



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

Parties included in Annex I to the Convention were requested by decision 6/CP.25 to submit their eighth national communication to the secretariat by no later than 31 December 2022. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the eighth national communication and relevant supplementary information under the Kyoto Protocol of Hungary, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention” and the “Guidelines for review under Article 8 of the Kyoto Protocol”.

Developed country Parties were requested by decision 6/CP.25 to submit their fifth biennial report to the secretariat by no later than 31 December 2022. This report presents the results of the technical review of the fifth biennial report of Hungary, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”.

The review of these submissions took place in Budapest from 8 to 12 April 2024.



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Abbreviations and acronyms

AEA	annual emission allocation
ALADIN	Limited Area Dynamic Adaptation InterNational Development regional climate model
Annex II Party	Party included in Annex II to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
COP	Conference of the Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CTF	common tabular format
ERT	expert review team
ESD	European Union effort-sharing decision
ESR	European Union effort-sharing regulation
EU	European Union
EU ETS	European Union Emissions Trading System
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
N ₂ O	nitrous oxide
NA	not applicable
NAGIS	National Adaptation Geo-information System
NC	national communication
NCCS	National Climate Change Strategy
NE	not estimated
NECP	National Energy and Climate Plan
NF ₃	nitrogen trifluoride
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
NO _x	nitrogen oxides
PaMs	policies and measures
PFC	perfluorocarbon
RCP	representative concentration pathway
REMO	Regional Model
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. Part II: Reporting of supplementary information under Article 7, paragraph 2”
SF ₆	sulfur hexafluoride
SO ₂	sulfur dioxide
SO _x	sulfur oxides

TIMES	The Integrated Market Allocation–Energy Flow Optimization Model System
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the NC8 and BR5 of Hungary. The review was organized by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention” and “Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention” (annex to decision 13/CP.20), and the “Guidelines for review under Article 8 of the Kyoto Protocol” (annex to decision 22/CMP.1 and annex I to decision 4/CMP.1).
2. In accordance with decision 13/CP.20, a draft version of this report was transmitted to the Government of Hungary, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.
3. The review was conducted from 8 to 12 April 2024 in Budapest by the following team of nominated experts from the UNFCCC roster of experts: Aygun Narimanova (Azerbaijan), Innocent Nkurikiyimfura (Rwanda), Yusuf Serengil (Türkiye) and Marius Țăranu (Republic of Moldova). Yusuf Serengil and Marius Țăranu were the lead reviewers. The review was coordinated by Marion Vieweg-Mersmann and Sarah Klinghammer (secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC8 of Hungary in accordance with the UNFCCC reporting guidelines on NCs,¹ the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol² and of the information reported in the BR5 of Hungary in accordance with the UNFCCC reporting guidelines on BRs.³

1. Timeliness

5. The NC8 was submitted on 4 August 2023, after the deadline of 31 December 2022 mandated by decision 6/CP.25. The NC8 was resubmitted on 10 May 2024 to address issues raised during the review. The resubmission included changes and additions to the information on national circumstances relevant to GHG emissions and removals, GHG emissions and trends, PaMs and projections. Detailed information on improvements related to the resubmission is provided in paragraph 14 below. Unless otherwise specified, the information and values from the latest submission are used in this report.
6. Hungary informed the secretariat on 30 June 2023 about its difficulties with making a timely NC8 submission. In accordance with decision 13/CP.20, a Party should inform the secretariat thereof by the due date of the submission in order to facilitate the arrangement of the review process. The ERT noted with great concern the delay in the submission and recommended that Hungary make its next submission on time.
7. The BR5 was submitted on 4 August 2023, after the deadline of 31 December 2022 mandated by decision 6/CP.25. The CTF tables were submitted on 30 April 2024. The BR5 was resubmitted on 10 May 2024 as part of the resubmission of the NC8.
8. Hungary informed the secretariat on 30 June 2023 about its difficulties with making a timely BR5 submission. In accordance with decision 13/CP.20, a Party should inform the

¹ Decision 6/CP.25, annex.

² Decision 15/CMP.1, annex, and decision 3/CMP.11, annex III.

³ Decision 2/CP.17, annex.

secretariat thereof by the due date of the submission in order to facilitate the arrangement of the review process. The ERT noted with great concern the delay in the submission.

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

9. Issues and gaps identified by the ERT related to the information reported by Hungary in its NC8 are presented in tables 1–2. In addition, the ERT noted that the NC8 is not fully structured following the outline contained in the appendix to the UNFCCC reporting guidelines on NCs. For example, chapter 5 on projections does not include a section on the assessment of the aggregate effect of PaMs. The ERT therefore recommends that the Party structure its next NC following the outline contained in the appendix to the UNFCCC reporting guidelines on NCs.

10. The information reported, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs. The ERT concludes that the issues of a mandatory nature related to supplementary information under the Kyoto Protocol do not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol.

11. The ERT noted that Hungary made improvements to the reporting in its NC8 compared with that in its NC7, including by addressing some recommendations and encouragements from the previous review report in the areas of national circumstances relevant to GHG emissions and removals, GHG emissions and trends, PaMs, and projections and the total effects of PaMs.

Table 1

Assessment of completeness and transparency of mandatory information reported by Hungary in its eighth national communication

<i>Section of NC</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation</i>
Executive summary	Complete	Transparent	–
National circumstances relevant to GHG emissions and removals	Complete	Transparent	–
GHG inventory	Complete	Transparent	–
PaMs	Mostly complete	Transparent	Issues 3 and 5 in table I.1
Projections and the total effect of PaMs	Mostly complete	Transparent	Issue 4 in table I.2
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent	–
Financial resources and transfer of technology ^a	NA	NA	NA
Research and systematic observation	Complete	Transparent	–
Education, training and public awareness	Complete	Transparent	–

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in annex I. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

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

Table 2

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

<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation</i>
National system	Complete	Transparent	–

<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation</i>
National registry	Complete	Mostly transparent	Issue 2 in table I.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	–
PaMs in accordance with Article 2	Complete	Transparent	–
Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	–
Information under Article 10 ^a	NA	NA	NA
Financial resources ^b	NA	NA	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Mostly complete	Transparent	Issue 1 in table I.3

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in annex I. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

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

^b Hungary is not an Annex II Party and is therefore not obliged to provide information on financial resources under Article 11 of the Kyoto Protocol, including on “new and additional” resources.

12. Issues and gaps identified by the ERT related to the information reported by Hungary in its BR5 are presented in table 3. The information reported mostly adheres to the UNFCCC reporting guidelines on BRs. The ERT notes that issue 3 in table II.2 has been identified in three successive reviews.

13. The ERT noted that Hungary made improvements to the reporting in its BR5 compared with that in its BR4, by addressing some recommendations and encouragements from the previous review report in the areas of GHG emissions and trends, progress in achievement of quantified economy-wide emission reduction targets, and projections.

Table 3

Summary of completeness and transparency of mandatory information reported by Hungary in its fifth biennial report

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation</i>
GHG emissions and removals	Complete	Transparent	–
Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	Complete	Transparent	–
Progress in achievement of targets	Mostly complete	Transparent	Issue 4 in table II.2
Provision of support to developing country Parties ^a	NA	NA	NA

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in annex II. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

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

14. The NC8 resubmission made during the review improved:

(a) The information reported on national circumstances relevant to GHG emissions and removals by providing more up-to-date information in the sections on financial assets and wealth of households, inflation, the entrepreneurial sector, current account balance and financing and external trade;

(b) The GHG inventory information reported by including information from the latest available GHG inventory, which covers emissions up to 2021;

(c) The information reported on PaMs by providing information on PaMs in the IPPU sector and on the assessment of the economic and social consequences of response measures;

(d) The information reported on projections and the total effects of PaMs by clarifying projection scenario definitions and noting that projections do not include those related to fuel sold to ships and aircraft engaged in international transport; providing information on projections, namely references to publications containing projections, in tabular format; and providing information on the strengths and weaknesses of the models or approaches used;

(e) The supplementary information related to the Kyoto Protocol reported by providing additional information on how the Party's national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1 in conjunction with decisions 3/CMP.11 and 4/CMP.11, and information on steps taken to promote and/or implement any decisions of ICAO and IMO to limit or reduce GHG emissions from aviation and marine bunker fuels.

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

A. National circumstances relevant to greenhouse gas emissions and removals

1. Technical assessment of the reported information

15. The NC8 contains key data on the governmental structure, legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and waste management. The information reported on the national circumstances of Hungary explains the relationship between its historical and future emission trends and its national circumstances. The decrease in GHG emissions between 1985 and 2021 is largely the result of Hungary's transition to a market-based economy and the effect of the global financial and economic crisis, in addition to the implementation of Hungary's climate change policy.

16. Between 1990 and 1995, Hungary experienced extensive and rapid socioeconomic change owing to its transition to a market economy. This change caused an economic recession in parts of Hungarian heavy industry (e.g. manufacturing of basic metals, machinery and mining), resulting in a reduction in fuel use in addition to a decline in the national output and changes in the fuel mix driven by a rise in energy prices. The economic recession also affected the industrial processes sector (e.g. three of the five ammonia production plants and three of the four nitric acid plants were closed down by 1995) and the agriculture sector (e.g. there was a significant decrease of around 50 per cent in the livestock population and a reduction in the use of fertilizers by about 60 per cent), which in turn resulted in a decreasing level of GHG emissions.

17. The ERT noted that Hungary's economy grew (in terms of GDP) by 79.8 per cent between 1990 and 2021, while at the same time the Party's GHG emissions (excluding LULUCF) decreased by 32.4 per cent, and thus the ERT observed a decoupling of economic development from GHG emissions.

18. The Party also highlighted the reduction in the consumption of fossil fuels and mineral energy resources (e.g. coal) and the increased use of renewable energy sources as other important drivers of the reduction in GHG emissions between 1990 and 2021. For example, the share of coal in primary energy consumption fell from 30 to 5 per cent between 1985 and 2020. In 2021, 33.7 per cent of domestic primary energy supply was from natural gas, 29.3 per cent was from petroleum products, 15.1 per cent from nuclear power, 12.9 per cent from renewable sources, 5 per cent from coal and 4 per cent from electricity imports.

19. Hungary requested flexibility in accordance with Article 4, paragraphs 6 and 10, of the Convention in relation to the base-year definition. In accordance with Article 4, paragraph 6, of the Convention and decision 9/CP.2, Hungary, as a Party with an economy in transition, may use an average of its total GHG emissions for 1985–1987 as its base year.

2. Assessment of adherence to the reporting guidelines

20. The ERT assessed the information reported in the NC8 and BR5 of Hungary and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Greenhouse gas inventory information⁴

1. Technical assessment of the reported information

21. Hungary reported information in its BR5 and NC8 on its historical GHG emissions and inventory arrangements from its 2023 inventory submission and using GWP values from the AR5. Total GHG emissions⁵ excluding emissions and removals from LULUCF decreased by 33.7 per cent between 1990 and 2020, while total GHG emissions including net emissions or removals from LULUCF decreased by 39.0 per cent over the same period. Emissions excluding emissions and removals from LULUCF in 2021 decreased by 42, 32 and 17 per cent compared with the base year (average of 1985–1987), 1990 and 2005 respectively.

22. Hungary's GHG emission trend can be approximately divided into four periods. In the first period, from the base year (1985–1987) to 1992, emissions decreased by 31.3 per cent. In the second period, from 1993 to 2005, GHG emissions remained stable as the country gradually adapted to the market economy, followed by a 23.8 per cent decrease in emissions between 2006 and 2013. The modernization of the chemical industry, high energy prices and mild winters were the major drivers for the reduction in GHGs in the first three years of this period. The global financial and economic crisis had a major impact on Hungary's economic output, resulting in a significant drop of 8 per cent in GHG emissions between 2008 and 2009. Following a modest increase in emissions in 2010, emissions decreased further between 2011 and 2012. In contrast, the decline in economic output ended in the first quarter of 2010, and in 2014 Hungary's GDP returned to the same level as before the financial crisis and even exceeded it in 2015. Between 2013 and 2017, emissions increased by 11 per cent owing to an increase in mineral and metal production (particularly iron and steel), which accompanied the growth of the construction industry. Emissions remained relatively stable between 2017 and 2019, followed by a decrease of almost 3 per cent in 2020 to around the 2016 level, mainly due to a significant reduction in transport emissions as a consequence of the pandemic. However, this temporary decrease in emissions owing to the pandemic was followed by an increase in 2021 by 2 per cent. Removals from the LULUCF sector increased from 2.4 Mt CO₂ eq/year in the base year to 7.2 Mt CO₂ eq in 2021, or by 200 per cent.

23. Table 4 illustrates the emission trends by sector and by gas for Hungary. The emissions reported in the 2023 inventory submission differ from the data reported in CTF table 1 in that the Party used data from its 2022 annual submission for its NC8 and BR5.

⁴ GHG emission data in this section, which use GWP values from the AR5, are based on Hungary's 2023 inventory submission, version 2, which has not yet been subject to review. All emission data in subsequent chapters are based on Hungary's BR5 CTF tables, which use GWP values from the AR4 unless otherwise noted.

⁵ In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified.

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

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2020	2021	1990–2020	2020–2021	1990	2020–2021
<i>Sector</i>									
1. Energy	69 449.16	56 658.32	49 979.41	44 679.93	46 132.72	–35.7	3.3	73.1	71.8
A1. Energy industries	20 865.33	23 805.78	18 004.70	12 335.19	11 497.35	–40.9	–6.8	22.0	17.9
A2. Manufacturing industries and construction	13 398.38	4 563.74	3 361.76	4 970.07	5 210.78	–62.9	4.8	14.1	8.1
A3. Transport	8 998.28	9 195.35	11 772.70	12 637.04	13 995.81	40.4	10.8	9.5	21.8
A4. and A5. Other	22 376.56	15 653.55	14 642.40	12 715.99	13 469.52	–43.2	5.9	23.6	21.0
B. Fugitive emissions from fuels	3 810.61	3 439.90	2 197.85	2 021.63	1 959.26	–46.9	–3.1	4.0	3.1
C. CO ₂ transport and storage	NO	NO	NO	NO	NO	–	–	–	–
2. IPPU	11 358.68	7 958.53	6 402.32	7 353.18	7 149.77	–35.3	–2.8	12.0	11.1
3. Agriculture	10 090.85	6 149.08	5 604.19	7 169.75	7 201.98	–28.9	0.4	10.6	11.2
4. LULUCF	–3 361.54	–1 099.38	–4 831.98	–7 109.55	–7 197.38	–111.5	–1.2	NA	NA
5. Waste	4 086.33	4 612.39	4 547.85	3 762.46	3 733.37	–7.9	–0.8	4.3	5.8
6. Other ^a	NO	NO	NO	NO	NO	–	–	–	–
<i>Gas^b</i>									
CO ₂	73 376.83	58 505.99	52 087.46	47 335.47	48 563.86	–35.5	2.6	77.3	75.6
CH ₄	13 801.48	11 520.60	9 780.51	9 207.07	9 206.95	–33.3	–0.0	14.5	14.3
N ₂ O	7 456.42	4 810.76	3 308.87	4 461.51	4 485.77	–40.2	0.5	7.9	7.0
HFCs	0.00	202.98	1 258.46	1 848.69	1 862.46	NA	0.7	0.0	2.9
PFCs	337.53	253.89	4.12	1.64	1.76	–99.5	7.3	0.4	0.0
SF ₆	12.77	84.10	94.36	110.94	97.04	768.9	–12.5	0.0	0.2
NF ₃	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions excluding LULUCF	94 985.02	75 378.31	66 533.79	62 965.32	64 217.84	–33.7	2.0	100.0	100.0
Total GHG emissions including LULUCF	91 623.49	74 278.93	61 701.81	55 855.77	57 020.46	–39.0	2.1	NA	NA

Source: GHG emission data: Hungary's 2023 inventory submission, version 2.

^a Emissions and removals reported under the sector other (sector 6) are not included in total GHG emissions.

^b Emissions by gas without LULUCF. The Party did not report indirect CO₂ emissions separately in CRF table 6.

24. In brief, Hungary's national inventory arrangements were established in accordance with governmental decree 278/2014. The changes in these arrangements since the BR4 include the establishment of the Ministry of Energy, which was designated as the national entity and has overall responsibility for climate policy and environment. The Ministry's Climate Policy Department plays a coordinating and supervisory role in the national system, and its deputy head is Hungary's current UNFCCC focal point. The Hungarian Meteorological Service, known as HungaroMet as of 1 January 2024, is the designated main compiler of the GHG inventory; the Forest Research Institute of the University of Sopron, the Hungarian National Land Centre and the National Food Chain Safety Office provide technical support on the LULUCF sector; and the Institute of Agricultural Economics is responsible for preparing the agriculture part of the inventory.

2. Assessment of adherence to the reporting guidelines

25. The ERT assessed the information reported in the NC8 and BR5 of Hungary and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. No issues

relating to the topics discussed in this chapter of the review report were raised during the review.

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

(a) Technical assessment of the reported information

26. Hungary provided in the NC8 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1 in conjunction with decisions 3/CMP.11 and 4/CMP.11. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC8 contains a reference to the description of the national system provided in the NIR of the 2022 and 2023 inventory submissions.

(b) Assessment of adherence to the reporting guidelines

27. The ERT assessed the information reported in the NC8 and BR5 of Hungary and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry

(a) Technical assessment of the reported information

28. In its NC8 Hungary provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 in conjunction with decision 3/CMP.11 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The Party reported in its NC8 that there have been no fundamental changes to the national registry since its previous submission. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2022 annual submission of Hungary.

(b) Assessment of adherence to the reporting guidelines

29. The ERT assessed the information reported in the NC8 of Hungary and identified an issue relating to transparency, and thus adherence to the reporting guidelines for supplementary information. The finding is described in table I.3.

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

1. Technical assessment of the reported information

30. Hungary reported information on its economy-wide emission reduction target in its BR5. For Hungary the Convention entered into force on 25 May 1994. Under the Convention Hungary committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020.

31. The 2020 target for the EU and its member States was formalized in the EU 2020 climate and energy package. The legislative package regulated emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ using GWP values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target for 2020 under the Convention.

32. The EU-wide targets for 2020 under the Convention and for 2013–2020 under the Kyoto Protocol were primarily implemented through the EU ETS and ESD. The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap was put in place for 2013–2020 for the EU ETS with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. For 2030, a reduction target of 62

per cent below the 2005 level has been set for emissions covered by the EU ETS. The ESD was operational in 2013–2020 and covered sectors outside the EU ETS, including transport (excluding aviation and international maritime transport), residential and commercial buildings, agriculture, small industry and waste. The ESD was regulated through targets for each member State that added up to a reduction at the EU level of 10 per cent below the 2005 level by 2020. The ESR, the successor to the ESD, was adopted in 2018 and amended in 2023 with the target of reducing emissions covered under the ESR by 40 per cent below the 2005 level by 2030.

33. The EU generally allowed its member States to use units from the Kyoto Protocol mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Operators and airline operators could use such units to fulfil their requirements under the EU ETS in 2013–2020, and member States could use such units for their national ESD targets, within specific limitations.

34. The European Commission set out its vision for a climate-neutral EU in November 2018, and in December 2019 presented the European Green Deal as a road map with actions for making the EU economy sustainable. The European Council endorsed in December 2019 the objective of making the EU climate-neutral by 2050. As part of the European Green Deal, the 2050 climate-neutrality target was made binding in the first European Climate Law, adopted in 2021. It also increased the ambition of the 2030 emission reduction target to at least 55 per cent below the 1990 level. Member States will set out any increased ambition in the update of their NECPs.

35. Hungary has a national target of limiting its emission growth to 10 per cent above the 2005 level by 2020 for ESD sectors. This target has been translated into binding quantified AEAs for 2013–2020. Hungary’s AEAs change following a path from 50,398.98 kt CO₂ eq in 2013 to 52,830.57 kt CO₂ eq in 2020.⁶ Under the ESR, Hungary has a national target of reducing emissions from covered sectors to 18.7 per cent below the 2005 level by 2030.

36. In addition, Hungary’s law XLIV of 2020 on climate protection sets a national goal of achieving climate neutrality by 2050, and establishes medium- and long-term emission reduction and energy goals for the country. By 2030, Hungary aims to reduce GHG emissions by at least 40 per cent compared with the 1990 level and achieve a renewable energy share of at least 21 per cent in gross final energy consumption. After 2030, should final energy consumption exceed the 2005 level, the additional energy required will be provided exclusively by carbon-neutral energy sources.

2. Assessment of adherence to the reporting guidelines

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

D. Information on policies and measures

1. Technical assessment of the reported information

38. Hungary provided in its NC8 and BR5 information on its PaMs⁷ implemented, adopted and planned to fulfil its commitments under the Convention. Hungary’s set of PaMs is similar to that previously reported, with a few exceptions. Hungary provided in its NC8 a list of PaMs included in the NC6 that are no longer in place; the National Waste Management Plan 2014–2020 has been added to the list since the NC7. The list includes strategies and action plans that have expired or been revised such as the second National Energy Efficiency Action Plan, the National Forest Programme 2006–2015 (which was replaced by the National Forest Strategy 2016–2030), the National Environmental Programme 2009–2014, the

⁶ According to the EU transaction log.

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

Hungarian Rural Development Strategic Plan (2007–2013) and the Széchenyi Plan (replaced by the Széchenyi 2020 initiative and its operative programmes).

39. Hungary reported on its policy context and legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs. Hungary also indicated that there have been no changes to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target.

40. Hungary's assessment of the economic and social consequences of its response measures includes ensuring that GHG emission mitigation is fully integrated within future development projects, and that such projects promote cooperation that fosters technological transfer and enhanced funding options for climate change related projects. As an EU member State, Hungary's national climate policy is largely determined by EU legislation. Therefore, the information on response measures provided by the EU in its reports submitted to the UNFCCC is relevant to Hungary. The Party further explained that its approach is guided by the principle of supporting ambitious national emission reduction targets within a climate policy framework that avoids adverse impacts on developing countries, such as carbon leakage. Hungary did not report on actions to identify and review its own policies and practices that encourage activities that lead to greater levels of emissions.

41. In its reporting on PaMs, Hungary provided the estimated emission reduction impacts for some of its PaMs. Where estimated impacts were not provided, the Party did not supply an explanation specific to individual PaMs. The Party explained during the review that estimated impacts were not provided for some PaMs because the calculations are still under way.

42. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO₂ emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package. The 2021 European Climate Law, which forms part of the European Green Deal, made climate neutrality by 2050 legally binding and raised the EU-wide 2030 emission reduction target to at least 55 per cent compared with the 1990 level. In 2023, the EU adopted several pieces of legislation that were part of the "Fit for 55" package intended to help achieve the new 2030 target. These new laws strengthened both the ESR and EU ETS 2030 targets, extended the EU ETS to include maritime shipping in 2024 and established the Social Climate Fund to address equitability of mitigation impacts. They also created the EU ETS 2 to cover at the point of distribution most fuel used in sectors not covered by the EU ETS, beginning in 2027.

43. The 2021–2030 EU-wide policies are operationalized through the NECPs of EU member States, which should set out national objectives for each of the five dimensions of the Energy Union, namely energy security; the internal energy market; energy efficiency; decarbonization; and research, innovation and competitiveness. The NECPs are periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal. Hungary's NECP is in the process of being revised; a draft version was submitted to the European Commission in 2023 that focuses on enhancing the use of renewable energy and increasing forest cover in line with Hungary's National Forest Strategy.

44. Hungary introduced national-level policies to achieve its targets under the ESD, the ESR and domestic emission reduction targets. The key policies reported are the NCCS, the National Sustainable Development Framework Strategy 2012–2024 and the National Environmental Programme up until 2026. The mitigation effect of the improvement of the bicycle transportation network is the most significant. Other policies that have delivered emission reductions are the application of usage-based road tolls on heavy-duty vehicles, and education on and the broad application of eco-driving. The ERT identified the improvement of the bicycle transportation network as a mitigation action of particular interest because it has led to a large GHG emission reduction in a short period of time. In 2022, the Government also adopted the National Clean Development Strategy 2020–2050.

45. Hungary highlighted the domestic mitigation actions that are under development, such as those being revised to align with the more ambitious 2030 target of the EU to reduce domestic emissions by at least 55 per cent compared with the 1990 level. Among the mitigation actions that provide a foundation for significant additional action are the energy saving programme for public buildings, the establishment of the National Energy Efficiency Advisory Network and the new requirements on the energy performance of buildings. Table 5 provides a summary of the reported information on the PaMs of Hungary.

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

<i>Sector</i>	<i>Key PaMs^a</i>	<i>Estimated mitigation impact in 2020 (kt CO₂ eq)</i>	<i>Estimated mitigation impact in 2030 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	National Climate Change Strategy	NE	NE
	National Energy Strategy 2030, with an outlook until 2040	NE	NE
	National Energy and Climate Plan	NE	NE
	National Environmental Programme up until 2026	NE	NE
Energy			
Energy supply and renewable energy	Operational grant for the production of renewable energies	NE	NE
	Expansion of the Paks Nuclear Power Plant	NE	NE
Energy efficiency	New requirements on energy performance of buildings	NE	NE
	Energy saving programme for public buildings	NE	NE
	National Energy Efficiency Action Plan	NE	NE
Transport	Improvement of the bicycle transportation network	1 550.0	NE
	Application of usage-based road toll on heavy duty vehicles	136.6	NE
	Education and broad application of eco-driving	68.2	NE
IPPU			
Stationary industrial installations (mineral, chemical and metal production industries)	The EU Emissions Trading System (EU ETS) (Directive 2003/87/EC and a wide series of implementing and delegated legal acts based thereon; Decision (EU) 2015/1814)	NE	NE
	Industrial Emissions Directive 2010/75/EU	NE	NE
Fluorinated gases	Mobile Air Conditioning Systems Directive (Directive 2006/40/EC)	NE	NE
	Fluorinated greenhouse gases regulation (Regulation (EU) No 517/2014)	NE	NE
Agriculture	Greening payment	NE	NE
	Protection against soil erosion	NE	NE
LULUCF	National Forest Programme	NE	NE
	Rural Development Programme	NE	NE
Waste	National Waste Management Plan	NE	NE
	Environmental Product Fee	NE	NE

Note: The estimated mitigation impacts are estimates of emissions of CO₂ eq avoided in a given year as a result of the implementation of mitigation actions.

^a Names of PaMs reproduced as reported in Hungary's BR5.

46. In addition, Hungary reported on its second NCCS for 2017–2030. During the review, Hungary provided detailed information on the NCCS and its three main components, namely the National Decarbonization Roadmap, the National Adaptation Strategy, and the Partnership for the Climate Awareness-Raising Plan. The objective of the National Decarbonization Roadmap is to launch a planning mechanism that contributes to the development of the Hungarian green economy and the sharing of international decarbonization burdens on the basis of balanced respect for competitiveness, welfare,

technological shift and climate protection. The NCCS is operationalized via the Climate Change Action Plan. Its main role is to transpose into practice the climate change development concepts included in the second NCCS.

47. Funding of climate action is partly achieved via the EU structural funds and Hungary's operational programmes. Hungary reported that improving energy efficiency and increasing renewable energy, among other things, are achieved via its operational programmes, which include the Environment and Energy Efficiency Operational Programme, the Economic Development and Innovation Operational Programme and the Integrated Transport Development Operational Programme. Additionally, resources from income generated from the sale of emission allowances under the EU ETS are invested in mitigation measures via the Economy Greening Scheme and the Green Economy Financing Scheme.

2. Assessment of adherence to the reporting guidelines

48. The ERT assessed the information reported in the NC8 and BR5 of Hungary and identified issues relating to completeness and transparency, and thus adherence to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The findings are described in tables I.1 and II.1.

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

(a) Technical assessment of the reported information

49. In its NC8, Hungary reported that the implementation of the Kyoto Protocol is underpinned by the common legal framework on climate change. The overall responsibility for climate change policymaking lies with the Ministry of Energy, and a number of national institutions are involved in policy implementation. The Climate Policy Department within the Ministry of Energy is responsible for international and EU-level climate negotiations and national climate lawmaking. It also includes the National Climate Protection Authority, which carries out tasks relating to the administration of fluorinated gases and the EU ETS and is the administrator of the national registry. The Ministry of Energy develops economic instruments for environmental protection, monitors and promotes the introduction of environmentally friendly materials, energy, and water-saving waste-efficient technologies, and is responsible for developing environmental awareness-raising and educational programmes. The Ministry of Agriculture is responsible for nature conservation and for developing agricultural and forestry policy. It also manages agricultural and rural development as the second pillar of the EU Common Agricultural Policy, as well as related research and development, setting out short-, medium- and long-term goals.

50. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Hungary committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year level (see paras. 30–32 above).

51. The Party has arrangements and enforcement procedures to meet its commitments under the Kyoto Protocol, including procedures for addressing non-compliance. These include the Act on the Implementation of the UNFCCC and its Kyoto Protocol (2007), which also describes the rules for joint implementation projects in the territory of Hungary. As an EU member State, Hungary fulfils its emission reduction commitments for 2020 jointly with the whole EU. The EU ETS and ESD, which serve this purpose, were transposed into national law by the Act on Emission Trading (2012). Since 2013, the EU ETS operates through a set of EU-wide harmonized rules. Hungarian authorities are bound by EU law in the operation of the EU ETS, including in relation to the auctioning and free allocation of emission allowances, which is carried out via national allocation plans adopted before 2013. The respective Acts, as well as governmental decrees 323 (2007), 410 (2012), 341 (2013), 278 (2014) and 14 (2015), provide publicly accessible detailed rules on the enforcement and administrative procedures concerning Hungary's climate-related obligations.

52. Hungary has provisions in place to make information on legislative arrangements and administrative procedures related to compliance and enforcement publicly accessible. The

Ministry of Energy is responsible for publishing this information on its website,⁸ which is regularly updated.

53. Hungary has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. Such arrangements and procedures are set out in the Hungarian Forest Strategy 2016–2030, the main goal of which is to achieve at least 27 per cent forest coverage in Hungary by 2050, which requires annual afforestation of around 15,000 ha. The Ministry of Agriculture is responsible for developing forestry policy and for nature conservation, while the national system for continuous collection of data on forests and forestry is managed by the Forestry Department of the National Land Centre.

(b) Assessment of adherence to the reporting guidelines

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

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

(a) Technical assessment of the reported information

55. In the NC8 Hungary reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties.

56. The Party reported in its BR5 that it is guided by the principle that national emission reduction targets should be achieved through national climate policies that avoid adverse impacts on developing countries, such as carbon leakage. The Party's main instrument is the integration of climate policy into development policy, which is guaranteed via the second NCCS for 2017–2030. However, the ERT noted that it was not clear from the information reported in the BR5 how the second NCCS will guarantee that climate policy is integrated into development policy.

57. During the review, Hungary provided additional information on how the adverse effects of PaMs on other Parties and on international trade are minimized, including the impact assessments conducted by Hungary and the EU before the implementation of new PaMs. In its NC8 and BR5, Hungary reported information on cooperation in the development of technologies. Although Hungary does not participate in large-scale development projects relating to climate change alone, as an EU member State it fully supports the activities of the EU in that regard. Hungary's approach to minimizing adverse impacts consists mainly of adherence to EU policies, such as those aimed at avoiding adverse impacts, fostering sustainable development and improving international trade.

58. The NC8 includes information on how Hungary promotes and implements the decisions of ICAO and IMO to limit emissions from aviation and marine bunker fuels. Hungary reported that the CORSIA State Action Plan, submitted to ICAO in September 2022, lists the domestic actions to reduce CO₂ emissions that are based on ICAO decisions. In addition, Hungary is exploring national options for reducing CO₂ emissions from sustainable aviation fuels within the framework of its national sustainable aviation fuel project, which could contribute to the achievement of the ICAO long-term global aspirational goal for international aviation of net zero carbon emissions by 2050 at both the national and regional level. Hungary also reported that the implementation of IMO decisions is regulated by EU rules applicable to EU member States. According to the reporting obligations under those rules, there are limited effects on emissions from marine bunker fuels in Hungary, since

⁸ <https://kormany.hu/energiaugyi-miniszterium>.

there are no vessels in the national registry that exceed the established threshold of 5,000 gross tonnes for measurement, reporting and verification of emissions.

59. Further information on how Hungary strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the NIR of the 2022 annual submission. The reporting included information on cooperation with developing countries, which is focused on sharing knowledge, expertise and available technologies. Although Hungary does not take part in large-scale development projects focused solely on climate change, as an EU member State, it fully supports the activities of the EU in that regard. Hungary’s approach to minimizing adverse impacts consists mainly of adhering to EU policies, such as those aimed at avoiding adverse impacts, fostering sustainable development and improving international trade. Hungary reported in its NC8 that within the framework of bilateral scientific and technological cooperation programmes funded by the National Research, Development and Innovation Fund, it has supported research activities focusing on various aspects of climate change, including through bilateral cooperation programmes with China, India and Morocco. Hungary also supports the work under the Technology Mechanism and has delegated an expert as a member of the Technology Executive Committee.

(b) Assessment of adherence to the reporting guidelines

60. The ERT assessed the information reported in the NC8 of Hungary and identified an issue relating to completeness, and thus adherence to the reporting guidelines for supplementary information. The finding is described in table I.3.

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

1. Technical assessment of the reported information

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

Table 6
Summary of information on emissions covered by the European Union effort-sharing decision annual emission allocation and use of units from market-based mechanisms by Hungary
 (kt CO₂ eq)

<i>Year</i>	<i>ESD emissions</i>	<i>AEA</i>	<i>Use of units from market-based mechanisms</i>	<i>AEAs transferred to (–) or from (+) other Parties</i>	<i>Annual AEA surplus/deficit</i>	<i>Cumulative AEA surplus/deficit</i>
2013	38 436.98	50 398.98	0.00	0.00	11 962.00	11 962.00
2014	38 423.03	51 516.64	0.00	0.00	13 093.61	25 055.61
2015	41 437.59	52 634.30	0.00	0.00	11 196.71	36 252.32
2016	42 059.94	53 751.96	0.00	0.00	11 692.02	47 944.34
2017	43 141.88	50 064.25	0.00	0.00	6 922.37	54 866.71
2018	43 249.95	50 986.36	0.00	0.00	7 736.41	62 603.12
2019	44 894.94	51 908.46	NA	0.00	7 013.52	69 616.64
2020	43 906.33	52 830.57	NA	–3 789.67	5 134.57	74 751.21

Sources: Hungary’s BR5 and EU transaction log (AEAs), which use GWP values from the AR4.

Note: For a given year, a positive number (surplus) indicates that annual or cumulative ESD emissions were lower than the corresponding AEA or cumulative AEAs, while a negative number (deficit) indicates that annual or cumulative ESD emissions were higher than the corresponding AEA or cumulative AEAs.

2. Assessment of adherence to the reporting guidelines

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

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

63. In assessing the Party's contribution towards achievement of the 2020 joint EU target on the basis of the information reported in its BR5, the ERT noted that, under the EU 2020 climate and energy package, Hungary committed to limiting its emission growth under the ESD to 10 per cent above the 2005 level by 2020 (see para. 35 above). This target has been translated into binding quantified AEAs for 2013–2020. In 2020 Hungary's ESD emissions were 6.9 per cent (43,906.33 kt CO₂ eq) lower than in 2005 (47,164.36 kt CO₂ eq), implying that the country has met and exceeded its 2020 target. The ERT also noted that in 2020, Hungary's ESD emissions were 9.7 per cent (5,134.57 kt CO₂ eq) below the AEA. Taking the use of market-based mechanisms into account, Hungary has a cumulative surplus of 74,751.21 kt CO₂ eq with respect to its AEAs between 2013 and 2020. Although ESD emissions increased in 2013–2020, the ERT noted that Hungary met and exceeded its ESD target by implementing mitigation actions that are delivering emission reductions, thereby limiting the increase in ESD emissions.

64. The ERT noted that the BR5 of the EU indicates that the total GHG emissions excluding LULUCF of the EU and including the use of units from market-based mechanisms do not exceed the emission level corresponding to the target in 2020, and thus that the EU has achieved its joint target. See the report on the technical review of the BR5 of the EU for further details. Therefore, the ERT concluded that, on the basis of the information reported in the BR5, Hungary has met its 2020 commitment under the Convention through its contribution to achieving the joint EU target.

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

F. Projections

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

66. Hungary reported in its BR5 and NC8 updated projections for 2030–2040 relative to actual inventory data for 2020 under the WEM scenario, using GWP values from the AR4. The WEM scenario reported by Hungary includes PaMs implemented and adopted until 2016 in the energy sector and until 2019 in other sectors. During the review, the Party provided updated results of the more recently compiled projections annexed to the draft NECP submitted to the European Commission, which extend up to 2050.

67. In addition to the WEM scenario, Hungary reported the WAM scenario. The WAM scenario includes planned PaMs. The WEM scenario is based on the current emission trends and does not apply any constraints on the share of renewable energy, energy efficiency and GHG emissions to the modelling of the energy sector projections for 2030 and 2050. The goal under the WAM scenario is to achieve climate neutrality by 2050. This scenario assumes a maximum final energy consumption of 734 PJ and a minimum 27 per cent share of renewable energy in gross final energy consumption by 2030. After 2030, a linear GHG emission reduction pathway is assumed. Under the WAM scenario, emission reductions are achieved in all sectors, with the largest reductions up to 2050, compared with the 1990 level, expected in the energy (99.0 per cent), transport (84.3 per cent), waste (53.0 per cent),

agriculture (38.8 per cent) and industry/industrial processes (10.7 per cent) sectors. Carbon capture, utilization and storage is considered essential to achieving net zero under the WAM scenario, while hydrogen and electrification play a key role in the partial decarbonization of industry. While there is no significant change in the fuel structure under the WEM scenario compared with the fuel structure situation in 2020, a substantial realignment of the fuel structure is projected under the WAM scenario. Hydrogen will be introduced from 2040 and will play an increasingly important role, accounting for 15 per cent of total energy consumption by 2050. Hydrogen primarily replaces natural gas. The definitions indicate that the scenarios for the energy and IPPU sectors were prepared in accordance with the UNFCCC reporting guidelines on BRs. Projections are presented at five-year intervals between the base year (or from 2016 for the energy sector and from 2019 for other sectors) and 2040.

68. The projections are presented on a sectoral basis, using different sectoral categories from those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) for 2030–2040. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4. Hungary reported on factors and activities affecting emissions for each sector, except for the agriculture and LULUCF sectors.

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

69. The methodology used for the preparation of the projections is different from that used for the preparation of the emission projections for the NC7. Hungary provided information on the new assumptions, methodologies, models and approaches used for the projection scenarios. The Party also provided information on its most recent projections compiled within the framework of its NECP and the supporting documentation, including projections in tabular format for all sectors except the LULUCF sector. The projections reported in the NECP use population, GDP and energy prices as the key input parameters. Hungary used TIMES for the energy sector projections, which applies mathematical optimization while taking into account technological constraints. For the agriculture sector, the volume of agricultural production was projected using randomized minimum squares (the Cochrane–Orcutt regression method), using changes in population and oil prices as variables. The Green Economy Model was used for the other sectors and to estimate the social costs and benefits of GHG emission reductions.

70. To prepare its projections, Hungary relied on key underlying assumptions relating to population, energy prices and economic development indicators. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. According to CTF table 5, the population of Hungary is assumed to decrease from 9,770,000 in 2020 to 9,705,471 in 2025 and 9,624,131 in 2030. The crude oil price is assumed to increase from EUR 6.01 in 2020 to EUR 14.38 in 2025 and 2030. The price of natural gas is also assumed to increase, from EUR 3.01 in 2020 to EUR 13.20 in 2025, before falling to EUR 11.30 in 2030. During the review, the Party provided recent projections prepared in 2023 and reported in its NECP. Although a downward trend is assumed in terms of population, the number of new dwellings built is projected to exceed the decrease in the number of existing dwellings, resulting in an overall increase in the size of the residential area per inhabitant. The demand for refrigerators and freezers is also assumed to increase by 42 per cent between 2019 and 2050, the demand for lighting by 57 per cent and for other electrical devices by 112 per cent. In public transportation, the future share of bus, suburban rail, metro, tram and trolleybus transport is assumed to remain the same.

71. Sensitivity analyses were conducted for EU ETS carbon prices. According to the analysis, by 2030, higher EU ETS carbon prices would result in a 53 per cent reduction in emissions under the EU ETS and a 14.8 per cent increase in emissions under the ESR, while total emissions excluding LULUCF would be 8.9 per cent lower, compared with the WAM scenario projections for the same year.

(c) Results of projections

72. The projected emission levels under different scenarios are presented in table 7 and figure 1, which include the updated projections contained in the NECP provided by the Party during the review and reported in Hungary’s 2023 inventory submission.

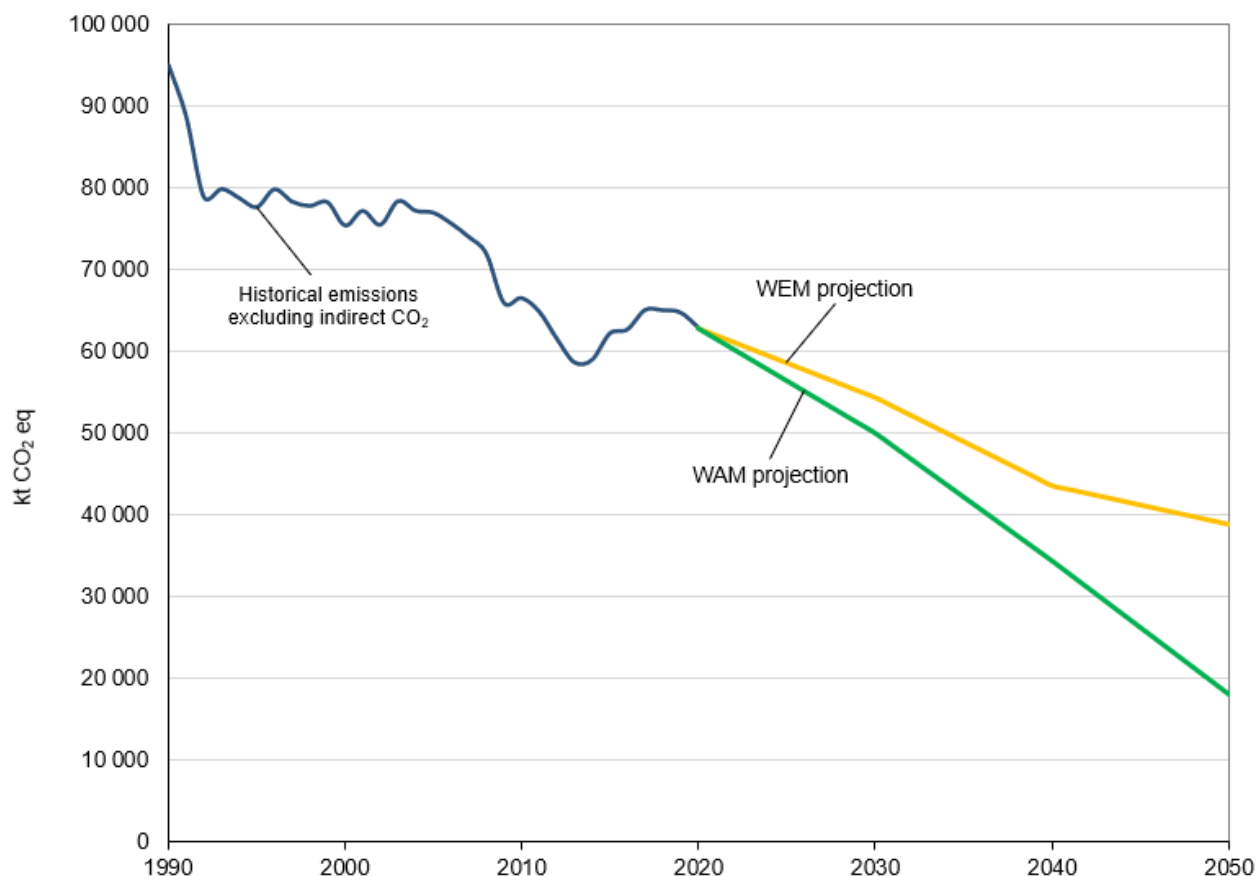
Table 7
Summary of greenhouse gas emission projections for Hungary

	<i>GHG emissions (kt CO₂ eq/year)</i>	<i>Change in relation to 1990 level (%)</i>	<i>Change in relation to 2020 level (%)</i>
Inventory data 1990	94 985.02	NA	NA
Inventory data 2020	62 965.32	NA	NA
WEM projections for 2030	54 490.33	-42.6	-13.5
WAM projections for 2030	50 127.87	-47.2	-20.4
WEM projections for 2040	43 697.11	-54.0	-30.6
WAM projections for 2040	34 465.33	-63.7	-45.3
WEM projections for 2050	38 952.52	-59.0	-38.1
WAM projections for 2050	18 092.54	-81.0	-71.3

Sources: Hungary’s BR5 CTF table 6, which uses GWP values from the AR4. Updated projections were provided by Hungary during the review.

Note: The projections are of GHG emissions excluding LULUCF and excluding indirect CO₂.

Figure 1
Greenhouse gas emission projections reported by Hungary



Source: Hungary’s BR5 CTF table 6, which uses GWP values from the AR4. Updated projections were provided by Hungary during the review.

73. Hungary’s total GHG emissions excluding LULUCF are projected under the WEM scenario to decrease by 42.6, 54.0 and 59.0 per cent below the 1990 level in 2030, 2040 and 2050 respectively. The LULUCF sector projections were not available when the NECP,

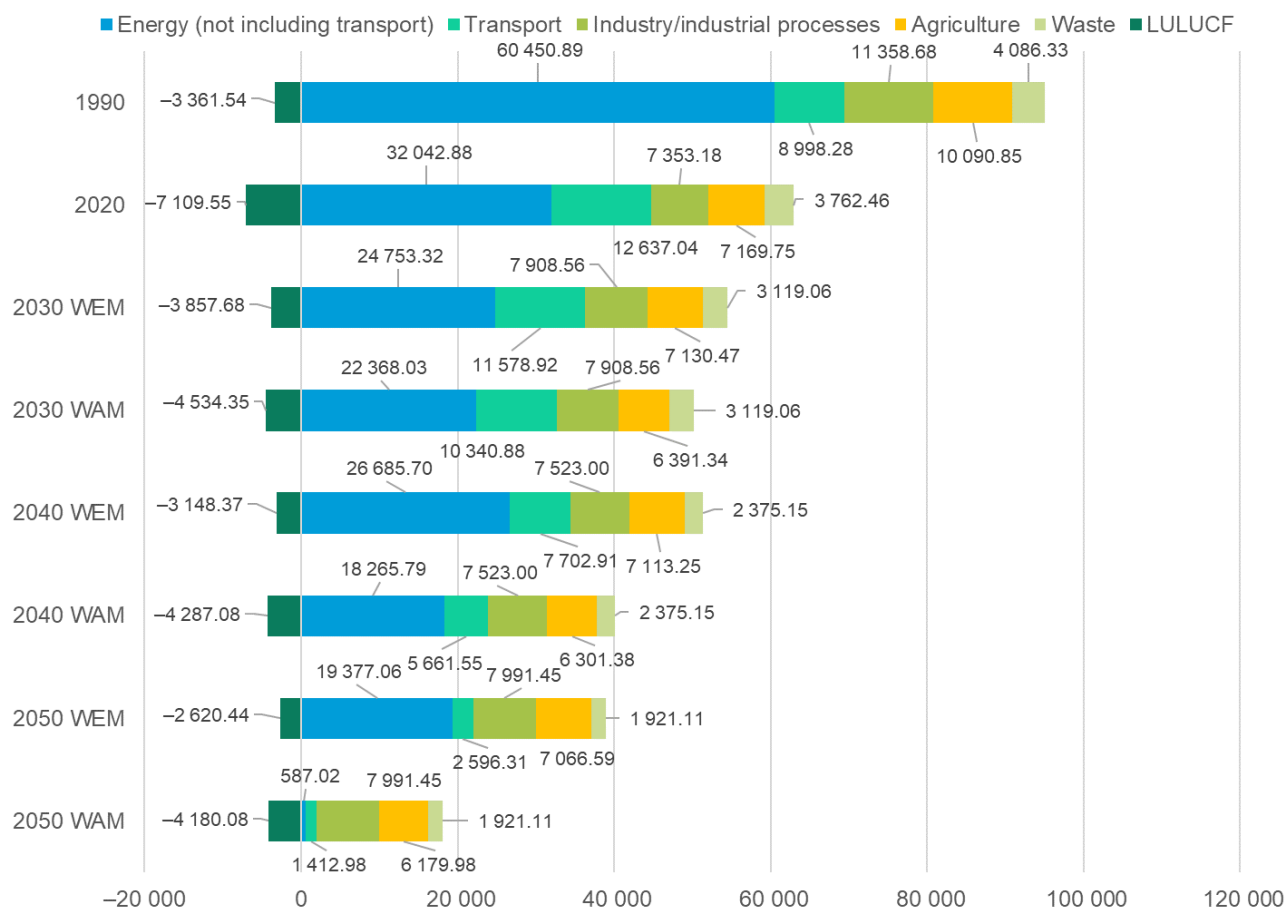
which is the basis for reporting in the NC8 and BR5, was under preparation, but were provided during the review. Under the WAM scenario, emissions in 2030, 2040 and 2050 are projected to be lower than those in 1990 by 47.2, 63.7 and 81.0 per cent respectively.

74. Hungary presented the WEM and WAM scenarios by sector for 2030, 2040 and 2050, as summarized in figure 2 and table 8.

Figure 2

Greenhouse gas emission projections for Hungary presented by sector

(kt CO₂ eq)



Source: Hungary's BR5 CTF table 6, which uses GWP values from the AR4. Updated projections for 2040 and 2050 from the NECP and the latest LULUCF projections were provided by Hungary during the review.

Table 8

Summary of greenhouse gas emission projections for Hungary presented by sector

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2030		2050		1990–2030		1990–2050	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	60 450.89	24 753.32	22 368.03	19 377.06	587.02	-59.1	-63.0	-67.9	-99.0
Transport	8 998.28	11 578.92	10 340.88	2 596.31	1 412.98	28.7	14.9	-71.1	-84.3
Industry/industrial processes	11 358.68	7 908.56	7 908.56	7 991.45	7 991.45	-30.4	-30.4	-29.6	-29.6
Agriculture	10 090.85	7 130.47	6 391.34	7 066.59	6 179.98	-29.3	-36.7	-30.0	-38.8
LULUCF	-3 361.54	-3 857.68	-4 534.35	-2 620.44	-4 180.08	14.8	34.9	-22.0	24.4
Waste	4 086.33	3 119.06	3 119.06	1 921.11	1 921.11	-23.7	-23.7	-53.0	-53.0
Other	0.00	0.00	0.00	-	-	-	-	-	-
Total GHG emissions	94 985.02	54 490.33	50 127.87	38 952.52	18 092.54	-42.6	-47.2	-59.0	-81.0

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2030		2050		1990–2030		1990–2050	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
excluding LULUCF									

Source: Hungary's BR5 CTF table 6, which uses GWP values from the AR4. Updated projections for 2040 and 2050 from the NECP and the latest LULUCF projections were provided by Hungary during the review.

75. According to the projections reported for 2030 under the WEM scenario, the most significant absolute emission reductions are expected to occur in the energy sector (not including transport), amounting to projected reductions of 59.1 per cent between 1990 and 2030, rising to reductions of 67.9 per cent between 1990 and 2050. Transport sector emissions are projected to increase by 28.7 per cent by 2030 and to decrease by 71.1 per cent by 2050 compared with the 1990 level. The emission reductions in the industry/industrial processes and agriculture sectors are estimated to be 29.6 and 30.0 per cent respectively between 1990 and 2050. According to the NECP, significant GHG emission reductions are expected to occur in the agriculture sector in relation to anaerobic digestion of farm animal manure and manure management, with projected reductions under the livestock and manure management categories of 45.1 and 49.9 per cent, respectively, in 1990–2050.

76. Hungary presented the WEM and WAM scenarios by gas for 2030 and 2050, as summarized in table 9.

Table 9

Summary of greenhouse gas emission projections for Hungary presented by gas

Gas ^a	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2030		2050		1990–2030		1990–2050	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO ₂	73 376.83	41 663.04	38 090.70	28 172.38	23 747.58	–43.2	–48.1	–61.6	–67.6
CH ₄	13 801.48	6 787.55	6 665.52	5 192.64	4 882.08	–50.8	–51.7	–62.4	–64.6
N ₂ O	7 456.42	4 512.34	3 844.24	4 554.95	3 770.67	–39.5	–48.4	–38.9	–49.4
HFCs	0.002	1 364.88	1 364.88	900.60	900.60	63 402 103	63 402 103	41 835 082	41 835 082
PFCs	337.53	0.55	0.55	0.04	0.04	–99.8	–99.8	–100.0	–100.0
SF ₆	12.77	161.98	161.98	131.91	131.91	1 168.4	1 168.4	933.0	933.0
NF ₃	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions without LULUCF	94 985.02	54 490.33	50 127.87	38 952.52	18 092.54	–42.6	–47.2	–59.0	–81.0

Source: Hungary's BR5 CTF table 6, which uses GWP values from the AR4. Updated projections for 2050 were provided by Hungary during the review.

^a Hungary did not include indirect CO₂ emissions in its projections.

77. One of Hungary's most important decarbonization measures is the transformation of the lignite-fired Mátra power plant using low-carbon technologies, thus phasing out coal and lignite from domestic electricity production by 2030 at the latest. The projections also include the construction of a new gas turbine power plant at the Mátra power plant site, after which coal-based electricity production will be phased out. During the review, Hungary provided additional information, explaining that while the WAM scenario projections include the target of a 27 per cent share of renewable energy in final energy consumption by 2030, this target has since been raised to 29 per cent. To achieve this target, Hungary will aim to increase the share of first-generation biofuels produced from food and feed crops to almost 4 per cent by 2030, while also increasing the share of waste and second-generation (or advanced) biofuels and biogas to at least 4.5 per cent and the share of renewable transport fuel of non-biological origin to a minimum of 1 per cent of final energy consumption in the transport sector. Hungary is also planning to invest in solar power generation capacity, which it aims to increase from the current level of about 6 GW to at least 12 GW by 2030.

(d) Assessment of adherence to the reporting guidelines

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

2. Assessment of the total effect of policies and measures**(a) Technical assessment of the reported information**

79. In its NC8 Hungary did not present an estimate of the total effect of its PaMs in the NC8 and BR5, but did report on its PaMs. During the review, Hungary explained that information on the estimated and expected total effect of implemented and adopted PaMs in terms of GHG emissions avoided or sequestered, including the assessment of trends, is included in chapter 4 of the NECP.

(b) Assessment of adherence to the reporting guidelines

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

3. Supplementary relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol**(a) Technical assessment of the reported information**

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

(b) Assessment of adherence to the reporting guidelines

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

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

83. Hungary is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3–5, of the Convention. However, Hungary provided information in its NC8 and BR5 on its provision of support to developing country Parties. The ERT commends Hungary for reporting this information and suggests that it continue to do so in future NCs.

84. Hungary reported that it is committed to contributing to the green transition of developing countries and to reporting information on the assistance provided, in line with EU regulation 2018/1999 on the governance of the Energy Union and climate action.

85. In May 2019, the Western Balkans Green Center became operational. It operates under the supervision of the Ministry of Energy of Hungary and seeks to contribute to the climate protection efforts of Western Balkan countries in line with their nationally determined contributions. Its grant programme is aimed at developing bankable and capacity-building projects. In total, 47 projects have been launched since 2019, with a total budget of EUR 7 million, of which EUR 4 million was grants.

86. In addition, the Hungarian Center of Excellence in Green Transition for the countries of the Western Balkans was established in 2019 in partnership with the Energy Community Secretariat, aimed at speeding up convergence processes and strengthening the efforts of the

respective countries to combat climate change. It facilitates knowledge exchange and the transfer of international and Hungarian best practices, mobilizing expertise in relevant legislation and administration via workshops, webinars, technical assistance and twinning projects. It also helps local banks and financial institutions to develop their sustainability frameworks and regulations, for example through the EU taxonomy for sustainable activities.

87. Hungary's provision of financial support to developing country Parties through multilateral and bilateral channels is categorized into mitigation, adaptation and cross-cutting activities. Its total climate finance increased from USD 1.03 million in 2018 to USD 29.78 million in 2020. The greatest share of Hungary's international climate finance goes to cross-cutting and adaptation projects, including in Northern, Eastern and Southern Africa, South-Eastern Asia and South-Eastern Europe.

H. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

88. In its NC8 Hungary provided information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Hungary provided a description of climate change vulnerability and impacts on agriculture, forestry, human health, public safety (including disaster management and security policy), tourism, urban infrastructure and water management, and highlighted the adaptation response actions taken and planned at different levels of government. Hungary also included information on the latest developments in adaptation planning under the second NCCS and its action plans.

89. Hungary has addressed adaptation matters through the adoption of the second NCCS in 2018, which provided further direction, using sector-specific action lines, to ministries and government agencies on enhancing preparedness for climate change. The second NCCS contains action lines for each sector, with implementation supported by measures set out in the three-year Climate Change Action Plan, which was first adopted in 2020. Future iterations of the plan are currently being developed.

90. The NC8 includes a detailed overview of the future impacts of climate change in Hungary for 2021–2050 and 2071–2100, which were provided by HungaroMet and based on the results of the regional climate models (ALADIN and REMO) combined with moderate (RCP4.5) and high (RCP8.5) anthropogenic emissions scenarios. Based on the results of the model calculations for the twenty-first century, a mean annual temperature increase of less than 2 °C is expected in 2021–2050 across the whole country. By the end of the century (2071–2100), the average temperature increase across the whole country is expected to be between 1.6 and 4.0 °C compared with the reference period 1971–2000. Studies show that temperature extremes are shifting significantly towards warming: the number of frosty days will decrease and the number of summer and heatwave days will increase, by up to a whole month by the end of the century.

91. Hungary has implemented several adaptation projects funded under the EU LIFE Programme. For example, the overall goal of the “Municipalities as integrators and coordinators in adaptation to climate change” project was to improve the climate resilience of vulnerable municipalities in Hungary by reducing their climate change related risks, including by testing, introducing and fostering the integration of sustainable ecosystem-based water management approaches into natural resources management strategies and land-use planning practices of local governments and strengthening the coordination role of local municipalities in climate change adaptation planning and risk recognition. The aim of the project “Cooperation of cities and local companies for climate change adaptation” is to implement joint municipal–industrial adaptation actions by developing public–private partnerships whereby local government and local industrial companies act together to reduce climate risks and increase resilience to climate change with a view to enabling replication of actions in other regions. Table 10 summarizes the information on vulnerability and adaptation to climate change presented in the NC8 of Hungary.

Table 10

Summary of information on vulnerability and adaptation to climate change reported by Hungary

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture	Vulnerability: Droughts causing irrigation problems, thus hindering agricultural production; floods and inundations. Adaptation: Land-use change; implementation of organic agricultural practices on wetlands; improved flood and inundation defences; improved irrigation and water use.
Forestry	Vulnerability: High temperatures and droughts impairing forest development; extreme weather events causing tree loss and forest degradation; new diseases and pests. Adaptation: Introduction of new drought-resistant species; improved forest management practices and research and development.
Human health	Vulnerability: Heatwaves causing heart and respiratory problems in urbanized areas; appearance of new pests and diseases. Adaptation: Health-care development; formation of air-conditioned shelters; vaccination and improved research and development in the field; implementation of a heatwave monitoring and alert system.
Public safety	Vulnerability: Migration; weather-related catastrophes (floods, storms, blizzards). Adaptation: Improved civil defences; improved institutional background; development and implementation of preparedness and preventive measures.
Tourism	Vulnerability: Shortening and shifting of tourist seasons as a result of climate change. Adaptation: Promotion of climate-friendly tourism.
Urban infrastructure	Vulnerability: Heatwaves causing heat island effects. Adaptation: Urban area development; afforestation, where possible, to increase green cover; implementation of improved engineering practices.
Water management	Vulnerability: Droughts threatening freshwater supply; floods threatening water defence lines and human settlements. Adaptation: Infrastructural developments; improved water management practices; utilization of rainwater for irrigation.

2. Assessment of adherence to the reporting guidelines

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

I. Research and systematic observation**1. Technical assessment of the reported information**

93. In its NC8 Hungary provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the Global Climate Observing System and the Intergovernmental Panel on Climate Change. Hungary also provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.

94. Hungary has implemented international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. Funding for climate change research in Hungary mainly stems from EU sources and the National Research, Development and Innovation Fund. Hungary's research efforts are coordinated and supported through the active participation of the Hungarian Academy of Sciences, HungaroMet and national universities and research institutions.

95. In Hungary, vulnerability assessments are conducted under NAGiS, the principal decision-supporting geographic information system tool underpinning Hungary’s adaptation policy. The results of the vulnerability assessments conducted under NAGiS and its partner projects (e.g. on human health care, arable farming, forests, natural habitats, drinking water supply and the threat of climate change induced flash floods in hilly regions) have been incorporated into Hungary’s second NCCS. In the second development phase of NAGiS, decision-supporting modules were developed and several new results were published in the fields of tourism, agriculture, internal migration, the labour market, water management (flash flood and rainwater management, sensitivity of water provision in municipalities) and vulnerability related to shallow geohazards. The Hungarian Scientific Panel on Climate Change was established in 2020 with the aim of studying, reporting and disseminating the latest knowledge on climate change related research in Hungary.

96. In terms of activities related to systematic observation, Hungary reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Observation activities are mainly carried out or coordinated by HungaroMet and the Department of Meteorology at Eötvös Loránd University. HungaroMet has collaborated with the Global Telecommunication System of the World Meteorological Organization and with various international organizations, including the European Commission, on background GHG concentrations and air quality monitoring. Hungary has also continued to provide data to the Global Atmosphere Watch programme since the 1990s.

97. HungaroMet implemented an open data policy for meteorological data in January 2021. As a result, climate measurements, including meteorological station data and gridded data sets, have been made publicly available online.⁹ A climate data visualization platform¹⁰ was also developed and made publicly accessible. The aim of the platform is to assist climate impact researchers, planners and decision makers by providing regional and urban information compiled from measurements and climate simulation data, which can be visualized in the form of maps and graphs. Additionally, a new data portal, based on an expanded and reorganized observation network, is under development to further support adaptation planning.

98. The National Multidisciplinary Laboratory for Climate Change was established in 2022 to analyse the effects of climate change in Hungary. Under this project, HungaroMet participates in producing climate data sets and in developing a climate information system and climate communication tools and services.

99. The NC8 reflects actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Hungary provided funding for scientists from developing countries working on global climate change research.

2. Assessment of adherence to the reporting guidelines

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

J. Education, training and public awareness

1. Technical assessment of the reported information

101. In its NC8 Hungary provided information on its actions relating to education, training and public awareness. The Party provided information, as contained in its second NCCS and related action plans, on the general policy on education, training and public awareness; primary, secondary and higher education; public information campaigns; training

⁹ At <https://odp.met.hu>.

¹⁰ <https://klimadat.met.hu>.

programmes; education materials; resource or information centres; the involvement of the public and non-governmental organizations; and its participation in international activities.

102. The NC8 includes a list of courses related to climate change offered at Hungarian universities and colleges, as well as centralized and decentralized training activities that are mostly geared towards professionals in the fields of construction and engineering. A key element of climate education is the inclusion of climate change and sustainability in the curriculum at all levels of education. ‘Eco-schools’ and ‘green kindergartens’ also play an important role, and the number of participating schools has increased from around 1,000 in 2017 to around 1,400 in 2023, representing a third of all schools in the country. The NC8 also contains information on activities undertaken by various organizations to raise awareness of climate change, ranging from churches and national civil organizations to local branches of international non-governmental organizations. Awareness-raising is also one of the three pillars of Hungary’s second NCCS and its action plans.

2. Assessment of adherence to the reporting guidelines

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

III. Conclusions and recommendations

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

105. The information provided in the NC8 includes most of the elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Hungary reported on the national system, the national registry, supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, PaMs in accordance with Article 2 of the Kyoto Protocol, domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures, information under Article 10 of the Kyoto Protocol, and financial resources provided to developing country Parties. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by Hungary in its 2022 annual submission.

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

107. In its NC8 Hungary reported on its key national circumstances related to GHG emissions and removals, including information on its geographical profile, climate profile, population profile, governmental structure, settlements structure and building stock, and economic profile, and on the energy, industry, transportation, agriculture, LULUCF and waste sectors. A reduction in the consumption of fossil fuels and mineral energy resources and an increase in the use of renewable energy sources are the most significant drivers of the reduction in GHG emissions between 1990 and 2021.

108. In 2020, Hungary’s total GHG emissions excluding LULUCF were estimated to be 33.7 per cent below its 1990 level, using GWP values from the AR5. The decrease in emissions was driven mainly by the economic downturn in the country due to its transition to a market economy, in particular in 1985–1995, which was followed by almost two decades

of economic growth characterized by an increase in GDP without a corresponding increase in GHG emissions.

109. As reported in the BR5, under the Convention Hungary committed to contributing to the achievement of the joint EU quantified economy-wide target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covered all sectors and CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector were not included. Under the ESD Hungary had a target of limiting its emission growth to 10 per cent above the 2005 level by 2020.

110. The EU has a joint 2030 emission reduction target of at least 55 per cent below the 1990 level. This will be primarily implemented through the EU ETS and ESR, which have targets to reduce emissions by 2030 by 62 and 40 per cent respectively compared with the 2005 level. In addition, the 2021 European Climate Law, which forms part of the European Green Deal, made climate neutrality by 2050 legally binding. Hungary's Law XLIV of 2020 on climate protection sets a national goal for the country to become climate neutral by 2050 and establishes its medium- and long-term emission reduction and energy goals.

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

112. The GHG emission projections provided by Hungary in its NC8 and BR5 correspond to the WEM and WAM scenarios. Hungary provided updated projections during the review up to 2050. Under the WEM scenario, emissions in 2030 are projected to be 42.6 per cent below the 1990 level and 13.5 per cent below the 2020 level. Under the WAM scenario, emissions in 2030 are projected to be 47.2 per cent below the 1990 level and 20.4 per cent below the 2020 level.

113. Hungary's main policy framework relating to energy and climate change is the second NCCS, which includes the National Adaptation Strategy, the National Decarbonization Roadmap and the Partnership for the Climate Awareness-Raising Plan. In 2022, the Government also adopted the National Clean Development Strategy 2020–2050. Hungary also adopted the National Sustainable Development Framework Strategy 2012–2024; the National Energy Strategy 2030, with an outlook until 2040; and the NECP. The NECP, which was adopted in 2020 and will be updated in 2024, will provide the cornerstone of the Party's climate mitigation policy in the years to come.

114. Hungary is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3–5, of the Convention. However, it provided information in its BR5 and NC8 on its provision of support to developing country Parties. The financial support provided to developing country Parties through multilateral and bilateral channels is categorized into mitigation, adaptation and cross-cutting activities. Hungary's total climate finance increased from USD 1.03 million in 2018 to USD 29.78 million in 2020. The greatest share of Hungary's international climate finance goes to cross-cutting and adaptation projects, including in Northern, Eastern and Southern Africa, South-Eastern Asia and South-Eastern Europe.

115. In the NC8 Hungary provided information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. The Party's adaptation policies are described in the second NCCS, which was approved by Parliament in 2018. Information on the Climate Change Action Plan as an instrument for implementing the second NCCS was provided during the review.

116. In its NC8 Hungary provided information on its activities relating to research and systematic observation. Through such activities, Hungary has contributed information and data to both domestic and international activities, including contributions to the Global

Climate Observing System and the Intergovernmental Panel on Climate Change. Funding for climate change research in Hungary mainly stems from EU sources and the National Research, Development and Innovation Fund. The research outputs (e.g. of NAGiS) have provided valuable information to support the implementation, supervision and evaluation of the second NCCS and the planning and implementation of other national, regional and local adaptation measures. The second development phase of the NAGiS project further supports adaptation, the dissemination of knowledge and awareness-raising in Hungary through various technical tools and database developments, and through user-friendly decision-supporting modules.

117. In its NC8 Hungary provided information on its actions relating to education, training and public awareness. Climate change issues are integrated into education programmes at all levels of education. Awareness-raising is one of the three pillars of the second NCCS and its action plans. Awareness-raising activities are undertaken by organizations ranging from churches and national civil organizations to local branches of international non-governmental organizations.

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

- (a) To improve the completeness of its reporting by:
 - (i) Providing information on mitigation impacts for all individual or groups of PaMs or explaining why this is not possible due to its national circumstances, and providing a brief description of estimation methods (see issue 3 in table I.1);
 - (ii) Providing 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 (see issue 5 in table I.1);
 - (iii) Providing relevant information on the factors and activities for each sector (see issue 4 in table I.2);

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

119. In the course of the review of Hungary's NC8, the ERT formulated the following recommendations relating to adherence to the reporting guidelines for supplementary information:

- (a) To improve the completeness of its reporting by providing information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol or on any changes that have occurred compared with the information reported in its last submission (see issue 1 in table I.3);
- (b) To improve the transparency of its reporting by providing transparent information 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 complies with the requirements of the technical standards for data exchange between registry systems (see issue 2 in table I.3).

120. In the course of the review of Hungary's BR5, the ERT formulated the following recommendations relating to adherence to the UNFCCC reporting guidelines on BRs:

- (a) To improve the completeness of its reporting by providing relevant information on the factors and activities to explain the emission trends for each sector (see issue 4 in table II.2);
- (b) To improve the timeliness of its reporting (see para. 7 above).

Annex I

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

Tables I.1–I.3 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on NCs for Hungary’s NC8.

Table I.1

Findings on policies and measures from the review of the eighth national communication of Hungary

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 10 Issue type: completeness Assessment: encouragement	Hungary did not indicate the PaMs that are innovative and/or effectively replicable by other Parties. The ERT encourages Hungary to report on PaMs that are innovative and/or effectively replicable by other Parties in its next NC.
2	Reporting requirement specified in paragraph 12 Issue type: completeness Assessment: encouragement	In its NC8, Hungary did not report on actions taken to implement its commitments under Article 4, paragraph 2(e)(ii), of the Convention, which requires Parties to identify and periodically update their own policies and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur. The ERT encourages Hungary to include in its next NC information on actions taken to implement its commitments under Article 4, paragraph 2(e)(ii), of the Convention.
3	Reporting requirement specified in paragraph 20 Issue type: completeness Assessment: recommendation	In its NC8, Hungary did not report, as appropriate, a quantitative estimate of the impact of all individual PaMs or collections of PaMs, including estimated changes in activity levels and/or emissions and removals due to adopted and implemented PaMs reported, and did not explain why it was not possible to report such estimates. In addition, Hungary did not provide a brief description of estimation methods. The ERT reiterates the recommendation from the previous review report that Hungary report in its next NC, to the extent possible, mitigation impacts for all individual or groups of PaMs, or explain why this is not possible due to its national circumstances. The ERT also reiterates the recommendation from the previous review report that Hungary report in its next NC a brief description of estimation methods.
4	Reporting requirement specified in paragraph 21 Issue type: completeness Assessment: encouragement	In its NC8, the Party did not provide information on the costs and non-GHG mitigation benefits of PaMs and how they interact with other PaMs at the national level. The ERT reiterates the encouragement from the previous review report for Hungary to provide information in its next NC on the costs and non-GHG mitigation benefits of PaMs and how they interact with other PaMs at the national level.
5	Reporting requirement specified in paragraph 22 Issue type: completeness Assessment: recommendation	In its NC8, the Party did not provide 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 ERT recommends that Hungary provide information in its next NC on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.

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

Table I.2

Findings on projections including aggregate effects of policies and measures reported in the eighth national communication of Hungary

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 25 Issue type: completeness Assessment: encouragement	In its NC8, Hungary did not report WOM scenario projections. During the review, Hungary explained that no WOM scenario was produced for the NC8 and BR5. The ERT encourages the Party to report WOM scenario projections in its next NC or explain the reasons for not reporting such projections.
2	Reporting requirement specified in paragraph 27 Issue type: transparency Assessment: encouragement	Hungary presented a sensitivity analysis for the energy sector projections, which was performed for the EU ETS carbon prices used in the projections. However, the Party did not specify which carbon price assumptions were used for the sensitivity analysis. In addition, the Party did not present a sensitivity analysis for other sectors. The ERT encourages Hungary to extend the sensitivity analysis to other sectors and provide a brief explanation of the assumptions used in its next NC.
3	Reporting requirement specified in paragraph 32 Issue type: completeness Assessment: encouragement	Hungary did not report projections of indirect emissions of CO, NO _x and NMVOCs, as well as SO _x . During the review, Hungary explained that projections of indirect GHGs (NO _x , NMVOCs and SO ₂) for the WEM scenario are prepared every two years under the Convention on Long-range Transboundary Air Pollution and the EU national emission reduction commitments directive. The Party indicated that these projections could therefore be included in future submissions. However, the Party explained that the possibility of developing projections of CO requires further investigation. The ERT reiterates the encouragement from the previous review report for Hungary to provide projections of indirect emissions of CO, NO _x , NMVOCs and SO _x in its next NC.
4	Reporting requirement specified in paragraph 45 Issue type: completeness Assessment: recommendation	The Party reported information on factors and activities from 1990 to at least 15 years from the most recent inventory year to explain the emission trends for each sector, except for the agriculture and forestry sectors. The ERT reiterates the recommendation from the previous review report that Hungary provide in its next NC relevant information on the factors and activities for each sector, which may be provided in tabular format.

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

Table I.3

Findings on minimization of adverse impacts and supplementary information related to the Kyoto Protocol reported in the eighth national communication of Hungary

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation</i>
1	Reporting requirement specified in paragraph 25 Issue type: completeness Assessment: recommendation	Hungary included in the 2021 NIR information 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 8–9, of the Convention. However, in its 2022 NIR Hungary did not include information on any changes that have occurred compared with the information reported in the 2021 NIR. The ERT recommends that Hungary provide information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol or on any changes that have occurred compared with the information reported in its last submission.

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation</i>
2	Reporting requirement specified in paragraph 32 Issue type: transparency Assessment: recommendation	<p>The ERT concludes that this potential problem of a mandatory nature does not influence the Party’s ability to fulfil its commitments for the second commitment period of the Kyoto Protocol.</p> <p>In its NC8 the Party did not provide a transparent description of the procedures employed in the national registry to minimize discrepancies in the issuance, transfer, acquisition, cancellation and retirement of emission reduction units, certified emission reductions and temporary certified emission reductions. Further, the NC8 does not provide information on the results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems (the Party reported the same information as provided in the NC7).</p> <p>During the review, Hungary provided additional information on the above elements.</p> <p>The ERT reiterates the recommendation from the previous review report that Hungary provide transparent information 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 complies with the requirements of the technical standards for data exchange between registry systems by including transparent information on the elements listed in paragraph 32(e) and (j) of the reporting guidelines for supplementary information, which may be provided in tabular format.</p> <p>The ERT concludes that this potential problem of a mandatory nature does not influence the Party’s ability to fulfil its commitments for the second commitment period of the Kyoto Protocol.</p>

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

Annex II

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

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

Table II.1

Findings on mitigation actions and their effects from the review of the fifth biennial report of Hungary

No.	<i>Reporting requirement and issue type</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 8 Issue type: transparency Assessment: encouragement	Hungary reported information on the assessment of the economic and social consequences of response measures in its BR5. The Party explained that, as an EU member State, its national climate policy is largely determined by EU legislation. Therefore, the relevant information provided by the EU in its reports submitted to the UNFCCC is relevant to Hungary. However, Hungary did not provide detailed information on how it performs the assessment of the economic and social consequences of response measures or provide any links to relevant reports where more detailed information is available. The ERT reiterates the encouragement from the previous review report for Hungary to provide, to the extent possible, detailed information on the assessment of the economic and social consequences of response measures.
2	Reporting requirement specified in paragraph 24 Issue type: completeness Assessment: encouragement	Hungary did not report in its BR5 information on its domestic arrangements established for the process of the self-assessment of compliance with emission reduction commitments or the level of emission reduction required by science, or information on its progress in establishing national rules for taking local action against domestic non-compliance with emission reduction targets. In addition, the Party did not report information on the progress made in the establishment of national rules for taking local action against domestic non-compliance with emission reduction targets. During the review, the Party explained that as an EU member State, the national self-assessment process for evaluating compliance with its emission reduction commitments was established within the regulatory framework of the EU. Hungary also explained that the achievement of internal compliance under the EU 2020 climate and energy package, including the national targets under the ESD, is not subject to assessment by the UNFCCC of the joint EU commitment under the Convention, and each EU member State decides how these targets will be achieved and which national PaMs are needed to fulfil them. The monitoring process for compliance with EU targets was harmonized for all EU member States, as set out in the EU monitoring mechanism regulation (regulation 525/2013), which was repealed in 2018 by the EU regulation on the governance of the Energy Union and climate action (regulation 2018/1999). Hungary’s national strategic climate-related documents, which define the country’s emission reduction targets, are regularly updated and reviewed by Parliament. Hungary also explained that the EU ETS, ESD and ESR systems cover almost all national emissions of CO ₂ , N ₂ O and PFCs reported in the NIR. These systems have their own non-compliance measures that apply to all participants. In Hungary, the EU ETS was transposed into national legislation via law 217/2012 and non-compliance measures are clearly defined for the operators of stationary installations and airline operators. The non-compliance measures defined in

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

<i>No.</i> <i>Reporting requirement and issue type</i>	<i>Description of the finding with recommendation or encouragement</i>
	<p>the ESD (established by EU decision 406/2009/EC) and the ESR (established by EU regulation 2018/842) are also applicable to all EU member States.</p> <p>The ERT reiterates the encouragement from the previous review report for Hungary to include, to the extent possible, information on its domestic arrangements established for the process of self-assessment of compliance with emission reduction commitments or the level of emission reduction required by science, and information on its progress in establishing national rules for taking local action against domestic non-compliance with emission reduction targets. The ERT also encourages Hungary to include, to the extent possible, information on the progress made in the establishment of national rules for taking local action against domestic non-compliance with emission reduction targets.</p>

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

Table II.2

Findings on projections reported in the fifth biennial report of Hungary

<i>No.</i> <i>Reporting requirement and issue type</i>	<i>Description of the finding with recommendation or encouragement</i>
<p>1 Reporting requirement^a specified in paragraph 25</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Hungary did not report WOM scenario projections.</p> <p>During the review, Hungary explained that no WOM scenario was produced for the NC8 and BR5.</p> <p>The ERT encourages the Party to improve the completeness of its reporting by including a WOM scenario.</p>
<p>2 Reporting requirement^a specified in paragraph 27</p> <p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>Hungary presented a sensitivity analysis for the energy sector projections, which was performed for the EU ETS carbon prices used in the projections. However, the Party did not specify which carbon price assumptions were used for the sensitivity analysis. Moreover, the Party did not present a sensitivity analysis for other sectors.</p> <p>To improve the transparency of the reporting, the ERT encourages Hungary to extend the sensitivity analysis to other sectors and provide a brief explanation of the methodologies and parameters used.</p>
<p>3 Reporting requirement^a specified in paragraph 32</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Hungary did not report projections of indirect emissions of CO, NO_x and NMVOCs, as well as SO_x.</p> <p>During the review, Hungary explained that projections of indirect GHGs (NO_x, NMVOCs and SO₂) for the WEM scenario are prepared every two years under the Convention on Long-range Transboundary Air Pollution and the EU national emission reduction commitments directive. The Party indicated that these projections could therefore be included in future submissions. However, the Party explained that the possibility of developing projections of CO requires further investigation.</p> <p>The ERT reiterates the encouragement from the previous review report for Hungary to enhance the completeness of its reporting by including emission projections for indirect GHGs such as CO, NO_x, NMVOCs and SO_x.</p>
<p>4 Reporting requirement^a specified in paragraph 45</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>The Party reported assumptions for 2016, 2020, 2025 and 2030. As 2020 is the most recent inventory year, the information reported does not cover at least 15 years from the most recent inventory year and does not contain relevant information on factors and activities for each sector.</p> <p>The ERT reiterates the recommendation from the previous review report that Hungary provide relevant information on the factors and activities for each sector, which could be provided in tabular format, in order to enhance the completeness of the emission trends reported. The ERT further recommends that Hungary report information from 1990 to at least 15 years from the most recent inventory year.</p>

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

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

Annex III

Documents and information used during the review

A. Reference documents

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

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

BR4 of Hungary. Available at <https://unfccc.int/BR4>.

BR5 CTF tables of Hungary. Available at <https://unfccc.int/BR5>.

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

BR5 of Hungary. Available at <https://unfccc.int/BR5>.

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

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

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

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”. FCCC/CP/2019/13/Add.1. Available at <https://unfccc.int/documents/210471>.

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

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

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

NECPs of Hungary. Available at https://commission.europa.eu/publications/hungary-draft-updated-necp-2021-2030_en.

NC8 of Hungary. Available at <https://unfccc.int/NC8>.

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

Report on the individual review of the annual submission of Hungary submitted in 2022. FCCC/ARR/2022/HUN. Available at https://unfccc.int/sites/default/files/resource/arr2022_HUN_0.pdf.

Report on the technical review of the BR4 of Hungary. FCCC/TRR.4/HUN. Available at <https://unfccc.int/documents/250125>.

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

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

B. Additional information provided by the Party

Responses to questions during the review were received from Dénes Kőbányai (Ministry of Energy of Hungary), including additional material. The following references were provided by Hungary and may not conform to UNFCCC editorial style as some have been reproduced as received:

Ministry of Technology and Industry. 2022. *International Civil Aviation Organization (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) State Action Plan Hungary*. Available at https://www.icao.int/environmental-protection/Documents/ActionPlan/CORSIA%20State%20Action%20Plan%20Hungary_final.pdf.
