United Nations

FCCC/IDR.7/MCO

Framework Convention on Climate Change

Distr.: General
3 July 2018

English only

Report on the technical review of the seventh national communication of Monaco

Parties included in Annex I to the Convention were requested by decision 9/CP.16 to submit their seventh national communication to the secretariat by 1 January 2018. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the seventh national communication and relevant supplementary information under the Kyoto Protocol of Monaco, conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

GE.18-10993(E)

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Abbreviations and acronyms

Annex II Party	Party included in Annex II to the Convention
BR	biennial report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CRF	common reporting format
CTF	common tabular format
ERT	expert review team
EU	European Union
F-gases	fluorinated gases
GCOS	Global Climate Observing System
GDP	gross domestic product
GHG	greenhouse gas
HFC	hydrofluorocarbon
IE	included elsewhere
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
reporting guidelines for supplementary information	"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2"
SF_6	sulfur hexafluoride
UNFCCC reporting guidelines on BRs	"UNFCCC biennial reporting guidelines for developed country Parties"
UNFCCC reporting guidelines on NCs	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications"
WAM	'with additional measures'
WEM	'with measures'
WOM	'without measures'

I. Introduction and summary

A. Introduction

1. This is a report on the centralized technical review of the NC7 of Monaco. The review was coordinated by the secretariat in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention", particularly "Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention" (annex to decision 13/CP.20), and the "Guidelines for review under Article 8 of the Kyoto Protocol" (annex to decision 22/CMP.1 and annex I to decision 4/CMP.11).[1]

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of Monaco, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. The review was conducted from 12 to 17 March 2018 in Bonn, Germany, by the following team of nominated experts from the UNFCCC roster of experts: Ms. Asia Adlan (Sudan), Mr. Menouer Boughedaoui (Algeria), Mr. Christo Christov (Bulgaria), Ms. Nancy Liliana Gamba Cabezas (Colombia), Mr. Domenico Gaudioso (Italy), Mr. Liviu Gheorghe (Romania), Mr. Dirk Günther (Germany), Ms. Fui Pin Koh (Malaysia), Ms. Sangchan Limjirakan (Thailand), Mr. Juan Luis Martin Ortega (Spain), Mr. Engin Mert (Turkey), Ms. Gherghita Nicodim (Romania), Mr. Koki Okawa (Japan), Ms. Marcela Itzel Olguin-Alvarez (Mexico), Mr. Brian Quirke (Ireland), Ms. Kristina Saarinen (Finland), Ms. Marina Shvangiradze (Georgia) and Ms. Caroline Tagwireyi (Zimbabwe). Mr. Gaudioso, Ms. Saarinen and Ms. Shvangiradze were the lead reviewers. The review was coordinated by Ms. Veronica Colerio, Ms. Suvi Monni and Ms. Sevdalina Todorova (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Monaco in accordance with the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11).

1. Timeliness

5. The NC7 was submitted on 12 February 2018, after the deadline of 1 January 2018 mandated by decision 9/CP.16.

6. The ERT noted with concern the delay in the submission but also acknowledged that, compared with the previous NC submission, Monaco has made efforts regarding the deadline and the NC7 was submitted during the grace period (decision 22/CMP.1). The ERT recommends that Monaco make efforts to ensure that its next submission is on time (see para. 20 below). In response to a question raised by the ERT during the review, Monaco explained that it is working to resolve the problem with the delayed submission and plans to submit the next NC on time.

[1] At the time of the publication of this report, the Party had submitted its instrument of acceptance of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

7. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Monaco in its NC7, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs. The ERT noted that Monaco has improved completeness and transparency compared with the previous submission and commends Monaco for the efforts made in this regard.

Table 1

Assessment of completeness and transparency of mandatory information reported by Monaco in its seventh national communication, including supplementary information under the Kyoto Protocol

Section of NC	*Completeness*	*Transparency*	*Reference to description of recommendations*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to description of recommendations*
Executive summary	Complete	Transparent		National system	Complete	Transparent	
National circumstances	Complete	Mostly transparent	Issue 1 in table 4	National registry	Complete	Transparent	
GHG inventory	Complete	Mostly transparent	Issue 1 in table 6	Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Mostly Transparent	Issue 1 in table 15
PaMs	Complete	Mostly transparent	Issue 5 in table 8	PaMs in accordance with Article 2	Complete	Mostly transparent	Issue 6 in table 8
Projections and the total effect of PaMs	Mostly complete	Partially transparent	Issues 1, 2, 3 and 9 in table 12 Issue 1 in table 14	Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Mostly transparent	Issue 1 in table 17	Information under Article 10[a]	NA	NA	NA
Financial resources and transfer of technology[b]	NA	NA	NA	Financial resources[c]	NA	NA	NA
Research and systematic observation	Mostly complete	Mostly transparent	Issues 1, 2 and 3 in table 18	Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	
Education, training and public awareness	Complete	Transparent					

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below.

[a] The assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to Annex II Parties only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

[b] Monaco is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention.

[c] Monaco is not an Annex II Party and is therefore not obliged to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

3. Summary of reviewed supplementary information under the Kyoto Protocol

8. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the NIR of the 2017 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2
Overview of supplementary information under the Kyoto Protocol reported by Monaco

Supplementary information	*Reference to the section of NC7*
National registry	3.4
National system	3.2
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	5.4.3
PaMs in accordance with Article 2	4 and 7.2
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	4.1.2
Information under Article 10	4 and 6–9
Financial resources[a]	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Reported in the NIR of the Party's 2017 annual submission (section 15)

[a] Reporting on financial resources under the Kyoto Protocol is relevant to Annex II Parties. As Monaco is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

II. Technical review of the information reported in the seventh national communication, including the supplementary information under the Kyoto Protocol

A. Information on national circumstances and greenhouse gas emissions and removals

1. National circumstances relevant to greenhouse gas emissions and removals

(a) Technical assessment of the reported information

9. In the NC7 Monaco provides a complete summary of the national circumstances, legislation, institutions, population, geography, economy, industries and services, and infrastructure. Monaco has completed the NC7 according to the encouragement made in the previous review report[2] to include information on government structure and responsibilities in the different levels of administration, as they are related to climate change. Monaco has also added information on GDP, market structure and building stocks, and has provided assessments on how these affect emissions. The ERT notes that Monaco has completed the information and generally improved the reporting in the section.

10. The ERT took note of the national circumstances of Monaco, namely that it is the second smallest independent State in the world, with a population of 37,308 inhabitants in 2016 and territory of 202 ha. Monaco has a very close political, economic and cultural

[2] FCCC/IDR.6/MCO, paragraph 15.

relationship with France, established through the Treaty of Protective Friendship in 1918 and confirmed with a new treaty signed in 2002. The tight economic relationship is reflected in a customs agreement, a tax agreement and a monetary agreement. The existing customs union between Monaco and France results in the similarity of the Monegasque energy market to the French market. The EU climate change related policy directly impacts Monaco via its close relations with France.

11. The ERT noted that during the period 1990–2015 Monaco's population and GDP increased by 27.5 and 50.0 per cent, respectively, while GHG emissions per GDP unit and GHG emissions per capita decreased by 57.8 and 36.8 per cent, respectively. Although energy consumption is growing, emissions per inhabitant are decreasing, as is the energy intensity (i.e. the ratio of the final energy consumption and GDP, corresponding to increased energy efficiency). These indicators show a significant decoupling of total GHG emissions from economic growth. Table 3 illustrates the national circumstances of Monaco by providing some indicators relevant to emissions and removals.

Table 3
Indicators relevant to greenhouse gas emissions and removals for Monaco for the period 1990–2015

						Change (%)	
Indicator	*1990*	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*
GDP per capita (thousands 2010 USD)	124.39	140.421	144.56	178.57	186.54	50.0	4.5
GHG emissions without LULUCF per capita (t CO_2 eq)	3.37	3.36	2.34	2.09	2.13	–36.8	1.9
GHG emissions without LULUCF per GDP unit (kg CO_2 eq per 2010 USD)	0.03	0.02	0.02	0.01	0.01	–57.8	–2.4

Sources: (1) GHG emission data: Monaco's 2017 GHG inventory submission, version 2; (2) population and GDP: United Nations Department of Economic and Social Affairs, Population Division (see https://unstats.un.org/unsd/snaama/selbasicfast.asp).

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

(b) Assessment of adherence to the reporting guidelines

12. The ERT assessed the information reported in the NC7 of Monaco and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 4.

Table 4
Findings on national circumstances relevant to greenhouse gas emissions and removals from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 8 Issue type: transparency Assessment: recommendation	The previous ERT (FCCC/IDR.6/MCO, para. 15) recommended that Monaco improve the transparency of its NC by providing further information on the impact of national circumstances and changes therein on the national GHG emissions and removals. The ERT noted the improvements in the section on national circumstances and noted that there were examples of their impact on GHG emissions in the most recent years reported (e.g. for the transport sector). However, the information is not provided systematically and there is no clear information or references in most cases on the impact of the national circumstances and changes therein on the GHG emissions and their trends. The ERT recommends that Monaco improve the transparency of its NC by providing further information on how its national circumstances affect its GHG emissions and removals and how its national circumstances and changes therein affect GHG emissions and removals over time.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

2. Information on greenhouse gas inventory arrangements, emissions, removals and trends

(a) Technical assessment of the reported information

13. Total GHG emissions[3] excluding emissions and removals from LULUCF decreased by 17.7 per cent between 1990 and 2015, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 17.7 per cent over the same period. Table 5 illustrates the emission trends by sector and by gas for Monaco.

Table 5
Greenhouse gas emissions by sector and by gas for Monaco for the period 1990–2015

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
Sector									
1. Energy	98.50	102.03	78.20	71.46	71.61	–27.3	0.2	99.2	87.6
A1. Energy industries	18.01	28.07	18.72	20.83	21.58	19.8	3.6	18.1	26.4
A2. Manufacturing industries and construction	NO	NO	NO	NO	NO	NA	NA	NA	NA
A3. Transport	33.51	37.11	26.42	26.67	24.93	–25.6	–6.5	33.7	30.5
A4. and A5. Other	45.19	36.18	32.47	23.38	24.53	–45.7	4.9	45.5	30.0
B. Fugitive emissions from fuels	1.78	0.66	0.59	0.58	0.58	–67.6	–0.6	1.8	0.7
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	0.27	3.76	6.15	5.80	7.09	2 550.6	22.2	0.3	8.7
3. Agriculture	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NA	NA	NA	NA
4. LULUCF	0.00	–0.04	–0.05	–0.03	0.07	4 217.1	–358.1	NA	NA
5. Waste	0.55	2.05	2.38	2.55	3.01	450.5	17.9	0.6	3.7

[3] 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. Values in this paragraph are calculated based on the 2017 annual submission, version 2.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Gas[a]									
CO_2	95.30	98.32	75.46	68.52	68.72	–27.9	0.3	96.0	84.1
CH_4	2.13	2.45	2.55	2.68	3.11	46.1	16.2	2.1	3.8
N_2O	1.65	3.48	4.33	4.09	3.76	128.4	–8.2	1.7	4.6
HFCs	0.02	3.47	4.28	4.40	6.01	37 964.1	36.6	0.0	7.4
PFCs	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NA	NA	NA	NA
SF_6	0.22	0.12	0.11	0.11	0.11	–51.5	–6.0	0.2	0.1
NF_3	NO	NO	NO	NO	NO	NA	NA	NA	NA
Total GHG emissions without LULUCF	**99.31**	**107.84**	**86.73**	**79.81**	**81.71**	**–17.7**	**2.4**	**100.0**	**100.0**
Total GHG emissions with LULUCF	**99.31**	**107.80**	**86.68**	**79.78**	**81.78**	**–17.7**	**2.5**	**NA**	**NA**

Source: GHG emission data: Monaco's 2017 annual submission, version 2. Please note that, for the purpose of the projections, the Party reported and used different inventory data for 1990–2015, which are planned to be officially submitted in the 2018 inventory submission.

[a] Emissions by gas without LULUCF and without indirect CO_2.

14. The decrease in total emissions was mainly driven by factors influencing the emissions from the energy sector, such as the decrease in transport and other energy sectors. The ERT noted that, in a very small State and economy such as Monaco, GHG emissions could change drastically from one year to the next, as can be seen in the IPPU, LULUCF and waste sectors. The contribution of these sectors is relatively small, as is their impact on the overall emissions in Monaco.

15. Between 1990 and 2015, GHG emissions from the energy sector decreased by 27.3 per cent (26.89 kt CO_2 eq), owing mainly to the trends in the categories transport (decrease of 25.6 per cent or 8.59 kt CO_2 eq) and other sectors (residential, commercial/institutional) (decrease of 45.7 per cent or 20.66 kt CO_2 eq). Monaco provided in its NC7 a partial description of the factors underlying emission trends and provided additional information during the review week. In the category transport, the decrease is due to the reduction in fuel sales for road transport. Monaco indicated that this trend may be attributed to the implementation of several policies to reduce air pollution and the technological improvement of vehicles. Other factors mentioned are the price of fuels, the reduction of the points of sale for fuel and their less easy access compared with filling stations outside Monaco. Monaco has not been able to quantify the relationship between these factors and the trend in fuel sales. The decrease in other sectors (residential, commercial/institutional) is due to the progressive substitution of oil for heating, following policies to ban its use, and to a shift to renewable energy and gas-based heating systems. Unlike other Parties included in Annex I to the Convention, for Monaco the energy industries have a limited share in the energy sector (26.4 per cent of total GHG emissions in 2015) given the limited local energy generation, which consists mainly of thermal generation from energy recovery from waste and seawater heat pumps. The ERT noted that GHG emissions from energy industries (waste incineration with energy recovery) increased during the 1990–2015 period by 19.8 per cent (or 3.6 kt CO_2 eq). The key driver of the increase in emissions from energy industries is the amount of waste incinerated, particularly the amount of waste that is imported from France.

16. Between 1990 and 2015, GHG emissions from IPPU increased by 2,550.6 per cent (6.82 kt CO_2 eq), owing mainly to the use of HFCs for refrigeration and air conditioning in the residential, industrial, commercial and transport sectors. There are no emissions from agriculture reported by Monaco over the time series. Until 2014, the LULUCF sector was a net sink of GHGs. In 2015 the sector became a source of 0.07 kt CO_2 eq; net GHG

emissions have increased by 0.07 kt CO_2 eq since 1990 (4,217.1 per cent change). The change in the trend was mainly driven by the conversion of 0.6 ha of green spaces into built-up land. Between 1990 and 2015, GHG emissions from the waste sector increased by 450.5 per cent (2.46 kt CO_2 eq), owing mainly to an increase in the volume of wastewater treated.

17. Emissions of CO_2 decreased by 27.9 per cent between 1990 and 2015. This reduction is mainly driven by the decrease in emissions from the transport and other energy sectors. CH_4 emissions increased by 46.1 per cent in the same period. This trend is attributed to the increase in emissions from wastewater treatment. Emissions of N_2O greatly increased between 1990 and 2015 (128.4 per cent), owing to increases in emissions from fuel combustion. Emissions of HFCs strongly increased (37,964.1 per cent) as a result of their increased use for domestic and commercial refrigeration and automotive air conditioning.

18. The summary information provided on GHG emissions was generally consistent with the information reported in the 2017 annual submission. Inconsistencies were due to minor discrepancies in the data and units reported in the NC7 and those contained in the CRF tables of the 2017 annual submission (e.g. data for CH_4, N_2O and SF_6 are reported in the text of the NC (pp.65 and 66) in t gas but were labelled as being in kt CO_2 eq).

(b) Assessment of adherence to the reporting guidelines

19. The ERT assessed the information reported in the NC7 of Monaco and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 6.

Table 6
Findings on greenhouse gas inventory information from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 11 Issue type: transparency Assessment: recommendation	Monaco provided in the annex to its NC7 CRF table "Summary 2", with summary information on the CO_2 eq emissions for the years 1990 and 2015. This information is consistent with the figures in the 2017 annual inventory submission. Information on the trends for the period 1990–2015 was provided in the form of a diagram. However, the NC does not contain summary information from the national GHG inventory for 1990–2015 using the emission trend tables given in the CRF. The ERT noted that the figures provided in the diagram were consistent with the trends presented in the BR3 CTF table 1, which corresponds to CRF table 10 (trend table). However, Monaco did not include in the diagram any cross reference to the BR3 that was submitted together with the NC7. The ERT recommends that Monaco improve the transparency of its reporting by including, in its next NC, summary information from the national GHG inventory for the period from 1990 to the last but one year prior to the year of submission of the NC, including CO_2 eq and emission trend tables given in the CRF (CRF table 10). Alternatively, the Party could make a direct reference to CTF table 1 when submitted simultaneously with the NC.
2	Reporting requirement specified in paragraph 12 Issue type: transparency Assessment: encouragement	Monaco has provided in its NC7 a descriptive summary and diagrams on GHG emissions by gas and by sector. The ERT noted some minor inconsistencies between the text and the figures provided in its NC and the figures provided in the CRF tables of the 2017 annual inventory submission (e.g. HFC-125 in 2015). During the review, Monaco confirmed that these were mistakes and explained the reasons for these inconsistencies. The ERT reiterates the encouragement made in the previous review report (FCCC/IDR.6/MCO, para. 16) that Monaco improve the transparency of its reporting by ensuring that data and units provided in the description are consistent with the corresponding data and information contained in the relevant annual inventory submission and clearly explain any possible inconsistencies in the data.
3	Reporting requirement specified in	The ERT noted that Monaco provided in its NC7 a description of the factors underlying the emission trends for the energy sector for the category public electricity and heat production

paragraph 12 Issue type: transparency Assessment: encouragement	and for the IPPU sector for the category product uses as substitutes for ozone-depleting substances. However, similar information was not provided for all other categories. During the review, Monaco provided additional information on drivers for other categories within these sectors and for other sectors. The ERT also found additional information on the key drivers of emission trends in the 2017 NIR and in the national circumstances section of the NC7. The ERT encourages Monaco to improve the transparency of its reporting by providing a description of the factors underlying emission trends for all sectors. Further, the ERT considers that comprehensive cross-referencing between the sections of the NC could further improve its transparency.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

(a) Technical assessment of the reported information

20. Monaco provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The ERT noted the delay in the submission of the NC7 as well as of the NC6. The ERT also took note of the review of the national system and its changes, as reflected in the report on the individual review of the 2017 annual submission of Monaco,[4] and its conclusion that the Party is not sufficiently implementing decision 15/CMP.1 and the annex to decision 19/CMP.1 in conjunction with decision 3/CMP.11. The report assessed the Party's delay in making its annual submission as a problem with the functioning of the national system and raised a question of implementation in this regard.[5]

(b) Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the NC7 of Monaco and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry

(a) Technical assessment of the reported information

22. In the NC7 Monaco provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2017 annual submission of Monaco.

(b) Assessment of adherence to the reporting guidelines

23. The ERT assessed the information reported in the NC7 of Monaco and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

[4] FCCC/ARR/2017/MCO.

[5] With respect to this question of implementation, see document FCCC/ARR/2017/MCO, table 6.

B. Information on policies and measures and institutional arrangements

1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

24. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Monaco committed to reducing its GHG emissions by 22 per cent below the base-year level. The base year for implementation of the Kyoto Protocol target is 1990 for CO_2, CH_4, N_2O and NF_3 and 1995 for HFCs, PFCs and SF_6. To achieve its target, Monaco gives priority to domestic measures even though the Party also plans to use credits from flexible mechanisms. Implementation of the Kyoto Protocol by Monaco is underpinned by the Climate and Energy Plan (Plan Energie Climat), adopted in 2013, and the Low Carbon Strategy (Stratégie Bas Carbone). The plan sets the framework for future climate policy and for Monaco to meet its emission reduction target for 2020. It aims for a reduction in emissions by 30 per cent below the 1990 level, to reduce energy consumption by 20 per cent compared with the 2007 level and to achieve 20 per cent of final energy consumption from renewable sources. The plan will be revised in 2018 to include new targets and, based on this, the Low Carbon Strategy will be initiated in 2019–2020.

25. The overall responsibility for climate change policymaking lies with the Environment Department and a number of national institutions, such as the Department of External Relations and Cooperation, are involved in the implementation of the policy. The Environment Department is responsible for defining the PaMs in the area of climate change as well as for the coordination of their application and their monitoring and evaluation. At the end of 2015, the Mission for Energy Transition was established, which manages projects to limit GHG emissions and develop renewable energy. It also manages the National Green Fund supporting climate-sound projects and long-term energy transition.

26. Monaco has legislative arrangements and administrative procedures in place to make information publicly accessible, carried out by the Environment Department through the Sovereign Ordinance.

27. Monaco has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, and forest management under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. The preservation of biodiversity in Monaco is part of the Government's sustainable development policy. In 2017, the Environment Department initiated the elaboration of a National Strategy for Biodiversity, following the commitments under the Convention on Biological Diversity. There are also grants for projects related to biodiversity and State services that contribute to the protection of biodiversity, especially in the climate change context.

(b) Assessment of adherence to the reporting guidelines

28. The ERT assessed the information reported in the NC7 of Monaco and recognized that the reporting is complete and transparent. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

(a) Technical assessment of the reported information

29. Monaco provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. The Party reported in its NC on its policy context and legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs.

30. Monaco provided information on a set of PaMs similar to, but broader than, those previously reported (see paras. 38–48 below). The Party did not report on any changes made since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target.

31. Monaco gave priority to implementing the PaMs that make the most significant contribution to its emission reduction efforts. Monaco did not provide information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. Monaco reported on how it periodically updates its PaMs to reduce greater levels of emissions and on the PaMs that have been discontinued since the previous submission, explaining that monitoring of climate-related measures in the principality is done by the Environment Department, and that it is a stated priority of the Climate and Energy Plan to develop performance indicators for those monitoring activities.

32. Monaco reported in the NC7 (section 4.1.2, p.99) that there is no territorial subdivision of policies implemented in the country.

33. For Monaco the Convention entered into force on 21 March 1994. Under the Convention Monaco committed to reducing its GHG emissions by 30 per cent below the 1990 level by 2020.[6] The target includes all GHGs included in the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", namely CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3. The target includes all IPCC sources and sectors included in the annual GHG inventory, except emissions and removals from the LULUCF sector.

34. The key overarching cross-sectoral policy reported by Monaco is the Climate and Energy Plan, adopted in 2013 and to be revised in 2018 (see para. 24 above). The impact of this policy is estimated (energy sector total) to be a reduction of 4.11 kt CO_2 eq in 2020. In addition to the Climate and Energy Plan, the Environmental Code, which was adopted in 2017, constitutes the framework law for future regulations. The second chapter of the Code, on energy, has five key elements including the general objectives, which comply with the Convention and its Kyoto Protocol and GHG emission inventories. The mitigation effect of the suppression of importing French waste is the most significant among the measures, with a quantified mitigation impact of 6.12 kt CO_2 eq in 2020. Other policies that may deliver significant emission reductions are the "Waste management plan towards 2030", the development of urban heating and cooling system in buildings, and the optimization of wastewater treatment.

35. Monaco highlighted the mitigation actions that are under development, such as increasing the fraction of biomethane in the total gas consumption to 30 per cent by 2030 and reducing emissions from dry cleaning.

36. Table 7 provides a summary of the reported information on the PaMs of Monaco.

Table 7
Summary of information on policies and measures reported by Monaco

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	Climate and Energy Plan	4.11 (sector total)	7.4 (sector total)
	Environmental Code	NE	NE
	Committed Commerce Approach	NE	NE

[6] For details on the base year, see document FCCC/TRR.3/MCO, paragraph 12 and table 4, issue 3.

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Energy	Waste management plan towards 2030	IE (under waste)	IE (under waste)
Transport	Increase the number of electric and hybrid vehicles	NE	NE
	Promotion of bicycles and electric bicycles	NE	NE
Renewable energy	Increase of fraction of biomethane in the total gas consumption	2.69	3.39
	Requalification of the incineration plant from waste to energy	IE	IE
Energy efficiency	Development of urban heating and cooling systems for buildings	0	4.15
	Energy efficiency regulations and audits for new buildings and refurbished buildings	NE	NE
IPPU	Reduction in emissions of F-gases	0.1	2.3
	Reduction in emissions from dry cleaning	0	0
LULUCF	Tree Code	NE	NE
	Preservation of green spaces	NE	NE
Waste	Suppression of import of French waste	6.12	6.12
	Waste management plan towards 2030	2.95	4.52
	Optimization of wastewater treatment	0.5	3.73

Note: The estimates of mitigation impact are estimates of emissions of CO_2 or CO_2 eq avoided in a given year as a result of the implementation of mitigation actions.

37. Monaco provided the estimation of impacts for the significant PaMs in its NC7. These are new measures that take into account the evolution of the PaMs planned (additional) and adopted in relation to the objectives of the principality and the trends observed in the last four years. However, the ERT noted that some existing PaMs reported previously that will have large impacts on achieving the target in 2020 are not mentioned in the current submission.

(b) Policies and measures in the energy sector

38. The energy sector is the sector of greatest importance for the GHG emissions in Monaco, accounting for 87.6 per cent of national emissions in 2015. Between 1990 and 2015, GHG emissions from the energy sector decreased from 99.2 per cent of the national total (a decrease of 26.89 kt CO_2 eq), mainly owing to the trends in fuel sales for road transport and the substitution of oil for heating in other sectors (residential, commercial/institutional) (see table 5 and para. 15 above).

39. **Energy supply**. France provides most of the electricity used in Monaco. Within the principality, energy is produced by seawater heat pumps and by waste incineration plants. This energy production accounted for 26.4 per cent of total GHG emissions in 2015, nearly all of which relates to waste incineration. With the priority to reduce the quantity of waste incinerated, especially of fossil fuel waste, the waste incinerated has decreased in recent years to 50,000 t waste per year. A share of the incinerated waste is imported from France. Thus, in 2015, the imported waste accounted for more than 16,000 t household waste. The treatment of imported waste from France will be terminated from 2019, which is expected to reduce emissions in 2020 by 6.12 kt CO_2 eq. A refurbishment of the incineration plant is planned by 2025, which will allow for the implementation of improved technologies; and priority is to be given to incineration for energy production, with the reduced incineration capacity being a maximum of 45,000 t waste per year.

40. **Renewable energy sources**. Monaco has used its coastline to install more than 60 seawater heat pumps. These plants produce about 176,000 MWh/year, or 15–20 per cent of the final energy consumption. In addition to current heat pumps under operation for individual buildings, Monaco plans to develop two loops for heating and cooling buildings in the Condamine and Larvatto districts, with the aim of bringing these into service in 2022, in order to renovate the buildings that are currently heated by fuel boilers. With regard to traditional renewable energy sources, the NC7 provided information on a subsidy implemented to promote the development of solar photovoltaic energy (30 per cent of the cost of solar installation), and on the planned increase of the biomethane fraction in natural gas consumption. The NC7 reports that the efforts to increase the use of renewables are already visible in Monaco and in 2016 125 MWh were produced by photovoltaic energy.

41. **Energy efficiency**. GHG emissions from the other energy sectors,[7] including public, commercial and residential buildings, have been reduced significantly since 1990 (45.19 kt CO_2 eq) to 24.53 kt CO_2 eq in 2015, representing 45.5 and 30.0 per cent of total emissions in 1990 and 2015, respectively. Many of the PaMs presented in the NC7 are related to energy efficiency, especially those measures implemented in public buildings. Energy economies are ensured by the more stringent regulations set for new buildings. An example is the technical management of public buildings to control energy use. In 2018–2019, a total of 250 buildings will be equipped with remote energy management. Energy audits will cover all existing building up to 2022 with follow-up renovations to ensure their energy efficiency.

42. **Residential and commercial sectors**. Several PaMs have been implemented to control the energy consumed by residential buildings. New and additional PaMs include: Smart+ project for the 100 largest consumers of electricity to know more precisely their electricity usage; a subsidy for the replacement of single-glazed windows by double glazing; and the generalized application of a ban on heating oil to all buildings.

43. **Transport sector**. GHG emissions from the transport sector decreased by 25.6 per cent between 1990 and 2015 (24.93 kt CO_2 eq in 2015). Those emissions accounted for 30.5 per cent of total emissions in 2015, and more than 90 per cent of the emissions are from road transport. The Government's transport policy is to reduce the various negative impacts of road traffic, such as noise and air pollution. The effects of other various transport policies, including French and EU measures on road transport, are difficult to quantify directly, but the impacts of these are reflected in the GHG inventory through the sale of fuels. Thus, the EU directive on biofuels in transport (EU directive 2015/1513) directly impacts Monaco via the fuel import from France. Some examples of recent policy developments in Monaco include: the improved bus service between Nice and Monaco; a car-sharing service of electric vehicles with an initial 15 vehicles in 2014 and a future goal of 50 vehicles; the subsidy to purchase electric vehicles at 30 per cent of the price up to EUR 9,000; the acquisition of additional hybrid buses; and a rental service for electric bicycles, with 17 stations and a fleet of 105 bicycles in 2018. Monaco reported that two urban goods distribution centres were established in 1989 to optimize the distribution of goods while reducing the number of trucks in circulation and the GHG emissions.

44. The NC7 states that Monaco is a member of the European Civil Aviation Conference and thereby fully supports the efforts of the International Civil Aviation Organization to address environmental concerns, including the strategic challenge of climate change for sustainable development of international air transport.

45. **Industrial sector**. Since the 1950s, the industrial sector in Monaco has largely relied on light, non-polluting industries that generate high added value. Monaco reported that heavy chemistry, iron and steel, cement, raw materials extraction or any other heavy industries are not occurring (NC7, section 2.10, p.51) and therefore it has not reported any PaMs targeting energy consumption by the industrial sector.

[7] Other energy sectors excludes energy production and transport, and includes public, commercial and residential buildings (NC7, p.73).

(c) Policies and measures in other sectors

46. **Industrial processes**. GHG emissions from the industrial processes sector have increased sharply since 1990 (0.27 kt CO_2 eq) to 7.09 kt CO_2 eq in 2015 (8.7 per cent of total emissions), mainly owing to an increase in the use of HFCs and PFCs in refrigeration and air conditioning devices. Monaco will indirectly benefit from regulations adopted in France and the EU (e.g. the quotas set on certain F-gases by EU regulation 517/2014) for reduction of F-gas emissions. In order to promote actions in this area, a new national regulation will be adopted in 2018 aimed at prohibiting equipment whose operation emits the highest levels of F-gases and taking measures to limit fugitive emissions (leak tests of all devices containing F-gases).

47. **LULUCF**. The LULUCF sector had been a net sink in Monaco until 2014, but it was a source of emissions of 0.07 kt CO_2 eq in 2015 (0.08 per cent of total emissions). The historical removals were mainly driven by conservation policies and preservation of green spaces. Responding to a question from the ERT on the preservation of green spaces, Monaco explained that the new urban planning regulation sets the green/pavement space obligations. Monaco also reported a Tree Code (Sovereign Order no. 3197), which defines actions to manage and conserve heritage trees in the principality.

48. **Waste management**. GHG emissions from waste increased to 3.01 kt CO_2 eq in 2015 (3.7 per cent of total emissions), mainly driven by an increase in the amount of sewage sludge produced in the principality. Monaco has reported numerous measures under the "Waste management plan towards 2030", which aims to reduce the amount of waste and the amount of waste to be incinerated. The wastewater treatment plant in Monaco has a treatment capacity of 100,000 population equivalent, which at present does not allow for the purification of all the effluent produced. The treatment process will therefore be reinforced and restructured in 2018 to reach a capacity of 130,000 population equivalent. Although an increase of sewage sludge generation is anticipated, the amount of total waste incinerated will decrease together with the reduction of household waste.

(d) Minimization of adverse impacts in accordance with Article 2 and Article 3, paragraph 14, of the Kyoto Protocol of the Kyoto Protocol

49. In the NC7 Monaco reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. Monaco reported that it is working with Mongolia on issues linked to agricultural production. Some of the actions undertaken in the realm of this cooperation include developing innovative concepts of agricultural production and livestock adapted to extreme climate, and introducing agricultural and livestock production methods to enable nomadic people to continue to live off their traditional livelihoods. During the review, Monaco provided the ERT with additional information on the support provided and future plans.

50. Further information on how Monaco strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2017 annual submission. Monaco reported on: the analysis of potential effects of domestic activities on developing countries; and its engagement with cooperation programmes with developing countries that may reduce the impact of oil price fluctuations on their populations.

(e) Assessment of adherence to the reporting guidelines

51. The ERT assessed the information reported in the NC7 of Monaco and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 8.

Table 8
Findings on policies and measures, including those in accordance with Article 2 of the Kyoto Protocol, from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement[a] specified in paragraph 18	The ERT noted that the tables in chapter 4 of the NC7 do not include significant PaMs included in the NC6, for example the optimization of the amount of incinerated waste with an estimated impact of 12 kt CO_2 eq in 2020.
	Issue type: transparency	During the review, Monaco explained that this measure was adopted and has been applied since 2010, but it is no longer a new measure and thus not included in the NC7.
	Assessment: encouragement	The ERT encourages Monaco, in order to improve the transparency of its reporting, in cases where a policy or measure has been maintained over time, to make reference to the complementary list of PaMs in previous NCs, or maintain a brief description contained in the latest NC to ensure that the information in the NC covers all active PaMs.
2	Reporting requirement[a] specified in paragraph 23	The ERT noted that the tables in chapter 4 of the NC7 lack many of the estimated impacts of PaMs, and the text in chapter 4 provides limited information on the quantitative impacts of PaMs.
	Issue type: transparency	In order to improve the transparency of the reporting, the ERT encourages Monaco to provide, as appropriate, a quantitative estimate of the impacts of individual PaMs or collections of PaMs within the text and tables of the NC, together with a brief description of estimation methods. The ERT further encourages Monaco to provide relevant explanations in its next NC should it not be possible to provide a quantitative estimate for all mitigation impacts owing to its national circumstances.
	Assessment: encouragement	
3	Reporting requirement[a] specified in paragraph 24	The ERT noted that the NC7 did not provide information on non-GHG mitigation benefits.
	Issue type: completeness	In response to a question from the ERT during the review, Monaco explained that the Climate and Energy Plan from 2018 will evaluate the impact of the PaMs on fossil and non-fossil energy consumption. Therefore, Monaco could mention non-GHG benefits on electricity in the next report. Further, Monaco explained that the trend in water consumption has been decreasing since 2003, but Monaco does not plan to evaluate this evolution.
	Assessment: encouragement	The ERT encourages Monaco to incorporate information on the non-GHG benefits of PaMs (e.g. reduced emissions of air pollutants or health benefits) in its next NC in order to improve the completeness of its reporting.
4	Reporting requirement[a] specified in paragraph 24	The ERT noted that the NC7 did not provide information on the cost of individual PaMs.
	Issue type: completeness	In response to a question from the ERT during the review, Monaco explained that budgetary allocations for some projects managed by the Government can be provided, but the budget allocated for legal instruments and other administrative tasks is not evaluable. Monaco also provided examples of annual budgetary allocations for individual PaMs.
	Assessment: encouragement	The ERT encourages Monaco to improve the completeness of its reporting by including in the next NC the cost of PaMs or an explanation of why information about the costs of PaMs could not be provided.
5	Reporting requirement[a] specified in paragraph 25	The ERT noted that the NC7 did not provide information on how Monaco believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.
	Issue type: completeness	In response to a question from the ERT during the review, Monaco explained that the revision of the Climate and Energy Plan and the elaboration of the Low Carbon Strategy aim to provide, by 2019–2020, a long-term strategy in accordance with decision 1/CP 21, paragraph 35, and as stipulated in Article 4, paragraph 19, of the Paris Agreement, and that this work will also consider the impact of actual and/or additional policies on longer-term GHG emissions. Monaco also indicated that the trend in the GHG emissions projected to 2030 and reported in the NC7 shows a decrease in line with its national targets.
	Assessment: recommendation	The ERT recommends that, based on the work envisaged and in order to improve the completeness of its reporting, Monaco clearly state in its next NC how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.
6	Reporting requirement[b]	The ERT noted that there is no information provided in the NC7 related to decisions taken by

specified in paragraph 35	IMO in order to limit or reduce GHG emissions.
Issue type: transparency	During the review, Monaco provided additional information, noting that it verifies compliance with the IMO GHG requirements by commercial vessels during control operations and during the registration and control operations for the ships of Monaco.
Assessment: recommendation	The ERT recommends that Monaco improve the transparency of its reporting by providing in its next NC information on any steps taken by it to promote and/or implement any decisions taken by IMO.

Note: The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

[a] Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

[b] Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

52. Monaco reported updated projections for 2020 and 2030 relative to actual inventory data for 2015 under the WEM scenario. Monaco indicated in its NC7 that the inventory data used for preparing the projections have been recalculated as a result of an update of emission factors, correction of errors and changes in the methodology for Monaco's next NIR. The WEM scenario reported by Monaco includes implemented and adopted PaMs until 2030.

53. In addition to the WEM scenario, Monaco reported the WAM and WOM scenarios. The WAM scenario includes planned PaMs, while the WOM scenario excludes all PaMs implemented, adopted or planned after 2015. The ERT noted that the WAM scenario was not provided in the NC6. Monaco described its scenarios in the projections section of the NC7. Information on the specific PaMs included in the WEM scenario was provided by Monaco in the PaMs section of its NC7. Monaco indicated that its WEM scenario includes policies such as the implementation of a waste management plan by 2030, stopping the import of waste from France and the Climate and Energy Plan; while its WAM scenario includes planned measures that are not yet implemented or adopted, which are additional to the measures included in the WEM scenario, for instance the further development of urban heating and cooling networks and hot water loops, the adding of biomethane to natural gas consumption and additional improvements to the energy efficiency of buildings. Although the definitions provided for the WOM and WAM scenarios are in line with the UNFCCC reporting guidelines on NCs, it was not clear to the ERT which definition Monaco uses for the WEM scenario and some deviations from the definitions of the scenarios were detected.

54. The projections are presented on a sectoral basis, using different sectoral categories from those used in the reporting on mitigation actions for 2015–2030 for the subdivision of the energy sector. During the review, Monaco provided projections using the same categories as for the mitigation actions.

55. Projections were presented on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs, SF_6 and NF_3 for 2015–2030. The projections are also provided in an aggregated format for each sector as well as for the Party total using global warming potential values from the IPCC Fourth Assessment Report.

56. Monaco reported emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides.

57. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals.

58. Monaco partially reported on factors and activities affecting emissions for each sector; no information was provided for the international bunker fuels sector. During the review, Monaco provided additional information on the projection of underlying factors, which facilitated the review process.

(b) Methodology, assumptions and changes since the previous submission

59. The methodology used for the preparation of the projections is similar to that used for the preparation of the emission projections for the NC6 and BR2 and is based on the methodology used for the inventory estimates as presented in the 2017 NIR. Monaco reported in its NC7 that the only difference is a change in the inventory methodology compared with that used for the NC6, BR2 and 2017 NIR, which also affects the estimation of future emissions from the sectors using the bottom-up approaches applied by the Party. During the review, Monaco confirmed that no other changes in the methodology for the preparation of projections have been made. The Party indicated that further changes in the projections are due to updates to the PaMs, for instance for energy industries and other energy sectors, and updates to the assumptions used (e.g. on the trends for F-gases).

60. To prepare its projections, Monaco relied on few underlying key variables such as population growth. Variables such as energy prices and economic development indicators were not taken into account. Additional underlying factors were partially described in the projections section of Monaco's NC7. During the review, Monaco provided further data and explanations per sector. The reported scenarios were built on specific assumptions for each sector.

61. In the energy sector, one of the main influencing factors is the amount of waste incinerated. The projections are based on secondary data on waste management and on the expected results of a measure on the import of waste from France from 2019 onwards. The projections for other energy sectors (residential, commercial and institutional) are based mainly on the effect on fuel consumption under the full implementation of a ban on oil-based heating systems and on changes in the energy efficiency of buildings. In the transport sector, the main factor is fuel consumption for road transport. The scenario is based on the evolution of the fleet and its structure, and its impact on fuel sales.

62. The projections for the IPPU sector are dominated by the evolution in the use of ozone-depleting substances. The F-gas projections are influenced by the per capita amount of residential and commercial cooling and air conditioning appliances, population growth and the fleet of vehicles using automotive refrigeration.

63. The factors influencing the waste sector are the volume of untreated wastewater, which evolves based on population growth, and assumptions on the effect of measures to increase the capacity of the wastewater treatment plant.

64. Sensitivity analyses were conducted for a number of assumptions. Monaco assessed qualitatively the sensitivity to changes in the amount of waste incinerated and in the implementation of measures on energy consumption in the residential, commercial and public sectors. In addition, Monaco conducted a quantitative sensitivity analysis of the emissions from road transport based on fuel sales given the uncertainties associated with the projections for this sector. Monaco assumed that the impact of vehicle fuel efficiency improvements on fuel sales is zero in 2020 and 10 per cent in 2030. The sensitivity analysis for the road transport sector resulted in emission levels of 26.17 kt CO_2 eq in 2020, 24.73 kt CO_2 eq in 2025 and 22.98 kt CO_2 eq in 2030, which are higher than the projected levels in all the scenarios for the same years.

(c) Results of projections

65. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 9 and the figure below. The values in the table use the historical and projection data contained in the NC7, and the updated 1990 data are not the same as in the 2017 annual inventory submission and in table 5 of this report.

Table 9
Summary of greenhouse gas emission projections for Monaco

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
Kyoto Protocol base year[b]	99.32	NA	NA
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020)[c]	77.47	22.0	22.0
Quantified economy-wide emission reduction target under the Convention[d]	69.96[e]	30.0	30.0
Inventory data 1990[f]	99.95	NA	NA
Inventory data 2015[f]	84.11	–15.3	–15.8
WOM projections for 2020[g]	82.04	–17.4	–17.9
WEM projections for 2020[g]	66.16	–33.4	–33.8
WAM projections for 2020[g]	61.82	–37.8	–38.1
WOM projections for 2030[g]	79.90	–19.5	–20.1
WEM projections for 2030[g]	55.77	–43.8	–44.2
WAM projections for 2030[g]	44.89	–54.8	–55.1

Note: The projections are for GHG emissions without LULUCF.

[a] "Base year" in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base-year level of emissions is provided in the initial review report, contained in document FCCC/IRR/2017/MCO.

[c] The Kyoto Protocol target for the second commitment period (2013–2020) for Monaco is to reduce emissions by 22 per cent compared with the base-year level by 2020. The value is calculated using the information on the base year contained in document FCCC/IRR/2017/MCO.

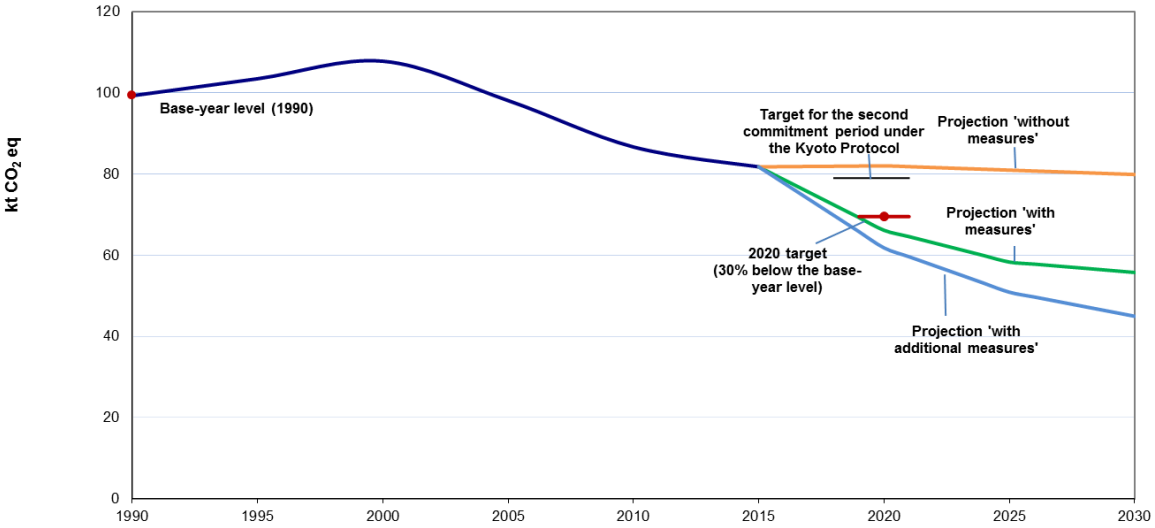
[d] The quantified economy-wide emission reduction target under the Convention for Monaco is to reduce emissions by 30 per cent compared with the base-year level by 2020.

[e] The value reported is the value calculated using the updated inventory data reported in the projection section of the NC7 (as reported on p.163 of the NC7).

[f] From Monaco's projection table as contained in Monaco's NC7.

[g] From Monaco's NC7.

Greenhouse gas emission projections reported by Monaco



Sources: Data for the years 1990–2015 and 2020 and 2030: Monaco's NC7; total GHG emissions excluding LULUCF.

66. Monaco's total GHG emissions excluding LULUCF are projected to be 66.16 and 55.77 kt CO_2 eq in 2020 and 2030, respectively, under the WEM scenario, which represents a decrease of 33.8 and 44.2 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030, amounting to around 61.82 and 44.89 kt CO_2 eq, respectively, are projected to be lower than those in 1990 by 38.1 and 55.1 per cent, respectively.

67. Monaco committed itself to reducing its total GHG emissions by 30 per cent by 2020 compared with the base year (or to reach an emission level of 69.96 kt CO_2 eq using the recalculated inventory data for 1990). The 2020 projections suggest that Monaco can be expected to achieve its 2020 target under the Convention (see para. 33 above).

68. Under the WEM scenario, Monaco appears to be in a position to reach its emission reduction target for the second commitment period by domestic PaMs alone because the total GHG emissions in 2020 are expected to amount to 66.16 kt CO_2 eq or a 33.8 per cent reduction under the WEM scenario.

69. Monaco presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 10.

Table 10
Summary of greenhouse gas emission projections for Monaco presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Sector	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (not including transport)	64.98	31.93	28.48	26.00	12.16	–50.9	–56.2	–60.0	–81.3
Transport	33.94	27.63	26.73	24.28	19.27	–18.6	–21.2	–28.5	–43.2
Industry/industrial processes	0.48	5.70	5.70	4.83	3.99	1 087.5	1 087.5	906.3	731.3
Agriculture	0.00	NO	NO	NO	NO	–	–	–	–
LULUCF	0.00	–0.01	–0.01	–0.01	–0.01	–	–	–	–
Waste	0.55	0.90	0.90	0.66	0.66	63.6	63.6	20.0	20.0

Total GHG emissions without LULUCF	**99.95**	**66.16**	**61.82**	**55.77**	**44.89**	**–33.8**	**–38.1**	**–44.2**	**–55.1**

Source: Monaco's table on projections as contained in its NC7.

70. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector (excluding transport) followed by the transport sector, amounting to projected reductions of 33.05 kt CO_2 eq (50.9 per cent) and 6.31 kt CO_2 eq (18.6 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario slightly changes in the energy sector (without transport) because the measures with the strongest impact on the WEM scenario are expected to be implemented around 2020.

71. The projections reported for 2030 under the WEM scenario show that the most significant reduction will continue to occur in the energy sector (without transport) and in the transport sector, with 39.04 kt CO_2 eq (60.0 per cent) and 9.66 kt CO_2 eq (28.5 per cent) between 1990 and 2030, respectively. Monaco expects an increase of 5.22 kt CO_2 eq (1,087.5 per cent) and of 4.83 kt CO_2 eq (906.3 per cent) in the emissions from the IPPU sector for 2020 and 2030, respectively, compared with the emission levels in 1990. The ERT notes that after 2015 the projections show a decreasing trend for the IPPU sector, in contrast to the increasing emission trend observed from 1990 to 2015 (see table 5).

72. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector and by gas remain the same.

73. Monaco presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 11.

Table 11
Summary of greenhouse gas emission projections for Monaco presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Gas	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2	95.53	57.56	53.23	48.40	38.46	–39.7	–44.3	–49.3	–59.7
CH_4	2.14	1.02	1.02	0.75	0.72	–52.3	–52.3	–65.0	–66.4
N_2O	2.06	2.36	2.35	2.31	2.24	14.6	14.1	12.1	8.7
HFCs	0.00	5.11	5.11	4.21	3.37	–	–	–	–
PFCs	NO, IE	NO	NO	NO	NO	–	–	–	–
SF_6	0.22	0.11	0.11	0.11	0.11	–50.0	–50.0	–50.0	–50.0
NF_3	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions without LULUCF	**99.95**	**66.16**	**61.82**	**55.77**	**44.89**	**–33.8**	**–38.1**	**–44.2**	**–55.1**

Source: Monaco's table on projections as contained in its NC7.

74. For 2020 the most significant reductions under the WEM scenario are projected for CO_2 and CH_4 emissions: 37.98 kt CO_2 eq (39.7 per cent) and 1.12 kt CO_2 eq (52.3 per cent) between 1990 and 2020, respectively. The projections show an increase in N_2O emissions in the same period. However, the contribution of N_2O to the overall emissions remains very low. Monaco expects a significant increase in HFC/PFC emissions, from negligible emissions in 1990 to 5.11 kt CO_2 eq in 2020. The ERT notes that the projections show a decreasing trend for F-gases compared with 2015 for the projections, in contrast with the increasing emission trend observed from 1990 to 2015 (see table 5).

75. The pattern of projected emissions reported for 2030 under the same scenario remains the same for CO_2 and HFCs/PFCs but differs for CH_4 and N_2O. After a strong decrease between 2015 and 2020, CH_4 and N_2O emissions slightly decrease from 2020 to 2030. The most significant reductions are projected for CO_2 and CH_4 emissions: 47.13 kt CO_2 eq (49.3 per cent) and 1.39 kt CO_2 eq (65.0 per cent) between 1990 and 2030, respectively. The contribution of both CH_4 and N_2O to the total emissions in the WEM scenario remains very low (below 5 per cent).

76. If additional measures are considered (i.e. in the WAM scenario), the patterns of emission reductions by 2020 and by 2030 presented by gas remain the same.

77. The ERT noted that there are differences in the results of the projections between Monaco's NC7 and its NC6 under the WEM scenario (Monaco did not include a WAM scenario in its NC6). Although Monaco reports in its NC7 a total emission reduction excluding LULUCF of 33.79 kt CO_2 eq (33.8 per cent) between 1990 and 2020, the emission reduction for the same period was reported as 25.50 kt CO_2 eq (23.7 per cent) in the NC6. Monaco did not discuss these differences in its NC7. The ERT observed that the main differences are for the projections for the energy sector (without transport). A comparison between the WEM scenarios in the NC6 and NC7 for this sector shows that the differences are particularly significant for the categories energy industries and other energy sectors (residential, commercial and public sectors). The ERT noted that, for the projections in the energy industries category, Monaco included in its NC7 additional measures that significantly reduce the amount of waste incinerated, while in its NC6 Monaco only assumed a temporary shutdown of the waste incineration plant and a slight reduction of its capacity. For other energy industries, Monaco included in the NC7 a complete ban on the use of heating oil and improvements in the energy efficiency of buildings. In contrast, the WEM scenario in the NC6 included a ban on the use of heating oil only for new buildings and no further measures on energy efficiency. The ERT also identified differences for the IPPU sector. Based on the comparison between the NC6 and the NC7, the ERT found that the differences in the sector can be attributed to additional measures included from 2023 to prevent the use of F-gases with a global warming potential greater than 150 for stationary air conditioning.

(d) Assessment of adherence to the reporting guidelines

78. The ERT assessed the information reported in the NC7 of Monaco and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 12.

Table 12
Findings on greenhouse gas emission projections reported in the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 29 Issue type: transparency Assessment: recommendation	Monaco included in its NC7 projections for the WEM, WAM and WOM scenarios. In an overview of the PaMs that are taken into account in the WEM scenario, the ERT noted that Monaco indicates that in the WEM projections one planned measure regarding the modernization of the waste energy recovery plant was included. During the review, Monaco explained that the modernization of the waste energy recovery plant is no longer considered as planned but as adopted because the budget and human resources have already been allocated to it and the corresponding studies are being conducted. The ERT recommends that Monaco improve the transparency of its reporting by ensuring that the PaMs are correctly labelled as "planned", "implemented" and "adopted" and included in the projection scenarios consistently with the definition for each scenario.

2	Reporting requirement specified in paragraph 31 Issue: transparency Assessment: recommendation	Monaco included in its NC7 projections on a sectoral basis and on a gas-by-gas basis for 2020–2030 in tabular format. Together with the projections, actual inventory data for the period 1990–2015 were provided as requested by the UNFCCC reporting guidelines on NCs. However, the ERT noted inconsistencies between the updated inventory data included in the projections section of the NC7 and the CRF data and the data provided in the emissions and trends section. Although the emissions and trends section includes the data from the 2017 annual submission, the projections section includes updated inventory data that had not been officially submitted at the time of the review. The NC7 (p.140) notes that changes in the inventory data result from improvements in the inventory methodology and correction of mistakes. However, the information provided is not sufficient to understand the reasons for using updated inventory data and the effect of using updated inventory data on the projection results. The ERT recommends that Monaco improve the transparency of its next NC by presenting emission projections relative to actual inventory data for the preceding years reported in the inventory section of the NC, or clearly specify any changes in the inventory data and explain the rationale for using different inventory data for the projections.
3	Reporting requirement specified in paragraph 34 Issue: transparency Assessment: recommendation	Monaco presented projections on a sectoral basis as required by the UNFCCC reporting guidelines on NCs. The ERT noted inconsistencies between the sectoral categories used in the PaMs section and in the projections section of Monaco's NC7 with regard to the energy sector. During the review, Monaco provided projections using the same sectoral categories as used in the PaMs section. The ERT recommends that Monaco improve the transparency of its reporting by using, in its next NC, to the extent possible, the same sectoral categories that are used in the PaMs section of the NC.
4	Reporting requirement specified in paragraph 38 Issue type: transparency Assessment: encouragement	Monaco provided several diagrams illustrating the information on the projections by sector and by gas that are included in its NC7. It also provided several additional diagrams for subsectors. The diagrams presented unadjusted inventory data and WEM, WOM and WAM projections for the period 1990–2030, while using the data from the 2017 inventory submission for the 1990–2015 period. However, the data used for the projections and reported in the NC are revised data and contain different values for the 1990–2015 period. In addition, the ERT noted some inconsistencies in the diagrams. Monaco provided the respective clarifications and updated diagrams during the review week along with a diagram for the energy sector without transport that was not originally included in the submission. The ERT encourages Monaco to improve the transparency of its next NC by ensuring internal consistency between the numerical data provided in the text, tables and diagrams of the projections section of the submission, as well as clearly indicate any difference from the inventory data reported in the same submission, if any.
5	Reporting requirement specified in paragraph 43 Issue type: completeness Assessment: encouragement	Monaco provided a brief description of the models and approaches used for the projections. However, the ERT noted that not all aspects included in paragraph 43 of the UNFCCC reporting guidelines on NCs are covered. In general: (a) A brief description by sector is provided; (b) The type of model is not indicated; (c) The original purpose of the model is indicated only for a few sectors (e.g. waste generation and fuel sales); (d) The strengths and weaknesses of the model or approach used are not provided; (e) It is not explained how the model or approach accounts for any overlap or synergies that may exist between different PaMs. The ERT encourages Monaco to improve the completeness of its reporting by including in its next NC a description of the models and approaches used according to the aspects indicated in paragraph 43 of the UNFCCC reporting guidelines on NCs.

6	Reporting requirement specified in paragraph 45 Issue type: transparency Assessment: encouragement	Monaco provided information on the changes since the NC6 regarding the methodology used to develop GHG emission projections. However, those address only changes in the inventory estimates and emission factors used. During the review, Monaco confirmed that the changes mentioned focused on the methodology for the inventory and not the projections. The ERT noted differences between the results of the projections submitted in the NC7 (see para. 77 above), which were not explained by Monaco. The ERT encourages Monaco to improve the transparency of its reporting by including in its next NC an assessment of any changes in the results of projections compared with those presented in the previous NC, also including information on changes to the key assumptions used.
7	Reporting requirement specified in paragraph 47 Issue type: transparency Assessment: encouragement	To prepare its projections, Monaco relied on population growth and other variables. However, variables such as energy prices and economic development indicators were not taken into account. Monaco did not explore the influence of GDP on the factors underlying the emissions. During the review, Monaco explained that, owing to national circumstances, it has difficulties using an economic indicator (GDP) as a basis for the projections. Moreover, Monaco has no GDP projections. The Party also indicated that it is working within the framework of its Climate and Energy Plan to analyse the correlation between energy and socioeconomic variables. The ERT reiterates the encouragement made in the previous review report (FCCC/IDR.6/MCO, para.65) that Monaco improve the transparency of its reporting by including, in its next NC, information on all key assumptions and drivers (for instance key macroeconomic indicators and energy prices) affecting projected emissions.
8	Reporting requirement specified in paragraph 47 Issue type: transparency Assessment: encouragement	The ERT noted that the NC7 contained limited information on the methodology used to develop the GHG emission projections. Population and other variables and parameters are described in the projections section of the NC, but values, assumptions and the rationale behind them are mostly not provided. The ERT found some information in the PaMs section, but the projections section does not contain cross references to this section. For instance, assumptions on the amount of waste incinerated are not presented. It is also unclear how fuel consumption evolves as a result of the implementation of the ban on oil-fired heating systems and also as a result of incentives for solar energy. The ERT noted that a similar issue was raised in the previous review report (FCCC/IDR.6/MCO, para.63) and Monaco was encouraged to improve the transparency of its reporting by exploring how to include in its next NC more detailed information on the drivers and associated data used to generate the GHG emission projections. During the review, Monaco provided additional information on the underlying factors used in the projections, which facilitated the review process. The ERT encourages Monaco to improve the transparency of its reporting by including in its next NC more detailed information on the factors underlying the projections (variables, parameters), assumptions, the rationale behind them and associated values used to generate the GHG emission projections. The ERT notes that providing, in the projections section, cross references to the PaMs section where relevant information is presented would further increase the transparency of reporting.
9	Reporting requirement specified in paragraph 48 Issue type: transparency Assessment: recommendation	Monaco has provided information on factors and activities underlying emission trends for some of the sectors in the projections section of its NC7. The ERT identified further information in the PaMs section. However, information was missing for energy generation, transport and the waste sector, as well as for international bunkers. During the review, Monaco provided relevant information, in tabular format, on the factors and activities underlying the emission trends for these sectors. The ERT recommends that Monaco improve the transparency of its reporting by including in its next NC relevant information on factors and activities underlying projected emission trends for each sector, such as the information provided during the review, to enable the reader to understand the emission trends in the years 1990–

2030. This information on factors and activities may be presented in tabular format.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

79. In the NC7 Monaco presented an estimate of the total effect of its PaMs, in accordance with the WEM scenario, compared with a situation without such PaMs for 2030. Information per scenario is presented in terms of GHG emissions by gas in 2020 and 2030. The ERT noted that Monaco did not include information on the total effect of PaMs avoided or sequestered by gas (on a CO_2 eq basis) for the projection years. During the review, Monaco provided this information.

80. In the NC7 Monaco reported that the total estimated effect of its adopted and implemented PaMs is a reduction of 24.13 kt CO_2 eq by 2030. According to the information reported in the NC7, PaMs implemented in the energy and waste sectors will deliver the largest emission reductions, followed by PaMs implemented in the industry sector. The ERT noted that the PaMs implemented in the transport sector led, in the WEM scenario, to an increase in emissions compared with the WOM scenario for this sector. During the review, Monaco explained that the main reason for this is an adopted measure to modernize and expand the heliport. Although this will induce a slight increase in emissions in the short and medium term, Monaco foresees emission reductions in the long term because the new heliport is expected to favour the supply of biofuels instead of fossil fuels. Table 13 provides an overview of the total effect of PaMs as reported by Monaco.

Table 13
Projected effects of Monaco's planned, implemented and adopted policies and measures by 2020 and 2030

	2020		*2030*	
Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*
Energy (without transport)	13.26	3.45	18.22	13.84
Transport	–0.11	0.92	–0.12	5.01
Industrial processes	0.13	0.00	2.30	0.84
Agriculture	NO	NO	NO	NO
Land-use change and forestry	0.00	0.00	0	0
Waste management	2.61	0.00	3.73	0
Total	**15.89**	**4.34**	**24.13**	**10.88**

Source: ERT calculations on the basis of Monaco's NC7 and BR3 and data provided during the review.

Note: The total effect of implemented and adopted PaMs is defined as the difference between the WOM and the WEM scenario; the total effect of planned PaMs is defined as the difference between the WEM and the WAM scenario.

(b) Assessment of adherence to the reporting guidelines

81. The ERT assessed the information reported in the NC7 of Monaco and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 14.

Table 14
Findings on the assessment of the total effect of policies and measures from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 40 Issue type: completeness Assessment: recommendation	Monaco reported in its NC7 the total effect of PaMs in the WEM scenario compared with the WOM scenario in 2030. Monaco also included projections for all gases for 2020 and 2030 for the WEM and WOM scenarios, which means that a straightforward calculation can be made of the expected total effect of PaMs by gas. However, the ERT noted that Monaco did not include specific information on the total effect of PaMs by gas for the projection years, as requested in the UNFCCC reporting guidelines on NCs. During the review, Monaco provided this information. The ERT recommends that Monaco improve the completeness of its reporting by including in the projections section of its next NC the total effect of PaMs presenting the effect in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis) and year.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

3. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

(a) Technical assessment of the reported information

82. In the NC7 Monaco provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. Monaco states in the NC7 that use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is envisaged, particularly the clean development mechanism, although the Party would prefer implementation of complementary national measures.

(b) Assessment of adherence to the reporting guidelines

83. The ERT assessed the information reported in the NC7 of Monaco and identified an issue relating to transparency. The finding is described in table 15.

Table 15
Findings on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 33 Issue type: transparency Assessment: recommendation	The ERT noted that, in section 5.4.3 of the NC7, Monaco indicates that the use of mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is envisaged for it to meet its target. The ERT also noted that the Party reported that 23,966 Kyoto Protocol units for the first commitment period will be carried over to the second commitment period. According to paragraphs 39 and 60 of document FCCC/TP/2014/8, the Party does not intend to use the carry-over of assigned amount units from the first commitment period under the Kyoto Protocol. During the review, Monaco explained that the use of market-based mechanisms should only intervene if the domestic PaMs are not sufficient or in the case of any delay in the implementation of PaMs, and that their use will be re-evaluated in the next submission, and it confirmed its intention to carry over assigned amount units from the first commitment period under the Kyoto Protocol to the second commitment period. The ERT recommends that Monaco further clarify in its next NC how its use of the mechanisms is supplemental to domestic action, and how its domestic action thus constitutes a significant element of the effort made to fulfil the 2020 target, elaborating on the definition of supplementarity.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information. The reporting on the requirements not included in this table is considered to be complete and transparent.

D. Provision of financial and technological support to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

84. Monaco is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Monaco provided information in the BR3 on its provision of support to developing country Parties. The ERT commends Monaco for reporting this information and suggests that it continue to do so in future NCs.

85. Monaco reports in the CTF tables that it has provided public financial support through bilateral, regional and other channels in 2015 of EUR 822,000 and USD 25,000 as grants for adaptation in the fields of agriculture, water and sanitation and cross-cutting sectors. The recipient countries were Burkina Faso, Madagascar, Mali, Mongolia and Samoa. In 2016, the amount was EUR 792,000 as grants for adaptation in the fields of agriculture, forestry and cross-cutting sectors through official development assistance. The receiving countries and regions were the same as in 2015. Between 2014 and 2017, more than half of Monegasque official development assistance was devoted to the least developed countries considered particularly vulnerable to climate change. In these countries, the actions supported are mainly in the health and education sectors, in line with the priority needs.

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

86. In the NC7 Monaco provided the required information on the projected impacts of climate change in the country; and the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations. However, Monaco did not provide an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Monaco provided a description of climate change vulnerability and impacts and highlighted the adaptation response actions taken and planned at different levels of government.

87. Monaco provided information on the projected impacts of climate change in the country, focusing on the changes in temperature and precipitation trends, bioclimatic characteristics and energy consumption for 2020, 2050 and 2080, following the IPCC A2 and B2 scenarios.[8] Monaco provided a description of climate change vulnerability and impacts covering health, sea level rise, ecosystems, environmental impact studies, water supply, energy and smart cities. However, the ERT noted that more detailed reporting of climate change vulnerability assessment is required, particular with regard to relating climate change impacts to the identified vulnerable areas.

88. Impetus to the process of addressing adaptation matters has been given through a cross-sectoral study initiated in 2015 that mobilized key government, institutional and civil society experts to establish an initial climate change adaptation strategy and plan on enhancing preparedness for climate change.

89. During the review, Monaco stated that the framework study “Climate Adaptation Strategy” was developed from April 2015 to April 2016 and focused on local climate projections, developing a bibliography on general and local circumstances, assessment of vulnerability and establishing action plans. The vulnerability analysis was conducted based on a combination of the probability of occurrence, intensity of a climatic hazard (exposure) and the magnitude of the risk for the environment and population (sensitivity). Based on this analysis, an action plan was developed for each key issue outlining specific strategic

[8] Further information on IPCC scenarios is available at http://www.ipcc.ch/ipccreports/sres/emission/index.php?idp=0.

and operational goals and 53 key actions for the first phase of implementation. Monitoring of the actions is planned for 2018–2022.

90. Table 16 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Monaco.

Table 16
Summary of information on vulnerability and adaptation to climate change reported by Monaco

Vulnerable area	*Examples/comments/adaptation measures reported*
Energy	*Vulnerability*: In either IPCC A2 or B2 climate change scenarios the minimum and maximum temperatures will increase. Consequently, it is anticipated that there will be a decrease in energy consumption related to heating and an increased energy demand for cooling. *Adaptation*: Smart cities programme; reinforcement of the energy efficiency of the district heating and cooling distribution network by promoting clean energy production and storage technologies; improved energy network.
Ecosystems	*Vulnerability*: Changes in marine environment, such as the proliferation of filamentous algae and other exotic species, have already been observed in addition to the thermal stresses on the water column. *Adaptation*: An alert and rescue procedure for swimmers and seafront residents related to presence of the seaweed *Ostreopsis ovata* has been in operation since 2009.
Coastal zones	*Vulnerability*: Coastal hazards and the risk of submerging of beaches or ports may increase significantly with a gradual rise in sea level (a 4.7 cm rise has been observed over the last 10 years) and in the event of an increase in the frequency of extreme weather events. *Adaptation*: No specific measures have been implemented.
Human health: air pollution	*Vulnerability*: The allergic risks linked to pollen pollution will be more noticeable. It is anticipated that, as warm seasons and crop production increase, pollen seasons may be earlier and longer. *Adaptation*: No specific measures have been implemented.
Human health: emergence of diseases	*Vulnerability*: The mosquito *Aedes albopictus*, which is known to be a vector of chikungunya disease, was observed in 2006. The urban environment is suitable for its survival and development in the presence of water and heat niches. *Adaptation*: No specific measures have been implemented.
Water resources	*Vulnerability*: No drought zone area is reported, because the Monaco water supply areas do not reach the threshold for crisis alert. *Adaptation*: In 2007 a drought action plan was approved in the Alpi Marittime region, which sets levels of drought alertness and corresponding measures to restrict water consumption. Policies have been implemented to maintain local water production and reduce consumption, resulting in a total reduction in water consumption of around 20 per cent across the last 20 years.

91. The ERT noted that, as in the NC6, Monaco still does not provide a detailed description of international adaptation activities, nor did it provide information on bilateral cooperation with developing countries on adaptation.

2. Assessment of adherence to the reporting guidelines

92. The ERT assessed the information reported in the NC7 of Monaco and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 17.

Table 17
Findings on vulnerability assessment, climate change impacts and adaptation measures from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement	Monaco's NC7 (chapter 7 on financial support and technology transfer) referred to support

specified in paragraph 49 Issue type: transparency Assessment: recommendation	granted for adaptation. However, the ERT considered that this information did not constitute a transparent outline of the action taken to implement Article 4, paragraph 1(b), of the Convention on published national programmes containing measures to facilitate adequate adaptation to climate change and Article 4, paragraph 1(e), of the Convention on the implemented measures to facilitate the adequate adaptation to climate change and information on the cooperation with developing country Parties in preparation for adaptation to the impacts of climate change. During the review, Monaco provided updated information on the development and first phase of implementation of an adaptation plan. The ERT reiterates the recommendation made in the previous review report (FCCC/IDR.6/MCO, para. 86) that Monaco enhance its reporting of information on the expected impacts of climate change in Monaco and report an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation, and recommends that Monaco include in particular information on the progress of the first phase of implementation of the adaptation plan and on any bilateral cooperation with developing countries on adaptation, which would improve the transparency of the reporting in the chapter.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

F. Research and systematic observation

1. Technical assessment of the reported information

93. Monaco has provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities. Monaco has not provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers. However, the ERT recognized that, owing to its small size and limited resources, Monaco's engagement in international activities is limited.

94. Monaco has implemented research through national and international bodies that are established in Monaco, and has participated in international engagement and partnerships on environment and climate change related research. The two national research organizations are the Scientific Centre of Monaco (Centre Scientifique de Monaco), which specializes in the study of the functioning of coral ecosystems (tropical and Mediterranean) in relation to global climate change, and the Museum of Prehistoric Anthropology of Monaco. The regional and international activities in the area of mitigation and adaptation to climate change include: the Acidification of the Oceans "Proposal of Monaco", focusing on ocean acidification and the cost of inaction of public authorities; the framework agreement of partnership between the Government of Monaco, the National Park of Mercantour, the Maritime Alps (Alpi Marittime) Natural Park and the Prince Albert II of Monaco Foundation, aimed at the understanding and preservation of biodiversity; and the International Coral Reef Initiative Collaborative Industrial Project "OPTIMAPAC", aiming to optimize the performance of seawater heat pumps in their overall technical and environmental aspects, taking into account the potential effects on the marine environment and conditions for the favourable development of marine thermal energy.

95. Despite the enumerated projects, the ERT noted the lack of information on climate change research, systematic observation and climate modelling to highlight the efforts in advancing capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time.

96. In terms of activities related to systematic observation, Monaco has reported on national plans, programmes and support for ground-based climate observing systems, including satellite and non-satellite climate observation. However, Monaco has not reported on challenges related to the maintenance of a consistent and comprehensive observation system.

97. The NC7 does not reflect actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring

systems in developing countries. Monaco has not reported on funding provided for scientists from developing countries working on global climate change research.

2. Assessment of adherence to the reporting guidelines

98. The ERT assessed the information reported in the NC7 of Monaco and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 18.

Table 18
Findings on research and systematic observation from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 58 Issue type: transparency Assessment: recommendation	The ERT noted that the NC7 included information on domestic research and systematic observation activities and cooperation projects, but it does not provide sufficient information on international activities in the area (e.g. with the World Climate Programme, the International Geosphere–Biosphere Programme, and GCOS). The issue was noted in the previous review report (FCCC/IDR.6/MCO, para. 90). During the review, Monaco clarified that the country does not implement global climate observing activities. The ERT recommends that the Party improve the transparency of its NC by providing information on whether any international activities with regard to research and systematic observation (e.g. linked to the World Climate Programme, the International Geosphere–Biosphere Programme and GCOS) have taken place and, if so, by providing an outline of the action taken in its next NC, or clearly report why it is not possible to report on such actions owing to its national circumstances.
2	Reporting requirement specified in paragraph 58 Issue type: completeness Assessment: recommendation	The NC7 does not provide information on action taken to support related capacity-building in developing countries. During the review, Monaco provided the required information on support given to developing countries relating to research and systematic observation, education, training and public awareness. The ERT recommends that the Party improve the completeness of its reporting by including, in the relevant section of the next NC, information on support given to developing countries related to research and systematic observation.
3	Reporting requirement specified in paragraph 59 Issue type: completeness Assessment: recommendation	The ERT noted that the NC7 does not provide summary information on GCOS activities in accordance with paragraph 64 of the UNFCCC reporting guidelines on NCs, for example including summary information on the current status of national plans, programmes and support for ground- and space-based climate observing systems, including long-term continuity of data, data quality control and availability, and exchange and archiving of data in the areas of atmospheric, ocean and terrestrial climate observing systems. During the review, Monaco clarified that the country does not implement global climate observing activities. The ERT recommends that the Party provide in the next NC summary information on GCOS activities or explain why this may not be possible because of its national circumstances.
4	Reporting requirement specified in paragraph 62 Issue type: completeness Assessment: encouragement	The NC7 does not report on identified opportunities for and barriers to free and open international exchange of data and information or report on action taken to overcome those barriers. During the review, Monaco clarified that it is not a climate data provider. However, Monaco uses and provides local data for regional observing activities. Noting this information, the ERT encourages Monaco to provide in the next NC a clarification of its involvement in international exchange of data and information.
5	Reporting requirement specified in	The UNFCCC reporting guidelines on NCs request Parties to provide information on highlights, innovations and significant efforts made with regard to: (1) climate process and climate system studies; (2) modelling and prediction; (3) research on the impacts of climate

paragraph 63	change; (4) socioeconomic analysis; and (5) research and development on mitigation and adaptation technologies. The ERT noted that such information is not included in the NC7 of Monaco.
Issue type: completeness	During the review, Monaco explained that it does not implement research and observation on impacts of climate change outside of its territory, on socioeconomic analysis including both impact and response options, or on the impacts of mitigation and adaptation technologies.
Assessment: encouragement	Noting the national circumstances of Monaco, the ERT encourages the Party to provide in its next submission any relevant information on the efforts made in the above-mentioned areas, as requested in paragraph 63 of the UNFCCC reporting guidelines on NCs.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

G. Education, training and public awareness

1. Technical assessment of the reported information

99. In the NC7 Monaco provided information on its actions relating to education, training and public awareness at the domestic level. The Party provided information on the general policy on education, training and public awareness, primary, secondary and higher education, public information campaigns, training programmes, education materials, resource or information centres, the involvement of the public and non-governmental organizations and its participation in international activities.

100. In Monaco, an Environmental Education and Sustainable Development Programme has been developed to address the concepts of eco-responsibility and eco-citizenship for all levels of education. In addition to the State Directorate of National Education, Youth and Sports, non-governmental organizations and the private sector play a key role in education, training and awareness on energy and climate change issues. For example, the "JeunElec" programme on sustainable mobility is carried out in collaboration with the Monegasque Association of Friends of the Electric Vehicle at the college level. With regard to communication programmes on environment and climate change, periodical publications are produced and published by the Government.

101. During the review, Monaco provided further information on actions taken to support capacity-building in developing countries relating to education, training and public awareness. In Mali, Monaco provided support for the economic empowerment of rural women regarding food insecurity and climate change, and for young people in the Koulikoro region and the Bamako district in strengthening entrepreneurial and professional capacities in agrosilvopastoral and artisanal trades. Monaco also provided support to professional agricultural organizations in Mali for developing sustainable agriculture and ensuring food security. Monaco further provided support to the Association Zebunet of Madagascar in rural economic development and community reforestation. The support given by Monaco to Burkina Faso aimed at positive impacts on health and the environment (e.g. by promoting the use of improved stoves and solar lamps).

2. Assessment of adherence to the reporting guidelines

102. The ERT assessed the information reported in the NC7 of Monaco and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 19.

Table 19
Findings on education, training and public awareness from the review of the seventh national communication of Monaco

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 65 Issue type: transparency Assessment: encouragement	The NC7 provides information on actions taken in capacity-building, education, training and public awareness. The activities and programmes on public information campaigns, training programmes, resource centres and information on the involvement of the public and non-governmental organizations focus more on the environment and sustainable development. The NC7 only mentions that the actions are mainly aimed at the Monegasque community, although some of them are international in scope. However, no additional information on participation in international activities is provided. The issue was noted in the previous review report (FCCC/IDR.6/MCO, para. 93). During the review, Monaco provided information on support given to developing countries relating to education, training and public awareness. The ERT encourages Monaco to improve the transparency of its reporting by including information in the next NC on its participation in international activities such as the support given to developing countries relating to education, training and public awareness.

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

III. Conclusions and recommendations

103. The ERT conducted a technical review of the information reported in the NC7 of Monaco in accordance with the UNFCCC reporting guidelines on NCs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC7 provides an overview of the national climate policy of Monaco.

104. The information provided in the NC7 includes most of the elements of the supplementary information under Article 7 of the Kyoto Protocol, with the exception of information on PaMs in accordance with Article 2 of the Kyoto Protocol, particularly on the actions taken to promote and implement any decisions taken by IMO and on the supplementarity of the use of the Kyoto Protocol mechanisms. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by Monaco in its 2017 annual submission.

105. Monaco's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 17.7 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 17.7 per cent below its 1990 level, in 2015. Emission decreases were driven by policies and several external factors influencing the consumption of fossil fuels for road transport and the implementation of the prohibition of using heating oil in the residential, commercial and public sectors. The increase in the amount of waste incinerated owing to the import of waste from France outweighed those improvements.

106. Under the Convention, Monaco committed to reducing its GHG emissions by 30 per cent below the 1990 level by 2020. The target includes all IPCC sectors included in the annual GHG inventory, except emissions and removals from the LULUCF sector. Under the Kyoto Protocol, for its second commitment period, from 2013 to 2020, Monaco committed to reducing its GHG emissions by 22 per cent below the base-year (1990 for CO_2, CH_4, N_2O and NF_3 and 1995 for HFCs, PFCs and SF_6) level.

107. Monaco's main policy framework relating to energy and climate change is the Climate and Energy Plan, which aims for a reduction in emissions by 30 per cent below the 1990 level, to reduce energy consumption by 20 per cent compared with the 2007 level and to achieve 20 per cent of final energy consumption from renewable sources. Key legislation supporting Monaco's climate change goals includes the Environmental Code, which creates

the regulatory framework for climate change policy in the country, and the "Waste management plan towards 2030", which plans for a reduction in the amount of waste generated and incinerated. The mitigation actions with the most significant mitigation impact are the suppression of importing French waste and the development of urban heating and cooling systems in buildings.

108. The GHG emission projections provided by Monaco include those under the WOM, WEM and WAM scenarios. In the three scenarios, emissions are projected to be 17.9, 33.8 and 38.1 per cent, respectively, below the 1990 level in 2020. On the basis of the reported information, the ERT concludes that Monaco expects to meet its 2020 target under the Convention under the WEM and WAM scenarios with domestic measures.

109. The projections indicate that Monaco is on track to meet its Kyoto Protocol target for the second commitment period (22 per cent reduction compared with the 1990 level by 2020) under the WEM and WAM scenarios.

110. The NC7 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it did not elaborate on supplementarity as such. The use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is envisaged, although the Party gives preference to the implementation of complementary national measures.

111. Monaco is not an Annex II Party and is therefore not obliged to adopt measures and fulfil the obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Monaco provided information in the NC7 on its support to developing country Parties.

112. In the NC7 Monaco has provided information on vulnerability and adaptation for health, sea level rise, ecosystems, water supply and energy. During the review, the Party further elaborated on the steps taken in conducting the framework study "Climate Adaptation Strategy" and described the status of the study.

113. In its NC7 Monaco reported on domestic and international research and systematic observation activities. During the review, Monaco provided further information on its support given to developing countries in the field of research and systematic observation.

114. Sufficient information on education, training and public awareness policies, including education in schools, public communication and periodical publications on the environment and climate change, is reported in the NC7 of Monaco as an integral part of the climate chance policy. The education and public awareness campaigns are led by the State or by other institutions, non-governmental organizations and the private sector. The Party also reported on its support related to capacity-building in developing countries regarding education, training and public awareness.

115. In the course of the review, the ERT formulated the following recommendations for Monaco to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:[9]

(a) To improve the completeness of its reporting by:

(i) Including information how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention (issue 5 in table 8);

(ii) Including, in the projections section of its next NC, the total effect of PaMs in terms of GHGs avoided or sequestered, by gas (on a CO_2 eq basis) and year (issue 1 in table 14);

(iii) Including information on support given to developing countries related to research and systematic observation (issue 2 in table 18);

(iv) Providing summary information on GCOS activities or explaining why this may not be possible (issue 3 in table 18);

[9] The recommendations are given in full in the relevant sections of this report.

(b) To improve the transparency of its reporting by:

(i) Providing further information on how its national circumstances affect its GHG emissions and removals and how its national circumstances and changes therein affect GHG emissions and removals over time (issue 1 in table 4);

(ii) Including summary information from the national GHG inventory for the period from 1990 to the last but one year prior to the year of submission of the NC, including CO_2 eq and emission trend tables given in the CRF (CRF table 10) (issue 1 in table 6);

(iii) Providing information on any steps taken by it to promote and/or implement any decisions taken by IMO (issue 6 in table 8);

(iv) Ensuring that the PaMs are correctly labelled as "planned", "implemented" and "adopted" and included in the projection scenarios consistently with the definition for each scenario (issue 1 in table 12);

(v) Presenting emission projections relative to actual inventory data for the preceding years reported in the inventory section of the NC, or clearly specifying any changes in the inventory data and explaining the rationale for using different inventory data for the projections (issue 2 in table 12);

(vi) Using for the projections, to the extent possible, the same sectoral categories that are used in the PaMs section (issue 3 in table 12);

(vii) Including relevant information on factors and activities underlying projected emission trends for each sector to enable the reader to understand the emission trends in the years 1990–2030 (issue 9 in table 12);

(viii) Reporting on how its use of the Kyoto Protocol mechanisms is supplemental to domestic action, and how its domestic action thus constitutes a significant element of the effort made to fulfil the 2020 target, also elaborating on the definition of supplementarity used (issue 1 in table 15);

(ix) Enhancing its reporting of information on the expected impacts of climate change and reporting an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention and in particular including information on the progress of the first phase of implementation of the adaptation plan and on any bilateral cooperation with developing countries on adaptation (issue 1 in table 17);

(x) Providing information on whether any international activities with regard to research and systematic observation (e.g. linked to the World Climate Programme, the International Geosphere–Biosphere Programme and GCOS) have taken place and, if so, by providing an outline of the action taken in its next NC, or clearly reporting why it is not possible to report on such actions owing to its national circumstances (issue 1 in table 18);

(c) To improve the timeliness of its reporting by submitting its next NC on time (see para. 6 above).

IV. Questions of implementation

116. During the review the ERT assessed the NC7, including the supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol with regard to timeliness, completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. No question of implementation was raised by the ERT during the review. With respect to the question of implementation related to Monaco's 2017 annual submission, see document FCCC/ARR/2017/MCO, table 6.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Monaco. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php.

"Additional information relating to the quantified economy-wide emission reduction targets contained in document FCCC/SB/2011/INF.1/Rev.1". FCCC/AWGLCA/2012/MISC.1. Available at http://unfccc.int/resource/docs/2012/awglca15/eng/misc01.pdf.

BR3 of Monaco. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/5937801_monaco-br3-1-mco-br3-2018-v1.pdf.

BR3 CTF tables of Monaco. Available at http://unfccc.int/national_reports/biennial_reports_and_iar/biennial_reports_data_interface/items/10132.php.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at http://unfccc.int/resource/docs/cop5/07.pdf.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex to decision 15/CMP.1. Available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex III to decision 3/CMP.11. Available at http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf.

"Guidelines for review under Article 8 of the Kyoto Protocol". Annex to decision 22/CMP.1. Available at http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 13/CP.20. Available at http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf.

NC7 of Monaco. Available at http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/4295138_monaco-nc7-1-nc7_mc_v1.pdf.

Report on the individual review of the annual submission of Monaco submitted in 2015. FCCC/ARR/2015/MCO. Available at http://unfccc.int/resource/docs/2016/arr/mco.pdf.

Report on the individual review of the annual submission of Monaco submitted in 2017. FCCC/ARR/2017/MCO. Available at http://unfccc.int/resource/docs/2018/arr/mco.pdf.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Monaco. FCCC/IRR/2017/MCO. Available at http://unfccc.int/resource/docs/2018/irr/mco.pdf.

Report of the technical review of the second biennial report of Monaco. FCCC/TRR.2/MCO. Available at http://unfccc.int/resource/docs/2016/trr/mco.pdf.

Report on the technical review of the sixth national communication of Monaco. FCCC/IDR.6/MCO. Available at http://unfccc.int/resource/docs/2015/idr/mco06r01.pdf.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to decision 4/CMP.11. Available at http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf.

"Quantified economy-wide emission reduction targets by developed country Parties to the Convention: assumptions, conditions, commonalities and differences in approaches and comparison of the level of emission reduction efforts. Technical paper." FCCC/TP/2014/8. Available at https://unfccc.int/sites/default/files/resource/docs/2014/tp/08.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Jérémie Carles (Direction de l'Environnement), including additional material.