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**Report of the individual review of the annual submission of
France 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.

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I. Introduction and summary

1. This report covers the centralized review of the 2012 annual submission of France, 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: generalist – Ms. Daniela Romano (Italy) and Mr. Tinus Pulles (Netherlands); energy – Ms. Ana Carolina Avzaradel (Brazil) and Ms. Inga Konstantinaviciute (Lithuania); industrial processes – Mr. Domenico Gaudio (Italy) and Mr. Koen Smekens (Belgium); agriculture – Mr. Sergio González (Chile) and Mr. Renato Rodrigues (Brazil); land use, land-use change and forestry (LULUCF) – Ms. Ana Blondel (Canada) and Mr. Thiago Mendes (Brazil); and waste – Ms. Medea Inashvili (Georgia) and Mr. Sabin Guendehou (Benin). Mr. Guendehou and Mr. Pulles were the lead reviewers. The review was coordinated by Mr. Vitor Góis Ferreira (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 France, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. In 2010, the main greenhouse gas (GHG) in France was carbon dioxide (CO₂), accounting for 73.2 per cent of total GHG emissions¹ expressed in CO₂ eq, followed by methane (CH₄) (12.0 per cent) and nitrous oxide (N₂O) (11.4 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) collectively accounted for 3.4 per cent of the overall GHG emissions in the country. The energy sector accounted for 70.8 per cent of total GHG emissions, followed by the agriculture sector (18.0 per cent), the industrial processes sector (7.2 per cent), the waste sector (3.8 per cent) and the solvent and other product use sector (0.2 per cent). Total GHG emissions amounted to 522,415.81 Gg CO₂ eq and decreased by 6.6 per cent between the base year² and 2010.

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, CO₂, CH₄ and N₂O emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector.

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.

¹ In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified.

² “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from Annex A sources only.

Table 1

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

	Greenhouse gas	Base year ^a	Gg CO ₂ eq							Change Base year–2010(%)	
			1990	1995	2000	2005	2008	2009	2010		
Annex A sources	CO ₂	395 036.71	395 036.71	393 081.44	410 999.46	422 637.56	392 763.54	374 650.11	382 550.32	-3.2	
	CH ₄	62 909.20	62 909.20	64 591.66	65 357.42	62 647.64	63 277.78	62 476.22	62 430.86	-0.8	
	N ₂ O	91 041.41	91 041.41	89 746.64	77 300.58	67 476.85	65 642.32	61 720.04	59 578.98	-34.6	
	HFCs	3 736.21	3 736.21	3 189.95	7 123.24	11 961.01	14 396.46	14 846.20	16 908.08	352.5	
	PFCs	4 293.45	4 293.45	2 561.81	2 486.86	1 430.37	563.10	365.35	382.91	-91.1	
	SF ₆	2 015.51	2 015.51	2 236.66	1 575.37	995.35	692.68	553.39	564.66	-72.0	
KP-LULUCF	Article 3.3 ^b	CO ₂					7 286.38	6 128.30	3 085.97		
		CH ₄					175.53	165.11	134.15		
		N ₂ O					72.09	74.36	74.30		
	Article 3.4 ^c	CO ₂	NA					-60 183.11	-52 245.46	-45 317.96	NA
		CH ₄	NA					559.95	590.73	648.04	NA
		N ₂ O	NA					59.84	68.32	71.22	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.

^a “Base year” for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for all gases. 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

		<i>Gg CO₂ eq</i>								<i>Change</i>
<i>Sector</i>		<i>Base year^a</i>	<i>1990</i>	<i>1995</i>	<i>2000</i>	<i>2005</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>Base year–2010 (%)</i>
Annex A	Energy	381 111.17	381 111.17	381 158.62	397 968.58	407 256.41	378 044.85	362 386.12	370 021.77	–2.9
	Industrial processes	59 062.19	59 062.19	57 432.55	44 651.47	42 535.78	40 001.21	36 532.99	37 552.13	–36.4
	Solvent and other product use	2 065.02	2 065.02	1 813.55	1 829.59	1 468.46	1 299.29	1 185.09	1 224.46	–40.7
	Agriculture	104 021.71	104 021.71	99 380.80	102 115.19	96 363.26	98 142.26	94 616.58	93 876.46	–9.8
	Waste	12 772.40	12 772.40	15 622.63	18 278.11	19 524.87	19 848.29	19 890.53	19 740.98	54.6
LULUCF		NA	–19 388.67	–25 394.94	–24 508.12	–40 198.54	–43 433.38	–36 152.88	–32 224.18	NA
Total (with LULUCF)		NA	539 643.81	530 013.23	540 334.82	526 950.23	493 902.51	478 458.43	490 191.63	NA
Total (without LULUCF)		559 032.48	559 032.48	555 408.16	564 842.94	567 148.77	537 335.89	514 611.31	522 415.81	–6.6
Other ^b		NO	NO	NO	NO	NO	NO	NO	NO	NA
KP-LULUCF	Article 3.3 ^c	Afforestation and reforestation					–7 260.90	–7 530.31	–7 883.96	
		Deforestation					14 794.91	13 898.07	11 178.38	
		Total (3.3)					7 534.01	6 367.76	3 294.42	
	Article 3.4 ^d	Forest management					–59 563.33	–51 586.42	–44 598.70	
		Cropland management	NA				NA	NA	NA	NA
		Grazing land management	NA				NA	NA	NA	NA
		Revegetation	NA				NA	NA	NA	NA
	Total (3.4)		NA				–59 563.33	–51 586.42	–44 598.70	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, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.

^a “Base year” for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for all gases. 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 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 CO₂ eq
for the year 2010, including the commitment period reserve**

	<i>As reported</i>	<i>Revised estimates</i>	<i>Adjustment^a</i>	<i>Final^b</i>
Commitment period reserve	2 537 663 976			2 537 663 976
Annex A emissions for current inventory year				
CO ₂	382 507 094	382 550 325		382 550 325
CH ₄	62 430 861			62 430 861
N ₂ O	59 578 976			59 578 976
HFCs	16 908 076			16 908 076
PFCs	382 911			382 911
SF ₆	564 659			564 659
Total Annex A sources	522 372 578	522 415 808		522 415 808
Activities under Article 3, paragraph 3, for current inventory year				
3.3 Afforestation and reforestation on non-harvested land for 2009 as reported	-7 883 958			-7 883 958
3.3 Afforestation and reforestation on harvested land for 2009 as reported	NA, NO			NA, NO
3.3 Deforestation for 2009 as reported	11 178 380			11 178 380
Activities under Article 3, paragraph 4, for current inventory year^c				
3.4 Forest management for current inventory year	-44 598 695			-44 598 695
3.4 Cropland management for current inventory year				
3.4 Cropland management for base year				
3.4 Grazing land management for current inventory year				
3.4 Grazing land management for base year				
3.4 Revegetation for current inventory year				
3.4 Revegetation in base year				

Abbreviations: NA = not applicable, 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 CO₂ eq
for the year 2009**

	<i>As reported</i>	<i>Revised estimates</i>	<i>Adjustment^a</i>	<i>Final^b</i>
Annex A emissions for 2009				
CO ₂	374 606 824	374 650 109		374 650 109
CH ₄	62 476 223			62 476 223
N ₂ O	61 720 042			61 720 042
HFCs	14 846 197			14 846 197
PFCs	365 349			365 349
SF ₆	553 389			553 389
Total Annex A sources	514 568 024	514 611 309		514 611 309
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for 2009 as reported	-7 530 310			-7 530 310
3.3 Afforestation and reforestation on harvested land for 2009 as reported	NA, NO			NA, NO
3.3 Deforestation for 2009 as reported	13 898 074			13 898 074
Activities under Article 3, paragraph 4, for current inventory year^c				
3.4 Forest management for 2009	-51 586 418			-51 586 418
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, 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 CO₂ eq
for the year 2008**

	<i>As reported</i>	<i>Revised estimates</i>	<i>Adjustment^a</i>	<i>Final^b</i>
Annex A emissions for 2008				
CO ₂	392 724 770	392 763 544		392 763 544
CH ₄	63 277 785			63 277 785
N ₂ O	65 642 321			65 642 321
HFCs	14 396 462			14 396 462
PFCs	563 098			563 098
SF ₆	692 683			692 683
Total Annex A sources	537 297 119	537 335 894		537 335 894
Activities under Article 3, paragraph 3, for 2008				
3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported	-7 260 901			-7 260 901
3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported	NA, NO			NA, NO
3.3 Deforestation for current year of commitment period as reported	14 794 907			14 794 907
Activities under Article 3, paragraph 4, for 2008^c				
3.4 Forest management for 2008	-59 563 326			-59 563 326
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, 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 4 April 2012; it contains two complete sets of common reporting format (CRF) tables (one for the reporting under the Convention and the other for the reporting under the Kyoto Protocol) for the period 1990–2010 and a national inventory report (NIR). France 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 4 April 2012. The annual submission was submitted in accordance with decision 15/CMP.1.

7. France officially submitted revised emission estimates on 5 and 23 November 2012 in response to the list of potential problems and further questions raised by the expert review team (ERT) in the course of the review, including information on KP-LULUCF. The Party submitted revised estimates of CO₂ emissions from lime production (see paras. 62–63 below). The values in this report are those submitted by the Party on 23 November 2012.

8. The ERT also used the previous years' annual 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.³

9. During the review, France 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

10. The inventory covers all mandatory⁴ source and sink categories for the period 1990–2010 and is complete in terms of years and geographical coverage. Indeed, only GHG emissions from multilateral operations (memo item) are reported as not estimated (“NE”).

³ 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 (ITL) administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry.

⁴ 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.

11. The ERT noted that France has provided a complete set of CRF tables, except for CRF table 8(b) (explanations of recalculations). However, related information on recalculations is included in the NIR. In addition, CRF table 7 (key categories) is only provided for 2010 and not for the base year. The ERT considered that CRF tables 7 and 8(b) are required, as part of the official annual submission, 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). The ERT noted with concern that this omission had already been identified in previous review reports. In response to questions raised by the ERT during the review, France informed the ERT that it is developing a procedure for reporting CRF table 7 and that this procedure will be applied to report for 2011 and the base year in its next annual submission. However, in addition France explained that preparing input for CRF table 8(b) would be very time-consuming using the CRF Reporter and is thus not foreseen. The ERT therefore strongly reiterates the recommendation made in the previous review report that France provide CRF tables 7 and 8(b), at least for the base year and the latest inventory year, in order to ensure the comparability and completeness of its reporting, in its next annual submission.

12. The KP-LULUCF table NIR-3 was included in France’s 2012 annual submission and the ERT commends the Party for having followed the recommendation made in the previous review report.

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

Overview

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

14. France described the changes in the national system since the previous annual submission and these changes are discussed in chapter II.G of this report.

Inventory planning

15. The NIR and additional information submitted by the Party described the national system for the preparation of the inventory. The Ministère de l’Écologie, du Développement durable et de l’Énergie (MEDDE)⁵ has overall responsibility for the national inventory. MEDDE coordinates with other ministries, attributes responsibilities to different institutions and organizations and has final responsibility for submitting the inventory to the UNFCCC. Other organizations are also involved in the preparation of the inventory.

16. The preparation of the GHG inventory is delegated to the Centre Interprofessionnel Technique d’Études de la Pollution Atmosphérique (CITEPA). CITEPA collects the data from other institutions, selects the estimation methods, prepares the inventory, implements quality assurance/quality control (QA/QC) procedures and archives the inventory and related documents. The École des Mines de Paris is responsible for the estimation of the country’s emissions of fluorinated gases (F-gases) and provides these emission estimates to CITEPA.

⁵ As reported in the Party’s 2011 annual submission, the former name of this ministry was Ministère de l’Écologie, du Développement durable, des Transports et du Logement.

17. The Groupe de Concertation et d'Information sur les Inventaires d'Émissions (GCIIE), coordinated by MEDDE and composed of all relevant ministries, discusses the results of each annual GHG inventory, advises and approves the methodological changes and the inventory improvement plan, provides recommendations and proposes actions and research activities for the improvement of the inventory.

18. Every year GCIIE reviews the draft inventory and MEDDE revises, if necessary, the inventory before approving it and submitting it to the UNFCCC. The findings of the review report are incorporated, together with the findings of GCIIE, into an inventory action plan.

19. France has established a process for the official consideration and approval of the inventory, including recalculations, prior to its submission and for responding to any issues raised during the review. However, the ERT noted with concern that the national system of France has not been able to implement or respond to a number of recommendations made in previous review reports, some of which have been repeated in different review reports and some of which are strongly reiterated recommendations. Most of these recommendations are reiterated again in this report. Although the ERT recognizes that the implementation of such recommendations would not significantly influence the accuracy of the inventory, the relevant issues hamper the expert review (e.g. the non-completion of CRF tables 7 and 8(b) (see para. 11 above)) and have an impact on the general transparency and comparability of the inventory (see paras. 31, 77, 79 and 80 below). Therefore, the ERT strongly recommends that France enhance its national system so that it is able to address the reiterated recommendations made in this and previous review reports.

20. The ERT considered that, as was the case in the Party's 2010 and 2011 annual submissions, the description of the national system in the NIR (section 1.2) does not mention all of the institutions involved in the inventory preparation process; for example, the École des Mines de Paris, responsible for the estimation of F-gas emissions, and the Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME), which has an important role in the compilation of the inventory for the waste sector by providing activity data (AD), some emission factors (EFs) and the methodology to estimate emissions from landfills, are not mentioned in the general description of the national system. In response to questions raised by the ERT during the review, France stated that it will include in the NIR of its next annual submission a table listing all of the institutions involved in the data flows needed for the inventory, as laid down in the Arrêté du 24 août 2011 relatif au système national d'inventaires d'émissions et de bilans dans l'atmosphère (NOR:DEV1124328A). The ERT strongly reiterates the recommendation in previous review reports⁶ that France improve the general description of its national system in the NIR, including a list of all of the institutions involved in the inventory preparation process, in its next annual submission.

Inventory preparation

Key categories

21. France has reported tier 1 and tier 2 key category analyses, both level and trend assessment, as part of its 2012 annual submission. The tier 1 key category analysis performed by France and that performed by the secretariat⁷ produced similar, although not

⁶ FCCC/ARR/2010/FRA, paragraph 30, and FCCC/ARR/2011/FRA, paragraph 18.

⁷ 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 Land Use, Land-Use Change and Forestry*. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

identical, results, owing to the different levels of disaggregation used (France used a higher level of disaggregation). France has included the LULUCF sector in its key category analysis, which was performed in accordance with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF). The tier 2 key category analysis was prepared for the first time for the 2012 annual submission, including the LULUCF sector. The ERT commends France for this improvement, which was made in accordance with a recommendation made in the previous review report.

22. The ERT noted with appreciation that France uses tier 2 or higher estimation methods for all key categories, with the exception of emissions from agricultural soils, for which tier 2 methods are difficult to develop and apply. The ERT concluded that France has used its key category analysis to plan the development of its inventory.

23. Following a recommendation in the previous review report, France has identified key categories for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, and has reported them in KP-LULUCF CRF table NIR-3 for the first time. The ERT commends the Party for that achievement.

Uncertainties

24. France has provided a tier 1 uncertainty analysis. In line with the findings contained in the review reports of the Party's 2010 and 2011 annual submissions, the ERT noted that uncertainties are provided at a high level of aggregation of categories (36 categories) and, consequently, the same uncertainty values for AD and EFs are assumed for subcategories (e.g. for: CH₄ emissions from enteric fermentation; fugitive emissions from oil and natural gas; transport; mineral products; chemical industry; and consumption of halocarbons and SF₆). The ERT also noted that, although those 36 categories cover all categories and gases reported, the uncertainty analysis does not adequately reflect the methodologies and quality of the data used for the different categories and, therefore, cannot be used to prioritize inventory improvements. In order to be effective, the tier 1 uncertainty analysis from the IPCC good practice guidance requires independent consideration for each category, fuel and gas when different quality data or methodologies have different uncertainties.

25. In response to questions raised by the ERT during the review, France stated that its aggregation of categories for the uncertainty analysis is in line with the IPCC good practice guidance and categories are aggregated only when categories are mutually dependent or AD and/or EFs are correlated and taking into consideration that the IPCC good practice guidance states that "dependency and correlation can be addressed by aggregating the source categories to the level of overall consumption" (chapter 6.3.3, page 6.18). The ERT noted that this is not the case for all of the aggregated categories in France's uncertainty analysis. In addition, France has not provided specific information on uncertainty values related to EFs and AD for all individual categories. The ERT concluded that France's uncertainty analysis is not fully in line with the IPCC good practice guidance, and strongly reiterates the recommendation in the previous review reports that France prepare and report its uncertainty analysis in accordance with the IPCC good practice guidance for its next annual submission. Responding to the ERT at the end of the review, France reiterated its consideration that the uncertainty analysis is in accordance with the IPCC good practice guidance, but stated that it will disaggregate the uncertainty analysis for individual subcategories, especially when the quality of data and methodology tiers are significantly different.

26. France has estimated the overall inventory uncertainty for 2010 to be 16.2 per cent if the LULUCF sector is excluded and 17.6 per cent if LULUCF is included. France has

estimated the trend uncertainty to be 2.8 per cent excluding the LULUCF sector and 3.1 per cent including the LULUCF sector. The ERT noted that these estimated uncertainties are lower than those reported in the 2011 annual submission;⁸ however, France does not provide explanations in the NIR for the apparent increase in accuracy. In response to questions raised by the ERT during the review, France indicated that it had updated the uncertainty estimates for some categories using more sophisticated Monte Carlo analysis (e.g. N₂O from direct and indirect soil emissions from agricultural soils and pasture, range and paddock), leading to improved uncertainty ranges for those categories. The ERT commends the Party for enhancing the uncertainty analysis for some categories, but recommends that it ensure that all major changes in uncertainty parameters be explained in a transparent manner in the NIR in its next annual submission.

Recalculations and time-series consistency

27. Recalculations have been performed and reported in accordance with the IPCC good practice guidance, and France has provided recalculated estimates (CRF table 8(a)) for all years and all sectors from 1990 to 2009. The recalculations led to a decrease in the estimated total GHG emissions, for 1990 of 0.7 per cent and a decrease in the estimate for 2010 of 0.5 per cent. With regard to total GHG emissions including LULUCF, the estimate of emissions for 1990 increased by 3.1 per cent and that for 2010 by 5.5 per cent.

28. The ERT noted that the recalculations reported by France of the time series 1990–2009 have been undertaken to take into account revised EFs and AD for all sectors and gases (table 76 of the NIR lists about 80 categories for which recalculations have been performed). Most of the recalculations are due to updates of underlying statistical data and their impact is relatively small. However, for the LULUCF sector, the figure reported for total estimated removals in the 2012 annual submission is about half that reported in the 2011 annual submission (see para. 88 below).

29. France has provided an overview of the recalculations in chapter 10 and annex 6 to the NIR, and the rationale for some of the recalculations is provided in the sectoral sections of the NIR, but not in a comprehensive manner (see paras. 50 and 58 and 59 below). The ERT commends France for the improvement of table 76 of the NIR, in which background information on the recalculations is now provided. However, CRF table 8(b) is still empty in the 2012 annual submission for all years. Therefore, the ERT considered that France did not report recalculations in a transparent manner, although some improvements have been made since the previous annual submission. The ERT reiterates the recommendation in the previous review report that France report recalculations in a transparent and comprehensive manner, including justification for such recalculations, in its next annual submission. In addition, the ERT strongly recommends that France transfer the information provided in the NIR to CRF table 8(b) for all years, where relevant, for its next annual submission.

Verification and quality assurance/quality control approaches

30. France has elaborated and implemented a QA/QC plan in accordance with the IPCC good practice guidance. The plan includes general QC procedures (tier 1), as well as some category-specific procedures (tier 2) for the key categories and also for the categories in relation to which significant methodological changes or data revisions have occurred.

⁸ The overall inventory uncertainty for 2009 was reported to be 18.3 per cent excluding the LULUCF sector and 22.5 per cent if LULUCF is included. The trend uncertainty reported for 2009 (1990–2009) was 2.5 per cent excluding the LULUCF sector and 4.0 per cent including the LULUCF sector (FCCC/ARR/2011/FRA, para. 23).

Transparency

31. Recommendations in the previous review reports reflected concerns regarding the balance of the information provided between the main body of the NIR and the OMINEA report.⁹ Over successive annual submissions, as has been concluded in previous review reports, the Party has enhanced the balance between the two parts, but the present ERT considered that the NIR still does not properly reflect the high quality of the French inventory and that it is frequently not sufficiently detailed or does not provide specific information enabling the ERT to easily assess whether the inventory is in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. Therefore, the ERT recommends that France continue to assess the distribution of information between the OMINEA report and the main body of the NIR, in order to enhance the transparency of its reporting.

32. France has submitted two complete sets of CRF tables, one under the Convention and one under the Kyoto Protocol, with different geographical coverage (the GHG inventory under the Kyoto Protocol does not include the countries and overseas territories not included in the European Union),¹⁰ but only one NIR. The ERT found that it is often not clear to which set of CRF tables the description and figures in the NIR are referring to; for example, the figures in table 76 of the NIR do not match those reported in either set of CRF tables (see para. 41 below). Therefore, the ERT reiterates the strong recommendation in the previous review report that France, in its next annual submission, refer to the CRF tables submitted under the Kyoto Protocol and, when this is not the case, clearly indicate to which territorial aggregation the information refers.

Inventory management

33. France has a centralized archiving system, which includes the archiving of 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, external and internal reviews, and documentation on annual key categories and key category identification and planned inventory improvements. The archived information is maintained and updated by CITEPA. During the review, the ERT was provided with the requested additional archived information.

3. Follow-up to previous reviews

34. France has taken action to follow up on a number of recommendations in the previous review reports, including implementing a tier 2 key category analysis and preparing a key category analysis for KP-LULUCF activities, reporting CRF table 7 for the latest inventory year and including information on reasons for recalculating estimates for most categories for which recalculations were performed. The inventory has reached a high degree of completeness and the completeness and transparency of the NIR are constantly improving.

35. In addition, France reports in annex 10 to its NIR detailed responses to individual recommendations in the previous review reports, most of which have been responded to by implementing improvements. Where this is not the case, explanations are provided and relevant actions are listed. The ERT commends France for this transparent and detailed

⁹ Report entitled "Organisation et méthodes des inventaires nationaux des émissions atmosphériques", which is included as an annex to the NIR.

¹⁰ According to section 1.8 of the NIR: French Polynesia, Wallis and Futuna, Mayotte, New Caledonia, Saint Pierre and Miquelon, Clipperton Island and the French Antarctic Territories.

reporting of its follow up on recommendations made in previous review reports. The ERT noted with concern that the national system of France has not been able to implement or respond to a number of recommendations made in previous review reports, some of which have been repeated in different review reports and some of which are strongly reiterated recommendations. Reiteration of these recommendations is indicated in the current annual review report.

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

36. During the review, the ERT identified a number of areas for improvement. These are listed in table 7 below.

37. Recommended improvements relating to specific categories are presented in the relevant sector chapters of this report and in table 7 below.

B. Energy

1. Sector overview

38. The energy sector is the main sector in the GHG inventory of France. In 2010, emissions from the energy sector amounted to 370,021.77 CO₂ eq, or 70.8 per cent of total GHG emissions. Since 1990, emissions have decreased by 2.9 per cent. The key drivers for the decrease in emissions are the fall in emissions in the categories manufacturing industries and construction (reduction of 16,438.48 Gg CO₂ eq or 19.4 per cent), energy industries (reduction of 3,208.03 Gg CO₂ eq or 5.0 per cent) and fugitive emissions from solid fuels (reduction of 4,953.08 Gg CO₂ eq or 51.5 per cent). These decreases were partially offset by an increase in emissions from the transport category (of 10,942.49 Gg CO₂ eq or 9.0 per cent). Within the sector, 35.7 per cent of the emissions were from transport, followed by 27.9 per cent from other sectors, 18.5 per cent from manufacturing industries and construction and 16.6 per cent from energy industries. The remaining 1.3 per cent were fugitive emissions.

39. France has made recalculations for the energy sector between its 2011 and 2012 annual submissions following changes in AD and EFs. The impact of these recalculations on the energy sector is an increase in emissions for 2009 of 0.5 per cent and a decrease in the estimate of emissions for 1990 of 0.3 per cent. The main recalculations took place in the following categories:

(a) Public electricity and heat production, owing to the revision of the CH₄ EFs for natural gas and changes in AD (increase of 2009 emissions by 316.65 Gg CO₂ eq, or 0.7 per cent);

(b) Petroleum refining, owing to the revision of CH₄ EFs and changes in AD. In addition, for the period 1990–2002 emissions associated with steam cracking were reallocated to the industrial processes sector (increase of 2009 emissions by 29.03 Gg CO₂ eq, or 0.2 per cent);

(c) Manufacturing industries and construction, owing to the update of AD based on the national energy balance (decrease of 2009 emissions by 481.98 Gg CO₂ eq, or 0.8 per cent);

(d) Transport, owing to the revision of CH₄ and N₂O EFs and changes in AD based on traffic statistics (increase of 2009 CO₂ emissions by 253.02 Gg CO₂ eq, or 0.2 per cent, and decrease of 2009 N₂O emissions by 276.90 Gg CO₂ eq, or 0.8 per cent);

(e) Other sectors, owing to the revision of CH₄ EFs and AD;

(f) Fugitive emissions from fuels, owing to the reallocation of emissions to fuel combustion (petroleum refining) and the update of the methodology for the estimation of CH₄ leakages in the distribution network (decrease of 2009 emissions by 31.52 Gg CO₂ eq, or 0.6 per cent).

40. The reporting on the energy sector is complete. The CRF tables include emission estimates for all categories, gases and fuels, and emissions from the energy sector have been reported for all years of the inventory time series.

41. In the previous review report it was identified that the geographical coverage of the AD provided in the NIR for the energy sector was not always consistent, and, in some cases, it was not completely transparent to which submitted CRF tables (Convention or Kyoto Protocol) the data referred. The ERT reiterates the strong recommendation in the previous review report¹¹ that France, in its next annual submission, refer to the CRF tables submitted under the Kyoto Protocol or, when this is not the case, clearly indicate to which territorial aggregation the information refers.

42. The description of the energy sector is generally transparent, but for some categories there is a lack of explanation for the variation in the implied emission factor (IEF) time series (see paras. 48 and 49 below). In order to improve transparency, the ERT recommends that France provide more detailed explanations for variations in the IEF time series in its next annual submission.

2. Reference and sectoral approaches

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

43. Estimates of CO₂ emissions from fuel combustion were calculated using the reference and the sectoral approaches. For 2010, estimated CO₂ emissions calculated using the sectoral approach were 0.59 per cent higher than those calculated using the reference approach. In the NIR, France reported that the non-energy use of solid and gaseous fuels and the exclusion from the reference approach of the other fuels combusted in waste incineration plants explain the difference in the emission estimates calculated using the two approaches.

44. Several differences between the data reported in the CRF tables (reference approach) and international statistics (data reported to the International Energy Agency (IEA)) were identified during previous stages of the review; for example, liquefied petroleum gas imports in 2010 were 14 per cent higher when calculated using the reference approach than IEA data; and exports of natural gas in 2010 were 4 per cent higher according to IEA data than reported in the CRF tables. In response to questions raised by the ERT during the review, France explained that the reference approach was prepared using data provided by MEDDE to IEA and any differences are due to the use of different net calorific values and the use of a provisional energy balance for 2010 for the calculation of the emission estimates using the reference approach. The ERT recommends that France continue to improve the consistency of the AD used in the inventory (sectoral approach), the national energy balance (reference approach), and international sources of information. France identified in the NIR plans for the further harmonization of the data used in the inventory and the national energy balance, especially for emissions from iron and steel production and steam cracking. The ERT encourages France to report on the progress made in its next annual submission.

¹¹ FCCC/ARR/2011/FRA, paragraph 44.

International bunker fuels

45. The split of emissions between international bunker fuels and domestic navigation was based on a study carried out in 2010 by CITEPA, which was performed following recommendations in the previous review reports. The ERT considers that the split between the two uses and the reporting thereon have been carried out in accordance with the IPCC good practice guidance.

Feedstocks and non-energy use of fuels

46. The ERT concluded that the reporting on feedstocks and non-energy use of fuels is not transparent and has not improved since the Party's previous annual submission. CRF table 1.A(d) includes estimates of the quantities of feedstocks and non-energy use of fuels, showing estimates of the carbon stored in the non-energy use of fuels, but does not include information on the associated CO₂ emissions and where these were allocated: in the column "associated CO₂ emissions of feedstocks and non-energy use of fuels" all fuels are reported as included elsewhere ("IE"), except for other petroleum products; and not applicable ("NA") is reported in the column "allocated under". The ERT reiterates the recommendation in the previous review reports that France improve the transparency and completeness of the information reported in CRF table 1.A(d) in its next annual submission.

3. Key categories

Stationary combustion: gaseous and other fuels – CO₂

47. The trend in the CO₂ IEF for gaseous fuels in the electricity and heat production category is unstable: a constant value (57.00 t/TJ) is used for the period 1990–2004, while variable values (in the range of 56.45–57.00 t/TJ) are reported for 2005 onwards. The CO₂ IEF for gaseous fuels for petroleum refining also shows an unstable time series: a constant value (57.00 t/TJ) is reported for the period 1990–2004 and variable values (in the range of 55.23–57.01 t/TJ) for 2005 onwards. The ERT recognized that the variation is due to the application of data from the European Union emissions trading system (EU ETS), which increases the accuracy of estimates for the most recent years, but noted that changes in the IEFs over the years are usually smaller. Therefore, the ERT recommends that France, in its next annual submission, analyse the variations in the IEF time series, taking into consideration the uncertainty of the values reported and the need to ensure time-series consistency, and provide the appropriate justification for such variations in the NIR.

48. The CO₂ IEF for other fuels in the electricity and heat production category increased by 18.4 per cent between 1990 (84.74 t/TJ) and 2010 (100.32 t/TJ). The ERT noted that the NIR does not include an explanation for this. In response to questions raised by the ERT during the review, France informed the ERT that the category other fuels corresponds mainly to waste consumed by incineration plants with energy recovery, and that the increase in the IEF in recent years resulted from the increase in the incineration of municipal waste, which has the highest EF. The ERT recommends that France include more information to explain this IEF trend in the NIR of its next annual submission.

49. With regard to the manufacture of solid fuels and other energy industries, the trend in the CO₂ IEF for gaseous fuels is not stable: the values ranged between 52.52 and 54.42 t/TJ for the period 1990–1998, while a lower constant value (36.25 t/TJ) was reported for 1999–2001 and a higher constant value (57.00 t/TJ) was reported for 2002–2008; and for 2009 and 2010 AD and emissions are reported as not occurring ("NO"). The ERT noted that the NIR does not contain explanations for changes in this IEF. Therefore, the ERT recommends that France provide information to explain this IEF trend in the NIR in its next annual submission.

50. The ERT found that the AD reported for 2009 for municipal solid waste (MSW) in the category public electricity and heat production was recalculated between the 2011 and the 2012 annual submissions, but that no relevant explanatory information is contained in the NIR (page 92). In response to questions raised by the ERT during the review, France explained to the ERT that AD on the amount of MSW incinerated with energy recovery were provided by ADEME on the basis of a survey (named ITOM) that is conducted every two years. When preparing the 2011 annual submission, the most recent AD available were for 2008 and emissions for 2009 were estimated on the basis of the data for 2008 using a forecast scenario which is included in France's fifth national communication. Concerning the 2012 annual submission, the results of the ITOM survey for 2010 were not available and the most recent AD available for the preparation of the inventory were for 2008. However, the estimated emissions for 2009 were recalculated on the basis of a forecast scenario prepared under the mechanism for monitoring GHG emissions (reported to the European Commission). France informed the ERT that the ITOM survey, including data for 2010, would be available for the preparation of the next annual submission. The ERT recommends that France ensure that it includes explanatory information in the NIR, in its next annual submission, when it has performed recalculations.

Civil aviation: liquid fuels – CO₂

51. France presents planned improvements for this category in the NIR (to be introduced in the 2014 annual submission), including more specific bottom-up information on operating conditions at the airport level and ensuring that national emission estimates for aviation reported in the inventory are consistent with the future reporting system of the EU ETS for aviation. The ERT encourages France in its efforts to increase the accuracy of the inventory, but recommends that it ensure time-series consistency when performing recalculations for its future annual submissions.

Road transportation: liquid and biomass fuels – CO₂

52. In previous review reports¹² it was strongly recommended that France obtain country-specific values for the carbon content of the diesel and gasoline sold in France. The ERT noted that the CO₂ IEFs (72.35 t/TJ and 74.70 t/TJ for gasoline and diesel oil, respectively) used by France in its 2012 annual submission were the same as those in the 2011 annual submission, which were derived from the COPERT IV model¹³ on the basis of the default carbon/hydrogen ratios considered by that model. These values differ from the IPCC default values for Europe (73.00 t/TJ and 74.00 t/TJ, respectively). In response to questions raised by the ERT during the review, France explained that, after the last in-country review (2010 annual submission), experts from the petroleum industry at the national and European levels were contacted to determine whether specific data for the conditions in France were available. The experts responded that the carbon (C) and hydrogen contents of fuels are not part of the fuel composition requirements and are therefore not collected. The experts also stated that the fuel composition may vary according to the season. On the other hand, according to French petroleum experts, European fuels are very representative of French fuels, given the country's position between the North and South of Europe, and are most probably reflected in the COPERT IV defaults. Nevertheless, the Party stated that CITEPA is still in discussions with the experts from the petroleum industry, trying to resolve this issue. The ERT welcomes France's effort and reiterates recommendations made in previous review reports to obtain country-specific values for the carbon content of the diesel and gasoline sold in France for the estimation of the relevant CO₂ emissions in its next annual submission.

¹² FCCC/ARR/2010/FRA, paragraph 66, and FCCC/ARR/2011/FRA, paragraph 56.

¹³ Information on the model is available at <<http://www.emisia.com/copert/>>.

53. As already noted in the previous review report, in annex 3 to the NIR France has reported the percentages of biofuels in fuels used in the country but it has excluded the use of these fuels in the French overseas territories. The ERT noted that the amount of bioethanol combusted cannot be estimated from these percentages and the data in the CRF tables. The ERT recommends that France report separately the AD for biodiesel and bioethanol in its NIR, in its next annual submission, in order to ensure transparency.

Fugitive emissions from fuels – CO₂, CH₄ and N₂O¹⁴

54. The ERT commends France for addressing the recommendation in the previous review report to reallocate the fuel combustion emissions from petroleum refining processes (e.g. fluid catalytic cracking and sulphur recovery plants) to the energy sector. But the ERT concluded that the description of the allocation of fugitive emissions from petroleum refining provided in the NIR is still not transparent. For example, the ERT noted that France stated in its NIR that the calculation of CO₂ fugitive emissions from refining processes are based on the national CO₂ EFs from table 25 of the NIR, but the ERT notes that these are fuel combustion EFs. For the CH₄ EF, France informs of using the emissions reported directly by the companies involved and, for the N₂O EF, France has referred to the EFs for fuel combustion. In response to questions raised by the ERT during the review, France explained that, as all process emissions from refineries are reported under the EU ETS, total estimated CO₂ emissions are based on data in annual EU ETS reports and are allocated according to the different CRF categories according to its type. The ERT recommends that France clearly describe the allocation of emissions from petroleum refining in the NIR of its next annual submission.

C. Industrial processes and solvent and other product use

1. Sector overview

55. In 2010, emissions from the industrial processes sector amounted to 37,552.13 Gg CO₂ eq, or 7.2 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 1,224.46 Gg CO₂ eq, or 0.2 per cent of total GHG emissions. Since 1990, emissions have decreased by 36.4 per cent in the industrial processes sector, and decreased by 40.7 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 emissions from chemical industry, by 24,251.98 Gg CO₂ eq, or 86.0 per cent, of which adipic acid and nitric acid production accounted for 14,416.99 and 5,379.39 Gg CO₂ eq of the emission reduction, respectively (97.3 and 81.9 per cent reductions, respectively). With regard to those two categories, considerable reductions of N₂O emissions resulted from the implementation of abatement techniques. Other categories in which considerable emission reductions were experienced (greater than 2,500.00 Gg CO₂ eq) were cement and aluminium production and fugitive emissions from halocarbon production. These emission reductions were partly offset by an increase in GHG emissions from refrigeration and air-conditioning equipment and the category aerosols/metered dose-inhalers (MDI), which increased by 10,770.94 and 5,164.32 Gg CO₂ eq, respectively. Compared with 2009, emissions from the industrial processes sector increased by 2.8 per cent in 2010, indicating a modest revival after the economic downturn between 2007 and 2009. The emission reduction in the solvent and other product use sector between the base year and 2010 originated mainly from a reduction in CO₂ emissions from paint application (by 354.10 Gg

¹⁴ Not all emissions related to all gases under this category are key categories, particularly N₂O 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.

CO₂ eq, or 76.1 per cent) and from degreasing and dry cleaning (by 230.67 Gg CO₂ eq, or 1,261.1 per cent).

56. Within the industrial processes sector, 46.3 per cent of the emissions were from consumption of halocarbons and SF₆, followed by 32.8 per cent from mineral products, 10.5 per cent from chemical industry and 9.9 per cent from metal production. Production of halocarbons and SF₆ accounted for the remaining 0.5 per cent. Within the solvent and other product use sector, 52.8 per cent of the emissions were from other non-specified uses, 37.9 per cent from paint application, 7.9 per cent from chemical products, manufacture and processing and 1.5 per cent from degreasing and dry cleaning.

57. France has made recalculations for the industrial processes sector between its 2011 and 2012 annual submissions following changes in AD and EFs, in order to correct identified errors and as a result of the reallocation of emissions between the industrial processes and the energy sectors. The impact of these recalculations on the industrial processes sector is a decrease in the estimated emissions of 0.1 per cent for the base year and a decrease of 2.1 per cent for 2009. The main recalculations for 2009 took place in the following categories:

(a) Metal production, owing to a reallocation of CO₂ emissions from iron and steel production between the industrial processes and the energy sector (iron and steel) on the basis of the carbon balance, resulting in an emission decrease of 500.54 Gg CO₂ eq, or 15.0 per cent, in the category metal production;

(b) Chemical industry, owing to a recalculation of CH₄ emissions on the basis of an update of basic data from industrial plants (ethylene, styrene and propylene), resulting in an emission increase of 4.44 Gg CO₂ eq, or 7.4 per cent;

(c) Consumption of halocarbons and SF₆, owing to a correction made in the calculation model to correct for the double counting of end-of-life emissions, resulting in a decrease in the estimate of HFC and PFC emissions by 610.37 Gg CO₂ eq, or 3.9 per cent. In response to questions raised by the ERT during the review, France explained that the double counting occurred between fugitive emissions during the last year of the appliance usage and the end-of-life;

(d) CO₂ emissions from lime production (recalculations made in the original submission and, during the review, in response to the list of potential problems and further questions raised by the ERT during the review week), CH₄ emissions from iron and steel production, PFC emissions from aluminium production and HFC emissions from production of halocarbons and SF₆, resulting in an increase in the combined estimated emissions of 44.36 Gg CO₂ eq, or 0.4 per cent.

58. France has also made recalculations for the solvent and other product use sector between its 2011 and 2012 annual submissions, as reported in CRF table 8(a). The impact of the recalculations on the solvent and other product use sector is a decrease in the estimated emissions of 1.9 per cent for 2009 and an increase of 0.1 per cent for the base year. However, the ERT noted that the NIR stated that no recalculations were made for this sector (overview table 76 of the NIR). In response to questions raised by the ERT during the review, France explained that recalculations of CO₂ emissions resulted mainly from the recalculation of non-methane volatile organic compounds (NMVOC) emissions due to the use of updated data on "industrial coating application" (CO₂ emissions are derived from indirect emissions). The ERT reiterates the recommendation in the previous review report¹⁵ that France report all recalculations and related information in a transparent and consistent manner in both the NIR and in the CRF tables in its next annual submission.

¹⁵ FCCC/ARR/2011/FRA, paragraph 65.

59. The ERT considered that France did not report explanations for all recalculations for the industrial processes and solvent and other product use sectors in a transparent manner, although some improvements were made since its previous annual submission, for example: recalculations are discussed for relevant categories in the NIR; and an overview table with the recalculations and a concise rationale is included in an annex to the NIR. The ERT reiterates the recommendation in the previous review report that France report in a transparent and consistent manner recalculations, including justification for such recalculations, in its next annual submission.

60. Regarding the transparency of the reporting on the industrial processes and solvent and other product use sectors, although France provides in the NIR detailed methodological explanations for each category, the ERT considers that the information and references contained thereon are not always accurate and updated. France acknowledged these shortcomings during the review and indicated that it will improve the relevant reporting in its next annual submission.

2. Key categories

Cement production – CO₂

61. France did not implement the recommendations in the previous review reports and the ERT strongly recommends that the Party do so and report thereon in its next annual submission. In particular, the ERT recommends that France, in its next annual submission:

(a) Report the number of plants applying a tier 3 estimation method and those still applying a tier 2 method, with the corresponding AD and EFs used, in order to increase transparency;

(b) Increase transparency by reporting EFs and AD disaggregated by cement type (alumina and Portland);

(c) Increase transparency by reporting on the share of non-carbonate carbon and cement kiln dust in the IEF.

Lime production – CO₂

62. France reports that it is using plant-specific data for all production sites to estimate emissions from lime production for 2004 onwards and that for before 2004 average EFs from a limited number of sites were used to estimate emissions from the total production. The NIR does not provide information on whether or not this average EF was appropriate for the calculation of the emissions from the remaining (i.e. not directly reporting) plants for the period 1990–2003, and the ERT considered that this may have some impact on the final IEF, given the variety of lime types. In response to questions raised by the ERT during the review, France provided information on the share of the AD covered by directly reporting plants: for non-hydraulic lime, the coverage is 100 per cent for 2004 onwards (but only 23 per cent in 2000); and for hydraulic lime, AD are known for the whole period except for two plants covering 3 per cent of the AD (estimated by the French Lime Federation), and emissions for these plants are estimated using the average EF for the majority of the plants. The ERT recommends that France include this information in its next annual submission, in order to increase transparency.

63. The NIR states that all CO₂ emissions from lime produced by sugar refineries are reported under the LULUCF sector, but the ERT determined, during the review, that it was not clear where such emissions were reported. In response to questions raised by the ERT during the review, France explained that the limestone coming from sugar refineries is captured in scum by recarbonation and used in agriculture, and that the related emissions were included under limestone use for cropland remaining cropland (CRF table 5(IV)).

However, the ERT considered that France did not provide documentation (scientific literature or results of field tests) showing that this recarbonation has a 100 efficiency, and, therefore, considered that the inventory may be underestimated for the industrial processes sector and for total emissions from categories included in Annex A to the Kyoto Protocol. Therefore, the ERT included this issue in the list of potential problems and further questions raised by the ERT during the review week.

64. On 23 November 2012, France submitted revised emission estimates for this category, preparing a carbon balance on the basis of: the annual statistics for sugar beet production and a ratio of 18 kg limestone/t sugar beet;¹⁶ the statistics for sugar scum used for agricultural liming (crude matter including humidity)¹⁷ and a proportion of 24 per cent calcium oxide in the scum.¹⁸ The estimates were calculated for the entire time series, assuming an average value of 80 per cent recarbonation, which was considered by France to be a conservative estimate. The revision led to an increase of 43.23 Gg CO₂ eq in the estimate of emissions for this category in 2010. The ERT considers that the inventory for the industrial processes sector is now not underestimated, but encourages the Party to continue its efforts to enhance the accuracy of the inventory in its next annual submission. The ERT noted, however, that the estimated emissions reported in CRF table 5(IV) did not change, but they should, as part of the emissions are now reported under the industrial processes sector. The ERT recommends that France revise its estimates for the LULUCF sector in its next annual submission in order to avoid double counting.

Ammonia production – CO₂

65. As noted in the previous review report, the AD and IEF for ammonia production have been significantly variable since 2006. France explained during the review of its 2011 annual submission that the increase in the IEF between 2008 (1.47 t/t ammonia produced) and 2009 (1.82 t/t ammonia produced) by 24.2 per cent was due to the use of lower load factors (AD reduction of 9.6 per cent) and the decrease in the efficiency of this industrial process. However, with respect to the Party's 2012 annual submission, the ERT noted that between 2009 and 2010 production was reduced by 19.3 per cent at the same time that the IEF was decreased by 17.3 per cent (1.50 t/t ammonia produced in 2010) (resulting in a decrease in the emission estimate of 33.2 per cent). In response to a question raised by the ERT during the review, France explained that this simultaneous decrease in AD and the IEF can be explained by the closure of a plant in 2010 while the remaining ones have a better efficiency. Also, France informed the ERT, during the review, that a double counting of CO₂ emissions from urea production was detected for 2009 and that it will revise the relevant emission estimates for its next annual submission to 1.68 t/t ammonia produced. The ERT recommends that France revise the calculations and report transparently on these issues in its next annual submission.

Nitric acid production – N₂O

66. N₂O emissions from nitric acid production decreased considerably over the period 2000–2010 (an 80.6 per cent decrease). France explains in its NIR that this is due to the closure of inefficient plants and to the installation and operating conditions of N₂O destruction devices. However, the NIR is not transparent on the number of plants equipped with such devices. Also, although emission estimates for two plants (in a total of nine plants) were calculated on the basis of an IEF based on previous measurements (while emissions for the other seven plants are based on measurements), it is not clear if this IEF is

¹⁶ Communication from the French Sugar Manufacturers Federation, 2012.

¹⁷ Livraisons d'amendements minéraux basiques, ANPEA.

¹⁸ Service d'Assistance Technique à la Gestion des Epandages, SATEGE, Cahier technique, August 2010.

representative for these two plants in more recent years. In response to questions raised by the ERT during the review, France provided more information on the data collection from the two plants, indicating that one reports measured emissions, which are verified by the appropriate authority, and only for the other one are emissions calculated using the IEF. The ERT recommends that the Party transparently report such information in its next annual submission by updating the description of the methodology accordingly.

Aluminium production – CO₂, PFCs

67. The ERT noted that since 2009 the ratio of CF₄ to C₂F₆ emissions has increased substantially, from an average value of 4.33 in the period 1990–2008 to 14.87 in 2009 and 15.28 in 2010. The CO₂ EF, in accordance with information provided by the Party during the review, increased by 8 per cent in 2009 compared with the 1990–2007 average and by another 7 per cent in 2010. In response to questions raised by the ERT during the review, France provided the ERT with an explanation for these trends, namely that the plant that closed in 2008 had the lowest CF₄ to C₂F₆ ratio compared with the remaining two production sites (about 3 while the ratio for the other plants is between 9 and 12). Moreover, France reported operational dysfunctions in 2009 and 2010 (breakdowns on electrolysis tanks), which caused the increase in the CO₂ IEF from 1.75 to 1.87 t/t aluminium. The ERT recommends that France include this information in its next annual submission. In addition, France provided to the ERT during the review more information on the methodologies applied to estimate emissions for this category, following recommendations in the previous review reports, explaining that these (especially by mass balance for CO₂) are estimated by calculation, pursuant to protocols from IAI (International Aluminium Institute), which are in line with the 1996 Revised IPCC Guidelines. The ERT recommends that France include this information in the methodological description in its next annual submission.

Consumption of halocarbons and SF₆ – HFCs and PFCs,

68. With regard to refrigeration and air conditioning, France reports in the NIR that the decrease in actual HFC-134a emissions from domestic appliances is caused by stock renewal. During the review, the ERT informed France that this may not be a satisfactory explanation, to which France replied that the use of substance R600a (isobutane) as a substitute coolant has been expanded in recent years. Although this substance is not covered by the Revised 1996 IPCC Guidelines or the IPCC good practice guidance and since there is scientific evidence that it is not climate neutral, the ERT considered that emissions of this gas could be reported in CRF table 9(b). The ERT encourages France to improve the reporting in its NIR on this and other substances used for cooling and also to use CRF table 9(b) for this purpose in its next annual submission.

69. In addition, the ERT noted, in a background report from Centre Énergétique et Procédés de l'École des Mines de Paris (CEP-ENSMP), related to basic data for the model used by France to estimate hydrocarbon and SF₆ emissions from refrigeration and air-conditioning equipment, that R744, the trade name for CO₂, is used as a coolant, among others. However, the ERT found no report of emissions from the use of CO₂ in the above-mentioned category. Therefore, the ERT encourages France, in its next annual submission, to improve the reporting on CO₂ emissions, but also to investigate the origin of the CO₂ in order to avoid double counting.

70. The ERT found that the NIR lacks transparency in terms of the reporting of AD for and emissions of HFCs from the use of aerosols/MDI: the reported HFC emissions are only a fraction of the reported stock (AD), while the IPCC good practice guidance indicates that emissions from sales of aerosols are emitted within two years. In response to questions raised by the ERT during the review, France commented that emissions due to the

production of aerosols are included in the product-life emissions. The ERT concluded that, if the reported AD for stock relate to the sum of the stock stored at producers and the sales in a particular year, this could explain the low implemented product-life EF of 8 to 11 per cent related to the total stock. The ERT recommends that France provide more transparency on this issue in its next annual submission.

71. France still uses a tier 1a method to estimate potential emissions, thereby not taking into account F-gases in products. In response to questions raised by the ERT during the review about plans to improve the quality of the data reported, France mentioned that a new survey is planned by ADEME for 2013. The ERT recommends that France report on the outcome of the inquiry, when available. The ERT noted that the performed recalculations of emissions for this category were insufficiently documented in the NIR and reiterates the recommendation made in previous review reports that France improve the transparency of the NIR by providing the most recent information on the model used, including information on background reports, the assumptions used, data collection, QA/QC checks, model validation and peer reviews, in its next annual submission.

3. Non-key categories

Other (chemical industry) – CO₂

72. France reports CO₂ emissions from phthalic anhydride production in the CRF tables but does not provide a description of the methodology for estimating such emissions in the NIR. In response to questions raised by the ERT during the review, France provided more information on the IEF, as AD are confidential, but without further clarifying the reported 16.5 per cent decrease in emissions since 2005. The ERT reiterates the recommendation in the previous review report¹⁹ that France include a methodological description for this sub-category in its next annual submission.

Iron and steel production – N₂O

73. In its NIR, France states that it reports N₂O emissions from iron and steel production; but such emissions are not reported in the CRF tables, since there is no space to report N₂O emissions from iron and steel production. The ERT encourages France to report these emissions under other metal production.

D. Agriculture

1. Overview

74. In 2010, emissions from the agriculture sector amounted to 93,876.46 Gg CO₂ eq, or 18.0 per cent of total GHG emissions. Since 1990, emissions have decreased by 9.8 per cent. The key drivers for the fall in emissions are the decreases in N₂O emissions from agricultural soils, by 8,029.02 Gg CO₂ eq, or 14.7 per cent, between 1990 and 2010, and in CH₄ emissions from enteric fermentation, by 2,013.40 Gg CO₂ eq, or 6.6 per cent, from 1990, and these are explained by the decrease in the quantity of synthetic fertilizer applied to agricultural soils and the reduction in the populations of dairy cattle, non-dairy cattle and sheep. Within the sector, 49.6 per cent of the emissions were from agricultural soils, followed by 30.3 per cent from enteric fermentation, 19.9 per cent from manure management and 0.1 per cent from rice cultivation. The remaining 0.04 per cent were from field burning of agricultural residues.

¹⁹ FCCC/ARR/2011/FRA, paragraph 82.

75. France has made recalculations for the agriculture sector between its 2011 and 2012 annual submissions: in order to update the categorization of livestock; and owing to changes in the manure management systems and nitrogen (N) excretion factors, the recalculation of the nitrogen supplied by crop residues and the recalculation of the burning of crop residues due to the use of finer detail in terms of crops. The impact of these recalculations on the agriculture sector is a decrease in the estimated emissions of 1.2 per cent for 2009 and a decrease of 4.3 per cent for the base year. The main recalculations took place in the following categories:

- (a) Enteric fermentation (decrease of 2009 emissions by 958.48 Gg CO₂ eq, or 3.3 per cent);
- (b) Manure management (decrease of 2009 emissions by 976.55 Gg CO₂ eq, or 4.9 per cent);
- (c) Agricultural soils (increase of 2009 emissions by 721.89 Gg CO₂ eq, or 1.6 per cent).

76. The inventory for the agriculture sector is complete in terms of categories and gases. Emission estimates have been provided for all years of the time series and no categories have been reported as “NE”. In the Party’s previous annual submissions, the category field burning of agricultural residues was reported under the waste sector and the ERT appreciates that France has reallocated it to the agriculture sector in its 2012 annual submission, thereby enhancing comparability with other Parties.

77. The ERT noted problems related to the lack of transparency of the inventory methodologies and country-specific values, which had already been identified in the two previous review reports, such as the missing background information to support the methods used to estimate the country-specific CH₄ EFs for enteric fermentation (see paras. 79 and 80 below) and the information on AD for agricultural soils (see para. 83 below). Therefore, the ERT reiterates the recommendation that the Party improve the description of the methodologies used to calculate the emissions of CH₄ from enteric fermentation and N₂O from agricultural soils in its next annual submission.

78. The ERT noted that the uncertainty values for all of the key categories under the agriculture sector were high, both for AD and for EFs: 15 per cent and 140 per cent, respectively, for N₂O from direct soil emissions; 120 per cent and 430 per cent, respectively, for N₂O from indirect soil emissions; and 20 per cent and 200 per cent, respectively, for N₂O emissions from pasture, range and paddock manure. In response to questions raised by the ERT during the review, France informed the ERT that it still uses a tier 1 approach to calculate the total uncertainty of the inventory, but that it has started to implement tier 2 Monte Carlo analysis for specific sensitive categories (e.g. for direct soil emissions; pasture, range and paddock; and indirect soil emissions) and the result of the sectoral application of the tier 2 Monte Carlo analysis is used as input to the tier 1 uncertainty analysis (combined tier 1 and tier 2 approach). France also informed the ERT that some research programmes are under way to allow France to report using higher-tier methodologies the emissions from the agriculture sector, thereby potentially reducing uncertainty further. The ERT welcomes France’s effort to improve the methodology for calculating uncertainties for the agriculture sector and encourages it to develop higher-tier analysis for all key categories and provide the results of these research programmes in its future annual submissions.

2. Key categories

Enteric fermentation – CH₄

79. France used a country-specific tier 2 method to estimate emissions from enteric fermentation. The method uses recommended quantities of animal fodder, developed by the Institut National de la Recherche Agronomique (INRA), and a CH₄ conversion factor (Y_m). A difference compared with the default IPCC methodologies is that Y_m applies to metabolizable energy, whereas in both the Revised 1996 IPCC Guidelines and the IPCC good practice guidance Y_m is multiplied by the gross energy intake. The ERT considered that the explanation in the NIR is not transparent and complete enough to enable comparability and replication of the country-specific method.

80. In particular, France did not compare the results of the country-specific method with those of the IPCC tier 2 method and did not provide transparent evidence to show that its method is a more accurate way of estimating emissions, as it was recommended to do in previous review reports.²⁰ The ERT strongly reiterates the recommendation that France assess the country-specific approach used, by comparing the EFs derived using the two methods (the country-specific method and the method from the IPCC good practice guidance), and provide a detailed description of the results in its next annual submission, thereby improving the transparency of its reporting of the method to estimate emissions from enteric fermentation.

81. Further, during the review, France informed the ERT that a study called “MONDFERENT” (Matière Organique Non Digestible et FERmentation ENTerique), the objective of which is to improve the country-specific EFs for enteric fermentation, is currently being developed by INRA, but the results are not yet available (the first results on cattle are expected by the end of 2012). France also informed the ERT that it expects that the revised EFs will be available for the preparation of the 2013 or 2014 annual submission for cattle, and for the 2014 or 2015 annual submission for other animal categories. The ERT recommends that France provide revised estimates as early as possible and include sufficient and transparent explanations of the country-specific method and EFs and recalculations made for this category no later than in its 2014 annual submission, at least for significant animal categories.

Manure management –CH₄

82. France estimated CH₄ emissions from manure management using the default IPCC tier 1 method, including default values for volatile solids (VS). In response to questions raised by the ERT during the review, France informed the ERT that the same study mentioned in relation to enteric fermentation (see para. 81 above) will also develop methodologies for estimating CH₄ emissions from manure management and parameters comparable to those presented in the IPCC good practice guidance. France also informed the ERT that the main parameter to be updated is VS, which should be available for cattle by the 2013 or 2014 annual submission, while the methane conversion factor (MCF) values could be improved, taking into account French circumstances, by the 2014 or 2015 annual submission. According to France, it is unlikely that the parameter for maximum CH₄ producing capacity for manure (B₀) will be revised in the near future. The ERT encourages France to continue its efforts to develop country-specific values, at least for VS, for its next annual submission. The ERT encourages France to develop country-specific values for MCF and B₀ and make them available by its 2014 annual submission.

²⁰ FCCC/ARR/2010/FRA, paragraph 96, and FCCC/ARR/2011/FRA, paragraph 89.

Agricultural soils – N₂O

83. As already identified in the previous review report, France indicated in its NIR that it uses a tier 1 method from the Revised 1996 IPCC Guidelines to estimate N₂O emissions from agricultural soils, but without specifying whether the method is tier 1a or tier 1b. Recommendations in the previous review report included that France improve the transparency of its reporting of the method used for this category by indicating and justifying the type of tier 1 method used and including summary information on the equations used in its 2012 annual submission. However, France did not implement this recommendation. In response to questions raised by the ERT during the review, France informed the ERT that the methodology has not changed since the previous annual submission and that it is using a tier 1a method, since the default EF (0.0125 kgN-N₂O/kgN) from the Revised 1996 IPCC Guidelines is used for synthetic fertilizers, manure, crop residues and N-fixing plants. France also informed the ERT that research projects are under way that could help in the development of country-specific EFs in the near future. The ERT encourages France to intensify these studies and use a country-specific EF as soon as possible and recommends that it report on its improvement plans and any developments in its next annual submission.

84. In line with the conclusions stated in the previous review report, the ERT considered that the information on AD for this category in the NIR is incomplete and not transparent. In response to a question raised by the ERT during the review, France responded that it could provide information on areas and crop yields that are used in the calculation of emissions from agricultural residues. The ERT reiterates the recommendation made in the previous review report that France provide more information on AD for this category in its next annual submission, in order to improve transparency.

85. To estimate direct emissions from agricultural soils, France has used a value for the fraction of livestock N excreted and deposited onto soil during grazing (Frac_{GRAZ} in CRF table 4.D) of 0.41, which the previous review report concluded to be incorrect. In response to questions raised by the ERT during the review, France informed that it has implemented the recommendation in the previous review report and the value for Frac_{GRAZ} was adjusted by volatilization. France highlighted that the revised value is very similar to the one used in previous annual submissions (e.g. Frac_{GRAZ} is 0.43 in the 2011 and 2012 annual submissions for 1990), but that is simply a coincidence because the share of pasture has changed significantly following the revision of manure management systems. France informed the ERT that, in its next annual submission, it is likely to use the amount of urine and dung N deposited by grazing animals on pasture, range and paddock (Frac_{PRP}) instead of Frac_{GRAZ}, following the IPCC good practice guidance. The ERT recommends that France justify this choice in its next annual submission.

3. Non-key categories

Field burning of agriculture residues – N₂O and CH₄

86. In the previous annual submission, France reported this category under the waste sector. The ERT appreciates France's effort to report these emissions under the agriculture sector in its 2012 annual submission. However, the ERT noted that, although the total estimated GHG emissions for the category show an increase from 1990 to 1998 (by 17.6 per cent), between 1998 and 2007 there is a substantial decrease in the estimated emissions (by 56.1 per cent) and the estimated emissions increase again after 2007 (by 15.9 per cent). In response to questions raised by the ERT during the review, France gave the following explanation: "Representative data on this type of practice are very rare. However, this estimate was done thanks to two sets of data from surveys relative to the years 2000 and 2005 representative of the crops that exist in France. This estimate is then

based on extrapolation before 1999 and after 2005 and interpolation between 2000 and 2005. These surveys provide the share of the residues that are burnt for each type of crop. The slight fluctuations that are presented before 2000 and after 2005 are due to the different share of each crop and the trend between 2000 and 2005 was estimated thanks to the surveys. It is difficult to link this trend with specific legislation because normally field burning is not allowed in France, but it can certainly be linked to the changes relative to residues, which are removed (and burnt) from crops less in order to maintain organic matter in the agricultural soils". The ERT considered this explanation sufficient, but recommends that France guarantee time-series consistency in its next annual submission.

E. Land use, land-use change and forestry

1. Sector overview

87. In 2010, net removals from the LULUCF sector amounted to 32,224.18 Gg CO₂ eq. Since 1990, net removals have increased by 66.2 per cent. The key driver for the increase in removals is the category forest land remaining forest land, where CO₂ removals amounted to 45,343.80 Gg CO₂ eq in 2010, representing an increase of 53.5 per cent since 1990. Within the sector, net removals of 52,620.18 Gg CO₂ eq were from forest land, followed by net removals of 7,918.50 Gg CO₂ eq from grassland and net removals of 3,517.19 Gg CO₂ eq from wetlands. France also reported net emissions of 16,968.93 Gg CO₂ eq from cropland, net emissions of 14,316.01 Gg CO₂ eq from settlements and net emissions of 417.76 Gg CO₂ eq from other (LULUCF). Other land accounted for net emissions of 129.00 Gg CO₂ eq.

88. France has made recalculations for the LULUCF sector between its 2011 and 2012 annual submissions for the following reasons: in response to the previous review report; following changes in AD, including the use of updated statistical data on growth and forest mortality; the inclusion of an additional statistical source for harvesting (direct measurement of samples in the forest); and the consideration of carbon stock changes in part of wetlands (areas under human influence). The impact of these recalculations on the LULUCF sector is a decrease of 43.4 per cent in the estimate of emissions for 2009 and a decrease of 52.1 per cent in the estimate of emissions for the base year. The main recalculations took place in the following categories:

(a) CO₂ net removals from forest land remaining forest land (decrease of 20,620.32 Gg CO₂ eq for 2009, or 28.3 per cent);

(b) CO₂ net emissions from land converted to settlements (increase of 11,008.65 Gg CO₂ eq for 2009, or 296.5 per cent);

(c) CO₂ net emissions from land converted to wetlands (increase of 3,557.42 Gg CO₂ eq for 2009 from net emissions of 286.99 CO₂ eq reported in the 2011 annual submission).

89. For the preparation of inventory estimates for the LULUCF sector, France uses tier 2 estimation methods with country-specific parameters for all categories and gases, and the inventory is in accordance with the IPCC good practice guidance for LULUCF. The reporting on the LULUCF sector is generally complete. All categories are reported for all years of the time series (1990–2010) but not all French territories are fully covered (see para. 96 below). In addition, emissions and removals from some carbon pools are not reported (see para. 92 below).

90. In the NIR, France claims that French forests act as CH₄ sinks on the basis of studies that indicate the absorption of CH₄ by undisturbed forest soils. The absorption factor of 2.4 kg CH₄/ha was applied to the forest land category. However, the Party indicated that,

because of reporting constraints, these removals are reported in the subcategory “methane removal from forest soils as CO₂ eq”, which was reported under other (LULUCF 5.G) as net CO₂ emissions/removals in CO₂ eq. It clarified in the NIR that removals from this sink are not considered in the accounting under the Kyoto Protocol. During the review, the ERT asked the Party to clarify the inclusion of CH₄ emissions calculated in CO₂ eq and provide the AD used to calculate the amount of CH₄ absorption. The Party explained to the ERT during the review that the AD is the area of forest land remaining forest land in mainland France and was 14 kha in 2010. In addition, it explained that CH₄ emission estimates are converted to CO₂ eq since CRF reporter does not allow reporting of CH₄ removals. Since the ERT did not receive such information from France during the review, it recommends that France provide the information in a transparent manner in its next annual submission.

91. The ERT noted that, in general, the transparency of the reporting on the LULUCF sector is appropriate. France’s National Forest Inventory (NFI) is referenced throughout the main body of the NIR, and the TERUTI-LUCAS land-use surveying system, used for precisely surveying the various land uses, is concisely and clearly presented. However, the transparency of the NIR could be further enhanced through the provision, for example, of more details on the approaches and equations used by France from the IPCC good practice guidance for LULUCF, and through the provision of more complete references for the sources of information. The ERT recommends that France address these issues in its next annual submission. There also is some room for improvement regarding the reporting of changes in the soil carbon pool for forest land, such as by providing information on the management practices applied to land converted from forest land. The ERT recommends that France make such improvements, in order to enhance the transparency of its next annual submission.

92. In line with what was identified in previous review reports, France has still reported some carbon pools as “NO” in its 2012 annual submission when it appears that these may not have been estimated due to a lack of information (including mineral soils, living biomass and dead biomass in some subcategories under forest land, cropland, grassland, wetlands, settlements and other land). This is in spite of the fact that in the two previous review reports²¹ it was recommended that France either report relevant estimates, report the carbon pools as “NE”, or justify why emissions from the carbon pools do not occur. The ERT reiterates the recommendation made in the previous review report that France improve the transparency of its reporting on these pools in its next annual submission.

93. In previous annual submissions, France reported as zero the carbon stock change in some pools, across different categories, that are assumed to be unchanging or do not occur in the country. For its 2012 annual submission, France has followed partially the recommendations in the previous review reports²² and the number of such cases has been significantly reduced. The Party has instead used the appropriate notation key in accordance with the UNFCCC reporting guidelines, namely “NO” (in particular, for organic soils for forest land remaining forest land and land converted to forest land; mineral soils and organic soils for cropland remaining cropland; organic soils for land converted to cropland; mineral and organic soils for grassland remaining grassland; and organic soils for land converted to grassland). However, France still reports the carbon stock change as zero for the pools mineral soils and organic soils for forest land remaining forest land and other land converted to cropland. The ERT commends the Party for the enhancements made and reiterates the recommendation in the previous review report that France report the changes in these pools using the appropriate notation key (“NO” or “NE”) or by providing estimates in its next annual submission.

²¹ FCCC/ARR/2010/FRA, paragraph 108, and FCCC/ARR/2011/FRA, paragraph 108.

²² FCCC/ARR/2010/FRA, paragraphs 106 and 107, and FCCC/ARR/2011/FRA, paragraphs 109 and 110.

94. The uncertainty of the LULUCF sector was estimated at 30 per cent for AD and 50 per cent for EFs, and the combined uncertainty was 58 per cent. In the previous review report it was noted that France did not report uncertainties for individual categories. In response to questions raised by the ERT during the review, France informed the ERT: that the uncertainty associated with LULUCF data is still based on expert judgement; that, owing to time constraints, the uncertainty estimates were not revised after the large-scale recalculations were undertaken for the 2012 annual submission; but that the latest estimates are probably more reliable than the estimates presented previously. The ERT recommends that France update the uncertainty analysis for the LULUCF sector for its next annual submission.

2. Key categories

Forest land remaining forest land – CO₂

95. France has used a tier 2 method and country-specific parameters for this category, which is in accordance with the IPCC good practice guidance for LULUCF. For 2010, France reports net CO₂ removals of 46,062.41 Gg CO₂, which is 11.8 per cent lower than the value reported for 2009 (52,245.46 Gg CO₂), but 51.0 per cent higher than the value reported for 1990 (30,498.51 Gg CO₂).

96. In the previous review report it was noted that there were insufficient forest data available for Guyana, Guadeloupe, Martinique and La Réunion to produce a meaningful picture of the evolution of forest carbon stocks, and, although France assumes that the harvests compensate for the forest growth as the use of the local forest types is rare, it was concluded, in the previous review report, that this assumption was not sufficiently justified. In the NIR of the 2012 annual submission (page 168 of the NIR) France reported that in French Guyana, Guadeloupe, Martinique and La Réunion the samples are partially available and areas are assumed to be stable over time, and that owing to the small amount of logging and the forest type, it can be supposed to compensate for increased harvesting. During the review, the ERT asked the Party to clarify the reasons for the use of partially complete data, taking into consideration that forest land remaining forest land is a key category and that the area of Guyana, Guadeloupe, Martinique and La Réunion accounts for more than one third of France's forest land remaining forest land. In addition, the ERT asked France to clarify the assumption that the data are stable over time. France did not provide a documented response during the review (France informed that logging in those areas is low, but no comprehensive data on the evolution of gains and losses was provided) and, therefore, the ERT reiterates the recommendation in the previous review report that France either revise the estimates from those areas using data on actual biomass growth and removals or provide sufficient justification for the assumptions made, including supporting documentation, in the NIR of its next annual submission.

97. For net carbon stock change in living biomass there is an, overall, increasing trend in the IEF, the value for 2010 (0.63 Mg C/ha) being 57.5 per cent higher than the value for 1990 (0.40 Mg C/ha). For net carbon stock change in dead organic matter the following inter-annual changes in the IEF were considered very significant: 1999/2000 (–109.5 per cent) and 2009/2010 (–120.4 per cent), but no explanations were provided in the NIR. In response to a question raised by the ERT during the review, France informed the ERT that for living biomass the increase in CO₂ removals is linked to the growth of forests and is based on the NFI. For net carbon stock change in dead organic matter France informed the ERT that the large inter-annual changes were related to large storms (named Martin and Lothar and Klaus), which took place in 1999 and 2009, respectively, and had a deep impact on the forest carbon pools. The ERT recommends that the Party include these explanations in its next annual submission.

Land converted to forest land – CO₂

98. There is an, overall, increasing trend in the net CO₂ removals from land converted to forest land, the value for 2010 (–7,276.38 Gg) being 66.3 per cent higher than the value for 1990 (–4,375.78 Gg). This trend mostly reflects the increasing trend in net carbon stock change in living biomass, with the IEF for 2010 (1.11 Mg C/ha) being 57.1 per cent higher than the IEF for 1990 (0.71 Mg C/ha). For net carbon stock change in mineral soils the overall trend in the IEF is not stable: the value decreased between 1990 (0.15 Mg C/ha) and 2008 (0.11 Mg C/ha), but increased thereafter up to 2010 (0.12 Mg C/ha). In response to a question raised by the ERT during the review, France responded that the estimated increase in CO₂ removals from land converted to forest land is based on NFI data and linked to the evolution of the French forest, especially to the type of land-use changes. France informed the ERT that variations in the land-use change area also have an impact on the net carbon stock change in dead organic matter and soil organic matter. However, France recognized that the information on this trend could be improved and corrected in the NIR. Therefore, the ERT recommends that France improve and correct the information in its next annual submission.

F. Waste

1. Sector overview

99. In 2010, emissions from the waste sector amounted to 19,740.98 Gg CO₂ eq, or 3.8 per cent of total GHG emissions. Since 1990, emissions have increased by 54.6 per cent. The key drivers for the rise in emissions are the increase in CH₄ emissions from landfills by 82.4 per cent (7,071.56 Gg CO₂ eq) and the increase in CH₄ and N₂O emissions from (composting and production of biogas), reported under other, by 548.1 per cent (474.97 Gg CO₂ eq). Other policies that France has implemented, since 2000, such as those to limit waste generation from domestic and industrial sources and to promote waste recycling, composting and energy recovery from waste incineration, have not yet had a large impact on the increasing trend in emissions. Within the sector, 79.3 per cent of the emissions were from solid waste disposal on land, followed by 10.1 per cent from wastewater handling, 7.8 per cent from waste incineration and 2.8 per cent from composting and production of biogas reported under other (waste).

100. France has made recalculations for the waste sector between its 2011 and 2012 annual submissions in response to the previous review report and following changes in AD and EFs. The impact of these recalculations on the waste sector is a decrease of 9.5 per cent in the estimate of emissions for 2009 and a decrease of 3.4 per cent in the estimate of emissions for 1990. Recalculations for 2009 took place in the following categories:

- (a) Solid waste disposal on land (decrease of 1,368.95 Gg CO₂ eq, or 8.0 per cent);
- (b) Wastewater handling (decrease of 310.87 Gg CO₂ eq, or 13.2 per cent);
- (c) Waste incineration (decrease of 470.83 Gg CO₂ eq, or 22.5 per cent);
- (d) Composting and biogas production (increase of 59.36 Gg CO₂ eq, or 12.6 per cent).

101. The inventory for the waste sector is complete and covers all categories for which there are methodologies in the Revised 1996 IPCC Guidelines or the IPCC good practice guidance. The inventory is in line with the IPCC good practice guidance and is consistent in terms of methods and data sources.

102. The ERT concluded, however, that the transparency of the reporting could be improved: the derivation of some country-specific parameters and historical data was not sufficiently documented in the NIR. However, during the review, in response to questions raised by the ERT, France provided further documentation (see paras. 104 and 106 below). The ERT recommends that the Party include this information in its next annual submission.

2. Key categories

Solid waste disposal on land – CH₄

103. France uses a tier 2 method, the first order decay (FOD) model from the IPCC good practice guidance, to estimate CH₄ emissions from managed and unmanaged landfills. France has applied a combination of country-specific data (methane generation rate constant (k) and degradable organic carbon (DOC) value) and default IPCC parameters, including fraction of CH₄ in landfill gas and CH₄ oxidation factor. In response to questions raised by the ERT during the review, France provided the ERT with access to the spreadsheets used by France to implement the method, and the ERT concluded that the method was applied in line with the IPCC good practice guidance. The ERT encourages France to analyse the possibility of applying the method to each landfill site or group of landfills with similar conditions, in order to improve the accuracy of the emission estimates, and to report on any improvements made in its next annual submission.

104. However, the ERT noted that the country-specific data were not transparently explained in the NIR, and that there was a lack of information on the waste categorization (rapidly degradable, moderately degradable or slowly degradable) and on the composition of waste sent to solid waste landfills. In response to questions raised by the ERT during the review, France provided improved documentation to the ERT on the country-specific data and waste composition. For instance, the ERT could understand that the k values were derived from 160 in-situ measurements on over 50 landfills and that the waste categorization was based on the CH₄ generation potential (100 m³/Mg waste for rapidly degradable, 50 m³/Mg for moderately degradable and 0 m³/Mg for inert). The composition of the different waste categories used to derive DOC values was also provided. The ERT recommends that France include this documentation of country-specific parameters (k and DOC values) and waste composition in the NIR of its next annual submission.

105. The ERT identified that CH₄ recovered from landfills that could be subtracted from emissions was reported as “NO”. France explained that this approach followed the conclusions of the 2010 review report²³ and was due to the fact that the Party could not yet obtain complete data on the amount of CH₄ recovered at landfill sites when the 2012 annual submission was being prepared. Surveys are being conducted to collect data for the period 2008–2011 from all French landfills (300 sites) and France expects to have these data by the end of September 2012. The ERT commends France for these efforts and encourages the Party to use improved data on the amount of CH₄ recovered and provide revised estimates of CH₄ emissions from landfills in its next annual submission.

106. According to the information provided in the NIR, figures for the amount of waste sent to landfills were collected by surveys conducted every two years. However, it was not clear from the NIR when the first and last surveys were conducted and how data between surveys and historical data back to 1960 were interpolated or extrapolated. In response to questions raised by the ERT during the review on this issue, France clarified that surveys were conducted by ADEME in 1980, 1985, 1989, 1993, then each year between 1995 and 2000 and every two years between 2002 and 2008. The missing data between surveys were estimated by linear interpolation and historical data back to 1964 were estimated by means

²³ FCCC/ARR/2010/FRA, paragraphs 128–133.

of simple extrapolation using the trend in the existing data. The ERT recommends that France include this information in its next annual submission. The ERT also recommends that France analyse the possibility of using extrapolation based on drivers (e.g. gross domestic product and population) to estimate the historical amount of waste landfilled for its next annual submission.

Wastewater handling – CH₄ and N₂O

107. In France, domestic and commercial wastewater is treated in wastewater treatment plants, septic tanks or discharged directly to the aquatic environment. Industrial wastewater is either discharged in domestic wastewater treatment plants or treated in situ. France applied the default method from the IPCC good practice guidance together with a combination of country-specific data (e.g. MCF) and default parameters (e.g. biochemical oxygen demand and B₀) to estimate CH₄ emissions from domestic and commercial wastewater treatment (in plants and septic tanks). CH₄ leakage occurring during the process of biogas production through anaerobic digestion was estimated using an IPCC default factor. Emissions from industrial wastewater were estimated using a default method and parameters (chemical oxygen demand (COD), and B₀) from the IPCC good practice guidance. The ERT considered that the emissions from wastewater handling were estimated in accordance with the IPCC good practice guidance.

108. N₂O emissions from human sewage and industrial wastewater were reported under the waste sector, while N₂O emissions from sludge spreading on agricultural land were reported under the agriculture sector. For N₂O emissions from human sewage, France applied the default method and EFs from the Revised 1996 IPCC Guidelines and country-specific data on protein consumption and the efficiency of the treatment plant. N₂O emissions from industrial wastewater discharged in domestic wastewater treatment plants and treated in situ were also estimated using a method in line with the IPCC good practice guidance.

Waste incineration – CO₂, CH₄ and N₂O²⁴

109. The types of waste incinerated in France include household waste, sludge resulting from wastewater treatment plants, household garden waste, industrial waste, plastic foil waste in agriculture, hospital waste, waste oil and corpses. France calculated only CO₂ emissions from the fossil part of the incinerated waste and included under the waste sector only the emissions resulting from waste incineration without energy recovery, while emissions from waste incineration with energy recovery are reported under the energy sector, which is in line with the IPCC good practice guidance. The ERT commends France for this proper allocation of emissions.

110. France used plant-specific data on the amount of waste incinerated and EFs based on measurements. However, for non-CO₂ emissions France used a combination of country-specific, IPCC default and parameters from the EMEP/EEA air pollutant emission inventory guidebook (usually referred to as EMEP/CORINAIR) parameters. France has implemented the recommendation made in the previous review report and reallocated CH₄ and N₂O emissions from field burning of agricultural residues to the agriculture sector. The ERT commends France for this reallocation, which has improved the comparability of the inventory.

²⁴ Not all emissions related to all gases under this category are key categories, particularly CH₄ and N₂O emissions. However, since the calculation procedures for issues related to this category are discussed as a whole, the individual gases are not assessed in separate sections.

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

111. France has submitted estimates for afforestation, reforestation and deforestation activities under Article 3, paragraph 3, of the Kyoto Protocol and for the elected activity forest management under Article 3, paragraph 4, of the Kyoto Protocol. The Party has chosen to account for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol annually.

112. France has selected and applied inventory methodologies in accordance with the IPCC good practice guidance for LULUCF, in line with the requirements set out in the annex to decision 15/CMP.1. For the representation of land use, France uses IPCC approach 2, based on data from the TERUTI-LUCAS survey and the NFI. The reporting of land units subject to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is based on IPCC approach 2 (broad area identification). France has opted to report on a regionally administrative basis: 22 mainland regions, plus four overseas regions. The use of the TERUTI-LUCAS surveying system ensures that the location of the boundaries that demarcate the lands subject to all of the mandatory and elected KP-LULUCF activities are clearly identified, in accordance with the requirement set out in decision 15/CMP.1, annex, paragraph 6(b).

113. In the previous review report France was strongly recommended²⁵ to report, in its 2012 annual submission, verifiable information demonstrating that unaccounted pools (litter and mineral soils under forest management) were not a net source of GHG emissions, as required in decision 15/CMP.1, annex, paragraph 6(e). France did not include that information in its 2012 annual submission. However, in response to questions raised by the ERT during the review, the Party presented information indicating that it has launched and is financing a study to evaluate whether there is a significant carbon stock change in forest in France on the basis of national data coming from the measuring network RENECOFOR (Réseau National de suivi à long terme des ECosystèmes FORestiers). RENECOFOR has been using over 100 permanent sample plots since the early 1990s.²⁶ In addition, France provided information on ongoing work by INFOSOL (the unit of INRA in charge of most soil-related issues), which is based on models, showing that French forest soils are net sinks. The ERT therefore strongly reiterates the recommendation in the previous review report that France report this information in its next annual submission. The ERT also recommends the Party to report net emissions/removals for these pools as “NE” in CRF table 5(KP-I)A.2. and “NE” in CRF table NIR-1, in order to enhance transparency.

114. France has not reported uncertainty estimates for each of its mandatory and elected activities. The ERT reiterates the recommendation in the previous review report that France report information on uncertainties for the KP-LULUCF activities in its next annual submission.

115. France has made recalculations for the KP-LULUCF activities between its 2011 and 2012 annual submissions to take into consideration new AD (data on forest growth and mortality, new data from the NFI and revised land use matrices) and the inclusion of carbon stock changes in wetlands. The impact of these recalculations on each KP-LULUCF activity for 2009 is as follows:

²⁵ FCCC/ARR/2011/FRA, paragraph 145.

²⁶ See <<http://www.onf.fr/renecofor/@@index.html>>.

(a) Net emissions from deforestation have increased by 13,791.45 Gg CO₂ eq or 37.5 per cent;

(b) Net removals from forest management have decreased by 20,586.42 Gg CO₂ eq or 28.5 per cent;

(c) Net removals from afforestation/reforestation have increased by 632.45 Gg CO₂ eq or 9.2 per cent.

116. France indicated in the NIR that many methodological improvements have been put in place, among others with regard to issues associated with growth and forest mortality and the estimation of forest harvesting, but the ERT noted that no information is provided in the NIR on the quantified impact of recalculation on net emissions and removals. Therefore, the ERT recommends that France provide further clarification of this issue in its next annual submission.

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

Afforestation and reforestation – CO₂

117. In 2010, this activity was a net sink of 7,883.96 Gg CO₂ eq (an increase of 4.7 per cent compared with 2009).

118. France has improved the consistency and transparency of the reporting on biomass burning under afforestation and reforestation, as was recommended in the previous review report, by improving the consistency between CRF table 5(KP-II)5 and CRF table 5(V). The ERT welcomes the improvements made.

119. France reported in the NIR that the Party decided, on the basis of the definition provided in the annex to decision 16/CMP.1, that areas of afforestation and reforestation due to the increase of agricultural abandonment are to be considered areas afforested/reforested, to the extent that such land becomes managed forests. However, forest areas in wetlands and other lands are excluded. According to the information provided in the NIR these transitions result from policy decisions and they are considered human-induced new forests, after which they are managed in a different way from the human promotion of natural seed dispersion. The ERT recommends that France enhance the explanations in relation to this issue in its next annual submission.

Deforestation – CO₂

120. In 2010, this activity was a net source of 11,178.38 Gg CO₂ eq (a decrease of 19.6 per cent compared with 2009).

121. Similar to what was identified in the previous review report, the ERT noted that for 2010 the reported area of forest land converted to cropland (deforestation) in CRF table 5(KP-II)3 (644.63 kha) is about two and a half times larger than the area of forest land converted to cropland reported in CRF tables 5.B and 5(III) (134.75 kha), while the N₂O emissions reported are very similar in both cases (0.19 Gg in CRF table 5(III) and 0.20 Gg in KP-LULUCF table 5(KP-II)3). The ERT reiterates the recommendation in the previous review report that France ensure the consistency of its estimates and/or explain the use of the different EFs in those cases in its next annual submission.

Activities under Article 3, paragraph 4, of the Kyoto Protocol

Forest management – CO₂

122. In 2010, this category was a net sink of 44,598,70 Gg CO₂ (a decrease of 13.5 per cent compared with 2009).

123. France has used a tier 2 method, in accordance with the IPCC good practice guidance for LULUCF, with country-specific parameters to prepare estimates of emissions and removals for this activity. France considered the changes in the stocks of the reported carbon pools that were a consequence of silvicultural practices performed on managed forests. The areas under forest management were estimated on the basis of a regional rate conversion for managed forests. Therefore, the area under forest management differs from the area of forest land remaining forest land under the Convention, although the methods used for estimating the changes in stocks of carbon pools under the Convention were the same as for under the Kyoto Protocol. Relevant information that activities are human induced is provided in the NIR and is in accordance with the requirement set out in decision 15/CMP.1, annex, paragraph 9(a).

124. As identified for the LULUCF sector, the ERT recommends that France clarify in its next annual submission the methodology and data used to prepare a meaningful understanding of the evolution of forest carbon stocks in Guyana, Guadeloupe, Martinique and La Réunion, especially the assumption that harvests compensate for forest growth, taking into consideration that the combined area accounts for more than one third of the land area reported by France under KP-LULUCF (see para. 96 above).

125. In table NIR-2 for 2008 the area under forest management at the end of the year was reported as 21,640.59 kha, but in table NIR-2 for 2009 the area under forest management at the beginning of the year was reported as 21,642.71 kha. Similarly, for 2009 the area under forest management at the end of the year was reported as 21,595.69 kha, but in table NIR-2 for 2010 the area under forest management at the beginning of the year was reported as 21,597.24 kha. A similar issue was identified in relation to the same activity in the previous review report. In response to questions raised by the current ERT, France indicated that these small differences in areas are difficult to resolve because of the many different regions reported under the Kyoto Protocol for France and the specific reporting requirements for KP-LULUCF activities, but the Party assumed that this issue could be corrected. The ERT reiterates the recommendation in the previous review report that France correct this issue in its next annual submission.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

126. France has reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 14/CMP.1 and 15/CMP.1. The ERT took note of the findings included in the SIAR on the SEF tables and the SEF comparison report.²⁷ 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.

127. 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. Information reported by the Party on records of any discrepancies and on any records of non-replacement was found to be consistent with information provided to the secretariat by

²⁷ The SEF comparison report is prepared by the ITL administrator and provides information on the outcome of the comparison of data contained in the Party's SEF tables with corresponding records contained in the ITL.

the ITL. No non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

Accounting of activities under Article 3, paragraph 3, of the Kyoto Protocol and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol

128. France has reported information on its accounting of KP-LULUCF in the accounting table, as included in the annex to decision 6/CMP.3. Information on the accounting of KP-LULUCF has been prepared and reported in accordance with decisions 16/CMP.1 and 6/CMP.3.

129. Table 6 shows the accounting quantities for KP-LULUCF as reported by France and the final values after the review.

Table 6

Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol, in t CO₂ eq

	2012 submission ^a		2010 and 2011	"Net" accounting quantity ^f
	As reported	Revised estimates	submission ^b	
		Final	Final	
Afforestation and reforestation	-22 675 169	-22 675 169	-13 611 348	-9 063 821
Deforestation	39 871 361	39 871 361	21 834 675	18 036 686
Forest management	-33 329 526	-33 329 526	-24 356 661	-8 972 865
Article 3.3 offset ^d	-17 196 192	-17 196 192	-8 223 327	-8 972 865
Forest management cap ^e	-16 133 333	-16 133 333	-16 133 333	0
Cropland management	NA	NA	NA	NA
Grazing land management	NA	NA	NA	NA
Revegetation	NA	NA	NA	NA

Abbreviations: CRF = common reporting format, 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.

^a The values included under the 2012 submission are the cumulative accounting values for 2008, 2009 and 2010 as reported in the accounting table of the KP-LULUCF CRF tables for the inventory year 2010.

^b The values included under the 2010 and 2011 submissions are the final accounting values as a result of the 2010 and 2011 reviews and are included in table 4 of the 2011 annual review report (FCCC/ARR/2011/FRA, page 37), in the column "2011 submission", "Final".

^c The "net" accounting quantity is the quantity of Kyoto Protocol units that France shall issue or cancel under each activity under Article 3, paragraph 3, and paragraph 4, if relevant, based on the final accounting quantity in the 2012 submission and where the quantities issued or cancelled based on the 2011 and 2010 review have been subtracted ("net accounting quantity" = final 2012 – final 2010 and 2011).

^d Article 3.3 offset: For the first commitment period, a Party included in Annex I that incurs a net source of emissions under the provisions of Article 3, paragraph 3, may account for anthropogenic greenhouse gas emissions by sources and removals by sinks in areas under forest management under Article 3, paragraph 4, up to a level that is equal to the net source of emissions under the provisions of Article 3, paragraph 3, but not greater than 9.0 Mt carbon times five, if the total anthropogenic greenhouse gas emissions by sources and removals by sinks in the managed forest since 1990 is equal to, or larger than, the net source of emissions incurred under Article 3, paragraph 3.

^e In accordance with decision 16/CMP.1, annex, paragraph 11, for the first commitment period only, additions to and subtractions from the assigned amount of a Party resulting from forest management under Article 3, paragraph 4, after the application of decision 16/CMP.1, annex, paragraph 10, and resulting from forest management project activities undertaken under Article 6, shall not exceed the value inscribed in the appendix of the annex to decision 16/CMP.1, times five.

130. Based on the information provided in table 6 for the activity afforestation/reforestation, France shall issue 9,063,821 removal units (RMUs) in its national registry.

131. Based on the information provided in table 6 for the activity deforestation, France shall cancel 18,036,686 assigned amount units, emission reduction units certified emission reduction units and/or RMUs in its national registry.

132. Based on the information provided in table 6 for the activity forest management, France shall issue 8,972,865 RMUs in its national registry.

3. National registry

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

4. Calculation of the commitment period reserve

134. France has reported its commitment period reserve in its 2012 annual submission. France reported that its commitment period reserve has not changed since the initial report review (2,537,663,976 t CO₂ eq), as it is based on the assigned amount and not on the most recently reviewed inventory. The ERT agrees with this figure.

5. Changes to the national system

135. France reported that there have been changes in its national system since its previous annual submission. The changes in the national system reported by the Party were: the composition of GCIIE; and the reference to the ministerial decree establishing the national system, a new version of which (August 2011) replaced the version of December 2006. France clarified that the new decree does not change dispositions concerning the national inventory, but integrates components of the GHG balances and the national territorial inventories. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

6. Changes to the national registry

136. France reported that there are changes in its national registry since its previous annual submission. The Party described the changes in the NIR, including: a new registry software version (5.3) having been released in 2011 to cover security requirements (by the European Commission and the UNFCCC) and to cover the new message flow to increase transaction reliability; the enhancement of the publicly available information; and tests on the vulnerability of the registry (intrusion of the website) carried out by independent external auditors. The ERT concluded that, taking into account the confirmed changes, France's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions.

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

137. France reported that there are changes in its reporting of the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The ERT concluded that the information provided is complete and transparent.

138. The actions that France takes to minimize adverse impacts include: improving capacity development with developed countries, including transfer of technology and observation systems; establishing criteria for selecting biofuels subject to fiscal incentives; and financial support for multilateral cooperation in the area of climate change (mitigation and adaptation). The NIR also reports on actions taken in the context of the European Union and technology cooperation outside of public aid.

III. Conclusions and recommendations

A. Conclusions

139. France made its annual submission on 4 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, paragraphs 3 and 4, of the Kyoto Protocol, Kyoto Protocol units, changes to the national system and the national registry, and the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol). This is in line with decision 15/CMP.1.

140. The ERT concludes that the inventory submission of France has generally been prepared and reported in accordance with the UNFCCC reporting guidelines. The inventory submission is complete and the Party has submitted a generally complete set of CRF tables for the years 1990–2010 and an NIR; these are complete in terms of geographical coverage, years, sectors, categories and gases. However, France did not provide CRF table 8(b) (explanations for recalculations) for the period 1990–2009, in spite of the fact that related information on recalculations is included in the NIR, and CRF table 7 (key categories) is only provided for 2010.

141. 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.

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

143. France has made recalculations for the inventory between its 2011 and 2012 annual submissions, partly in response to the 2011 annual review report and following changes in AD and EFs. The impact of these recalculations on the national totals is a decrease in the estimated emissions for 1990 of 0.7 per cent and a decrease in the estimated emissions for 2010 of 0.5 per cent. The main recalculations for 2009 took place in the following categories:

(a) CH₄ emissions from solid waste disposal on land (decrease in estimated emissions by 1,368.95 Gg CO₂ eq or 8.0 per cent);

(b) CH₄ and N₂O emissions from manure management (decrease in estimated emissions by 976.55 Gg CO₂ eq or 4.9 per cent);

(c) Emissions from halocarbons and SF₆ (decrease in estimated emissions by 607.09 Gg CO₂ eq or 3.7 per cent);

(d) CH₄ emissions from enteric fermentation (decrease in estimated emissions by 958.48 Gg CO₂ eq or 3.3 per cent);

(e) N₂O emissions from agricultural soils (increase in estimated emissions by 721.89 Gg CO₂ eq or 1.6 per cent);

144. France has reported information on activities under Article 3, paragraph 3, of the Kyoto Protocol and the elected activity, forest management, under Article 3, paragraph 4, of the Kyoto Protocol. It has selected and applied inventory methodologies in accordance with the IPCC good practice guidance for LULUCF and generally in line with the requirements set out in the annex to decision 15/CMP.1. In its original submission of 4 April 2012, France did not provide verifiable information demonstrating that unaccounted pools (litter and mineral soils under forest management) were not a net source of GHG emissions, as required in decision 15/CMP.1, annex, paragraph 6(e). However, in response to questions raised by the ERT during the review, the Party provided information to the ERT showing that these pools were not net sources, which the ERT concluded is in accordance with decisions 15/CMP.1 and 16/CMP.1. The ERT considered that the arrangements in the national system enable an accurate estimation of the areas of forest land. However, the ERT identified some problems with the identification of areas of forest land in Guyana, Guadeloupe, Martinique and La Réunion (see paras. 96 and 124 above).

145. France has made recalculations for the KP-LULUCF activities between its 2011 and 2012 annual submissions to take into consideration new AD (data on forest growth and mortality, new data from the NFI and revised land use matrices) and the inclusion of carbon stock changes in wetlands. The impact of these recalculations on each KP-LULUCF activity for 2009 is as follows:

(a) Net emissions from deforestation have increased by 13,791.45 Gg CO₂ eq., or 37.5 per cent;

(b) Net removals from forest management have decreased by 20,586.42 Gg CO₂eq, or 28.5 per cent;

(c) Net removals from afforestation/reforestation have increased by 632.45 Gg CO₂ eq, or 9.2 per cent.

146. France 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.

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

148. 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.

149. France 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 ERT concluded that the information provided is complete and transparent (see para. 138 above).

B. Recommendations

150. The ERT identifies issues for improvement as listed in table 7 below.

Table 7
Recommendations identified by the expert review team

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Paragraph reference</i>
General	Completeness	To provide CRF tables 7 and 8(b), at least for the base year and the latest inventory year	11 and 29
	National system	To enhance the national system, in order to address reiterated recommendations made in previous review reports	19
		To improve the general description of the national system in the NIR, including a list of all of the institutions involved in the inventory preparation process	20
	Uncertainty analysis	To revise the manner in which the uncertainty analysis is prepared, in accordance with the IPCC good practice guidance	25 and 26
	Recalculations	To ensure that recalculations are explained in the NIR and in CRF table 8(b)	29, 50, 58, 59 and 116
	Transparency	To enhance the transparency of the reporting	20, 26, 29, 42, 46, 47–49, 50, 53, 54, 62, 65, 66, 67, 70, 71, 72, 76, 79, 84, 86, 90–92, 96–97, 102, 104, 106, 116, 119 and 121
		To continue to assess the distribution of information between the OMINEA report and the main body of the NIR	31
	To refer to the CRF tables submitted under the Kyoto Protocol as a general rule in the NIR and, when this is not the case, clearly indicate to which territorial aggregation the information refers	32 and 41	
Energy	Comparison of the reference approach with the sectoral approach and international statistics	To improve the consistency of the AD used in the inventory (sectoral approach) with the national energy balance (reference approach) and international sources of information	44
	Feedstocks and non-energy use of fuels	To improve the transparency and completeness of the information reported in CRF table 1.A(d)	46
	Stationary combustion-gaseous and other fuels – CO ₂	To analyse variations in the IEF time series for several categories and fuels	47–49
	Civil aviation: liquid fuels – CO ₂	To ensure consistency when preparing future planned recalculations	51
	Road transportation: liquid	To obtain country-specific values for the carbon content of the diesel and gasoline sold in France for	52

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Paragraph reference</i>
	fuels – CO ₂	the estimation of CO ₂ emissions	
		To report separately the AD for biodiesel and bioethanol in the NIR	53
	Fugitive emissions from fuels	To enhance the description of the allocation of emissions from petroleum refining	54
Industrial processes and solvent and other product use	Cement production – CO ₂	To report the number of plants applying each tier 3 method; to recalculate emissions for the plants using a tier 3 methodology for the entire time series; to increase transparency, by reporting the EFs and AD disaggregated by cement type (alumina and Portland); and to elaborate on the effects of non-carbonate carbon and CKD on emission estimates for before 2007	61
	Ammonia production – CO ₂	To revise the calculations	65
Agriculture	Enteric fermentation – CH ₄	To assess the country-specific approach used, by comparing the EFs derived from the country-specific method and those from the IPCC good practice guidance	81,
		To provide revised estimates, as soon as the results of ongoing studies are available	81
	Agricultural soils – N ₂ O	To enhance the description of AD	84
		To justify the choice to report Frac _{PRP} instead of Frac _{GRAZ} in the CRF tables	85
	Field burning of agricultural residues – N ₂ O and CH ₄	To improve the consistency of the AD time series	86
LULUCF	Overview	To revise the estimates for the LULUCF sector (cropland) for the next annual submission, in order to avoid the double counting of emissions from the use of limestone in agriculture	64
		To clarify the reporting of emissions in CO ₂ eq and to provide the AD for CH ₄ removals from forest soils	92
		For the missing carbon pools, to report estimates, report them as “NE”, or justify why they do not occur	92
		To use the appropriate notation key, or provide estimates, to report some carbon pools instead of zero	93
		To update the uncertainty analysis, taking into consideration recalculations	94
	Forest land remaining forest land – CO ₂	To revise the estimates using data on actual biomass growth and removals, or provide sufficient justification for the assumption that forest carbon	96 and 97

<i>Sector</i>	<i>Category</i>	<i>Recommendation</i>	<i>Paragraph reference</i>
		stocks in some territorial areas are stable	
	Forest land converted to forest land – CO ₂	To improve transparency in the explanation of trends and inter-annual changes	98
Waste	Overview	To improve the transparency of the reporting on the derivation of some country-specific parameters and historical data	102, 104 and 106
	Solid waste disposal on land	To analyse the possibility of using extrapolation to estimate the amount of waste sent to landfills	106
KP-LULUCF	Decision 15/CMP.1	To report information demonstrating that unaccounted pools (litter and mineral soils under forest management) were not a net source of GHG emissions	113
	Uncertainties	To report information on uncertainties for the KP-LULUCF activities	114
	Afforestation/reforestation	To enhance the transparency of the assumptions used to justify that all agricultural areas converted to forest land are human-induced forests	119
	Deforestation	To ensure the consistency of the reported values for the area of forest land converted to cropland or explain the use of the different EFs.	121
	Forest management	To improve and correct the reporting of areas under forest management in CRF table NIR-2	125

IV. Questions of implementation

151. 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/gp/landuse/gp/landuse.htm>>.

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

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

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

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

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

Status report for France 2012. Available at <<http://unfccc.int/resource/docs/2012/asr/fra.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/FRA. Report of the individual review of the annual submission of France submitted in 2011. Available at <<http://unfccc.int/resource/docs/2012/arr/fra.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 Ms. Frédérique Millard (Ministère de l'Écologie, du Développement durable et de l'Énergie) and Mr. Jean-Pierre Chang Centre Interprofessionnel Technique d'Études de la Pollution Atmosphérique (CITEPA), including additional material on the methodologies and assumptions used. The following documents¹ were also provided by France:

ADEME, 2003. Outil de calcul des émissions dans l'air de CH₄, CO₂, SO_x, NO_x issues des centres de stockage de déchets ménagers et assimilés

CORPEN. 1999. Estimation des flux d'azote, de phosphore et de potassium associés aux vaches laitières et à leur système fourrager. Influence de l'alimentation et du niveau de production. Ministère de l'agriculture et de la pêche

CORPEN. 2001. Estimation des flux d'azote, de phosphore et de potassium associés aux bovins allaitants et aux bovins en croissance ou à l'engrais, issus des troupeaux allaitants et laitiers, et à leur système fourrager. Ministère de l'agriculture et de la pêche

CORPEN. 2003. Estimation des rejets d'azote - phosphore - potassium - cuivre et zinc des porcs. Influence de la conduite alimentaire et du mode de logement des animaux sur la nature et la gestion des déjections produites. Ministère de l'agriculture de la pêche et des affaires rurales

CORPEN. 2006. Estimation des rejets d'azote, phosphore, potassium, calcium, cuivre et zinc par les élevages avicoles. Influence de la conduite alimentaire et du mode de logement des animaux sur la nature et la gestion des déjections. Ministère de l'agriculture et de la pêche, Ministère de l'écologie et du développement durable

P. Ciais, M. J. Schellaas, S. Zaehle, S. L. Piao, A. Cescatti, J. Liski, S. Luyssaert, G. Le-Maire, E.-D. Schulzes, O. Boriaud, A. Freibauer, R. Valentini and G. J. Nabuurs. 2008. Carbon Accumulation in European Forests. *nature geoscience* | VOL 1 | JULY 2008. Available at www.nature.com/naturegeoscience

Jari Liskia,b, Daniel Perruchoud, Timo Karjalainen. 2002. Increasing carbon stocks in the forest soils of western Europe. *Forest Ecology and Management* 169 (2002) 159-175

S. Luyssaert, P. Ciais, S. L. Piao, E.-D. Schulze, M. Jungz, S. Zaehle, M. J. Schelhaas, M. Reichstein, Z. G. Churkin, D. Papale, G. Abrisk, C. Beerz, J. Grace, D. Lous, W. G. Mattheucci, F. Magnani, G. J. Nabuurs, H. Verbeeck, M. Sulkava, G. R. Van D E R Werf, I. A. Janssens. 2009. The European carbon balance. Part 3: forests. *Global Change Biology* (2010) 16, 1429–1450, doi: 10.1111/j.1365-2486.2009.02056.x

Journal Officiel de la République Française. 2011. Arrêté du 24 août 2011 relatif au système national d'inventaires d'émissions et de bilans dans l'atmosphère NOR: DEVR1124328A. Journal Officiel de la République Française. 13 Septembre 2011

¹ Reproduced as received from the Party.

Annex II

Acronyms and abbreviations

AD	activity data
CH ₄	methane
C	carbon
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
DOC	degradable organic carbon
EF	emission factor
ERT	expert review team
EU	European Union
F-gas	fluorinated gas
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ without GHG emissions and removals from LULUCF
GWP	global warming potential
HFCs	hydrofluorocarbons
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1,000 grams)
LULUCF	land use, land-use change and forestry
m ³	cubic metre
Mg	megagram (1 Mg = 1 tonne)
Mt	million tonnes
N ₂ O	nitrous oxide
NA	not applicable
NE	not estimated
NIR	national inventory report
NO	not occurring
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
RMU	removal unit
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