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COMPLIANCE COMMITTEE

CC/ERT/2011/21  
11 October 2011

**Report of the in-depth review of the fifth national communication  
of Croatia**

**Note by the secretariat**

The report of the in-depth review of the fifth national communication of Croatia was published on 7 October 2011. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.5/HRV, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.





**Framework Convention on  
Climate Change**

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Parties included in Annex I to the Convention are requested, in accordance with decision 10/CP.13, to submit a fifth national communication to the secretariat by 1 January 2010. In accordance with decision 8/CMP.3, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their fifth national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This report presents the results of the in-depth review of the fifth national communication of Croatia conducted by an expert review team in accordance with the relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

## Contents

	<i>Paragraphs</i>	<i>Page</i>
I. Introduction and summary .....	1–9	3
A. Introduction .....	1–4	3
B. Summary .....	5–9	3
II. Technical assessment of the reviewed elements .....	10–88	4
A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures .....	10–23	4
B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol .....	24–54	9
C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms .....	55–71	16
D. Vulnerability assessment, climate change impacts and adaptation measures	72–74	20
E. Research and systematic observation .....	75–79	22
F. Education, training and public awareness .....	80–84	23
G. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol .....	85–86	24
H. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol .....	87–88	25
III. Conclusions and recommendations .....	89–102	25
IV. Questions of implementation .....	103	28
Annex		
Documents and information used during the review.....		29

## I. Introduction and summary

### A. Introduction

1. For Croatia the Convention entered into force on 7 July 1996 and the Kyoto Protocol on 28 August 2007. Under the Kyoto Protocol, Croatia committed itself to reducing its greenhouse gas (GHG) emissions by 5 per cent in relation to the base year<sup>1</sup> level during the first commitment period from 2008 to 2012.

2. This report covers the centralized in-depth review (IDR) of the fifth national communication (NC5) of Croatia, coordinated by the UNFCCC secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 9 to 14 May 2011 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Jorge Alvarez Lam (Peru), Mr. Kennedy Amankwa (Ghana), Mr. Eric De Brabanter (Luxembourg), Ms. Violeta Hristova Hristova (Bulgaria), Ms. Tuğba İçmeli (Turkey), Mr. Seungdo Kim (Republic of Korea), Ms. Sara Moarif (France) and Mr. Nguyen Mong Cuong (Viet Nam). Mr. Alvarez Lam and Mr. De Brabanter were the lead reviewers. The review was coordinated by Ms. Inkar Kadyrzhanova and Ms. Barbara Muik (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each section of the NC5. The ERT also evaluated the supplementary information provided by Croatia as a part of the NC5 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Croatia in its 2010 annual submission and elaborated on further in its 2011 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

4. In accordance with decision 22/CMP.1, a draft version of this report was communicated to the Government of Croatia, which informed the ERT that it had no comments for incorporation in this final version of the report.

### B. Summary

5. The ERT noted that Croatia's NC5 complies in general with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol<sup>2</sup> is provided in the NC5. Croatia considered most of the recommendations provided in the report of the centralized in-depth review of the second, third and fourth national communications of Croatia.<sup>3</sup> The ERT commended Croatia for its coherent and consistent reporting.

6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3 above was mostly transparent and mostly complete and was provided on time. During the review, Croatia provided further relevant information.

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<sup>1</sup> "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

<sup>2</sup> Decision 15/CMP.1, annex, chapter II.

<sup>3</sup> FCCC/IDR.4/HRV.

### **1. Completeness**

7. The NC5 covers all sections required by the UNFCCC reporting guidelines, and most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, except for information on how Croatia strives to implement policies and measures (PaMs) under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts, on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention; and the steps taken to promote and/or implement any decisions of the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) in order to limit or reduce GHG emissions not controlled by the Montreal Protocol from aviation and marine bunker fuels (see paras. 25 and 53 below). The NC5 does not include some information required by the UNFCCC reporting guidelines on PaMs (see para. 25 below); projections and the total effect of PaMs (see para. 56 below); and research and systematic observation (see paras. 76–78 below). During the review, Croatia provided the additional information on the missing reporting elements. The ERT recommends that Croatia enhance the completeness of its reporting by including this information in its next national communication.

### **2. Transparency**

8. The ERT acknowledged that Croatia's NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, is broadly transparent. The NC5 provides clear information on most aspects of implementation of the Convention and its Kyoto Protocol. The NC5 is structured following the outline contained in the annex to the UNFCCC reporting guidelines and supplementary information submitted under Article 7, paragraph 2, of the Kyoto Protocol is easily identifiable. In the course of the review, the ERT formulated a number of recommendations that could help Croatia to further increase the transparency of its reporting with regard to: the description of the national registry (see para. 22 below); projections and total effects of PaMs (see paras. 58 and 68 below); vulnerability and adaptation (see para. 74 below); research and systematic observation (see para. 78 below); education, training and public awareness (see para. 80 below); and information on the minimization of adverse impacts (see para. 88 below).

### **3. Timeliness**

9. The NC5 was submitted on 12 February 2010, after the deadline of 1 January 2010 mandated by decision 10/CP.13. Croatia informed the secretariat about its difficulties with the timeliness of its national communication submission on 29 December 2009 in accordance with paragraph 139 of decision 22/CMP.1. The ERT noted with concern the delay in the submission of the NC5.

## **II. Technical assessment of the reviewed elements**

### **A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures**

10. In its NC5, Croatia has provided a concise description of the national circumstances and has elaborated on the framework legislations and key policy documents on climate change. The NC5 also referred to the description of the national system provided in the

report mandated by decision 13/CMP.1, submitted in 2008,<sup>4</sup> and in the national inventory report (NIR) of the Party's 2009 annual submission. Further technical assessment of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B.1 below.

## 1. National circumstances

11. In its NC5, Croatia has provided a description of its national circumstances, and information on how these national circumstances affect GHG emissions and removals in Croatia and how changes in these national circumstances affect GHG emissions and removals over time. Information was provided on the government structure, population, geography, climate, economy and relevant economic sectors. The ERT noted that the main drivers of emission trends in Croatia include the transition from a centrally planned to a market economy, which started in the early 1990s, the massive restructuring of the economy and the spillover effects of the global economic crisis of the late 2000s.

12. At the beginning of the 1990s, the Party experienced its largest fall in emissions and a significant slowdown in economic activity, driven by the collapse of the regional economic cooperation and the break-up of Yugoslavia. The period 2000–2005 is associated with a relative decoupling of the emission trend from growth in gross domestic product (GDP), as well as with a relative decarbonization of the economy. Croatia's economy provides an example of the transition towards a low-carbon economy that is characterized by economic growth, especially in the 2000s, and the reduction of carbon intensity, measured by the decrease of GHG emissions per GDP unit (see para. 17 below). The ERT encourages Croatia to report in more detail on national circumstances that affect GHG emissions and removals, and on how changes in national circumstances affect GHG emissions and removals over time. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

13. Croatia is a parliamentary republic; its Government comprises 16 ministries, three central state administration offices, nine state bureaux and county offices of government bodies. The territorial and administrative structure of Croatia consists of 21 district (regional) self-government units, including 20 counties and the City of Zagreb, and 556 local self-government units, including 127 towns and 429 municipalities. The overall responsibility for climate change policymaking and implementation of the Convention lies within the Ministry of Environmental Protection, Physical Planning and Construction (MEPPPC). Implementation of the Convention and its Kyoto Protocol is underpinned by the Air Quality Protection and Improvement Plan for the period 2008–2011, adopted in May 2008. Further legislative arrangements and administrative procedures, including those for the national system and the national registry, are presented in chapters II.A.2, II.A.3 and II.B below.

14. Croatia requested flexibility, in accordance with Article 4, paragraphs 6 and 10, of the Convention, with regard to the determination of the level of emissions for the base year. Decision 7/CP.12 reflects the outcome of the consideration of this request and allows Croatia to add 3.5 Mt CO<sub>2</sub> eq to its 1990 level of total GHG emissions not controlled by the Montreal Protocol for the purpose of establishing the level of emissions for the base year for the implementation of its commitments under Article 4, paragraph 2, of the Convention.

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<sup>4</sup> Croatia's initial report under the Kyoto Protocol compiled to facilitate the calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol, available at <[http://unfccc.int/national\\_reports/initial\\_reports\\_under\\_the\\_kyoto\\_protocol/items/3765.php](http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/items/3765.php)>.

Table 1  
**Indicators relevant to greenhouse gas emissions and removals for Croatia**

	1990	1995	2000	2005	2008	Change 1990– 2000 (%)	Change 2000– 2008 (%)	Change 1990– 2008 (%)
Population (million)	4.78	4.67	4.43	4.44	4.43	-7.4	0.2	-7.2
GDP (USD 2000 billion using PPP)	56.0	40.6	47.5	59.3	67.12	-15.1	41.2	19.8
TPES (Mtoe)	8.99	7.05	7.79	8.88	9.09	-13.3	16.7	1.1
GDP per capita (USD 2000 thousand using PPP)	11.7	8.69	10.7	13.3	15.1	-8.3	40.9	29.2
TPES per capita (toe)	1.88	1.51	1.76	2.00	2.05	-6.4	16.5	9.0
GHG emissions without LULUCF (Tg CO <sub>2</sub> eq)	31.4	22.9	26.0	30.2	30.96	-17.3	19.0	-1.5
GHG emissions with LULUCF (Tg CO <sub>2</sub> eq)	24.5	16.1	18.8	22.1	22.32	-23.3	18.7	-8.9
CO <sub>2</sub> emissions per capita (Mg)	4.83	3.64	4.50	5.26	5.33	-6.8	18.4	10.3
CO <sub>2</sub> emissions per GDP unit (kg per USD 2000 using PPP)	0.41	0.42	0.42	0.39	0.35	1.6	-16.0	-14.6
GHG emissions per capita (Mg CO <sub>2</sub> eq)	6.58	4.92	5.88	6.82	6.98	-10.6	18.8	6.2
GHG emissions per GDP unit (kg CO <sub>2</sub> eq per USD 2000 using PPP)	0.56	0.57	0.55	0.51	0.46	-2.5	-15.7	-17.8

*Sources:* (1) GHG emissions data: Croatia's 2011 GHG inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

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

*Abbreviations:* GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

15. Croatia has provided a summary of information on GHG emission trends for the period 1990–2007. This information is broadly consistent with the 2009 annual submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO<sub>2</sub> eq) (given in the common reporting format), are also provided in an annex to the NC5. During the review, the ERT assessed the Party's recently submitted 2011 annual submission and it has reflected the findings in this report.

16. Total GHG emissions, excluding emissions and removals from land use, land-use change and forestry (LULUCF), decreased by 8.2 per cent between 1990 and 2009, whereas total GHG emissions, including net emissions or removals from LULUCF, decreased by 17.8 per cent. This decrease was mainly attributed to the decrease of carbon dioxide (CO<sub>2</sub>) emissions (by 5.8 per cent), which accounted for 65.9 per cent of total GHG emissions in 1990 and 64.7 per cent in 2009. Nitrous oxide (N<sub>2</sub>O) emissions decreased by 18.7 per cent during the period 1990–2009; their share was 16.1 per cent of total GHG emissions in 1990 and 15.9 per cent in 2009. Emissions of methane (CH<sub>4</sub>) increased by 0.1 per cent over the same period, and they accounted for 14.1 per cent of total GHG emissions in 1990 and



17.2 per cent in 2009. Emissions of fluorinated gases (F-gases) accounted for about 3.9 per cent of total GHG emissions in 1990 and 2.2 per cent in 2009.

17. A major drop in the Party's emissions occurred between 1990 and 1994, followed by an increase in emissions between 1995 and 2008 and a subsequent emission decrease in 2009. Trends in the total GHG emissions were underpinned by the emission trends in the energy sector, which were driven by growing energy consumption, increased energy production, the growing shares of natural gas and liquid fuels in the fuel mix, fluctuations in hydropower consumption, which depends on hydrological conditions, increasing transport flows and associated fuel consumption. Analysis of drivers for GHG emission trends in each sector is provided in chapter II.B below. Table 2 provides an overview of Croatia's GHG emissions and removals by sector from 1990 to 2009.

Table 2  
**Greenhouse gas emissions by sector in Croatia, 1990–2009**

Sector	GHG emissions (Tg CO <sub>2</sub> eq)						Change (%)		Shares <sup>a</sup> by sector (%)	
	1990	1995	2000	2005	2008	2009	1990–2009	2008–2009	1990	2009
1. Energy	22.53	17.06	19.28	22.60	22.81	21.46	-4.8	-5.9	71.7	74.4
A1. Energy industries	7.14	5.27	5.90	6.86	6.73	6.39	-10.5	-4.9	22.7	22.1
A2. Manufacturing industries and construction	5.87	3.56	3.63	4.10	4.21	3.39	-28.2	-19.5	18.7	11.8
A3. Transport	4.06	3.43	4.50	5.64	6.24	6.16	51.7	-1.4	12.9	21.3
A4.–A5. Other	3.79	2.92	3.51	3.98	3.53	3.53	-6.9	0.0	12.1	12.2
B. Fugitive emissions	1.67	1.87	1.74	2.02	2.10	1.99	19.4	-5.4	5.3	6.9
2. Industrial processes	3.81	2.01	2.85	3.27	3.57	2.96	-22.2	-17.0	12.1	10.3
3. Solvent and other product use	0.11	0.10	0.09	0.18	0.22	0.13	22.7	-40.0	0.3	0.5
4. Agriculture	4.38	3.07	3.14	3.48	3.43	3.31	-24.3	-3.3	13.9	11.5
5. LULUCF	-6.93	-6.86	-7.22	-8.10	-8.64	-8.71	25.7	0.8	-22.1	-30.2
6. Waste	0.61	0.74	0.66	0.75	0.93	1.00	62.9	6.9	1.9	3.5
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>GHG total with LULUCF</b>	<b>24.51</b>	<b>16.11</b>	<b>18.80</b>	<b>22.17</b>	<b>22.32</b>	<b>20.15</b>	<b>-17.8</b>	<b>-9.7</b>	<b>NA</b>	<b>NA</b>
<b>GHG total without LULUCF</b>	<b>31.44</b>	<b>22.98</b>	<b>26.02</b>	<b>30.27</b>	<b>30.96</b>	<b>28.87</b>	<b>-8.2</b>	<b>-6.8</b>	<b>100.0</b>	<b>100.0</b>

*Note:* The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

*Abbreviations:* GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable.

<sup>a</sup> The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

## 2. National system

18. In accordance with decision 15/CMP.1, Croatia provided in its NC5 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1 (decision 19/CMP.1). The description includes all the elements as required in decision 15/CMP.1.

19. In its NC5, Croatia has reported on a clear division of responsibility between the institutions participating in the inventory preparation: MEPPPC; the Croatian Environment Agency (CEA); and the authorized institution responsible for inventory compilation. MEPPPC is responsible for ensuring data collection and exchange between the national competent bodies, approval of the methodologies used for estimation of emissions and removals and approval of the national GHG inventory submission prior to its formal submission to the UNFCCC secretariat. CEA is responsible for organization of the inventory preparation process, collection of activity data, development of the quality assurance/quality control (QA/QC) plan, implementation of QA activities and archiving of activity data, emission factors and background information used for estimating emissions. The authorized institution, which is elected for three-year periods through open public tendering, is responsible for inventory planning, preparation and management, including calculation of emission estimates, undertaking uncertainty assessments, making recalculations, identification of key categories and other reporting requirements. In its 2010 and 2011 annual submissions, Croatia has reported no changes in the national system, but it has reported some changes in its QA/QC plan (see para. 21 below).

20. Croatia provided a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, of the Kyoto Protocol and its elected activity under Article 3, paragraph 4, of the Kyoto Protocol (forest management) also contributes to the conservation of biodiversity and the sustainable use of natural resources (see para. 50 below). The main legislation is part II of the Regulation on Greenhouse Gas Emissions Monitoring in the Republic of Croatia, which established the national system for the estimation and reporting of GHG emissions by sources and removals by sink and defined the roles and responsibilities of the institutions involved in the national system.

21. The ERT took note of the recommendations made in the report of the individual review of the 2010 annual submission of Croatia (2010 ARR)<sup>5</sup> related to the provision of more detailed information on the QA/QC plan and changes thereto. The ERT noted that, in its NC5, Croatia has reported on a new QA/QC plan prepared for its 2009 annual submission. The ERT also noted that additional information on the QA/QC plan was provided in the Party's 2011 annual submission. Further, during the review, the ERT learned that, following the recommendations made in the 2009 ARR, Croatia made some efforts to improve the reporting on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The ERT concluded that the national system continued to perform its required functions as set out in decision 19/CMP.1.

### **3. National registry**

22. In its NC5, Croatia has provided general information on the national registry. In its 2009 annual submission, the Party provided a more detailed description of the national system, including a description on how its national registry performs the functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and how it complies with the requirements of the technical standards for data exchange between registry systems. However, the Party has not provided a reference, in this context, to its 2009 annual submission in its NC5. The ERT noted that the national registry of Croatia is not connected to the international transaction log, and thus it cannot perform transactions owing to the fact that Croatia's assigned amount has not yet been established.

23. The ERT took note of the recommendations made in the standard independent assessment report that Croatia: report on any changes in its national registry; provide through its national registry the public information referred to in paragraphs 45–48 of the

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<sup>5</sup> FCCC/ARR/2010/HRV.

annex to decision 13/CMP.1, and report on any changes to that public information; and provide more complete and detailed information on the network time protocol procedure and disaster recovery plan. The ERT also took note of the recommendations made in the 2009 and 2010 ARRs on the same issues. The ERT further noted that Croatia addressed these recommendations and reported thereon in the 2011 annual submission. The ERT recommends that Croatia further improve the national registry and report on its efforts in its next national communication. The ERT concluded that Croatia's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

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

24. As required by the UNFCCC reporting guidelines, Croatia has provided in its NC5 comprehensive and well-organized information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. Each sector has its own textual description of the principal PaMs adopted to implement commitments under Article 4, paragraph 2(a) and (b), of the Convention, supplemented by summary tables on PaMs by sector. Croatia has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention. The NC5 contains a similar set of PaMs to those in the NC4.

25. However, the ERT noted that Croatia did not provide the following reporting elements required by the UNFCCC reporting guidelines: information on PaMs subdivided by gas; information on PaMs addressing F-gases; information on the steps taken to promote and/or implement any decisions of ICAO and IMO in order to limit or reduce GHG emissions not controlled by the Montreal Protocol from aviation and marine bunker fuels; and information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects. During the review, Croatia provided some of the missing information to the ERT. The ERT recommends that Croatia include information on the missing reporting elements in its next national communication.

26. In its NC5, Croatia has provided comprehensive information on the PaMs at the national level and limited information on the PaMs at the subnational level (see para. 32 below). The ERT encourages Croatia to report in more detail on synergies and overlaps between the PaMs at the national and subnational levels in its next national communication. Most of the recommendations made in the previous review report were addressed in the NC5, including the reporting of comprehensive and well-organized information on PaMs, supplemented by summary tables, and information on the mitigation impacts of PaMs.

27. Croatia's key climate and energy policy is reflected in the Sustainable Development Strategy (2009), which defines the general principles of the national climate change policy and outlines the pathway towards a low-carbon economy. In 2009, Croatia adopted its Energy Strategy until 2020 that set the goals of a 10 per cent reduction of gross final energy consumption by 2020 compared with the average consumption level during the period 2001–2005 and an increase of the share of renewable energy sources (RES) in gross final energy consumption to 20 per cent by 2020. Croatia also adopted many strategy documents, action plans and acts on environmental protection, energy efficiency enhancement and the wider use of RES. In particular, the Air Quality Protection and Improvement Plan for the period 2008–2011 covered climate change issues and determined 33 main measures that are currently being implemented.

28. According to the NC5, in order to achieve its target under the Kyoto Protocol for the first commitment period (2008–2012), Croatia has put in place domestic PaMs in all sectors, in particular in the energy sector, promoting energy efficiency improvements and the increased use of RES and cogeneration.

29. Among its cross-cutting PaMs, Croatia reported on the regulatory and economic PaMs, for example the regulation on a CO<sub>2</sub> emission charge (EUR 2–2.5/t CO<sub>2</sub> eq), which covers all stationary sources emitting more than 30 t CO<sub>2</sub>/year, and the regulation on GHG emission quotas. In its NC5, Croatia has not provided information on the cost-effectiveness of its PaMs. In response to a question raised by the ERT during the review, Croatia informed the ERT that it considers its most cost-effective policy to be the introduction of a feed-in tariff to promote the use of RES. The ERT encourages Croatia, in its next national communication, to include information on its most effective and innovative PaMs. In its NC5, Croatia has not reported information on PaMs that could potentially lead to higher levels of GHG emissions than would otherwise occur. The ERT encourages Croatia to undertake an analysis of the long-term effect of its PaMs and to report, in its next national communication, on those PaMs that could potentially lead to emission increases.

30. The NC5 provided estimates of the mitigation effects of Croatia’s PaMs by sector. According to the Regulation on Greenhouse Gas Emissions Monitoring in the Republic of Croatia, the report on the implementation of mitigation PaMs is to be prepared every two years and the PaMs are to be reviewed, through independent review, in between two reports or at least every two years, starting from 2009. In response to a question raised by the ERT during the review, Croatia provided additional information on its procedures to monitor and update its PaMs. The ERT encourages Croatia to report on the results of the reviews of its PaMs and to include the additional information provided during the review in its next national communication. Table 3 provides a summary of the reported information on the PaMs of Croatia.

Table 3  
**Summary of information on policies and measures**

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Policy framework and cross-sectoral measures</i>	
Sustainable Development Strategy (Reference number (OG) 30/09) (2009)	Defines the general principles of the national climate change policy and the pathway towards a low-carbon economy
Environmental Protection and Energy Efficiency Act (OG 107/03) (2003)	Establishes the Environmental Protection and Energy Efficiency Fund, which aims to secure necessary financing for activities to promote energy efficiency and renewable energy sources (RES)
Air Protection Act (OG 178/04, 60/08) (2008); Air Quality Protection and Improvement Plan for the period 2008–2011 (2008)	Establishes the mechanisms for the preparation of the national allocation plan for the European Union emissions trading scheme (EU ETS), the establishment of the national registry and participation in joint implementation projects
Regulation on Greenhouse Gas (GHG) Emissions Monitoring in the Republic of Croatia (OG 01/07) (2006)	Establishes the national system and national GHG inventory; defines procedure for the review of policies and measures
Regulation on GHG Emission Quotas and the Method of Emission Allowance Trading (OG 142/08) (2008)	Introduces a GHG emission cap for electricity producers and industrial installations
Regulation on Emission Charges (OG	Introduces CO <sub>2</sub> emission charges (EUR 2.5/t

<i>Major policies and measures</i>	<i>Examples/comments</i>
73/07) (2007)	CO <sub>2</sub> eq) for all stationary sources emitting more than 30 t CO <sub>2</sub> /year
<i>Policies and measures by sector</i>	
<i>Energy</i>	
Energy Strategy of the Republic of Croatia (OG 130/09) (2009)	Sets the goals of a 10 per cent reduction of gross final energy consumption by 2020 compared with the average consumption level during the period 2001–2005 and of an increase of the share of RES in gross final energy consumption to 20 per cent by 2020; regulates participation in the EU ETS and Kyoto Protocol mechanisms
Promoting RES and heat and power cogeneration (CHP)	Various regulations adopted on the minimum share of electricity generation from RES and CHP, financial incentives, a feed-in tariff system and the credit programme (RES: 284.4 Gg CO <sub>2</sub> eq in 2010 and 4,123.9 Gg CO <sub>2</sub> eq in 2020; and CHP: 474.2 Gg CO <sub>2</sub> eq in 2020)
Physical Planning and Building Act (OG 76/07, 38/09) (2009); Energy Efficiency Programme for 2008–2016 (2008) and Energy Efficiency National Action Plan for 2008–2010 (2008)	Outlines measures in the residential and services sectors; regulates establishment of energy servicing company; sets technical regulations on energy efficiency in buildings, energy performance and certification of buildings and labelling of household appliances (607.4 Gg CO <sub>2</sub> eq in 2010 and 2,509.3 Gg CO <sub>2</sub> eq in 2020)
<i>Transport</i>	
Fuel efficiency and CO <sub>2</sub> emissions from new passenger cars	Emission reduction was estimated at 97.2 Gg CO <sub>2</sub> eq in 2010 and 319.7 Gg CO <sub>2</sub> eq in 2020
Energy Strategy of the Republic of Croatia (OG 130/09) (2009); Act on Biofuels for Transport (OG 65/09) (2009); Ordinance on Biofuel Quality (OG 145/05, 33/11) (2005)	Sets the target of reaching the share of 10 per cent RES by 2020 in transport fuel, without import of raw material; regulates production, trade and storage of biofuels; sets the national indicative goal of reaching 5.75 per cent biofuels in total liquid fuel consumption by 2010 and 10 per cent by 2020 (139.9 Gg CO <sub>2</sub> eq in 2010 and 460.1 Gg CO <sub>2</sub> eq in 2020)
Use of liquefied petroleum gas and compressed natural gas in vehicles	Emission reduction was estimated at 6.5 Gg CO <sub>2</sub> eq in 2010 and 67.3 Gg CO <sub>2</sub> eq in 2020
<i>Industrial processes</i>	
N <sub>2</sub> O emission reduction in nitric acid production	Emission reduction was estimated at 608.6 Gg CO <sub>2</sub> eq in 2010 and 608.6 Gg CO <sub>2</sub> eq in 2020
Reduction of clinker in cement and increased recycling of glass	Emission reduction was estimated at 195.3 Gg CO <sub>2</sub> eq in 2010 and 236.3 Gg CO <sub>2</sub> eq in 2020
Regulation on Substances that Deplete the Ozone Layer (OG 120/05) (2005)	Transposes the regulation on fluorinated gases
Reduction of emissions of volatile organic compounds in solvent use	Solvent management plan, modification of application techniques and biofiltration (40.1 Gg CO <sub>2</sub> eq in 2010 and 157.0 Gg CO <sub>2</sub> eq in 2020)
<i>Agriculture</i>	
Action Plan for the Agriculture Sector	Analyses adaptation potential in agriculture and

<i>Major policies and measures</i>	<i>Examples/comments</i>
Efficient management of organic manure	socio-economic impacts of adaptation measures Emission reduction was estimated at 50.0 Gg CO <sub>2</sub> eq in 2010 and 66.6 Gg CO <sub>2</sub> eq in 2020
<i>Forestry</i>	
Forestry Act (OG 140/05, 82/06, 129/09) (2008)	Regulates the growing, protection, usage and management of forests and forest land as a natural resource in conformity with sustainable development criteria
Measures to increase carbon sinks	Forestation, reforestation and improvement of private forest management
<i>Waste</i>	
Waste Act (OG 178/04, 111/06, 60/08, 87/09) (2009); Waste Management Strategy for 2005–2025 (OG 130/05) (2005); Waste Management Plan for 2007–2015 (OG 85/07) (2007)	Regulates landfill gas flaring and utilization for electricity generation (90.7 Gg CO <sub>2</sub> eq in 2010 and 175.2 Gg CO <sub>2</sub> eq in 2020); utilization of biodegradable municipal waste in district heating plants (15.8 Gg CO <sub>2</sub> eq in 2010 and 591.9 Gg CO <sub>2</sub> eq in 2020); utilization of refuse-derived fuel in cement industry (41.5 Gg CO <sub>2</sub> eq in 2010 and 144.9 Gg CO <sub>2</sub> eq in 2020)

*Note:* The greenhouse gas reduction estimates, given for some measures (in parentheses), are reductions in CO<sub>2</sub> or CO<sub>2</sub> eq for the years 2010 and 2020, unless stated otherwise.

## 1. Policy framework and cross-sectoral measures

31. In Croatia, MEPPPC and its Department on Atmosphere Protection play a key role in the development of climate change policy and legislation. The other ministries involved in the implementation of climate change policy are: the Ministry of Economy, Labour and Entrepreneurship; the Ministry of the Sea, Transport and Infrastructure; the Ministry of Agriculture, Fisheries and Rural Development; and the Ministry of Regional Development, Forestry and Water Management. CEA, founded in June 2002, is the central agency responsible for data collection and consolidation at the national level, maintenance of environmental databases, monitoring and reporting. The Environmental Protection and Energy Efficiency Fund (hereinafter referred to as the Energy Efficiency Fund) was founded in 2003 with the aim of securing necessary financing for projects and programmes in the areas of environmental protection, energy efficiency enhancement and wider use of RES.

32. The NC5 reports that six Croatian cities that are the signatories of the Covenant of Mayors committed to going beyond the European Union (EU) emission reduction target of a 20 per cent emission reduction by 2020 as compared with the 2005 level by enhancing energy efficiency and cleaner energy production. The PaMs implemented in the transport sector in the cities of Zagreb and Koprivnica serve as good practice examples of mitigation PaMs at the municipal level. These PaMs are aimed at promoting walking, cycling, use of non-motorized alternatives to cars and use of biofuels in public transport, as well as integrating public transport systems by introducing one billing system. City mayors and county prefects of 146 municipalities signed the Energy Charter to express their concern about and awareness of increased energy consumption and climate change at the local level.

33. Harmonization of the national legal framework with the EU legislation is a key process, which will be practically finished by mid-2011. For example, the two-phased approach to Croatia's access to the European Union emissions trading scheme (EU ETS) has already been agreed. In 2009, the eligible facilities received their emission permits; during the period 2010–2012, these installations have to establish emission monitoring and

verification systems at each facility. In addition, in 2009, Croatia developed its national allocation plan that covered 81 installations. These installations will receive emission quotas in the third phase of the EU ETS upon the accession of Croatia to the EU.

## 2. Policies and measures in the energy sector

34. Between 1990 and 2009, GHG emissions from the energy sector decreased by 4.8 per cent (1.07 Tg CO<sub>2</sub> eq), owing mainly to an increase in hydropower use and a decrease in consumption of coke and coal. The share of emissions from energy in the total GHG emissions of Croatia increased from 71.7 per cent in 1990 to 74.4 per cent in 2009. Within the sector, emissions increased significantly in transport, by 51.7 per cent (2.10 Tg CO<sub>2</sub> eq), and decreased in manufacturing industries, by 28.2 per cent (2.48 Tg CO<sub>2</sub> eq), and energy industries, by 10.5 per cent (0.75 Tg CO<sub>2</sub> eq).

35. **Energy supply.** In 2007, liquid fuels had the largest share in the total primary energy supply (45.6 per cent), followed by natural gas (27.4 per cent) and RES (13.5 per cent) and other fuels constituting the rest. Among RES, 10.1 per cent of energy comes from large-scale hydropower and the rest from all other RES. Domestic coal production was phased out in 2000. During the period 1990–2009, there was an increase in the consumption of RES, in particular wood fuel, and a decrease in the consumption of natural gas, liquid fuels and electricity. Croatia is promoting the wider utilization of RES and the reduction of final energy consumption. In the longer term, Croatia has plans to build a 1,000 MW nuclear power plant and introduce the commercially available carbon capture and storage technology by 2025.

36. **Renewable energy sources.** In its NC5, Croatia has reported that it adopted a number of regulations to promote the use of RES. The Energy Strategy of the Republic of Croatia has set the target of increasing the share of RES in gross final energy consumption to 20 per cent by 2020 (the share in 2005 was 12.5 per cent). Within this national target, the sectoral targets for RES are to reach: 35 per cent RES in electricity generation, including large hydropower plants; 10 per cent in transport; and 20 per cent in heating and cooling. The regulation on a feed-in tariff system for electricity generation from RES and cogeneration defines the feed-in tariffs based on the RES type, plant size and amount of generated electricity. For example, the feed-in tariff for wind turbines is 0.64–0.65 Croatian Kuna (HRK)/kWh, for geothermal power plants is 1.04–1.20 HRK/kWh and for solar power plants is 2.10–3.40 HRK/kWh.

37. As reported in the NC5, the Energy Efficiency Fund provided financing for 850 projects aimed at promoting the use of RES and energy efficiency for the total budget of HRK 329 million by 2009 (see para. 38 below). Croatia has reported in its NC5 that, according to the assessment made by the Energy Efficiency Fund, the investment in the above-mentioned projects would result in an annual emission reduction equal to 0.8 Tg CO<sub>2</sub> eq. There is also a loan programme, which is a component of the project on promotion of RES in Croatia financed by the Global Environment Facility through the World Bank, for financing the RES projects. Its purpose is to encourage the development of the market for economically sound and environmentally sustainable investment projects aimed at the promotion of the use of RES and to create stimulating enabling environment for investments in the use of RES.

38. **Energy efficiency.** The Energy Strategy of the Republic of Croatia set the target of a 10 per cent reduction in final energy consumption by 2020 compared with the average consumption level during the period 2001–2005. In line with this strategy, Croatia prepared the National Energy Efficiency Programme for 2008–2016 and the Energy Efficiency Action Plan for 2008–2010. The projects on improvements in energy efficiency, that are funded by the Energy Efficiency Fund, are aimed at the promotion of the wider use of cogeneration plants, use of district heating systems, organization of energy audits and

demonstration activities, improvements in public lighting systems, fuel substitutions and waste heat utilization. Croatia has reported on an ESCO, the energy service company of Hrvatska Elektroprivreda, which implements energy efficiency projects in residential and commercial buildings and provides services for the modernization, reconstruction and refurbishment of existing plants and facilities with the aim of promoting rational energy consumption. Croatia introduced feed-in tariff rates to promote electricity generation from combined heat and power, to reach the target of 2 per cent of total electricity consumption by 2010.

39. **Residential and commercial sectors.** The energy used by private households, commercial buildings and public facilities constitutes about 40 per cent of total final energy consumption in Croatia. Croatia has implemented a number of PaMs in these sectors that promote energy efficiency, in particular energy performance standards, certification of buildings and labelling of household appliances. Croatia also adopted the Physical Planning and Building Act and the Regulation on Energy Performance of Buildings targeting the large energy-saving potential in non-residential buildings; these PaMs are estimated to result in reduced energy consumption from 200–300 kWh/m<sup>2</sup> to 60–80 kWh/m<sup>2</sup>. In addition, Croatia also started a programme to train energy auditors and energy certifiers of buildings.

40. **Transport sector.** The share of emissions from transport in Croatia's total GHG emissions in 1990 was 12.9 per cent (4.06 Tg CO<sub>2</sub> eq) and it almost doubled to reach 21.3 per cent (6.16 Tg CO<sub>2</sub> eq) in 2009. During the period 1990–2009, the emission increase was driven by the increased number of vehicles, the increased distances travelled per vehicle and a decreased number of passengers per car. Between 1990 and 2009, the number of registered passenger cars and heavy-duty vehicles increased by 35.4 per cent and 240 per cent, respectively.

41. Croatia has a well-developed set of PaMs addressing the emissions from this sector. It has initiated a number of projects to promote a shift between transport modes and to increase the attractiveness of rail transport for the transportation of passengers and goods.

42. Further, Croatia adopted regulatory instruments to introduce biofuels. The Ordinance on Biofuel Quality aims to achieve the share of 5.75 per cent biofuels in total liquid fuel consumption by 2010 and 10 per cent by 2020. According to the NC5, Croatia is promoting improvements in fuel efficiency, the use of low CO<sub>2</sub> emitting vehicles (emitting 120 g CO<sub>2</sub>/km by 2010–2012) and the use of liquefied petroleum gas and compressed natural gas in vehicles. The Ministry of the Sea, Transport and Infrastructure and the Energy Efficiency Fund started a programme for the replacement of old non-efficient vehicles used for transportation of passengers and goods with new ones that meet the EURO 4 and EURO 5 vehicle emission standards. The Energy Efficiency Fund approved funding in the amount of HRK 44.5 million for replacement of 639 vehicles.

43. In its NC5, Croatia has not reported on any PaMs targeting emissions from international transport. Croatia provided some additional information in response to a question raised by the ERT during the review, stating that the aviation sector will be included in the EU ETS in 2012. The operators of flights from Croatia to EU member States will be obliged to provide 15 per cent of their emission allowances through auctioning. The same obligation will apply to flights within Croatia and to third countries, starting from 2014. The ERT recommends that Croatia provide information on steps taken to promote and/or implement the decisions of ICAO and IMO in its next national communication.

44. The ERT commends Croatia for the provision in its NC5 of comprehensive and well-structured information on PaMs targeting the energy sector.



### 3. Policies and measures in other sectors

45. Between 1990 and 2009, GHG emissions from the industrial processes (including solvent and other product use), agriculture and waste sectors decreased by 17.0 per cent (1.51 Tg CO<sub>2</sub> eq). Emissions from these sectors were driven mainly by the phasing out of aluminium and ferroalloys production; the reduction in the use of mineral fertilizers; the reduction in the animal population, in particular cattle; and increased municipal solid waste, driven by improving living standards but partially offset by waste recycling practices.

46. **Industrial processes.** Between 1990 and 2009, GHG emissions from the industrial processes sector decreased by 22.2 per cent (0.85 Tg CO<sub>2</sub> eq), driven mainly by the decrease in economic activity, which led to the decrease in emissions from the production of cement, lime, ammonia and steel. Croatia has implemented activities targeting the reduction of CO<sub>2</sub> emissions through reduction of clinker use in cement production and the increase of recycled glass in container glass production, as well as activities targeting N<sub>2</sub>O emissions from nitric acid production through non-selective catalytic reduction.

47. Emissions of F-gases, which occur in the use of refrigeration and cooling systems in vehicles and buildings, have been increasing since 1995. Such emissions accounted for only 0.1 per cent of Croatia's total GHG emissions in 2009; as such, Croatia does not have any PaMs specifically targeting these emissions.

48. **Agriculture.** Between 1990 and 2009, GHG emissions from the agriculture sector decreased by 24.3 per cent (1.06 Tg CO<sub>2</sub> eq). A significant emission decrease was experienced from 1990 to 1996, owing to decreases in the animal population, crop production, consumption of mineral fertilizers and overall agricultural production. Emissions almost stabilized during the period 1996–2009. Croatia adopted the Rural Development Strategy for the period 2008–2013 and implemented PaMs aimed at the effective management of organic manure and mineral fertilizers.

49. **LULUCF.** The LULUCF sector was a net sink of 8.71 Tg CO<sub>2</sub> eq in Croatia in 2009 and net GHG removals have increased by 25.7 per cent since 1990. In its NC5, Croatia has reported on the Forestry Act, which regulates the growing, protection, usage and management of forests and forest land as a valuable natural resource for biodiversity, and ensures forest management based on principles of economic sustainability, social responsibility and environmental conservation. One of the most important provisions of this Act, in the context of climate change, is that forests should be managed in conformity with sustainable management criteria, implying the maintenance and conservation of forest ecosystems and their contribution to the global carbon cycle.

50. Croatia provided a description of the national legislative arrangements and administrative procedures that seek to ensure that activities under Article 3, paragraph 4, of the Kyoto Protocol (forest management) are performed based on the Forest Act and the Forest Management Regulation. As mentioned in paragraph 20 above, the implementation of these activities contributes to the conservation of biodiversity and the sustainable use of natural resources. The forest management area plan is prepared for a 10-year period and approved by the Ministry of Regional Development, Forestry and Water Management.

51. Croatia has reported on the improvement of private forest management as a key measure. In this context, a forest advisory service has been established to provide advisory support to private farmers on best practices in the sustainable management and improvement of forest stands.

52. **Waste management.** Between 1990 and 2009, GHG emissions from the waste sector increased by 62.9 per cent (0.3 Tg CO<sub>2</sub> eq), driven mainly by increasing amounts of municipal solid waste and waste incineration without energy recovery. According to the NC5, Croatia has introduced waste prevention, reduction and recycling requirements, as

defined by its Waste Management Strategy for 2005–2025 and Waste Management Plan for 2007–2015. Croatia has reported on projects on methane recovery from landfills for energy purposes. In the waste sector, Croatia is planning to implement the thermal treatment of municipal waste from 2020.

#### **4. Minimization of adverse effects in accordance with Article 2, paragraph 3, of the Kyoto Protocol**

53. In its NC5, Croatia has not 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 effects of climate change, effects on international trade, and social, environmental and economic impacts, on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT recommends that Croatia report on this missing reporting element in its next national communication.

54. Information on how Croatia strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the Party's 2011 annual submission, is presented in chapter II.H below.

### **C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms**

#### **1. Projections overview, methodology and key assumptions**

55. The GHG emission projections provided by Croatia in the NC5 include 'without measures', 'with measures' and 'with additional measures' scenarios until 2030, presented relative to actual inventory data until 2007, with a reference year of 2006. Projections are presented on a sectoral basis for most of the sectors, except for the LULUCF sector; they are presented using the same sectoral categories used in the section on PaMs of the NC5. Projections are also provided for a national total, using global warming potential values, and presented on a gas-by-gas basis for all gases, in a chart format only.

56. The ERT noted that Croatia did not provide the following reporting elements required by the UNFCCC reporting guidelines: projections for the LULUCF sector; projections presented on a gas-by-gas basis for each sector for the following GHGs: CO<sub>2</sub>, CH<sub>4</sub> (for all sectors, except for the agriculture sector), N<sub>2</sub>O (for all sectors, except for the agriculture sector), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>) (treating PFCs and HFCs collectively in each case); and emission projections related to fuel sold to ships and aircraft engaged in international transport. During the review, Croatia provided the ERT with additional information in a tabular format on emission projections presented on a gas-by-gas basis for all gases to complement the information reported in the NC5. Information on the other remaining reporting elements has not been provided by Croatia. The ERT reiterates the recommendations made in the previous review report that Croatia report, in its next national communication, emission projections for the LULUCF sector; complete projections on a gas-by-gas basis for all gases; and projections related to fuel sold to ships and aircraft engaged in international transport separately and not included in the totals.

57. In its NC5, Croatia has reported that the 'without measures' scenario is a 'business as usual' scenario that is based on the assumption that energy consumption will continue growing following the current trend and that the effect of PaMs is not included; the 'with measures' scenario includes the effect of PaMs that are already being implemented and adopted; and the 'with additional measures' scenario includes the effect of planned PaMs.

58. The ERT noted that Croatia has not reported a description of the methodologies used in the preparation of the projections in the NC5. The description of the key variables and assumptions used has been reported for the energy sector only. The ERT reiterates the encouragement made in the previous review report and strongly encourages Croatia to report on the methodology used and on key underlying factors, variables and assumptions used for the preparation of projections for all sectors, in order to increase the transparency of its reporting, in its next national communication. Also, the NC5 does not contain information on the sensitivity analysis of the projections to underlying assumptions, such as fuel prices and GDP growth rate. The ERT encourages Croatia to undertake a sensitivity analysis of key drivers and to report the results of this analysis in its next national communication.

## 2. Results of projections

59. In the initial report of Croatia under the Kyoto Protocol,<sup>6</sup> Croatia has reported emissions for the Kyoto Protocol base year as 36.03 Tg CO<sub>2</sub> eq and the corresponding Kyoto Protocol target as 34.23 Tg CO<sub>2</sub> eq/year on average during the period 2008–2012. These figures include 3.5 Tg CO<sub>2</sub> eq added to the 1990 level of total GHG emissions in accordance with decision 7/CP.12 (see para. 14 above). During the initial review, these figures were recalculated. According to the report of the review of the initial report for Croatia,<sup>7</sup> the recalculated emissions for the Kyoto Protocol base year are equal to 31.32 Tg CO<sub>2</sub> eq and the corresponding Kyoto Protocol target is equal to 29.76 Tg CO<sub>2</sub> eq/year on average during the period 2008–2012.

60. Croatia disagreed with the figures provided in the report of the review of the initial report. The report of the review of the initial report with a question of implementation was submitted for consideration to the enforcement branch of the Compliance Committee, which made its decision regarding Croatia's calculation of its assigned amount. Croatia submitted an appeal against the decision of the enforcement branch of the Compliance Committee to the Conference of Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). Subsequently Croatia withdrew its appeal.

61. In its NC5, Croatia has reported emissions for the Kyoto Protocol base year as 34.82 Tg CO<sub>2</sub> eq and the corresponding Kyoto Protocol target as 33.08 Tg CO<sub>2</sub> eq/year on average during the period 2008–2012. As reported in the NC5, the Party's projected total GHG emissions in 2010 are 36.39 Tg CO<sub>2</sub> eq, 34.09 Tg CO<sub>2</sub> eq and 33.02 Tg CO<sub>2</sub> eq under the 'without measures', 'with measures' and 'with additional measures' scenarios, respectively.

62. For this report, the ERT compared the emission projections to the base year levels and the Kyoto Protocol targets for both sets of values, namely those reported in the NC5 and those resulting from the initial review.

63. According to the NC5, under the 'without measures' scenario, projected total GHG emissions in 2010 are above the Kyoto Protocol target by 3.31 Tg CO<sub>2</sub> eq or above the base year level by 4.5 per cent. Whereas under the 'with measures' scenario, projected total GHG emissions in 2010 are above the Kyoto Protocol target by 1.01 Tg CO<sub>2</sub> eq or below the base year level by 2.1 per cent. Under the 'with additional measures' scenario, projected total GHG emissions in 2010 are below the Kyoto Protocol target by 0.06 Tg CO<sub>2</sub> eq or below the base year level by 5.2 per cent. Thus, the projections reported in the NC5 indicate that Croatia is in a position to meet its Kyoto Protocol target (which is a 5 per cent reduction in emissions below the base year level) using domestic PaMs only, but only under the 'with additional measures' scenario.

<sup>6</sup> Initial report of the Republic of Croatia under the Kyoto Protocol, 2008.

<sup>7</sup> FCCC/IRR/2008/HRV.

64. According to the estimates made by the ERT during the review using the figures provided in the report of the review of the initial report and the emission projections reported in the NC5, projected total GHG emissions in 2010 are above the Kyoto Protocol target by 6.33 Tg CO<sub>2</sub> eq, 4.33 Tg CO<sub>2</sub> eq and 3.26 Tg CO<sub>2</sub> eq, or above the base year level by 16.2 per cent, 8.8 per cent and 5.4 per cent, under the ‘without measures’, ‘with measures’ and ‘with additional measures’ scenarios, respectively. Thus, according to these estimates, Croatia may not be in a position to meet its Kyoto Protocol target, set in the report of the review of the initial report, using domestic PaMs only, even under the ‘with additional measures’ scenario.

65. The ERT noted that, in its NC5, Croatia has reported very limited information explaining the activities undertaken to bridge the possible gap to the Kyoto Protocol target. The ERT noted that information on accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol has not been reported in the NC5 either. The ERT encourages Croatia to report information on accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in its next national communication. The ERT further encourages Croatia to enhance the transparency of its reporting on projections by providing information on factors and PaMs affecting emission trends during the period 1990–2009 and how these factors affect the projections until 2020.

66. In its NC5, Croatia has reported the projected mitigation impact of individual PaMs in terms of GHG emissions avoided or sequestered, by gas (on a CO<sub>2</sub> eq basis), for the waste and agriculture sectors, namely the mitigation impact of PaMs in terms of CO<sub>2</sub> and CH<sub>4</sub> emissions from 2005 to 2030 for the waste sector (in tabular format) and the mitigation effects of PaMs in terms of CH<sub>4</sub> and N<sub>2</sub>O emissions from 1995 to 2030 for the agriculture sector (in chart format).

67. As shown in table 4, projected total GHG emissions in 2020 are above the 1990 level of total GHG emissions by 9.78 Tg CO<sub>2</sub> eq and 9.33 Tg CO<sub>2</sub> eq, or by 31.1 per cent and 29.7 per cent, under the ‘with measures’ and ‘with additional measures’ scenarios, respectively. Key results of Croatia’s GHG emission projections are provided in table 4 and the emission trends are illustrated in the figure below.

Table 4  
**Summary of greenhouse gas emission projections for Croatia**

	<i>Greenhouse gas emissions (Tg CO<sub>2</sub> eq per year)</i>	<i>Changes in relation to base year level (%)</i>	<i>Changes in relation to 1990 level (%)</i>
Inventory data 1990 <sup>a</sup>	31.44	0.4	NA
Inventory data 2009 <sup>a</sup>	28.87	-7.8	-8.2
Kyoto Protocol base year <sup>b</sup>	31.32	NA	-0.4
Kyoto Protocol target <sup>b</sup>	29.76	-5.0	-5.3
‘Without measures’ projections for 2010 <sup>c</sup>	36.39	16.2	15.7
‘With measures’ projections for 2010 <sup>c</sup>	34.09	8.8	8.4
‘With additional measures’ projections for 2010 <sup>c</sup>	33.02	5.4	5.0
‘Without measures’ projections for 2020 <sup>c</sup>	50.49	61.2	60.6
‘With measures’ projections for 2020 <sup>c</sup>	41.22	31.6	31.1

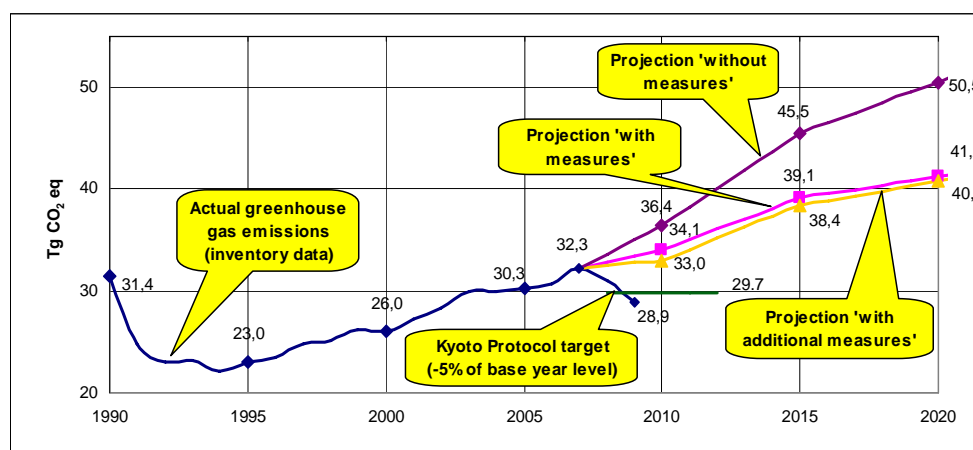
	Greenhouse gas emissions (Tg CO <sub>2</sub> eq per year)	Changes in relation to base year level (%)	Changes in relation to 1990 level (%)
'With additional measures' projections for 2020 <sup>c</sup>	40.77	30.2	29.7

<sup>a</sup> Data source: Croatia's 2011 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

<sup>b</sup> Data source: Based on the report of the review of the initial report contained in document FCCC/IRR/2008/HRV.

<sup>c</sup> Data source: Croatia's fifth national communication.

### Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2009: Croatia's 2011 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry; (2) Data for the years 2010–2020: Croatia's fifth national communication; the emissions are without land use, land-use change and forestry.

### 3. Total effect of policies and measures

68. In its NC5, Croatia has reported the total effect of PaMs in a way that is not sufficiently transparent. However, during the review, Croatia provided the ERT with information on the total effect of implemented and adopted PaMs, defined as the difference between the 'without measures' and 'with measures' scenarios, that was equal to 2.31 Tg CO<sub>2</sub> eq in 2010 and 9.27 Tg CO<sub>2</sub> eq in 2020. The ERT reiterates the recommendation made in the previous review report that Croatia improve the transparency of its reporting on the total effect of its PaMs implemented and adopted, and report relevant information on factors and activities used for projections for each sector in its next national communication.

69. In its NC5, Croatia has not reported transparently the estimated and expected total effect of planned PaMs, though it has reported the projected mitigation effect of the individual PaMs. The ERT encourages Croatia to report the estimated and expected total effect of planned PaMs more transparently in its next national communication by calculating it as the difference between the 'with measures' and 'with additional measures' scenarios.

70. According to the NC5, the PaMs implemented in the energy sector (without transport) are expected to deliver the largest emission reductions, equal to 1.07 Tg CO<sub>2</sub> eq in 2010 and 6.59 Tg CO<sub>2</sub> eq in 2020; followed by PaMs in the industrial processes sector (0.84 Tg CO<sub>2</sub> eq in 2010 and 1.00 Tg CO<sub>2</sub> eq in 2020) and the transport sector (0.24 Tg CO<sub>2</sub>

eq in 2010 and 0.85 Tg CO<sub>2</sub> eq in 2020). The most effective PaMs and drivers behind GHG emission reductions are described in chapters II.B.1 and II.B.2 above. Table 5 provides an overview of the total effect of PaMs as reported by Croatia.

Table 5  
**Projected effects of planned, implemented and adopted policies and measures in 2010 and 2020**

Sector	<i>Effect of implemented and adopted measures</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of planned measures</i>	<i>Relative value(% of 1990 emissions)</i>	<i>Effect of implemented and adopted measures</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of planned measures</i>	<i>Relative value(% of 1990 emissions)</i>
	(Tg CO <sub>2</sub> eq)		(Tg CO <sub>2</sub> eq)		(Tg CO <sub>2</sub> eq)		(Tg CO <sub>2</sub> eq)	
	2010				2020			
Energy (without CO <sub>2</sub> from transport)	1.07	3.4	1.10	3.4	6.59	21.0	0.50	1.5
Transport – CO <sub>2</sub>	0.24	0.8	NA	NA	0.85	2.7	NA	NA
Industrial processes	0.84	2.7	NA	NA	1.00	3.2	NA	NA
Agriculture	0.05	0.2	NA	NA	0.07	0.2	NA	NA
Land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA
Waste management	0.10	0.3	NA	NA	0.76	2.4	NA	NA
<b>Total</b>	<b>2.31</b>	<b>7.3</b>	<b>1.10</b>	<b>3.4</b>	<b>9.27</b>	<b>29.5</b>	<b>0.50</b>	<b>1.5</b>

*Source:* Croatia's fifth national communication.

*Note:* The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios; the total effect of planned policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.

*Abbreviation:* NA = not available.

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

71. In its NC5, Croatia has provided explicit information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. However, Croatia has reported that it does not plan to use the mechanisms to meet its Kyoto Protocol target for the first commitment period (2008–2012).

#### D. **Vulnerability assessment, climate change impacts and adaptation measures**

72. In its NC5, Croatia has provided the required information on the expected impacts of climate change in the country and on adaptation options for the following sectors: agriculture, biodiversity, coastal zones and marine ecosystems. However, the ERT noted that Croatia did not provide an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. However, the ERT was informed by Croatia during the review that Croatia will carry out the assessment studies on

climate change impacts, vulnerabilities and adaptation in the areas of meteorology, hydrology and water resources, agriculture, forestry, biological diversity and natural ecosystems, coast and coastal area management, tourism and public sectors. The ERT recommends that the Party undertake such studies, identify the actions to be taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation and report on these efforts in its next national communication. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

Table 6

**Summary of information on vulnerability and adaptation to climate change**

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	<i>Vulnerability:</i> A longer growing season and higher carbon concentration help in crop production; decrease in precipitation; water insufficiency in agriculture; frequency of droughts may threaten winter wheat and maize crops <i>Adaptation:</i> Investment in research and public awareness; crop rotation; fast growing crops; improvements in irrigation
Biodiversity and natural ecosystems	<i>Vulnerability:</i> Plan phenology; changes in distribution of plants and genetic diversity; seawater flooding <i>Adaptation:</i> Ex situ and in situ protection of threatened species and migratory corridors; adjustment of spatial plans and protected area management plans; adjustment of species protection programmes; scientific impact assessment
Coastal zones	<i>Vulnerability:</i> Sea level rise and sea flooding may affect ports, coastal freshwater sources and wetlands, and disrupt tourism and recreation <i>Adaptation:</i> Capacity-building for coastal zone planning and management; design and management of coastal areas; silting of beaches; alternative sources of water supply; water purification
Forests	<i>Vulnerability:</i> Spatial distribution and density of forests and other types of vegetation; possible disappearance of existing vegetation or appearance of new vegetation; changes in productivity of forest ecosystems, ecological stability, forest health and forest value; increased risk of forest fires
Marine ecosystems and fisheries	<i>Vulnerability:</i> Rising sea temperature would result in fish depletion, increase in population of warm water species and longer reproduction seasons; introduction of new organisms that transmit diseases or undesirable species <i>Adaptation:</i> Species management programmes; continued research, monitoring and analysis of climate change impacts
Public health	<i>Vulnerability:</i> Heat waves; spread of flood- or waterborne diseases; spread of diseases outside of their common areas; increased incidence of respiratory allergies; malaria in coastal areas
Water resources	<i>Vulnerability:</i> Impact on water flow, evapotranspiration, groundwater inflow, water level in rivers and lakes, and water temperature; rise in temperature, annual evapotranspiration and decline in annual precipitation could decrease the water discharges; impact on hydropower

73. In its NC5, Croatia has reported on the regional climate scenarios prepared using the regional climate model of the third generation (RegCM3) and atmospheric and oceanic model (EH5OM) according to the A2 scenario of the *Special Report on Emissions*

*Scenarios* of the Intergovernmental Panel on Climate Change for the European continent for the years 2041–2070. Based on the modelling studies, assessments of climate change impacts and vulnerability to climate change have been carried out for some sectors. Croatia has identified coastal zones as the most vulnerable area to climate change; thus, this sector has become the focus of the adaptation measures, such as capacity-building, management of coastal resources, integration of sea level rise related concerns into the design and management plans for coastal areas, silting of beaches with gravel and sand, developing alternative sources of water supply and increasing capacity for water purification.

74. The ERT noted that there is no mention of the tools and methodologies used in the vulnerability assessment for the following sectors: hydrology and water resources, agriculture, coastal zones, marine ecosystems and fisheries, and public health. The ERT also noted a lack of information on the expected socio-economic or ecological impacts of climate change and on research on vulnerability. Further, the ERT noted that tourism is identified as one of the most vulnerable sectors; however, the vulnerability assessment of the tourism sector has not been reported in the NC5. During the review, the ERT was informed by Croatia that the tourism sector is very important for its economy and that the climate change impact on the tourism sector should be analysed with the participation of all stakeholders. Therefore, the ERT encourages Croatia to conduct such an impact assessment and report on the tools and methodologies used, in order to improve the transparency of reporting, in its next national communication.

## **E. Research and systematic observation**

75. In its NC5, Croatia has provided information on its actions relating to research and systematic observation and has addressed both domestic and international activities, including the Global Earth Observation System of Systems and the Global Climate Observing System (GCOS). Croatia also provided a summary of information on GCOS activities. The Meteorological and Hydrological Service (MHS) has been responsible for Croatia's participation in GCOS since 1992. The publication entitled "Croatian Climate Observing System" has been printed in conformity with the GCOS methodology. However, the ERT noted that most of the information on research and systematic observation reported in the NC5 is identical to that reported in the NC4, with limited updated information.

76. The ERT noted that Croatia did not follow the recommendation made in the previous review report to provide information on its actions taken to support related capacity-building activities in developing countries for the purpose of enabling the participation of those developing countries in research and development efforts and on its actions taken to establish and maintain observing systems and related data and monitoring systems. The ERT therefore encourages Croatia to provide this information in its next national communication.

77. In its NC5, Croatia did not follow the outline for the national communication provided in the annex to the UNFCCC reporting guidelines and it did not provide information in the subsection on general policy on research and systematic observation. The ERT recommends that Croatia follow the outline provided for the national communication more closely for its next national communication. Croatia did not report information on funding allocated for research and systematic observation. The ERT encourages Croatia to provide this information in its next national communication.

78. In its NC5, Croatia has reported information on the recommendations for further research and studies on climate change impacts in the critically important sectors of the economy; this information had already been reported in the NC4. However, the ERT noted that, in comparison with the NC4, in its NC5 Croatia has not provided further information



on: highlights, innovations and significant efforts made in the area of climate process and climate system research and studies of impacts of climate change; or socio-economic analysis of impacts and response options and research and development in relation to mitigation and adaptation technologies. The ERT encourages the Party to include this information and update the section on research and systematic observation in its next national communication.

79. During the period 2006–2007, the Croatian Forest Institute participated in the EU project on carbon balance drafting and new resource management tools according to the Kyoto Protocol, which, among other things, established stations for field measurements and held a round-table discussion on the Kyoto Protocol and forestry issues. According to the NC5, the Party's international research activities are currently limited to cooperation with the EU countries only.

## **F. Education, training and public awareness**

80. In its NC5, Croatia has provided information on its actions relating to education, training and public awareness, at both the domestic and international levels, as part of regional programmes. Croatia has provided information about the programmes implemented since 1995, such as GLOBE, Eco-Schools and Eco-Quiz. However, it was not possible for the ERT to identify the level of advancement on these programmes between the NC4 and the NC5. Croatia also provided information about the new programmes implemented in recent years, such as programmes in relation to public awareness and education on RES, energy efficiency, business planning for projects on clean production and planning of energy-optimal buildings. As was reported in the NC5, currently Croatia has prioritized the programmes aimed at environmental protection, promotion of RES and energy efficiency. The ERT encourages Croatia to report on the advancement of these programmes in its next national communication.

81. According to the NC5, to facilitate the access to information of all interested stakeholders and to ensure the fulfilment of the right to timely and accurate information on environment and climate change, CEA has been assigned the responsibility for the collection, integration and processing of environmental data. The ERT encourages Croatia to report on the activities undertaken by this agency in relation to mechanisms for the implementation and prioritization of programmes on education and access to information on climate change.

82. In its NC5, Croatia has reported on the activities of the Society for Sustainable Development Design to raise public awareness and inform and educate the general public in the fields of RES, energy efficiency, cleaner production and sustainable development. In its NC5, Croatia has reported on many public awareness raising campaigns undertaken in recent years; however, it has not reported on how these campaigns are monitored, assessed and improved over time in order to address the emerging demands of society. During the review, the ERT could not identify whether the public participates in the preparation of and public consultations on the national communication. The ERT encourages Croatia to report, in its next national communication, on the coordination of activities undertaken by non-governmental organizations and civil society on public-awareness raising and support to the Government. The ERT further encourages Croatia to report on the impact and mechanisms for monitoring the effectiveness of these campaigns and to report on the consultation process organized during the preparation of its next national communication.

83. In its NC5, Croatia has reported on many activities on education, training and public awareness, but it has not identified an overall policy or programme that integrates all these activities. The ERT encourages Croatia to report, in its national communication, on its

efforts to integrate these activities into a general national programme on education, training and public awareness that would provide for much greater public involvement and participation.

84. Education on environment and sustainable development is integrated into the regular education system at primary level. The ERT welcomes the actions taken and encourages Croatia to expand the coverage of these activities to other levels of education in order to facilitate awareness at all levels of the education system.

**G. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol**

85. Croatia has provided most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC5. The supplementary information is placed in different sections of the NC5. Table 8 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC5 chapters in which this information is provided.

86. Croatia has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: information on what efforts Croatia is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts, on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention; and information on the steps taken to promote and/or implement any decisions of ICAO and IMO in order to limit or reduce GHG emissions not controlled by the Montreal Protocol from aviation and marine bunker fuels. The technical assessment of the information reported under Article 7, paragraph 2, is contained in the relevant chapters of this report. The ERT recommends that Croatia include these missing reporting elements in its next national communication.

Table 8

**Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol**

<i>Supplementary information</i>	<i>Reference</i>
National registry	Chapter 3.6 of the NC5
National system	Chapter 3.7 of the NC5
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Chapter 4.4.8 of the NC5
Policies and measures in accordance with Article 2	Chapter 4 of the NC5
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Chapter 1.2.1 of the 2011 NIR
Information under Article 10	Chapters 4.4.7, 8.3 and 4.4.7 of the NC5
Financial resources <sup>a</sup>	Not reported

<sup>a</sup> As a country with an economy in transition, Croatia does not have to report on the implementation of Article 11 of the Kyoto Protocol, including on the provision of “new and additional” financial resources.

*Abbreviations:* NC5 = fifth national communication, NIR = national inventory report.

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

87. Croatia reported the information requested in section H, “Minimization of adverse impacts in accordance with Article 3, paragraph 14”, of the annex to decision 15/CMP.1 as a part of its 2010 and 2011 annual submissions. Croatia reported that its national PaMs are implemented in order to fulfil its commitments related to the Convention and its Kyoto Protocol. In response to questions raised by the ERT during the review, Croatia provided further information, stating that currently its PaMs do not have adverse impacts on developing countries, except for the potential impact of carbon leakage that could take place in the future, as Croatia neighbours Parties not included in Annex I to the Convention. The ERT considers the reported information to be mostly transparent and mostly complete.

88. The ERT recommends that Croatia report further information, in its next annual submission, on how it is striving, under Article 3, paragraph 14, of the Kyoto Protocol, to implement its commitments mentioned in Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention, and on how it gives priority to the actions relating to the minimization of adverse impacts of response measures.

## III. Conclusions and recommendations

89. The ERT concludes that the NC5 generally provides a good overview of the national climate policy of Croatia. The information provided in the NC5 includes most mandatory information required by the UNFCCC reporting guidelines, except for: information on PaMs subdivided by gas; projections for the LULUCF sector; projections by gas in tabular format; projections related to fuel sold to ships and aircraft engaged in international transport; an outline of action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to climate change adaptation; and information on action related to capacity-building on research and systematic observation in developing countries.

90. The NC5 also includes most elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, except for information on how Croatia strives to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts, on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention; and the steps taken to promote and/or implement any decisions of ICAO and IMO in order to limit or reduce GHG emissions not controlled by the Montreal Protocol from aviation and marine bunker fuels. During the review, Croatia provided some information on the missing reporting elements.

91. Croatia’s total GHG emissions, excluding LULUCF, in 2009 were 8.2 per cent below its 1990 level and 17.8 per cent below that level, including LULUCF. The emission trend was defined by two groups of countervailing drivers: on the one hand, growing energy consumption, increased energy industry activity and increasing transport flows and associated fuel consumption, and on the other hand, growing shares of natural gas and liquid fuels in the fuel mix.

92. In the NC5, Croatia has reported GHG emission projections for the period from 2010 to 2030 for three scenarios, namely ‘without measures’, ‘with measures’ and ‘with additional measures’. In the initial report of Croatia under the Kyoto Protocol, Croatia has reported the emission level for the Kyoto Protocol base year and the corresponding Kyoto Protocol target, adding 3.5 Mt CO<sub>2</sub> eq to the 1990 level of total GHG emissions in

accordance with decision 7/CP.12. During the initial review, these figures were recalculated. Croatia disagreed with these recalculated figures and the report of the review of the initial report with a question of implementation was submitted for consideration to the enforcement branch of the Compliance Committee, which made its decision regarding Croatia's calculation of its assigned amount. Croatia submitted an appeal against the decision of the enforcement branch of the Compliance Committee to the CMP. Subsequently Croatia withdrew its appeal.

93. For this report, the ERT compared the emission projections to the base year levels and the Kyoto Protocol targets for both sets of values, namely those reported in the NC5 and those resulting from the initial review. According to the estimates made by the ERT during the review using the figures provided in the report of the review of the initial report and the emission projections reported in the NC5, projected total GHG emissions in 2010 are above the Kyoto Protocol target by 6.33 Tg CO<sub>2</sub> eq, 4.33 Tg CO<sub>2</sub> eq and 3.26 Tg CO<sub>2</sub> eq, or above the base year level by 16.2 per cent, 8.8 per cent and 5.4 per cent, under the 'without measures', 'with measures' and 'with additional measures' scenarios, respectively. Thus, according to these estimates, Croatia may not be in a position to meet its Kyoto Protocol target (which is a 5 per cent reduction in emissions below the base year level) using domestic PaMs only, even under the 'with additional measures' scenario.

94. The NC5 contains explicit information on how Croatia's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. According to its NC5, Croatia does not plan to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target for the first commitment period (2008–2012).

95. Croatia provided comprehensive information on its PaMs at the national level. The framework climate and energy policy is reflected in the Sustainable Development Strategy (2009) that defines the general principles of the national climate change policy and sets the economy on the pathway towards low-carbon development. In order to achieve its Kyoto Protocol target, Croatia has put in place domestic PaMs in all sectors, in particular in the energy sector, targeting energy efficiency improvements and increased use of RES and cogeneration. In particular, the Air Quality Protection and Improvement Plan for 2008–2011 determined 33 climate change mitigation measures.

96. Coastal zones are the area most vulnerable to climate change, which are affected by sea level rise. Climate change impacts are observed in other sectors, such as agriculture, forestry, biodiversity, public health, and marine ecosystems and fisheries. Various adaptation measures have been explored as potential response measures to these impacts. However, there has been no climate change adaptation programme prepared in Croatia up to now.

97. In its NC5, Croatia has provided information on its activities relating to research and systematic observation. Croatia reported on its systematic observation and monitoring of all parts of the climate system, including satellite observations, at the global, regional and national levels.

98. Croatia has implemented several actions related to education, training and public awareness in recent years. It has prioritized the education programmes aimed at environmental protection, promotion of RES and energy efficiency.

99. The ERT concluded that Croatia's national system continues to perform its required functions as set out in decision 19/CMP.1; and that the national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the CMP. The ERT noted that updates of databases and applications, implemented security measures and changes to the

national registry software are documented on a regular basis by nominated responsible persons.

100. 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 provided by the Party in its 2010 and 2011 annual submissions is mostly transparent and mostly complete.

101. In the course of the IDR, the ERT formulated several recommendations relating to the completeness and transparency of Croatia's reporting under the Convention and its Kyoto Protocol. The key recommendations<sup>8</sup> are that Croatia:

(a) Improve the completeness of its reporting by including in its next national communication the following:

(i) Information on PaMs subdivided by gas and PaMs addressing F-gases;

(ii) Information on how it strives to implement PaMs under Article 2, paragraph 3, of the Kyoto Protocol in such a way as to minimize adverse impacts, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts, on other Parties, especially developing country Parties;

(iii) Information on steps taken to promote and/or implement any decisions of ICAO and IMO in order to limit or reduce GHG emissions not controlled by the Montreal Protocol from aviation and marine bunker fuels;

(iv) Emission projections for the LULUCF sector; projections on a gas-by-gas basis for each sector for the following GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub> (treating PFCs and HFCs collectively in each case);

(v) Emission projections related to fuel sold to ships and aircraft engaged in international transport reported separately and not included in the national totals;

(vi) Information on actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation;

(b) Improve the transparency of reporting by:

(i) Providing more detailed information on emission projections and the total effect of PaMs, including relevant information on factors and activities used for projections for each sector;

(ii) Providing clear and transparent information on the estimated and expected total effect of PaMs implemented and adopted;

(c) Improve the completeness and transparency of its reporting by including, in its next annual submission, further information on: how it is striving, under Article 3, paragraph 14, of the Kyoto Protocol, to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention; and how it gives priority to the actions relating to the minimization of adverse impacts of response measures.

102. The ERT encourages Croatia to undertake a number of improvements regarding the transparency and completeness of its reporting; the most important of these are that the Party:

<sup>8</sup> The recommendations are given in full in the relevant sections of this report.

- (a) Report in more detail on national circumstances that affect GHG emissions and removals, and how changes in national circumstances affect GHG emissions and removals over time;
- (b) Report on the methodology used for the preparation of projections and key underlying factors, variables and assumptions used;
- (c) Provide more transparent and detailed information on expected impacts of climate change and the methodology and tools used for vulnerability assessment;
- (d) Provide information on action taken to support capacity-building in developing countries related to research and systematic observation, action to establish and maintain observing systems and related data and monitoring systems, and the general policy on, and funding of, research and systematic observation;
- (e) Report on its efforts to develop a general national programme on education, training and public awareness that would provide for much greater public involvement and participation.

#### **IV. Questions of implementation**

103. During the review, the ERT assessed the NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness and transparency. No questions of implementation were identified by the ERT during the review. The ERT noted that at the time of the preparation and publication of this report the question of implementation on the calculation of Croatia's assigned amount and its commitment period reserve identified in the report of the review of the initial report for Croatia remained unresolved.

## Annex

### Documents and information used during the review

#### A. Reference documents

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

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

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

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

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>>.

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FCCC/IRR/2008/HRV. Report of the review of the initial report of Croatia. Available at <<http://unfccc.int/resource/docs/2009/irr/hrv.pdf>>.

FCCC/IDR.4/HRV. Report of the centralized in-depth review of the second, third and fourth national communication of Croatia. Available at <<http://unfccc.int/resource/docs/2009/idr/hrv04.pdf>>.

Fifth national communication of Croatia. Available at <[http://unfccc.int/resource/docs/natc/hrv\\_nc5.pdf](http://unfccc.int/resource/docs/natc/hrv_nc5.pdf)>.

2009 greenhouse gas (GHG) inventory submission of Croatia. Available at <[http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/4771.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php)>.

2010 GHG inventory submission of Croatia. Available at <[http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/5270.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php)>.

2011 GHG inventory submission of Croatia. Available at <[http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/5888.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php)>.

## **B. Additional information provided by the Party**

Responses to questions during the review were received from Ms. Jasenka Necak (Ministry of Environmental Protection, Physical Planning and Construction), including additional material on updated policies and measures, GHG projections, the national registry and recent climate policy developments in Croatia.

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