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Report on the technical review of the eighth national communication and the technical review of the fifth biennial report of Croatia

Parties included in Annex I to the Convention were requested by decision 6/CP.25 to submit their eighth national communication to the secretariat by no later than 31 December 2022. 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 eighth national communication and relevant supplementary information under the Kyoto Protocol of Croatia, 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".

Developed country Parties were requested by decision 6/CP.25 to submit their fifth biennial report to the secretariat by no later than 31 December 2022. This report presents the results of the technical review of the fifth biennial report of Croatia, 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".

The review of these submissions took place in Zagreb from 15 to 19 April 2024.

Contents

Abbreviations and acronyms

AEA	annual emission allocation
Annex II Party	Party included in Annex II to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CCUS	carbon dioxide capture, utilization and storage
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CTF	common tabular format
ERT	expert review team
ESD	European Union effort-sharing decision
ESR	European Union effort-sharing regulation
EU	European Union
EU ETS	European Union Emissions Trading System
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IPPU	industrial processes and product use
LEAP	Low Emissions Analysis Platform
LULUCF	land use, land-use change and forestry
MAED	Model for Analysing Energy Demand
MESSAGE	Model for Energy Supply Strategy Alternatives and their General Environmental Impacts
N_2O	nitrous oxide
NA	not applicable
NC	national communication
NE	not estimated
NF_3	nitrogen trifluoride
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
NO_X	nitrogen oxides
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”
RES	renewable energy source(s)
SF_6	sulfur hexafluoride
SO_X	sulfur oxides
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on CTF tables	“Common tabular format for ‘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 in-country technical review of the NC8 and BR5 of Croatia. The review was organized 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 IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention" and "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.1).

2. In accordance with decision 13/CP.20, a draft version of this report was transmitted to the Government of Croatia, which provided comments that were considered and incorporated with revisions into this final version of the report.

3. The review was conducted from 15 to 19 April 2024 in Zagreb by the following team of nominated experts from the UNFCCC roster of experts: Joel Bengtsson (Sweden), Xiang Gao (China), Aiymgul Kerimray (Kazakhstan), Kadi Meltz (Estonia) and Gladys Santis (Chile). Xiang Gao and Aiymgul Kerimray were the lead reviewers. The review was coordinated by Karin Simonson (secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC8 of Croatia in accordance with the UNFCCC reporting guidelines on NCs,[1] 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[2] and of the information reported in the BR5 of Croatia in accordance with the UNFCCC reporting guidelines on BRs.[3]

1. Timeliness

5. The NC8 was submitted on 20 March 2024, after the deadline of 31 December 2022 mandated by decision 6/CP.25. The NC8 was resubmitted on 3 May 2024 to address issues raised during the review. The resubmission included changes and additions to information on national circumstances; GHG information, PaMs; projections; research and systematic observation; and education, training and public awareness. Detailed information on improvements related to the resubmission is provided in paragraph 13 below. Unless otherwise specified, the information and values from the latest submission are used in this report.

6. Croatia informed the secretariat on 17 October 2022 about its difficulties with making a timely NC8 submission. The ERT noted with great concern the delay in the submission and recommended that Croatia make its next submission on time.

7. The BR5 was submitted on 20 March 2024, after the deadline of 31 December 2022 mandated by decision 6/CP.25. The CTF tables were submitted on 28 February 2024. The CTF tables and BR5 were resubmitted on 3 May 2024 to address issues raised during the review. The resubmission included changes and additions to information on national circumstances; the quantified economy-wide emission reduction target and related assumptions, conditions and methodologies; PaMs; estimates of emission reductions and removals; the use of units from market-based mechanisms and LULUCF; progress in

[1] Decision 6/CP.25, annex.
[2] Decision 15/CMP.1, annex, and decision 3/CMP.11, annex III.
[3] Decision 2/CP.17, annex.

achieving the quantified economy-wide emission reduction target; projections; and the provision of financial, technological and capacity-building support to developing country Parties. Detailed information on improvements related to the resubmission is provided in paragraph 13 below. Unless otherwise specified, the information and values from the latest submission are used in this report.

8. Croatia informed the secretariat on 17 October 2022 about its difficulties with making a timely BR5 submission. The ERT noted with great concern the delay in the submission.

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

9. Issues and gaps identified by the ERT related to the information reported by Croatia in its NC8 are presented in tables 1–2. The information reported, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs.

10. The ERT noted that Croatia made improvements to the reporting in its NC8 compared with that in its NC7, including by addressing recommendations and encouragements from the previous review report in the areas of national circumstances relevant to GHG emissions and removals, GHG inventory information, PaMs, projections and the total effects of PaMs, vulnerability assessment, climate change impacts and adaptation measures, research and systematic observation, and supplementary information related to the Kyoto Protocol.

Table 1
Assessment of completeness and transparency of mandatory information reported by Croatia in its eighth national communication

Section of NC	*Completeness*	*Transparency*	*Reference to description of recommendation*
Executive summary	Complete	Transparent	–
National circumstances relevant to GHG emissions and removals	Complete	Transparent	–
GHG inventory	Complete	Transparent	–
PaMs	Complete	Transparent	–
Projections and the total effect of PaMs	Complete	Mostly transparent	Issue 3 in table I.2
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent	–
Financial resources and transfer of technology[a]	NA	NA	NA
Research and systematic observation	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 annex I. The assessment of completeness and transparency by the ERT in this table is based only on the "shall" reporting requirements.

[a] Croatia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paras. 3–5, of the Convention.

Table 2
Assessment of completeness and transparency of mandatory supplementary information under the Kyoto Protocol reported by Croatia in its eighth national communication

Supplementary information under the Kyoto Protocol	*Completeness*	*Transparency*	*Reference to description of recommendation*
National system	Complete	Transparent	–
National registry	Complete	Transparent	–

Supplementary information under the Kyoto Protocol	*Completeness*	*Transparency*	*Reference to description of recommendation*
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	–
PaMs in accordance with Article 2	Complete	Transparent	–
Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	–
Information under Article 10[a]	NA	NA	NA
Financial resources[b]	NA	NA	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	–

Note: The assessment of completeness and transparency by the ERT in this table is based only on the "shall" reporting requirements.

[a] The assessment refers to information provided by the Party on the provisions contained in Article 4, paras. 3, 5 and 7, of the Convention, as reported under Article 10 of the Kyoto Protocol, which is relevant to Annex II Parties only. An assessment of the information 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] Croatia 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.

11. Issues and gaps identified by the ERT related to the information reported by Croatia in its BR5 are presented in table 3 and annex II. The information reported mostly adheres to the UNFCCC reporting guidelines on BRs.

12. The ERT noted that Croatia made improvements to the reporting in its BR5 compared with that in its BR4, by addressing many recommendations and encouragements from the previous review report in the areas of GHG emissions and trends, its quantified economy-wide emission reduction target and related assumptions, conditions and methodologies, progress in achievement of quantified economy-wide emission reduction targets and relevant information, and projections.

Table 3
Summary of completeness and transparency of mandatory information reported by Croatia in its fifth biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendation*
GHG emissions and removals	Complete	Transparent	–
Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	Complete	Transparent	–
Progress in achievement of targets	Complete	Transparent	–
Provision of support to developing country Parties[a]	NA	NA	NA

Note: The assessment of completeness and transparency by the ERT in this table is based only on the "shall" reporting requirements.

[a] Croatia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paras. 3–5, of the Convention.

13. The NC8, BR5 and CTF table resubmissions made during the review improved:

(a) The information reported on national circumstances relevant to GHG emissions and removals by including information on how the national circumstances impact GHG emissions and removals over time;

(b) The GHG inventory information reported by including information on GHG emission trends in the LULUCF sector;

(c) The information reported on its quantified economy-wide emission reduction target and related assumptions, conditions and methodologies by providing information on the contribution of LULUCF and market-based mechanisms towards the target;

(d) The information reported on PaMs by including information on PaMs influencing GHG emissions from international transport, PaMs that are innovative and replicable, challenges in estimating the impact of individual PaMs, and non-GHG benefits of PaMs;

(e) The information reported on projections and the total effects of PaMs by including information on emissions for 2020 in the NC8 (projections chapter), which is consistent with the information reported in the common reporting tables of the 2022 NIR and in CTF tables 6(a) and 6(c); cross-references to CTF tables 6(a) and 6(c) in NC8 section 5.1.3; projection tables in the NC8 in the correct tabular format; and additional information on the description of the strengths and weaknesses of each model and how each model accounts for overlap or synergies that may exist between different PaMs;

(f) The information reported on research and systematic observation by including examples of projects and programmes that support capacity-building in developing countries;

(g) The information reported on education, training and public awareness by including examples of educational outreach efforts and campaigns to raise public awareness.

II. Technical review of the information reported in the eighth national communication and fifth biennial report

A. National circumstances relevant to greenhouse gas emissions and removals

1. Technical assessment of the reported information

14. The NC8 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and water resource management. After declaring independence from Yugoslavia in October 1991, Croatia established new legislative, executive and judicial institutions. The decline in total GHG emissions between 1991 and 1994 was mainly due to the war in Croatia and the transition from a centralized, planned economy. Between 1995 and 2008, emissions started to increase at an average rate of 3.0 per cent per year. Croatia's economy had been growing steadily since 2015 (following the recovery from the 2008 global economic crisis), but was significantly impacted by the coronavirus disease 2019 pandemic in 2020, particularly in the tourism sector. Emissions excluding LULUCF declined by 3.6 per cent in 2019–2020 owing to a decline in energy sector emissions. The country's economic recovery began again in 2021.

15. The changes in total emissions from 1990 to 2021 were driven by different factors that changed over time: war from 1990 to 1994; increased energy and industrial sector activity between 1995 and 2007; and the global economic crisis between 2008 and 2016. In 2015–2020, emissions fluctuated slightly with no clear upward or downward trajectory. Croatia has a declining population trend, with the total population decreasing by 9.6 per cent between 2011 and 2021. However, energy-related emissions are not directly correlated with the population trend and fluctuated in 2015–2020. Croatia is increasingly importing energy to meet its growing energy demand (with the exception of 2020, when demand was lower owing to the pandemic). The share of RES continues to grow, amounting to 31.7 per cent of final energy consumption in 2021. The largest share of non-renewable energy use is attributed to industry, transport and other sectors.

2. Assessment of adherence to the reporting guidelines

16. The ERT assessed the information reported in the NC8 of Croatia and identified an issue relating to transparency, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.1.

B. Greenhouse gas inventory information[4]

1. Technical assessment of the reported information

17. Croatia reported information in its BR5 and NC8 on its historical GHG emissions and inventory arrangements using GWP values from the AR4. More recent information on GHG emissions was reported in Croatia's 2023 inventory submission, which used GWP values from the AR5. Total GHG emissions[5] excluding emissions and removals from LULUCF decreased by 24.0 per cent between 1990 and 2020, while total GHG emissions including net emissions or removals from LULUCF decreased by 27.5 per cent over the same period. Emissions decreased between 1990 and 1994, followed by a steady increase. Emissions peaked in 2007, followed by a substantial decrease between 2008 and 2014. Between 2015 and 2021 emissions fluctuated slightly, with an increase between 2015 and 2017, a decrease between 2018 and 2020 and an increase by 2.3 per cent in 2021 compared with 2020.

18. The changes in total emissions from 1990 to 2021 were driven by different factors in different time periods (see para. 15 above). From 1995 to 2007, the steady increase in emissions was due to the higher consumption of liquid fuels in the public electricity and heat production sector, an increase in industrial production capacity and an increase in waste sector emissions. Croatia's moderate economic recovery caused emissions to increase between 2015 and 2017, with the largest increases observed in most of the subsectors of the energy sector (except for energy industries). The minor fluctuations in emissions in 2018–2021 were mainly due to the decrease in emissions in all subsectors of the energy sector in 2018–2020, and the increase in all subsectors of the energy sector (except for fugitive emissions) in 2021 compared with 2020.

19. Table 4 illustrates the emission trends by sector and by gas for Croatia. The emissions reported in the 2023 inventory submission differ from the data reported in CTF table 1 because the data in CTF table 1 are based on the 2022 annual submission. Recalculations were made in the 2023 inventory submission compared with the 2022 annual submission, mainly for the LULUCF and waste sectors and HFC emissions. GWP values from the AR4 were used in the 2022 NIR, whereas GWP values from the AR5 were used in the 2023 NIR.

Table 4
Greenhouse gas emissions by sector and by gas for Croatia for 1990–2021

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2020*	*2021*	*1990–2020*	*2020–2021*	*1990*	*2021*
Sector									
1. Energy	21 512.57	18 257.15	19 764.71	15 554.96	16 272.30	–27.7	4.6	68.4	66.6
A1. Energy industries	7 087.34	5 831.82	5 901.52	3 694.23	3 756.69	–47.9	1.7	22.5	15.4
A2. Manufacturing industries and construction	5 233.83	3 073.89	3 029.72	2 393.69	2 430.36	–54.3	1.5	16.6	9.9
A3. Transport	3 893.62	4 494.84	5 948.34	5 798.26	6 261.90	48.9	8.0	12.4	25.6
A4. and A5. Other	4 245.24	3 886.96	4 055.39	3 208.41	3 374.41	–24.4	5.2	13.5	13.8

[4] GHG emission data in this section, which use GWP values from the AR5, are based on Croatia's 2023 inventory submission, version 1, which has not yet been subject to review. All emission data in subsequent chapters are based on Croatia's BR5 CTF tables, which use GWP values from the AR4 unless otherwise noted.

[5] 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.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2020*	*2021*	*1990–2020*	*2020–2021*	*1990*	*2021*
B. Fugitive emissions from fuels	1 052.54	969.63	829.74	460.36	448.95	–56.3	–2.5	3.3	1.8
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	4 403.43	2 953.27	3 408.55	3 646.34	3 595.93	–17.2	–1.4	14.0	14.7
3. Agriculture	4 424.34	3 093.20	3 135.04	2 700.72	2 700.94	–39.0	0.0	14.1	11.0
4. LULUCF	–6 312.20	–6 695.43	–6 887.63	–5 666.79	–5 802.37	10.2	–2.4	NA	NA
5. Waste	1 113.84	1 350.03	1 862.76	2 004.81	1 877.24	80.0	–6.4	3.5	7.7
6. Other[a]	NO	NO	NO	NO	NO	–	–	–	–
Gas[b]									
CO_2	22 974.68	19 660.01	21 018.17	16 870.53	17 410.63	–26.6	3.2	73.0	71.2
CH_4	4 821.38	3 734.93	4 420.01	4 001.93	3 887.16	–17.0	–2.9	15.3	15.9
N_2O	2 529.78	2 195.23	2 155.02	1 450.38	1 439.72	–42.7	–0.7	8.0	5.9
HFCs	NO	50.76	567.73	1 574.63	1 699.28	NA	7.9	NA	7.0
PFCs	1 117.28	NO	NO	NO	NO	–	–	3.6	–
SF_6	11.06	12.72	10.13	9.35	9.63	–15.4	3.0	0.0	0.0
NF_3	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions excluding LULUCF	**31 454.18**	**25 653.65**	**28 171.06**	**23 906.82**	**24 446.42**	**–24.0**	**2.3**	**100.0**	**100.0**
Total GHG emissions including LULUCF	**25 141.98**	**18 958.22**	**21 283.43**	**18 240.03**	**18 644.05**	**–27.5**	**2.2**	**NA**	**NA**

Source: GHG emission data: Croatia's 2023 inventory submission, version 1.
[a] Emissions and removals reported under the sector other (sector 6) are not included in total GHG emissions.
[b] Emissions by gas without LULUCF. The Party did not report indirect CO_2 emissions.

20. In brief, Croatia's national inventory arrangements were established in accordance with the Regulation on the Monitoring of Greenhouse Gas Emissions, Policies and Mitigation Measures in the Republic of Croatia. The changes in these arrangements since the BR4 include the renaming of the Ministry of Environmental Protection and Energy in 2020 to the Ministry of Economy and Sustainable Development. The Ministry of Economy and Sustainable Development took over responsibility for all tasks related to environmental protection, including overall responsibility for the inventory. All staff who previously worked on the preparation of the national inventory within the Ministry of Environmental Protection and Energy have continued to carry out the same task within the Ministry of Economy and Sustainable Development. The Ministry of Economy and Sustainable Development is the national focal point for the UNFCCC with overall responsibility for the functioning of the national system. Inventory preparation is assigned to the authorized institution, which is chosen for a three-year period by public tender.

2. Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the NC8 and BR5 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs.

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

(a) Technical assessment of the reported information

22. Croatia provided in the NC8 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 in conjunction with decisions 3/CMP.11 and 4/CMP.11. The description includes all the elements mandated by paragraph 30 of the annex to decision

15/CMP.1. The NC8 also contains a reference to the description of the national system provided in the NIR of the 2022 annual submission.

(b) Assessment of adherence to the reporting guidelines

23. The ERT assessed the information reported in the NC8 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. 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

24. In its NC8 Croatia provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 in conjunction with decision 3/CMP.11 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 2022 annual submission of Croatia.

(b) Assessment of adherence to the reporting guidelines

25. The ERT assessed the information reported in the NC8 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

C. Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies

1. Technical assessment of the reported information

26. Croatia reported information on its economy-wide emission reduction target in its BR5. For Croatia the Convention entered into force on 7 July 1996. Under the Convention Croatia committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020.

27. The 2020 target for the EU and its member States was formalized in the EU 2020 climate and energy package. The legislative package regulated emissions of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 using GWP values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target for 2020 under the Convention.

28. The EU-wide targets for 2020 under the Convention and for 2013–2020 under the Kyoto Protocol were primarily implemented through the EU ETS and ESD. The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap was put in place for 2013–2020 for the EU ETS with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. For 2030, a reduction target of 62 per cent below the 2005 level has been set for emissions covered by the EU ETS. The ESD was operational in 2013–2020 and covered sectors outside the EU ETS, including transport (excluding aviation and international maritime transport), residential and commercial buildings, agriculture, small industry and waste. The ESD was regulated through targets for each member State that added up to a reduction at the EU level of 10 per cent below the 2005 level by 2020. The ESR, the successor to the ESD, was adopted in 2018 and amended in 2023 with the target of reducing emissions covered under the ESR by 40 per cent below the 2005 level by 2030.

29. The EU generally allowed its member States to use units from the Kyoto Protocol mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Operators and airline operators could use

such units to fulfil their requirements under the EU ETS in 2013–2020, and member States could use such units for their national ESD targets, within specific limitations.

30. The European Commission set out its vision for a climate-neutral EU in November 2018, and in December 2019 presented the European Green Deal as a road map with actions for making the EU economy sustainable. The European Council endorsed in December 2019 the objective of making the EU climate-neutral by 2050. As part of the European Green Deal, the 2050 climate-neutrality target was made binding in the first European Climate Law, adopted in 2021. It also increased the ambition of the 2030 emission reduction target to at least 55 per cent below the 1990 level. Member States will set out any increased ambition in the update of their national energy and climate plans. The Party noted that according to a communication of the European Commission, EU member States are committed to achieving a net reduction in GHG emissions of 90.0 per cent by 2040 compared with the 1990 level, but commitments for national contributions aimed at meeting this target are still under discussion.

31. Croatia has a national target of limiting its emission growth to 11.0 per cent above the 2005 level by 2020 for ESD sectors. This target has been translated into binding quantified AEAs for 2013–2020. Croatia's AEAs change following a linear path from 19,613.81 kt CO_2 eq in 2013 to 19,317.94 kt CO_2 eq in 2020.[6] Under the ESR, Croatia has a national target of reducing emissions from covered sectors to 16.7 per cent below the 2005 level by 2030.

32. Croatia also reported information on its adoption of the Low-Carbon Development Strategy of the Republic of Croatia until 2030 with a view to 2050 (Official Gazette 63/21), with the goal of achieving a competitive low-carbon economy by 2050. Under the Party's 'gradual transition' scenario, it is expected that Croatia could achieve a reduction in total GHG emissions of 56.8 per cent by 2050, while under its 'strong transition' scenario, a 73.1 per cent decrease by 2050 is expected. In addition, Croatia reported in its Integrated National Energy and Climate Plan for 2021–2030 that the target share of RES in gross final energy consumption is 42.5 per cent by 2030.

2. Assessment of adherence to the reporting guidelines

33. The ERT assessed the information reported in the BR5 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

D. Information on policies and measures

1. Technical assessment of the reported information

34. Croatia provided in its NC8 and BR5 information on its PaMs[7] implemented and planned to fulfil its commitments under the Convention. Croatia's set of PaMs is similar to that previously reported, with a few exceptions.

35. Croatia reported on its policy context and legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs. The national system for monitoring the implementation of PaMs in Croatia is regulated by chapter III of the Regulation on the Monitoring of Greenhouse Gas Emissions, Policies and Mitigation Measures in the Republic of Croatia. The Ministry of Economy and Sustainable Development is the ministry responsible for reporting on the implementation of PaMs. Following a public tender process, the Ministry selected the Energy Research and Environmental Protection Institute to prepare the related reports over a three-year period. In accordance with the Act on Climate Change and Ozone Layer Protection, a committee for intersectoral coordination of PaMs, which includes members from central government bodies, has been established as part of the national system. Under its National Development Strategy,

[6] According to the EU transaction log.

[7] The UNFCCC reporting guidelines on BRs use the term "mitigation actions", whereas the UNFCCC reporting guidelines on NCs use the term "policies and measures". The terms are used interchangeably in this report to refer to the relevant information in either the NC or BR.

Croatia is working to align its development policies with the achievement of its longer-term target of achieving climate neutrality. Croatia is planning to enhance its national monitoring system to effectively track the implementation and impact of emission reduction measures. Croatia also provided information on changes to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target. The Croatian Agency for the Environment and Nature was merged with the Ministry of Environmental Protection and Energy in 2018. Following this change in organizational structure, all tasks, legal rights and obligations remained under the Ministry of Environmental Protection and Energy.

36. Croatia's assessment of the economic and social consequences of its response measures includes an approach based on the Convention on Environmental Impact Assessment in a Transboundary Context and the EU directive on the assessment of the effects of certain plans and programmes on the environment (directive 2001/42/EC). This approach includes a comprehensive impact assessment system for all new legislative proposals aimed at identifying and minimizing potential negative impacts on third parties within the national and transboundary contexts. This assessment process also allows for the participation of the public who may be affected. Croatia reported that its actions to identify and review its own policies and practices that encourage activities that lead to greater levels of emissions are aimed at identifying policies that support GDP growth or pro-natalist policies, which are key drivers of increased energy consumption, leading to greater levels of GHG emissions.

37. In its reporting on PaMs, Croatia did not provide the estimated emission reduction impacts for all of its individual PaMs. Where estimated impacts were not provided, the Party did not supply an explanation. The Party explained during the review that estimated impacts for individual PaMs were not provided because some of the measures complement and overlap with other measures and the estimated impacts were therefore reported for a collection of PaMs; some measures do not have a direct GHG mitigation impact, but rather an indirect effect on improving the regulatory process or coordination of measures; and for some other measures, further research is needed. Croatia estimated the impacts of some of its PaMs in groups by sector and subsector, including general energy consumption, transport, waste and agriculture, for 2025, 2030, 2035 and 2040.

38. The Party described its general methodology for estimating the impacts of its groups of PaMs, in which sectoral models are integrated into the Long-Range Energy Alternatives Planning System software. Croatia reported that eight different bottom-up models are used for the modelling and provided a list of assumptions and sectoral and subsectoral data used.

39. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO_2 emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package. The 2021 European Climate Law, which forms part of the European Green Deal, made climate neutrality by 2050 legally binding and raised the EU-wide 2030 emission reduction target to at least 55 per cent compared with the 1990 level. In 2023, the EU adopted several pieces of legislation that were part of the "Fit for 55" package intended to help achieve the new 2030 target. These new laws strengthened both the ESR and EU ETS 2030 targets, extended the EU ETS to include maritime shipping in 2024 and established the Social Climate Fund to address equitability of mitigation impacts. They also created the EU ETS 2 to cover at the point of distribution most fuel used in sectors not covered by the EU ETS, beginning in 2027.

40. The 2021–2030 EU-wide policies are operationalized through the national energy and climate plans of EU member States, which should set out national objectives for each of the five dimensions of the Energy Union, namely energy security; the internal energy market; energy efficiency; decarbonization; and research, innovation and competitiveness. The national energy and climate plans are periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal. Croatia's national energy and climate plan specifies that its revised national target under the ESR is to reduce emissions by 16.7 per cent below the 2005 level by 2030 (see para. 31 above) and to have a 42.5 per cent

share of RES in gross final energy consumption by 2030, along with an increase in energy efficiency.

41. Croatia introduced national-level policies to achieve its targets under the ESD, the ESR and domestic emission reduction targets. The key policies reported are expanding and increasing the energy efficiency of the electricity transmission network, reducing losses in the distribution network and introducing smart grids, increasing the efficiency of district heating systems, increasing the efficiency of the gas transport network and promoting RES for the production of electricity and heat. The mitigation effect of PaMs included in the National Action Plan for Energy Efficiency is the most significant. The ERT identified the adoption and implementation of the Programme for Energy Poverty Reduction and the Programme for Combating Energy Poverty, which includes the use of RES in residential buildings in areas of special State care for 2021–2025, as mitigation actions of particular interest because they combine measures to address energy efficiency, use of RES and social equity.

42. Croatia highlighted the domestic mitigation actions that are under development, such as those being revised to align with the more ambitious 2030 target of the EU to reduce domestic emissions by at least 55 per cent compared with the 1990 level. Among the mitigation actions that provide a foundation for significant additional action are the legislative adjustments for cleaner transport; the advanced biofuel market development plan; the decarbonization of transport through the production of advanced biofuels from residues of agricultural production and energy crops with integrated CCUS; information, education and capacity-building for RES use; spatial planning prerequisites for RES use; the development of the regulatory framework for RES use; and the construction and use of energy storage. Table 5 provides a summary of the reported information on the PaMs of Croatia.

Table 5
Summary of information on policies and measures reported by Croatia

Sector	*Key PaMs*[a]	*Estimated mitigation impact in 2020 (kt CO_2 eq)*	*Estimated mitigation impact in 2030 (kt CO_2 eq)*
Energy			
Energy efficiency	National Action Plan for Energy Efficiency	NE	NE
	Increasing the efficiency of the district heating systems		
	Promoting nearly zero-emission building construction and renovation standards		
	Energy renovation programme for public buildings		
Energy supply and renewable energy	Promoting renewable energy use for production of electricity and heat Development of the electricity transmission network and energy efficiency education	NE	NE
	Programme for energy poverty reduction and the programme for combating energy poverty		
	Information, education and capacity-building for RES use		
	Spatial planning prerequisites for RES use		
	The development of the regulatory framework for RES use		
	The construction and use of energy storage		
Transport	Financial incentives for the purchase of energy-efficient vehicles	NE	NE
	Development of infrastructure for alternative fuels		
	Promotion of sustainable intermodal transport at national level		
	Legislative adjustments for cleaner transport		
	The advanced biofuel market development plan		
	The decarbonization of transport through the production of advanced biofuels from residues of agricultural production and energy crops with integrated CCUS		

Sector	*Key PaMs*[a]	*Estimated mitigation impact in 2020 (kt CO_2 eq)*	*Estimated mitigation impact in 2030 (kt CO_2 eq)*
IPPU	Limiting fluorinated greenhouse gas emissions	NE	NE
	Gradual reduction of the amount of fluorocarbons that can be placed on the market		
	Restrictions and prohibitions on placing certain products and equipment on the market		
Agriculture	Anaerobic decomposition of manure and biogas production	NE	NE
	Improving methods of applying mineral fertilizers		
	Improvement of livestock facilities and manure management systems		
Waste	Ensuring the system of treatment and use of landfill gas	NE	NE
	Reducing the amount of disposed biodegradable waste		
	Use of biogas for biomethane production and electricity and heat generation		

Note: The estimated mitigation impacts are estimates of emissions of CO_2 eq avoided in a given year as a result of the implementation of mitigation actions. The Party did not estimate the impact of adopted and implemented PaMs for 2030; the impact of planned PaMs in 2030 is presented in table 10.

[a] Names of PaMs reproduced as reported in Croatia's BR5.

2. Assessment of adherence to the reporting guidelines

43. The ERT assessed the information reported in the NC8 and BR5 of Croatia and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The finding is described in table II.1.

3. Domestic and regional programmes and legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

44. In its NC8, Croatia reported that the implementation of the Kyoto Protocol is underpinned by its ratification of the Kyoto Protocol (Official Gazette – International Agreements 5/07) and the Act on the Ratification of the Doha Amendment to the Kyoto Protocol (Official Gazette – International Agreements 6/15), under which Croatia has fulfilled its obligations under the Kyoto Protocol to reduce GHG emissions by 5.0 per cent below the 1990 level in 2008–2012. The overall responsibility for climate change policymaking lies with the Ministry of Economy and Sustainable Development, which serves as the national focal point for the UNFCCC and the Kyoto Protocol, oversees Croatia's participation in the EU ETS, serves as the national administrator of the Croatian part of the consolidated registry of the EU linked to the EU transaction log and the international transaction log, and coordinates all climate and environmental policy in Croatia. Numerous sectoral ministries, public bodies at the national and local level, and other national institutions are involved in policy implementation.

45. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Croatia committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year level (see paras. 26–28 above).

46. The Party has arrangements and enforcement procedures to meet its commitments under the Kyoto Protocol, including procedures for addressing non-compliance. These include the annual compliance assessments established for all EU member States, which include a review of the GHG inventory information to ensure compliance with ESD requirements and an assessment of the recording and monitoring of compliance of entities under the EU ETS through the consolidated registry of the EU. In addition to periodic reviews to determine compliance in 2013–2020, a final audit was conducted in 2022 to determine whether each EU member State had met the required ESD emission reductions to achieve the 2020 target.

47. Croatia has provisions in place to make information on legislative arrangements and administrative procedures related to compliance and enforcement publicly accessible on the EU transaction log website, such as the Environmental Protection Act (Official Gazette 80/13, 153/13, 78/15, 12/18 and 118/18) and through coordination with relevant national governmental bodies, as well as through engagement with relevant EU institutions. Over the reporting period, there were no changes to the list of publicly available information owing to confidentiality reasons.

48. Croatia has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. Croatia's Law on Forests (Official Gazette 68/18, 115/18, 98/19, 32/20 and 145/20) regulates forest management practices to ensure economic sustainability, biodiversity conservation and enhanced carbon sequestration. These objectives are operationalized through ten-year national forest management plans which set out specific measures to balance ecological, economic and social objectives.

(b) Assessment of adherence to the reporting guidelines

49. The ERT assessed the information reported in the NC8 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. Policies and measures in accordance with Article 2 and minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

(a) Technical assessment of the reported information

50. In the NC8 Croatia 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. In general, Croatia follows the framework established at the EU level by implementing a comprehensive impact assessment system to ensure that potential negative impacts on various stakeholders and third parties are identified and minimized within the legislative process.

51. The NC8 includes information on how Croatia promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels. As an EU member State, Croatia supports CORSIA as a means of limiting GHG emissions from international aviation. Croatia also participates in the activities of the International Maritime Organization, including as part of EU efforts to include GHG emissions from this sector in the EU ETS as a means of further incentivizing GHG emission reductions.

52. Further information on how Croatia 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 2023 inventory submission. Croatia reported on its self-assessment of any potential adverse impacts of its ongoing energy sector liberalization, as well as any potential impacts on international markets. Croatia reported that it has no subsidies for environmentally unsound technologies and does not engage in non-energy use of fossil fuels or CCUS technologies. The Party reported information on what it prioritized in implementing its commitments under Article 3, paragraph 14, including supporting the uptake of RES and improved energy efficiency measures through access to various funds, certification, awareness-raising efforts and projects.

(b) Assessment of adherence to the reporting guidelines

53. The ERT assessed the information reported in the NC8 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for

supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

E. Estimates of emission reductions and removals and the use of units from market-based mechanisms and land use, land-use change and forestry and progress in achieving the quantified economy-wide emission reduction target

1. Technical assessment of the reported information

54. Croatia reported in its BR5 that it did not use units from market-based mechanisms under the Kyoto Protocol and other market-based mechanisms under the Convention to meet its commitment under the ESD. It reported in CTF tables 4 and 4(b) that it did not use any units from market-based mechanisms in 2019 or 2020. Given that the contribution of LULUCF activities is not included in the joint EU target under the Convention, reporting thereon is not applicable to Croatia. Table 6 illustrates Croatia's ESD emissions and use of units from market-based mechanisms for achieving its ESD target.

Table 6
Summary of information on emissions covered by the European Union effort-sharing decision annual emission allocation and use of units from market-based mechanisms by Croatia
(kt CO_2 eq)

Year	*ESD emissions*	*AEA*	*Use of units from market-based mechanisms*	*AEAs transferred to (–) or from (+) other Parties*	*Annual AEA surplus/deficit*	*Cumulative AEA surplus/deficit*
2013	15 125.53	19 613.81	NA	NA	4 488.28	4 488.28
2014	14 663.20	19 805.26	NA	NA	5 142.06	9 630.34
2015	15 565.31	19 996.71	NA	NA	4 431.40	14 061.74
2016	16 006.81	20 188.16	NA	NA	4 181.35	18 243.09
2017	16 669.30	18 681.01	NA	NA	2 011.71	20 254.80
2018	16 219.17	18 893.32	NA	NA	2 674.15	22 928.95
2019	16 058.24	19 105.63	NA	NA	3 047.39	25 976.34
2020	16 518.24	19 317.94	NA	NA	2 799.70	28 776.04

Sources: Croatia's BR5 CTF table 4(b) and EU transaction log (AEAs), which use GWP values from the AR4.
Note: For a given year, a positive number (surplus) indicates that annual or cumulative ESD emissions were lower than the corresponding AEA or cumulative AEAs, while a negative number (deficit) indicates that annual or cumulative ESD emissions were higher than the corresponding AEA or cumulative AEAs

2. Assessment of adherence to the reporting guidelines

55. The ERT assessed the information reported in the BR5 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Assessment of achievement of the quantified economy-wide emission reduction target

56. In assessing the Party's contribution towards achievement of the 2020 joint EU target on the basis of the information reported in its BR5, the ERT noted that, under the EU 2020 climate and energy package, Croatia committed to limiting its emissions under the ESD to 11.0 per cent above the 2005 level by 2020 (see para. 31 above). This target has been translated into binding quantified AEAs for 2013–2020. In 2020 Croatia's ESD emissions were 14.5 per cent (2,799.70 kt CO_2 eq) below the AEA. Croatia has a cumulative surplus of 28,776.04 kt CO_2 eq with respect to its AEAs between 2013 and 2020. The ERT noted that the Party did not make use of units from market-based mechanisms in 2020.

57. The ERT noted that the Party reported that the total GHG emissions excluding LULUCF of the EU and including the use of units from market-based mechanisms do not exceed the emission level corresponding to the target in 2020, and thus that the EU has

achieved its joint target. See the report on the technical review of the BR5 of the EU for further details. Therefore, the ERT concluded that, on the basis of the information reported in the BR5 and provided during the review, Croatia has met its 2020 commitment under the Convention through its contribution to achieving the joint EU target.

58. The ERT noted that the Party's ESD emissions in 2020 do not exceed its AEA for 2020.

F. Projections

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

59. Croatia reported in its BR5 and NC8 updated projections for 2025–2040 relative to actual inventory data for 2020 under the WEM scenario, using GWP values from the AR4. The WEM scenario reported by Croatia includes PaMs implemented and adopted until the end of 2022.

60. In addition to the WEM scenario, Croatia reported the WAM scenario. Croatia did not report a WOM scenario. Croatia provided a definition of its scenarios, explaining that its WEM scenario includes current PaMs that are already being implemented (i.e. adopted PaMs), while its WAM scenario includes existing and planned PaMs in line with the more ambitious targets and measures. The definitions indicate that the scenarios were prepared in accordance with the UNFCCC reporting guidelines on BRs.

61. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6, as well as NF_3, for 2025–2040. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4. Croatia reported on factors and activities affecting emissions for each sector.

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

62. The methodology and models used for the preparation of the projections are identical to those used for the preparation of the emission projections for the NC7. Croatia provided information on changes since the submission of its NC7 in the sectoral assumptions used for the projection scenarios.

63. The methodology and models used for estimating the emission projections were described at the sectoral level. The Party used MAED for analysing energy demand, MESSAGE for assessing the optimization of the power system and centralized heating systems (relating to heat production), and the PLEXOS model for analysing and confirming the feasibility of the operation of the electric power system on an hourly basis for selected years. The LEAP software was used to create models of different energy systems, where each requires its own unique data structure. The projections for the industrial sector were modelled using the Industrial Processes Model, which is an engineering simulation model that uses Excel spreadsheets. Waste sector projections were modelled using an engineering simulation model with Excel spreadsheets, while the projections for the agriculture and LULUCF sectors were modelled following the bottom-up reference-based Excel spreadsheet approach.

64. To prepare its projections, Croatia relied on key underlying assumptions relating to population trends, GDP growth rate and energy prices. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections and were reported in tabular format in the NC8, BR5 and CTF table 5. There were changes since the NC7 in the key variables and assumptions used by the Party, such as GDP growth rate and population. In the NC8, the GDP growth rate used for the projections was 2.2 per cent for 2025 and 2030, whereas in the NC7 it was 1.2 per cent for 2025 and 1.3 per cent for 2030. In the NC8, the population was expected to be 3.83 million in 2025 and 3.76 million in 2030, whereas in the NC7 it was expected to be 4.14 million in 2025 and 4.08 million in 2030. Croatia reported a description of the changes in the sectoral assumptions and the corrections to the calculations of projections compared with the NC7, including the

correction of errors and changes in activity data and emission factors. For example, in the energy sector changes were made to the CH_4 emission factors for biofuels, the CO_2 emission factor for coal and the amounts of solid fuel biomass.

65. Sensitivity analyses were conducted for a number of important assumptions, such as population and GDP growth rate. For the sensitivity analysis, data on population and GDP growth rate from an EU document on recommended parameters for reporting on GHG projections, integrated plans and long-term strategies were used. Applying the GDP growth rates set out in the EU document, GHG emissions in 2030 are lower by 0.1 per cent compared with the WEM scenario and by 2.8 per cent compared with the WAM scenario, while GHG emissions in 2040 are lower by 2.3 per cent compared with the WEM scenario and by 5.7 per cent compared with the WAM scenario. Applying the population parameters set out in the EU document (3.76 million inhabitants in Croatia in 2030 and 3.53 million in 2040), GHG emissions in 2030 are 1.2 per cent higher compared with the WEM scenario and 0.6 per cent higher compared with the WAM scenario, while GHG emissions in 2040 are 1.4 per cent higher compared with the WEM scenario and 1.0 per cent higher compared with the WAM scenario.

(c) Results of projections

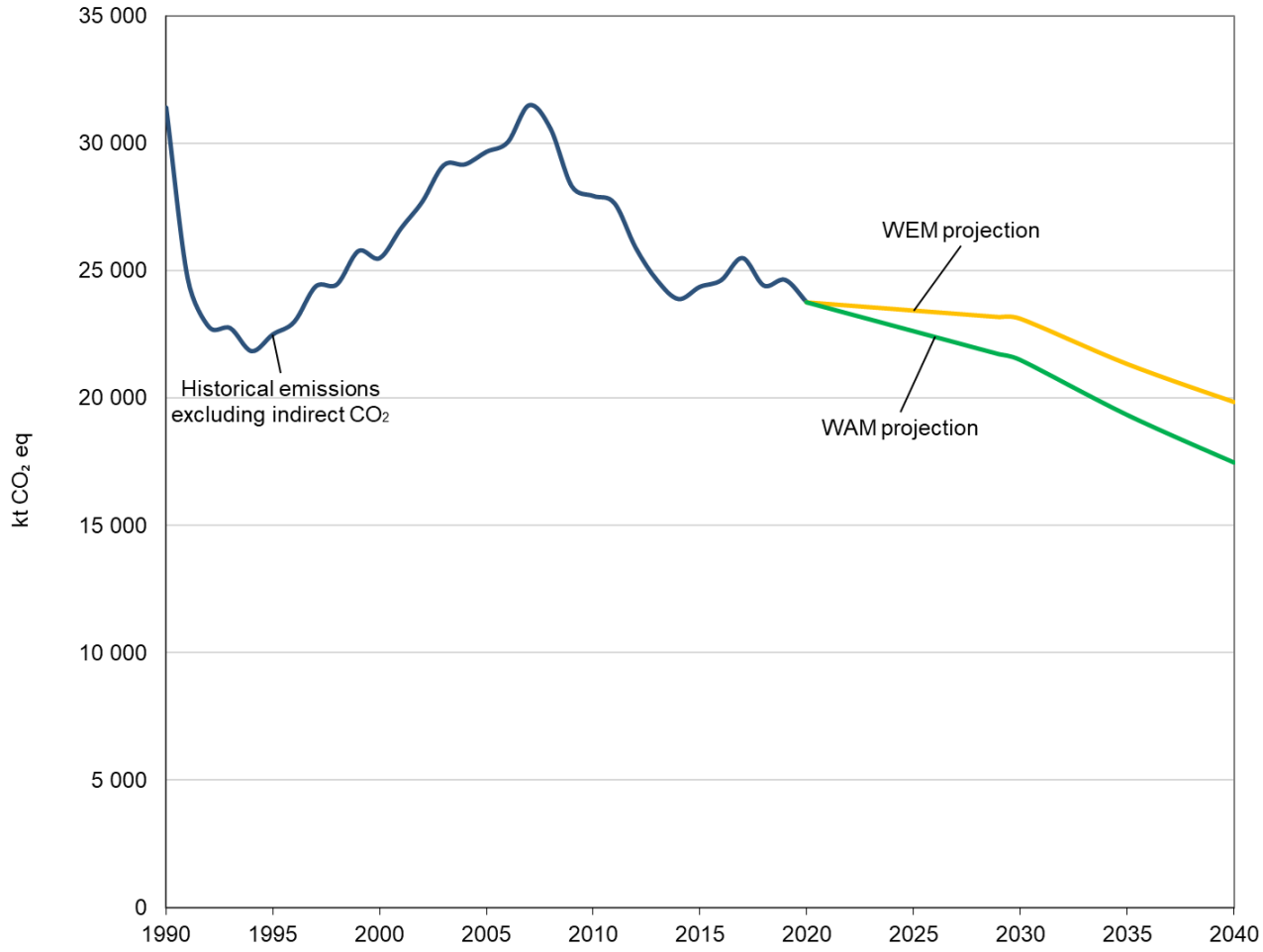
66. The projected emission levels under different scenarios are presented in table 7 and figure 1.

Table 7
Summary of greenhouse gas emission projections for Croatia

	GHG emissions (kt CO_2 eq/year)	*Change in relation to 1990 level (%)*	*Change in relation to 2020 level (%)*
Inventory data 1990	31 394.43	NA	NA
Inventory data 2020	23 758.40	–24.3	NA
WEM projections for 2030	23 115.89	–26.4	–2.7
WAM projections for 2030	21 496.40	–31.5	–9.5
WEM projections for 2040	19 843.25	–36.8	–16.5
WAM projections for 2040	17 466.46	–44.4	–26.5

Sources: Croatia's NC8 and BR5 CTF table 6 and table 5-1, which use GWP values from the AR4.
Note: The projections are of GHG emissions excluding LULUCF and excluding indirect CO_2.

Figure 1
Greenhouse gas emission projections reported by Croatia

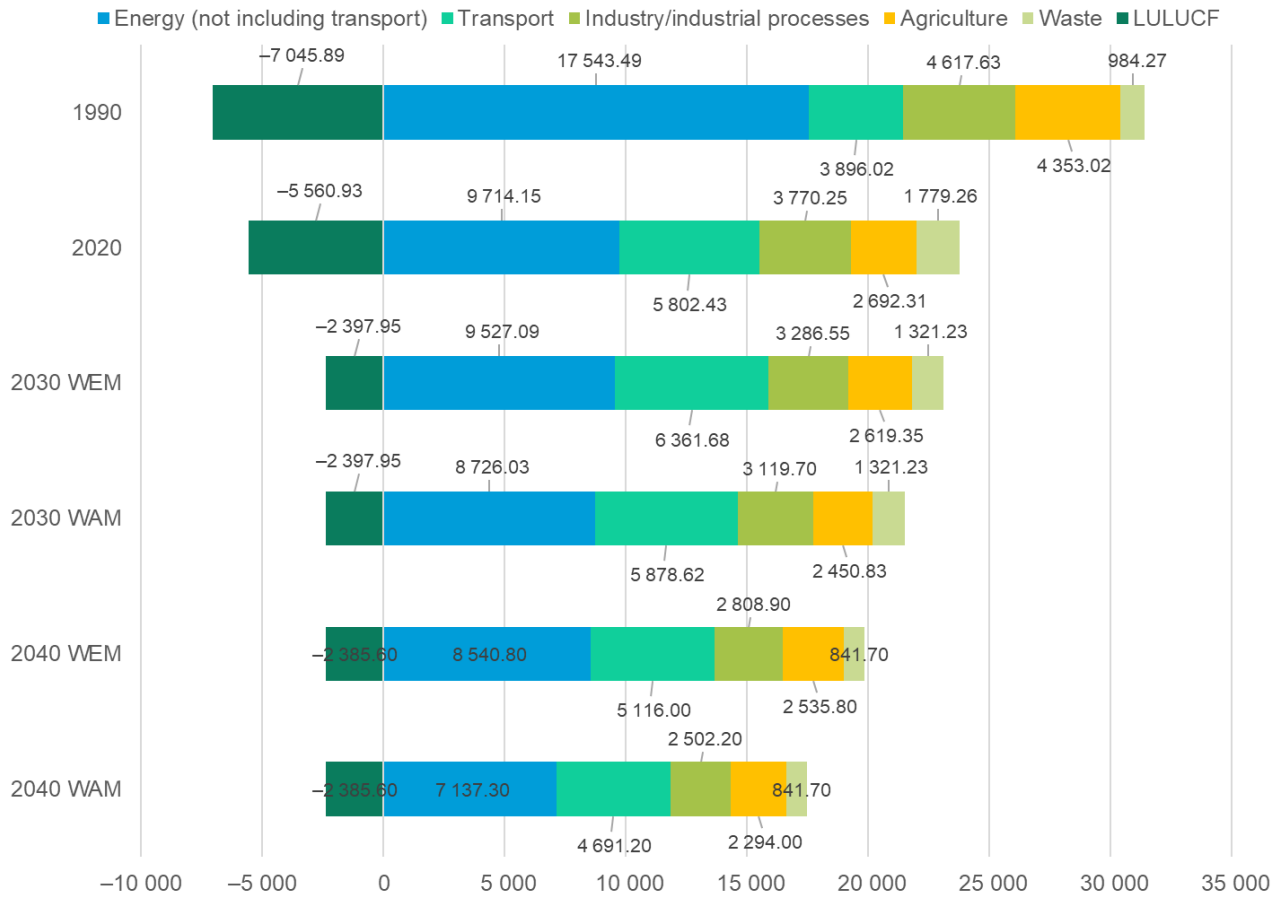


Sources: Croatia's NC8 and BR5 CTF tables 1 and 6 (total GHG emissions excluding LULUCF), which use GWP values from the AR4.

67. Croatia's total GHG emissions excluding LULUCF are projected under the WEM scenario to decrease by 26.4 and 36.8 per cent below the 1990 level in 2030 and 2040 respectively. When including LULUCF, total GHG emissions are projected under the WEM scenario to decrease by 14.9 per cent below the 1990 level in 2030. Projections of total emissions including LULUCF under the WEM and WAM scenarios were not reported for 2035 and 2040 in the NC8, and LULUCF projections were presented separately in the NC8. Under the WAM scenario, emissions in 2030 and 2040 are projected to be lower than those in 1990 by 31.5 and 44.4 per cent respectively.

68. Croatia presented the WEM and WAM scenarios by sector for 2030 and 2040, as summarized in figure 2 and table 8.

Figure 2
Greenhouse gas emission projections for Croatia presented by sector
(kt CO_2 eq)



Sources: Croatia's NC8 and BR5 CTF table 6, which use GWP values from the AR4.

Table 8
Summary of greenhouse gas emission projections for Croatia presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2030		*2040*		*1990–2030*		*1990–2040*	
Sector	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (not including transport)	17 543.49	9 527.09	8 726.03	8 540.80	7 137.30	–45.7	–50.3	–51.3	–59.3
Transport	3 896.02	6 361.68	5 878.62	5 116.00	4 691.20	63.3	50.9	31.3	20.4
Industry/industrial processes	4 617.63	3 286.55	3 119.70	2 808.90	2 502.20	–28.8	–32.4	–39.2	–45.8
Agriculture	4 353.02	2 619.35	2 450.83	2 535.80	2 294.00	–39.8	–43.7	–41.8	–47.3
LULUCF	–7 045.89	–2 397.95	–2 397.95	–2 385.60	–2 385.60	66.0	66.0	66.1	66.1
Waste	984.27	1 321.23	1 321.23	841.70	841.70	34.2	34.2	–14.5	–14.5
Other	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA
Total GHG emissions excluding LULUCF	**31 394.43**	**23 115.89**	**21 496.40**	**19 843.20**	**17 466.50**	**–26.4**	**–31.5**	**–36.8**	**–44.4**

Sources: Croatia's NC8 and BR5 CTF table 6, which use GWP values from the AR4.

69. According to the projections reported for 2030 under the WEM scenario, the most significant absolute emission reductions are expected to occur in the energy sector, amounting to projected reductions of 45.7 per cent between 1990 and 2030. The pattern of

projected emissions reported for 2040 under the WEM scenario remains largely the same for most sectors, except for the transport and waste sectors. The transport sector shows an increasing emission trend until 2030, followed by a declining trend in 2035 and 2040. Emissions from the waste sector are projected to change significantly owing to higher absolute emission reductions in 2035 and in 2040 compared with the emission reductions in 2025 and 2030, with a projected decrease by 14.5 per cent below the 1990 level by 2040. When additional PaMs are taken into consideration in the WAM scenario, all sectors, except for the LULUCF and waste sectors, are projected to have higher emission reductions compared with the WEM scenario. The projections for the LULUCF and waste sectors under the WEM and WAM scenarios are identical.

70. Croatia presented the WEM and WAM scenarios by gas for 2030 and 2040, as summarized in table 9.

Table 9
Summary of greenhouse gas emission projections for Croatia presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2030		*2040*		*1990–2030*		*1990–2040*	
Gas[a]	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2	22 979.79	17 389.94	15 983.57	15 244.42	13 191.09	–24.3	–30.4	–33.7	–42.6
CH_4	4 307.79	3 237.69	3 065.94	2 606.28	2 331.76	–24.8	–28.8	–39.5	–45.9
N_2O	2 855.88	1 538.61	1 520.93	1 461.55	1 438.77	–46.1	–46.7	–48.8	–49.6
HFCs	NO	945.32	921.73	528.85	502.79	NA	NA	NA	NA
PFCs	1 240.24	NO	NO	NO	NO	–100.0	–100.0	–100.0	–100.0
SF_6	10.73	4.33	4.23	2.14	2.04	–59.6	–60.6	–80.1	–81.0
NF_3	NO	NO	NO	NO	NO	NA	NA	NA	NA
Total GHG emissions without LULUCF	**31 394.43**	**23 115.89**	**21 496.40**	**19 843.25**	**17 466.46**	**–26.4**	**–31.5**	**–36.8**	**–44.4**

Sources: Croatia's NC8 and BR5 CTF table 6, which use GWP values from the AR4.
[a] Croatia did not include indirect CO_2 emissions in its projections.

(d) Assessment of adherence to the reporting guidelines

71. The ERT assessed the information reported in the NC8 and BR5 of Croatia and identified issues relating to completeness and transparency, and thus adherence to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The findings are described in tables I.2 and II.2.

2. Assessment of the total effect of policies and measures

(a) Technical assessment of the reported information

72. In its NC8 Croatia presented the estimated and expected total effect of implemented and adopted PaMs, estimated as the difference between emissions in 2020 (the reference year for projections) and emissions in 2025, 2030, 2035 and 2040. Croatia also estimated the effect of planned PaMs as the difference between the total emissions under the WEM scenario and the WAM scenario. Information is presented in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis), in 2025, 2030, 2035 and 2040.

73. Croatia reported that the total estimated effect of its implemented and adopted PaMs is 186.50 kt CO_2 eq in 2025, 642.50 kt CO_2 eq in 2030, 2,421.50 kt CO_2 eq in 2035 and 3,915.20 kt CO_2 eq in 2040 (compared with 2020). According to the information reported in its NC8, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by PaMs implemented in the IPPU and waste sectors. The additional estimated effect of Croatia's planned PaMs is 983.50 kt CO_2 eq in 2025, 1,619.49 kt CO_2 eq in 2030, 1,998.60 kt CO_2 eq in 2035 and 2,376.80 kt CO_2 eq in 2040. Table 10 provides an overview of the total effect of PaMs as reported by Croatia.

Table 10
Projected effects of Croatia's planned, implemented and adopted policies and measures in 2030 and 2040
(kt CO_2 eq)

	2030		*2040*	
Sector	*Effect of implemented and adopted measures*	*Effect of planned measures*	*Effect of implemented and adopted measures*	*Effect of planned measures*
Energy (without transport)	NE	801.06	NE	1 403.50
Transport	NE	483.06	NE	424.80
Industry/industrial processes	NE	166.85	NE	306.70
Agriculture	NE	168.52	NE	241.80
Land-use change and forestry	NE	0.00	NE	0.00
Waste management	NE	0.00	NE	0.00
Total	**NE**	**1 619.49**	**NE**	**2 376.80**

Source: Croatia's NC8, which uses GWP values from the AR4.
Note: The total effect of implemented and adopted PaMs is defined as the difference between the WOM and the WEM scenarios. However, a WOM scenario was not reported, so the total effect of implemented and adopted PaMs cannot be estimated.

(b) Assessment of adherence to the reporting guidelines

74. The ERT assessed the information reported in the NC8 of Croatia and identified an issue relating to transparency, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.2.

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

(a) Technical assessment of the reported information

75. In the NC8 Croatia reported that it does not plan to use market-based mechanisms to meet its Kyoto Protocol target. The ERT notes that reporting on the supplementarity of such mechanisms is therefore not relevant for Croatia.

(b) Assessment of adherence to the reporting guidelines

76. The ERT assessed the information reported in the NC8 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

G. Provision of financial, technological and capacity-building support to developing country Parties

77. Croatia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3–5, of the Convention. However, Croatia provided information in its NC8 and BR5 on its provision of support to developing country Parties. Croatia reported that it provided USD 31,119 in 2019 and USD 18,709 in 2020 to specialized United Nations bodies, indicating that this financial support was allocated to the core budget of the UNFCCC. However, the amount provided specifically to support developing countries was not separately identified, as the support was classified as core/general.

H. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

78. In its NC8 Croatia provided information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Croatia provided a description of climate change vulnerability and impacts on eight key sectors, namely water resources, forestry, agriculture, fisheries, biodiversity, health, energy and tourism, and the two cross-sectoral areas of spatial planning and development and risk management, and highlighted the adaptation response actions taken and planned at different levels of government. These actions include the integration of climate change into the National Development Strategy of the Republic of Croatia until 2030 and other public policies, including environmental impact and strategic environmental assessments, as well as collaboration, research, knowledge exchange and financing for adaptation.

79. Croatia has addressed adaptation matters through the adoption of its Climate Change Adaptation Strategy of the Republic of Croatia for the period until 2040 with a view to 2070, which encompasses a total of 83 climate change adaptation measures and provided further direction to government agencies on enhancing preparedness for climate change. Table 11 summarizes the information on vulnerability and adaptation to climate change presented in the NC8 of Croatia.

Table 11
Summary of information on vulnerability and adaptation to climate change reported by Croatia

Vulnerable area	*Examples/comments/adaptation measures reported*
Water resources	Vulnerability: Reduction in surface and underground water; sea level rise and changes in sea thermohaline properties; saltwater intrusion; increased frequency and intensity of torrents, rainwater and flooding in vulnerable and urban areas.
	Adaptation: Measures to strengthen the resilience of urban areas to anthropogenic pressures determined by climate change, coastal zones and municipal infrastructure are being implemented. Planned measures include enhancing existing models, including by developing a forecasting model for rising sea levels; strengthening protection against extreme temperatures; increasing resilience in urban areas; and improving monitoring.
Agriculture	Vulnerability: Changes in the duration of vegetative periods and lower crop yields; increasing demand for irrigation; lower yields due to flooding and stagnation of surface water; reduced growth rate and quality of yields; emergence of new diseases affecting agricultural production.
	Adaptation: Implementing an experimental research programme on adaptation in the agriculture sector and integrating climate risks in the development of irrigation systems.
Biodiversity	Vulnerability: Habitat fragmentation; changes in ecosystem structure, functions and services, and in the composition of species communities, phenology, abundance and distribution; degradation and extinction of species due to extreme events including fires; loss of endemic species; and spreading of invasive alien species.
	Adaptation: Improving knowledge and creating databases with a view to assessing the vulnerability of ecosystems, habitats, wild species, protected areas and ecological network areas for predictive models; establishing a climate monitoring and early warning system; and integrating actions for the preservation and revitalization of natural ecosystems and biodiversity.
Energy	Vulnerability: Decrease in electricity production in hydropower plants; increase in the consumption of electricity for cooling purposes; decrease in the production of energy in thermal power plants; damage to energy infrastructure due to extreme weather events such as ice breaking and floods.
	Adaptation: Strengthening resilience in relation to the storage of electrical energy, and analysing existing capacities and vulnerabilities related to electricity and heat production.
Fisheries	Vulnerability: Species migration; increase in the number of alien species; decrease in primary production and pelagic fish; higher mortality of shellfish due to increased sea

Vulnerable area	*Examples/comments/adaptation measures reported*
	acidity; impaired capacity of ecosystem services; decrease in the socioeconomic stability of fisheries.
	Adaptation: Developing new markets, strengthening aquaculture capacities for breeding and supporting adaptive fisheries management.
Forestry	Vulnerability: Increased incidence of forest fires; decreased productivity of some ecosystems; migration of harmful organisms; shift in phenological phases; increased sensitivity and extinction rate of tree species; reduced forest capacity to provide ecosystem services.
	Adaptation: Incorporating adaptation into sectoral strategies, strengthening risk assessment, building capacities for fire protection including early warning systems and promoting afforestation and reforestation for climate resilience.
Health	Vulnerability: Increased mortality among the population; reduced air quality; reduction in the availability of potable water; increased levels of pollutants in the environment; impacts on the epidemiology of diseases related to climate factors.
	Adaptation: Developing health–economic indicators for climate conditions and human biomonitoring to track the impact of environmental factors on human health.
Risk management	Vulnerability: Fires caused by open burning; epidemics and pandemics; increased health and socioeconomic burden on communities due to food contamination and environmental pollution following extreme weather events.
	Adaptation: Strengthening the Croatian Disaster Risk Reduction Platform and conducting risk assessments.
Spatial planning and development	Vulnerability: Occurrence of heat islands in settlements; flooding in settlements caused by sea level rise; flooding in settlements due to extreme precipitation.
	Adaptation: Strengthening knowledge of sea level rise and its impacts on coastal areas, tourism, heat islands and extreme precipitation in settlements, and environmental and water protection; implementing public information and education programmes focusing on targeted groups in vulnerable areas, and information programmes for decision-makers at all levels of government.
Tourism	Vulnerability: Impact on attractiveness of coastal and inland areas; damage to and reduced functionality of various infrastructure systems; deterioration of ecosystems, biodiversity and cultural heritage important for tourism.
	Adaptation: Integrating climate change into the tourism development strategy and strengthening the resilience of tourism infrastructure to different weather extremes.

80. Croatia provided a detailed description of international adaptation activities, including specific projects such as the Climate Bridges project aimed at strengthening cooperation for transnational climate protection in the Western Balkans, from Croatia via Bosnia and Herzegovina to Albania, and highlighted key examples of climate protection from the region. The project includes the development of climate protection strategies with pilot regions in Albania, Bosnia and Herzegovina and Croatia, as well as the creation of a network for climate action in the Western Balkans to promote transnational climate policy in the region. Croatia also provided information on bilateral cooperation with developing countries on adaptation, such as the Interreg Instrument for Pre-Accession Assistance programmes Croatia–Bosnia and Herzegovina–Montenegro, and Croatia–Serbia for 2021–2027.

2. Assessment of adherence to the reporting guidelines

81. The ERT assessed the information reported in the NC8 of Croatia and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

I. Research and systematic observation

1. Technical assessment of the reported information

82. In its NC8 Croatia provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the World Climate Programme and the Global Climate Observing System. Croatia also 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.

83. Croatia has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. Examples include the AdriAdapt project, a resilience information platform for Adriatic cities and towns, which provided high-resolution climate projections with detailed information specific to the Adriatic region to support local and regional resilience; the Adriatic Decadal and Interannual Oscillations: Observations, Modelling and Consequences project, designed to investigate and quantify processes driving interannual to decadal thermohaline variations in the Adriatic–Ionian basin; and the Carstic Coastal Water Management Endangered by Climate Change project, focused on research on unwanted consequences of climate change in coastal karst aquifers, such as an increase in salinity and water temperature and a deterioration in water quality.

84. In terms of activities related to systematic observation, Croatia reported on national plans, programmes and support for ground-based climate observing systems. This includes the modernization of its meteorological and hydrological observation networks, along with contributions to international data centres including the Global Runoff Data Centre, the Water Information System for Europe State of Environment database (emissions to water) and the European Flood Awareness System, providing flow data from hydrological stations and on groundwater levels from limnigraphic and piezometer stations. Other activities include monitoring air quality, coastal waters, and data and indicators on the marine environment, mariculture and fisheries, and contributions to networks specified in the Global Climate Observing System Implementation Plan. Croatia also reported on challenges related to the maintenance of a consistent and comprehensive observation system.

85. The NC8 reflects actions taken to support capacity-building in developing countries. Cross-border cooperation between Croatia, Bosnia and Herzegovina, Montenegro and Serbia on a range of topics including climate change has been established through the EU Interreg Instrument for Pre-Accession Assistance programmes Croatia–Bosnia and Herzegovina–Montenegro and Croatia–Serbia for 2021–2027.

2. Assessment of adherence to the reporting guidelines

86. The ERT assessed the information reported in the NC8 of Croatia and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.3.

J. Education, training and public awareness

1. Technical assessment of the reported information

87. In its NC8 Croatia provided information on its actions relating to education, training and public awareness at the domestic and international 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. In particular, Croatia's Low-Carbon Development Strategy highlights the role of the education system in promoting the principles of low-carbon development, while its Climate Change Adaptation Strategy

contains measures related to raising awareness and knowledge on adaptation. In its NC8, Croatia also highlighted its participation in projects and programmes on environmental protection and sustainable development, such as the Global Learning and Observation for Benefit of the Environment Programme, the Eco-Schools project and the national Young Guardians of Nature programme, which advance environmental education activities, enable networking and ensure mutual support. Comprehensive information was also provided on activities in which non-governmental organizations participate; activities related to the provision of information for and education of professionals; and resources for information and education, such as the interactive platform on climate change adaptation and the national energy efficiency portal.

2. Assessment of adherence to the reporting guidelines

88. The ERT assessed the information reported in the NC8 of Croatia and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.4.

III. Conclusions and recommendations

89. The ERT conducted a technical review of the information reported in the NC8 of Croatia in accordance with the UNFCCC reporting guidelines on NCs. The ERT concluded that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC8 provides an overview of the national climate policy of Croatia.

90. The information provided in the NC8 includes all elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Croatia reported on the national system, the national registry, supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, PaMs in accordance with Article 2 of the Kyoto Protocol, domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures, and information under Article 10 of the Kyoto Protocol. 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 Croatia in its 2023 inventory submission.

91. The ERT conducted a technical review of the information reported in the BR5 and BR5 CTF tables of Croatia in accordance with the UNFCCC reporting guidelines on BRs. The ERT concluded that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and that the BR5 and its CTF tables provide an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; and the progress of Croatia towards achieving its target.

92. In its NC8 Croatia reported on its key national circumstances related to GHG emissions and removals, including its legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency, water resource management and the impact of post-war contamination. Croatia reported that economic decline, including as a result of the pandemic, resulted in reduced industrial activity, and thus a decrease in GHG emissions, which was reinforced by the rise in installations of facilities using RES and the implementation of PaMs such as the Energy Renovation Program for Public Sector Buildings. Croatia noted that the increase in GHG emissions was mainly attributable to economic recovery and growth.

93. Croatia's total GHG emissions excluding LULUCF in 2020 were estimated to be 24.0 per cent below its 1990 level, using GWP values from the AR5. Emissions decreased in 1990–1994, followed by a steady increase which peaked in 2007, and a decreasing trend between 2008 and 2014, with a slightly fluctuating trend in 2015–2021. The changes in total emissions were driven by different factors in different time periods. The decrease in emissions in 1990–1994 was caused by the war, while from 1995 to 2007 the steady increase in emissions was due to the higher consumption of liquid fuels. The global economic crisis and decrease in industrial production led to a decline in emissions between 2008 and 2014,

followed by an increase between 2015 and 2017 resulting from Croatia's moderate economic recovery. The decrease in emissions in 2018–2020 was mainly caused by the reduction in emissions in all subsectors of the energy sector, which was followed by an increase in emissions in 2021 in all subsectors of the energy sector (except for fugitive emissions) compared with 2020.

94. As reported in the BR5, under the Convention Croatia committed to contributing to the achievement of the joint EU quantified economy-wide target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covered all sectors and CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector were not included. Under the ESD Croatia had a target of limiting its emission growth to 11.0 per cent above the 2005 level by 2020.

95. The EU has a joint 2030 emission reduction target of at least 55 per cent below the 1990 level. This will be primarily implemented through the EU ETS and ESR, which have targets to reduce emissions by 2030 by 62 and 40 per cent respectively compared with the 2005 level. Under the ESR, Croatia has a revised target of reducing emissions by 16.7 per cent by 2030 compared with the 2005 level. The EU's 2040 emission reduction target, which would be 90.0 per cent reduction compared with the 1990 level, as well as national contributions to meeting this target, are still under discussion.

96. The ERT noted that the total GHG emissions of the EU excluding LULUCF do not exceed the emission level corresponding to the target in 2020, and thus that the EU has achieved its joint target. The ERT therefore concluded that Croatia has met its 2020 commitment under the Convention through its contribution to achieving the joint target of the EU. See the report on the technical review of the BR5 of the EU for further details. The ERT noted that the Party met its 2020 ESD target because its ESD emissions in 2020 did not exceed its AEA for 2020.

97. The GHG emission projections provided by Croatia in its NC8 and BR5 correspond to the WEM and WAM scenarios. Under the WEM scenario, emissions in 2030 are projected to be 26.4 per cent below the 1990 level and 2.7 per cent below the 2020 level. Under the WAM scenario, emissions in 2030 are projected to be 31.5 per cent below the 1990 level and 9.5 per cent below the 2020 level.

98. Croatia's main policy framework relating to energy and climate change is governed by the Act on Climate Change and Ozone Layer Protection, through which the Party oversees the implementation of EU directives on climate action and ozone layer preservation, while the National Development Strategy, which serves as the overarching strategic planning document, is used to align development policies towards achieving climate neutrality through emission reductions. The Party described the mitigation actions that it has implemented to help it achieve its 2020 and longer-term targets, which include measures set out in the National Action Plan for Energy Efficiency. These PaMs include promoting nearly zero energy buildings in construction and renovation standards and requiring all newly constructed buildings to adhere to these standards. In addition, Croatia has implemented measures to enhance the efficiency of district heating systems and the gas transport network, while also advocating for increased use of RES for electricity and heat production.

99. Croatia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3–5, of the Convention.

100. In its NC8 Croatia provided information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Croatia highlighted its vulnerabilities and risks, in particular for water resources, forestry, agriculture, fisheries, biodiversity, health, energy and tourism, and the cross-sectoral areas of spatial planning and development and risk management. Adaptation measures for all these sectors are set out in Croatia's Climate Change Adaptation Strategy for the period until 2040 with a view to 2070.

101. In its NC8 Croatia provided information on its activities relating to research and systematic observation. Croatia has implemented and cooperated in research projects, such as the AdriAdapt project, a resilience information platform for Adriatic cities and towns,

which provided high-resolution climate projections with detailed information for the Adriatic region. Croatia has modernized its meteorological and hydrological observation networks and has contributed to international data centres, such as the Global Runoff Data Centre, the Water Information System for Europe State of Environment database, the European Flood Awareness System and the Global Climate Observing System.

102. In its NC8 Croatia provided information on its actions relating to education, training and public awareness. Croatia highlighted its participation in projects and programmes on environmental protection and sustainable development, such as the Global Learning and Observation for Benefit of the Environment Programme, the Eco-Schools project and the national Young Guardians of Nature programme, as well as resources for information and education such as the interactive platform on climate change adaptation.

103. In the course of the review, the ERT formulated the following recommendations for Croatia to improve its adherence to the UNFCCC reporting guidelines on NCs in its next NC:

(a) To improve the transparency of its reporting by providing an estimate of GHG emissions avoided by gas (on a CO_2 eq basis) based on the total effect of PaMs for the projections under the WEM scenario compared with a situation without such PaMs (see issue 4 in table I.2);

(b) To improve the timeliness of its reporting by submitting its next NC on time (see para. 5 above).

104. In the course of the review of Croatia's BR5, the ERT formulated a recommendation relating to adherence to the UNFCCC reporting guidelines on BRs, specifically to improve the timeliness of its reporting (see para. 7 above).

Annex I

Assessment of adherence to the reporting guidelines for the eighth national communication of Croatia

Tables I.1–I.4 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on NCs for Croatia's NC8.

Table I.1
Findings on greenhouse gas inventory information from the review of the eighth national communication of Croatia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 7 Issue type: transparency Assessment: encouragement	In its NC8, the Party provided a descriptive summary and figures illustrating GHG emission and removal trends and a description of the factors underlying the emission trends in all sectors, with the exception of the LULUCF sector. Croatia reported that the main reason for the changes in LULUCF emissions in 1990–2020 was due to land-use change. However, without more detailed information, it was not clear which land-use categories have changed over this period. During the review, the Party provided additional information on the trends in LULUCF sector emissions and a description of the factors underlying the emission trends in the LULUCF sector. For the forest land category, the underlying factors affecting emission trends include a change in the age-class structure of forests, as well as increased harvesting rates following the 1991–1995 conflict which took place in Croatia. The Party explained that the settlements category is the main contributing category to LULUCF emissions, while the wetlands category is the lowest contributing category. However, the Party did not provide an explanation of the factors underlying these emission trends. Croatia also explained that changes in some of the emission factors used and reported areas are driving the changes in emission trends in the cropland category. The ERT reiterates the encouragement from the previous review report for Croatia to provide a detailed description of the factors underlying the emission trends for the LULUCF sector in its next NC.

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 and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs.

Table I.2
Findings on projections including aggregate effects of policies and measures reported in the eighth national communication of Croatia

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: encouragement	The Party used 2020 as the starting point for the WEM and WAM scenario projections. The ERT noted that at the time of the submission of the NC8, the 2023 inventory submission was the most recent submission (submitted on 13 April 2023), in which the most recent inventory year is 2021. During the review, Croatia explained that 2020 was used as the starting point (reference year) for the projections because the modelling of the projections was conducted at the end of 2022 and beginning of 2023, when the 2022 NIR was the last available NIR, in which the most recent inventory year was 2020. The ERT reiterates the encouragement from the previous review report for Croatia to provide in its next NC projections using the most recent inventory year for which GHG inventory data are available as the starting point.
2	Reporting requirement specified in paragraph 32	The Party did not report projections of indirect emissions of CO, NO_X and NMVOCs, as well as SO_X, in its NC8. In the NC8, the Party explained that projections of indirect GHG emissions are compiled under the National Air Pollution Control Programme for 2020–2029, but are inconsistent and not aligned with current strategic and planning documents.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Issue type: completeness Assessment: encouragement	During the review, Croatia clarified that at the time of preparation of the NC8, projections of indirect GHG emissions with 2020 as the most recent historical year that are aligned and consistent with strategic and planning documents and with the projections of direct GHG emissions were not available. The ERT reiterates the encouragement from the previous review report for Croatia to provide projections of indirect GHG emissions of CO, NO_X and NMVOCs, as well as SO_X, in its next NC.
3	Reporting requirement specified in paragraph 37 Issue type: transparency Assessment: recommendation	The Party did not report an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs. The ERT noted that the Party reported the total effect of the implementation of PaMs for the WEM scenario as the difference between the emissions in 2020 and the emissions in 2025, 2030, 2035 and 2040. During the review, Croatia explained that the total effect of PaMs was not estimated compared with a situation without such PaMs because the necessary data are not available. The ERT reiterates the recommendation from the previous review report that when presenting the total effect of its PaMs in the next NC, the Party provide an estimate of GHG emissions avoided by gas (on a CO_2 eq basis) based on the total effect of PaMs in accordance with the WEM scenario, compared with a situation without such PaMs.

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 and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs.

Table I.3
Findings on research and systematic observation from the review of the eighth national communication of Croatia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 67 Issue type: completeness Assessment: encouragement	Croatia provided information on the current status of national plans, programmes and support for ground- and space-based national climate observing systems. However, the NC8 did not contain information regarding the support for developing countries to establish and maintain observing systems and related data and monitoring systems. During the review, Croatia explained that, to date, it has not provided support for developing countries to establish and maintain observing systems and related data and monitoring systems, but that it is planning to do so in future. The ERT encourages Croatia to include in its next NC information on support for developing countries to establish and maintain observing systems and related data and monitoring systems or state clearly in its next NC that no such support was provided.

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 and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs.

Table I.4
Findings on education, training and public awareness from the review of the eighth national communication of Croatia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 68 Issue type: completeness Assessment: encouragement	In the NC8, the information on actions relating to education, training and public awareness reported does not include information on the extent of public participation in the preparation or domestic review of the NC. During the review, the Party explained that the Croatian Meteorological and Hydrological Service, as the relevant professional institution, prepared selected chapters of the NC and that the general public was not involved in the preparation of the NC. The ERT encourages Croatia to include in its next NC information on the extent of public participation in the preparation or domestic review of the NC.

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 and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs.

Annex II

Assessment of adherence to the reporting guidelines for the fifth biennial report of Croatia

The BR5 of Croatia is the final BR under the measurement, reporting and verification system established under the Convention.[1] Nevertheless, ERTs continue to provide recommendations and encouragements to the Parties on completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. Parties may find these recommendations and encouragements relevant, as appropriate, when preparing their initial biennial transparency report under the enhanced transparency framework of the Paris Agreement. Tables II.1–II.2 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on BRs for Croatia's BR5.

Table II.1
Findings on mitigation actions and their effects from the review of the fifth biennial report of Croatia

No.	*Reporting requirement and issue type*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 8 Issue type: completeness Assessment: encouragement	The Party did not report information on the assessment of the economic and social consequences of response measures in its BR5. However, relevant information was reported in the NC8. During the review, Croatia clarified that the relevant information reported in the NC8 was also used for reporting under the BR5 and suggested that it could add a reference to that section of the NC in its next submission. The ERT encourages Croatia to provide, to the extent possible, information on the assessment of the economic and social consequences of response measures, including by adding cross-references, as appropriate.

Note: Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs or to the CTF table number from the UNFCCC reporting guidelines on CTF tables. The reporting on the requirements not included in this table is considered to be complete and transparent, and thus adheres to the UNFCCC reporting guidelines on BRs.

Table II.2
Findings on projections reported in the fifth biennial report of Croatia

No.	*Reporting requirement and issue type*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement[a] specified in paragraph 29 Issue type: transparency Assessment: encouragement	The Party used 2020 as the starting point for the WEM and WAM scenario projections. The ERT noted that at the time of the submission of the BR5, the 2023 inventory submission was the most recent submission (submitted on 13 April 2023), in which the most recent inventory year is 2021. During the review, Croatia explained that 2020 was used as the starting point (reference year) for the projections because the modelling of the projections was conducted at the end of 2022 and beginning of 2023, when the 2022 NIR was the last available NIR, in which the most recent inventory year was 2020. The ERT reiterates the encouragement from the previous review report for Croatia to provide projections using the most recent inventory year for which GHG inventory data are available as the starting point.
2	Reporting requirement[a] specified in paragraph 32 Issue type: completeness	The Party did not report projections of indirect emissions of CO, NO_X and NMVOCs, as well as SO_X, in its BR5. However, the ERT noted that in the NC8, the Party explained that projections of indirect GHG emissions are compiled under the National Air Pollution Control Programme for 2020–2029, but are inconsistent and not aligned with current strategic and planning documents.

[1] The COP, by decision 1/CP.24, decided that the final BRs shall be those submitted to the secretariat no later than 31 December 2022 and reaffirmed that, for Parties to the Paris Agreement, following the submission of the final BR, the modalities, procedures and guidelines contained in the annex to decision 18/CMA.1 will supersede the measurement, reporting and verification system established under decision 1/CP.16, paras. 40–47 and 60–64, and decision 2/CP.17, paras. 12–62.

No.	*Reporting requirement and issue type*	*Description of the finding with recommendation or encouragement*
	Assessment: encouragement	During the review, Croatia clarified that at the time of preparation of the BR5, projections of indirect GHG emissions with 2020 as the most recent historical year that are aligned and consistent with strategic and planning documents and with the GHG emission projections were not available. The ERT reiterates the encouragement from the previous review report for Croatia to provide projections of indirect GHG emissions of CO, NO_X and NMVOCs, as well as SO_X.
3	Reporting requirement[a] specified in paragraph 42 Issue type: completeness Assessment: encouragement	Croatia reported that there were changes to some of the parameters (e.g. GDP, population and certain sector-specific data) used to prepare the projections compared with the previous submission. Croatia reported information on more key assumptions in the BR4 than in the BR5. The value for the GDP growth rate for 1995 was not reported in CTF table 5. In addition, information on the main differences in the assumptions used in the BR5 compared with those used in the NC7 was not provided. During the review, Croatia explained that CTF table 5 shows the key assumptions used, as required by the UNFCCC reporting guidelines on NCs. The Party further explained that the value for the GDP growth rate for 1995 was not reported in CTF table 5 because relevant and reliable data for 1995 are not available. The ERT reiterates the encouragement from the previous review report that the Party report the main differences in the assumptions used between the projections reported in the BR and those reported in previous NCs.

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

[a] Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs, as per para. 11 of the UNFCCC reporting guidelines on BRs.

Annex III

Documents and information used during the review

A. Reference documents

2022 GHG inventory submission of Croatia. Available at https://unfccc.int/ghg-inventories-annex-i-parties/2022.

2023 GHG inventory submission of Croatia. Available at https://unfccc.int/ghg-inventories-annex-i-parties/2023.

BR4 of Croatia. Available at https://unfccc.int/BR4.

BR5 CTF tables of Croatia. Available at https://unfccc.int/BR5.

BR5 of Croatia. Available at https://unfccc.int/BR5.

BR5 of the EU. Available at https://unfccc.int/BR5.

"Common tabular format for 'UNFCCC biennial reporting guidelines for developed country Parties'". Annex to decision 19/CP.18. Available at https://unfccc.int/resource/docs/2012/cop18/eng/08a03.pdf.

"Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention". FCCC/SBSTA/2014/INF.6. Available at http://unfccc.int/resource/docs/2014/sbsta/eng/inf06.pdf.

European Green Deal. European Commission document COM(2019) 640 final. Available at https://ec.europa.eu/info/files/communication-european-green-deal_en.

"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/2019/13/Add.1. Available at https://unfccc.int/documents/210471.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex to decision 15/CMP.1. Available at https://unfccc.int/documents/4253.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Annex III to decision 3/CMP.11. Available at https://unfccc.int/documents/9101.

"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.

National energy and climate plans of Croatia. Available at https://commission.europa.eu/system/files/2023-07/CROATIA_per cent20DRAFTper cent20UPDATEDper cent20NECPper cent202021per cent202030per cent20per cent282per cent29_0.pdf.

NC8 of Croatia. Available at https://unfccc.int/NC8.

NC8 of the EU. Available at https://unfccc.int/NC8.

Report on the individual review of the annual submission of Croatia submitted in 2022. FCCC/ARR/2022/HRV. Available at https://unfccc.int/documents/627327.

Report on the technical review of the BR4 of Croatia. FCCC/TRR.4/HRV. Available at https://unfccc.int/documents/274768.

Report on the technical review of the NC8 and the technical review of the BR5 of the EU. FCCC/IDR.8/EU–FCCC/TRR.5/EU. Available at https://unfccc.int/documents/630393.

"UNFCCC biennial reporting guidelines for developed country Parties". Annex I to decision 2/CP.17. Available at http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Višnja Grgasović (Ministry of Economy and Sustainable Development of Croatia).