have decreased by 26.2 per cent, when they represented 10.5 per cent of total GHG emissions. The key drivers for the fall in emissions are the decreases in the number of livestock, the application of animal manure to soil and the use of synthetic fertilizers. Within the sector, 40.0 per cent of the emissions were from enteric fermentation, followed by 36.6 per cent from agricultural soils. The remaining 23.4 per cent were from manure management.

67. The Netherlands has made recalculations for the agriculture sector between the 2011 and 2012 annual submissions following corrections in the calculations and due to the use of new AD. The impact of these recalculations on the agriculture sector is an increase in emissions of 17.57 Gg CO_2 eq, or 0.01 per cent, for 1990 and a decrease in emissions of 165.97 Gg CO_2 eq, or 1.0 per cent, for 2009. The methodology has been used consistently throughout the time series. The time-series consistency of the AD is also maintained due to the continuity in the data provided. The main recalculations took place in the following categories:

(a) CH_4 emissions from enteric fermentation due to the correction of an error in the calculation of the EFs used for mature non-dairy and young cattle for 1992 (an increase in emissions of 38.36 Gg CO_2 eq, or 0.5 per cent);

(b) CH_4 emissions from manure management due to separate reporting of AD on rabbits and fur-bearing animals, which were previously reported under poultry, for 2009 (an increase in emissions of 19.76 Gg CO_2 eq, or 0.7 per cent);

(c) N_2O emissions from agricultural soils due to the correction of an error in the division of manure over surface spreading and its incorporation into soil for the years 1999–2009 (a decrease in emissions of 185.74 Gg CO_2 eq, or 2.9 per cent).

68. The calculation methods for enteric fermentation and manure management correspond to tier 2 methods, and N_2O emissions from agricultural soils were estimated with the use of a tier 3 method in accordance with the IPCC good practice guidance. The Netherlands reported that some activities are not occurring in the country, such as rice cultivation, prescribed burning of savannas and field burning of agricultural residues.

69. Based on the updated ammonia emission model, which was used in the 2011 annual submission for 2009 to report emissions, the Netherlands performed additional calculations to estimate N_2O emissions from manure application, among emissions from other categories. The distinction was made between surface spreading and incorporation into the soil, with the latter estimated as manure available for application minus amount of manure used for surface spreading. The previous model assumed that from 1999 onwards these emissions were equal to zero, and thus, subtracted amount was removed from additional calculations at that point of the time series. In the new model, manure used for surface spreading in the recent years is distinguished, but subtraction in the additional calculations was not reinstated, resulting in a double counting of this amount.

70. The ERT noted the incorrect use of notation keys. For example, in CRF tables 4.A and 4.B(a), the Netherlands used the notation key "IE" to report the weight, feeding situation, milk yield, work, pregnancy and digestibility of feed for rabbits, fur-bearing animals and dairy and non-dairy cattle. Furthermore, the same notation key ("IE") was used in CRF table 4.B(b) to report on N excretion per animal waste management system for rabbits, fur-bearing animals and poultry for anaerobic lagoons, daily spread, pasture range

and paddock, and other. However, the Netherlands did not specify where these values have been included.

71. In response to questions raised by the ERT during the review, the Netherlands informed the ERT that in CRF table 4.A, the notation key "NE" should be used to report emissions from the subcategory rabbits and fur-bearing animals and that the method used does not require those parameters. With regard to CRF table 4.B(a), the Netherlands stated that CH_4 emissions were not estimated as the relevant IPCC EFs and methods are not available and that the contribution of these emissions is negligible. With regard to CRF table 4.B(b), the Netherlands informed the ERT that for N_2O emissions it distinguishes between liquid and solid manure systems for rabbits and fur-bearing animals. Therefore, the use of the notation keys "NE" or "NO" is more appropriate in CRF table 4.B(b). The Netherlands informed the ERT that it is planning to review and correct these notation keys in its next annual submission. Nevertheless, the ERT noted that the estimation of N_2O emissions from manure management itself is correct. The ERT recommends that the Netherlands revise and correct the notation keys in its next annual submission, in order to improve the accuracy and transparency of its reporting.

2. Key categories

Enteric fermentation – CH_4

72. For enteric fermentation, the Netherlands used tier 1, tier 2 and tier 3 methods. The ERT noted the recommendation in the previous review report that the Netherlands provide information regarding the method used to determine the value of the CH_4 conversion rate for cattle both in the NIR and in the Monitoring Protocols. The ERT noted that the country-specific study is provided in Dutch.[12] The ERT encourages the Netherlands to provide the translation of the above-mentioned study or the relevant parts of this study in English, in its next annual submission.

73. In the previous annual submission, the Netherlands reported the figure 0.00 for the "feeding situation" of all animals as additional information in CRF table 4.A. The ERT noted that no improvement has been made in the 2012 annual submission; therefore, the ERT reiterates the recommendation in the previous review report that the Netherlands improve the accuracy and transparency of its reporting by filling in CRF table 4.A correctly in its next annual submission.

Manure management – CH_4 and N_2O

74. For the CH_4 emission estimates, the Netherlands used tier 2 and country-specific EFs. For the N_2O emission estimates, the Party also used the tier 2 method, while a default EF was used. The ERT noted that the 2012 annual submission includes a new category, rabbits and fur-bearing animals, which was previously reported under poultry. The ERT also noted that this new category was not well described in the NIR. In response to questions raised by the ERT during the review, the Netherlands provided information explaining that the category rabbits and fur-bearing animals includes minks and, until 2007, it also included foxes, husbandry of which is now prohibited by law. The ERT recommends that the Netherlands include clear and detailed information on the methods and EFs used for this category in its next annual submission.

75. The ERT noted that in CRF table 4.B(a), the Netherlands has reported the buffalo, and mules and asses livestock populations using the notation key "NO". However, for other AD (e.g. the average gross energy intake and average CH_4 conversion rate) the Netherlands

[12] Gestandaardiseerde berekeningsmethode voor dierlijke mest en mineralen. Standaardcijfers 1990–2008.

has used the notation key "NE" instead of the notation key "NO". During the review, the ERT asked the Netherlands to explain why there was an inconsistency in the use of the notation keys. In response to questions raised by the ERT during the review, the Netherlands stated that buffalo do not occur in the Netherlands, while the population of mules and asses has not been estimated due to their low numbers. The Netherlands acknowledged the inconsistency in the use of the notation keys and agreed to correct this error in its next annual submission. The ERT recommends that the Netherlands maintain consistency in the notation keys used to report emissions from buffalo, and mules and asses. The ERT strongly recommends that the Netherlands estimate emissions from mules and asses in order to improve the completeness and transparency of the reporting in its next annual submission.

Agricultural soils – N_2O

76. The Netherlands used diverse methodologies for the estimation of N_2O emissions from agricultural soils, consisting of tier 1, tier 1b, tier 2 and tier 3 methods. On the other hand, the Party used both country-specific and default EFs. The ERT noted that the total amount of gross N applied to soil decreased significantly by 38.0 per cent between 1990 and 2010. In response to the questions raised by the ERT during the review, the Netherlands explained that the differences were linked to the manure- and fertilizer-use policy, through which a range of measures have been introduced, such as pig and poultry production regulations and maximum nutrient application standards. As a result, the animal population numbers have stabilized and their diets have improved considerably, resulting in a reduction in the N content in manure. For grazing animals (dairy cattle), management practice has changed and the animals are now kept indoors for a greater proportion of time, thus reducing the amount of N excreted in the meadows. Several abatement techniques have also been introduced, such as changes in the flooring used, and the use of storage covers and air scrubbers, thereby preventing emissions from stables and storage. In 1991, it became mandatory to incorporate manure into soils, rather than surface spreading and, further, the amount of N in manure exported abroad has increased significantly. All these measures have given rise to large changes in the N flows related to agriculture over the period 1990–2010. The ERT recommends that the Netherlands include this detailed information justifying the changes in the N flows in its next annual submission, in order to increase the transparency of its reporting.

77. In CRF table 4, the Netherlands has reported CH_4 emissions from sludge application on land under the agricultural soils category using the notation key "NE" due to a lack of data and owing to the negligible share of emissions from this category. In response to a question raised by the ERT during the review, the Netherlands stated that sufficient data are available on the use of sludge in agriculture but that there is no IPCC method available for the estimation of CH_4 emissions from sewage sludge application. Therefore, these emissions have not been estimated. However, N_2O emissions from sludge application on land have been estimated. In addition, N_2O emissions have been reported under direct soil emissions and have also been counted towards indirect emissions. The ERT recommends that the Netherlands correct the comment in CRF table 4, clearly stating that the notation key "NE" has been used due to the fact there are no IPCC methods available. The ERT also recommends that the Netherlands provide a reference or include in the NIR the data on the use of sludge in agriculture in its next annual submission.

78. In the NIR, the Netherlands stated that, since 2010, it has complied with the requirements of the European Union Farm Accountancy Data Network, and that from 2010 onwards a new definition of farms has been used. One of the criteria for inclusion in the agricultural census has now changed: previously, the criterion for inclusion was three Dutch size units – this has now changed to 3,000 standard output. The Netherlands reported in the NIR that the effect of the changes on the animal populations is very insignificant; the

official statistics have not been recalculated and, therefore, the inventory does not reflect this change either. In response to a question raised by the ERT during the review, the Netherlands explained how the new definition of farms affects the animal population and the efforts that have been undertaken to ensure the time-series consistency. Following the switch to the new definition, CBS recalculated some years of the time series to compare the differences and, as these were only minor, CBS decided not to adjust the official statistics for the years prior to 2010. The Netherlands stated that this is consistent with the observation that both definitions indicate the same farm size, that, on average, a very small number of farms is actually affected and that the substitution occurs in relation to farms both entering and exiting the statistical pool. The ERT recommends that the Netherlands include sufficiently transparent documentation on the changes in the definitions of farm size and their possible effects on emissions from the agriculture sector in its next annual submission.

E. Land use, land-use change and forestry

1. Sector overview

79. In 2010, net emissions from the LULUCF sector amounted to 3,001.37 Gg CO_2 eq, corresponding to 1.4 per cent of total GHG emissions. Since 1990, net emissions have increased by 0.05 per cent. The emission trend fluctuates highly from year to year, with the inter-annual changes ranging from 10 per cent to 13 per cent in some years. The reason for these fluctuations is the increase in emissions from land converted to settlements and the decrease in removals from forest land remaining forest land. Grassland remaining grassland is the largest emissions category, while forest land remaining forest land is the largest sink in the sector. The shares of other categories are very low compared to these two categories. The grassland remaining grassland category has a constant value of 4,246.00 Gg CO_2 throughout the reporting period of 1990–2010. Within the sector, in 2010, net CO_2 emissions of 4,505.11 Gg CO_2 were from grassland, followed by net CO_2 emissions of 807.80 Gg CO_2 from settlements and 164.06 Gg CO_2 from cropland. Wetlands accounted for net CO_2 emissions of 131.18 Gg CO_2 and other land accounted for 26.82 Gg CO_2. The remaining net emissions 59.72 Gg were from other (lime application). Net CO_2 removals of 2,693.31 Gg CO_2 were from forest land.

80. The Netherlands has made recalculations for the LULUCF sector between the 2011 and 2012 annual submissions in response to recommendations in the previous review report and following changes in AD. A new land-use map available as of 1 January 2009 has been used for the first time together with an updated map of organic soils. A tier 1 method has been implemented for the carbon stock changes in biomass in cropland and grassland. These improvements, along with some other minor changes, resulted in the recalculations for the entire time series. The impact of these recalculations on the LULUCF sector is an increase in emissions of 308.08 Gg CO_2, or 11.4 per cent, for 1990 and of 390.44 Gg CO_2, or 15.8 per cent, for 2009. The main recalculations took place in the following categories:

(a) CO_2 emissions from land converted to cropland, due to updated AD, an updated organic soils map and methodological improvements (an increase in CO_2 emissions of 114.41 Gg CO_2, or 233.6 per cent);

(b) CO_2 emissions from land converted to grassland, due to updated AD, an updated organic soils map and methodological improvements (a decrease in CO_2 emissions of 305.96 Gg CO_2, or 55 per cent);

(c) CO_2 emissions from land converted to settlements, due to updated AD (an increase in CO_2 emissions of 498.41 Gg CO_2, or 166.1 per cent).

81. The inventory for the LULUCF sector is generally complete in terms of years, gases, geographic coverage and categories. The Netherlands has used the notation key "NE" throughout the CRF tables to report carbon stock changes in mineral and organic soils (except for cropland remaining cropland and grassland remaining grassland) and biomass burning. The non-CO_2 emissions have been reported as "NE" for the entire time series for all categories. The ERT noted that the Party calculated CO_2 emissions from organic soils for cropland remaining cropland and grassland remaining grassland, while the emissions from mineral soils for these categories were reported as "0". The ERT further noted that CO2 emissions for biomass and dead organic matter for the same categories were reported as "NE", which resulted from lack of activity data on CO_2 removals in small areas of orchards. In response to a question raised by the ERT during the review, the Netherlands clarified that zero emissions were assumed on the basis of case studies by Hanegraaf et al. (2009) and Reijneveld et al. (2009). The ERT considered the clarification and found it insufficient to justify the assumption made by the Party. The ERT recommends that, in its next annual submission, the Netherlands obtain the data and report the estimates for the categories currently reported as "NE", where an IPCC methodology and default EFs are available in the IPCC good practice guidance for LULUCF or provide evidence that these pools are not net sources of CO_2.

82. According to section 7.5.4 of the NIR, N_2O and CH_4 emissions from drainage, fertilization and biomass burning have not been reported for forest land due to the assumption that these activities seldom occur. However, according to the UNFCCC reporting guidelines, the actual value has to be provided or the most suitable notation key should be used. The ERT recommends that the Netherlands use the appropriate notation key to report those pools, where no emissions have been reported. The ERT further recommends that, in its next annual submission, the Netherlands provide verifiable justification for the assumptions used for those categories, where the notation keys "NO" and "NE" have been reported.

2. Key categories

Grassland remaining grassland – CO_2

83. The ERT noted that for this category, the Netherlands reported emissions only from organic soils. The carbon stock changes in living biomass have been reported as "NE" due to the lack of data on CO_2 removals in small areas of orchards. Emissions and removals from mineral soils have been reported as "0" (see para. 81 above). The ERT further noted that the definition of grassland used by the Netherlands covers all orchards and shrubland which, according to the vegetation structure, fall below the thresholds used for the forest land category and are not considered as cropland. The ERT considers that using this wide definition of grassland conversions from woody biomass to herbaceous cover is satisfactory. The ERT recommends that, in its next annual submission, the Netherlands obtain the data and report the estimates for the categories currently reported as "NE", where an IPCC methodology and default EFs are available in the IPCC good practice guidance for LULUCF or provide evidence that these pools are not net sources of CO_2.

3. Non-key categories

Land converted to grassland – CO_2

84. The ERT noted that under this category the Netherlands reported emissions and removals in living biomass and dead organic matter, while carbon stock changes in mineral and organic soils have been reported as "NE". The ERT also noted that the Netherlands include emissions from organic soils for this category under the category grassland remaining grassland. The ERT recommends that the Party in its next annual submission

change the notation key to "IE". For mineral soils the ERT recommends that, in the next annual submission, the Netherlands use the approach recommended by the IPCC good practice guidance for LULUCF to report the mineral soil carbon pool or provide evidence that it is not a net source of emissions.

N_2O emissions from disturbance associated with land-use conversion to cropland – N_2O

85. N_2O emissions from disturbance associated with land-use conversion to cropland are reported as "NE", as was done in the previous annual submission, due to a lack of data. The ERT noted that in the previous review report the ERT recommended that the Netherlands use a tier 1 method to estimate N_2O emissions for this category. The ERT reiterates the recommendation in the previous review report that the Netherlands obtain the data and estimate N_2O emissions from disturbance associated with land-use conversion to cropland in its next annual submission.

Biomass burning – CO_2, CH_4 and N_2O

86. The Netherlands used the notation keys "NE", "NO" and "NA" in CRF table 5(V) to report emissions from biomass burning. The emissions from controlled burning were reported as "NE" for all categories, except for forest land and cropland remaining cropland, for which the Netherlands used the notation keys "NO" and "NA", respectively. The Netherlands reported in the NIR that controlled burning is forbidden by law and very little or no data are available. To justify the use of the relevant notation keys, the ERT recommends that the Netherlands provide a description of the legislation on the controlled burning in its next annual submission. The ERT further recommends that the Netherlands reconcile the use of the notation keys for specific land-use categories in accordance with existing legislation.

87. The Netherlands has reported CO_2, CH_4 and N_2O emissions from wildfires as "NE" for all categories, except for land converted to forest land and cropland remaining cropland, where the notation keys "NO" and "NA" have been used accordingly. The ERT noted that in the previous review report the ERT recommended that the Netherlands report emissions from wildfires. The ERT further noted that, according to the *Global Forest Resources Assessment 2010* published by the Food and Agriculture Organization of the United Nations, about 30 ha of forest and other woody vegetation land in the Netherlands are subject to wildfires annually. However, according to the NIR, the data on biomass burning for wildfires have not been available since 1996. The ERT recommends that the Netherlands obtain the data on the areas of wildfires, estimate the CO_2 and non-CO_2 emissions for the entire time series and include them in its next annual submission.

F. Waste

1. Sector overview

88. In 2010, emissions from the waste sector amounted to 5,007.86 Gg CO_2 eq, or 2.4 per cent of total GHG emissions. Since 1990, emissions have decreased by 60.8 per cent. The key drivers for the fall in emissions are the increases in waste recovery and recycling, which led to a reduction in solid waste disposal on land, and the increase in the recovery of landfill gas as a result of the implementation of the national waste management policies and measures. The emission trends are transparently explained in the NIR. Within the sector, in 2010, 86.0 per cent of the emissions were from solid waste disposal on land, followed by 12.9 per cent from wastewater handling and 1.1 per cent from other (waste). Emissions from waste incineration are reported under the energy sector since all waste incineration installations produce electricity and/or heat.

89. The Netherlands has made recalculations for the waste sector between the 2011 and 2012 annual submissions for the entire time series from 1990 to 2009 in response to recommendations in the previous review report and due to the use of new AD. The impact of these recalculations on the waste sector is an increase in emissions of 0.42 Gg CO_2 eq, or 0.003 per cent, for 1990 and a decrease in emissions of 1.27 Gg CO_2 eq, or 0.02 per cent, for 2009. The main recalculations took place in the following categories:

(a) CH_4 emissions from solid waste disposal on land, due to the implementation of the recommendations in the previous review report related to the update of historical data on the annual amount of waste sent to landfills in the period 1945–1979 (an increase in emissions of 0.07 Gg CO_2 eq for 2009);

(b) CH_4 and N_2O emissions from wastewater handling from septic tanks (a decrease in emissions of 1.34 Gg CO_2 eq, or 0.2 per cent, for 2009).

90. The inventory for the waste sector is transparent and complete in terms of gases, categories, geographical coverage and years. The ERT noted that the information on the methods, EFs, uncertainty analysis and sector-specific QA/QC activities is provided in the Monitoring Protocols, which are part of the annual submission.

91. The Netherlands reported in the NIR that the QA/QC activities for this sector are covered by the general QA/QC procedures and by the specific procedures performed by the inventory compilers and coordinated by RIVM. The NIR does not provide information on which category-specific QA/QC procedures have been implemented. The ERT recommends that the Netherlands include information on the results of the category-specific QA/QC procedures in the relevant sections of the NIR in its next annual submission, in order to enhance the transparency of its reporting.

92. The ERT noted that the Netherlands has implemented most of the recommendations in the previous review report, namely, the recalculation of CH_4 emissions from solid waste disposal on land using updated historical data on waste disposal since 1945, and the estimation of N_2O emissions from septic tanks (see paras. 95 and 96 below). The ERT commends the Netherlands for these improvements. The ERT noted that the uncertainty assessments remain at the same level despite the improvements in AD in recent years, and therefore reiterates the recommendation in the previous review report that the Netherlands use the uncertainty analysis as a tool to identify the priorities for the sectoral improvements and provide an explanation of the expert judgement used in the uncertainty assessments for the waste sector.

2. Key categories

Solid waste disposal on land – CH_4

93. The Netherlands has used the first order decay method with country-specific parameters and a modification of the normalization factor based on the model validation study which explored the actual formation of CH_4 over the years. This is in line with the IPCC good practice guidance. All waste disposal sites in the country are categorized as managed according to the IPCC classification. The AD on the amount and composition of the waste, as well as the amount of landfill gas generated, are collected annually by the NL Agency.

94. The NIR and the CRF tables provide general information on the methods, EFs and AD used for the estimation of CH_4 emissions from managed landfill sites, with reference to the Monitoring Protocol related to landfill sites, which contains detailed information on the methodologies and AD used for the estimation of emissions as well as on the uncertainty assessment performed. The ERT recommends that the Netherlands keep track of the updates or revisions of the Monitoring Protocols on the waste sector in order to enhance the

transparency of the information on the AD collection system and the methodology used for the estimation of CH_4 emissions, and update the information reported in the NIR.

95. The ERT noted that the Netherlands has updated the AD on the amount of waste disposed for the period 1945–1990 based on linear extrapolation between every fifth year (1950, 1955, 1960, 1965 and 1970) and has provided an explanation in the NIR, as recommended in the previous review report.

3. Non-key categories

Wastewater handling – CH_4 and N_2O

96. The Netherlands has reported N_2O emissions from domestic and commercial wastewater and septic tanks. The country-specific methods and EFs used for the estimation of CH_4 and N_2O emissions are described in the Monitoring Protocol related to wastewater handling. These methods are in line with the methodologies from the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. Most of the AD are collected by CBS through annual surveys of the operators of public and industrial wastewater treatment plants. The Netherlands reported in the NIR that N_2O emissions from industrial wastewater were reported under domestic and commercial wastewater since most industrial wastewater is sent to municipal wastewater treatment plants. The Netherlands has reported N_2O emissions from industrial sludge under industrial wastewater as "NE" in the CRF tables. The ERT recommends that, in its next annual submission, the Netherlands correct the notation key used to "IE", in accordance with the explanation provided in the NIR and in the Monitoring Protocols.

97. The Netherlands has reported CH_4 emissions from wastewater treatment plants and septic tanks using a combination of country-specific and IPCC default parameters and EFs, which is in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

Other (waste) – CH_4 and N_2O

98. The Netherlands has reported CH_4 and N_2O emissions from compost production and digesting of separated organic waste from households under this category. The Monitoring Protocol related to composting provides detailed information on the country-specific method, EFs and AD used to estimate CH_4 and N_2O emissions. The ERT noted that the documentation box of CRF table 6 contains the AD for the amount of compost production which are used in the calculation of the emission estimates for these categories.

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

99. The Netherlands has reported complete and transparent information on activities under Article 3, paragraph 3, of the Kyoto Protocol for the years 2008–2010, in line with the requirements outlined in paragraphs 5–9 of the annex to decision 15/CMP.1. The Netherlands has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol and has elected commitment period accounting. The ERT noted that complete and spatially explicit land-use maps used by the Netherlands allow the identification of lands and land-use changes with sufficient spatial and temporal resolution.

100. The Netherlands uses a forest definition of 20 per cent of crown cover and an area of 0.5 ha, which the Netherlands has defined as "forest according to the Kyoto Protocol" (FAD). The Netherlands applies a "trees outside the forest" (TOF) definition for the groups of trees that cover an area smaller than 0.5 ha. Both definitions are provided in the NIR. As the TOF lands are considered as a land category different from the FAD category, the conversions between the TOF and FAD categories are reported as activities under Article 3, paragraph 3, of the Kyoto Protocol. The ERT noted that according to decision 16/CMP.1, the units of land subject to human-induced afforestation, reforestation and deforestation have to be tracked separately from the areas under regular forest management (which has not been elected by the Netherlands). Furthermore, only the units of lands afforested (reforested or deforested) through direct human-induced activities since 1 January 1990 and thereon are to be accounted for under Article 3, paragraph 3, of the Kyoto Protocol, and these units of lands must be treated separately from the existing forest lands, which correspond to the definition of forest applied by the Party. The ERT recommends that, in the next annual submission, the Netherlands provide more descriptive information and justify that the conversions between the TOF and FAD correspond to the definitions of afforestation, reforestation and deforestation outlined in the annex to decision 16/CMP.1. The ERT further recommends that the Netherlands justify that afforestation, reforestation and deforestation on the units of lands under the Kyoto Protocol are tracked over time separately from the other forest land.

101. The Netherlands is planning to use the 2009 and 2013 land-use maps in addition to the 1990 and 2004 land-use maps in its next annual submission, in order to improve the estimation of land-use changes. The land-use map as of 1 January 2009 has been produced and used in the compilation of the 2012 annual submission, which has improved the accuracy of the Netherlands' reporting of the units of lands subject to management practices. The ERT commends the Netherlands for this improvement.

102. The Netherlands has made recalculations for the KP-LULUCF activities between the 2011 and 2012 annual submissions for 2008 and 2009 following changes in AD due to the use of the 2009 land-use map, the implementation of tier 1 EFs for biomass for land-use conversions to and from cropland and grassland and in response to the recommendations made in the previous review report. The impact of these recalculations on each KP-LULUCF activity for 2009 is as follows:

(a) Afforestation and reforestation: a decrease in net CO_2 removals of 94.90 Gg CO_2 eq, or 17.7 per cent, due to changes in AD and added estimated pools;

(b) Deforestation: a decrease in net emissions of 45.64 Gg CO_2 eq, or 5.5 per cent, due to changes in AD and added estimated pools.

103. As for the afforestation and reforestation activities, the changes in carbon stocks in litter and dead wood have not been reported, because the Party applied the "not a source" principle. The rationale for this is that afforested sites should have more dead wood and litter compared to those under the initial land use. Controlled burning is reported as "NO", while the wildfires have been reported as "NE". The ERT noted that it is possible to report controlled burning as "NO". However, the ERT recommends that the Netherlands collect the necessary statistics on wildfires in order to provide the emission estimates for afforestation and reforestation in its next annual submission.

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

Afforestation and reforestation – CO_2

104. The Netherlands has reported the losses in carbon stocks in above- and below-ground biomass as "NO" for the land conversions between TOF and FAD. The Party has

only reported the carbon gains owing to the conversions between these two land uses. In response to a question raised by the ERT during the review, the Netherlands explained that the only difference between the FAD and TOF areas is the size of the area. As the forested areas less than 0.5 ha or 30 m in width are classified as TOF, the Netherlands does not calculate the emissions due to the removal of above- and below-ground biomass during the afforestation and reforestation activities. The ERT noted that this issue was also raised in the previous review report. The ERT recommends that in the next annual submission, the Netherlands provide verifiable information that demonstrates that the pools unaccounted for under the conversions between TOF and FAD are not net sources of emissions, as required by the annex to decision 15/CMP.1.

Deforestation – CO_2

105. For land conversions from FAD to TOF, the Netherlands has reported the carbon gains in the above- and below-ground biomass pools. The ERT noted that the Party has reported the losses in the carbon stocks as "NO" for these pools. The ERT further noted that for the same conversions, the Netherlands has reported the losses in the carbon stocks for the litter and dead wood pools. The ERT recommends that in its next annual submission, the Netherlands justify that the assessment of the emissions and removals from the changes in carbon stocks owing to deforestation activities under Article 3, paragraph 3, of the Kyoto Protocol has been performed in accordance with the methodology provided in the IPCC good practice guidance for the LULUCF.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

106. The Netherlands 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.[13] 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.

107. Information on the accounting of Kyoto Protocol units has been prepared and reported in accordance with decision 15/CMP.1, annex, chapter I.E, 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 referred to in decision 22/CMP.1, annex, paragraph 88(a–j). 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. The ITL identified a total of 34 discrepant transactions proposed by the Netherlands during the reporting period. All of these transactions are clearly marked with a "no" under each discrepancy and are thus not assessed as discrepancies under this review. No non-replacement occurred during the reported period. The national registry has adequate procedures in place to minimize discrepancies.

National registry

108. 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

[13] The SEF comparison report is prepared by the international transaction log (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.

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.

Calculation of the commitment period reserve

109. The Netherlands has reported its commitment period reserve in its 2012 annual submission. The Netherlands reported that its commitment period reserve has not changed since the initial report review (901,135,927 t CO_2 eq), as it is based on the assigned amount and not the most recently reviewed inventory. The ERT agrees with this figure.

3. Changes to the national system

110. In the NIR of its 2012 annual submission, the Netherlands reported that there were no changes to its national system since the previous annual submission in accordance with decision 15/CMP.1, annex, chapter I.F.

111. The ERT concluded that, overall, the Netherlands' national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1. However, the ERT recommends that the Netherlands further strengthen the entire functionality of its national system, in order to address the recommendations contained in the current and previous review reports.

4. Changes to the national registry

112. The Netherlands reported that there have been changes to its national registry since the previous annual submission. The Netherlands described the changes in its NIR, in accordance with decision 15/CMP.1, annex, chapter I.G. Since the previous annual submission, there have been two updates of the registry software, mainly aimed at enhancing the security measures, ensuring that the registry conforms to technical standards, implementing procedures to minimize discrepancies and ensuring the quality of data transfers and data integrity. The ERT concluded that, taking into account the confirmed changes to the national registry, the Netherlands' 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

113. The Netherlands reported that there have been limited changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, since the previous annual submission. The changes refer to activities concerning the Green Climate Fund and new market mechanisms, which are seen as important steps to support developing countries in climate adaptation and mitigation, and developments in demonstration projects on carbon capture and storage. The ERT concluded that, taking into account the confirmed changes in the reporting, the information provided is complete and transparent.

114. The Netherlands confirmed that the national policy on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol is being implemented in a consistent and transparent manner. The latest developments in this area

include the enhanced operational arrangements of the Green Climate Fund and new market mechanisms, particularly through the promotion of transparency with regard to fast-start financing and the development of adequate modalities and procedures. Further, the Netherlands has been preparing two large-scale carbon dioxide capture and storage demonstration projects, with the aim of reducing CO_2 emissions to the atmosphere, noting that the use of fossil fuels will still be inevitable in the coming decades.

III. Conclusions and recommendations

A. Conclusions

115. The Netherlands made its annual submission on 14 April 2012. 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, paragraph 3, 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.

116. The ERT concludes that the annual submission of the Netherlands has been prepared and reported in accordance with the UNFCCC reporting guidelines. The submission is complete and the Netherlands has submitted a complete set of CRF tables for the years 1990–2010 and an NIR; these are complete in terms of geographical coverage, years, gases and sectors, but generally complete in terms of categories. The ERT noted that potential emissions of F-gases; CH_4 emissions from manure management for mules and assess; CO_2, CH_4 and N_2O emissions from biomass burning for all subcategories, except for land converted to forest land and cropland remaining cropland; and N_2O emissions from disturbance associated with land-use conversion to cropland were reported using the notation key "NE", even though there are IPCC methodologies available.

117. The Netherlands also reported the following emissions using the notation key "NE", for which IPCC methodologies and/or EFs are not available, namely: fugitive CO_2 and CH_4 emissions from distribution of oil products and from other operations with oil; fugitive CO_2 emissions from other leakage (natural gas); CO_2 emissions from asphalt roofing and from road paving with asphalt; and CH_4 and N_2O emissions from sludge from industrial wastewater. The ERT encourages the Netherlands to make efforts to estimate and report these emissions in order to improve the completeness of its reporting in the next annual submission.

118. 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.

119. The Netherlands' inventory is in line with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF.

120. The Netherlands has made recalculations for the inventory between the 2011 and 2012 annual submissions in response to the recommendations in the 2011 annual review report, following improvements in AD and methods, as a result of the reallocation of categories and in order to rectify identified errors. The impact of these recalculations on total GHG emissions without LULUCF is an increase in emissions of 14.76 Gg CO_2 eq, or 0.01 per cent, for 1990 and a decrease of 141.51 Gg CO_2 eq, or 0.1 per cent, for 2009. The main recalculations took place in the following categories:

(a) CO_2 emissions from the categories manufacturing industries and construction and other in the energy sector, due to updated AD;

(b) N_2O emissions from nitric acid production in the industrial processes sector, due to the use of new AD from the EU ETS reports;

(c) CH_4 and N_2O emissions from manure management in the agriculture sector, due to the split of the AD for rabbits, fur-bearing animals and poultry;

(d) CO_2 emissions from land conversion to cropland and grassland in the LULUCF sector, due to the introduction of the new land-use map and the improvements to the estimation methodology;

(e) N_2O and CH_4 emissions from wastewater handling in the waste sector.

121. The submission of information required under Article 3, paragraph 3, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1. The Netherlands has reported complete and transparent information on activities under Article 3, paragraph 3, of the Kyoto Protocol for the years 2008–2010. The Netherlands has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol and has elected commitment period accounting.

122. The Netherlands has performed recalculations for the KP-LULUCF activities between the 2011 and 2012 annual submissions in response to the recommendations in the 2011 annual review report and following changes in AD. The impact of these recalculations on each KP-LULUCF activity for 2009 is as follows:

(a) Afforestation and reforestation: a decrease in net CO_2 removals by 17.7 per cent due to changes in data and added estimated pools;

(b) Deforestation: a decrease in CO_2 emissions by 5.5 per cent due to changes in data and added estimated pools.

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

124. The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1. However, the ERT identified that the Netherlands needs to further strengthen the functionality of its national system, particularly regarding QA/QC procedures across all sectors and in order to address the recommendations made in the current and previous review reports.

125. 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.

126. The Netherlands has reported information under decision 15/CMP.1, annex, chapter I.H, "Minimization of adverse impacts in accordance with Article 3, paragraph 14" as part of its 2012 annual submission. The latest developments in this area include the enhanced operational arrangements of the Green Climate Fund and new market mechanisms, particularly through the promotion of transparency with regard to fast-start financing and the development of adequate modalities and procedures. The Netherlands has been preparing two large-scale carbon dioxide capture and storage demonstration projects, with the aim of reducing CO_2 emissions to the atmosphere, noting that the use of fossil fuels will still be inevitable in the coming decades.

B. Recommendations

127. The ERT identifies issues for improvement as listed in table 6 below. All recommendations are for the next annual submission, unless otherwise specified.

Table 6
Recommendations identified by the expert review team

Sector	*Category*	*Recommendation*	*Paragraph reference*
Cross-cutting	General	Obtain the data, calculate potential emissions of F-gases, CO_2, CH_4 and N_2O emissions from biomass burning for all subcategories, except for land converted to forest land and cropland remaining cropland, and N_2O emissions from disturbance associated with land-use conversion to cropland	9
		Fully complete CRF Summary table 3 for the entire time series	10
		Explain the allocation of the emission estimates reported as "IE" in the NIR and the CRF tables	12
		Include in the NIR the descriptions of the methods and parameters used, particularly for higher-tier methods and country-specific parameters	13
		Further enhance the functionality of the national system and report emissions from all categories for which IPCC methodologies and EFs are available	17
		Ensure that sufficient resources and planning are put in place to ensure that the new land-use map is produced on time	18
		Describe, in the NIR, how the results of the key category analysis have been used for the improvement of the inventory	21
		Explain the difference in the uncertainty estimates for the consecutive annual submissions	22
		Document how the results of the uncertainty analysis have been used for the improvement of the inventory	22
		Improve the QC checks applied to plant-specific data and describe them	24
		Strengthen the arrangements under the national system, in order to ensure the complete, updated and transparent descriptions of the methods used to calculate the emissions in the NIR and in the Monitoring Protocols	25
		Elaborate on alternative ways for reporting the data, methods and parameters used for the estimation of emissions in line with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" and without violating existing country-specific rules on confidentiality	26
		Address the pending recommendations from the previous review reports	31
Energy	General	Improve the transparency of the reporting by providing documentation on all recalculations in the NIR and in the CRF tables, including any changes to the AD, EFs or methods applied	36

Sector	*Category*	*Recommendation*	*Paragraph reference*
		Ensure that all information (e.g. emission estimation methods and CH_4 and N_2O EFs) is consistently reported in the NIR, the CRF tables and other national inventory documentation, such as the Monitoring Protocols	38
		Address all pending recommendations relating to the energy sector made in the previous review reports	39
		Review the appropriateness of the IPCC default EFs used, with the aim of calculating more country-specific EFs, particularly for fuels associated with a large proportion of emissions from fuel combustion	41
		Continue to perform the verification activity based on the EU ETS data at regular intervals	42
		Improve the transparency of the reporting by including in the NIR a more transparent description of the QC procedures performed for the plant-specific data	43
	Reference and sectoral approaches	Report on the apparent energy consumption in CRF table 1.A(c)	44
	Stationary combustion: solid, liquid and gaseous fuels – CO_2, CH_4 and N_2O	Provide a more transparent description, including additional information on the AD and EFs, to justify the low value of the implied emission factors	47
		Correctly allocate CO_2, CH_4 and N_2O emissions from fuel combustion from on-site coke production in iron and steel plants	48
	Road transportation: liquid fuels – CO_2 and N_2O	Report on the progress made with regard to the study to update the N_2O and CO_2 EFs for diesel oil and gasoline	49
		Ensure the consistency in the reporting between the NIR and other inventory documentation	49
	Natural gas – other leakage – CO_2	Review the use of the notation keys, correct the identified error and improve the QA/QC processes related to the information provided in the CRF tables	50
Industrial processes and solvent and other product use	General	Estimate the potential HFC, PFC and SF_6 emissions under consumption of halocarbons and SF_6	55
		Find alternative ways, without violating the existing country-specific rules on confidentiality, to report the AD, EFs and emission estimates for ammonia, nitric acid, silicon carbide, ethylene and caprolactam production and emissions of HFCs from aerosols and foam blowing and SF_6 from semiconductor manufacture and electrical equipment	56
		Further improve the category-specific QC activities and verification procedures, in cases where the AD and EFs are confidential, and include the results in the NIR	57

Sector	*Category*	*Recommendation*	*Paragraph reference*
	Nitric acid production – N_2O	Retrieve the results of the measurements taken in 1998 and 1999 in order to demonstrate time-series consistency, archive all measurement results properly, and make that information available for review by the ERT	58
	Iron and steel production – CO_2	Include information on the carbon mass balance for iron and steel production	59
	Production of halocarbons and SF_6 – HFCs	Enhance the category-specific QA/QC procedures to verify the plant-specific information provided by the companies, in accordance with the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, and provide the results in the NIR	60
	Consumption of halocarbons and SF_6 – HFCs	Report the emissions of F-gases across all categories, as appropriate, in order to enhance the transparency of the reporting	62
	Soda ash production and use – CO_2	Verify the plant-specific data on the non-energy use of coke, in order to ensure that double counting is avoided, and clearly indicate this in the NIR	64
		Use the correct notation keys in the CRF tables	64
Agriculture	General	Revise and correct the notation keys, in order to improve the consistency and transparency of the reporting	71
	Enteric fermentation – CH_4	Improve the accuracy of the reporting by filling in CRF table 4.A correctly	73
	Manure management – CH_4 and N_2O	Include clear and detailed information on the methods and EFs used for the estimation of emissions from rabbits and fur-bearing animals	74
		Maintain consistency in the notation keys used to report emissions from buffalo, and mules and asses	75
		Estimate emissions from mules and asses	75
	Agricultural soils – N_2O	Include detailed information justifying the changes in the nitrogen flows related to agriculture, in order to increase the transparency of the reporting	76
		Correct the comment in CRF table 4, clearly stating that the notation key “NE” has been used due to the fact that there are no IPCC estimation methods available	77
		Provide a reference or include in the NIR the data on the use of sludge in agriculture	77
		Include sufficiently transparent documentation on the changes in the definitions of farm size and their possible effects on emissions from the agriculture sector	78
LULUCF	General	Obtain the data and report the estimates for the categories currently reported as “NE”, where an IPCC methodology and default EFs are available in the IPCC good practice guidance for LULUCF or provide evidence that these pools are not net sources of CO_2	81

Sector	*Category*	*Recommendation*	*Paragraph reference*
		Use the appropriate notation key (i.e. "NE" and "NO") to report those pools, where no emissions have been assumed	82
		Provide the verifiable justification for the assumptions made for those categories, where the "NO" and "NE" notation keys have been used	82
	Grassland remaining grassland – CO_2	Obtain the data and report the estimates for the categories currently reported as "NE", where an IPCC methodology and default EFs are available in the IPCC good practice guidance for LULUCF or provide evidence that these pools are not net sources of CO_2.	83
	Land converted to grassland – CO_2	Change the notation key to "IE" to report emissions from organic soils	84
		Use the approach recommended by the IPCC good practice guidance for LULUCF to report the mineral soil carbon pool or provide evidence that it is not a net source of emissions	84
	N_2O emissions from disturbance associated with land-use conversion to cropland – N_2O	Obtain the data and estimate N_2O emissions from disturbance associated with land-use conversion to cropland	85
	Biomass burning – CO_2	Provide a description of the legislation on controlled burning	86
		Reconcile the use of the notation keys for specific land-use categories in accordance with existing legislation	86
		Obtain the data on the areas of wildfires, estimate the CO_2 and non-CO_2 emissions for the entire time series and include them in the NIR	87
Waste	General	Include information on the results of the category-specific QA/QC checks in the relevant sector chapter of the NIR, in order to enhance the transparency of the reporting	91
		Use the uncertainty analysis as a tool to identify the priorities for the sectoral improvements and provide an explanation of the expert judgement used in the uncertainty assessments for the waste sector	92
	Solid waste disposal on land – CH_4	Keep track on updates or revisions of the Monitoring Protocols on waste sector in order to enhance the transparency of the information on the AD collection system and methodology used for the estimation of CH_4 emissions	94
	Wastewater handling – CH_4 and N_2O	Correct the notation key used to "IE", in accordance with the explanation provided in the NIR and in the Monitoring Protocols	96
Supplementary information required under Article 7, paragraph 1, of the Kyoto	General	Provide more descriptive information and justify that the conversions between the TOF and FAD correspond to the definitions of afforestation, reforestation and deforestation outlined in the annex to decision 16/CMP.1	100

Sector	*Category*	*Recommendation*	*Paragraph reference*
Protocol			
		Justify that afforestation, reforestation and deforestation on the units of lands under the Kyoto Protocol are tracked over time separately from the other forest land	100
		Collect the necessary statistics on wildfires in order to provide the emission estimates for afforestation and reforestation	103
	Afforestation and reforestation – CO_2	Provide verifiable information that demonstrates that the pools unaccounted for under the conversions between TOF and FAD are not net sources of emissions, as required by the annex to decision 15/CMP.1	104
	Deforestation – CO_2	Justify that the assessment of the emissions and removals from the changes in carbon stocks owing to deforestation activities under Article 3, paragraph 3, of the Kyoto Protocol has been performed in accordance with the methodology provided in the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*	105
	Changes in the national system	Further strengthen the entire functionality of the national system in order to address the recommendations contained in the current and previous review reports	111

Abbreviations: AD = activity data, CRF = common reporting format, EFs = emission factors, ERT = expert review team, EU ETS = European Union emissions trading scheme, FAD = "forest according to the Kyoto Protocol", F-gases = fluorinated gases, IE = included elsewhere, 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, LULUCF = land use, land-use change and forestry, NE = not estimated, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, TOF = "trees outside the forest".

IV. Questions of implementation

128. 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 the Netherlands 2012. Available at <http://unfccc.int/resource/docs/2012/asr/nld.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2012. Available at <http://unfccc.int/resource/webdocs/sai/2012.pdf>.

FCCC/ARR/2011/NLD. Report of the individual review of the annual submission of the Netherlands submitted in 2011. Available at <http://unfccc.int/resource/docs/2012/arr/nld.pdf>.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Harry Vreuls (NL Agency), including additional material on the methodologies and assumptions used. The following documents[1] were also provided by the Netherlands:

NL Agency, 2012. Spreadsheet: Mass balance for iron and steel industry for 2009.

Ministerie van Infrastructuur en Milieu, 2011. Leidraad koudemiddelenregistratie en monitoring Fgassen_v06-2011_1 (in Dutch language). (Information generated in line with the obligations under the F-gas framework regulation).

PriceWaterhouseCoopers, 2011. AgentschapNL Handelsstromenonderzoek 2010 – Rapportage PwC v1.1 (in Dutch language). Annual reports on consumption data of HFCs.

Ligt, T.J. de, Analyse verschillen CO_2-eq.-emissies EU-ETS en MJV-rapportages 2010 t.b.v. NIR 2012, Utrecht, 2011,

Dröge, R., Hensema, A., Broeke, H.M. ten, Hulskotte, J.H.J. 2011: Emissions of two-wheeled vehicles. TNO-060-UT-2011-01556, TNO, Utrecht.

[1] Reproduced as received from the Netherlands.

Annex II

Acronyms and abbreviations

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