



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

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 Kazakhstan, 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 Kazakhstan, 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 Astana from 5 to 9 February 2024.



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Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
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
CTF	common tabular format
ERT	expert review team
ETS	emissions trading scheme
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MBM	market-based mechanism
N ₂ O	nitrous oxide
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NF ₃	nitrogen trifluoride
NMVO	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
NO _x	nitrogen oxides
PaMs	policies and measures
PFC	perfluorocarbon
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. Part II: Reporting of supplementary information under Article 7, paragraph 2”
SF ₆	sulfur hexafluoride
SO _x	sulfur oxides
TIMES-KAZ	The Integrated Market Allocation–Energy Flow Optimization Model System for Kazakhstan
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 Kazakhstan. 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 Kazakhstan, which provided comments that were considered and incorporated, as appropriate, with revisions into this final version of the report.
3. The review was conducted from 5 to 9 February 2024 in Astana by the following team of nominated experts from the UNFCCC roster of experts: Tan Ching Tiong (Malaysia), Kristina Gonchar (Belarus), Jolanta Merkeliene (Lithuania), Ole-Kenneth Nielsen (Denmark) and Hongwei Yang (China). Ole-Kenneth Nielsen and Hongwei Yang were the lead reviewers. The review was coordinated by Nalin Kumar Srivastava (secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC8 of Kazakhstan 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 Kazakhstan in accordance with the UNFCCC reporting guidelines on BRs.³

1. Timeliness

5. The NC8 was submitted on 30 December 2022, before the deadline of 31 December 2022 mandated by decision 6/CP.25. The NC8 was resubmitted on 13 February 2023. An addendum to the NC8 was submitted on 7 February 2024 to address issues raised during the review. The addendum included additions to the supplementary information reported pursuant to Article 7, paragraph 2, of the Kyoto Protocol. Detailed information on improvements related to the resubmission is provided in paragraph 12 below. Unless otherwise specified, the information and values from the latest submission are used in this report.
6. The BR5 was submitted on 30 December 2022, before the deadline of 31 December 2022 mandated by decision 6/CP.25. The CTF tables were submitted on 14 February 2023, after the deadline of 31 December 2022 mandated by decision 6/CP.25. An addendum to the BR5 was submitted on 7 February 2024 and the CTF tables were resubmitted on 8 February 2024 to address issues raised during the review. The addendum and resubmission included additions to the information reported on the Party’s quantified economy-wide emission reduction target and progress in achieving it, and projections, including revised versions of CTF tables 2(a–d), 2(e)I, 4, 4(a), 4(b), 6(a), 6(b) and 6(c). Detailed information on improvements related to the resubmission is provided in paragraph 12 below. Unless

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.

otherwise specified, the information and values from the latest submission are used in this report.

7. Kazakhstan did not inform the secretariat about its difficulties with making a timely submission of the CTF tables. 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 concern the delay in the submission.

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

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

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

Table 1

Assessment of completeness and transparency of mandatory information reported by Kazakhstan 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	Mostly transparent	Issues 6, 7 and 9 in table I.1
Projections and the total effect of PaMs	Partially complete	Mostly transparent	Issues 2, 5, 8, 10 and 17 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 Kazakhstan 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 Kazakhstan 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 ^a	NA	NA	NA
National registry ^a	NA	NA	NA
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 ^a	NA	NA	NA
PaMs in accordance with Article 2	Complete	Transparent	–
Domestic and regional programmes and/or arrangements and procedures	Mostly complete	Transparent	Issue 1 in table I.5
Information under Article 10 ^b	NA	NA	NA
Financial resources ^c	NA	NA	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	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 The requirements set out in the annex to decision 15/CMP.1, as amended by decision 3/CMP.11, apply to Parties with quantified emission limitation and reduction commitments inscribed in the third column of Annex B in the Doha Amendment to the Kyoto Protocol and so are not applicable to Kazakhstan since it has not ratified the Doha Amendment.

^b 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.

^c Kazakhstan 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.

10. Issues and gaps identified by the ERT related to the information reported by Kazakhstan 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 6 in table II.2 has been identified in three or more successive reviews.

11. The ERT noted that Kazakhstan 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 relevant information, and projections.

Table 3

Summary of completeness and transparency of mandatory information reported by Kazakhstan 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	Mostly transparent	Issue 1 in table II.1 Issues 1, 3, 6 and 15 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 Kazakhstan 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.

12. The resubmission of the CTF tables and the submission of the addendum to the NC8 and BR5 made during the review improved:

(a) The information reported on the Party’s quantified economy-wide emission reduction target and related assumptions, conditions and methodologies by including a description of the quantified economy-wide emission reduction target in the text and in CTF tables 2(a–d) and 2(e)I;

(b) The information reported on progress in achievement of quantified economy-wide emission reduction targets and relevant information by including information on total emissions excluding LULUCF, the contribution of LULUCF and the quantity of units from MBMs under the Convention in the text and in CTF tables 4, 4(a) and 4(b);

(c) The information reported on projections and the total effects of PaMs by correcting errors in the estimated emissions reported in CTF tables 6(a), 6(b) and 6(c);

(d) The supplementary information related to the Kyoto Protocol reported by including information or explanations relating to the national registry; national legislative arrangements and administrative procedures in place to ensure that the implementation of activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, 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; and steps taken to promote and/or implement any decisions by 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

13. The NC8 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater. In 1990–1999, Kazakhstan’s emissions decreased significantly after the collapse of the Soviet Union in 1991 and continued to follow a downward trend until 1999. Emissions have been increasing rapidly since 2000 owing to economic growth and transformation. They reached their peak in 2018 (when total GHG emissions were above the 1990 level), before decreasing sharply in 2020 as a result of the coronavirus disease 2019 pandemic. The main drivers of Kazakhstan’s GHG emission trend are changes in GDP and population growth. In 2017–2019, the Party experienced stable GDP growth of 11–13 per cent, followed by a slowdown in GDP growth owing to the pandemic in 2020. Between 2012 and 2020, Kazakhstan’s population grew, on average, by 1.5 per cent annually.

14. The energy sector is Kazakhstan’s main emissions source, with coal being the dominant fuel in domestic energy consumption. However, in recent years, there has been a gradual shift to a more balanced mix of energy sources, which has seen an increase in the use of natural gas and renewable energy to help Kazakhstan achieve its decarbonization goals. The share of power generated from renewable energy sources doubled during 2017–2019.

2. Assessment of adherence to the reporting guidelines

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

B. Greenhouse gas inventory information⁴

1. Technical assessment of the reported information

16. Kazakhstan reported information in its BR5 and NC8 on its historical GHG emissions and inventory arrangements using GWP values from the AR4. More recent information on GHG emissions was reported in Kazakhstan’s 2023 inventory submission, for which GWP values from the AR4 were also used. Total GHG emissions⁵ excluding emissions and removals from LULUCF decreased by 13.6 per cent between 1990 and 2020, while total GHG emissions including net emissions or removals from LULUCF decreased by 10.0 per cent over the same period. Emissions decreased in 1990–2000, before showing an increasing trend thereafter. Emissions excluding emissions and removals from LULUCF in 2021 increased compared with those in 2020. The changes in total emissions were driven mainly by factors such as a significant decrease in GDP from 1990 to 1998, followed by consistent growth in GDP thereafter. As described in paragraph 14 above, the energy sector is Kazakhstan’s main emissions source. Emissions in the energy sector decreased between 2018 and 2021 due to an increase in the use of natural gas and renewable energy. In the IPPU sector, emissions increased by 18.9 per cent between 1990 and 2020, owing mostly to increases in mineral production and the use of fluorinated gases. Emissions in the agriculture sector have declined by 5.6 per cent, mostly owing to a fall in livestock numbers from 1990 to 2020. Population growth is the main driver of the increase in emissions in the waste sector between 1998 and 2021.

17. Table 4 illustrates the emission trends by sector and by gas for Kazakhstan. The emissions reported in the 2023 inventory submission differ from the data reported in CTF table 1 in that they incorporate recalculations made since the 2022 annual submission. The major recalculations performed for the 2023 inventory submission were in the energy, IPPU and waste sectors.

Table 4

Greenhouse gas emissions by sector and by gas for Kazakhstan for 1990–2021

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2020	2021	1990–2020	2020–2021	1990	2021
<i>Sector</i>									
1. Energy	316 244.47	168 959.96	257 820.69	259 502.41	261 932.51	–17.9	0.9	81.8	77.5
A1. Energy industries	142 368.62	60 805.05	103 753.04	124 317.81	126 641.06	–12.7	1.9	36.8	37.5
A2. Manufacturing industries and construction	18 862.92	22 107.28	28 707.48	26 326.20	24 287.23	39.6	–7.7	4.9	7.2
A3. Transport	22 546.02	9 713.37	21 678.07	19 341.54	25 166.48	–14.2	30.1	5.8	7.4
A4. and A5. Other	58 320.17	27 677.70	63 792.71	54 708.75	45 356.39	–6.2	–17.1	15.1	13.4
B. Fugitive emissions from fuels	74 146.74	48 656.56	39 889.38	34 808.11	40 481.35	–53.1	16.3	19.2	12.0
C. CO ₂ transport and storage	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	–	–	–	–
2. IPPU	22 737.40	17 341.32	20 182.94	27 031.37	27 083.92	18.9	0.2	5.9	8.0
3. Agriculture	43 860.95	70 620.38	33 385.84	41 419.52	42 845.43	–5.6	3.4	11.3	12.7
4. LULUCF	–6 496.21	42 710.78	65 559.36	8 127.16	2 714.36	225.1	–66.6	NA	NA
5. Waste	3 839.97	3 512.47	4 466.03	6 017.66	6 261.51	56.7	4.1	1.0	1.9
6. Other ^a	NO	NO	NO	NO	NO	–	–	–	–
<i>Gas^b</i>									

⁴ GHG emission data in this section, for which GWP values from the AR4 were used, are based on Kazakhstan’s 2023 inventory submission, version 1. All emission data in subsequent chapters are based on Kazakhstan’s BR5 CTF tables, for which GWP values from the AR4 were used 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.

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2020	2021	1990–2020	2020–2021	1990	2021
	CO ₂	268 173.09	143 380.20	248 803.23	255 486.48	255 142.93	–4.7	–0.1	69.4
CH ₄	100 850.95	56 744.47	47 605.14	55 943.08	59 921.35	–44.5	7.1	26.1	17.7
N ₂ O	17 658.75	60 036.45	17 749.90	19 998.59	20 340.56	13.3	1.7	4.6	6.0
HFCs	NO, NA	273.01	1 072.99	2 529.75	2 706.49	–	7.0	–	0.8
PFCs	NA, NO	NA, NO	622.50	10.75	9.65	–	–10.3	–	0.0
SF ₆	NA, NO	NA, NO	1.73	2.31	2.37	–	2.9	–	0.0
NF ₃	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	–	–	–	–
Total GHG emissions excluding LULUCF	386 682.79	260 434.12	315 855.51	333 970.96	338 123.36	–13.6	1.2	100.0	100.0
Total GHG emissions including LULUCF	380 186.58	303 144.90	381 414.87	342 098.12	340 837.72	–10.0	–0.4	–	–

Source: GHG emission data: Kazakhstan's 2023 inventory submission, version 1.

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

^b Emissions by gas without LULUCF. The Party did not report indirect CO₂ emissions.

18. In brief, Kazakhstan's national inventory arrangements were established in accordance with the Environmental Code of the Republic of Kazakhstan (first adopted in January 2007 before being updated in January 2021) and order 46 of the Minister of Ecology and Natural Resources of February 2022. The Ministry of Ecology and Natural Resources has overall responsibility for the national GHG inventory system and is in charge of the related legal, institutional and procedural arrangements, in line with its responsibilities and designation as the single national entity responsible for the national GHG inventory. The joint stock company Zhasyl Damu is the institution responsible for compiling the GHG inventory, preparing the GHG inventory report and implementing the quality assurance/quality control processes. An inter-institutional working group consisting of representatives of various State bodies and organizations was established in 2022 and is involved in providing initial data, developing the quality assurance/quality control plan and implementing the verification activities. The changes in these arrangements since the BR4 include new rules for monitoring the completeness, transparency and reliability of the national inventory of GHG emissions and removals established by order 46 of the Minister of Ecology and Natural Resources of February 2022.

2. Assessment of adherence to the reporting guidelines

19. The ERT assessed the information reported in the NC8 and BR5 of Kazakhstan 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

20. Kazakhstan 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 ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2021 annual submission of Kazakhstan.

(b) Assessment of adherence to the reporting guidelines

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

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

4. National registry

(a) Technical assessment of the reported information

22. In its NC8 the Party explained that Kazakhstan did not ratify the Doha Amendment to the Kyoto Protocol and therefore the requirements to provide 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 to comply with the requirements of the technical standards for data exchange between registry systems do not apply to Kazakhstan.

(b) Assessment of adherence to the reporting guidelines

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

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

1. Technical assessment of the reported information

24. Kazakhstan reported information on its economy-wide emission reduction target in its BR5. For Kazakhstan the Convention entered into force on 15 August 1995. Under the Convention Kazakhstan's target was to reduce its GHG emissions by 15 per cent below the 1990 level by 2020. The target includes GHGs included in the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", namely CO₂, CH₄, N₂O, HFCs, PFCs and SF₆. It also includes all IPCC sources and sectors included in the annual GHG inventory, excluding LULUCF. The GWP values used are from the AR4. Kazakhstan reported that it does not plan to make use of MBMs for achieving its target (see para. 45 below). In absolute terms this means that, under the Convention, Kazakhstan has to reduce its emissions from 385,603.00 kt CO₂ eq (in 1990)⁶ to 327,762.55 kt CO₂ eq by 2020.

25. In addition to its 2020 target, Kazakhstan also has longer-term unconditional and conditional NDC targets to reduce its GHG emissions by 15 and 25 per cent respectively below the 1990 level by 2030. The Party announced its intention to reach carbon neutrality by 2060 at the Climate Ambition Summit in December 2020 and, in 2023, it adopted a strategy for achieving this goal.

2. Assessment of adherence to the reporting guidelines

26. The ERT assessed the information reported in the BR5 of Kazakhstan 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

27. Kazakhstan provided in its NC8 and BR5 information on its PaMs⁷ implemented, adopted and planned to fulfil its commitments under the Convention. Kazakhstan's set of

⁶ The emission level in 1990 was calculated on the basis of the 2022 annual submission.

⁷ The UNFCCC reporting guidelines on BRs use the term "mitigation actions", whereas the UNFCCC

PaMs is similar to that previously reported, with a few exceptions. The NC8 contains details on PaMs that were previously reported but have been discontinued since the Party's previous submission together with reasons for their discontinuation. Moreover, Kazakhstan reported new PaMs that have the same effects as the discontinued PaMs. In Kazakhstan, the main PaMs have a five-year period of implementation, meaning that many of them were replaced with similar PaMs in 2021 for the subsequent period (2021–2025). A further reason for the change in PaMs relates to the update to the Environmental Code (see para. 18 above), which resulted in more than 20 orders and decisions being discontinued owing to their provisions being included in the update to the Environmental Code.

28. Kazakhstan did not report on its policy context or legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs; nor did it provide information on changes to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target. During the review, the Party explained that the Ministry of Ecology and Natural Resources collected information on PaMs from various sources, including plans and strategic documents, while the ministries or agencies responsible for implementing specific PaMs also undertook the monitoring thereof.

29. In its reporting on PaMs, Kazakhstan provided the estimated emission reduction impacts for most 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 in the energy and IPPU sectors because they are regulatory in nature and hence help other PaMs to bring about emission reductions.

30. The Party described its general methodology for estimating the impacts of its PaMs in the energy, IPPU and LULUCF sectors, which is based on the TIMES-KAZ model and the Carbon Budget Model of the Canadian Forest Sector. In the NC8 Kazakhstan did not report on how it quantified the mitigation impacts of its PaMs in the agriculture and waste sectors, but during the review the Party provided additional information thereon. The mitigation impacts of biogas installations on farms were estimated on the basis of the amount of avoided emissions resulting from replacing electricity generated from fossil fuels with electricity generated from biogas installations. The Party quantified the mitigation impacts in the agriculture sector as the difference in emissions resulting from decreasing the number of pedigree livestock and replacing them with ordinary livestock with the same level of production activity.

31. The key overarching cross-sectoral policy reported by Kazakhstan is its ETS, which is based on a cap-and-trade approach and covers over 200 installations. The ETS emission quota for the installations covered by the ETS for 2018–2020 was 485.90 Mt CO₂ eq. As per the fourth, fifth and sixth national allocation plans, from 2021 onward the quota must decrease by 1.5 per cent for each subsequent year (until 2030). In addition, the Environmental Code provides the framework for future climate policy and for Kazakhstan meeting its emission reduction target for 2030. The main innovations in the Environmental Code relate to the 'polluter pays' principle, the introduction of the best mitigation technologies and adaptation to climate change. The mitigation effect of introducing a carbon tax on sectors not covered by the ETS is the most significant. This measure was planned as part of the road map for implementing the updated NDC of Kazakhstan for 2022–2025, which includes sectoral and institutional decarbonization measures, as well as an assessment of GHG emission reduction potentials, investment needs by funding sources, and spillover effects and risks. Other policies that have delivered significant emission reductions are increasing the share of renewable energy sources in power generation and reducing the share of coal in power generation. Overall, both of these policies could potentially lead to emission reductions of 43 Mt CO₂ eq by 2035.

32. The ERT identified the Green Kazakhstan project as a mitigation action of particular interest because of its GHG mitigation potential alongside other environmental benefits. This project was created with the objective of implementing an initiative launched by the President

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.

of Kazakhstan to plant two billion trees by 2025. The aims of the Green Kazakhstan project are to plant 133,000 ha forest by 2025 (with a budget of 46.4 billion tenge for 2021–2025) and to increase the land covered by specially protected natural areas from 7,593,000 ha in 2021 to 7,767,000 ha in 2025. Another strategic goal of the Green Kazakhstan project is to promote the effective use of water by reducing irrigation losses by 4 km³/year by 2025 and creating additional water storage of 1.7 km³.

33. Kazakhstan highlighted the mitigation actions that had been developed but not adopted by the time of publication of the NC8, such as its road map for NDC implementation post-2020 and concept for low-carbon development. The latter provides two scenarios, namely a ‘business as usual’ scenario and a ‘carbon neutrality’ scenario, which outlines the measures necessary for Kazakhstan to become climate-neutral by 2060. The road map for NDC implementation includes the recommended carbon tax values for each stage of NDC implementation, namely USD 16.40/t CO₂ eq for the first stage (2021–2022), USD 24.20/t CO₂ eq for the second stage (2023–2025) and USD 29.40/t CO₂ eq for the third stage (2026–2030). Among the mitigation actions that provide a foundation for significant additional action are the Partnership for Market Readiness programme, which has provided short- and medium-term policy recommendations and capacity to support the country on its path to carbon neutrality; the action plan for implementing the concept for the transition of Kazakhstan to a green economy for 2021–2030; and the State Programme for Industrial and Innovative Development for 2020–2025. Table 5 provides a summary of the reported information on the PaMs of Kazakhstan.

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

<i>Sector</i>	<i>Key PaMs^d</i>	<i>Estimated mitigation impact in 2020 (kt CO₂ eq)</i>	<i>Estimated mitigation impact in 2035 (kt CO₂ eq)</i>		
Policy framework and cross-sectoral measures	ETS (cap-and-trade)	NE	NE		
	Environmental Code	NE	NE		
	Carbon tax on sectors not covered by the ETS	0	50 544		
	Action plan for implementing the concept for the transition of Kazakhstan to a green economy for 2021–2030	NE	NE		
	Partnership for Market Readiness programme	NE	NE		
Energy	Energy efficiency	State Programme for Industrial and Innovative Development for 2020–2025	NE	NE	
		Energy supply and renewable energy	Increasing the share of renewable energy sources in power generation	0	29 464
Energy	Energy supply and renewable energy	Reducing the share of coal in power generation	0	13 498	
		Increasing the share of natural gas in power generation	0	1 210	
		Concept for development of the gas sector of Kazakhstan until 2030	NE	NE	
		Transport	Energy efficiency requirements for transport	NE	NE
			Comprehensive plan for the development of the gas motor fuel market of Kazakhstan until 2020	NE	NE
IPPU	State Programme for Industrial and Innovative Development for 2020–2025	NE	NE		
Agriculture	Support of livestock breeding	0	180		
	Rational use of cultivated land	0	180		
	Rational use of pastures	0	180		
LULUCF	Forest cultivation	100	1 400		
	Offset projects in land use	0	350		
Waste	Prohibition of the disposal of paper, plastic and glass, and food waste	50	200		

<i>Sector</i>	<i>Key PaMs^a</i>	<i>Estimated mitigation impact in 2020 (kt CO₂ eq)</i>	<i>Estimated mitigation impact in 2035 (kt CO₂ eq)</i>
	Reducing the disposal of non-recyclable energy waste	0	180

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 Kazakhstan's BR5.

34. Kazakhstan identified issues in the national legislation related to the absence of a comprehensive analysis of climate-related PaMs from a gender equality perspective and highlighted sectors characterized by gender imbalance in relation to integration of gender considerations including energy, industry, agriculture, forestry and water management, where such analysis would be particularly useful.

2. Assessment of adherence to the reporting guidelines

35. The ERT assessed the information reported in the NC8 and BR5 of Kazakhstan 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

36. In its NC8 Kazakhstan reported that the adoption of the Environmental Code was the first step it took towards shaping the national legislation on GHG regulation. The Environmental Code includes a chapter on the regulation of GHG emissions and removals, a list of GHGs subject to State regulation, the regulatory principles and legislative framework for implementing various mitigation measures, and the market mechanisms for addressing GHG emissions and removals from industry (the ETS). The overall responsibility for climate change policymaking lies with the Ministry of Ecology and Natural Resources. A number of national institutions are involved in policy implementation. In 2013, Kazakhstan approved its initial concept for the transition to a green economy and adopted an action plan for its implementation for 2013–2020. The concept covered general approaches to the transition to a green economy in terms of energy savings and energy efficiency, as well as energy development in general.

37. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Kazakhstan committed to reducing its GHG emissions by 5 per cent below the base-year level. The ERT noted that Kazakhstan has not ratified the Doha Amendment to the Kyoto Protocol.

38. Kazakhstan has provisions in place to make information on legislative arrangements and administrative procedures related to compliance and enforcement publicly accessible, such as publishing all draft and approved legal acts on a publicly available portal.⁸ Every legal act is open for comment and discussion at the drafting stage.

39. Kazakhstan 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. Kazakhstan's Environmental Code includes legal norms aimed at conserving and sustainably using biodiversity in accordance with the principle of equitable distribution of and access to environmental goods and services. These norms include compensation for loss of biodiversity and voluntary payments for ecosystem services. The Environmental Code is also aimed at protecting land from soil degradation and depletion, disturbance and deterioration (e.g. due to wind erosion and desertification) by requiring individuals and legal entities to

⁸ <https://legalacts.egov.kz/>.

take steps to prevent soil degradation and depletion when using land, the degradation and death of forests, and adverse effects on the sustainability of ecological systems.

(b) Assessment of adherence to the reporting guidelines

40. The ERT assessed the information reported in the NC8 of Kazakhstan and identified an issue relating to completeness and thus adherence to the reporting guidelines for supplementary information. The finding is described in table I.5.

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

41. In the NC8 Kazakhstan 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. Kazakhstan described the official development assistance provided to developing countries through bilateral and multilateral channels. The assistance covers a range of focus areas, including social and economic infrastructure, food assistance, emergency response for recovery and reconstruction, and disaster prevention.

42. The NC8 includes information on how Kazakhstan promotes and implements the decisions of ICAO and IMO to limit emissions from aviation and marine bunker fuels. Since 1 January 2022, Kazakhstan has been included in the list of countries that will participate in the ICAO Carbon Offsetting and Reduction Scheme for International Aviation, whereby a range of measures, including aviation technology improvements, operational improvements, sustainable aviation fuel and market-based measures, are being implemented to achieve global goals and promote sustainable growth in international aviation. Kazakhstan does not currently participate in IMO initiatives related to GHG emission reduction.

43. Further information on how Kazakhstan 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 2022 annual submission. Kazakhstan reported on the official development assistance provided to developing countries. The Kazakhstan Agency for International Development was established on 15 December 2020 by decision of the Government. The authorized body in the field of official development assistance is the Ministry of Foreign Affairs. The Party reported information on what it prioritized in implementing its commitments under Article 3, paragraph 14, including providing development assistance to the countries of Central Asia and Afghanistan, with environmental protection and climate change issues as the focus areas for official development assistance.

(b) Assessment of adherence to the reporting guidelines

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

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

1. Technical assessment of the reported information

45. On its use of units from LULUCF activities, Kazakhstan reported in CTF tables 4 and 4(a) that in 2019–2020 it did not use any units from LULUCF activities. Kazakhstan reported that it did not use units from MBMs under the Kyoto Protocol or any other MBMs. It reported

in CTF tables 4 and 4(b) that it did not use any units from MBMs in 2019–2020. Table 6 illustrates Kazakhstan’s total GHG emissions, contribution of LULUCF and use of units from MBMs towards achieving its target.

Table 6

Summary of information on greenhouse gas emissions, use of units from market-based mechanisms and land use, land-use change and forestry by Kazakhstan

(kt CO₂ eq)

<i>Year</i>	<i>Emissions excluding LULUCF</i>	<i>Contribution of LULUCF^a</i>	<i>Use of units from MBMs</i>	<i>Net emissions including LULUCF and MBMs</i>
1990 (base year)	385 603.00	NA	NA	385 603.00
2010	300 827.00	NA	NA	300 827.00
2011	290 780.93	NA	NA	290 780.93
2012	295 683.66	NA	NA	295 683.66
2013	303 671.29	NA	NA	303 671.29
2014	351 476.32	NA	NA	351 476.32
2015	355 832.87	NA	NA	355 832.87
2016	360 910.22	NA	NA	360 910.22
2017	379 435.89	NA	NA	379 435.89
2018	392 754.75	NA	NA	392 754.75
2019	359 628.25	NA	NA	359 628.25
2020	342 868.79	NA	NA	342 868.79
			2020 target ^b	327 762.55

Sources: Kazakhstan’s BR5 and BR5 CTF tables 2(a), 4, 4(a)I, 4(a)II, 4(b) and 6(a), for which GWP values from the AR4 were used.

^a Kazakhstan’s emission reduction target does not include emissions or removals from LULUCF.

^b The emission level that corresponds to the 2020 target is calculated on the basis of the GHG emissions excluding LULUCF in the base year and the Party’s target (i.e. reduction in emissions compared with the base year).

2. Assessment of adherence to the reporting guidelines

46. The ERT assessed the information reported in the BR5 of Kazakhstan 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

47. In assessing the Party’s achievement of its 2020 target on the basis of the information reported in its BR5, the ERT noted that Kazakhstan’s target under the Convention was to reduce its emissions by 15 per cent below the 1990 level by 2020 (see para. 2424 above). In 2020 Kazakhstan’s annual total GHG emissions excluding LULUCF were 342,868.79 kt CO₂ eq. The ERT noted that the contribution of LULUCF is not included in the Party’s base or target year and that Kazakhstan did not use units from MBMs. Taking this into account, emissions in 2020 were 15,106.24 kt CO₂ eq (3.9 per cent) above the emission level corresponding to the 2020 target (see table 6). The ERT concluded that, on the basis of the information reported in the BR5 and provided during the review, the total 2020 GHG emissions excluding LULUCF of Kazakhstan exceed the emission level corresponding to the 2020 target, and thus the target is considered not to have been achieved.

F. Projections

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

48. Kazakhstan reported in its BR5 and NC8 updated projections for 2030–2035 relative to actual inventory data for 2020 under the WEM scenario, using GWP values from the AR4.

The WEM scenario reported by Kazakhstan includes PaMs implemented and adopted until 2020.

49. In addition to the WEM scenario, Kazakhstan reported the WAM and WOM scenarios. The WAM scenario includes planned PaMs, while the WOM scenario excludes all PaMs implemented, adopted or planned after 2020. Kazakhstan provided a definition of its scenarios, explaining that its WEM scenario includes policies such as increasing the share of power generation based on natural gas and renewable energy, while its WAM scenario includes reducing coal production, commissioning a nuclear power plant and introducing a carbon tax on sectors not currently covered by the ETS. The definitions indicate that the scenarios were prepared in accordance with the UNFCCC reporting guidelines on BRs.

50. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) for 2030 (by sector and by gas) and 2035 (by sector). The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4.

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

51. During the review, the Party explained that the methodology used for the preparation of the projections is different from that used for the preparation of the emission projections for the NC7 for some sectors, such as solid waste disposal on land, for which the IPCC waste model⁹ is now used. Kazakhstan did not provide information on changes since the submission of its NC7 in the assumptions, methodologies, models and approaches used for the projection scenarios.

52. To prepare its projections, Kazakhstan relied on key underlying assumptions relating to population, the GDP forecast and gross value added for different sectors. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. CTF table 5 includes information on GDP and population only.

(c) Results of projections

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

Table 7
Summary of greenhouse gas emission projections for Kazakhstan

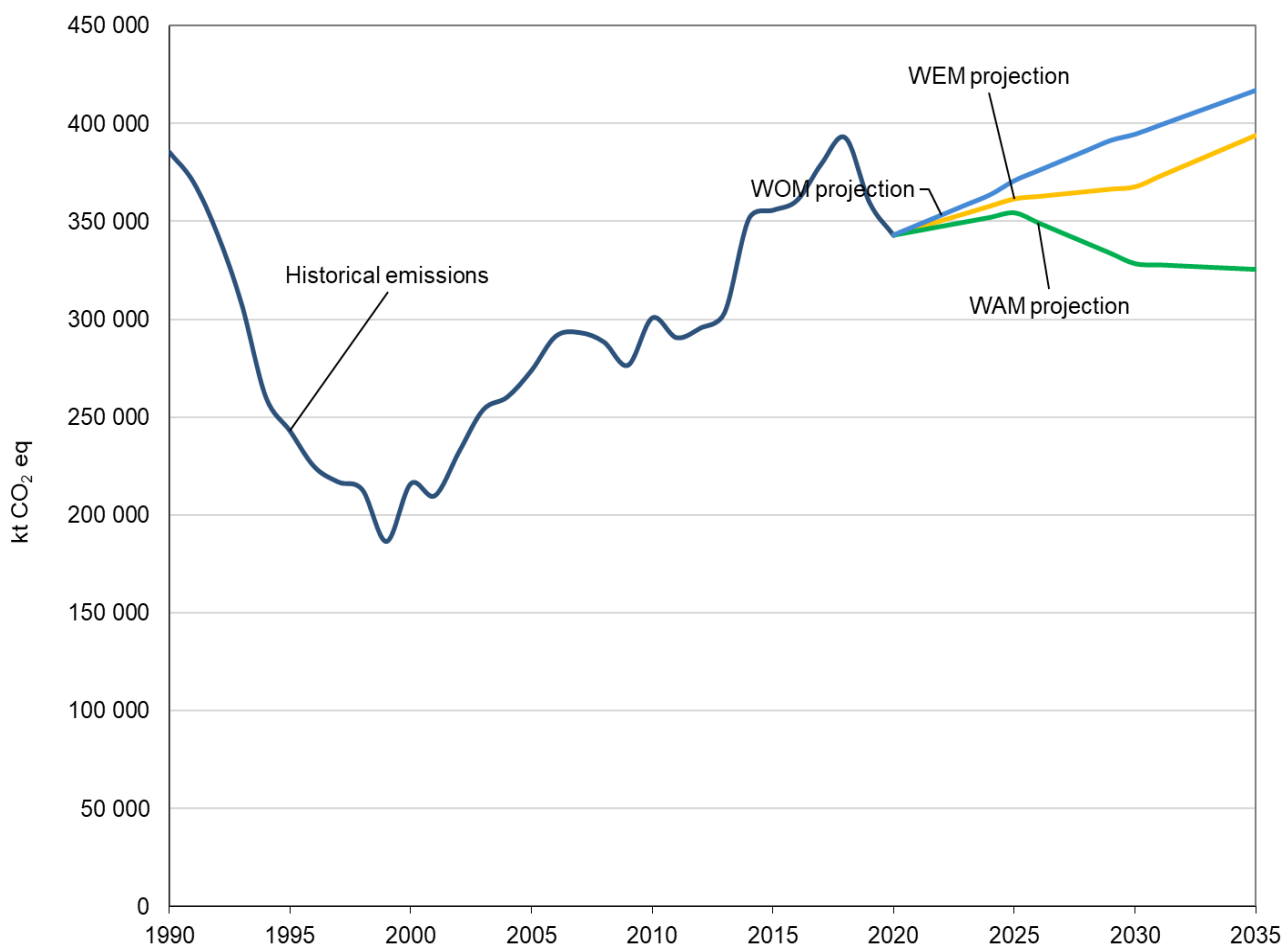
	<i>GHG emissions (kt CO₂ eq/year)</i>	<i>Change in relation to 1990 level (%)</i>	<i>Change in relation to 2020 level (%)</i>
Inventory data 1990	385 603.00	NA	NA
Inventory data 2020	342 868.79	-11.1	NA
WOM projections for 2030	394 441.41	2.3	15.0
WEM projections for 2030	367 563.37	-4.7	7.2
WAM projections for 2030	328 164.11	-14.9	-4.3
WOM projections for 2035	415 797.30	7.8	21.3
WEM projections for 2035	393 957.60	2.2	14.9
WAM projections for 2035	325 258.30	-15.6	-5.1

Sources: Kazakhstan's NC8 and BR5 CTF table 6, for which GWP values from the AR4 were used. Updated projections were provided by Kazakhstan during the review.

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

⁹ See <https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html>.

Figure 1
Greenhouse gas emission projections reported by Kazakhstan



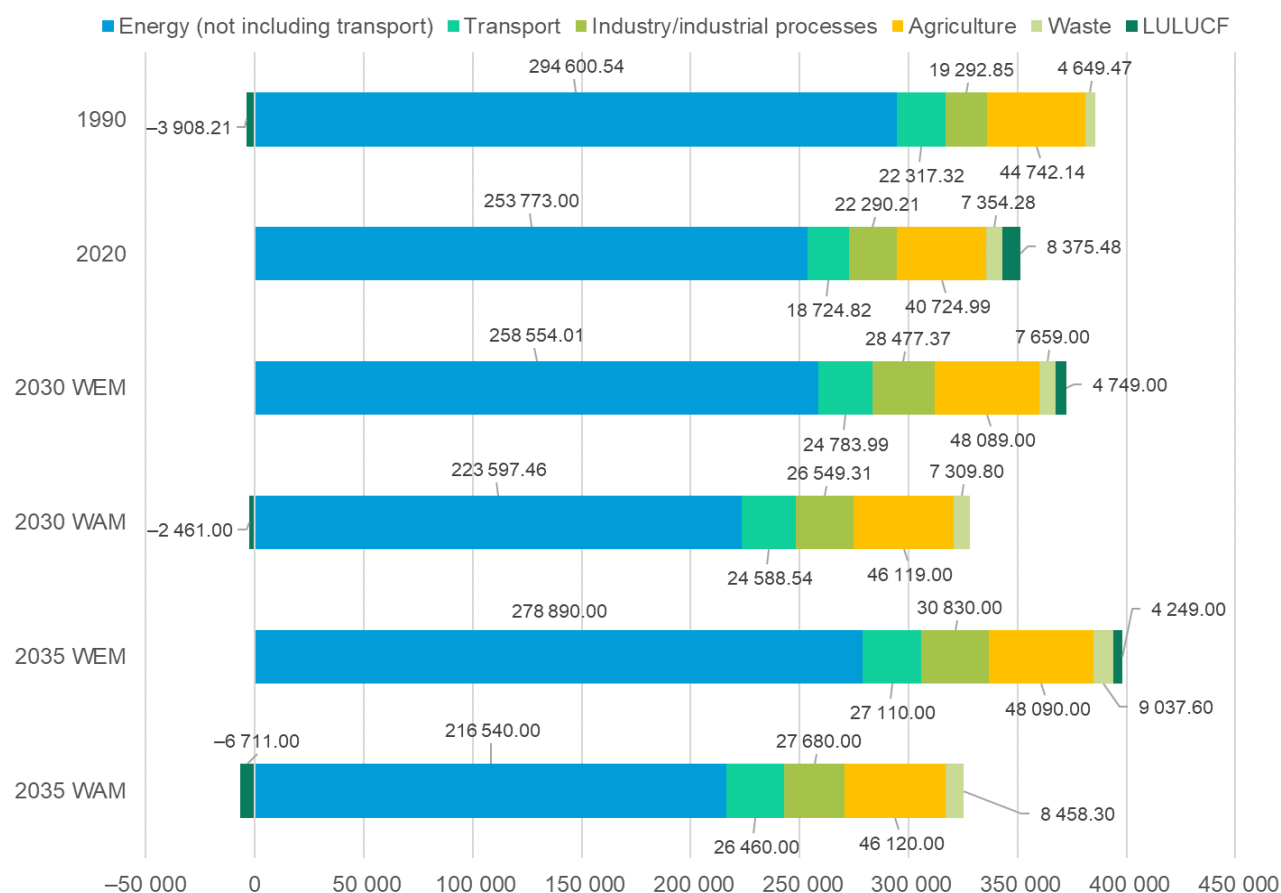
Sources: Kazakhstan's NC8 and BR5 CTF tables 1 and 6 (total GHG emissions excluding LULUCF), for which GWP values from the AR4 were used. Updated projections were provided by Kazakhstan during the review.

54. Kazakhstan's total GHG emissions excluding LULUCF are projected under the WEM scenario to decrease by 4.7 per cent below the 1990 level in 2030 and to increase by 2.2 per cent above the 1990 level in 2035. When including LULUCF, total GHG emissions are projected under the WEM scenario to decrease by 2.5 per cent below the 1990 level in 2030 and to increase by 4.3 per cent above the 1990 level in 2035. Under the WAM scenario (excluding LULUCF), emissions in 2030 and 2035 are projected to be lower than those in 1990 by 14.9 and 15.6 per cent respectively.

55. Kazakhstan presented the WEM and WAM scenarios by sector for 2030 and 2035, as summarized in figure 2 and table 8.

Figure 2

Greenhouse gas emission projections for Kazakhstan presented by sector

 (kt CO₂ eq)


Sources: Kazakhstan's NC8 and BR5 CTF table 6, for which GWP values from the AR4 were used. Updated projections were provided by Kazakhstan during the review.

Table 8

Summary of greenhouse gas emission projections for Kazakhstan presented by sector

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2030		2035		1990–2030		1990–2035	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	294 601.22	258 554.01	223 597.46	278 890.00	216 540.00	-12.2	-24.1	-5.3	-26.5
Transport	22 317.32	24 783.99	24 588.54	27 110.00	26 460.00	11.1	10.2	21.5	18.6
Industry/industrial processes	19 292.85	28 477.37	26 549.31	30 830.00	27 680.00	47.6	37.6	59.8	43.5
Agriculture	44 742.14	48 089.00	46 119.00	48 090.00	46 120.00	7.5	3.1	7.5	3.1
LULUCF	-3 908.21	4 749.00	-2 461.00	4 249.00	-6 711.00	221.5	37.0	208.7	-71.7
Waste	4 649.47	7 659.00	7 309.80	9 037.60	8 458.30	64.7	57.2	94.4	81.9
Total GHG emissions excluding LULUCF	385 603.00	367 563.37	328 164.11	393 957.60	325 258.30	-4.7	-14.9	2.2	-15.6

Sources: Kazakhstan's NC8 and BR5 CTF table 6, for which GWP values from the AR4 were used. Updated projections were provided by Kazakhstan during the review.

56. According to the projections reported for 2030 under the WEM scenario, the most significant absolute emission reductions are expected to occur in the energy sector,

amounting to projected reductions of 12.2 per cent between 1990 and 2030. All other sectors show an expected increase in emissions from 1990 to 2030. The pattern of projected emissions reported for 2035 under the same scenario slightly changes owing to an expected increase in emissions, especially from the energy sector stemming from an increase in the share of natural gas, which reduces the reduction achieved since 1990 from 12.2 to 5.3 per cent.

57. Kazakhstan presented the WEM scenario by gas for 2030, as summarized in table 9.

Table 9

Summary of greenhouse gas emission projections for Kazakhstan presented by gas

Gas ^a	GHG emissions and removals (kt CO ₂ eq)			Change (%)	
	2030			1990–2030	
	1990	WEM	WAM	WEM	WAM
CO ₂	278 781.77	302 080.06	259 298.80	8.4	–7.0
CH ₄	87 734.22	41 010.00	45 157.00	–53.3	–48.5
N ₂ O	19 087.01	22 124.00	21 359.00	15.9	11.9
HFCs	NO, NA	1 486.00	1 486.00	NA	NA
PFCs	NA, NO	861.00	861.00	NA	NA
SF ₆	NA, NO	2.31	2.31	NA	NA
NF ₃	NO, NA	NA	NA	NA	NA
Total GHG emissions without LULUCF	385 603.00	367 563.37	328 164.11	–4.7	–14.9

Sources: Kazakhstan's BR5 CTF table 6, for which GWP values from the AR4 were used. Updated projections were provided by Kazakhstan during the review.

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

(d) Assessment of adherence to the reporting guidelines

58. The ERT assessed the information reported in the NC8 and BR5 of Kazakhstan 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

59. In its NC8 Kazakhstan did not present the estimated and expected total effect of implemented and adopted PaMs nor an estimate of the total effect of its PaMs, in accordance with the WEM scenario, compared with a situation without such PaMs. Kazakhstan included information for each reported measure in the chapter on PaMs but did not provide an overview of the total effect.

(b) Assessment of adherence to the reporting guidelines

60. The ERT assessed the information reported in the NC8 of Kazakhstan 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. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

(a) Technical assessment of the reported information

61. In the NC8 Kazakhstan reported that it does not plan to use MBMs to meet its Kyoto Protocol target, as the Party did not ratify the Doha Amendment to the Kyoto Protocol. The ERT notes that reporting on the supplementarity of such mechanisms is therefore not relevant for Kazakhstan.

(b) Assessment of adherence to the reporting guidelines

62. The ERT assessed the information reported in the NC8 of Kazakhstan 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

63. Kazakhstan 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.

H. Vulnerability assessment, climate change impacts and adaptation measures**1. Technical assessment of the reported information**

64. In its NC8 Kazakhstan provided information on the expected impacts of climate change in the country; the adaptation policies covering regional and 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 most significant vulnerable sectors are water resources, agriculture, tourism and health. The adaptation measures implemented include applying advanced water-saving technologies for agricultural activities, transitioning to drought-resistant crops, enhancing knowledge and awareness of the potential impacts of climate change, performing long-term development planning that incorporates climatic factors, and making infrastructure investments. Like the NC8, the NC7 reported water resources and agriculture as vulnerable sectors, but tourism and health were newly reported in the NC8.

65. Kazakhstan has addressed adaptation matters through the adoption of the updated Environmental Code in 2021, which includes a section on the public administration of adaptation to climate change in order to prevent and reduce vulnerability to and the impacts of climate change (including adverse effects and damage to human health, ecological systems, society and the economy), as well as to make use of opportunities associated with climate change. The updated Environmental Code also provides guidance to government agencies at different levels to help them enhance preparedness for climate change. Kazakhstan also adopted a new Water Code in 2003 to improve inter-State water-sharing by strengthening water diplomacy and the digitization, accounting and monitoring of water resources and by introducing water-saving technologies. Table 10 summarizes the information on vulnerability and adaptation to climate change presented in the NC8 of Kazakhstan.

Table 10

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

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture	<p>Vulnerability: Projected higher temperatures, together with increasing irrigated agricultural land areas, may significantly increase water consumption from 16,366 million m³ in 2020 to 41,575 million m³ in 2030.</p> <p>Economic losses in wheat yield and livestock productivity are estimated at 33 and 10 per cent respectively by 2030, and 12 and 15 per cent respectively by 2050. On the contrary, climate warming may have a positive impact on sunflower seed yield, with production increasing by 8 per cent by 2030 and by about 4 per cent by 2050.</p> <p>Adaptation: The advanced application of water-saving technologies and the transition to drought-resistant crops are key drivers of water consumption efficiency in the country.</p>
Tourism	<p>Vulnerability: The tourism industry is likely to be affected by changes in the characteristics, timings and duration of seasons, which may either harm or benefit tourism. Unseasonal weather and extreme weather events may affect the industry indirectly owing to damage to infrastructure, which would have the greatest impact on activities more closely related to the natural environment.</p>

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
	<p>Vulnerable industries include beach tourism, ski tourism, medical and wellness tourism, and ecotourism.</p> <p>Adaptation: Potential adaptation options include pursuing an ongoing adaptation strategy for coastal tourism, increasing research on the effects of climate change on ski tourism, providing infrastructural support to health resorts and ensuring accessibility to tourist resorts during periods of severe spring flooding and other extreme weather events, and improving preparedness for unexpected and extreme weather events.</p>
Human health	<p>Vulnerability: The medical conditions associated with climate change include injuries, poisoning and accidents, cardiovascular diseases, respiratory diseases, communicable diseases and mental illnesses. While it was possible to observe a higher incidence of diseases in an impact assessment undertaken by the Party of diseases that are potentially affected by climate factors and that may occur more frequently and be exacerbated by climate change, it was difficult to confirm such a relationship because of other non-climatic factors.</p> <p>Adaptation: The conclusions drawn from the impact assessment are probabilistic and require further study and confirmation. At least five years of monthly climatic and morbidity data and mortality indicators are needed for a more reliable assessment and identification of trends. Collecting these data remains challenging, as statistics are provided by health-care institutions annually. As an alternative, it may be possible for such an assessment to be conducted by means of local prospective data collection in coordination with the regional governments.</p>
Water resources	<p>Vulnerability: Modelling results have shown that run-off is expected to reduce by the end of the twenty-first century in all water basins, except for the Balkhash-Alakol Hydroeconomic Basin. Impacts on water availability could be compounded by the expected growth in water consumption due to the projected expansion of irrigated agricultural land by 2030 and the higher average annual temperature.</p> <p>Adaptation: The potential water shortages projected by climate modelling should be taken into account during the projected expansion of irrigated agricultural land, especially in relation to rivers in flat areas and mountainous areas.</p>

66. As a non-Annex I Party, Kazakhstan has made no commitment to cooperate with other non-Annex I Parties in preparing for adaptation. Kazakhstan did not provide information on bilateral cooperation with developing countries on adaptation.

2. Assessment of adherence to the reporting guidelines

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

I. Research and systematic observation

1. Technical assessment of the reported information

68. In its NC8 Kazakhstan provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including participation in and contributions to international research programmes and initiatives mainly undertaken through the country's National Hydrometeorological Service in cooperation with organizations such as the World Meteorological Organization, the Coordination Committee for Hydrometeorology of the Caspian Sea, the Interstate Council on Hydrometeorology of the Commonwealth of Independent States, the European Organisation for the Exploitation of Meteorological Satellites and the Regional Environmental Centre for Central Asia. The Party's climate research and data collection is guided by the Environmental Code, while resources needed to support climate observation are provided through the Development of Hydrometeorological and Environmental Monitoring budget programme of the Ministry of Ecology and Natural Resources.

69. Kazakhstan 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. International cooperation is carried out within the

framework of bilateral and multilateral agreements, memorandums, programmes and protocols, mainly in the areas of improving hydrometeorological technologies and services, supporting climate observations, and collecting and exchanging hydrometeorological and environmental data and information.

70. In terms of activities related to systematic observation, Kazakhstan reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Through the Environmental Code, Kazakhstan’s Unified State System of Environment and Natural Resources Monitoring covers several systematic observations of ecological and natural resources, and spatial, meteorological, hydrological and environmental monitoring. Among these systems, Kazakhstan’s hydrometeorological network consists of 341 weather meteorological stations, with 241 stations transferring information to the Global Observing System of the World Meteorological Organization daily.

71. The Party did not report on actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. However, the ERT notes that, as a non-Annex I Party, Kazakhstan is not obliged to provide support to developing countries for research and systematic observation.

2. Assessment of adherence to the reporting guidelines

72. The ERT assessed the information reported in the NC8 of Kazakhstan and identified issues relating to completeness and thus adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table I.4.

J. Education, training and public awareness

1. Technical assessment of the reported information

73. In its NC8 Kazakhstan provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness; primary, secondary and higher education; public information campaigns; training programmes; education materials; resource or information centres; the involvement of the public and non-governmental organizations; and its participation in international activities.

74. The Ministry of Science and Higher Education develops the environmental education curriculum for schoolchildren in the first to eleventh grades, which recommends that climate issues be taught to schoolchildren in the tenth grade. Non-governmental organizations have also prepared a methodological manual with the title *Climate Change – I Care!* to help teach schoolchildren in the seventh to ninth grades. The Kazakh–German University offers a programme on energy and environmental engineering in collaboration with the Hamburg University of Applied Sciences, Germany. Several online training courses on climate change are offered by the Central Asia Climate Information Platform. With the support of several bilateral aid agencies and multilateral organizations, a number of training courses have been provided on issues related to adaptation and climate-resilient technologies and practices, GHG emission calculations, and climate-related funding applications.

2. Assessment of adherence to the reporting guidelines

75. The ERT assessed the information reported in the NC8 of Kazakhstan 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

76. The ERT conducted a technical review of the information reported in the NC8 of Kazakhstan 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 Kazakhstan.

77. The information provided in the NC8 includes most of the elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Kazakhstan reported on the national system, the national registry, complementarity 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, information under Article 10 of the Kyoto Protocol, and domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures. 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 Kazakhstan in its 2022 annual submission.

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

79. In its NC8 Kazakhstan reported on its key national circumstances related to GHG emissions and removals, including key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater. The main drivers of Kazakhstan's GHG emission trend are changes in GDP and population growth. Between 2012 and 2020, Kazakhstan's population grew, on average, by 1.5 per cent annually. Emissions have been increasing rapidly since 2000 owing to economic growth and transformation. They reached their peak in 2018 (when total GHG emissions were above the 1990 level), before decreasing sharply in 2020 as a result of the pandemic.

80. Kazakhstan's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated in 2020 to be 13.6 per cent below its 1990 level. Emissions decreased in 1990–2000, before showing an increasing trend thereafter. The changes in total emissions were driven mainly by factors such as a significant decrease in GDP from 1990 to 1998, followed by consistent growth in GDP thereafter. Emissions in the energy sector, which is the main emissions source in Kazakhstan, decreased between 2018 and 2021 due to an increase in the use of natural gas and renewable energy. In the IPPU and waste sectors, emissions increased between 1990 and 2020 owing to economic and population growth in Kazakhstan. The decline in emissions in the agriculture sector is mostly related to a fall in livestock numbers from 1990 to 2020.

81. As reported in the BR5, under the Convention Kazakhstan's quantified economy-wide emission reduction target was to reduce its GHG emissions by 15 per cent below the 1990 level by 2020. The target covered CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed using GWP values from the AR4, and covered all sources and sectors included in the annual GHG inventory. Emissions and removals from the LULUCF sector were not included in the target. Kazakhstan reported that it does not plan to make use of MBMs for achieving its target. In absolute terms, this means that under the Convention Kazakhstan had to reduce its emissions from 385,603.00 kt CO₂ eq (in the base year) to 327,762.55 kt CO₂ eq by 2020.

82. In addition to its 2020 target, Kazakhstan also reported on its longer-term unconditional and conditional NDC targets to reduce its GHG emissions by 15 and 25 per cent respectively below the 1990 level by 2030. The Party announced its intention to reach carbon neutrality by 2060 at the Climate Ambition Summit in December 2020 and, in 2023, it adopted a strategy for achieving this goal.

83. Kazakhstan's annual total GHG emissions excluding LULUCF in 2020 were 11.1 per cent (42,734.21 kt CO₂ eq) below the base-year level. The ERT concluded that the total GHG emissions excluding LULUCF of Kazakhstan exceed the emission level corresponding to the 2020 target, and therefore that the target has not been achieved.

84. The GHG emission projections provided by Kazakhstan in its NC8 and BR5 correspond to the WEM, WOM and WAM scenarios. Under the WEM scenario, emissions in 2030 are projected to be 4.7 per cent below the 1990 level and 7.2 per cent above the 2020 level. Under the WAM scenario, emissions in 2030 are projected to be 14.9 per cent below the 1990 level and 4.3 per cent below the 2020 level.

85. Kazakhstan's main policy framework relating to energy and climate change is the Environmental Code, which defines a policy for reducing GHG emissions through the establishment of the foundations for an ETS market mechanism. The Party described the mitigation actions that it has implemented to help it achieve its 2020 and longer-term targets, which include measures to decrease the use of fossil fuels and increase the use of alternative and renewable energy. These PaMs are important for ensuring that Kazakhstan can transition to a low-carbon, green economy while minimizing impacts on the environment and climate.

86. Kazakhstan 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.

87. In its NC8 Kazakhstan 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. An assessment of climate change vulnerability and impacts was conducted for water resources, agriculture, tourism and health. The Environmental Code provides guidance on adaptation response in these sectors.

88. In its NC8 Kazakhstan provided information on its activities relating to research and systematic observation. Climate research and data collection is guided by the Environmental Code, while resources needed to support climate observation are provided through the Development of Hydrometeorological and Environmental Monitoring budget programme of the Ministry of Ecology and Natural Resources. Domestic and international observation is mainly undertaken in close collaboration with the World Meteorological Organization.

89. In its NC8 Kazakhstan provided information on its actions relating to education, training and public awareness. Reference materials have been developed by the Ministry of Science and Higher Education and non-governmental organizations for incorporation into the school curriculum. With the support of several bilateral aid agencies and multilateral organizations, a number of training courses have been provided on issues related to adaptation and climate-resilient technologies and practices, GHG emission calculations, and climate-related funding applications.

90. In the course of the review, the ERT formulated the following recommendations for Kazakhstan 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, as appropriate, quantitative estimates of mitigation impacts for individual PaMs or collections of PaMs, or, if such estimates are not possible, explaining why (see issue 6 in table I.1);
 - (ii) Providing information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals (see issue 9 in table I.1);
 - (iii) Reporting, to the extent possible, separately and not included in the national total, emission projections related to fuel sold to ships and aircraft engaged in international transport (see issue 5 in table I.2);
 - (iv) Presenting the estimated and expected total effect of implemented and adopted PaMs (see issue 8 in table I.2);
 - (v) Providing an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs (see issue 10 in table I.2);
 - (vi) Presenting information on factors and activities underlying projected emission trends for each sector from 1990 to at least 15 years from the most recent inventory year (see issue 17 in table I.2);

- (b) To improve the transparency of its reporting by:
 - (i) Including for each sector a brief description of the methods used to estimate the mitigation impacts of PaMs (see issue 7 in table I.1);
 - (ii) Presenting emission projections relative to actual historical inventory information to ensure correct, consistent and transparent reporting of the historical and projected emissions (see issue 2 in table I.2).

91. In the course of the review of Kazakhstan's NC8, the ERT formulated a recommendation relating to adherence to the reporting guidelines for supplementary information, namely to improve the completeness of its reporting by providing a complete description of any domestic and regional legislative arrangements and enforcement and administrative procedures the Party has in place to meet its commitments under the Kyoto Protocol, by including the procedures for addressing cases of non-compliance under domestic law, as stipulated by paragraph 37(a) of the annex to decision 15/CMP.1 (see issue 1 in table I.5).

92. In the course of the review of Kazakhstan'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:
 - (i) Providing information on changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards its economy-wide emission reduction target (see issue 1 in table II.1);
 - (ii) Reporting, to the extent possible, separately and not included in the national total, emission projections related to fuel sold to ships and aircraft engaged in international transport (see issue 6 in table II.2);
 - (iii) Presenting information on factors and activities underlying projected emission trends for each sector from 1990 to at least 15 years from the most recent inventory year (see issue 15 in table II.2);
- (b) To improve the transparency of its reporting by:
 - (i) Providing consistent information on PaMs included under the WEM and WAM scenarios (see issue 1 in table II.2);
 - (ii) Presenting emission projections relative to actual historical inventory information to ensure correct, consistent and transparent reporting of the historical and projected emissions (see issue 3 in table II.2).

Annex I

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

Tables I.1–I.5 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on NCs for Kazakhstan’s NC8.

Table I.1

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

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	The Party did not indicate in its NC8 PaMs that are innovative and/or effectively replicable by other Parties. The ERT noted many such PaMs, including the Environmental Code, reducing energy intensity and developing renewable energy. During the review, the Party explained that the PaMs mentioned above were not considered innovative because the core consideration of those PaMs is to transform its national economy from carbon-intensive to carbon-effective. The ERT encourages the Party to indicate which PaMs 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	The Party did not report in its NC8 on its actions taken to identify and periodically update its policies and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur. The ERT noted that some of the cross-sectoral PaMs reported by the Party, including the Environmental Code, the updated NDC and reducing the energy intensity of GDP, may enable it to identify and update such policies and practices. During the review, the Party clarified that the PaMs highlighted by the ERT will help to mitigate GHG emissions and will not lead to greater levels of anthropogenic GHG emissions than would otherwise occur. The ERT reiterates the encouragement from the previous review report for the Party to report in its next NC on its actions taken to identify and periodically update its policies and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur.
3	Reporting requirement specified in paragraph 13 Issue type: completeness Assessment: encouragement	The Party did not provide in its NC8 information on the assessment of the economic and social consequences of response measures. During the review, the Party explained that it needs capacity-building to enable it to assess the economic and social consequences of response measures. The ERT encourages the Party to report information, to the extent possible, on the assessment of the economic and social consequences of response measures in its next NC.
4	Reporting requirement specified in paragraph 14 Issue type: transparency Assessment: encouragement	In its NC8 the Party reported cross-sectoral PaMs under the energy sector PaMs. During the review, the Party explained that cross-sectoral PaMs were reported under the energy sector PaMs because the tasks for preparing the NC were allocated by sector and the cross-sectoral PaMs were covered under the energy sector. The ERT encourages the Party to report cross-sectoral PaMs in a separate section in the next NC.
5	Reporting requirement specified in paragraph 18 Issue type: completeness Assessment: encouragement	In its NC8 the Party did not provide a description of how the progress of PaMs in mitigating GHG emissions was monitored and evaluated over time. The Party did not report the institutional arrangements for the monitoring of GHG mitigation policy in this context. During the review, the Party explained that the Ministry of Ecology and Natural Resources collected information on PaMs from various sources, including plans and strategic documents, and that the progress of these PaMs was monitored by responsible agencies (ministries).

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		<p>The ERT reiterates the encouragement from the previous review report for the Party to provide a description of how the progress of PaMs in mitigating GHG emissions is monitored and evaluated over time, and, in this context, to also report on its institutional arrangements for the monitoring and evaluation of PaMs in the next NC.</p>
6	<p>Reporting requirement specified in paragraph 20</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>The Party did not report in its NC8 estimates of mitigation impacts for four PaMs (national plan for the distribution of GHG emission quotas for 2018–2020, rules for trading GHG emission quotas and carbon units under the ETS, a penalty for exceeding the established quota volume of GHG emissions and for submitting unreliable GHG inventory data, and the State Programme for Industrial and Innovative Development for 2020–2025). The Party did not explain why such estimates are not possible. The ERT noted that the Party reported the mitigation impacts of those four PaMs as “NE” in CTF table 3.</p> <p>During the review, the Party explained that it did not report estimates for the above-mentioned PaMs because they are regulatory in nature and hence support emission reductions by other PaMs.</p> <p>The ERT recommends that the Party provide, as appropriate, quantitative estimates of mitigation impacts for individual PaMs or collections of PaMs, or if such estimates are not possible, explain why in the next NC.</p>
7	<p>Reporting requirement specified in paragraph 20</p> <p>Issue type: transparency</p> <p>Assessment: recommendation</p>	<p>In its NC8 Kazakhstan reported limited information on the estimation methods used for the PaMs. The ERT noted that the Party provided a textual description of the TIMES-KAZ model and the Carbon Budget Model of the Canadian Forest Sector, both of which were used to assess the impacts of climate change mitigation measures in the energy, IPPU and LULUCF sectors. However, the Party did not provide information on the methods used to estimate the mitigation impacts of PaMs in the agriculture and waste sectors.</p> <p>During the review, Kazakhstan explained that the mitigation impacts of PaMs in the agriculture and waste sectors were estimated for each individual policy or measure as the emissions avoided owing to reductions in energy demand or activities that would otherwise cause GHG emissions. For example, the mitigation impact of biogas production was calculated on the basis of the difference between GHG emissions from the production of 1 t manure and those from the generation of energy produced by 1 t manure by a coal-fired power station.</p> <p>The ERT recommends that Kazakhstan include in its next NC a brief description of the methods used by the Party to estimate the mitigation impacts of PaMs for each sector.</p>
8	<p>Reporting requirement specified in paragraph 21</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>In its NC8 the Party did not provide for each policy or measure information on costs, on non-GHG mitigation benefits and on how it interacts with other PaMs at the national level.</p> <p>During the review, the Party explained that it did not provide the above-mentioned information in the NC8 owing to a lack of capacity and knowledge.</p> <p>The ERT encourages the Party to provide in the next NC information for each policy or measure on costs, on non-GHG mitigation benefits and on how it interacts with other PaMs at the national level.</p>
9	<p>Reporting requirement specified in paragraph 22</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>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.</p> <p>During the review, the Party clarified that a comprehensive assessment of PaMs based on the TIMES-KAZ modelling studies of decarbonization scenarios was published by Kazakhstan country experts for the energy and IPPU sectors in 2023 and that this could be a useful reference to address this issue.</p> <p>The ERT recommends that the Party provide information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in its next NC.</p>

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 Kazakhstan

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 27 Issue type: completeness Assessment: encouragement	The Party did not report a sensitivity analysis for the projections in its NC8. During the review, the Party explained that a sensitivity analysis was not performed for the projections reported. The ERT reiterates the encouragement from the previous review reports for Kazakhstan to report a sensitivity analysis for its projections in its next NC.
2	Reporting requirement specified in paragraph 28 Issue type: transparency Assessment: recommendation	In its NC8 the Party did not present emission projections relative to actual inventory data for the preceding years. The ERT noted several inaccuracies in the historical emissions reported in the NC8. For example, the energy sector emissions for 1990 were incorrectly reported in the NC8 as 316,919.00 kt CO ₂ eq instead of 316,917.74 kt CO ₂ eq, and the IPPU sector emissions for 1990 were incorrectly reported as 19,405.85 kt CO ₂ eq instead of 19,292.85 kt CO ₂ eq. During the review, the Party explained that its 2022 national inventory report was submitted in April 2023 and its NC8 was submitted in December 2022 and that updates to the inventory were made between December 2022 and April 2023. The Party also shared the correct historical emissions with the ERT. The ERT recommends that Kazakhstan present emission projections relative to actual historical inventory information to ensure correct, consistent and transparent reporting of the historical and projected emissions (including the totals) in its next NC.
3	Reporting requirement specified in paragraph 29 Issue type: transparency Assessment: encouragement	The ERT noted inconsistent information on the starting point for the projections in the NC8. For example, in annex 1 to the NC8, the base year for the projections in all the scenarios is said to be 2020 for the energy sector and 2019 for the IPPU sector. However, the main part of the NC8 mentions 2015 as the base year for the IPPU projections and 2017 as the base year for the energy projection model. During the review, the Party explained that the mention of 2017 for the energy projection model was the start year of the model, but that the model was calibrated against available historical data and that the basis for all projections in the NC8 was 2020 historical data. The ERT encourages Kazakhstan to include consistent information on the starting point used for the projections in the next NC.
4	Reporting requirement specified in paragraph 32 Issue type: completeness Assessment: encouragement	The ERT noted that Kazakhstan did not provide in its NC8 projections of indirect GHG emissions of CO, NO _x and NMVOCs, as well as SO _x . During the review, Kazakhstan explained that the model applied for the energy sector does not cover indirect GHG emissions. The ERT reiterates the encouragement from the previous review report for Kazakhstan to present projections of indirect GHG emissions of CO, NO _x and NMVOCs, as well as SO _x in its next NC.
5	Reporting requirement specified in paragraph 33 Issue type: completeness Assessment: recommendation	The ERT noted that Kazakhstan did not report separately emission projections related to fuel sold to ships and aircraft engaged in international transport in its NC8. During the review, Kazakhstan explained that the model applied for the energy sector does not cover international transport. The ERT reiterates the recommendation from the previous review report that Kazakhstan report, to the extent possible, separately and not included in the total, emission projections related to fuel sold to ships and aircraft engaged in international transport in its next NC.
6	Reporting requirement specified in paragraph 34 Issue type: completeness	Kazakhstan did not present historical emissions and projections on a quantitative basis in tabular format in its NC8. Such information should be presented in tabular format (tables 2, 3 and 4 of the UNFCCC reporting guidelines on NCs) and cover historical emissions for 1990 (and another base year, as appropriate), 1995, 2000, 2005, 2010 and subsequent years that end in either a zero or a five up to the most recent inventory year, while the information on projections should be presented starting from the most recent

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
	Assessment: encouragement	<p>inventory year and for subsequent years that end in either a zero or a five, extending at least 15 years from the most recent inventory year (e.g. 2020, 2025, 2030 and 2035). The NC8 presents such information only for the energy and IPPU sectors.</p> <p>During the review, the Party clarified that it will include this information in its next NC.</p> <p>The ERT encourages Kazakhstan to present historical data in tabular format for 1990 (and another base year, as appropriate), 1995, 2000, 2005, 2010 and subsequent years that end in either a zero or a five up to the most recent inventory year in its next NC.</p> <p>The ERT reiterates the encouragement from the previous review reports for Kazakhstan to present projection data in tabular format, as encouraged by the UNFCCC reporting guidelines on NCs (tables 2, 3 and 4), in its next NC.</p>
7	Reporting requirement specified in paragraph 35 Issue type: completeness Assessment: encouragement	<p>The ERT noted that Kazakhstan did not present figures in its NC8 illustrating the information referred to in paragraphs 31–34 of the UNFCCC reporting guidelines on NCs showing unadjusted inventory data and a WEM projection for the period from 1990 to the most recent inventory year and for subsequent years that end in either a zero or a five, extending at least 15 years from the most recent inventory year.</p> <p>During the review, Kazakhstan acknowledged this issue and indicated that it will include this information in its next NC.</p> <p>The ERT encourages Kazakhstan to present figures illustrating the information referred to in paragraphs 31–34 of the UNFCCC reporting guidelines on NCs showing unadjusted inventory data and a WEM projection for the period from 1990 to the most recent inventory year and for subsequent years that end in either a zero or a five, extending at least 15 years from the most recent inventory year in its next NC.</p>
8	Reporting requirement specified in paragraph 36 Issue type: completeness Assessment: recommendation	<p>The Party did not report information in its NC8 on the estimated and expected total effect of implemented and adopted PaMs.</p> <p>During the review, the Party explained that an estimate of the effect of adopted and implemented PaMs is provided in CTF table 3. However, the ERT noted that CTF table 3 contains estimated and expected effects of individual PaMs and not the total effect, and is not part of the NC8.</p> <p>The ERT recommends that Kazakhstan present the estimated and expected total effect of implemented and adopted PaMs in its next NC.</p>
9	Reporting requirement specified in paragraph 36 Issue type: completeness Assessment: encouragement	<p>The Party did not present the total expected effect of planned PaMs in the projections section of its NC8.</p> <p>During the review, the Party explained that an estimate of the effect of adopted and implemented PaMs is provided in CTF table 3. However, the ERT noted that CTF table 3 contains estimated and expected effects of individual PaMs and not the total effect, and is not part of the NC8.</p> <p>The ERT encourages Kazakhstan to present the total expected effect of planned PaMs in the projections section of its next NC.</p>
10	Reporting requirement specified in paragraph 37 Issue type: completeness Assessment: recommendation	<p>The Party did not provide in its NC8 an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs for all sectors.</p> <p>During the review, the Party explained that an estimate of the effect of adopted and implemented PaMs is provided in CTF table 3. However, the ERT noted that CTF table 3 contains estimated and expected effects of individual PaMs and not the total effect, and is not part of the NC8.</p> <p>The ERT recommends that Kazakhstan provide in its next NC an estimate of the total effect of its PaMs, in accordance with the WEM definition, compared with a situation without such PaMs.</p>
11	Reporting requirement specified in paragraph 39 Issue type: transparency Assessment: encouragement	<p>The ERT noted that Kazakhstan did not provide information on the models and/or approaches used to estimate fugitive emissions in the energy sector.</p> <p>During the review, the Party explained that the TIMES-KAZ model used in the energy sector covers both fugitive and combustion emissions. In other sectors, linear regression is used to extrapolate the historical trend.</p> <p>The ERT encourages Kazakhstan to provide detailed information in its next NC on the models and/or approaches used to project GHG emissions and removals. The ERT notes</p>

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
		that this could include the approaches used for specific sectors and subsectors and the projected AD.
12	Reporting requirement specified in paragraph 40 Issue type: completeness Assessment: encouragement	<p>In the description provided in the NC8 of the model and approaches used for developing projections, the Party did not describe the original purpose of the model or approach and whether and how it was modified for climate change purposes; did not summarize the strengths and weaknesses of each model or approach used; and did not explain how the model or approach accounts for any overlap or synergies that may exist between different PaMs.</p> <p>During the review, Kazakhstan provided references to the section in the NC8 that includes relevant information and further explained that the energy sector used a bottom-up approach (the TIMES-KAZ model) and that the IPPU sector used a linear regression method.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to report in its next NC, for each model or approach used, information on the gases and/or sectors for which it was used; its type and characteristics; the original purpose for which it was designed, and, if applicable, how it has been modified for climate change purposes; its strengths and weaknesses; and how it accounts for any overlap or synergies that may exist between different PaMs.</p>
13	Reporting requirement specified in paragraph 41 Issue type: transparency Assessment: encouragement	<p>The ERT noted that Kazakhstan did not provide references to more detailed information related to all models (except the TIMES-KAZ model) and approaches used for developing emission projections in its NC8.</p> <p>During the review, Kazakhstan provided references to the section in the NC8 that includes relevant information and further explained that the energy sector used a bottom-up approach (the TIMES-KAZ model) and that the IPPU sector used a linear regression method.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to include in its next NC references to documents containing more detailed information related to all models and approaches used for developing its projections.</p>
14	Reporting requirement specified in paragraph 42 Issue type: completeness Assessment: encouragement	<p>The ERT noted that Kazakhstan did not report the main differences in the assumptions, methods employed and results of the projections between the NC7 and NC8.</p> <p>During the review, Kazakhstan clarified that there have been no changes since the NC7 in the methods employed for the energy sector. Kazakhstan also explained that there were changes in the projection methodologies used for the waste sector, as the waste sector model provided in the 2006 IPCC Guidelines was now being used to project emissions from solid waste disposal on land. However, the Party did not explain the differences in the assumptions between the NC7 and NC8 for other sectors.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to report in its next NC the main differences in the assumptions, methods employed and emission projection results between the current NC and the previous NC.</p>
15	Reporting requirement specified in paragraph 43 Issue type: completeness Assessment: encouragement	<p>The ERT noted that Kazakhstan did not discuss in its NC8 the sensitivity of the emission projections to underlying assumptions, either quantitatively or qualitatively.</p> <p>During the review, Kazakhstan explained that the sensitivity of the projections to underlying assumptions was not analysed.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to discuss in its next NC the sensitivity of the projections to underlying assumptions qualitatively and, where possible, quantitatively.</p>
16	Reporting requirement specified in paragraph 44 Issue type: transparency Assessment: encouragement	<p>Kazakhstan did not provide information in its NC8 on all the key underlying assumptions and values of variables and reported information only on GDP and population for one historical year (2017).</p> <p>During the review, Kazakhstan referred to the pages of the NC8 that contain relevant information. However, the ERT noted that the information included in the NC8 does not cover all the key underlying assumptions and variables.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to provide, in tabular format, information on key underlying assumptions and values of variables, such as GDP growth, population growth, tax levels and international fuel</p>

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
		prices, used to develop the emission projections, including for historical and projected years.
17	Reporting requirement specified in paragraph 45 Issue type: completeness Assessment: recommendation	Kazakhstan did not present information on factors and activities for each sector from 1990 to at least 15 years from the most recent inventory year to provide the reader with an understanding of emission trends. During the review, Kazakhstan provided information on the main drivers of the GHG emission trend for the LULUCF sector (change in the area of farmed histosols) and the agriculture sector (subsidies provided for meat production). For these two examples, it would be relevant to show the trend in cultivated histosols and the cattle population. In the event of the emission factors or other parameters (feed intake, weight of animals, etc.) changing across the historical or projected time series, it would be relevant to also include this type of information. The ERT recommends that Kazakhstan present in its next NC relevant information on factors and activities underlying the projected emission trends for each sector from 1990 to at least 15 years from the most recent inventory year. This information on factors and activities may be presented in tabular format.

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

Table I.3

Findings on vulnerability assessment, climate change impacts and adaptation measures from the review of the eighth national communication of Kazakhstan

<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 47 Issue type: transparency Assessment: encouragement	In its NC8 the Party reported information on impacts, vulnerabilities and adaptation in a fragmented manner and did not use the structure encouraged in paragraph 47 of the UNFCCC reporting guidelines on NCs. During the review, Kazakhstan explained that the project team and experts drafted the chapter on impacts, vulnerabilities and adaptation by collecting the data available at the time of preparing the NC8. Since the Regional Environmental Centre for Central Asia had completed its work on the vulnerability assessment in time for it to be included in the NC8, the Party decided to include this information. Although Kazakhstan recently adopted legislation on climate change adaptation, it has not yet created a strategy for this. As such, the adaptation measures have not yet been implemented, even though reports are being collected for further analysis and monitoring. The ERT encourages the Party to use the structure provided in the UNFCCC reporting guidelines on NCs when reporting information on impacts, vulnerabilities and adaptation in the next NC.

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

Table I.4

Findings on research and systematic observation from the review of the eighth national communication of Kazakhstan

<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 65 Issue type: completeness Assessment: encouragement	The Party did not report on action taken to overcome barriers to free and open international exchange of data and information. During the review, Kazakhstan explained that free and open exchange of meteorological data took place through its participation in international organizations and conventions, including the World Meteorological Organization, the European Organisation for the Exploitation of Meteorological Satellites and the Coordination Committee for Hydrometeorology of the Caspian Sea. The Party also indicated that

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
		<p>there is no restriction on the exchange of information and there are online tools in addition to official requests to facilitate the free and open international exchange of data and information.</p> <p>The ERT encourages Kazakhstan to report on action taken to overcome barriers to free and open international exchange of data and information.</p>
2	<p>Reporting requirement specified in paragraph 66</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>In its NC8 the Party did not provide information on highlights, innovations and significant efforts made with regard to socioeconomic analysis, and research and development of mitigation and adaptation technologies.</p> <p>During the review, the Party explained that socioeconomic analysis, and research and development of mitigation and adaptation technologies were not carried out in the country. The Party indicated that it will be possible to include information on such studies conducted as part of international and national projects in future NCs.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to provide in its next NC information on highlights, innovations and significant efforts made with regard to socioeconomic analysis, and research and development of mitigation and adaptation technologies.</p>

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.5

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

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation</i>
1	<p>Reporting requirement specified in paragraph 37</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>The Party did not describe the procedures for addressing cases of non-compliance under domestic law as part of domestic and regional legislative arrangements and enforcement and administrative procedures the Party has in place to meet its commitments under the Kyoto Protocol.</p> <p>During the review, Kazakhstan provided additional information on the enforcement of its domestic ETS. However, the ERT noted that this information is not relevant to domestic and regional programmes and/or domestic and regional legislative arrangements and enforcement and administrative procedures, established pursuant to the implementation of the Kyoto Protocol, according to its national circumstances.</p> <p>The ERT recommends that Kazakhstan provide a complete description of any domestic and regional legislative arrangements and enforcement and administrative procedures the Party has in place to meet its commitments under the Kyoto Protocol by including the procedures for addressing cases of non-compliance under domestic law, as stipulated by paragraph 37(a) of the annex to decision 15/CMP.1.</p> <p>The ERT noted that the requirements set out in the annex to decision 15/CMP.1, as amended by decision 3/CMP.11, apply to Parties with quantified emission limitation and reduction commitments or objectives inscribed in the third column of Annex B in the Doha Amendment to the Kyoto Protocol and are not applicable to Kazakhstan, since Kazakhstan has not ratified the Doha Amendment to 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 Kazakhstan

The BR5 of Kazakhstan 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 Kazakhstan’s BR5.

Table II.1

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

No.	Reporting requirement and issue type	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 7 Issue type: completeness Assessment: recommendation	<p>The Party did not provide in its BR5 information on changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards its economy-wide emission reduction target.</p> <p>During the review, the Party explained that the Ministry of Ecology and Natural Resources collected information on PaMs from various sources, including plans and strategic documents, and that the progress of these PaMs was monitored by responsible agencies (ministries).</p> <p>The ERT recommends that the Party provide information on changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress towards its economy-wide emission reduction target.</p>
2	Reporting requirement specified in paragraph 8 Issue type: completeness Assessment: encouragement	<p>The Party did not provide in its BR5 information on the assessment of the economic and social consequences of response measures.</p> <p>During the review, Kazakhstan explained that it needs capacity-building to enable it to assess the economic and social consequences of response measures.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to provide, to the extent possible, detailed information on the assessment of the economic and social consequences of response measures.</p>
3	Reporting requirement specified in paragraph 24 Issue type: completeness Assessment: encouragement	<p>The Party did not report in its BR5 on the domestic arrangements established for the process of the self-assessment of compliance with emission reduction targets in comparison with emission reduction commitments or the level of emission reduction that is required by science and the progress made in the establishment of national rules for taking local action against domestic non-compliance with emission reduction targets.</p> <p>During the review, Kazakhstan explained that the self-assessment of compliance with emission reduction targets could partially be done on the basis of the annual submissions of national inventory reports. The Party also informed the ERT that national rules (its Environmental Code and its secondary legislation and its Code on Administrative Violations) have been established in the country for taking local action against domestic non-compliance with emission reduction targets within the operation of the domestic ETS.</p>

¹ The Conference of the Parties, 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 ERT reiterates the encouragement from the previous review report for the Party to report, to the extent possible, on the domestic arrangements established for the process of the self-assessment of compliance with emission reduction targets in comparison with emission reduction commitments or the level of emission reduction that is required by science and on its progress in establishing 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 Kazakhstan

<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 26</p> <p>Issue type: transparency</p> <p>Assessment: recommendation</p>	<p>The ERT noted inconsistencies in the PaMs included under the WEM and WAM scenarios across the BR5 submission. For example, the BR5 lists the national allocation plan as the only measure for the IPPU sector included in the WEM scenario, while CTF table 3 also mentions a ban on the export of scrap metal and domestic recycling implemented in 2019, as well as the prohibition of the disposal of scrap metal and glass implemented in 2019 (following changes in the Environmental Code for the purpose of developing the circular economy).</p> <p>During the review, Kazakhstan acknowledged this issue and indicated that PaMs included under the WEM and WAM scenarios will be checked and corrected in the next submission.</p> <p>The ERT recommends that Kazakhstan provide consistent information on PaMs included under the WEM and WAM scenarios.</p>
<p>2 Reporting requirement^a specified in paragraph 27</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>The Party did not report a sensitivity analysis for the projections in its BR5.</p> <p>During the review, the Party explained that a sensitivity analysis was not performed for the projections reported.</p> <p>The ERT reiterates the encouragement from the previous review reports for Kazakhstan to report a sensitivity analysis for its projections.</p>
<p>3 Reporting requirement^a specified in paragraph 28</p> <p>Issue type: transparency</p> <p>Assessment: recommendation</p>	<p>In its BR5 the Party did not present emission projections relative to actual inventory data for the preceding years. The ERT noted several inaccuracies in the historical emissions reported in the BR5. For example, the energy sector emissions for 1990 were incorrectly reported in the NC8 as 316,919.00 kt CO₂ eq instead of 316,917.74 kt CO₂ eq and the IPPU sector emissions for 1990 were incorrectly reported as 19,405.85 kt CO₂ eq instead of 19,292.85 kt CO₂ eq.</p> <p>During the review, the Party explained that its 2022 national inventory report was submitted in April 2023 and its BR5 was submitted in December 2022 and that updates to the inventory were made between December 2022 and April 2023. The Party also shared the correct historical emissions with the ERT.</p> <p>The ERT recommends that Kazakhstan present emission projections relative to actual historical inventory information to ensure correct, consistent and transparent reporting of the historical and projected emissions (including the totals).</p>
<p>4 Reporting requirement^a specified in paragraph 29</p> <p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>The ERT noted inconsistent information on the starting point for the projections in the BR5. For example, in annex 1 to the BR5, the base year for the projections in all the scenarios is said to be 2020 for the energy sector and 2019 for the IPPU sector. However, the main part of the BR5 mentions 2015 as the base year for the IPPU projections and 2017 as the base year for the energy projection model.</p> <p>During the review, the Party explained that the mention of 2017 for the energy projection model was the start year of the model, but that the model was calibrated against available historical data and that the basis for all projections in the NC8 and BR5 was 2020 historical data.</p>

No.	<i>Reporting requirement and issue type</i>	<i>Description of the finding with recommendation or encouragement</i>
		The ERT encourages Kazakhstan to include consistent information on the starting point used for the projections.
5	Reporting requirement ^a specified in paragraph 32 Issue type: completeness Assessment: encouragement	The ERT noted that Kazakhstan did not provide in its BR5 projections of indirect GHG emissions of CO, NO _x and NMVOCs, as well as SO _x . During the review, Kazakhstan explained that the model applied for the energy sector does not cover indirect GHG emissions. The ERT reiterates the encouragement from the previous review report for Kazakhstan to present projections of indirect GHG emissions of CO, NO _x and NMVOCs, as well as SO _x .
6	Reporting requirement ^a specified in paragraph 33 Issue type: completeness Assessment: recommendation	The ERT noted that Kazakhstan did not report separately emission projections related to fuel sold to ships and aircraft engaged in international transport in its BR5. During the review, Kazakhstan explained that the model applied for the energy sector does not cover international transport. The ERT reiterates the recommendation from the previous review report that Kazakhstan report, to the extent possible, separately and not included in the national total, emission projections related to fuel sold to ships and aircraft engaged in international transport.
7	Reporting requirement ^a specified in paragraph 34 Issue type: completeness Assessment: encouragement	Kazakhstan did not present historical emissions and projections on a quantitative basis, in tabular format in its BR5. The information on historical emissions should be presented in tabular format (tables 2, 3 and 4 of the UNFCCC reporting guidelines on NCs) for 1990 (and another base year, as appropriate), 1995, 2000, 2005, 2010 and subsequent years that end in either a zero or a five up to the most recent inventory year, while the information on projections should be presented starting from the most recent inventory year and for subsequent years that end in either a zero or a five, extending at least 15 years from the most recent inventory year (e.g. 2020, 2025, 2030 and 2035). The BR5 presents such information only for the energy and IPPU sectors. During the review, the Party clarified that it will include this information in its next submission. The ERT encourages Kazakhstan to present historical data in tabular format for 1990 (and another base year, as appropriate), 1995, 2000, 2005, 2010 and subsequent years that end in either a zero or a five up to the most recent inventory year. The ERT reiterates the encouragement from the previous review reports for Kazakhstan to present projection data in tabular format, as encouraged by the UNFCCC reporting guidelines on NCs (tables 2, 3 and 4), in its next NC.
8	Reporting requirement ^a specified in paragraph 35 Issue type: completeness Assessment: encouragement	The ERT noted that Kazakhstan did not present figures illustrating the information referred to in paragraphs 31–34 of the UNFCCC reporting guidelines on NCs showing unadjusted inventory data and a WEM projection for the period from 1990 to the most recent inventory year and for subsequent years that end in either a zero or a five, extending at least 15 years from the most recent inventory year. During the review, Kazakhstan acknowledged this issue and indicated that it will include this information in its next submission. The ERT encourages Kazakhstan to present figures illustrating the information referred to in paragraphs 31–34 of the UNFCCC reporting guidelines on NCs showing unadjusted inventory data and a WEM projection for the period from 1990 to the most recent inventory year and for subsequent years that end in either a zero or a five, extending at least 15 years from the most recent inventory year.
9	Reporting requirement ^a specified in paragraph 39 Issue type: transparency Assessment: encouragement	The ERT noted that Kazakhstan did not provide information on the models and/or approaches used to estimate fugitive emissions in the energy sector. During the review, the Party explained that the TIMES-KAZ model used in the energy sector covers both fugitive and combustion emissions. In other sectors, linear regression is used to extrapolate the historical trend. The ERT encourages Kazakhstan to provide detailed information in its next NC on the models and/or approaches used to project GHG emissions and removals. The ERT notes that this could include the approaches used for specific sectors and subsectors and the projected AD.

<i>No.</i>	<i>Reporting requirement and issue type</i>	<i>Description of the finding with recommendation or encouragement</i>
10	Reporting requirement ^a specified in paragraph 40 Issue type: transparency Assessment: encouragement	<p>In the description provided in the BR5 of the model and approaches used for developing projections, the Party did not describe the original purpose of the model or approach and whether and how it was modified for climate change purposes; did not summarize the strengths and weaknesses of each model or approach used; and did not explain how the model or approach accounts for any overlap or synergies that may exist between different PaMs.</p> <p>During the review, Kazakhstan provided references to the section in the NC8 that includes relevant information and further explained that the energy sector used a bottom-up approach (the TIMES-KAZ model) and that the IPPU sector used a linear regression method.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to report in its next NC, for each model or approach used, information on the gases and/or sectors for which it was used; its type and characteristics; the original purpose for which it was designed, and, if applicable, how it has been modified for climate change purposes; its strengths and weaknesses; and how it accounts for any overlap or synergies that may exist between different PaMs.</p>
11	Reporting requirement ^a specified in paragraph 41 Issue type: transparency Assessment: encouragement	<p>The ERT noted that Kazakhstan did not provide references to more detailed information related to all models (except the TIMES-KAZ model) and approaches used for developing emission projections in its BR5.</p> <p>During the review, Kazakhstan provided references to the section in the NC8 that includes relevant information and further explained that the energy sector used a bottom-up approach (the TIMES-KAZ model) and that the IPPU sector used a linear regression method.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to include in its next NC references to documents containing more detailed information related to all models and approaches used for developing its projections.</p>
12	Reporting requirement ^a specified in paragraph 42 Issue type: completeness Assessment: encouragement	<p>The ERT noted that Kazakhstan did not report the main differences in the assumptions, methods employed and results of the projections between the NC7 and BR5.</p> <p>During the review, Kazakhstan clarified that there have been no changes since the NC7 in the methods employed for the energy sector. Kazakhstan also explained that there were changes in the projection methodologies used for the waste sector, as the waste sector model provided in the 2006 IPCC Guidelines was now being used to project emissions from solid waste disposal on land. However, the Party did not explain the differences in the assumptions between the NC7 and BR5 for other sectors.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to report the main differences in the assumptions, methods employed and emission projection results between the current submission and the previous NC.</p>
13	Reporting requirement ^a specified in paragraph 43 Issue type: completeness Assessment: encouragement	<p>The ERT noted that Kazakhstan did not discuss in its BR5 the sensitivity of the emission projections to underlying assumptions, either quantitatively or qualitatively.</p> <p>During the review, Kazakhstan explained that the sensitivity of the projections to underlying assumptions was not analysed.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to discuss the sensitivity of the projections to underlying assumptions qualitatively and, where possible, quantitatively.</p>
14	Reporting requirement ^a specified in paragraph 44 Issue type: transparency Assessment: encouragement	<p>Kazakhstan did not provide information in its BR5 on all the key underlying assumptions and values of variables and reported information only on GDP and population for one historical year (2017).</p> <p>During the review, Kazakhstan referred to the pages of the NC8 that contain relevant information. However, the ERT noted that the information included in the NC8 does not cover all the key underlying assumptions and variables.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to provide, in tabular format, information on key underlying assumptions and values of variables, such as GDP growth, population growth, tax levels and international fuel prices, used to develop the emission projections, including for historical and projected years.</p>

No.	<i>Reporting requirement and issue type</i>	<i>Description of the finding with recommendation or encouragement</i>
15	Reporting requirement ^a specified in paragraph 45 Issue type: completeness Assessment: recommendation	<p>In its BR5, Kazakhstan did not present information on factors and activities for each sector from 1990 to at least 15 years from the most recent inventory year to provide the reader with an understanding of emission trends.</p> <p>During the review, Kazakhstan provided information on the main drivers of the GHG emission trend for the LULUCF sector (change in the area of farmed histosols) and the agriculture sector (subsidies provided for meat production). For these two examples, it would be relevant to show the trend in cultivated histosols and the cattle population. In the event of the emission factors or other parameters (feed intake, weight of animals, etc.) changing across the historical or projected time series, it would be relevant to also include this type of information.</p> <p>The ERT recommends that Kazakhstan present in its next NC relevant information on factors and activities underlying the projected emission trends for each sector from 1990 to at least 15 years from the most recent inventory year. This information on factors and activities may be presented in tabular format.</p>
16	Reporting requirement ^b specified in paragraph 12 Issue type: completeness Assessment: encouragement	<p>The ERT noted that Kazakhstan did not report on the changes since its most recent NC in the model or methodologies used for the preparation of projections.</p> <p>During the review, Kazakhstan clarified that there have been no changes since the NC7 in the methods employed for the energy sector. Kazakhstan also explained that there were changes in the projection methodologies used for the waste sector, as the waste sector model provided in the 2006 IPCC Guidelines was now being used to project emissions from solid waste disposal on land. However, the Party did not explain the differences in assumptions between the NC7 and BR5 for other sectors.</p> <p>The ERT reiterates the encouragement from the previous review report for Kazakhstan to report on the changes since its most recent NC in the model or methodologies used for the preparation of projections and provide supporting documentation.</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.

^b Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs.

Annex III

Documents and information used during the review

A. Reference documents

2022 GHG inventory submission of Kazakhstan.

Available at <https://unfccc.int/ghg-inventories-annex-i-parties/2022>.

2023 GHG inventory submission of Kazakhstan.

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

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“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>.

“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>.

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https://unfccc.int/sites/default/files/resource/arr2021_KAZ.pdf.

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Report on the technical review of the NC7 of Kazakhstan. FCCC/IDR.7/KAZ. Available at <https://unfccc.int/documents/198791>.

“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 Saule Sabiyeva (Ministry of Ecology and Natural Resources of Kazakhstan), including additional material. The following references were provided by Kazakhstan and may not conform to UNFCCC editorial style as some have been reproduced as received:

Bureau of National Statistics, Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. 2021. *Ecological indicators of environmental monitoring and assessment*. Available at <https://stat.gov.kz/en/ecologic-indicators/>.
