Advance Version

COMPLIANCE COMMITTEE

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10 August 2015

Report of the technical review of the sixth national communication of Kazakhstan

Note by the secretariat

The report of the technical review of the sixth national communication of Kazakhstan was published on 7 August 2015. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decisions 4/CMP.4 and 8/CMP.9), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.6/KAZ, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the technical review of the sixth national communication of Kazakhstan

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication supplementary information under Article 7, paragraph 2, of the Kyoto Protocol.

This report presents the results of the technical review of the third to sixth national communications and 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".

Contents

I. Introduction and summary

A. Introduction

1. For Kazakhstan the Convention entered into force on 15 August 1995 and the Kyoto Protocol on 17 September 2009.[1] Under the Convention, Kazakhstan made a commitment to reducing its greenhouse gas (GHG) emissions by 15 per cent by 2020 and by 25 per cent by 2050 below the 1990 level.[2] For the first commitment period of the Kyoto Protocol, from 2008 to 2012, Kazakhstan does not have a GHG emission reduction target inscribed in Annex B to the Kyoto Protocol.[3] 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 1990 level.

2. This report covers the in-country technical review of the third to sixth national communications (hereinafter referred to as the NC6) of Kazakhstan, coordinated 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" (annex to decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (annex to decision 22/CMP.1).

3. The review took place from 20 to 25 April 2015 in Astana, Kazakhstan, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Roberto Acosta (Cuba), Ms. Patricia Grobben (Belgium), Ms. Katherine Monahan (Canada) and Ms. Tatiana Tugui (Republic of Moldova). Mr. Acosta and Ms. Grobben were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene and Mr. Davor Vesligaj (secretariat).

4. During the review, the expert review team (ERT) reviewed each section of the NC6. The ERT also reviewed the supplementary information provided by Kazakhstan as a part of the NC6 in accordance with Article 7, paragraph 2, of the Kyoto Protocol.

5. In accordance with decisions 13/CP.20 and 22/CMP.1, a draft version of this report was communicated to the Government of Kazakhstan, which made no comment on it.

B. Summary

6. The ERT conducted a technical review of the information reported in the NC6 of Kazakhstan in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC

[1] At its seventh session, the Conference of the Parties noted that, upon the entry into force of the Kyoto Protocol for Kazakhstan, Kazakhstan became a Party included in Annex I for the purposes of the Kyoto Protocol in accordance with Article 1, paragraph 7, of the Kyoto Protocol. It also recognized that Kazakhstan will remain a Party not included in Annex I to the Convention for the purposes of the Convention.

[2] See documents FCCC/AWGLCA/2012/MISC.1 and FCCC/SBSTA/2014/INF.6.

[3] As Kazakhstan does not have GHG emission reduction target inscribed in Annex B of the Kyoto protocol for the first commitment period, some of the reporting requirements under Article 7, paragraphs 1 and 2, of the Kyoto Protocol, as defined in decision 15/CMP.1 that are related to the implementation of such a target are not relevant, namely the requirements to report on the national system, the national registry, supplementarity related to mechanisms, and information on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol.

reporting guidelines on NCs) and of the supplementary information provided in the NC6 under Article 7, paragraph 2, of the Kyoto Protocol in accordance with decision 15/CMP.1.

7. The ERT commends Kazakhstan for the significant improvement in the overall quality of the information provided in its NC6 in comparison with its previously submitted national communications.[4] It recognizes that, in order to fully meet the reporting requirements of the UNFCCC reporting guidelines on NCs, Kazakhstan needs to further improve the reported information in its next national communication as specified in the encouragements and recommendations provided in this report.

1. Completeness and transparency of reporting

8. The information reported in the NC6 is mostly complete and mostly transparent. Gaps and issues related to the reported information identified by the ERT are presented in table 1.

2. Timeliness

9. The NC6 was submitted on 24 December 2013, before the deadline of 1 January 2014 mandated by decision 9/CP.16, and a revised version, including some additional information under Article 7, paragraph 2, of the Kyoto Protocol, was submitted on 13 February 2014.

3. Adherence to the reporting guidelines

10. The information reported by Kazakhstan in its NC6 is mostly in adherence to the UNFCCC reporting guidelines on NCs as per decision 4/CP.5 (see table 1).

[4] This is the first time that Kazakhstan has prepared and submitted its national communication following the UNFCCC reporting guidelines on NCs, as well as the relevant supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Kazakhstan's second national communication was submitted on 4 June 2009 and was prepared following the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention".

Table 1
Assessment of completeness and transparency issues of reported information in the sixth national communication of Kazakhstan[a]

Sections of national communication	*Completeness*	*Transparency*	*Reference to paragraphs*	*Supplementary information under the Kyoto Protocol*[b]	*Completeness*	*Transparency*	*Reference to paragraphs*
Executive summary	Complete	Transparent		National system	NA	NA	
National circumstances	Partially complete	Mostly transparent	15	National registry	NA	NA	
Greenhouse gas inventory	Partially complete	Transparent	17	Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	NA	NA	
Policies and measures (PaMs)	Mostly complete	Mostly transparent	38, 44, 63, 65, 67 and 69	PaMs in accordance with Article 2	Not complete	NA	70
Projections and total effect of PaMs	Partially complete	Partially transparent	76 and 93	Domestic and regional programmes and/or arrangements and procedures	Partially complete	Partially transparent	30
Vulnerability assessment, climate change impacts and adaptation measures	Mostly complete	Transparent	103	Information under Article 10[c]	Complete	Mostly transparent	123
Financial resources and transfer of technology[d]	NA	NA		Financial resources[c]	NA	NA	
Research and systematic observation	Mostly complete	Transparent	108	Minimization of adverse impacts in accordance with Article 3, paragraph 14	NA	NA	
Education, training and public awareness	Complete	Mostly transparent	119				

Abbreviation: NA = not applicable.

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations.

[b] For the first commitment period of the Kyoto Protocol, from 2008 to 2012, Kazakhstan does not have a greenhouse gas emission reduction target inscribed in Annex B to the Kyoto Protocol. Therefore, Kazakhstan is not bound to report some of the supplementary information, as stipulated under Article 7, paragraphs 1 and 2, of the Kyoto Protocol, namely the national system, the national registry, supplementarity related to mechanisms, financial resources and information on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol.

[c] For the purposes of reporting information in this table, this assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to developed country Parties and other developed Parties included in Annex II to the Convention only. Assessment of the information provided by the Party 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. Assessment provided here is relevant to the information on activities related to the promotion of modalities for the development, application and diffusion of environmentally sound technologies under Article 10 of the Kyoto Protocol.

[d] Reporting on financial resources under the Kyoto Protocol is relevant to developed country Parties and other developed Parties that are included in Annex II to the Convention (Annex II Parties). As Kazakhstan is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

1. Information on relevant national circumstances

11. In its NC6, Kazakhstan has provided a concise description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implementation of policies and measures (PaMs) is provided in chapter II.B below.

12. Kazakhstan has provided information on its national circumstances following the headings recommended in the UNFCCC reporting guidelines on NCs; however, the ERT noted that the information provided by Kazakhstan in its NC6 lacked completeness and transparency regarding how changes in the national circumstances affect its GHG emissions and removals. The UNFCCC reporting guidelines on NCs request concise but explicit information on such a linkage to be reported. In addition, the ERT requested additional information to be reported under the headings of those national circumstances that have a major influence on the national GHG emissions and removals, which would facilitate the understanding of those key national circumstances and enhance the transparency of the relevant section of the national communication.

13. The information included in the NC6 covers political structure, population, geographical profile, climate profile and the economy, including specific sectors related to energy production, industry, transport, building stock, waste and related emissions from pollution, agriculture and forestry.

14. The information requested by the ERT included: disaggregated indicators and more detailed information; explanations of other main energy efficiency related actions; plans for renewable energy development; quantitative indicators of trends in the main means of transportation; disaggregated information on the relative importance of the main industrial sectors; existing standards for residential and commercial buildings; and quantitative information related to the Party's economic profile, such as trends in gross domestic product (GDP) and main economic trade partners. During the review, Kazakhstan provided additional information on the national circumstances, particularly on key drivers for emissions in the transport and mining sectors, existing standards for residential and commercial buildings, and GDP trends.

15. The ERT recommends that Kazakhstan provide concise relevant information to better explain the influence of key national circumstances, such as energy, transportation, industry building stocks and economic profile, on the national GHG emissions and removals in its next national communication, in line with the information provided during the review.

16. The ERT noted that, during the period 1990–2012, Kazakhstan's population and GDP increased by 2.7 and 73.5 per cent, respectively, while GHG emissions per GDP unit and GHG emissions per capita decreased by 54.3 and 22.8 per cent, respectively. This level of decoupling of GHG emissions from GDP was caused mainly by the economic recession

in the period 1990–1999 and the subsequent economic restructuring, the shift towards using less GHG-intensive fuels for electricity production and heating purposes, and the control of fugitive emissions since 2000. Table 2 illustrates the national circumstances of Kazakhstan by providing some indicators relevant to GHG emissions and removals.

Table 2
Indicators relevant to greenhouse gas emissions and removals for Kazakhstan

	1990	*2000*	*2005*	*2010*	*2011*	*2012*	*Change 1990–2012 (%)*	*Change 2011–2012 (%)*
Population (million)	16.35	14.88	15.15	16.32	16.56	16.79	2.7	1.4
GDP (2005 USD billion using PPP)	185.49	128.77	210.89	285.18	306.57	321.89	73.5	5.0
TPES (Mtoe)	73.45	35.68	50.88	69.12	77.34	74.85	1.9	–3.2
GHG emissions without LULUCF (kt CO2 eq)	357 601.99	171 981.88	226 338.67	286 103.42	277 953.15	283 549.97	–20.7	2.0
GHG emissions with LULUCF (kt CO2 eq)	350 586.19	149 192.83	209 932.77	266 724.37	256 948.95	260 032.07	–25.8	1.2
GDP per capita (2005 USD thousand using PPP)	11.35	8.65	13.92	17.47	18.52	19.17	69.0	3.5
TPES per capita (toe)	4.49	2.40	3.36	4.23	4.67	4.46	–0.8	–4.6
GHG emissions per capita (t CO2 eq)	21.87	11.55	14.94	17.53	16.79	16.89	–22.8	0.6
GHG emissions per GDP unit (kg CO2 eq per 2005 USD using PPP)	1.93	1.34	1.07	1.00	0.91	0.88	–54.3	–2.8

Sources: (1) GHG emission data: Kazakhstan's 2014 GHG inventory submission, version 1.3; (2) Population, GDP and TPES data: International Energy Agency.

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

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

2. Information on the greenhouse gas inventory, emissions and trends

17. Kazakhstan has provided a summary of information on GHG emission trends for the period 1990–2011. This information is consistent with the 2013 national GHG inventory submission. A summary trend table for GHG emissions and removals expressed in carbon dioxide equivalent (CO_2 eq) by source is provided in the NC6. The ERT noted that Kazakhstan did not provide information on GHG emission and removal trends by gas. The ERT recommends that Kazakhstan provide such information in its next national communication. During the review, the ERT took note of the Party's most recent GHG inventory data, which Kazakhstan submitted to the secretariat on 15 April 2014. Relevant information is reflected in this report, including in the graphs and tables.

18. The ERT noted an inconsistency between the data for energy supply for 2008 reported in table 3.1 of the NC6 and the corresponding data reported in the GHG inventory. During the review, Kazakhstan explained that there was an error in the inventory data and

that the data in the NC6 were correct. For future national communications, the ERT encourages Kazakhstan to explain any discrepancy in the data between the national communication and the relevant GHG inventory.

19. Total GHG emissions[5] excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 20.7 per cent between 1990 and 2012, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 25.8 per cent over the same period. The trend in the total emissions without LULUCF includes a significant decrease in emissions of 59.3 per cent between 1990 and 1999, followed by an increase in emissions of 95.0 per cent between 1999 and 2012. Between 1990 and 2012, carbon dioxide (CO_2) emissions decreased by 16.9 per cent, methane (CH_4) emissions decreased by 32.2 per cent and nitrous oxide (N_2O) emissions decreased by 47.1 per cent. An analysis of the drivers of GHG emission trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from 1990 to 2012.

Table 3
Greenhouse gas emissions by sector in Kazakhstan, 1990–2012

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share[a] by sector (%)*	
Sector	*1990*	*2000*	*2010*	*2011*	*2012*	*1990-2012*	*2011-2012*	*1990*	*2012*
1. Energy	298 102.67	143 983.67	244 042.91	234 620.16	241 231.56	–19.1	2.8	83.4	85.1
A1. Energy industries	138 498.51	58 176.66	100 260.85	100 917.01	106 310.63	–23.2	5.3	38.7	37.5
A2. Manufacturing industries and construction	21 988.24	21 752.40	28 385.18	29 254.52	28 665.48	30.4	–2.0	6.1	10.1
A3. Transport	22 651.50	9 199.82	19 970.36	20 065.11	23 249.49	2.6	15.9	6.3	8.2
A4.–A5. Other	62 403.13	28 221.51	63 117.36	51 270.33	49 002.94	–21.5	–4.4	17.5	17.3
B. Fugitive emissions	52 561.29	26 633.29	32 309.17	33 113.20	34 003.02	–35.3	2.7	14.7	12.0
2. Industrial processes	17 916.83	10 275.73	15 765.58	17 750.98	16 735.82	–6.6	–5.7	–5.0	5.9
3. Solvent and other product use	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA	NA	NA	NA
4. Agriculture	38 974.52	14 558.13	22 404.55	21 607.78	21 526.78	–44.8	–0.4	10.9	7.6
5. LULUCF	–7 015.81	–22 789.05	–19 379.05	–21 004.20	–23 517.90	235.2	12.0	NA	NA
6. Waste	2 607.98	3 164.34	3 890.39	3 974.24	4 055.81	55.5	2.1	0.7	1.4
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	**350 586.19**	**149 192.83**	**266 724.37**	**256 948.95**	**260 032.07**	**–25.8**	**1.2**	**NA**	**NA**
GHG total without LULUCF	**357 601.99**	**171 981.88**	**286 103.42**	**277 953.15**	**283 549.97**	**–20.7**	**2.0**	**100.0**	**100.0**

Source: Kazakhstan's 2014 GHG inventory submission, version 1.3 (for GHG emission data).
Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

[5] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding land use, land-use change and forestry, unless otherwise specified.

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

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

3. National system

20. Kazakhstan provided in its NC6 some information on the institutional, legal and procedural arrangements made for estimating anthropogenic emissions by sources and removals by sinks and for reporting and archiving inventory information. The 2014 annual national inventory report of Kazakhstan[6] contains a description of most of the elements defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (annex to decision 19/CMP.1); thus, a reference to that information would enhance the transparency of the reporting in the Party's next national communication.

21. During the review, Kazakhstan provided information on how the changes in the government structure that took place during the second half of 2014 caused some changes to the responsibilities of the institutions involved in the preparation and management of the GHG inventory. In 2010 the Ministry of Energy issued an order related to the establishment of a national inventory of emissions by sources and removals by sinks. The new national entity responsible for the preparation of the annual GHG inventory submissions is the Department of Climate Change within the Ministry of Energy.[7] The entity specialized in climate change and GHG emission research, joint stock company "Zhasyl Damu", is in charge of the development of the GHG inventory, including recalculations and the implementation of quality assurance/quality control (QA/QC) procedures.

22. The national GHG inventory system and its functions are set by the Rules of Maintaining State Cadastre of Sources of Greenhouse Gas Emissions and Removals. The rules were developed in accordance with the provisions of the Ecological Code of the Republic of Kazakhstan and were approved by a governmental resolution dated July 2012 and modified in September 2014.

23. The ERT noted that the reporting in the national communication could be enhanced by including descriptions of the collection of activity data, the selection of emission factors, the identification of key categories, QA/QC activities and the procedures for the official consideration and approval of the annual GHG inventory submission. The ERT also noted that information on the performance of the established functions of the national system, the institutional, legal and procedural arrangements for preparing and submitting the annual GHG inventory, and the QA/QC plan, its implementation and objectives could be explained in more detail in the next national communication. The ERT notes that Kazakhstan may consider including such information in its next national communication.

24. The ERT also notes that Kazakhstan may consider providing information on how its national system is performing the general and specific functions defined in the guidelines for national systems and providing more transparent information on the performance of the established functions of the national system, the institutional, legal and procedural

[6] Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php>.

[7] Following the restructuring of the Kazakh Government on 6 August 2014, the newly created Ministry of Energy assumed the functions and powers of the Ministry of Environment and Water Resources, of the former Ministries of Oil and Gas and of two departments of the Ministry of Industry and New Technologies. The Ministry of Investments and Developments assumed the functions and powers of the remaining departments of the former Ministry of Industry and New Technologies (focus on energy efficiency) and of the Ministry of Transportation and Communications.

arrangements for preparing and submitting the GHG inventory, and the QA/QC plan in its next national communication.

4. National registry

25. In its NC6, Kazakhstan has included information on the preparatory activities for launching its state registry of carbon units, including information on its database structure, quota registration and the conditions created to enable quota auction trading, as well as on other features of the registry. The rules for the functions of the state registry were also established in accordance with the Ecological Code of the Republic of Kazakhstan.

26. The ERT commends the Party for providing such information and noted that the development of the state registry will contribute to the fulfilling of Kazakhstan's obligations for the second commitment period of the Kyoto Protocol.

5. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

27. Kazakhstan has reported in its NC6 information on domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures, established pursuant to the implementation of the Kyoto Protocol, according to the national circumstances.

28. The NC6 describes extensively the legislative arrangements and key policy strategies, but information on the enforcement and administrative procedures to meet its obligations under the Kyoto Protocol is not entirely transparent. The NC6 does not describe the provisions that Kazakhstan put in place to make information on the legislative arrangements and enforcement and administrative procedures publicly accessible.

29. During the review, Kazakhstan clarified that non-compliance with the law by companies leads to the application of penalties, regulated by the Code of the Republic of Kazakhstan on Administrative Offences in the case of exceeding quotas on GHG emissions. Non-compliance, such as failing to submit the required amount of CO_2 certificates under the emissions trading system of Kazakhstan, may lead to court cases and the requirement to stop production. Senior government officials receive a reprimand if goals set for their respective institutional structures are not achieved. Kazakhstan informed the ERT that information on legislative arrangements and enforcement and administrative procedures is publicly available on the websites of the respective ministries. According to the national law, public entities have a defined number of days to answer questions or respond to requests for information from the public.

30. The ERT recommends that Kazakhstan include in its next national communication a more detailed description of its enforcement procedures and indicate how cases of non-compliance under domestic law are addressed, as provided during the review, in order to increase the transparency of the reporting. It also recommends that Kazakhstan describe how information on such arrangements is made publicly available.

31. The overall responsibility for climate change policymaking lies within the Ministry of Energy, which acts as the key initiator and developer of PaMs to address climate change. A number of other ministries are involved in the implementation of the climate change policy, such as the Ministry of Agriculture, the Ministry of Investment and Development and agencies such as "Zhasyl Damu". After the ratification of the Kyoto Protocol by Kazakhstan in 2009, the Ministry of Energy was appointed as the authorized body for the coordination and implementation of the Kyoto Protocol.

32. Implementation of Kazakhstan's climate policy is underpinned by the Environmental Code, adopted in 2007, which includes a specific chapter on the regulation

of GHG emissions and removals. The Environmental Code has provisions for the planning and implementation of internal mitigation measures, the mandatory participation of the public in defining such measures and the requirement for specific legal entities to keep track of and report on their annual GHG emissions. The Environmental Code also contains provisions for the possible participation of Kazakhstan in the second commitment period of the Kyoto Protocol.

33. The "Strategy Kazakhstan 2050" provides the development framework for the transition of Kazakhstan to a low-carbon economy, which is also further defined in the "Transition to a Green Economy Concept" document. The development strategy of Kazakhstan until 2030 is implemented by means of strategic development plans for each 10-year period and five-year sectoral action plans and industry programmes.

34. The Strategic Development Plan 2020, adopted in 2010, lays the foundation for Kazakhstan's climate policy. It identifies five key areas of development, including "accelerating the diversification of the economy", which covers climate change mitigation and adaptation. The plan provides the strategic direction for the inclusion of objectives, activities and targets to reduce GHG emissions, improve energy efficiency and develop renewable energy sources in the strategic plans of individual state bodies, such as the Ministry of Environment and the Ministry of Industry and New Technologies, and in the industry programme for 2010–2014 "Zhasyl Damu".

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

35. Kazakhstan has provided in its NC6 information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol.

1. Policies and measures related to implementation of commitments under the Convention

36. In its NC6, Kazakhstan has reported on its PaMs adopted to achieve its commitments under the Convention, including PaMs that do not have the limitation or reduction of GHG emissions and removals as their primary objective. In addition, Kazakhstan has reported on policies and practices that contribute to the development and modernization of the energy sector and will lead to an absolute increase in GHG emissions. The ERT encourages Kazakhstan to report transparently in its national communications on its policies and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur and to clearly distinguish them from PaMs that contribute to the limitation and reduction of GHG emissions and removals.

37. The ERT noted that, although the main information on PaMs is provided in chapter 4 of the NC6, some useful information on supporting legal, economic and financial instruments for the implementation of PaMs is reported in chapter 7. Having relevant information dispersed over two chapters has an impact on the transparency of the information provided. The ERT also noted that the description of policy objectives, their quantitative targets and the PaMs is not always coherent and consistent, which also affects the transparency of the reporting. During the review, Kazakhstan clarified the prevailing targets. The ERT encourages Kazakhstan to provide all relevant information on PaMs in the designated chapter (i.e. chapter 4) and to cross-reference it in other chapters, as appropriate, in its next national communication.

38. In its NC6, Kazakhstan has reported on PaMs in the energy sector only, although information on overall policy and planning was provided for other sectors, namely

industrial processes, agriculture, forestry and waste. During the review, Kazakhstan informed the ERT that some PaMs were implemented in those sectors but that they were not quantitatively analysed and consequently not reported in the NC6. The ERT recommends that Kazakhstan complete the reporting on PaMs in its next national communication by including a textual description of the PaMs for each sector, including industrial processes, agriculture, LULUCF and waste (see paras. 63, 65, 67 and 69 below). That textual description could also include an explanation of the absence of reported PaMs affecting GHG emissions for a particular sector. The ERT noted that the reporting on PaMs in the NC6 is not organized by sector and subdivided by GHG as required by the UNFCCC reporting guidelines on NCs. The description focuses on the impact of the PaMs on CO_2. Therefore, the ERT also recommends that Kazakhstan indicate in its next national communication the effects of PaMs on GHGs other than CO_2.

39. The summary tables provide the name, target sector, type of tool, status, responsible body and an estimation of the individual or aggregate effect for the priority PaMs for 2020, 2025 and 2030. The ERT noted that, although Kazakhstan provided some information on changes in activity levels, and that references to other documents were made, the NC6 does not include a brief description of the methods used to estimate the quantitative effect of the PaMs, individually or for groups of PaMs. The ERT encourages Kazakhstan to include a brief description in its national communication of the methods used to estimate the quantitative effect of the PaMs.

40. In its NC6, Kazakhstan has reported on its PaMs adopted, implemented and planned. The ERT noted, however, that the status of the PaMs (implemented, adopted or planned) was not always reported as per the definitions in the UNFCCC reporting guidelines on NCs. The ERT encourages Kazakhstan to report the status of its implemented, adopted and planned PaMs as per the definitions in the UNFCCC reporting guidelines on NCs.

41. The PaMs reported include mainly those planned, adopted and/or implemented at the national level. The NC6 also describes the system of policymaking at the local level and mentions that some regional programmes for energy efficiency have been developed and approved and that steps to implement them have been taken. Those programmes contribute to the achievement of the energy efficiency improvement plan at the national level.

42. The NC6 does not refer to PaMs described in the Party's previous national communication, except for a list of projects related to electricity generation. During the review, Kazakhstan provided the ERT with an overview of the status of the PaMs included in the previous national communication. It appears that, while a number of those PaMs have been implemented, several others have been cancelled. The ERT encourages Kazakhstan to make reference, in its next national communication, to the PaMs included in the NC6, to adapt the reported statuses if necessary and to focus on any alterations to those PaMs or the effects achieved. In the case that any PaMs are no longer in place, the ERT encourages Kazakhstan to provide information accordingly.

43. The NC6 does not provide information on Kazakhstan's institutional arrangements for monitoring and evaluating GHG mitigation policy over time, or on how Kazakhstan monitors and evaluates the progress made in the implementation of PaMs. During the review, the ERT was informed that the monitoring and evaluation of PaMs is realized by means of periodical reporting to the Government on the advancement of strategies and/or action plans. Kazakhstan also informed the ERT that the monitoring and evaluation of climate policy is carried out by the Administration of the President of the Republic of Kazakhstan and the Office of the Prime Minister of the Republic of Kazakhstan. The ERT noted that climate policy in Kazakhstan is under continuous improvement and modification on the basis of lessons learned and new insights. The ERT encourages Kazakhstan to describe in its next national communication its processes and institutional arrangements for monitoring and evaluating its PaMs over time.

44. Although Kazakhstan has included estimates of the emission reduction effects of its PaMs in its NC6, it has not provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. The ERT recommends that Kazakhstan include in its next national communication information on how it believes its PaMs are modifying longer-term trends in emissions and removals.

2. Policy framework and cross-sectoral measures

45. In its NC6, Kazakhstan has provided detailed information on its comprehensive economy-wide strategic and policy framework, which, inter alia, aims at low-carbon development and transitioning to a green economy in the long term. Goals and activities defined at the strategic level are further enforced by relevant legislative arrangements that prescribe short- and medium-term PaMs that contribute directly or indirectly to GHG emission reduction.

46. The "Strategy Kazakhstan 2050" provides the development framework for the transition of Kazakhstan to a low-carbon economy, which is further defined in the "Transition to a Green Economy Concept" document. The development strategy of Kazakhstan until 2030 is implemented by means of strategic development plans for each 10-year period and five-year sectoral action plans and industry programmes. The Strategic Development Plan 2020, adopted in 2010, lays the foundation for Kazakhstan's climate policy. It identifies five key areas of development, including "accelerating the diversification of the economy", which integrates climate change related issues, both mitigation and adaptation. The plan lays the basis for the inclusion of objectives, activities and targets to reduce GHG emissions, improve energy efficiency and develop renewable energy sources in the strategic plans of individual state bodies. The implementation of activities related to GHG emission reduction, the improvement of energy efficiency and the development of renewable energy sources are only to a limited extent defined at the local government level.

47. The overall responsibility for climate change related policymaking lies within the Ministry of Energy, which is the competent authority for energy, environment and the oil and gas sectors and, as such, acts as the key initiator and developer of climate change mitigation actions in Kazakhstan. Other ministries are also involved in the implementation and monitoring of PaMs within their competencies, such as the Ministry of Agriculture and the Ministry of Investment and Development, as well as agencies such as "Zhasyl Damu".

48. Information on interministerial decision-making processes or bodies was not provided in the NC6. During the review, Kazakhstan informed the ERT that no official coordination mechanism or interministerial decision-making process on climate change exists. It reiterated that the Ministry of Energy is the responsible authority for the implementation of the Kyoto Protocol and for the formulation of climate change mitigation policy. The Ministry of Energy involves other public authorities concerned and non-governmental organizations (NGOs) such as the Coordination Centre for Climate Change. The ERT noted that the reporting in the national communication could benefit from an enhanced exchange and coordination of information among relevant entities, for example through the establishment of an interministerial agency or coordination committee for climate change, including representatives of the Ministries of Environment, Energy, Transport, Economy, Agriculture, Forestry and Industry and other relevant agencies.

49. The implementation of climate change mitigation PaMs is underpinned by the Environmental Code, adopted in 2007, which includes a specific chapter on the regulation of GHG emissions and removals. The Environmental Code has provisions for the planning and implementation of mitigation measures, the mandatory participation of the public in defining such measures and the requirement for specific legal entities to keep track of and

report on their annual GHG emissions. The Environmental Code contains provisions that lay the groundwork for the possible participation of Kazakhstan in the second commitment period of the Kyoto Protocol.

50. The key cross-cutting climate and energy policies are Kazakhstan's emissions trading system (KazETS), which is based on a cap-and-trade approach and covered approximately 64 per cent of the Party's GHG emissions in 2012, and the Energy Efficiency Programme 2020, covering about 80 per cent of Kazakhstan's energy consumption.

51. KazETS currently covers 166 companies in the sectors of energy, oil and gas and industry, with annual GHG emissions exceeding 20 kt CO_2 eq. The system's rules were approved by law in 2012. The implementing agency for KazETS on behalf of the Ministry of Energy is state-owned company "Zhasyl Damu". In 2013, the pilot phase of KazETS was implemented, and then, on the basis of lessons learned, modifications were made for the implementation of the 2014–2015 phase. The latter phase provides useful insights for the Government to further improve the system, and 35 amendments to the Environmental Code, which provides the legal basis for KazETS, are currently under discussion in Parliament. The amendments relate among others to the allocation approach (benchmarking instead of grandfathering), to the monitoring, reporting and verification framework and to the further clarification of target sectors. At present, there is no clear link between KazETS and the emission reduction targets of the country.

52. The Energy Efficiency Programme 2020, implemented by the Ministry of Investment and Development, is discussed in more detail in paragraph 57 below.

53. Table 4 provides a summary of the reported information on the adopted PaMs of Kazakhstan.

Table 4
Summary of information on policies and measures reported by Kazakhstan

Sectors affected	*List of key policies and measures*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures			
	Emissions trading system (cap and trade)	20 000	30 000
Energy			
Energy supply			
	Fuel switching in power plants	2 000	3 000
Renewable energy	Promotion of hydro and wind power	2 000	2 000
Energy efficiency	Replacement of old coal power plants with new ones with higher efficiency	3 000	10 000
Residential and commercial sectors	Improved standards for heat insulation	2 000	5 000
Industrial sectors	Emission reporting, energy audit and upgrading assets	4 000	9 000
Agriculture	Not reported	NE	NE
Forestry	Not reported	NE	NE
Waste management	Not reported	NE	NE

Note: The greenhouse gas reduction estimates given for some measures are reductions in carbon dioxide or carbon dioxide equivalent for 2020 and 2030.

Abbreviation: NE = not estimated.

3. Policies and measures in the energy sector

54. Between 1990 and 2012, GHG emissions from the energy sector decreased by 19.1 per cent (56,871.11 kt CO_2 eq), owing mainly to the economic recession following the fall of the Soviet Union in 1991. The emission trend was decreasing until 1999, but GHG emissions from the energy sector have doubled since then (+102.4 per cent by 2012 compared with in 1999) and the trend is still increasing, owing to the steady growth of the economy over the last 15 years, accompanied by a corresponding increase in power consumption. The increasing trend in GHG emissions from fuel combustion since 1999 is most notable in transport (+295.9 per cent) and energy use in other sectors (+187.3 per cent). This is likely to be a result of the increase in living standards of the population. The GDP (2005 PPP) per capita grew on average by 7 per cent annually between 1998 and 2012.

55. ***Energy supply***. The development of the power sector in Kazakhstan is designed to meet the development needs of the country, particularly the demand for electricity, taking into consideration the accelerated implementation of social and economic reforms. The generation of electricity is dominated by the use of coal in power plants (72.9 per cent of the total electricity generated in 2011), followed by the use of fuel oil and hydropower (17.3 and 9.8 per cent, respectively, of the total electricity generated in 2011). Electricity consumption has increased on average by 6 per cent annually since 1999. Electricity demand is projected to increase from 82 TWh in 2010 to over 100 TWh in 2015. In order to fulfil the growing demand, Kazakhstan's energy policy aims at modernizing and expanding the capacities of existing power plants and constructing new generating capacity, including thermal power plants, renewable energy sources, primarily hydro, biomass and wind, and nuclear power. Technological priorities for the new fossil fuel powered facilities are the transition to combined-cycle gas-fired power plants and the transition to clean coal technology at coal-fired plants.

56. ***Renewable energy sources***. The target was to achieve a 1 per cent share of renewable energy in the total energy consumption of the country by 2014 or a target volume of electricity generated by renewable energy sources of 1 TWh, to be achieved through the construction and commissioning of wind power plants and small hydroelectric plants and the use of biomass energy. The law of 2009 on supporting the use of renewable energy sources provides a package of specific regulations to support the achievement of the target. During the review, Kazakhstan informed the ERT that the current share of renewable energy in energy consumption stands at 0.62 per cent and that the revision of existing and the development of new PaMs, such as feed-in tariffs for four types of renewable energy production (wind, solar, small hydro and biogas), have been undertaken to achieve the 2020 target (which is a 3 per cent share of renewable energy in total energy consumption). Those measures, along with the general policies aimed at enhancing the investment climate in Kazakhstan, should further stimulate the development of renewable energy sources in the country.

57. ***Energy efficiency***. Kazakhstan's target is to reduce the energy intensity of its GDP by 13 per cent by 2015 and by 25 per cent by 2020 compared with the 2008 level. The Government adopted a law on energy conservation and energy efficiency in 2012 and a package of by-laws thereto. The Kazakhstan Comprehensive Energy Efficiency Improvement Plan for the Period 2012–2015, adopted in 2011, and the Energy Efficiency Programme 2020, adopted in 2013, provide concrete implementation measures. The main objective of the latter programme is to create conditions in the country to promote energy savings. Specific activities include the mandatory reporting on energy consumption by specifically defined entities, mandatory energy auditing for specific consumers, the instauration of standards for products and buildings, a ban on specific products, differentiated tariffs according to energy efficiency performance, the training of

professionals, and research. Additionally, policies aimed at diversifying the economy, as launched under the Forced Industrial Innovative Development of Kazakhstan 2010–2014, followed by the Concept of Industrial and Innovative Development 2015–2019, are contributing to the realization of the target for the energy intensity of the GDP. During the review, Kazakhstan informed the ERT that by 2014 the energy intensity of its GDP had been reduced by 18.6 per cent compared with the level in 2008. Energy consumption per person increased, however, by 12.8 per cent over the same period.

58. ***Residential and commercial sectors***. The law on energy conservation and energy efficiency stipulates that the construction of new buildings as well as the expansion of existing buildings that consume 500 t or more conventional fuel per year need to include an energy audit in the pre-construction phase. The Ministry of Investment and Development set standards for the energy efficiency of buildings and revised the building code. The country has a programme in place to improve lighting systems (public and private).

59. ***Transport sector***. The NC6 mentions the implementation of the EURO 4 standards and the introduction of compressed natural gas for cars and buses as cost-competitive emission reduction measures in the transport sector. During the review, Kazakhstan provided information on measures related to the improvement of the energy efficiency of aircraft and trains as stipulated by the law on amendments and additions to certain legislative acts of the Republic of Kazakhstan on taxation, approved in 2013, which introduced higher tax rates for vehicles of 3000 cc and above. During the review, the ERT was informed about the plans for a bus rapid transport system in Astana and about the public bicycle system. The ERT noted that Kazakhstan considered the introduction of the EURO 4 standards for motor vehicles to be a GHG emission reduction measure, with estimated mitigation impacts of 3,000 kt CO_2 eq and 8,000 kt CO_2 eq by 2020 and 2030, respectively. Those standards, however, set emission limit values specifically for air pollutants such as particulate matter, carbon monoxide, hydrocarbons and nitrogen oxide but not for GHGs. The ERT encourages Kazakhstan to further research the effects of that particular measure on GHG emissions.

60. ***Energy production and the industrial sector***. The Ministry of Investment and Development puts special emphasis on the industrial sector as it consumes more than half of the country's energy resources and has an energy saving potential of up to 40 per cent. Industrial enterprises will be obliged to develop plans to improve energy efficiency, supported by the State in the form of the installation of a financing mechanism, training and research, as well as to participate in KazETS if their annual GHG emissions exceed 20 kt CO_2 eq.

4. Policies and measures in other sectors

61. Between 1990 and 2012, GHG emissions from industrial processes (including solvent and other product use) and agriculture decreased by 6.6 and 44.8 per cent (1,181 and 17,447 kt CO_2 eq), respectively, owing mainly to the economic recession following the fall of the Soviet Union in 1991. Emissions from waste increased by 55.5 per cent in the observed period, owing to the increases in the waste generation rate and the urban population.

62. ***Industrial processes***. Between 1990 and 2012, GHG emissions from the industrial processes sector decreased by 6.6 per cent (1,181.01 kt CO_2 eq), owing mainly to the global economic crisis and the decline in the demand for and price of metals.

63. The NC6 highlights a current industry programme, "Zhasyl Damu", that integrates the climate change issue, aiming to develop a 'green economy', reduce adverse human impact on the environment and health, and create conditions for the conservation and restoration of natural resources. However, relevant PaMs in the industrial sector (mining

and manufacturing industry), their effects and information on implementation in accordance with the UNFCCC reporting guidelines on NCs have not been reported. The ERT recommends that Kazakhstan improve the completeness of its reporting by presenting relevant information on PaMs as per the reporting requirements.

64. ***Agriculture***. Between 1990 and 2012, GHG emissions from the agriculture sector decreased by 44.8 per cent (17,447.74 kt CO_2 eq), owing mainly to the collapse of the economy following the fall of the Soviet Union in 1991. Since 1998 emissions from the agriculture sector have increased (+59 per cent by 2012 compared with in 1998), mainly because of the economic revival and the associated increase in the use of nitrogen fertilizers and the increase in the animal population.

65. Kazakhstan has not reported on PaMs in the agriculture sector. During the review, the ERT learned about some initiatives undertaken by Kazakhstan related to crop cultivation and livestock breeding that may be relevant to GHG emission reduction in the agriculture sector. The ERT recommends that Kazakhstan provide information on relevant PaMs in its next national communication.

66. ***LULUCF***. The LULUCF sector was a net sink of 23,517.90 kt CO_2 eq in Kazakhstan in 2012 and net GHG removals have increased by 235.2 per cent since 1990. The increasing trend has been driven mainly by the rehabilitation of natural vegetation and the reduced pressure on pasture ecosystems since the mid-1990s, and increased areas of young forest plantations at the beginning of the 1990s and thereafter, as well as reforestation efforts.

67. Kazakhstan has not reported on PaMs in the LULUCF sector. During the review, the ERT learned that the Party has a reforestation programme included in the Strategic Plan of the Ministry of Agriculture for 2011–2015 and that the programme is relevant to GHG emission reduction and enhancing sink capacity. The ERT recommends that Kazakhstan provide information on relevant PaMs in its next national communication.

68. ***Waste management***. Between 1990 and 2012, GHG emissions from the waste sector increased by 55.5 per cent (1,447.83 kt CO_2 eq), driven mainly by the increases in the waste generation rate and the urban population. Kazakhstan recognizes waste management as a serious problem, where considerable efforts are still required to establish a collection, treatment and disposal system.

69. The ERT noted that Kazakhstan did not report on PaMs in the waste sector. During the review, Kazakhstan informed the ERT that a programme for the improvement of municipal waste management was approved in 2014. The programme aims to establish an integrated waste management system that will cover collection, recycling and disposal facilities. It is planned to increase waste recycling by up to 40 per cent and to cover up to 95 per cent of the country with a waste collection system by 2030. The ERT recommends that Kazakhstan improve the completeness of its reporting by presenting information on PaMs in the waste sector. Gathering the most recent data on waste management PaMs could be improved by enhanced cooperation among agencies working on waste management, such as the Waste Department of the Ministry of Energy.

5. Policies and measures related to implementation of commitments under the Kyoto Protocol

70. The NC6 does not include any information on how Kazakhstan promotes and implements the decisions of the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to limit emissions from aviation and marine bunker fuels. The ERT recommends that Kazakhstan provide such information in its next national communication.

C. Projections and the total effect of policies and measures

71. The GHG emission projections provided by Kazakhstan in the NC6 include a 'with measures', a 'with additional measures' and a 'without measures' scenario until 2030, presented relative to actual inventory data for 1990, 1995, 2000, 2005 and 2011. An additional 'USSR' scenario, which assumes that Kazakhstan did not undergo the transition to a market economy, has also been provided. Projections are presented for energy, transport, industry, services, agriculture, LULUCF, waste and fugitive emissions, but data are not provided at an aggregated sector level using absolute values. Gas-by-gas projections are provided for CO_2, CH_4, N_2O, hydrofluorocarbons and perfluorocarbons.

1. Projections overview, methodology and key assumptions

72. Kazakhstan's projections in its NC6 are consistent with GHG emissions from its 2013 national inventory report. The TIMES-KZ model (Integrated MARKAL-EFOM System/IEA-ETSAP) is used for fuel combustion projections, whereas non fuel combustion emission projections are assessed by sectoral experts using varying methodologies, which are clearly explained in annex 3 to the NC6. The TIMES-KZ model uses a detailed technical and economic process description of the power industry (bottom-up approach) and represents economic and technical system elements, which include energy supply and demand, GHG emissions and relevant technologies. Economic and technical regularities have been described in the text of the NC6.

73. Kazakhstan's 'with measures' projections for fuel combustion are based on the TIMES-KZ model's most economic and efficient pathway to balancing energy supply and demand, given reasonable assumptions about key drivers (e.g. population and GDP). For this reason, energy efficiency and technological improvements are inherently captured in the 'with measures' scenario, assuming that government PaMs are able to overcome any barriers to rational economic behaviour.

74. The ERT noted that it is not clear which PaMs detailed in the PaMs chapter of the NC6 are inherently captured in the 'with measures' scenario, or what assumptions regarding future energy supply capacity and new production in key sectors were made in the modelling analysis. During the review, the ERT encouraged Kazakhstan to include details (in tabular format) on related key assumptions, projected electricity portfolio, the development of the energy and industrial sectors, and PaMs. The ERT encourages Kazakhstan to report in its next national communication on such key assumptions for each of its three scenarios ('with measures', 'with additional measures' and 'without measures') in a manner that allows better understanding of how the assumptions differ between scenarios.

75. The ERT also noted that emission projections for the oil and gas sector have not been reported separately. Given the prominence of the subsector in the country, the ERT encourages Kazakhstan to report its emission projections for the oil and gas sector separately, to the extent possible, and to provide a description of future development expectations for the subsector. Likewise, expected future trends in emissions for subsectors such as transportation, iron and steel, and mining should be discussed separately whenever possible.

76. The ERT noted that Kazakhstan has not reported GHG emission projections related to fuel sold to ships and aircraft engaged in international transport. The ERT recommends that Kazakhstan report separately, to the extent possible, these emission projections in its next national communication.

77. The ERT further noted that the 'with measures' scenario for fuel combustion appears robust, with realistic assumptions of major emission drivers as well as the correct

inclusion of implemented and adopted PaMs. During the review, Kazakhstan noted that some PaMs under the 'green economy concept' were not included in the 'with measures' projections, and questions were raised about how they could be reflected in subsequent projections. The ERT clarified that new PaMs adopted under the 'green economy concept' can be included in the 'with measures' projections once national legislation is in force, voluntary agreements have been established, financial and human resources have been attributed to the project, or there is a clear commitment to proceed with specified project/legislative/voluntary implementation.

78. Kazakhstan's 'with additional measures' scenario includes the implementation of a carbon tax (USD 10 from 2020 to 2025; USD 15 from 2025 to 2030; and USD 20 post 2030) and assumes an increase in the share of renewable energy resources in total energy consumption, especially wind, solar and nuclear energy, to 3 per cent by 2020 and to 30 per cent by 2030. During the review, Kazakhstan explained that a carbon tax is not currently under consideration, and that the carbon price established by KazETS is not expected to reach similar levels in the corresponding time periods. During the review, the ERT clarified that the 'with additional measures' scenario should include PaMs that are under discussion and have a realistic chance of being adopted and implemented. The ERT encourages Kazakhstan to draw a more realistic link between its 'with additional measures' scenario assumptions and its expectations for KazETS (e.g. applying a corresponding carbon price in the model to the sectors covered by KazETS, energy and electricity).

79. During the review, Kazakhstan noted the significant changes in the historical emission estimates for the LULUCF sector between its 2013 and 2014 inventory submissions as a result of methodological improvements, and explained that expectations regarding future emissions and removals from the sector remain highly uncertain. In addition, Kazakhstan clarified that the LULUCF sector is not included in its 2020 target to reduce emissions by 15 per cent relative to the 1990 level. As such, the ERT encourages Kazakhstan to provide aggregated emission projections with and without the LULUCF sector, and to provide figures, graphs and tables, related to the target, that exclude that sector from the analysis.

80. Owing to the inherent uncertainty regarding the sector and since LULUCF is not included in the Party's emission reduction target, the ERT recommends that projections be provided for all sectors excluding LULUCF, with LULUCF projections provided separately.

2. Results of projections

81. In the NC6, the projections chapter includes a statement and a figure related to Kazakhstan's 2020 commitment for the second commitment period of the Kyoto Protocol, indicating a commitment to maintaining its total emissions at 93 per cent of the 1990 level by 2020. However, during the review, the ERT learned that this was a misunderstanding related to the change in the base year, and that the target should be reported as 95 per cent of the 1990 level over the period 2013–2020. Kazakhstan is not currently required to report on any target for the second commitment period of the Kyoto Protocol, but relevant information is useful to the reader. The ERT encourages Kazakhstan to update the projections chapter to include current targets, as well as to describe its 2020 target under the Convention (i.e. emissions at 85 per cent of the 1990 level).

82. Under the 'with measures' scenario, total GHG emissions including LULUCF are projected to reach 355,049 kt by 2020 (1.3 per cent above the 1990 level including LULUCF) and 498,123 kt by 2030 (42.1 per cent above the 1990 level including LULUCF). Given the data provided in table 5.7 of the NC6, the ERT calculated that total GHG emissions excluding LULUCF will reach 358,250 kt by 2020 (0.2 per cent above the

1990 level excluding LULUCF) and 501,320 kt by 2030 (40.2 per cent above the 1990 level excluding LULUCF).

83. The ERT noted the very small impact that LULUCF emissions and removals have on the total projections. However, during the review, the ERT took note of the significant changes in the LULUCF estimates provided in the most recent, 2014 inventory submission and assessed that changes in LULUCF emissions and removals could play a more significant role in future projections.

84. The 'with measures' emission projections for 2020 show that Kazakhstan's emissions will amount to 358,250 kt CO_2 eq, or 648 kt CO_2 eq (0.2 per cent) above the 1990 level excluding LULUCF. This indicates that Kazakhstan's targets for the second commitment period of the Kyoto Protocol (95 per cent of the 1990 level) as well as 2020 target under the Convention (85 per cent of the 1990 level) could not be achieved under this scenario.

85. The 'with additional measures' scenario indicates that total national GHG emissions in 2020 will amount to 314.244 kt CO_2 eq, or 40,158 kt CO_2 eq (11.2 per cent) below the 1990 level and 22,278 kt CO_2 eq (6.6 per cent) below the target for the second commitment period of the Kyoto Protocol, but still by 13,482 kt CO_2 eq (4.4 per cent) above the 2020 target under the Convention.

86. The 'with measures' and 'with additional measures' emission projections for 2030 will amount to 501,320 kt CO_2 eq and 386,630 kt CO_2 eq, which is 40.2 and 8.1 per cent, respectively, above the 1990 level.

87. During the review, Kazakhstan indicated that emissions are now expected to be significantly lower, given more current economic projections. Specifically, projections of GDP have been revised downwards in line with current low oil and metal prices. The ERT encourages Kazakhstan to provide a sensitivity analysis in its next national communication, including varying GDP projections, in order for the reader to better assess the sensitivity of the projections to expected economic conditions.

88. Kazakhstan noted that it does not currently intend to use market-based mechanisms or accounting of emissions and removals from the LULUCF sector towards achieving its mitigation targets. During the review, Kazakhstan also noted that this position may change as further relevant guidance develops and evolves under the UNFCCC.

89. Although the carbon tax included in the 'with additional measures' scenario is not currently under consideration, the ERT noted that including this measure in analysis is very useful in order to identify where low-cost abatement opportunities exist in the economy. Specifically, the assumption of the carbon price created the largest decrease in GHG emissions in the energy supply sector as well as in the service sector. Generally, carbon pricing is able to realize further energy efficiency improvements across most sectors of the economy (note that the transportation sector is not sensitive to the carbon price).

90. During the review, Kazakhstan indicated that it will continue to promote renewable energy and low-carbon electricity development in line with the 'green economy concept'. Hydro, geothermal, wind and solar energy as well as nuclear energy are expected to play an increasingly important role in its electricity generating portfolio in the future. Likewise, KazETS is still in its infancy and the country hopes that it will become increasingly robust in the next few years. The increasing effect of those measures, coupled with lower GDP projections, is expected to lead to the lowering of the emission projections towards Kazakhstan's target. The ERT encourages Kazakhstan to continue developing its 'with measures' and 'with additional measures' scenarios as relevant factors develop and progress.

91. The 'without measures' scenario shows that GHG emissions could increase to 374.4 Mt by 2020 and 561.8 Mt by 2030 if no measures had been taken by actors in the economy to improve energy efficiency or adopt more efficient technological options. Under the 'without measures' scenario, emissions are projected to be 5.4 per cent above those under the 'with measures' scenario in 2020 and 12.8 per cent above those under the 'with measures' scenario in 2030.

92. Emission projections by GHG are presented in table 5.1 of the NC6. In 2011, CO_2 represented 78.0 per cent of the Party's overall emissions, CH_4 represented 17.9 per cent and N_2O represented 3.3 per cent. The share of CO_2 in the total emissions is projected to increase to 79.4 per cent by 2020 and to 81.0 per cent by 2030. The share of CH_4 in the total emissions is projected to decrease to 16.3 per cent by 2020 and to 14.9 per cent by 2030. N_2O emissions are projected to maintain their relative share of the total emissions, representing 3.5 per cent in 2020 and 3.2 per cent in 2030.

93. The ERT noted during the review that it is difficult for the reader to assess the expected projection trends by sector. Data are not provided in absolute values at the sectoral level, although graphs showing projected sectoral emissions as a relative percentage of total emissions are provided. However, a detailed and robust analysis of the emission projections for most subsectors is provided in the NC6, allowing the reader to obtain a good sense of the expected trends in most sectors. For example, emissions from electricity generation are expected to increase by 40.8 Mt (49 per cent) between 2011 and 2020 and by 84.5 Mt (101.2 per cent) between 2011 and 2030 (table 5.5 of the NC6). The ERT recommends that a table be provided in the next national communication, with absolute data, that summarizes the emission projections by sector.

94. The projections indicate that Kazakhstan could meet its target for the second commitment period of the Kyoto Protocol (95 per cent of the 1990 level) only under the 'with additional measures' scenario and would need to implement further PaMs to achieve its 2020 target under the Convention (85 per cent of the 1990 level). The ERT noted that the projections are subject to uncertainty given the uncertainty of future GDP growth rate and future development of the energy system, and that the projections are lower if much lower current GDP growth rates are assumed.

95. The projected emission levels under different scenarios and information on the Kyoto Protocol target and quantified economy-wide emission reduction target are presented in table 5 and the figure below.

Table 5
Summary of greenhouse gas emission projections for Kazakhstan

	Greenhouse gas emissions (kt CO_2 eq per year)	*Changes in relation to the base year[a] level (%)*
Base year[a]	357 601.99	
Kyoto Protocol target for the second commitment period (2013–2020)	339 721.89	–5.0
Quantified economy-wide emission reduction target under the Convention	303 961.69	–15.0
Inventory data 1990[b]	357 601.99	
Inventory data 2011[b]	277 953.15	–22.3
Inventory data 2012[b]	283 549.97	–20.7
'Without measures' projections for 2020[c]	374 365.10	6.8

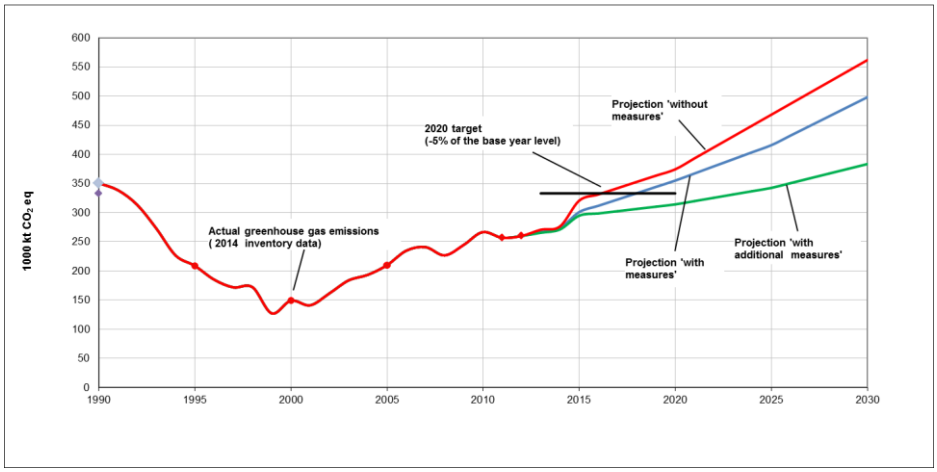
	Greenhouse gas emissions (kt CO_2 eq per year)	*Changes in relation to the base year[a] level (%)*
'With measures' projections for 2020[c]	355 048.77	1.3
'With additional measures' projections for 2020[c]	314 243.68	–10.4
'Without measures' projections for 2030[c]	561 790.70	60.2
'With measures' projections for 2030[c]	498 122.86	42.1
'With additional measures' projections for 2030[c]	383 433.68	9.4

[a] "Base year" in this column refers to the base year used for the emission reduction target under the Convention.

[b] Kazakhstan's 2014 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

[c] Kazakhstan's sixth national communication and/or first biennial report; the emissions are with land use, land-use change and forestry.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2012: Kazakhstan's 2014 greenhouse gas (GHG) inventory submission; the actual GHG emissions in the graph are with land use, land-use change and forestry (LULUCF); (2) Data for the years 2012–2030: Kazakhstan's sixth national communication and/or first biennial report; the emissions are with LULUCF; (3) 2013 GHG inventory data were used by Kazakhstan for the purpose of the modelling projections.

3. Total effect of policies and measures

96. In its NC6, Kazakhstan has presented the expected total effect of implemented and adopted PaMs in accordance with the 'with measures' definition compared with the 'without measures' scenario. Information is presented in terms of GHG emissions avoided or sequestered by 2030. During the review, sufficient data were provided to the ERT to calculate the effects by 2020 and 2025. Information was not provided by gas. Kazakhstan has not presented results for the historical years of 1995 and 2000.

97. Most analysis in this section of the NC6 has been presented in terms of the difference between the 'with measures' and 'with additional measures' scenarios. This is very helpful 'complementary' analysis since it shows where the modelling is recognizing

low-cost abatement options and the potential for carbon pricing and the use of renewable energy to significantly decrease emission trends. Kazakhstan may wish to provide in its next national communication the comparison between the 'with measures' and 'without measures' scenarios in order to assess the effect of adopted and implemented PaMs.

98. Kazakhstan has demonstrated the total estimated effect of its adopted and implemented PaMs to be an emission reduction of 19,316 kt CO_2 eq by 2020 and 63,667 kt CO_2 eq by 2030 in comparison with the 'without measures' scenario. The analysis does not break down those effects by aggregated sector. However, according to the information reported in the NC6, over 60 per cent of the emission reductions will occur as a result of efficiency improvements in the energy generating sector, while the rest of the abatement can be attributed to changes in the consumption sector. Changes in the energy generating sector include improved technology and fuel switching to less carbon-intensive resources. Changes in the consumption sector include a shift in consumer behaviour towards using less energy-intensive good and services.

99. The 'with additional measures' scenario shows that emissions could be 40,805 kt CO_2 eq lower in 2020 and 114,689 kt CO_2 eq lower in 2030 compared with under the 'with measures' scenario, reflecting the expected effect of implementing the carbon tax and augmenting renewable energy penetration. Table 6 provides an overview of the total effect of PaMs as reported by Kazakhstan.

Table 6
Projected effects of planned, implemented and adopted policies and measures in 2020 and 2030

Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*
	2020				*2030*			
Energy (without transport)	NE		NE	NE	NE	NE	NE	NE
Transport	NE		NE	NE	NE	NE	NE	NE
Industrial processes	NE		NE	NE	NE	NE	NE	NE
Agriculture	NE		NE	NE	NE	NE	NE	NE
Land-use change and forestry	NE		NE	NE	NE	NE	NE	NE
Waste management	NE		NE	NE	NE	NE	NE	NE
Total	**19 316**	**5.4**	**40 805**	**11.5**	**63 667**	**17.9**	**114 689**	**32.2**

Source: Kazakhstan's sixth national communication.
Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios.
Abbreviation: NE = not estimated.

D. Vulnerability assessment, climate change impacts and adaptation measures

100. In its NC6, Kazakhstan has extensively reported on the results of its research on the expected impacts of climate change and on potential associated adaptation measures in the areas of agriculture, crop cultivation (wheat production), cattle breeding (sheep), water resources, population, health, and social and economic development. The ERT commends

Kazakhstan for its extensive reporting on the results of its research on climate change scenarios and vulnerability in the NC6.

101. In the Strategic Plan of the Ministry of Agriculture for 2011–2015, Kazakhstan considers two aspects: reducing adverse human impact on the climate system and ensuring adaptation measures in the water and agriculture sectors. However, the ERT noted that Kazakhstan did not outline in its NC6 any actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation.

102. The results of engineering models indicate that the temperature will increase from 1.2 to 2.0 ^{o}C by 2030 relative to the 1990 level. It is expected that the amount of precipitation will decrease from May to September in the entire territory of Kazakhstan, leading to a change in soil humidity. Such changes will mostly affect agriculture, one of the key sectors of the national economy, namely crop cultivation and cattle breeding.

103. From the social and economic development perspective, rural areas dependent upon agriculture will be most vulnerable to climate change. The domination of the rural population, the low efficiency of agriculture and insufficient availability of water resources make the rural territories of North Kazakhstan, Akmola, East Kazakhstan, Almaty and Kostanay sensitive to climate change. Thus, climate change will hamper the economic and social development of those regions. To minimize such negative effects, Kazakhstan plans to implement an adaptation programme in the social and economic sector focused on the improvement of the control of water use, increasing the efficiency of land resource utilization, the improvement of regulatory control for forest protection and the increase of the territories' forest plantation and reclamation by planting saxaul forest.

104. During the review, Kazakhstan provided additional information on expected climate change impacts on grain cultivation and cattle breeding, the sectors considered to be the most vulnerable to climate change. The ERT recommends that Kazakhstan report in its next national communication on existing adaptation measures and their implementation, or explain the rationale for not prioritizing adaptation policy.

105. Table 7 summarizes the information on vulnerability and adaptation to climate change presented in the NC6.

Table 7
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture and food security	*Vulnerability*: Agricultural production will be vulnerable to declining precipitation, increase in aridity and the shift of moisture zones to the north. As a result, the yield of cereal crops will decrease *Adaptation*: No-till technology is currently being implemented in Kazakhstan in three northern regions. It is recommended to use new adopted crop varieties and implement plant-growing diversification. In southern Kazakhstan, the farmers plan to use drop irrigation. An effective plant-growing insurance system that is planned to be implemented will minimize the financial losses of agricultural product manufacturers resulting from unfavourable weather conditions
Agriculture and food security (cattle breeding)	*Vulnerability*: Winter weather conditions and forage provision influence sheep breeding, as forage provision influences cattle breeding. Calculations demonstrate that the spring vegetation period of pasture will begin 1–2 days earlier and finish 1–2 days later in autumn with regard to the current conditions by 2030. A decrease in yield capacity in the range of 10–14 per cent is forecast for pasture. For mountain pasture, supposed to be most affected, the pasture yield will decrease by 30 per cent by 2030. Pasturing during the warm period is critical for

Vulnerable area	*Examples/comments/adaptation measures reported*
	sheep productivity as premature crutching leads to low-grade wool and shorn sheep mortality. Therefore, it is necessary to determine the optimal term of crutching in advance *Adaptation*: The transhumant system of animal management was an adaptation measure to climate change applied before the 1990s, before the break-up of the institution of collective state farms. Kazakhstan plans to implement a pasturing control system based on climatic conditions and taking into account pasturing capacity, watering points, etc. This will make it possible to unite various seasonal pastures, reduce exogenous loading on animals, use pasture resources effectively and increase the productivity of cattle breeding
Biodiversity and natural ecosystems	*Vulnerability*: The ecosystems will degrade rapidly in the case of drought and high temperature in spring and summer. Anthropogenic factors together with climate change accelerate the aridization process on plains and mountains *Adaptation*: Kazakhstan plans to develop adaptation measures for certain species of flora and fauna. The creation of corridors is envisaged to contribute to ecosystem 'migration' and the active use of land management to contribute to natural renovation, forest plantation and the artificial regeneration of degraded territories
Human health	*Vulnerability*: The Ministry of Health, with the support of the World Health Organization, conducted research on the vulnerability of the healthcare system to climate change and an assessment of possibilities for adaptation for the following diseases: circulatory, respiratory, infections and mental health. The results show an increase in such diseases if the temperature increases *Adaptation*: Adaptation measures are not planned yet, but will become the perspective direction of the healthcare service for the sustainable development of the economy, the increase in the quality of life of the population, and the reduction of additional mortality and the amount and severity of diseases, conditional upon the influence of the environment. According to the research mentioned above, there is a need for adaptation measures to be developed for the following vulnerable groups: inhabitants of rural areas, 40 per cent of which have limited access to safe freshwater and a healthcare system; inhabitants of metropolises and cities (55 per cent of the country's population); and the older population, which will amount to up to 11 per cent of the total population by 2030, requiring social and medical services and leading to increased costs for the healthcare sector
Water resources	*Vulnerability:* The increase in air temperature, the current water deficit and the increase in water withdrawal beyond the border of Kazakhstan will lead to a decrease in the existing water resources and reduce transboundary run-off. There will be increased stress on water as the need for irrigation in agriculture grows *Adaptation:* Kazakhstan plans to design and implement modern water-saving technologies in economic sectors and implement interstate water relations and interbasin and transboundary transfer of river run-off

E. Research and systematic observation

106. Kazakhstan has provided information on its actions relating to research and systematic information, in particular those related to meteorology, hydrology and the atmosphere, and has addressed both domestic and international activities, related to the

Global Climate Observing System (GCOS) and the World Climate Programme. Kazakhstan has provided information on general policy, on existing barriers to research and systematic observation, on its participation in the international exchange of data, including related opportunities, and on its ongoing collaboration with its neighbours and other countries. It has also provided information on the main ongoing research in the country.

107. The NC6 does not include information on Kazakhstan's participation in domestic and international activities related to other relevant international programmes or institutions, such as the International Geosphere–Biosphere Programme and the Intergovernmental Panel on Climate Change (IPCC). Kazakhstan has also not reported on funding for research and systematic observation, on its activities related to the GCOS terrestrial observation systems or on research on mitigation and adaptation technologies.

108. During the review, Kazakhstan provided additional transparent information on the main existing barriers to research and systematic observation, including related to the exchange of data. Among those barriers is the insufficient hydrometeorological network in accordance with the parameters recommended by the World Meteorological Organization (WMO) to have a complete network that adequately covers the observation needs of the country (61 per cent meteorological, 67 per cent agrometeorological, 57 per cent hydrological and 58 per cent ecological). Kazakhstan is also reportedly lagging behind in terms of its technical, processing and human resources base in relation to the level of the hydrometeorology services of developed countries. The efforts made by Kazakhstan to overcome those barriers are described in paragraphs 112–114 below.

109. The ERT recommends that the Party provide information on its domestic and international activities related to research and systematic observation beyond those related to meteorological, hydrological and atmospheric issues, such as those related to the International Geosphere–Biosphere Programme, the IPCC and the GCOS terrestrial observation systems in its next national communication.

110. The ERT encourages Kazakhstan to provide information on existing and planned funding for research and systematic observation and on barriers related to the exchange of data, as well as on research and development in relation to mitigation and adaptation technologies in its next national communication. The ERT also encourages Kazakhstan to continue to identify and overcome the barriers that could affect performing research and systematic observation activities, including those that could affect the exchange and availability of relevant data.

111. The ERT noted that, after the collapse of the Soviet Union in the early 1990s, the national observation network steadily declined from 361 to 244 stations up to 1999. Since 1999 Kazakhstan has increased the number of stations, but there is still an insufficient number, according to GCOS standards, to enable the National Hydrometeorology Service to provide high-quality regional and global assessments of the state of the environment and climate change in Kazakhstan.

112. Kazakhstan has provided detailed information on its active participation in the global atmospheric systems of GCOS. In spite of the existing barriers and difficulties, 65 Kazakh stations provide information to the Global Surface Network and nine to the Global Upper Atmosphere Network. Kazakhstan is also active in the free and open international exchange of data, for example with the Global Precipitation Climatology Centre, the World Data Centre for Meteorology of the National Climatic Data Center of the United States of America and the World Data Center of the All-Russian Research Institute of Hydrometeorology Information. In addition, in the case of the threat of meteorological phenomena, Kazakhstan transmits storm warnings to the Hydrometeorology Services of Kirgizstan, the Russian Federation and Uzbekistan.

113. The modernization and development of the National Hydrometeorology Service is a vital task of the national policy on systematic observation, included in the development plans of the Ministry of Energy. The Development Strategy of the National Hydrometeorology Service of Kazakhstan up to 2020 has established among its main priority areas the development of the observation network up to the parameters established by WMO, the development of an integrated system of hydrometeorology and ecological monitoring using geographical information systems, the creation of an Electronic Forecasting Information Fund and the improvement of the quality of the products of forecasting activity for end-consumers (forecasts, recommendations, storm warnings, etc.)

114. Kazakhstan has carried out several research programmes linked to climate change, such as: the study and forecasting of droughts in Kazakhstan; guidelines for the development of projected climate change scenarios in Kazakhstan on the basis of regional climate models and statistical methods of regionalization; the assessment of ice conditions in the Kazakh sector of the Caspian Sea; and the zoning of the territory of Kazakhstan in accordance with climatic characteristics. The results of the research have been published; yet it is uncertain how or if they are taken into account in climate change mitigation or adaptation policymaking.

F. Education, training and public awareness

115. In its NC6, Kazakhstan has provided information on its actions related to education, training and public awareness related to climate change.

116. Educational curricula at all levels (primary, secondary and professional schools and the higher and postgraduate education system) contain many subjects related to environmental protection. Climate change is studied under meteorology at the Department of Meteorology and Hydrology of Al-Farabi University. Courses on energy efficiency and sustainable development have been introduced at the graduate and postgraduate levels.

117. Kazakhstan has conducted numerous training activities relevant to climate change, particularly on the GHG inventory, emissions trading schemes and environmental law, as well as specialized training and workshops for journalists. During the review, Kazakhstan noted its lack of agricultural specialists, trained in adaptation, who would be able to professionally integrate adaptation measures into the agriculture sector.

118. Kazakhstan actively cooperates with its neighbouring countries in Central Asia by implementing projects aimed at reducing GHG emissions and strengthening regional cooperation in the field of climate risk management and adaptation to climate change. The ERT commends the Party for the work done.

119. Climate change public awareness activities are implemented in Kazakhstan with the support of different NGOs, such as the Climate Change Coordination Centre, the Regional Environmental Centre for Central Asia and Green Academia.

120. During the review, Kazakhstan informed the ERT about its plans to involve NGOs, as members of the project steering committee, in decision-making processes, particularly for the development of its seventh national communication. The ERT recommends that the Party enhance the transparency of its reporting on public awareness by providing information on public information campaigns, the activities of resource and information centres, the involvement of the public and NGOs and its participation in international activities.

III. Summary of reviewed supplementary information under the Kyoto Protocol

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

121. Supplementary information provided by Kazakhstan under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is partially complete and mostly transparent. The supplementary information is located in different sections of the NC6. Table 8 provides an overview of the provided supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the sections of the NC6 in which it is provided.

122. Kazakhstan has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: identification of steps taken to promote and/or implement any decisions of ICAO and IMO in order to limit or to reduce GHG emissions not included in the Montreal Protocol from aviation and marine bunker fuels. The ERT recommends that Kazakhstan include that reporting element in its next national communication. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report.

123. Kazakhstan has reported on activities, actions and programmes aimed at fulfilling the commitments stipulated in Article 10 of the Kyoto Protocol throughout the different sections of the NC6. The ERT noticed that information related to the promotion of modalities for the development, application and diffusion of environmentally sound technologies was reported less explicitly than information on other commitments. During the review, the Party provided additional information on actions taken to improve energy efficiency through the application and diffusion of more efficient technologies. The ERT recommends that Kazakhstan, to enhance transparency, provide more detailed information on activities related to the promotion of modalities for the development, application and diffusion of environmentally sound technologies in its next national communication.

Table 8
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	*Reference to the sixth national communication*
National registry	NA
National system	Section 3.4
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	NA
Policies and measures in accordance with Article 2	Section 4[a]
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Sections 4.1 and 4.2
Information under Article 10	Sections 7.1 and 7.2
Financial resources[b]	NA

Abbreviation: NA= not applicable.

[a] Kazakhstan has not reported the required information on the identification of steps taken to promote and/or implement any decisions of the International Civil Aviation Organization and the International Maritime Organization in order to limit or to reduce greenhouse gas emissions not included in the Montreal Protocol from aviation and marine bunker fuels.

[b] Reporting on financial resources under the Kyoto Protocol is relevant to developed country Parties and other developed Parties that are included in Annex II to the Convention (Annex II Parties). As Kazakhstan is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

IV. Conclusions and recommendations

124. The ERT conducted a technical review of the information reported in the NC6 of Kazakhstan according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a general overview of the climate change related policies of Kazakhstan and is mostly complete and mostly transparent. The information provided in the NC6 includes most elements, as appropriate, of the supplementary information under Article 7 of the Kyoto Protocol, with the exception of information on PaMs in accordance with Article 2 of the Kyoto Protocol (see para. 122 above). During the review, Kazakhstan provided additional information on its PaMs, projections, research and systematic observation, national circumstances and national system.

125. Kazakhstan's emissions and removals in 2012 were estimated to be 20.7 per cent below the 1990 level excluding LULUCF and 25.8 per cent below including LULUCF. Emissions decreased substantially between 1990 and 1999 owing to the economic recession. The increase in emissions since 1999 is driven by strong economic growth, the continued reliance on fossil fuels for primary energy supply, the abundance of natural resources in the oil and gas and mining sectors, and population growth.

126. Kazakhstan has established a comprehensive economy-wide strategic and policy framework, which, inter alia, aims at low-carbon development and the transition to a green economy in the long term. Goals and activities defined at the strategic level are further enforced by relevant legislative arrangements that prescribe short- and medium-term PaMs that contribute directly or indirectly to GHG emission reduction. Given the importance of the energy sector in terms of the overall GHG emissions of Kazakhstan and the fact that the sector is heavily dependent upon fossil fuels, almost all of the PaMs reported in the NC6 are energy related, covering both supply, such as the modernization of production capacities, energy efficiency and the promotion of renewable energy sources, and demand, such as energy efficiency in the residential and commercial sector and the use of less carbon-intensive fuels in transport.

127. Significant importance is given to the establishment and functioning of KazETS, which covers installations in the energy and industry sectors, including oil and gas, which contribute approximately 64.0 per cent of the total GHG emissions in the country. PaMs in the industrial processes, agriculture, forestry and waste sectors were not reported in the NC6, although information provided by Kazakhstan during the review indicated that PaMs do exist in almost all sectors.

128. In its NC6, Kazakhstan has presented GHG emission projections for the period 2015–2030 under the following scenarios: 'without measures', 'with measures' and 'with additional measures'. The total projected GHG emissions excluding LULUCF by 2020 under the 'without measures', the 'with measures' and the 'with additional measures' scenarios in relation to the 1990 level are +6.8 per cent, +0.2 per cent and –11.2 per cent, respectively. The projections indicate that Kazakhstan could meet its target for the second commitment period of the Kyoto Protocol (95 per cent of the 1990 level) only under the 'with additional measures' scenario and would need to implement further PaMs to achieve its 2020 target under the Convention (85 per cent of the 1990 level). The ERT noted that the projections are subject to uncertainty given the uncertainty of future GDP growth rate

and future development of the energy system, and that the projections are lower if much lower current GDP growth rates are assumed.

129. In terms of the assessment of the expected impacts of and vulnerability to climate change, Kazakhstan has carried out extensive work focusing on agriculture as the most vulnerable sector, namely on crop cultivation (wheat production) and cattle breeding (sheep). Water supply for agriculture is also named among the vulnerable sectors. Climate change scenarios highlight significant changes in the temperature regimes during all seasons, differentiated by region. Although a strategic sectoral document for agriculture includes a few relevant adaptation measures, they are yet to be prioritized and implemented.

130. Kazakhstan undertakes research activities relevant to climate change and related policy. The research focuses mostly on climate scenario forecasts, drought forecasts, impacts on and vulnerability of crops and cattle, and the ozone layer. Mitigation-related research, such as on renewable energy sources and energy efficiency, is limited but growing. Kazakhstan develops meteorological and hydrological assessments and forecasts, focusing on atmospheric observation systems, but it has not provided information on terrestrial observations. It cooperates extensively with international meteorological and hydrological organizations such as the World Climate Programme and the GCOS atmospheric system. Kazakhstan carries out an active exchange of hydrometeorological and atmospheric data with several other countries.

131. Kazakhstan has carried out some activities related to education, training and public awareness in relation to climate change. Educational programmes at all levels, from primary to postgraduate education, contain many subjects related to environmental protection. The Party has conducted numerous training activities relevant to climate change, particularly on the GHG inventory, emissions trading system and environmental law. Public awareness activities are implemented in Kazakhstan with the support of NGOs.

132. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of Kazakhstan's reporting under the Convention and its Kyoto Protocol. The key recommendations[8] are that Kazakhstan:

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

(i) Information on how its national circumstances and changes therein affect GHG emissions and removals over time;

(ii) Information on GHG emission and removal trends by gas for the entire time series in a tabular format;

(iii) A textual description of the principal PaMs implemented, adopted and/or planned for each sector, or rationale in the case of their non-existence in the industrial processes, agriculture, forestry and waste sectors;

(iv) Information on the effects of PaMs on GHG emissions other than CO_2;

(v) An explanation of how Kazakhstan believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention;

(vi) GHG emission projections in an aggregated format for each sector (absolute numerical values in a tabular format), with separate projections related to fuel sold to ships and aircraft engaged in international transport;

[8] The recommendations are given in full in the relevant sections of this report.

(vii) A description of actions taken with regard to adaptation to climate change;

(viii) Information on domestic and international activities related to the International Geosphere–Biosphere Programme, the IPCC and terrestrial observation systems;

(ix) Identification of the steps taken to promote and/or implement any decisions of ICAO and IMO;

(x) A description of enforcement procedures, an indication of how cases of non-compliance under domestic law are addressed;

(xi) A description of any provisions to make information on the legislative arrangements and enforcement and administrative procedures publicly accessible;

(b) Improve the transparency of its reporting by including in its next national communication the following:

(i) Separate projections for the LULUCF sector;

(ii) Information on public awareness information campaigns, the activities of resource and information centres, the involvement of the public and NGOs and its participation in international activities;

(iii) More detailed information on activities related to the promotion of modalities for the development, application and diffusion of environmentally sound technologies under Article 10 of the Kyoto Protocol.

V. Questions of implementation

133. During the review, the ERT assessed the NC6, including relevant supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol with regard to timeliness, completeness, transparency and adherence to the reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

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

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

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

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

"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 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

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

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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/biennial_report_kaz_ru.pdf>.

2013 greenhouse gas inventory submission of Kazakhstan. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php>.

2014 greenhouse gas inventory submission of Kazakhstan. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Gulmira Sergazina and Ms. Aigerim Yergabulova (Ministry of Energy), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Kazakhstan.