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Report of the individual review of the annual submission of Monaco submitted in 2010*

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

Contents

I. Introduction and summary

A. Overview

1. This report covers the centralized review of the 2010 annual submission of Monaco, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 13 to 18 September 2010 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. Domenico Gaudioso (Italy) and Mr. Justin Goodwin (United Kingdom of Great Britain and Northern Ireland); energy – Ms. Kristien Aernouts (Belgium), Mr. Gebru Jember Endalew (Ethiopia), Mr. Fernando Farías (Chile) and Mr. Suthum Patumsawad (Thailand); industrial processes – Ms. Marisol Bacong (Philippines) and Mr. Dušan Vácha (Czech Republic); agriculture – Mr. Mahmoud Medany Awad (Egypt) and Mr. Sergio González (Chile); land use, land-use change and forestry (LULUCF) – Ms. Savitri Garivait (Thailand), Ms. Gro Hylen (Norway) and Mr. Harry Vreuls (Netherlands); and waste – Mr. Mark Hunstone (Australia) and Ms. Baasansuren Jamsranjav (Mongolia). Mr. Goodwin and Mr. González were the lead reviewers. The review was coordinated by Mr. Sabin Guendehou and Mr. Matthew Dudley (UNFCCC secretariat).

2. In accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1), a draft version of this report was communicated to the Government of Monaco, which made no comment on it.

B. Emission profiles and trends

3. In 2008, the main greenhouse gas (GHG) in Monaco was carbon dioxide (CO_2), accounting for 94.2 per cent of total GHG emissions[1] expressed in carbon dioxide equivalent (CO_2 eq), followed by nitrous oxide (N_2O) (3.1 per cent) and methane (CH_4) (0.6 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 2.0 per cent of the overall GHG emissions in the country. The energy sector accounted for 96.9 per cent of total GHG emissions, followed by industrial processes (2.0 per cent) and waste (1.1 per cent). Total GHG emissions amounted to 95.50 Gg CO_2 eq and decreased by 11.4 per cent between the base year[2] and 2008. The trends for the different gases and sectors are reasonable and consistent with the explanations provided in the national inventory report (NIR).

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

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

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

Table 1

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

			Gg CO_2 eq								*Change*
		Greenhouse gas	*Base year*	*1990*	*1995*	*2000*	*2005*	*2006*	*2007*	*2008*	*Base year–2008 (%)*
Annex A sources		CO_2	105.37	105.37	111.81	112.77	98.59	89.28	92.06	90.00	–14.6
		CH_4	0.66	0.66	0.80	0.81	0.63	0.53	0.63	0.60	–9.1
		N_2O	1.64	1.64	2.63	3.29	3.02	2.79	3.07	2.95	80.3
		HFCs	0.01	NA, NE, NO	0.01	2.60	1.77	0.61	1.89	1.86	24 598.1
		PFCs	NA, NE, NO	NA, NE, NO	NA, NE, NO	NA, NE, NO	0.06	0.07	0.06	0.02	NA
		SF_6	0.10	0.16	0.10	0.10	0.08	0.08	0.08	0.08	–15.5
KP-LULUCF	Article 3.3[b]	CO_2								NO	
		CH_4								NO	
		N_2O								NO	
	Article 3.4[c]	CO_2								NA	
		CH_4								NA	
		N_2O								NA	

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

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

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

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

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

			Gg CO_2 eq								*Change*
		Sector	*Base year[a]*	*1990*	*1995*	*2000*	*2005*	*2006*	*2007*	*2008*	*Base year–2008 (%)*
Annex A		Energy	107.02	107.02	114.24	115.81	101.20	91.62	94.66	92.51	–13.6
		Industrial processes	0.10	0.16	0.10	2.69	1.91	0.76	2.04	1.95	1 772.1
		Solvent and other product use	NE	NE	NE	NE	NE	NE	NE	NE	NE
		Agriculture	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA
		Waste	0.64	0.64	1.00	1.05	1.05	0.98	1.09	1.03	61.8
		Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
		LULUCF	NA	–0.03	–0.04	–0.04	–0.04	–0.04	–0.04	–0.04	NA
		Total (with LULUCF)	**NA**	**107.79**	**115.30**	**119.52**	**104.12**	**93.32**	**97.75**	**95.46**	**NA**
		Total (without LULUCF)	**107.77**	**107.82**	**115.34**	**119.56**	**104.15**	**93.36**	**97.79**	**95.50**	**–11.4**
KP-LULUCF	Article 3.3[b]	Afforestation & reforestation								NO	
		Deforestation								NO	
		Total (3.3)								**NO**	
	Article 3.4[c]	Forest management								NA	
		Cropland management	NA							NA	NA
		Grazing land management	NA							NA	NA
		Revegetation	NA							NA	NA
		Total (3.4)	**NA**							**NA**	**NA**

Abbreviations: 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, NE = not estimated, NO = not occurring.

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

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

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

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

Table 3
Information to be included in the compilation and accounting database, in tonnes of carbon dioxide equivalent

	As reported	*Adjustment*[a]	*Final*[b]	*Accounting quantity*[c]
Commitment period reserve	445 699		445 699	
Annex A emissions for current inventory year				
CO_2	89 999		89 999	
CH_4	583		596	
N_2O	2 950		2 950	
HFCs	1 856		1 856	
PFCs	16		16	
SF_6	82		82	
Total Annex A sources	**95 486**		**95 499**	
Activities under Article 3, paragraph 3, for current inventory year				
3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported	NO		NO	
3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported	NO		NO	
3.3 Deforestation for current year of commitment period as reported	NO		NO	
Activities under Article 3, paragraph 4, for current inventory year[d]				
3.4 Forest management for current year of commitment period				
3.4 Cropland management for current year of commitment period				
3.4 Cropland management for base year				
3.4 Grazing land management for current year of commitment period				
3.4 Grazing land management for base year				
3.4 Revegetation for current year of commitment period				
3.4 Revegetation in base year				

Abbreviations: NA = not applicable, NO = not occurring.

[a] "Adjustment" is relevant only to Parties for which the expert review team has calculated one or several adjustment(s).

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

[c] "Accounting quantity" is included in this table only for Parties that chose to account annually for activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, if any.

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

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

6. Monaco submitted a complete set of common reporting format (CRF) tables for the period 1990–2008 on 23 March 2010, an NIR on 30 March 2010 and an updated version of the NIR on 1 April 2010. It 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, and changes in the national system and in the national registry. The standard electronic format (SEF) tables were not submitted: Monaco explained that it is not required to submit the SEF tables since it has not yet transferred or acquired any units. The Party did not submit information on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. Therefore, the annual submission was not submitted fully in accordance with decision 15/CMP.1.

7. Monaco officially submitted additional emission estimates on 21 October 2010, in response to questions raised by the expert review team (ERT) in the course of the review, for CH_4 emissions from natural gas distribution (see para. 40 below). These additional estimates resulted in an increase in total GHG emissions by 0.01 per cent for 2008 compared with the figure provided in the original submission. In addition, Monaco submitted, on 17 September 2010, information on Article 3, paragraph 14, in response to questions raised by the ERT during the review (see para. 69 below). Where necessary, the ERT also used the previous year's submission during the review.

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

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

Completeness of inventory

10. The inventory covers all sectors existing in the country, is complete in terms of years and geographical coverage, covers most gases and reports information for most categories. During the review, Monaco improved the completeness of its inventory submission by providing estimates for fugitive CH_4 emissions from natural gas distribution, which had previously not been estimated (see para. 40 below). However, the Party's use of the notation key for not estimated ("NE") and the other notation keys has not significantly improved since its last annual submission. The ERT noted that Monaco has reported CO_2 emissions from asphalt roofing; HFC, PFC and SF_6 emissions from aerosols/metered dose inhalers, solvents and other applications using substitutes for ozone-depleting substances (ODS); and HFC and PFC emissions from electrical equipment as "NE", whereas these should be reported as not occurring ("NO"), using the notation key "NO". Potential HFC

[3] The SIAR, parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5 (a), 6 (c) and 6 (k)), under the auspices of the international transaction log 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.

and PFC emissions from refrigeration and air-conditioning equipment are reported as included elsewhere ("IE"), using the notation key "IE", in CRF table 2(I), whereas estimates for these emissions are provided in CRF table 2(II). The ERT recommends that Monaco correct its use of the notation keys in its next annual submission.

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

Overview

11. The ERT concluded that the national system continued to perform its required functions. The Party described the changes in the national system since the previous annual submission and these changes, related to the extension of the assistance mission of the Centre Interprofessionnel Technique d'Etudes de la Pollution Atmosphérique (CITEPA) for the preparation of the inventory, are discussed in paragraph 67 below.

Inventory planning

12. The NIR described the national system for the preparation of the inventory. The Direction de l'Environnement, within the Département de l'Equipement, de l'Environnement et de l'Urbanisme, has overall responsibility for the national inventory. Data for the preparation of the inventory are collected by the Direction de l'Environnement from several private and public companies and government institutions, including: the Société Monégasque d'Assainissement; the Société Monégasque de l'Electricité et du Gaz (SMEG); the Division des Statistiques de la Direction de l'Expansion Economique; the Direction de l'Aviation Civile; the Compagnie des Autobus de Monaco; the Société Monégasque des Eaux; the Service de l'Aménagement Urbain; the Mairie de Monaco; the Service des Titres et Circulation; the Direction du Contrôle des Concessions et des Télécommunications; the French Institut Géographique National. Legislation relating to the mandatory collection of data from both governmental and private institutions is included in the Party's "*Code de l'Environnement*", which is being discussed at the political level. Monaco has a quality assurance/quality control (QA/QC) plan in place, which is 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). CITEPA has reviewed the Party's 2003 inventory and will provide support in the future for the review of the inventory, on the basis of a service contract with the Direction de l'Environnement. However, the ERT identified that Monaco has not indicated in the NIR whether the 2008 inventory has been reviewed by CITEPA. The Département de l'Equipement, de l'Environnement et de l'Urbanisme submits the annual inventory, including the CRF tables and the NIR, to the UNFCCC secretariat. The ERT commends the Party for the progress already made in the organization of its national system and encourages Monaco to approve the legal framework for data collection and to report on this issue in its next annual submission.

Inventory preparation

Key categories

13. Monaco has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2010 submission. The key category analysis performed by the Party and that

performed by the secretariat[4] produced similar results. In response to a question raised by the ERT during the review, Monaco indicated that, following the recommendations of previous ERTs, the LULUCF sector was included in its key category analysis, despite the small contribution of this sector to the Party's total GHG emissions. The Party also indicated that a tier 2 key category assessment is being prepared, but it was not able to indicate when this will be reported in its annual submission. The ERT commends the Party for these improvements and reiterates the recommendation of previous ERTs that Monaco carry out a tier 2 key category assessment. The ERT also recommends that Monaco indicate, in its next annual submission, how it uses the key category analysis to prioritize improvements to the inventory.

Uncertainties

14. Monaco has reported a tier 1 uncertainty analysis in its 2010 submission, including the LULUCF sector. The estimated combined uncertainty for the overall GHG inventory for 2008 was 6.8 per cent, while the uncertainty associated with the overall emission trend was 1.7 per cent.

15. Monaco presents the uncertainties as standard deviations, rather than using the 95 per cent confidence interval as recommended in the IPCC good practice guidance, which means that the reported uncertainty values are around half of the uncertainty values that would be estimated if the 95 per cent confidence interval were used. The ERT recommends that Monaco use the 95 per cent confidence interval to present uncertainties, as recommended in the IPCC good practice guidance, to enable a better comparison with other Parties' uncertainties. Also, as Monaco plans to implement a tier 2 key category analysis, uncertainties should be accurately estimated.

16. As noted by previous ERTs, Monaco does not include in the NIR information on procedures for using the results of the uncertainty analysis as a tool to prioritize inventory improvements. The present ERT therefore reiterates the recommendation contained in previous review reports that Monaco use the results of the uncertainty analysis to improve the inventory in its future annual submissions.

Recalculations and time-series consistency

17. According to the NIR, recalculations have been performed for the entire time series for emissions of fluorinated gases (F-gases), using data on actual emissions as recommended by previous ERTs. However, CRF table 8(a) indicates that there is no difference between the figures reported in the previous and the latest submission. In response to a question raised by the ERT, Monaco confirmed that recalculations were performed for F-gases. The ERT recommends that the Party provide in its next annual submission, both in the CRF tables and in the NIR, consistent information on recalculations, including the reasons for the recalculations and their impact on estimated emission levels. The information provided in the CRF tables and in the NIR is largely consistent, with some exceptions in relation to reporting of the methods and emission factors (EFs) used for the estimations. In particular, CRF table summary 3 reports: that a tier 1 method is applied to estimate emissions from energy industries, transport, other sectors, and category other (energy), whereas the NIR does not indicate which tier method

[4] The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the 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.

is used; that the core inventory of air emissions (CORINAIR) method and EFs are applied to estimate emissions from waste incineration, whereas the NIR does not include this category; and that the default method and EF are used to estimate N_2O emissions from wastewater handling, whereas no method is reported in the NIR. The ERT recommends that Monaco improve the consistency of the information reported between the NIR and CRF table summary 3.

Verification and quality assurance/quality control approaches

18. Monaco has a QA/QC plan in place (included in annex 8 to the NIR), which is in accordance with the IPCC good practice guidance. The plan includes only general QC procedures (tier 1). An external review of the 2003 inventory was carried out in June 2005 by CITEPA. As announced in the 2009 and 2010 NIRs, CITEPA will again support the preparation and review of Monaco's inventory. However, the Party's 2010 inventory has not been reviewed by CITEPA. According to the new service contract with the Direction de l'Environnement, CITEPA will cooperate, on the one hand, in strengthening the procedure for the annual preparation of the inventory and, on the other hand, in establishing more representative EFs for the estimation of CO_2 emissions from waste incineration, as requested in previous review reports.

Transparency

19. Monaco has increased transparency in its 2010 submission by including more detailed information in the sectoral chapters on methodologies, activity data (AD) and EFs and by including in the NIR a table of contents.

20. The ERT recommends that Monaco continue to improve transparency in its next annual submission, by following the UNFCCC annotated outline of the NIR and the guidance contained therein.

Inventory management

21. Monaco 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. All data and copies of the documents used for the preparation of the inventory are archived at the Direction de l'Environnement. In addition, the recent installation of a computer server will allow for the electronic storage of all materials used in the context of the annual inventory.

3. Follow-up to previous reviews

22. Monaco has improved its inventory in its 2010 submission in response to recommendations made in previous review reports, in particular by providing an estimate for CO_2 emissions from road paving with asphalt, by shifting from estimating potential to actual emissions for HFC and PFC emissions from refrigeration and air conditioning, by including the LULUCF sector in the key category analysis and uncertainty analysis and by including in the NIR a table of contents. Other recommendations made in previous review reports, but not yet implemented by Monaco, include:

(a) To structure the NIR following the UNFCCC annotated outline of the NIR and the guidance contained therein;

(b) To improve transparency by including more information, in the NIR, on the methods, parameters and assumptions used;

(c) To include annual plans for inventory improvements in the NIR;

(d) To prepare an uncertainty analysis in accordance with the IPCC good practice guidance;

(e) To carry out a tier 2 key category assessment.

4. Areas for further improvement

Identified by the Party

23. The 2010 NIR does not identify specific areas for improvement. However, in its responses to questions raised by the ERT during the review, Monaco indicated that it is working to provide a correct submission of CRF tables 7, 8(a) and 8(b), to improve the consistency of the information provided on methods applied and EFs used between CRF table summary 3 and the NIR, and to carry out a tier 2 key category analysis.

Identified by the expert review team

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

(a) The revision of the structure of the NIR following the UNFCCC annotated outline of the NIR and the guidance contained therein;

(b) The inclusion of additional information and explanations in the sectoral chapters of the NIR on the selection of methodologies, EFs used, sources of AD and sector-specific QA/QC and verification measures;

(c) The preparation of the uncertainty analysis in accordance with the IPCC good practice guidance;

(d) The inclusion of information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

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

B. Energy

1. Sector overview

26. The energy sector is the main sector in the GHG inventory of Monaco. In 2008, emissions from the energy sector amounted to 92.51 Gg CO_2 eq, or 96.9 per cent of total GHG emissions. Since 1990, emissions have decreased by 13.6 per cent. The key driver for the fall in emissions is the 31.9 per cent reduction in emissions from the residential sector, which can be explained by changes in the type of fuel used over the period 1990–2008. Within the sector, 35.5 per cent of the emissions were from transport, followed by 33.4 per cent from other sectors and 31.0 per cent from energy industries.

27. Fugitive emissions from natural gas distribution are reported in the CRF tables as "NO". However, the NIR states that these emissions do occur, and this was confirmed by the Party in response to a question raised by the ERT during the review week (see para. 40 below). The ERT recommends that Monaco report the estimates provided during the review for fugitive emissions from natural gas distribution in its next annual submission.

28. For all categories and gases in the energy sector, Monaco reports, in CRF table summary 3, using a tier 1 methodology and IPCC default EFs for its estimations. However, as identified by the previous ERT, the description of the methodology for estimating CH_4 and N_2O emissions from road transportation provided in the NIR is consistent with the

tier 2 approach. The ERT reiterates the recommendation made in the previous review report that the Party revise its reporting in CRF table summary 3.

29. During the previous review, the previous ERT suggested that Monaco consult fuel suppliers and large consumers to obtain more detailed information on the fuels used in Monaco, and review and revise its CO_2 EFs for fuels for its next annual submission. The previous ERT also suggested that Monaco improve the references for any EFs and parameters used that are not IPCC defaults, discuss the reasons for choosing them and discuss significant trends. The present ERT reiterates the suggestions made during the previous review.

2. Reference and sectoral approaches

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

30. For 2008, Monaco reports in CRF table 1.A(c) that CO_2 emissions estimated using the reference approach are 0.4 per cent lower than those estimated using the sectoral approach. The ERT welcomes the efforts made by Monaco in improving the data for the reference approach for all years compared with in the previous annual submission and in providing background information in the NIR (annex 4).

31. As stated in the previous review report, a comparison of Monaco's estimates with international data was not possible for the review, as data for Monaco are included as part of the French submission to the International Energy Agency (IEA) and not reported separately. The ERT reiterates the encouragement of Monaco to make efforts to submit its data independently.

International bunker fuels

32. To separate emissions from international and domestic navigation, Monaco performed a survey in 2005 to determine the split between the two navigations: 91.0 per cent of the total fuel consumption was estimated to be for international navigation. The ERT reiterates the recommendation made in the previous review report that Monaco repeat this survey regularly to confirm or update the percentage identified in 2005.

33. The estimation of CO_2 emissions from international aviation is based on the fuels sold in the heliport of Monaco and these emissions increased by 35.7 per cent between 1990 and 2008. However, between 2007 and 2008 such CO_2 emissions decreased by 15.0 per cent. The ERT identified large inter-annual changes in the estimated CO_2 emissions from international aviation. This had already been identified by the previous ERT, which recommended that Monaco include in its 2010 annual submission the explanations provided during the previous review, namely that, as Monaco is a small country with no airports, the emissions reported for international aviation result from the movement of helicopters, occurring mainly between the city of Nice (France) and Monaco. As calculations of emissions are based on fuel sales and the annual traffic volume is highly variable, the CO_2 emissions estimated for this category also show significant inter-annual variation. The ERT reiterates the recommendation that Monaco include these explanations in the NIR of its next annual submission.

Feedstocks and non-energy use of fuels

34. In the previous review report, the ERT asked Monaco to check the use of bitumen and lubricants as reported in CRF table 1.A(d), since the use of these fuels had been reported as "NO". In its 2010 submission, Monaco has changed the use of lubricants to "NE", while the notation key for the use of bitumen remains the same. In response to the question raised by the present ERT as to whether the Party has checked the use of these

fuels, the Party responded that the notation keys are wrong and will be checked for the next annual submission.

3. Key categories

Stationary combustion: liquid, gaseous and other fuels – CO_2

35. Emissions of CO_2 from the incineration of municipal solid waste (MSW) and sludge with energy recovery are reported as emissions from the consumption of other fuels in the category public electricity and heat production. The emissions were estimated using the tier 1 method, and default values for the fossil fraction and carbon content of the fuels from the IPCC good practice guidance. In its 2009 and 2010 NIRs, Monaco indicated that it is planning to perform a survey on waste composition. In response to questions raised by the ERT during this review, Monaco stated that it has already started collaborating with CITEPA in order to define the various classes of waste and calculate the carbon content of the fuels. In addition, the Party indicated that it has started to contact several engineering offices in order to carry out waste sampling, but without success so far. Monaco further indicated that it hopes this study will take place next year. The ERT reiterates its support for this plan and encourages Monaco to implement it as soon as possible.

36. The CO_2 emissions from the incineration of MSW and sludge vary from year to year. During previous reviews, Monaco explained that in 2006 the amount of waste incinerated was low due to the temporary closure of the incineration plant. In addition, the Party stated that the amount of waste incinerated will probably decrease in the coming years as Monaco has started to separate and recycle MSW, thereby reducing the amount of waste incinerated. The ERT reiterates the recommendation made in the previous review report that, in order to improve the transparency of its reporting, Monaco include this information on trends in its NIR, as well as data on the total quantity of waste incinerated.

37. Emissions of CO_2 from the residential and commercial/institutional sectors accounted for 33.4 per cent of the total emissions from the energy sector in 2008. The trend in these emissions shows an overall decrease, with a reduction of 31.9 per cent from 1990 to 2008, which is the key driver for the overall decreasing trend in the total GHG emissions from the energy sector in Monaco. During the previous review, Monaco clarified that the decreasing emission trend observed in the residential sector is due to the fact that the domestic use of light fuel oil in new buildings has been forbidden since 16 September 2003 and the fact that citizens decided to change their heating systems from light fuel oil to natural gas; however, this information is not provided in the NIR of the 2010 submission. The ERT recommends that Monaco include this information in its next annual submission. The ERT identified that Monaco has not reported separate data for the commercial/institutional category and reiterates the recommendation formulated during the previous review that Monaco investigate the possibility of obtaining separate data for the commercial/institutional category, which is currently reported together with the residential category, for its next annual submission, although the Party indicated during the review that this issue is still under investigation.

Road transportation: liquid fuels – CO_2, CH_4 and N_2O

38. Monaco calculates its estimates of CO_2 emissions from road transportation on the basis of the amount of fuels sold and using default EFs from the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines). Monaco estimates CH_4 and N_2O emissions using a tier 2 approach, using net calorific values and EFs from the Revised 1996 IPCC Guidelines and CITEPA. The trend in CO_2 emissions from road transportation shows an overall decrease (by 8.4 per cent), from 32.34 Gg in 1990 to 29.64 Gg in 2008. During the previous review, Monaco

clarified that this decrease in emissions was due to an increase in the use of public transportation, such as buses and trains, as a result of government incentives targeting the people living in Monaco and commuters, but this information is not included in the 2010 annual submission. The ERT recommends that Monaco include this explanation in the NIR of its next annual submission. Furthermore, the ERT noticed that this decrease in emissions was also due to the higher percentage of biofuels used each year as presented in annex 2 to the NIR. The ERT recommends that Monaco provide more information on this emission trend in its next annual submission.

39. In 2008, N_2O emissions from the use of gasoline in road transportation accounted for 48.4 per cent of the total N_2O emissions from the energy sector. Emissions of N_2O from road transportation have increased by 439.3 per cent since 1990, caused by the high EF for passenger cars equipped with a catalytic converter (0.05 g/km). The ERT reiterates the recommendation that Monaco include this explanation in the NIR of its next annual submission.

4. Non-key categories

Fugitive emissions from natural gas distribution: gaseous fuels – CH_4

40. Monaco reported fugitive emissions from natural gas distribution as "NO" in the CRF tables, while in the NIR the Party indicated that 0.02 per cent (based on information from SMEG for 2005) of the overall quantity of gas distributed leaks out of the system. Therefore, the ERT concluded that the notation key used to report these emissions should be "NE" rather than "NO". The ERT recommended during the review that Monaco estimate CH_4 emissions from natural gas distribution either by collecting data from SMEG for the whole time series; using the 0.02 per cent estimate for distribution losses for 2005 and multiplying this by the total quantity of natural gas distributed each year; or using the available information on the length of the gas distribution system and the default EFs provided in the IPCC good practice guidance. Following the recommendation made by the ERT, Monaco used the 0.02 per cent estimate for distribution losses to provide estimates for CH_4 emissions from natural gas distribution. The result was an estimate of 0.0006 Gg for these emissions in 2008 and in increase in the estimated emissions from the energy sector by 0.01 per cent compared with the figure reported in the original submission. The ERT recommends that Monaco include estimated fugitive CH_4 emissions from natural gas distribution in its next annual submission.

C. Industrial processes and solvent and other product use

1. Sector overview

41. In 2008, emissions from the industrial processes sector amounted to 1.95 Gg CO_2 eq, or 2.0 per cent of total GHG emissions. Since the base year, emissions have increased by 1,116.3 per cent in the industrial processes sector. The key driver for the rise in emissions in the industrial processes sector is the increase in HFC emissions from refrigeration and air-conditioning equipment. Under the industrial processes sector, Monaco reports only potential and actual emissions of HFCs and PFCs from refrigeration and air-conditioning systems and SF_6 emissions from electrical equipment. The NIR indicates that mineral products, chemical industry, metal production, other production, and production of halocarbons and SF_6 do not occur in the country. The Party uses the notation key "NE" to report CO_2 emissions from asphalt roofing; HFC, PFC and SF_6 emissions from aerosols/metered dose inhalers, solvents and other applications using ODS substitutes; and HFC and PFC emissions from electrical equipment. However, during the review, Monaco clarified that these activities do not occur in the country. Therefore, the ERT recommends

that Monaco use the notation "NO" to report these emissions in the CRF tables in its next annual submission.

42. Under the solvent and other product use sector, the Party reports only emissions of non-methane volatile organic compounds from paint application, degreasing and dry cleaning, and other (printing industry and wood preservation). CO_2 and N_2O emissions from the solvent and other product use sector are reported as "NE". The ERT encourages Monaco, as requested in the previous review report, to explore approaches available in the scientific literature to estimate emissions for those categories that do not have methodologies prescribed in the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

43. In the CRF tables, potential HFC and PFC emissions from refrigeration and air-conditioning equipment are reported as "IE" and allocated under total potential emissions of halocarbons and SF_6 imported in products. The ERT recommends that Monaco provide estimates of total potential emissions in CRF table 2(I) and discuss in the NIR of its next annual submission why potential emissions imported in bulk were included with potential emissions imported in products, in order to improve transparency and consistency with the CRF tables.

2. Key categories

Refrigeration and air conditioning – HFCs

44. The NIR indicated that, following the recommendation made in the 2005 review report, Monaco conducted a survey in 2005 and 2006 in order to report back to 1995 emissions of HFCs, PFCs and SF_6, which had been reported only for the years 2001, 2002 and 2003. The Party also indicated that, following the recommendation made in the 2007 review report, a survey was conducted to complete the time series back to 1990. The NIR is not clear on how data were collected for the period 2004–2008 and how time-series consistency was ensured. The ERT recommends that Monaco describe in the NIR of its next annual submission the data collection process for the period 2004–2008 and how time-series consistency was ensured.

45. HFC emissions reported under the category refrigeration and air conditioning include emissions of HFC-32, HFC-125, HFC-134a and HFC-143a. However, Monaco has used the notation key "NO" to report HFC-32 for the period 1995–1999, HFC-125 for the years 1995, 1997 and 1998, and HFC-143a for the period 1995–1998, without providing explanations. The ERT encourages Monaco to confirm that the use of "NO" for these HFCs is correct in its next annual submission. The ERT identified that all inter-annual changes in HFC emissions, except for 1994–1995, 2002–2003, 2003–2004 and 2004–2005, were high, ranging between –97.3 per cent and 5,259.3 per cent, with the greatest change occurring in 1995–1996. The ERT recommends that Monaco explain the inter-annual changes in the reported HFC emissions in its next annual submission.

3. Non-key categories

Electrical equipment – SF_6

46. Monaco reported that SF_6 emissions occur only at SMEG and are calculated using methods from the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. However, the NIR did not identify the IPCC method used to calculate potential and actual emissions of SF_6 from electrical equipment, how the data were collected, and the QA/QC procedures implemented. The ERT recommends that Monaco provide this information in the NIR of its next annual submission.

D. Agriculture

Sector overview

47. Monaco indicated in the NIR that the absence of livestock production, pasture management and farmland for agriculture in the country enables it to consider that the corresponding emissions are negligible. The Party reported all categories in this sector as "NO" or "NA" in the CRF tables.

E. Land use, land-use change and forestry

1. Sector overview

48. In 2008, net removals from the LULUCF sector amounted to 0.04 Gg CO_2 eq. Since the base year, net removals have increased by 10.9 per cent.

49. Monaco reports emission/removals from settlements remaining settlements (parks and gardens) only, since this is the only land category present within the national territory. In addition, Monaco reports emissions/removals from the living biomass carbon pool only, and reports as "NE" net carbon stock changes in dead organic matter and in soils. According to the NIR, 43.82 ha of the national territory were occupied by public and private gardens in 2008. Most of the trees (85 per cent) are over 20 years old and are considered mature; for these old trees, gains of biomass are offset by losses and net changes in the carbon pools are assumed to be close to zero. Monaco estimates net removals for the remaining 15 per cent of the trees, which are younger than 20 years old. Following up on the recommendations made in the 2006 review report, Monaco has reported on ongoing work on aerial photography analysis to improve the accuracy of the estimations of land area and of carbon stock changes for public and private gardens in the settlements land-use category. The ERT welcomes this action and encourages Monaco to report on progress made in its next annual submission.

2. Non-key categories

Settlements remaining settlements – CO_2 and N_2O

50. Monaco has reported information (figures and notation keys) for the category settlements remaining settlements in CRF table 5.E. The Party used the tier 1a method from appendix 3a.4 to the *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) to estimate CO_2 removals due to tree growth. Monaco reported that the gains in carbon stock in living biomass for an area of 0.04 kha resulted in a removal of 0.04 Gg CO_2.

51. According to the NIR, nitrogen fertilizers are used in parks and gardens, and emissions of N_2O were estimated at 0.000084 Gg in 2008. The ERT noted that these emissions have not been reported in CRF table 5(I) under the land-use category other. The ERT recommends that the Party correct this inconsistency and report the estimated emissions in that CRF table as well as in the NIR in its next annual submission.

52. Monaco has reported as "NE" net carbon stock changes in dead organic matter and soil organic carbon under the category settlements remaining settlements (parks and gardens). The ERT encourages the Party to estimate and report emissions/removals for these pools in its future annual submissions.

F. Waste

1. Sector overview

53. In 2008, emissions from the waste sector amounted to 1.03 Gg CO_2 eq, or 1.1 per cent of total GHG emissions. Since the base year, emissions have increased by 61.8 per cent. The key driver for the rise in emissions is the incineration of sludge from wastewater treatment (waste incineration started in 1991). Within the sector, 72.9 per cent of the emissions were from wastewater handling, followed by 27.1 per cent from waste incineration.

54. Monaco has provided information on the methodology used to estimate emissions from the waste sector in the NIR. However, the ERT noted that the information provided is insufficient to understand the methodology used. The ERT recommends that Monaco provide, in its next annual submission, more information on the methodology and data used, particularly information on country-specific parameters such as protein consumption and trends in emissions. In addition, the ERT reiterates the recommendation made in the previous review report that Monaco provide a more detailed description of waste management practices and policies, and collection of data and information in its next annual submission.

2. Non-key categories

Wastewater handling – N_2O

55. Monaco estimates N_2O emissions from human sewage using the method described in the Revised 1996 IPCC Guidelines and a constant protein consumption value of 27.38 kg/person/year for the whole time series. The ERT noted that this value is lower than the values used by the other Western European countries. In response to a question raised by the ERT during the review, the Party provided a spreadsheet showing the estimation of average protein consumption in Monaco and a report of a study on food consumption, which support the protein consumption value used. The ERT recommends that Monaco include this information in its next annual submission.

Waste incineration – CH_4 and N_2O

56. Monaco reports emissions from the incineration of sludge from wastewater treatment under the waste sector. The incineration of MSW is used to produce energy and the emissions are reported under the energy sector. During the review, Monaco explained that sludge is mixed with MSW before incineration. Therefore, the ERT recommends that Monaco report emissions from the incineration of sludge under the energy sector, in line with the IPCC good practice guidance, as the incineration is used to produce energy.

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

57. Monaco indicated in the NIR that no land-use category in the country meets the definition of forest as stipulated in the annex to decision 16/CMP.1, and reported activities under Article 3, paragraph 3, of the Kyoto Protocol as "NO". The Party also indicated that it has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol as no

such activities have occurred since 1990. Therefore, Monaco reports activities under Article 3, paragraph 4, of the Kyoto Protocol as "NA".

58. CRF table NIR-2, the land-transition matrix, should be used to report land areas (in kha) and changes in land areas between the previous year and the current inventory year. As the Party's land area for all activities under Article 3, paragraph 3, is 0.00 kha, the ERT suggests that Monaco use this value for the afforestation and reforestation area and for the deforestation area in CRF table NIR-2 in its next annual submission. This will ensure consistency between the values for other area and total area provided in that table.

59. In CRF table NIR-2, the land-transition matrix, other (area) comprises the total area of the country that has not been reported for activities under Article 3, paragraph 3. The value for total area at the end of the current inventory year corresponds to the country's total land area and is constant for all years. However, Monaco reported this as "NA". During the review, the Party informed the ERT that its total land area is 0.2 kha. The ERT recommends that Monaco provide this value in CRF table NIR-2 in its next annual submission.

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

Afforestation and reforestation – CO_2, CH_4 and N_2O

60. Monaco has indicated in the NIR that no land in the country can be considered as subject to activities under Article 3, paragraph 3, of the Kyoto Protocol, and has reported afforestation and reforestation as "NO" in all KP-LULUCF CRF tables.

Deforestation – CO_2, CH_4 and N_2O

61. Monaco has indicated in the NIR that no land in the country can be considered as subject to activities under Article 3, paragraph 3, of the Kyoto Protocol, and has reported deforestation as "NO" in all KP-LULUCF CRF tables.

2. Information on Kyoto Protocol units

Standard electronic format and reports from the national registry

62. Monaco has not reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. However, Monaco is not required to report on its accounting of Kyoto Protocol units in accordance with section I.E of the annex to decision 15/CMP.1, since its national registry has not yet transferred or acquired any Kyoto Protocol units.

Accounting of activities under Article 3, paragraph 3, of the Kyoto Protocol

63. Monaco 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.

64. Table 4 shows the accounting quantities for KP-LULUCF as reported by the Party and the final values after the review.

Table 4
Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol, in t CO_2 equivalent

Activity	*Accounting quantity*	
	As reported	*Final*
Afforestation and reforestation	NA	NA
Deforestation	NA	NA
Forest management	NA	NA
Article 3.3 offset[a]	NA	NA
Forest management cap	NA	NA
Cropland management	NA	NA
Grazing land management	NA	NA
Revegetation	NA	NA

Abbreviation: NA = not applicable.

[a] Article 3.3 offset: For the first commitment period, a Party included in Annex I to the Convention 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 are equal to, or larger than, the net source of emissions incurred under Article 3, paragraph 3.

National registry

65. The ERT took note of the SIAR and its finding that, although the national registry does not yet have a live connection to the international transaction log, it continues to fulfil the requirements related to its reporting of information on and accounting of Kyoto Protocol units, its transaction procedures, its conformance to the technical standards, and its security, data safeguard and disaster recovery measures. The ERT further took note of the SIAR and its finding that the national registry is capable of performing the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). However, the SIAR identified that the national registry has not fulfilled the requirements regarding the public availability of information in accordance with section II.E of the annex to decision 13/CMP.1. In response to questions raised by the ERT during the review, Monaco indicated that, once the national registry is online, the information will be made publically available and will be accessible via the user interface.[5]

Calculation of the commitment period reserve

66. Monaco has reported its commitment period reserve in its 2010 annual submission. Monaco reported that its commitment period reserve (445,699 t CO_2 eq) has not changed since the initial report review, as it is based on the assigned amount and not on the most recently reviewed inventory. The ERT agrees with this figure.

[5] <https://www.registre-monaco.mc>.

3. Changes to the national system

67. Monaco provided information on changes in its national system in its annual submission. In its NIR, Monaco indicated that in 2009 the Direction de l'Environnement extended the assistance mission with CITEPA on the basis of a contract for the preparation of the inventory. The ERT concluded that, taking into account the confirmed change in the national system, Monaco's national system continues to be in accordance with the requirements of national systems set out in decision 19/CMP.1.

4. Changes to the national registry

68. Monaco reported that there are no changes in its national registry since the previous annual submission. The ERT concluded that the Party's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the CMP.

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

69. Monaco has not reported information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, as requested in chapter I.H of the annex to decision 15/CMP.1, in its 2010 annual submission. However, during the review, Monaco provided the ERT with the information requested. The information provided refers to the agreement of Monaco with Tunisia to support clean development mechanism projects in the energy sector in order to promote foreign investments contributing to the achievement of national sustainable development goals and, in particular, to promote employment in the energy and industrial sectors. The ERT found this information to be complete and transparent and in line with the information required by paragraph 23 of the annex to decision 15/CMP.1, and recommends that Monaco explore further steps in implementing Article 3, paragraph 14, of the Kyoto Protocol, taking into account the limited size of the possible impacts of its policies on developing countries, and report these steps in the NIR of its next annual submission.

III. Conclusions and recommendations

70. Monaco made its annual submission on 23 March 2010 (CRF tables) and 1 April 2010 (NIR). 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, and changes to the national system and the national registry). Information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided during the review in response to a question raised by the ERT. This is not in line with decision 15/CMP.1.

71. The ERT concludes that the inventory of Monaco has been prepared and reported in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines). The inventory submission is complete and the Party has submitted a complete set of CRF tables for the years 1990–2008 and an NIR; these are complete in terms of geographical coverage, years and sectors, and generally complete in terms of categories and gases. Some of the categories, particularly in the energy and LULUCF sectors, were reported as "NE".

72. The submission of information required under Article 7, paragraph 1, of the Kyoto Protocol has not been prepared and reported fully in accordance with decision 15/CMP.1, as information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was not provided on time.

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

74. Monaco has not reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. However, Monaco is not required to report on its accounting of Kyoto Protocol units in accordance with chapter I.E of the annex to decision 15/CMP.1, since its national registry has not yet transferred or acquired any Kyoto Protocol units.

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

76. The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the CMP.

77. The submitted information requested in chapter I.H of the annex to decision 15/CMP.1, "Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol", was transparent and complete.

78. In the course of the review, the ERT formulated a number of recommendations relating to the structure of the NIR, QA/QC, and the transparency of the information presented in Monaco's annual submission. The key recommendations are that Monaco:

(a) Revise the structure of its NIR following the UNFCCC annotated outline of the NIR and the guidance contained therein;

(b) Include additional information and explanations in the sectoral chapters of the NIR on the selection of methodologies, EFs used, sources of AD and QA/QC procedures;

(c) Improve the consistency of the information provided on methods applied and EFs used between the CRF tables and the NIR;

(d) Prepare its uncertainty analysis in accordance with the IPCC good practice guidance;

(e) Include information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

IV. Questions of implementation

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

Annex I

Documents and information used during the review

A. Reference documents

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

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

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

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

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

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

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

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

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

Status report for Monaco 2010.
Available at <http://unfccc.int/resource/docs/2008/asr/MCO.pdf>.

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

FCCC/ARR/2009/MCO. Report of the individual review of the annual submission of Monaco submitted in 2009.
Available at <http://unfccc.int/documentation/documents/items/3595.php#beg>.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Philippe Antognelli (Direction de l'Environnement), including additional material on the methodologies and assumptions used. The following documents[6] were also provided by Monaco:

Serge Hercberg. 2009. *ETUDE NUTRINET-SANTE. Cohorte pour l'étude des relations nutrition-santé, des comportements alimentaires et de leurs déterminants. Etat d'avancement et premiers résultats.* Unité de Recherche Epidémiologique Nutritionnelle.

[6] Reproduced as received from the Party.

Annex II

Acronyms and abbreviations

AD	activity data
CH_4	methane
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
CORINAIR	core inventory of air emissions
CRF	common reporting format
EF	emission factor
ERT	expert review team
F-gas	fluorinated gas
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
HFC	hydrofluorocarbons
IE	included elsewhere
IPCC	Intergovernmental Panel on Climate Change
kg	kilogram (1 kg = 1,000 grams)
KP-LULUCF	land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
MSW	municipal solid waste
NA	not applicable
NE	not estimated
NO	not occurring
N_2O	nitrous oxide
NIR	national inventory report
PFC	perfluorocarbons
QA/QC	quality assurance/quality control
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
UNFCCC	United Nations Framework Convention on Climate Change