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Report of the technical review of the second biennial report of Kazakhstan

According to decision 2/CP.17, developed country Parties are requested to submit their second biennial reports by 1 January 2016, that is, two years after the due date for submission of a full national communication. This report presents the results of the technical review of the second 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”.

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I. Introduction and summary

A. Introduction

1. This report covers the centralized technical review of the second biennial report (BR2)¹ 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” (annex to decision 13/CP.20). In accordance with the same decision, a draft version of this report was communicated to the Government of Kazakhstan, which did not provide any additional comments in relation to this final version of the report.

2. The review took place from 30 May to 4 June 2016 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Buket Akay (Turkey), Ms. Zuelclady Maria Fernanda Araujo Gutierrez (Mexico), Ms. Maria Jose Lopez (Belgium), Ms. Glasha Obrekht (Canada), Ms. Anna Romanovskaya (Russian Federation), Mr. Muzaffar Shodmonov (Tajikistan) and Ms. Dalia Streimikiene (Lithuania). Ms. Araujo Gutierrez and Ms. Romanovskaya were the lead reviewers. The review was coordinated by Mr. Daniel Hooper and Mr. Davor Vesligaj (UNFCCC secretariat).

B. Summary

3. The expert review team (ERT) conducted a technical review of the information reported in the BR2 of Kazakhstan in accordance with the “UNFCCC biennial reporting guidelines for developed country Parties” (hereinafter referred to as the UNFCCC reporting guidelines on BRs). During the review, Kazakhstan provided the following additional relevant information on: consistency of greenhouse gas (GHG) trends by sector; legal status of its emission reduction target; domestic arrangements established for the process of self-assessment of compliance with the target; implemented and planned measures in the agriculture sector; aggregate effect on total GHG emissions of all measures by sector and in total, and explanatory information for impacts that are not estimated; changes in the assumptions used for projections in the BR2 and detailed descriptions of the model; and strengths and weaknesses of the TIMES (The Integrated Markal–Energy Flow Optimization Model System) model used for the projection of GHG emissions from fuel combustion.

1. Timeliness

4. The BR2 was submitted on 16 February 2016, after the deadline of 1 January 2016 mandated by decision 2/CP.17. The common tabular format (CTF) tables were submitted on 16 February 2016 and resubmitted on 16 March 2016. Kazakhstan informed the secretariat on 28 December 2015 about its difficulties with submitting its BR2 and CTF tables by the deadline. The ERT noted the delay in the submission of the BR2 and CTF tables.

¹ The biennial report submission comprises the text of the report and the common tabular format (CTF) tables. Both the text and the CTF tables are subject to the technical review.

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

5. Issues and gaps related to the reported information identified by the ERT are presented in table 1 below. The information reported by Kazakhstan in its BR2 is mostly in adherence with the UNFCCC reporting guidelines on BRs as per decision 2/CP.17.

Table 1

Summary of completeness and transparency issues related to mandatory reported information in the second biennial report of Kazakhstan

<i>Section of the biennial report</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Paragraphs with recommendations</i>
Greenhouse gas emissions and trends	Complete	Mostly transparent	8
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Mostly transparent	12
Progress in achievement of targets	Complete	Partially transparent	16, 18, 19, 28, 32
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 chapter III.

Abbreviation: NA = not applicable.

^a Kazakhstan is not a Party included in Annex II to the Convention and is therefore not obliged to adopt measures and fulfil obligations as defined in Article 4, paragraphs 3, 4 and 5, of the Convention.

II. Technical review of the reported information

A. All greenhouse gas emissions and removals related to the quantified economy-wide emission reduction target

6. Kazakhstan has provided a summary of information on GHG emission trends for the period 1990–2013 in its BR2 and CTF tables 1(a)–(d). The BR2 makes reference to the national inventory arrangements, which are explained in more detail in the national inventory report included in Kazakhstan’s 2015 annual inventory submission (in chapter 2). The national inventory arrangements were established in accordance with the reporting requirements related to national inventory arrangements contained 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” (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines) that are required by paragraph 3 of the UNFCCC reporting guidelines on BRs. Further, Kazakhstan provided information on changes in the national inventory arrangements since its first biennial report (BR1).

7. On 18 March 2015, a decree of the Minister of Energy (No. 214) entitled “Rules for controlling completeness, transparency and reliability of State inventory of greenhouse gas emissions and removals” was adopted. The rules contained in this decree describe an updated procedure for preparing the annual national GHG inventory with the objective of fulfilling the international reporting commitments of Kazakhstan. In addition, since 2015, the authorized body responsible for the preparation of Kazakhstan’s GHG inventory has been the Ministry of Energy.

8. The information reported in the BR2 on emission trends is mostly consistent with that reported in the 2015 annual inventory submission of Kazakhstan. The ERT noted

inconsistencies between the 2015 annual inventory data included in CTF tables 1(a)–(d) and the textual portion of the BR2, including emission estimates and percentage calculations in the transport, mineral industry and metal industry sectors. In response to a question raised by the ERT during the review, Kazakhstan acknowledged these inconsistencies as being due to calculation errors and provided corrected data. To increase the transparency of reporting, the ERT recommends that Kazakhstan provide consistent inventory data and calculations in its CTF tables and the textual portion of the biennial report (BR) in its next submission. To reflect the most recently available data, version 3.0 of the Party’s 2016 annual inventory submission has been used as the basis for discussion in chapter II.A of this review report.

9. Total GHG emissions² excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 19.4 per cent between 1990 and 2014, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 9.3 per cent over the same period. The decrease in the total GHG emissions can be attributed mainly to carbon dioxide (CO₂) emissions, which decreased by 11.2 per cent (excluding LULUCF) between 1990 and 2014. Over the same period, emissions of methane (CH₄) decreased by 47.4 per cent, while emissions of nitrous oxide (N₂O) decreased by 6.1 per cent. The emission trends were driven mainly by the economic downturn that occurred between 1990 and 1999, which was followed by a steady economic recovery that began in 2000. This economic recovery was led by the revival of industrial production activities, coupled with investments being routed to the oil, gas and mining industries. While this economic recovery led to increasing GHG emissions between 2000 and 2014, the overall emissions in 2014 remained below the 1990 level.

10. The ERT noted that, during the period 1990–2014, Kazakhstan’s gross domestic product (GDP) per capita increased by 81.6 per cent, while GHG emissions per GDP and GHG emissions per capita decreased by 58.0 and 23.8 per cent, respectively. The slower growth of GHG emissions compared to GDP may be explained by the increased prominence of the service sector, the upgrading and construction of new facilities for power generation and transmission of electricity, as well as the increased use of renewable energy. Table 2 below illustrates the emission trends by sector and some of the economic indicators relevant to GHG emissions for Kazakhstan.

Table 2

Greenhouse gas emissions by sector and some indicators relevant to greenhouse gas emissions for Kazakhstan for the period 1990–2014

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share by sector (%)	
	1990	2000	2010	2013	2014	1990–2014	2013–2014	1990	2014
1. Energy	319 517.40	152 179.23	255 950.09	258 934.96	258 004.76	–19.3	–0.4	82.0	82.2
A1. Energy industries	142 368.63	60 824.31	103 851.15	115 510.67	114 780.43	–19.4	–0.6	36.5	36.6
A2. Manufacturing industries and construction	19 634.89	22 673.61	30 052.61	28 229.12	26 959.08	37.3	–4.5	5.0	8.6
A3. Transport	22 378.31	9 100.15	19 993.13	20 516.99	21 587.51	–3.5	5.2	5.7	6.9

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of carbon dioxide equivalent excluding land use, land-use change and forestry, unless otherwise specified. Values in this paragraph are calculated based on the 2016 inventory submission, version 3.0.

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share by sector (%)	
	1990	2000	2010	2013	2014	1990–2014	2013–2014	1990	2014
A4.–A5. Other	64 175.20	28 628.38	64 025.43	53 865.95	67 387.74	5.0	25.1	16.5	21.5
B. Fugitive emissions from fuels	70 960.37	30 952.79	38 027.78	40 812.23	27 289.99	–61.5	–33.1	18.2	8.7
C. CO ₂ transport and storage	NA	NA	NA	NA	0.00	–	–	–	0.0
2. IPPU	21 977.99	11 649.62	16 152.48	17 236.85	17 542.11	–20.2	1.8	5.6	5.6
3. Agriculture	44 253.06	23 575.62	27 950.87	30 461.97	32 738.60	–26.0	7.5	11.4	10.4
4. LULUCF	–16 264.84	13 184.38	1 714.06	18 489.34	24 696.05	251.8	33.6	NA	NA
5. Waste	3 826.81	4 383.73	5 290.42	5 604.10	5 715.69	49.4	2.0	1.0	1.8
6. Other	0.00	0.00	0.00	0.00	0.00	–	–	0.0	0.0
Total GHG emissions without LULUCF	389 575.27	191 788.20	305 343.85	312 237.88	314 001.16	–19.4	0.6	100.0	100.0
Total GHG emissions with LULUCF	373 310.42	204 972.58	307 057.91	330 727.22	338 697.21	–9.3	2.4	NA	NA
<i>Indicators</i>									
GDP per capita (thousands 2011 USD using PPP)	12.73	9.71	19.60	22.47	23.11	81.6	2.9		
GHG emissions without LULUCF per capita (t CO ₂ eq)	23.83	12.89	18.71	18.33	18.16	–23.8	–0.9		
GHG emissions without LULUCF per GDP unit (kg CO ₂ eq per 2011 USD using PPP)	1.87	1.33	0.95	0.82	0.79	–58.0	–3.7		

Sources: (1) GHG emission data: Kazakhstan’s 2016 annual inventory submission, version 3.0; (2) GDP per capita data: World Bank.

Note: The ratios per capita and per GDP unit as well as the changes in emissions and the shares by sector are calculated relative to total GHG emissions without LULUCF using the exact (not rounded) values, and may therefore differ from the ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, PPP = purchasing power parity.

B. Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target

11. In its BR2 and CTF tables 2(a)–(f), Kazakhstan reported a description of its target, including associated conditions and assumptions. CTF tables 2(a)–(f) mostly contain the required information in relation to the description of the Party’s emission reduction target, such as the base year, the period for achieving the target, the gases and sectors covered, the global warming potential (GWP) values used and the approach adopted to account for the

contribution of LULUCF. Further information on the target and the assumptions, conditions and methodologies related to the target is provided in section III of the BR2 and in this report (see para. 14 below).

12. Kazakhstan's CTF table 2(e) does not include information on its use of international market-based mechanisms in achieving its emission reduction target. However, in table 3.1 of the BR2, Kazakhstan specified that it does not intend to use the international market-based mechanisms. The ERT recommends that Kazakhstan improve the transparency of its reporting on the use of international market-based mechanisms by, for example, using notation keys such as "NA" (not applicable), and/or by providing an explanatory footnote to CTF table 2(e) in its next BR.

13. Kazakhstan did not provide any other information in CTF table 2(f), which was completely blank. In response to a question raised by the ERT during the review, Kazakhstan provided other information related to the legal status of its emission reduction target, explaining that the target is not explicitly adopted in domestic legislation. However, the strategic and operational plans of the Ministry of Energy of Kazakhstan include national targets, which are consistent with the 2020 target. To increase the transparency of reporting, the ERT suggests that Kazakhstan report any other information, including information on the domestic legal status of its target, in CTF table 2(f) in its next BR.

14. For Kazakhstan, the Convention entered into force on 15 August 1995. Under the Convention, Kazakhstan made a commitment to reduce its GHG emissions by 15.0 per cent by 2020 below the 1990 level. This target includes all GHGs included in the UNFCCC Annex I inventory reporting guidelines except for nitrogen trifluoride (NF₃), namely CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). It also includes all Intergovernmental Panel on Climate Change (IPCC) sources and sectors included in the annual GHG inventory, except LULUCF. The GWP values used are those from the IPCC Fourth Assessment Report (AR4). Emissions and removals from the LULUCF sector are not included in the target. Kazakhstan reported that it does not plan to make use of market-based mechanisms to achieve its target (see para. 26 below). In absolute terms, this means that under the Convention, Kazakhstan has to reduce emissions from 389,575.27 kt of carbon dioxide equivalent (CO₂ eq) (in the base year)³ to 331,138.98 kt CO₂ eq by 2020.

C. Progress made towards the achievement of the quantified economy-wide emission reduction target

15. This chapter provides information on the review of the reporting by Kazakhstan on the progress made in reducing emissions in relation to the target, mitigation actions taken to achieve its target, and the use of units from market-based mechanisms and LULUCF.

1. Mitigation actions and their effects

16. In its BR2 and CTF table 3, Kazakhstan reported on its progress in the achievement of its target and the mitigation actions implemented and planned since its sixth national communication (NC6) and BR1 to achieve its target. Kazakhstan has provided information on mitigation actions organized by sector. However, Kazakhstan did not organize its mitigation actions by gas. To increase the transparency of reporting, the ERT recommends that Kazakhstan, to the extent appropriate, organize its mitigation actions by sector and by

³ Kazakhstan chose 1990 as the base year for its 2020 target. The emission level in the base year is calculated based on Kazakhstan's 2016 annual inventory submission, version 3.0.

gas in its next BR. Further information on the mitigation actions related to the Party's target is provided in section IV of the BR2 and in this report (see para. 22 below).

17. This report highlights the changes made since the publication of the Party's NC6 and BR1. In its BR2, Kazakhstan provided 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 made towards its target. The changes in institutional arrangements include the addition of new ministries (Ministry of National Economy, Ministry of Culture and Sports, Ministry of Investments and Development, and Ministry of Energy), while some ministries were abolished (Ministry of Industry and New Technologies, Ministry of Transport and Communications, Ministry of Oil and Gas, and Ministry of Environment and Water Resources). The Ministry of Energy of Kazakhstan is now the authorized body in the field of the environment, and is responsible for the formation and implementation of public policy on renewable energy, waste management, the "green economy" and activities related to the reduction of GHG emissions.

18. In its BR2 and CTF table 3, Kazakhstan reported estimated mitigation impacts of some of its policies and measures (PaMs), but did not provide the estimated mitigation impact in 2020 for some of its mitigation actions in the energy, forestry and waste sectors. In response to a question raised by the ERT during the review, Kazakhstan explained that the mitigation impacts of some mitigation actions are too complex to be estimated fully, such as the "Concept on transition of the Republic of Kazakhstan to green economy" mitigation action. To increase the transparency of reporting, the ERT recommends that Kazakhstan report the estimated mitigation impacts of its mitigation actions in CTF table 3, or provide the rationale for not reporting such information (e.g. in a footnote to CTF table 3 or in the textual portion of its BR), if such impacts could not be estimated.

19. In its BR2, Kazakhstan did not include mitigation actions from the agriculture sector; however, such agriculture mitigation actions are reported in CTF table 3. During the review, Kazakhstan provided additional information, clarifying that in the agriculture sector, one biogas plant (0.4 MW) was installed, and that the possible total mitigation effect of biogas plants in Kazakhstan could reach 211.62 kt CO₂ eq by 2030 (not cumulative). To increase the transparency of reporting, the ERT recommends that Kazakhstan include relevant descriptions for mitigation actions for the agriculture sector in the textual part of its next BR.

20. In its BR2, Kazakhstan provided, to the extent possible, detailed information on the assessment of the economic and social consequences of its response measures. The implemented measures in the energy and waste sectors would result in an increase in employment and improvement in the quality of life for Kazakhstan's population. The "Gasification master plan of the Republic of Kazakhstan for 2015–2030" aims to create conditions for sustainable socioeconomic development through development of the gas system and use of gas as a clean fuel. Kazakhstan's planned project on capturing fugitive CH₄ from coal mines will improve the safety of miners and reduce fugitive CH₄ emissions.

21. The BR2 does not include information on the domestic arrangements established for the process of self-assessment of compliance with emission reductions required by science, nor on the progress made in the establishment of national rules for taking action against non-compliance with emission reduction targets. In response to a question raised by the ERT during the review, Kazakhstan provided additional information, elaborating on the arrangements and rules for self-assessment of compliance. Kazakhstan informed the ERT that key legislation supporting Kazakhstan's climate change goals includes the strategic plans that the Ministry of Energy of Kazakhstan adopts for a five-year cycle and the operational plans it adopts every year. These plans include national targets for GHG emissions that are consistent with Kazakhstan's 2020 target. Compliance with

Kazakhstan's 2020 target is monitored using data from the national inventory report. To increase the completeness of reporting, the ERT encourages Kazakhstan to provide information, to the extent possible, on: (i) the domestic arrangements established for the process of self-assessment of compliance with emission reductions required by science; and (ii) the progress made in the establishment of national rules for taking action against non-compliance with emission reduction targets, in its next BR.

22. The key overarching cross-sectoral policy reported in the BR2 is the "Concept on transition of the Republic of Kazakhstan to green economy". This policy includes a number of actions in various sectors, such as: the reduction of energy consumption, the development of alternative energy sources, and a decrease in air pollution in the energy and industrial processes and product use sectors; the intensification of production in the agriculture sector; and an increase of recycled waste in the waste management sector. In addition, the action plan for the development of alternative and renewable energy in Kazakhstan for 2013–2020 sets the framework and direction for future climate policy and is aimed at putting Kazakhstan on the path towards reaching its emission reduction target for 2020. The mitigation effect of the action plan is significant and estimated at 26,500 kt CO₂ eq in 2020. Other policies that have delivered significant emission reductions are: the gasification master plan for 2015–2030, which increases the usage of gas as a clean fuel; the modernization of joint stock company (JSC) "ArcelorMittal Temirtau" and "Kazzinc", aimed at the termination of open-hearth steel production and production of ferrosilicon; and the law "On energy saving and energy efficiency", which reduces GHG emissions through optimization of technological processes.

23. The BR2 highlights the mitigation actions that are under development, such as the construction of biogas plants, modernization and optimization of iron production, and the installation of carbon capture and storage technology during the production of clinker and lime. Among the mitigation actions that provide a foundation for significant additional actions, the modernization of iron production and the installation of carbon capture technologies are critical for Kazakhstan to attain its 2020 emission reduction target.

24. Table 3 below provides a concise summary of the key mitigation actions and estimates of their mitigation effects reported by Kazakhstan to achieve its target.

Table 3

Summary of information on mitigation actions and their impacts reported by Kazakhstan

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	Concept on transition of the Republic of Kazakhstan to green economy	NE	NE
	National allocation plan for GHG allowances for 2013, 2014–2015, 2016–2020	400	NE
	Gasification master plan of the Republic of Kazakhstan for 2015–2030	3 600	NE
Energy, including:	Concept for developing fuel and energy sector until 2030	NE	NE
Transport	IE		

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
Renewable energy	Action plan for the development of alternative and renewable energy in Kazakhstan for 2013–2020	26 400	NE
	Governmental decree on approval of feed-in tariffs in Kazakhstan	NE	NE
Energy efficiency	Law “On energy saving and energy efficiency”	1 500	1 680
IPPU	Modernization of JSC “ArcelorMittal Temirtau” and “Kazzinc”	2 650	2 800
Agriculture	Use of biogas plants in agriculture	NE	211
LULUCF	Strategic plan of the Ministry of Environment and Water Resources of the Republic of Kazakhstan for 2014–2018	NE	NE
Waste	Introduction of separate collection of biodegradable wastes and construction of recycling plants	NE	NE

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

Abbreviations: GHG = greenhouse gas, IE = included elsewhere, IPPU = industrial processes and product use, JSC = joint stock company, LULUCF = land use, land-use change and forestry, NE = not estimated.

25. The ERT commends Kazakhstan for significant improvements made in its reporting since the BR1 by addressing all recommendations and encouragements made in the previous technical review report related to mitigation actions.

2. Estimates of emission reductions and removals and the use of units from the market-based mechanisms and land use, land-use change and forestry

26. Kazakhstan reported in its BR2 and CTF tables 4, 4(a)I, 4(a)II and 4(b) that it does not plan to use units from market-based mechanisms under the Convention and other mechanisms towards the achievement of its 2020 target, nor does it include the contribution of LULUCF in its target.

27. For 2013, Kazakhstan reported in CTF table 4 annual total GHG emissions excluding LULUCF of 313,442 kt CO₂ eq, or 19.1 per cent below the 1990 level.

28. On its use of units from LULUCF activities, Kazakhstan reported in CTF tables 4 and 4(a) that in 2012 and 2013, it did not use any units to offset its total GHG emissions by indicating “0” and “NA”. In CTF table 4, Kazakhstan reported values for “Contribution from LULUCF”, although it had been stated that Kazakhstan does not include LULUCF in its target. In addition, Kazakhstan left CTF table 4(b) completely blank with no footnotes or notation keys. To increase the transparency of reporting, the ERT recommends that Kazakhstan ensure consistency in its reporting in CTF tables 4, 4(a) and 4(b), by for example indicating “NA” for contributions from LULUCF and units from market-based mechanisms and by providing explanatory footnotes in its next BR. Table 4 below illustrates Kazakhstan’s total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 4
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry as part of the reporting on the progress made by Kazakhstan towards the achievement of its target

<i>Year</i>	<i>Emissions excluding LULUCF (kt CO₂ eq)</i>	<i>Contribution from LULUCF (kt CO₂ eq)</i>	<i>Emissions including contribution from LULUCF (kt CO₂ eq)</i>	<i>Use of units from market-based mechanisms (kt CO₂ eq)</i>
1990	387 215.00	NA	387 215.00	NA
2010	303 837.00	NA	303 837.00	NA
2011	296 003.00	NA	296 003.00	NA
2012	305 634.00	NA	305 634.00	NA
2013	313 442.00	NA	313 442.00	NA

Sources: Kazakhstan's second biennial report and common tabular format tables 1, 4, 4(a)I, 4(a)II and 4(b).

Abbreviations: LULUCF = land use, land-use change and forestry, NA = not applicable.

29. To assess the progress towards the achievement of the 2020 target, the ERT noted that Kazakhstan's emission reduction target under the Convention is 15.0 per cent below the 1990 level (see para. 14 above). As discussed in chapter II.B above, in 2014, Kazakhstan's annual total GHG emissions excluding LULUCF were 19.4 per cent (75,574.11 kt CO₂ eq) below the base year level (based on Kazakhstan's 2016 annual GHG inventory data). In addition, the ERT noted that the contributions from LULUCF and the use of market-based mechanisms were not included by Kazakhstan to achieve its target.

30. The ERT noted that Kazakhstan's GHG emissions for 2014 were 4.4 per cent below its target, and that after the initial GHG emission decline in the 1990s, the GHG emission growth from 2000 onwards was slower than the GDP growth (see para. 10 above). However, as Kazakhstan's GHG emissions have continued to increase since 2000, it may face challenges in achieving its 2020 target. This is further supported by Kazakhstan's emission projections for 2020, which suggest that Kazakhstan can be expected to achieve its target under the Convention only under the 'with additional measures' (WAM) scenario (see para. 41 below).

3. Projections

31. Kazakhstan reported in its BR2 and CTF table 6(a) updated projections for 2020 and 2030 relative to actual inventory data for 2013 under the 'with measures' (WEM) scenario. Projections are presented on a sectoral basis, using the same sectoral categories as used in the section on mitigation actions, and on a gas-by-gas basis for the following GHGs: CO₂, CH₄, N₂O, PFCs and HFCs. Kazakhstan did not provide separate projections for SF₆, as this gas is not included in its annual GHG inventory submission. Projections are also provided in an aggregated format for each sector as well as for a Party total, using GWP values from the IPCC AR4. Further information on the projections is provided in section V of the BR2.

32. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately. In response to a question raised by the ERT during the review, Kazakhstan confirmed that aviation emissions were included in the emission total for the transport sector in the BR2. To increase the transparency of reporting, the ERT recommends that Kazakhstan report emission projections related to fuel sold to ships and aircraft engaged in international transport separately and not include them in the totals, to the extent possible, in its next BR.

33. In addition to the WEM scenario, Kazakhstan reported in its BR2 and CTF tables 6(b) and 6(c) the WAM and ‘without measures’ (WOM) scenarios. The projections are presented by sector and by gas in the same way as for the WEM scenario for the following years: 1990–2030. Kazakhstan provided information on the key variables and assumptions used in the preparation of the projection scenarios in CTF table 5.

34. In its BR2, Kazakhstan did not provide any information on the changes since the submission of its NC6/BR1 in the model or methodologies used for the preparation of its emission projections. In response to a question raised by the ERT during the review, Kazakhstan confirmed that the same TIMES tool was used for the emission projections in the energy sector in the BR2 as in the BR1, and provided the ERT with supporting documentation and a description of the model. However, Kazakhstan highlighted that the underlying assumptions changed; in particular, for the BR2, the latest available annual inventory data were used for calibration purposes, whereas in the BR1, emission trends were based on an extrapolation of historical emission data. To increase the completeness of reporting, the ERT encourages Kazakhstan to report on the changes in the assumptions, model and methodologies used for the preparation of its projections between its current national communication/BR and those used in previous versions. In addition, to increase the transparency of reporting, the ERT encourages Kazakhstan to provide more information on the TIMES tool/model used, such as a description of the model, and to provide supporting documentation or a reference to such documentation, in its next BR.

35. In its BR2, Kazakhstan did not summarize the strengths and weaknesses of the models and approaches used for its emission projections. In response to a question raised by the ERT during the review, Kazakhstan provided a document outlining such information for the TIMES tool used for the energy sector. To increase the completeness of reporting, the ERT encourages Kazakhstan to summarize the strengths and weaknesses of the models and approaches used for its emission projections, or provide a reference to such documentation, in its next BR.

36. In its BR2, Kazakhstan did not report any sensitivity analysis for its projection scenarios. In response to a question raised by the ERT during the review, Kazakhstan stated that due to a lack of time, no sensitivity analysis was conducted for its emission projections. To increase the completeness of reporting, the ERT encourages Kazakhstan to include information on its sensitivity analysis, if available, in its next BR.

37. As outlined in the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications” (hereinafter referred to as the UNFCCC reporting guidelines on NCs), the starting point for the WEM and WAM projection scenarios should be the latest year for which inventory data are available. In the BR2, the ERT noted that the projection figures provided indicate that the starting year for the projections was 2010, while CTF tables 6(a)–(c) indicate a start year of 2013. In response to a question raised by the ERT during the review, Kazakhstan stated that the start year of its emission projections was 2013, which is based on its 2015 annual inventory submission. To increase the transparency of reporting, the ERT encourages Kazakhstan to use the latest year for which inventory data are available as the starting point in its WEM and WAM projection scenarios and figures in its next BR.

Overview of projection scenarios

38. The WEM scenario reported by Kazakhstan includes implemented and adopted PaMs up to 2013. Kazakhstan also reported on a WAM scenario, which includes planned PaMs, and a WOM scenario, which excludes all PaMs implemented, adopted or planned after 2010. Kazakhstan provided a definition of its scenarios, explaining that its WEM scenario includes adopted PaMs for 2016–2020, while its WAM scenario includes

additional PaMs most likely to be undertaken to achieve its target. The definitions indicate that the scenarios have been prepared according to the UNFCCC reporting guidelines on NCs.

Methodology and changes since the previous submission

39. The methodology used in the BR2 is similar to that used for the preparation of the emission projections for the NC6/BR1 (see para. 34 above). To prepare its projections, Kazakhstan relied on the following key underlying assumptions: population trends and GDP growth rate. These variables and assumptions are reported in CTF table 5. The assumptions have been updated on the basis of the most recent economic developments known at the time of the reporting on projections. As stated in paragraph 34 above, Kazakhstan used the TIMES tool for its emission projections in the energy sector, which allows for bottom-up technical and economic modelling of energy systems. Non-fuel combustion GHG emissions were calculated using an adapted IPCC methodology and projected activity data. The emission projections methodology for all other sectors varied based on available historical data and projected indicators.

Results of projections

40. Kazakhstan's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 343,079.00 and 439,344.00 kt CO₂ eq, respectively, under the WEM scenario, which is a decrease of 11.4 per cent below the 1990 level and an increase of 13.5 per cent above the 1990 level, respectively. Under the WAM scenario, emissions in 2020 and 2030, amounting to around 321,934.00 and 322,383.00 kt CO₂ eq, respectively, are projected to be lower than those in 1990 by 16.9 and 16.7 per cent, respectively.

41. The 2020 projections suggest that Kazakhstan may face challenges to achieve its 2020 target under the Convention under the WEM scenario (see para. 14 above). However, under the WAM scenario, Kazakhstan can be expected to achieve its target.

42. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector and the agriculture sector, amounting to projected reductions of 39,206 kt CO₂ eq (13.2 per cent) and 11,638 kt CO₂ eq (26.7 per cent), respectively. GHG emissions from the waste sector, transport subsector, and the industrial processes and product use sector are projected to increase by 2,705 kt CO₂ eq (61.8 per cent), 2,575 kt CO₂ eq (11.5 per cent) and 1,428 kt CO₂ eq (7.2 per cent) above the 1990 level by 2020, respectively. The patterns of projected emissions reported for 2030 under the same scenario by sector are significantly altered, with GHG emissions in the agriculture sector decreasing by much less (4,564 kt CO₂ eq or 10.5 per cent) and GHG emissions in the energy sector increasing by 34,975 kt CO₂ eq (11.8 per cent). GHG emissions from all other sectors will increase significantly, including the transport subsector (13,748 kt CO₂ eq or 61.4 per cent), the industrial processes and product use sector (4,045 kt CO₂ eq or 20.3 per cent) and the waste sector (about 3,926 kt CO₂ eq or 189.7 per cent).

43. In 2020, the most significant reductions are projected for CO₂, CH₄ and N₂O emissions: 24,661 kt CO₂ eq (53.5 per cent), 19,423 kt CO₂ eq (42.1 per cent) and 2,013 kt CO₂ eq (4.4 per cent) between 1990 and 2020, respectively. The patterns of projected emissions reported for 2030 under the same scenario by gas are significantly altered, as all gases are projected to increase: CO₂ emissions are anticipated to increase by 31,558 kt CO₂ eq (11.6 per cent), followed by CH₄ with 15,780 kt CO₂ eq (16.3 per cent) and N₂O with 2,686 kt CO₂ eq (15.0 per cent).

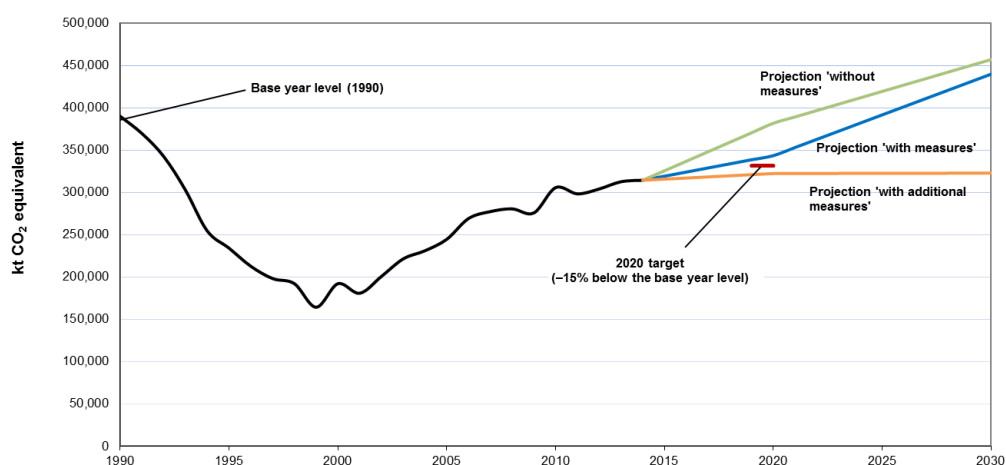
44. If additional measures are considered (i.e. under the WAM scenario), the pattern of emission reductions by 2020 presented by sector changes: the energy sector remains the

most prominent source of reductions, followed by the agriculture and industrial processes and product use sectors. The projected emission growth in the transport subsector increases under the WAM scenario by about 802 kt CO₂ eq compared to the WEM scenario. The pattern of projected emissions reported for 2030 under the same scenario shows that GHG emissions in the energy sector are projected to significantly decrease (by 75,666 kt CO₂ eq or 25.5 per cent), while GHG emissions from the transport, industrial processes and product use, and waste sectors will increase less than under the WEM scenario.

45. Under the WAM scenario, the pattern of emission reductions by 2020 presented by gas remains the same. However, the pattern of projected emissions reported for 2030 under the same scenario shows that CO₂ and CH₄ emissions are projected to decrease by 56,941 kt CO₂ eq (20.9 per cent) and 12,301 kt CO₂ eq (12.7 per cent), respectively, and N₂O emissions are projected to increase by 2,305 kt CO₂ eq (12.9 per cent).

46. The projected emission levels under the different scenarios and Kazakhstan’s quantified economy-wide emission reduction target are presented in the figure below.

Greenhouse gas emission projections by Kazakhstan



Sources: (1) Data for the years 1990–2014: Kazakhstan’s 2016 annual inventory submission, version 3.0; total GHG emissions excluding land use, land-use change and forestry; (2) Data for the years 2015 and 2030: Kazakhstan’s second biennial report; total GHG emissions excluding land use, land-use change and forestry.

Abbreviation: GHG = greenhouse gas.

Assessment of aggregate effects of policies and measures

47. The ERT acknowledged information submitted by Kazakhstan during the review on the estimated and expected effects of PaMs in terms of emissions avoided or sequestered for 2020 and 2030. In 2020, the estimated aggregated effects of implemented mitigation actions and planned mitigation actions are 38.23 kt CO₂ eq and 21.15 kt CO₂ eq, respectively. In 2030, the estimated aggregated effects of implemented mitigation actions and planned mitigation actions are 17.23 kt CO₂ eq and 116.96 kt CO₂ eq, respectively. This information was prepared in accordance with the WEM scenario compared with the WOM scenario. The ERT suggests that Kazakhstan report available estimations of aggregated effects of implemented and planned mitigation actions in its next BR.

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

48. Kazakhstan is not a Party included in Annex II to the Convention and is therefore not obliged to adopt measures and fulfil obligations as defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, as reported in its BR2, Kazakhstan provided information on its provision of support to developing country Parties. The ERT commends Kazakhstan for reporting this information and suggests that it continue to do so in future BRs.

49. In its BR2, Kazakhstan provided information on its compulsory membership fees to international environmental organizations, including United Nations organizations, and other international bodies, such as the Multilateral Fund for the Implementation of the Montreal Protocol on substances that deplete the ozone layer. These membership fees totalled USD 3.12, 3.26 and 3.45 million in 2013, 2014 and 2015, respectively. Within the same time period, voluntary contributions of Kazakhstan to the United Nations Environment Programme and the United Nations Development Programme (UNDP) increased from USD 0.03 million in 2013 to USD 0.47 million in 2015. Kazakhstan also stated that in 2016, it plans to increase its contributions to the international organizations and change its status from a recipient country to a donor country.

50. Kazakhstan also provides assistance on a voluntary basis, classified as humanitarian aid, to countries particularly vulnerable to the adverse effects of climate change (mostly to countries in the Central Asia region). The total humanitarian aid provided by Kazakhstan in 2013 and 2014 was USD 0.98 and 6.5 million, respectively. With regard to capacity-building, Kazakhstan reported that, in conjunction with UNDP, it adopted a programme entitled “Kazakhstan–Africa Partnership for the SDGs” to assist 45 African countries in the implementation of sustainable development goals (SDGs). Kazakhstan also highlighted that it has regional initiatives in place for technology transfer, including its “Green Bridge” initiative, which is also supported by other countries in the Central Asia region.

III. Conclusions

51. The ERT conducted a technical review of the information reported in the BR2 and CTF tables of Kazakhstan in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information is mostly in adherence with the UNFCCC reporting guidelines on BRs and provides an overview on: 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 progress made by Kazakhstan in achieving its target.

52. Kazakhstan’s total GHG emissions excluding LULUCF related to its quantified economy-wide emission reduction target were estimated to be 19.4 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 9.3 per cent below its 1990 level for 2014. The emission decrease was driven mostly by the economic downturn that occurred between 1990 and 1999, which was followed by a steady economic recovery beginning in 2000. This economic recovery was led by the revival of industrial production activities, coupled with investments being routed to the oil, gas and mining industries. While this economic recovery led to increasing GHG emissions between 2000 and 2014, the overall emissions in 2014 remained below the 1990 level.

53. Under the Convention, Kazakhstan committed itself to achieving a quantified economy-wide emission reduction target of 15.0 per cent by 2020 below the 1990 level. This target covers the following GHGs: CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed

using GWP values from the IPCC AR4, and covers sources and sectors included in the annual GHG inventory. Emissions and removals from the LULUCF sector are not included in the target, and Kazakhstan reported that it does not plan to make use of market-based mechanisms to achieve its target. In absolute terms, this means that under the Convention, Kazakhstan has to reduce emissions from 389,575.27 kt CO₂ eq (in the base year) to 331,138.98 kt CO₂ eq by 2020.

54. Kazakhstan's main policy framework relating to energy and climate change is the "Concept on transition of the Republic of Kazakhstan to green economy". Key legislation supporting Kazakhstan's climate change goals includes the strategic plans that the Ministry of Energy of Kazakhstan adopts for a five-year cycle and the operational plans it adopts every year. The mitigation action with the most significant mitigation impact is the action plan for the development of alternative and renewable energy in Kazakhstan for 2013–2020, which sets the framework and direction for future climate policy and is aimed at putting Kazakhstan on the path towards reaching its emission reduction target for 2020. Other significant mitigation actions include the gasification master plan for 2015–2030, which increases the usage of gas as a clean fuel; the modernization of JSC "ArcelorMittal Temirtau" and "Kazzinc", aimed at the termination of open-hearth steel production and production of ferrosilicon; and the law "On energy saving and energy efficiency", which reduces GHG emissions through optimization of technological processes.

55. For 2013, Kazakhstan reported in CTF table 4 total GHG emissions excluding LULUCF at 313,442.00 kt CO₂ eq, or 19.1 per cent below the 1990 level. Kazakhstan reported that it does not plan to use the units from the market-based mechanisms nor does it include the contribution of LULUCF to achieve its target. The ERT noted that Kazakhstan's GHG emissions for 2014 were 4.4 per cent below its target, and that after the initial GHG emission decline in the 1990s, the GHG emission growth from 2000 onwards was slower than the GDP growth (see para. 10 above). However, as Kazakhstan's GHG emissions have continued to increase since 2000, it may face challenges in achieving its 2020 target. This is further supported by Kazakhstan's emission projections for 2020, which suggest that Kazakhstan can be expected to achieve its target under the Convention only under the WAM scenario (see para. 41 above).

56. The GHG emission projections provided by Kazakhstan in its BR2 include those for the WOM, WEM and WAM scenarios. Under the WEM and WAM scenarios, emissions are projected to be 11.4 per cent and 16.9 per cent below the 1990 level in 2020, respectively. On the basis of the reported information, the ERT concluded that Kazakhstan may face challenges to achieve its 2020 target under the WEM scenario. However, under the WAM scenario, Kazakhstan is expected to meet its 2020 target.

57. Kazakhstan is not a Party included in Annex II to the Convention and is therefore not obliged to adopt measures and fulfil obligations as defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, as reported in its BR2, Kazakhstan provided information on its provision of support to developing country Parties including: compulsory and voluntary contributions to international organizations, provision of humanitarian aid to countries particularly vulnerable to the adverse effects of climate change (mostly for countries in the Central Asia region) and regional initiatives for technology transfer.

58. In the course of the review, the ERT formulated the following recommendations for Kazakhstan to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:⁴

⁴ The recommendations are given in full in the relevant chapters of this report.

- (a) Improve the transparency of its reporting by:
 - (i) Providing consistent inventory data and calculations in its CTF tables and the textual portion of the BR (see para. 8 above);
 - (ii) Using appropriate notation keys, such as “NA”, and/or provide an explanatory footnote to CTF table 2(e) regarding its use of international market-based mechanisms (see para. 12 above);
 - (iii) Reporting mitigation actions by sector and by gas (see para. 16 above);
 - (iv) Reporting the estimated mitigation impacts of its mitigation actions in CTF table 3, or providing explanatory information if such impacts could not be estimated (see para. 18 above);
 - (v) Providing relevant descriptions for mitigation actions in the agriculture sector (see para. 19 above);
 - (vi) Consistently reporting on its contributions from LULUCF and units from market-based mechanisms in CTF tables 4, 4(a) and 4(b) by indicating “NA” and by providing explanatory footnotes (see para. 28 above);
 - (vii) Reporting emission projections related to fuel sold to ships and aircraft engaged in international transport separately and not including them in the projection totals (see para. 32 above);
- (b) Improve the timeliness of its reporting by submitting its next BR on time (see para. 4 above).

Annex

Documents and information used during the review

A. Reference documents

“UNFCCC biennial reporting guidelines for developed country Parties”. Annex to decision 2/CP.17. Available at

<<http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=4>>.

“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”. Annex to decision 24/CP.19. Available at

<<http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=2>>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”.

FCCC/CP/1999/7. Available at <<http://unfccc.int/resource/docs/cop5/07.pdf>>.

“Guidelines for the 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>>.

FCCC/ARR/2013/KAZ. Report of the individual review of the inventory submission of Kazakhstan submitted in 2013. Available at

<<http://unfccc.int/resource/docs/2014/arr/kaz.pdf>>.

FCCC/IDR.6/KAZ. Report of the technical review of the sixth national communication of Kazakhstan. Available at <<http://unfccc.int/resource/docs/2015/idr/kaz06.pdf>>.

FCCC/TRR.1/KAZ. Report of the technical review of the first biennial report of Kazakhstan. Available at <<http://unfccc.int/resource/docs/2015/trr/kaz01.pdf>>.

2015 greenhouse gas inventory submission of Kazakhstan. Available at

<http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php>.

2016 greenhouse gas inventory submission of Kazakhstan. Available at

<http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php>.

Sixth national communication of Kazakhstan. Available at

<http://unfccc.int/files/national_reports/annex_i_natcom/application/pdf/kaz_nc3,4,5,6_eng.pdf>.

First biennial report of Kazakhstan. Available at

<http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/br1_kazakhstan_eng.pdf>.

Common tabular format tables of the first biennial report of Kazakhstan. Available at

<http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/kaz_2014_v2.0_resubmission.pdf>.

Second biennial report of Kazakhstan. Available at
<http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/br-text_eng_kz.pdf>.

Common tabular format tables of the second biennial report of Kazakhstan. Available at
<http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/7550.php>.

B. Additional information used during the review

Responses to questions during the review were received from Mr. Saulet Sakenov (Ministry of Energy), including additional material and the following documents¹ provided by Kazakhstan:

Loulou R., Remne U., Kanudia A., Lehtila A. and Goldstein G. 2005. Documentation for the TIMES Model, Part I. The Energy Technology Systems Analysis Programme. Available at
<<http://www.iea-etsap.org/web/Docs/TIMESDoc-Intro.pdf>>.

Kerimray A., Baigarin K., De Miglio R. and Tosato G. 2015. Climate change mitigation scenarios and policies and measures: the case of Kazakhstan. *Climate Policy*, Vol. 16, No. 3, 332–352. Available at
<<http://www.tandfonline.com/doi/abs/10.1080/14693062.2014.1003525>>.

¹ Reproduced as received from the Party.