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Report on the technical review of the fourth biennial report of Slovakia

Developed country Parties were requested by decision 2/CP.17 to submit their fourth biennial report to the secretariat by 1 January 2020. This report presents the results of the technical review of the fourth biennial report of Slovakia, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”. The review took place from 22 to 26 June 2020 remotely.

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Contents

	<i>Page</i>
Abbreviations and acronyms	3
I. Introduction and summary	4
A. Introduction	4
B. Summary.....	4
II. Technical review of the information reported in the fourth biennial report	5
A. Information on greenhouse gas emissions and removals related to the quantified economy-wide emission reduction target	5
B. Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	7
C. Progress made towards achievement of the quantified economy-wide emission reduction target	8
D. Provision of financial, technological and capacity-building support to developing country Parties.....	23
III. Conclusions and recommendations	24
Annex	
Documents and information used during the review	26

Abbreviations and acronyms

AEA	annual emission allocation
Annex I Party	Party included in Annex I to the Convention
Annex II Party	Party included in Annex II to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CPS	Compact Price-Induced Market Equilibrium System for Slovakia (model)
CTF	common tabular format
Envirostrategy 2030	Greener Slovakia: Strategy of the Environmental Policy of the Slovak Republic until 2030
ENVISAGE	Environmental Impact and Sustainability Applied General Equilibrium (model)
ERT	expert review team
ESD	European Union effort-sharing decision
ESR	European Union effort-sharing regulation
EU	European Union
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NECP	National Energy and Climate Plan
NF ₃	nitrogen trifluoride
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
N ₂ O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
RES	renewable energy source(s)
SF ₆	sulfur hexafluoride
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This is a report on the centralized technical review of the BR4¹ of Slovakia. The review was organized by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention” (annex to decision 13/CP.20).

2. In accordance with the same decision, a draft version of this report was transmitted to the Government of Slovakia, which provided comments that were considered and incorporated into this final version of the report.

3. The review was conducted together with the review of one other Annex I Party from 22 to 26 June 2020 remotely² by the following team of nominated experts from the UNFCCC roster of experts: Kokou Jérémie Fontodji (Togo), Olga Gavrilova (Estonia), Helen Guyes (Australia), Diana Harutyunyan (Armenia), Vaiva Kazanavičiūtė (Lithuania), Ekaterine Mikadze (Georgia) and Jose Manuel Ramirez Garcia (Spain). Ms. Harutyunyan and Mr. Ramirez Garcia were the lead reviewers. The review was coordinated by Veronica Colerio and Sevdalina Todorova (secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the BR4 of Slovakia in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR4 was submitted on 30 December 2019, before the deadline of 1 January 2020 mandated by decision 2/CP.17. The CTF tables were also submitted on 30 December 2019. The BR4 was resubmitted on 9 July 2020 to address issues raised during the review; the resubmission included additions and correction of errors, particularly in the section on PaMs. The CTF tables were also resubmitted on 9 July 2020; the resubmission included changes to and correction of errors in CTF tables 2(a), 2(b), 2(c), 3, 4, 6(a) and 6(c), and the removal of CTF table 4(a)II. Unless otherwise specified, the information and values from the latest submission are used in this report.

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

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Slovakia in its BR4 mostly adheres to the UNFCCC reporting guidelines on BRs.

Table 1

Summary of completeness and transparency of mandatory information reported by Slovakia in its fourth biennial report

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation(s)</i>
GHG emissions and removals	Complete	Transparent	–

¹ The BR submission comprises the text of the report and the CTF tables, which are both subject to the technical review.

² Owing to the circumstances related to the coronavirus disease 2019, the technical review of the BR submitted by Slovakia had to be conducted remotely.

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation(s)</i>
Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	Complete	Transparent	–
Progress in achievement of targets	Complete	Mostly transparent	Issue 1 in table 4 Issue 2 in table 9
Provision of support to developing country Parties ^a	NA	NA	NA

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

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

II. Technical review of the information reported in the fourth biennial report

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

1. Technical assessment of the reported information

7. Total GHG emissions³ both excluding and including emissions and removals from LULUCF decreased by 41 per cent between 1990 and 2018. Emissions were at the highest point in 1990 and decreased thereafter with the lowest point reached in 2014. After 2014 the trend was stable, with a slight increase in emissions from transport, households, waste and some industrial categories. The changes in total emissions were driven mainly by factors such as the transition from a centrally planned economy to a market-based economy with an increased share of services in Slovakia’s GDP, the global economic and financial crises of 2009 and the debt crisis in the eurozone that started in 2012.

8. Other factors contributing to the reduction in emissions are the changes in the fuel mix to move from coal and oil to natural gas and RES, improved energy efficiency and the industrial and economic restructuring towards less energy-intensive production. According to the BR4, in 2007–2017 Slovakia reduced its energy intensity by 11 per cent. In 2000–2014 it recorded the greatest reduction (82.5 per cent) in energy intensity values among EU member States (Joint Research Centre, 2016). The decrease in emissions is further attributed to the impact of national air protection legislation and the implementation of PaMs related to climate change. However, the stable trends in recent years of several indicators, such as GHG emissions per capita (around 8.0 t CO₂ eq per capita since 2012) and GHG emissions per unit of GDP (around 0.30 kg CO₂ eq per 2010 USD purchasing power parity since 2012), show that the improvements have reached their current limiting values and new packages of measures would be needed to maintain the decreasing emission trends.

9. Table 2 illustrates the emission trends by sector and by gas for Slovakia. Note that information in this paragraph and table 2 is based on Slovakia’s 2020 annual submission, version 3, which has not yet been subject to review. All emission data in subsequent chapters are based on Slovakia’s BR4 CTF tables unless otherwise noted. The emissions reported in the 2020 annual submission differ from the data reported in CTF table 1, which is based on the annual submission of 30 April 2019. The resubmission of the inventory data in October 2019 was not taken into account by Slovakia because of time limitation; the reasons are provided in the BR4. The difference in total reported GHG emissions for 2017 between the original and the resubmitted 2019 annual submission is 0.3 per cent, and in the 2020

³ In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified.

submission the reported 2017 emissions without LULUCF were increased by 0.1 per cent, which has no significant impact on the overall trends in the GHG emissions.

Table 2
Greenhouse gas emissions by sector and by gas for Slovakia for 1990–2018

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2017	2018	1990–2018	2017–2018	1990	2018
1. Energy	56 279.49	36 462.16	32 924.06	29 515.42	29 309.27	–47.9	–0.7	76.6	67.6
A1. Energy industries	18 965.53	12 111.24	9 179.14	7 616.15	7 430.52	–60.8	–2.4	25.8	17.1
A2. Manufacturing industries and construction	16 096.72	9 435.52	7 666.18	7 136.15	7 633.20	–52.6	7.0	21.9	17.6
A3. Transport	6 823.77	5 725.61	7 425.74	7 603.39	7 738.65	13.4	1.8	9.3	17.9
A4. and A5. Other	11 980.87	6 844.11	6 756.32	5 423.19	4 915.92	–59.0	–9.4	16.3	11.3
B. Fugitive emissions from fuels	2 412.60	2 345.69	1 896.68	1 736.53	1 590.98	–34.1	–8.4	3.3	3.7
C. CO ₂ transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	9 858.45	8 666.48	9 534.79	9 630.64	9 611.82	–2.5	–0.2	13.4	22.2
3. Agriculture	6 022.51	2 783.93	2 398.10	2 652.42	2 745.29	–54.4	3.5	8.2	6.3
4. LULUCF	–9 676.05	–9 860.58	–6 147.90	–6 584.39	–5 670.38	–41.4	–13.9	NA	NA
5. Waste	1 356.67	1 379.01	1 548.58	1 676.82	1 681.98	24.0	0.3	1.8	3.9
6. Other ^a	NO	NO	NO	NO	NO	NA	NA	NA	NA
<i>Gas^b</i>									
CO ₂	61 633.46	41 289.13	38 523.22	36 087.34	36 087.84	–41.4	0.0	83.8	83.3
CH ₄	7 255.12	5 319.01	4 797.65	4 616.36	4 442.03	–38.8	–3.8	9.9	10.2
N ₂ O	4 313.62	2 550.45	2 442.79	2 016.83	2 098.54	–51.4	4.1	5.9	4.8
HFCs	NO	105.04	597.24	739.06	702.77	NA	–4.9	NA	1.6
PFCs	314.86	14.91	25.01	8.62	7.78	–97.5	–9.8	0.4	0.0
SF ₆	0.06	13.04	19.62	7.08	9.39	15 992.0	32.6	0.0	0.0
NF ₃	NO	NO	NO	NO	NO	NA	NA	NA	NA
Total GHG emissions excluding LULUCF	73 517.13	49 291.58	46 405.54	43 475.29	43 348.35	–41.0	–0.3	100.0	100.0
Total GHG emissions including LULUCF	63 841.08	39 431.01	40 257.64	36 890.91	37 677.97	–41.0	2.1	NA	NA

Source: GHG emission data: Slovakia's 2020 annual submission, version 2.

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

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

10. In brief, Slovakia's national inventory arrangements were established in accordance with a decision of the Ministry of Environment of Slovakia on 1 January 2007 (Ministry of Environment, 2007). The ERT noted that, in line with previous recommendations, the BR4 included clear information on the changes in the national inventory system since the previous NC and BR. The BR4 also refers to chapter 1.2 of the 2019 national inventory report, where further information on the national inventory arrangements can be found.

11. No significant changes in the arrangement or structure of Slovakia's national inventory system have occurred since the BR3. As requested in the previous review report, the BR4 included information on the organizational change that occurred in January 2017 at the Slovak Hydrometeorological Institute, which resulted in the establishment of the Department of Emissions and Biofuels, defined as the single national entity of Slovakia's national inventory system. These institutional updates enhanced the robustness and sustainability of the national inventory system. The system is operational and functioning and fulfils all main tasks and obligations in line with the approved plans. Continuous actions to support the personnel and financial capacity of the system are carried out with a view to guaranteeing its performance.

2. Assessment of adherence to the reporting guidelines

12. The ERT assessed the information reported in the BR4 of Slovakia and recognized that the reporting is complete, transparent and thus adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

1. Technical assessment of the reported information

13. For Slovakia the Convention entered into force on 23 November 1994. Under the Convention Slovakia committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020.

14. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. The legislative package regulates emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ using GWP values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Operators and airline operators can use such units to fulfil their requirements under the EU ETS, and member States can use such units for their national ESD targets, within specific limitations.

15. The EU 2020 climate and energy package includes the EU ETS and the ESD (see paras. 31–32 below). The EU ETS mainly covers large point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap has been put in place for 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from ESD sectors are regulated through member State specific targets that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020.

16. The European Commission set out its vision for a climate-neutral EU in November 2018, and in December 2019 presented the European Green Deal as a road map with actions for making the EU economy sustainable. The European Council endorsed in December 2019 the objective of making the EU climate-neutral by 2050. As part of the European Green Deal, the Commission proposed in March 2020 to enshrine the 2050 climate-neutrality target into the first European Climate Law. The European Green Deal calls for increased ambition in the 2030 emission reduction target to at least 50 per cent below the 1990 level. Member States will set out any increased ambition in the update of their NECPs.

17. Slovakia has a national target of limiting its emission growth to 13 per cent above the 2005 level by 2020 for sectors under the ESD. This target has been translated into binding quantified AEAs for 2013–2020. Slovakia's AEAs change following a linear path from 24,023.50 kt CO₂ eq in 2013 to 25,948.87 kt CO₂ eq in 2020.⁴ The EU ETS/ESD emission ratio for 2015–2017 (BR4, table 3.3) indicated that ESD emissions amounted to around 49 per cent of the total GHG emissions of Slovakia.

18. In addition to its ESD target, Slovakia reported in its BR4 on its further commitments under the EU 2020 climate and energy package, specifically a target of a 14 per cent share of RES in gross final energy consumption by 2020 under the EU directive on renewable energy (directive 2009/28/EC) and a national indicative target to decrease final energy consumption to 378 PJ and primary energy consumption to 686 PJ by 2020 under the EU directive on energy efficiency (directive 2012/27/EU). The overall target for 2020 under the National Renewable Energy Action Plan (resolution 677/2010) is a 10 per cent share of RES in gross final energy consumption: 14.6 per cent of heat consumption met by RES, 24 per cent of

⁴ EU transaction log.

electricity demand met by electricity generated from RES and 10 per cent of energy demand in transport met by RES.

19. Slovakia also reported on its longer-term targets that have been pledged under the Convention through the EU nationally determined contribution submitted under the Paris Agreement and adopted by the EU under the 2030 climate and energy framework (see para. 29 below). The pledge is to reduce emissions by at least 40 per cent below the 1990 level by 2030, enabling the EU to move towards a low-carbon economy and implement its commitments under the Paris Agreement. In order to achieve this target, EU ETS emissions must be reduced by 43 per cent below the 2005 level by 2030 and ESR emissions must be reduced by 30 per cent below the 2005 level by 2030 (see para. 32 below). The individual binding target for Slovakia for the ESR sectors is a 12 per cent reduction in emissions below the 2005 level by 2030.

20. In February 2019 Slovakia approved Envirostrategy 2030,⁵ which sets a more ambitious 2030 national target for Slovakia, which is also supported in the NECP, aiming to reduce GHG emissions for the ESR sectors by at least 20 per cent below the 2005 level (see para. 34 below).

21. In its NECP for 2021–2030, adopted in December 2019, Slovakia strengthened some national goals and committed to achieving carbon neutrality by 2050. The national indicative energy efficiency target and contribution to the European energy efficiency target indicated in the NECP is a 30.3 per cent energy efficiency improvement by 2030 relative to the 2007 level (10.27 Mtoe final energy consumption). Slovakia proposes a target of 19.2 per cent of RES in final energy consumption by 2030, which is an increase on the 18 per cent proposed in the draft NECP of December 2018, and a 14 per cent share of RES in transport and 52 per cent interconnectivity of the electricity grid.

2. Assessment of adherence to the reporting guidelines

22. The ERT assessed the information reported in the BR4 of Slovakia and recognized that the reporting is complete, transparent and thus adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

23. Slovakia provided information on its package of PaMs implemented and planned, by sector and by gas, in order to fulfil its commitments under the Convention. The Party reported on its policy context and legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs.

24. Slovakia provided information on a set of PaMs similar to those previously reported, with a few exceptions. Fewer PaMs are reported in the BR4 than in the BR3. Slovakia explained that this is because the BR4 contains information on only the most important PaMs. As a result, some policies that have less mitigation impact or had an earlier implementation date are not reported in the BR4. Slovakia further clarified in the BR4 that no PaMs with a significant mitigation impact have been cancelled without replacement. The Party indicated that there have been no changes to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target since the previous NC and BR. In its BR4, Slovakia explained that the process of monitoring PaMs is harmonized for all EU member States in accordance with the EU monitoring mechanism regulation (regulation 525/2013,

⁵ See https://www.minzp.sk/files/iep/greener_slovakia-strategy_of_the_environmental_policy_of_the_slovak_republic_until_2030.pdf.

adopted in May 2013). The main aims of the regulation are to improve the quality of the data reported and to assist EU member States in tracking their progress towards emission targets for 2013–2020. In 2014 an EU implementing regulation (regulation 749/2014) and a delegated regulation (regulation 666/2014) were adopted to enable implementation of the above-mentioned EU monitoring mechanism regulation and its provisions, specifying in more detail the structure of the information, reporting formats and submission procedures.

25. In its reporting on PaMs, Slovakia provided the estimated emission reduction impacts for some of its PaMs in the energy sector based on a sectoral model. Mitigation impacts were not estimated for PaMs in other sectors. Where estimated impacts were not provided, the Party supplied an explanation applicable to all PaMs. Non-energy sector PaMs were included in the WEM projections scenario in a manner consistent with the previous submission using expert software.

26. Slovakia stated that the methodology used to estimate the impacts of PaMs was aligned with a study on low-carbon growth prepared in cooperation with the World Bank in 2018 (World Bank, 2019) in preparation for its national long-term strategy. For this study, only selected PaMs that could be quantified were modelled. A new model, CPS, was used to assess mitigation impacts for the energy sector. The CPS model is described as a single-country partial equilibrium model for the energy sector that balances energy supply and demand. The model outputs are based on technical and economic assessment.

27. Slovakia reported new information on the economic impact of PaMs in its BR4 (section 4.6) that was not in its BR3 (section 4.9). In the BR4, Slovakia reported on the macroeconomic impact of PaMs in terms of investment expenditure, energy system costs, employment and consumption. Impacts were largely reported for the change from the WEM to the WAM scenario, although some absolute annual impacts were also reported (BR4, table 4.10). The ERT noted that the inclusion of this new information is relevant to Slovakia's recent (2019) commitment to carbon neutrality by 2050. Modelling results in Slovakia's Low-Carbon Development Strategy⁶ show that additional mitigation actions may be required beyond the WAM scenario; the new information shows the domestic economic impact of the WAM actions that Slovakia is considering.

28. Slovakia partly reported on its self-assessment of compliance with its emission reduction targets and national rules for taking action against non-compliance. Slovakia's compliance process is based on the EU compliance process for measuring progress towards the EU 2020 and 2030 targets. National targets are currently set in non-legislative documents such as strategies, which are approved by the Government and often contain the requirement for regular reporting to the Government. Slovakia advised that it does not have national rules for taking action against non-compliance. However, legislation for setting national targets, and the means for assessing compliance with these targets, is under development.

29. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO₂ emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package. The 2030 climate and energy framework, adopted in 2014, includes more ambitious targets that will be updated as part of the European Green Deal.

30. The achievement of the Energy Union objectives and targets is ensured through a combination of Energy Union initiatives and national policies set out in integrated NECPs. The NECPs are periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal. Slovakia's BR4 referred to its draft NECP of December 2018. During the review Slovakia provided the ERT with its revised NECP of December 2019. The revised NECP contains energy sector targets for 2030, including a strengthened RES target as described in paragraph 21 above. The 2030 target for share of RES in final energy consumption was increased on the basis of an economic and technical assessment as well as feedback from a public consultation process. Slovakia identified scope to increase the use of RES in heat

⁶ See https://ec.europa.eu/clima/sites/its/its_sk_en.pdf.

generation to achieve the revised target. Another objective in the NECP is to extend Slovakia's Energy Policy (resolution 548/2014, adopted in 2014) to include decarbonization, which would be effected through, for example, replacing solid fuels with RES, improving energy efficiency and using alternative fuels in the transport sector.

31. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N₂O emissions from chemical industry, PFC emissions from aluminium production and CO₂ emissions from some industrial processes that were not covered in the previous phases of the EU ETS (since 2013). Auctioning is the default method for allocating allowances; however, harmonized rules for free allocations, based on benchmark values achieved by the most efficient 10 per cent of installations, are still in place as a safeguard for the international competitiveness of industrial sectors at risk of carbon leakage. For 2030, an emission reduction target of 43 per cent below the 2005 level has been set for the EU ETS.

32. The ESD became operational in 2013 and covers transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020, and it includes binding annual targets for each member State for 2013–2020. The ESR, successor to the ESD, was adopted in 2018. It sets national emission reduction targets for 2030 ranging from 0 to 40 per cent below the 2005 level, and trajectories with annual limits for 2021–2030, for all member States, and keeps many of the flexibilities of the ESD. Slovakia's ESR target is outlined in paragraph 19 above.

33. Slovakia highlighted the EU-wide mitigation actions that are under development, such as the reform of phase IV (2021–2030) of the EU ETS. Implementing the reform package will introduce more scarcity into the market by reducing the annual emission allowances and enforcing the market stability reserve. These EU ETS reforms are expected to increase the carbon prices and reduce emissions from energy supply in Slovakia. As a result, power generators in Slovakia are expected to transition from coal to gas.

34. Slovakia introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policies reported are the Energy Policy, Envirostrategy 2030, air protection legislation and energy efficiency improvements. Envirostrategy 2030 is a cross-cutting measure that increases Slovakia's 2030 ESR target to 20 per cent below the 2005 level (see para. 20 above). Furthermore, Envirostrategy 2030 aims to gradually introduce circular economy principles, whereby the recycling rate for municipal waste will be increased to a minimum of 60 per cent by 2030 and the landfill rate will be reduced to less than 25 per cent by 2035. Green public procurement will cover at least 70 per cent of the total value of all public procurement and support for green innovation, science and research will increase significantly.

35. The ERT noted that the actions to improve energy efficiency are of particular interest as having the most significant mitigation impacts. Slovakia reported reducing final energy consumption across many sectors (buildings, industry, public sector, transport and appliances) and that the greatest of the mitigation impacts are in the buildings sector. The mitigation impact of the energy efficiency improvements is projected to grow strongly from the estimated impact of avoided emissions of 366.52 kt CO₂ eq in 2020 to 1,252.35 kt CO₂ eq in 2030. Other implemented measures with significant impact are the EU winter package (with a projected reduction in emissions of 277.88 kt CO₂ eq in 2020) and the national air protection legislation.⁷

⁷ The mitigation effect of the national air protection legislation is not quantified as the policy was adopted in 1991 and has direct and indirect effects on GHG emissions; however, it is reported in the BR4 to have had a lasting effect since its adoption.

36. In its BR4, Slovakia highlighted the domestic mitigation actions that are under development: the NECP⁸ and the Low-Carbon Development Strategy, both of which have since been finalized. Individual PaMs being planned include decommissioning fossil fuel power plants, increasing the share of nuclear power in the energy mix, expanding the use of electricity in the transport sector, implementing an F-gas ban from 2020, decarbonizing electricity generation and continuing to improve final energy efficiency in all sectors. Among the mitigation actions that provide a foundation for significant additional action is the continuation of improving final energy efficiency in all sectors (CTF table 3). This planned measure builds on the success of the implemented energy efficiency improvements and shows strong growth in mitigation impact across the projected period.

37. Table 3 provides a summary of the reported information on the PaMs of Slovakia.

Table 3

Summary of information on policies and measures reported by Slovakia

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact in 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact in 2025 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact in 2030 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact in 2035 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	EU ETS	IE	IE	IE	IE
	Implementation of the EU winter package	277.78	293.81	315.05	371.18
	Envirostrategy 2030	NE	NE	NE	NE
	NECP	NE	NE	NE	NE
Energy	Low-Carbon Development Strategy	NE	NE	NE	NE
	Energy Policy	NE	NE	NE	NE
	Decommissioning fossil fuel power plants	NA	576.32	896.39	736.95
	Decarbonization of electricity generation	341.64	559.13	687.82	752.60
	Optimization of district heating network	NE	393.50	453.88	739.72
	Environmental design and use of products	21.99	47.33	55.23	69.85
	Transport	CO ₂ standards for cars and vans, efficiency standards for trucks along with the electrification of transportation	NE	NE	NE
Renewable energy	National Renewable Energy Action Plan	NE	NE	NE	NE
Energy efficiency	Continued improvement of final energy efficiency in all sectors	636.68	961.72	2 001.70	2 146.36
	Energy efficiency improvements	366.52	696.85	1 252.35	1 418.07
IPPU	Implementation of the EU F-gas regulation	NE	NE	NE	NE
Agriculture	Government ordinance 342/2014 Coll. on conditions for granting subsidies in agriculture through direct payments	NE	NE	NE	NE
LULUCF	Rural Development Programme for 2014–2020	NE	NE	NE	NE
Waste	Waste Management Programme 2016–2020	NE	NE	NE	NE

Sources: Slovakia's BR4 table 4.7 and CTF table 3. In CTF table 3 "NA" for "not available" (explanation provided in a footnote to the table) was used instead of "NE".

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

38. During the review, Slovakia indicated that the Government receives regular reporting on and evaluation of PaMs as an established practice. In addition, the Party is in the process of developing a climate change act that could potentially encompass a more centralized system for monitoring the implementation of climate change PaMs. The ERT noted that enhanced, more centralized arrangements for monitoring PaMs could be beneficial for tracking progress to the mid-term 2030 target and longer-term 2050 target. In particular, enhanced arrangements for quantifying the effect of the most significant PaMs in each sector would assist in tracking progress to post-2020 targets. In its BR4, Slovakia noted with concern the trend of rising transport emissions from 1990 to 2017 (mostly road transport) and

⁸ See https://ec.europa.eu/energy/sites/ener/files/sk_final_necp_main_en.pdf.

in the WEM scenario to 2030. The WAM scenario shows that CO₂ emissions from road transport can be stabilized by 2025 (BR4, figure 5.8). This highlights the importance of quantifying PaMs in all sectors and subsectors to assist with decisions about planned PaMs.

(b) **Policies and measures in the energy sector**

39. **Energy efficiency.** In its BR4, Slovakia reported on several cross-cutting policies and strategic measures relating to energy efficiency. The Energy Policy regulation is the strategic document defining the energy sector's primary objectives and priorities up to 2035 and beyond to 2050. Efficient energy utilization at optimum cost is one of its priorities. The Low-Carbon Development Strategy includes energy efficiency as one of its main pillars. Regarding strategic measures, in 2014 Slovakia implemented the measure on energy efficiency improvements, which determined minimum requirements with respect to the energy performance of new and existing buildings. This measure will be extended by a planned measure to cover final energy efficiency in all sectors, which includes strict building codes for new constructions, the promotion of heat recovery and best available technologies in industry, and development of infrastructure and soft measures enabling higher efficiency in the transport sector. Slovakia has estimated that the mitigation impact of specific energy efficiency improvement at the sectoral level (buildings, industry, the public sector, transport and appliances) will amount to 1,003.20 kt CO₂ eq by 2020.

40. On the basis of all these measures, Slovakia is well on track to meeting its 2020 target on energy efficiency. Its primary energy consumption (16.1 Mtoe in 2017) was already under the 2020 target of 16.4 Mtoe, with final energy consumption (11.1 Mtoe in 2017) still showing a gap to the 2020 target of 8.9 Mtoe. There has been a general decreasing trend over the past few years; however, the limits in decreasing the country's energy consumption have been clearly visible over the last four years. Therefore, further efforts are needed to lower final energy consumption in Slovakia.

41. **Energy supply and renewables.** The Energy Policy is intended to ensure the sustainability of the Slovak energy sector. In addition to improving energy efficiency, it aims to ensure the reliability and stability of the energy supply. Slovakia has a balanced proportion of nuclear fuel, fossil fuels and RES in its gross domestic energy consumption. In 2018 it was shared between natural gas (24.3 per cent), nuclear fuel (22.5 per cent), coal (20.0 per cent), crude oil (21.9 per cent) and RES (11.3 per cent). The energy intensity of the Slovak economy has declined and the share of gross energy consumption from RES had increased by 73 per cent in 2017 compared with the 2005 level. In addition, the Party is planning the decommissioning of some fossil fuel power plants. Concretely, Nováky and Vojany power plants will be decommissioned in 2023 and 2025, respectively.

42. The National Renewable Energy Action Plan was adopted in 2010 with the aim of increasing the share of electricity from RES in the power system and increasing consumption of biomass for producing heat and electricity (see para. 18 above). Additionally, the EU winter package was implemented with a view to supporting the transition to clean energy by increasing the share of electricity production from RES in the power system (with a target of 27 per cent renewable energy by 2030) and increasing the consumption of biomass for the production of electricity and heat. Eligible RES technologies for this decarbonization are solar photovoltaics, onshore wind turbines and biomass.

43. **Residential and commercial sectors.** These sectors are affected by the same cross-cutting policies and strategic measures related to energy efficiency described above (Energy Policy and Low-Carbon Development Strategy). The energy efficiency measures reported by Slovakia also contain specific actions for the residential and commercial sectors. In 2014 the Party started implementing some energy efficiency improvements focusing on the energy performance of new and existing buildings (renovation of buildings), which constitute the most important source of possible energy savings. Slovakia also reported that, in 2020, additional measures would be put in place based on the promotion of strict building codes for new constructions and that the district heating network is being optimized by the use of cogeneration of heat and electricity.

44. **Transport sector.** Slovakia reported on several policies and strategic measures relating to reducing emissions from the transport sector such as the environmental design and

use of products; CO₂ standards for cars and vans; efficiency standards for trucks along with the electrification of transportation; and the promotion of biofuels in road transport. Despite all these PaMs focused on the sector, transport is the sector with the greatest increase in its projected emissions by 2030 (28.9 per cent in 2030 in relation to the 1990 level in a WEM scenario; see para. 72 below and table 7).

45. The environmental design and use of products sets different regulations, including the requirement for the automotive industry to reduce the environmental impact of cars throughout their life cycle, with the use of vehicles produced in this way having the effect of reducing CO₂ emissions in the transport sector. Slovakia also reported on its implementation, by promoting and supporting fully electric cars or plug-in hybrid cars, of the EU regulations that set limits for CO₂ emissions from car and vans.⁹ Slovakia has in place a biofuels policy aligned to EU legislation and intends to accelerate implementation of second-generation biofuels by requiring operators to continuously increase the share of them blended in gasoline and diesel. The planned measures in the sector envisage strong uptake of electric cars and fuel cell cars, replacing internal combustion engine cars.

46. **Industrial sector.** The reduction in emissions in the sector in Slovakia in past years was the result of a combination of different impacts: industrial and technological restructuring connected with the fuel switching of fossil fuels from coal and oil to natural gas; economic restructuring towards less energy-intensive production; and temporary changes in production intensity. According to information from the Statistical Office of Slovakia, the energy industry, including industrial processes (production and distribution of electricity, natural gas and water), reached a 28 per cent share of the total GDP of Slovakia in 2017. Reducing industrial sector energy consumption is promoted through the cogeneration of industrial steam (including from biomass) and the self-generation of electricity.

(c) **Policies and measures in other sectors**

47. **Industrial processes.** Slovakia has regulated the market of some F-gases in line with EU regulation 517/2014, focusing on the F-gases with the highest GWP. The Party indicated in its BR4 that it is planning to ban the sale of products containing F-gases from 2020 in accordance with the timetable in annex III to EU regulation 517/2014.

48. **Agriculture.** The potential for reducing GHG emissions in agriculture is related to manure management, in particular the handling and storage of manure and slurry, and a change of animal feed plans. Slovakia has implemented several PaMs to address N₂O emissions from agricultural soils and manure use. These PaMs stem from Government ordinance 342/2014 Coll. and are delivered through direct payments for efficient fertilizer use, improved manure management and improved livestock management. N₂O emissions are addressed through efficient use and appropriate timing of nitrogen inputs from mineral fertilizers and through animal feeding and manure manipulation and processing. CH₄ emissions are addressed through managing the number of dairy cattle and intensive feeding with active substances.

49. **LULUCF.** Slovakia's Rural Development Programme for 2014–2020 is aimed at increasing agricultural and forest competitiveness and improving natural resource management. Around 20 per cent of agricultural land is to be managed with a view to protecting natural resources (biodiversity, soil and/or water). The Rural Development Programme contributed to the afforestation of around 1,500 ha and grassing of 50,000 ha arable land by 2016.

50. **Waste management.** Slovakia's national targets to reduce waste generated and sent to landfill are set in the Waste Management Programme 2016–2020, which evaluated the previous plans in the sector and upgraded the five-year target range 2011–2015. The Waste Prevention Programme 2019–2025 sets annual targets to 2025 and includes a new waste management information system to help to monitor waste flows from generation to recovery to disposal. Current targets apply to reducing residual municipal waste to 50 per cent of the

⁹ EU regulations 2009/443/EC, 2011/510/EC and 2007/715/EC.

2016 level by 2025, reducing biodegradable waste in residual municipal waste by 60 per cent by 2025 and reducing landfill to 10 per cent of total municipal waste by 2035.

(d) Response measures

51. Slovakia reported on its assessment of the economic and social consequences of its response measures, including on how structural change in the economy in response to decarbonization policies impacts the aggregate labour demand and wages and the impact of the EU ETS on third countries. The Party's initiatives focus on minimizing adverse impacts, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties, as a result of implemented measures such as fiscal policy instruments, biofuels policy and GHG emission reduction policies.

(e) Assessment of adherence to the reporting guidelines

52. The ERT assessed the information reported in the BR4 of Slovakia and identified issues relating to transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 4.

Table 4

Findings on mitigation actions and their effects from the review of the fourth biennial report of Slovakia

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 6 Issue type: transparency Assessment: recommendation	<p>In its BR4 submitted in December 2019 Slovakia reported incomplete information related to ESD GHG emissions in table 4.5, since no information about CH₄, SF₆ and HFCs was included. Additionally, the gases affected by implemented and planned PaMs by sector are mostly limited to one gas (e.g. CO₂ for the energy sector), when additional gases would be expected to be affected by the measures. Furthermore, in the BR4 the Party noted that the methodology used for PaMs reporting and emission projections is aligned with a study on low-carbon growth prepared in cooperation with the World Bank (World Bank, 2019) without providing an additional summary of the methodology used to estimate the effect of PaMs.</p> <p>During the review, Slovakia explained that only emissions allocated under the EU ETS were reported in table 4.5 of the BR4. CH₄, SF₆ and HFCs are not covered by the EU ETS and therefore are all allocated to the ESD commitment. In response to a comment of the ERT regarding the inconsistency of this explanation with the table title ("Evaluation of the EU ETS and ESD GHG emissions in 2016 and 2017"), the Party revised table 4.5 to include the F-gases. However, the ERT noted that information about CH₄ is still missing. The Party also clarified that the new CPS model used in estimating the energy and industrial sector emissions reported in the BR4 did not allow the mitigation impact of non-CO₂ emissions to be determined. During the review Slovakia provided links to the studies containing full descriptions of the methodology used to estimate the effect of PaMs.</p> <p>The ERT recommends that the Party improve the transparency of the information reported on its PaMs in future BRs by providing data on all gases under both the EU ETS and the ESD in the BR tables, as well as including a summary of the methodologies for estimating mitigation impacts and any limitations they may have (e.g. not allowing the mitigation impact of non-CO₂ emissions to be determined).</p>
2	Reporting requirement specified in paragraph 8 Issue type: transparency Assessment: encouragement	<p>Slovakia reported information on the economic and social consequences of response measures in section 4.6 of its BR4. The Party provided a detailed report on the economic impacts of changing from the WEM scenario to the WAM scenario. However, information on assessment of social consequences is missing.</p> <p>During the review Slovakia provided information on the social consequences of changing from the WEM scenario to the WAM scenario contained in its Low-Carbon Development Strategy, where consequences in terms of workforce restructuring, social rights and energy poverty are discussed.</p> <p>To enhance the transparency of the reporting, the ERT encourages the Party to provide, to the extent possible, detailed information on the assessment of both the economic and social consequences of response measures in its next BR.</p>

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
3	Reporting requirement specified in paragraph 24 Issue type: transparency Assessment: encouragement	Slovakia reported its assessment of compliance with emission reduction commitments at the EU level but did not provide information on the domestic arrangements established for the process of self-assessing compliance with emission reduction commitments. During the review, Slovakia explained that there are no national legislative rules that would put in place measures against non-compliance with national emission reduction targets. Targets are set in non-legislative documents such as strategies. The Party also explained that it has started preparing a climate change act with some planned mechanisms for setting national targets and ways to establish a process of assessing compliance with such targets. Noting the improbability of non-compliance with the emission reduction commitments by Slovakia, the ERT reiterates the encouragement from the previous review report for the Party to improve the transparency of its reporting by including, to the extent possible, information on domestic arrangements for the process of self-assessing compliance and national rules for taking action against non-compliance in its next BR.

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

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

(a) Technical assessment of the reported information

53. Slovakia reported that it does not intend to use units from market-based mechanisms under the Convention to meet its commitment under the ESD. It reported in CTF tables 4 and 4(b) that it did not use any units from market-based mechanisms in 2016 or 2017 (reported as “NA” in CTF table 4 and zero in CTF table 4(b)).

54. The use of flexible mechanisms to meet emission reduction targets is possible under both the EU ETS and the ESD for EU member States. The use of flexible mechanisms in Slovakia currently involves only operators in the EU ETS. In its BR4 Slovakia stated that it is not planning to use international credits in the ESD scheme for meeting the annual trajectory target; however, the Party has already used the carry-over flexibility under the scheme.

55. Given that the contribution of LULUCF activities is not included in the joint EU target under the Convention, reporting of contributions of LULUCF activities is not applicable for Slovakia.

56. Table 5 illustrates Slovakia’s ESD emissions and the use of units from market-based mechanisms to achieve its ESD target.

Table 5

Summary of information on the use of units from market-based mechanisms by Slovakia to achieve its target

Year	ESD emissions (kt CO ₂ eq)	AEA (kt CO ₂ eq)	Use of units from market-based mechanisms (kt CO ₂ eq) ^a	Annual AEA surplus/deficit (kt CO ₂ eq) ^b	Cumulative AEA surplus/deficit (kt CO ₂ eq)
2013	21 080.248	24 023.495	NA	2 943.247	2 943.247
2014	19 782.144	24 383.530	NA	4 601.386	7 544.633
2015	20 084.623	24 743.565	NA	4 658.942	12 203.575
2016	19 758.694	25 103.599	NA	5 344.905	17 548.480
2017	21 249.803	25 041.595	NA	3 791.792	21 340.272
2018	NA	25 344.020	NA	NA	NA

Sources: Slovakia’s BR4, information provided by the Party during the review and EU transaction log (AEAs).

^a The use of “NA” indicates that the Party stated in its BR that it does not intend to use market-based mechanisms to achieve its target.

^b A positive number (surplus) indicates that ESD emissions were lower than the AEA, while a negative number (deficit) indicates that ESD emissions were greater than the AEA.

57. In assessing the progress towards achieving the 2020 joint EU target, the ERT noted that Slovakia's emission reduction target for the ESD is 13 per cent above the 2005 level (see para. 17 above). In 2017, Slovakia's emissions covered by the ESD were 15.1 per cent (3,791.79 kt CO₂ eq) below the AEA under the ESD. The Party has a cumulative surplus of 21,340.27 kt CO₂ eq with respect to its AEAs between 2013 and 2017, and carried over its surplus AEAs in accordance with the results of the compliance cycle for 2013, 2014, 2015 and 2016 ESD emissions.

58. The ERT noted that Slovakia is making progress towards its ESD target by implementing mitigation actions that are delivering significant emission reductions.

(b) Assessment of adherence to the reporting guidelines

59. The ERT assessed the information reported in the BR4 of Slovakia and recognized that the reporting is complete, transparent and thus adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

60. Slovakia reported updated projections for 2020 and 2030 relative to actual inventory data for 2016 under the WEM scenario. The WEM scenario reported by Slovakia includes implemented PaMs until 2018.

In addition to the WEM scenario, Slovakia reported the WAM scenario for all sectors; however, projected GHG emissions for the agriculture and waste sectors are the same as those reported under the WEM scenario, since no additional measures were planned. Slovakia also reported the WOM scenario only for the LULUCF sector in the textual part of the BR4. The WAM scenario includes planned PaMs, while the WOM scenario excludes all PaMs implemented, adopted or planned after 2016. Slovakia provided a description of its scenarios, explaining that its WEM scenario, which is equivalent to the EU 2016 reference scenario, includes policies such as fuel switching of district heating solid fuel fired plants to biomass and gas, and a subsidy on new sales of passenger cars, while its WAM scenario includes earlier decommissioning of solid fuel fired utility power plants, a RES support scheme in power generation and the clean energy for all Europeans policy package, launched by the European Commission in 2016, and is based on the implementation of the EU CO₂ scenario in the energy sector.¹⁰ The WEM (reference scenario) and the WAM (Dcarb2 scenario (median targets for renewables and energy efficiency)) are described in section 5.1 of the BR4 with reference to the Low-Carbon Development Strategy, where further details of the scenarios are included. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on BRs.

61. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs, SF₆ and NF₃ for 2020–2040. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4. Slovakia reported on factors and activities affecting emissions for each sector.

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

62. The methodology used for the preparation of the projections is different from that used for the preparation of the emission projections for the NC7 for some sectors. For the energy and IPPU sectors the new model CPS substituted for the previously used model (MESSAGE) and a more detailed modelling approach was applied for the LULUCF sector (projections of forest land included simulation of changes in age structure, tree species composition, growing stock and biomass available for harvesting), while the methodology for the agriculture and

¹⁰ The EU CO₂ scenario sets targets for the EU, such as reducing GHG emissions by 40 per cent by 2030 in relation to the 1990 level and 80–85 per cent by 2050, ensuring a 27 per cent share of RES in final energy demand in 2030 and increasing energy efficiency by reducing primary energy by 30 per cent by 2030 in relation to the 2007 level.

waste sectors remained the same. Slovakia provided information on the changes since the submission of its NC7 in the assumptions, methodologies, models and approaches used in the projection scenarios.

63. The major change in terms of methodology is linked to the use of the CPS model, which is based on demand for energy by sector and fuel, modelling of energy efficiency possibilities, capacities of technologies, power generation mix, cogeneration and other energy supply technologies, fuel prices and system costs, investment by sector and energy-related CO₂ emissions. Further information on the models is available in the study on low-carbon growth prepared in cooperation with the World Bank in 2018 (World Bank, 2019), which focuses on the preparation of the projections and provides an analysis of potential development in terms of Slovakia's obligations with respect to GHG emission reduction under the Paris Agreement and as an EU member State. In addition to the CPS model applied for the energy sector, a macroeconomic model, ENVISAGE-Slovakia, was applied to reflect the development of the Slovak economy. Slovakia updated and provided additional information about the models and software tools used for estimating projections, including information about gases and sectors covered and the strengths and weaknesses of the models used, as requested in the previous review report.

64. The change in the model and the introduction of more effective measures used in the preparation of projections for the energy and IPPU sectors for the BR4 resulted in a significant reduction in projected GHG emissions in relation to those reported in the NC7 and BR3 (e.g. 37.5 per cent lower projected GHG emissions under the WAM scenario in the energy sector (excluding transport) in 2030 and 17.0 per cent lower projected GHG emissions under the WAM scenario in the IPPU sector in 2030), while changes in the projections of GHG emissions from the agriculture sector since the NC7 and BR3 are attributed to the application of updated activity data and higher methodological tiers. Significant changes in the projected GHG removals in the LULUCF sector since the NC7 and BR3 are related to updated information about the future development of growing stock, harvested volumes and biomass increment in managed forest land. A significant reduction (32.3 per cent) in projected GHG emissions from the waste sector under the WAM scenario in 2030 in relation to those reported in the NC7 and BR3 is explained as being due to strengthened policy (Waste Prevention Programme 2019–2025).

65. The overall impact of the CPS model and the advanced methodology applied for estimating GHG projections, as well as the introduction of more effective measures, resulted in a reduction of 12.0 per cent in projected GHG emissions under the WAM scenario in 2030 in relation to those reported in the NC7 and BR3. The change for the WEM scenario for the same year is an increase in projected emissions of 1.6 per cent. Slovakia reported in CTF table 5 the key variables and assumptions used in the preparation of the projection scenarios.

66. To prepare its projections, Slovakia relied on key underlying assumptions relating to population, energy and EU ETS carbon prices, economic development indicators, development of transportation, waste amounts generated and agricultural production, etc. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. It is projected that GDP will significantly increase in 2020 and 2030 (by 9.4 and 43.3 per cent, respectively, in relation to 2017 data), while the population figure will fluctuate around 5.5 million. A decrease in livestock numbers is projected in the agriculture sector (of 8.2 and 11.3 per cent for 2020 and 2030, respectively, in relation to 2015 data), while a significant increase in passenger-kilometres and freight transport tonnes-kilometres in relation to 2015 data is projected (of 17.8 and 51.2 per cent for 2020 and 2030, respectively, for passenger-kilometres and 14.3 and 40.5 per cent for 2020 and 2030, respectively, for tonnes-kilometres).

(c) Results of projections

67. The projected emission levels under different scenarios and information on the quantified economy-wide emission reduction target are presented in table 6 and figure 1.

Table 6
Summary of greenhouse gas emission projections for Slovakia

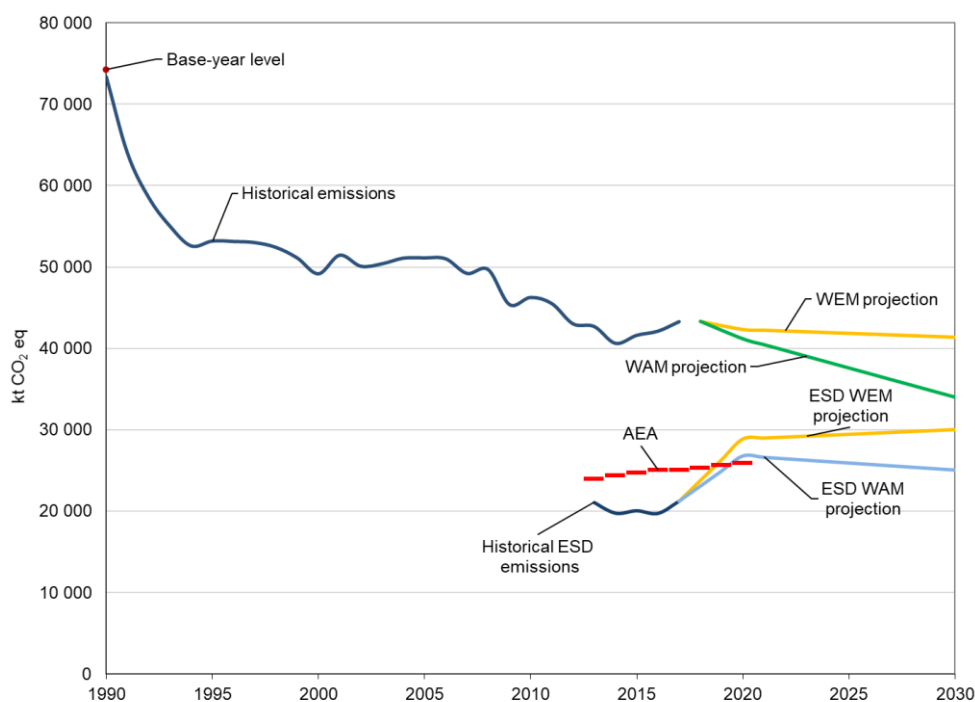
	Total GHG emissions		Emissions under the ESD	
	GHG emissions (kt CO ₂ eq per year)	Change in relation to 1990 level (%)	ESD emissions (kt CO ₂ eq per year)	Comparison to 2020 AEA (%)
2020 AEA under the ESD ^a	NA	NA	25 948.871	NA
Inventory data 1990	73 979.97	–	NA	NA
Inventory data 2017	43 316.45	–41.4	21 249.803	–18.1
WEM projections for 2020	42 354.74	–42.7	28 866.960	11.2
WAM projections for 2020	41 202.63	–44.3	26 825.090	3.4
WEM projections for 2030	41 399.02	–44.0	30 019.197	15.7
WAM projections for 2030	34 019.06	–54.0	25 086.432	–3.3

Sources: Slovakia's BR4 and CTF table 6 (data for 2017 are based on CTF table 1, since they are not provided in CTF table 6). ESD emissions and projections data were provided by Slovakia during the review.

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

^a The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. Slovakia's target under the ESD is 13 per cent above the 2005 level by 2020.

Figure 1
Greenhouse gas emission projections reported by Slovakia



Sources: EU transaction log (AEAs) and Slovakia's BR4 and CTF tables 1 and 6. ESD emissions and projections data were provided by Slovakia during the review.

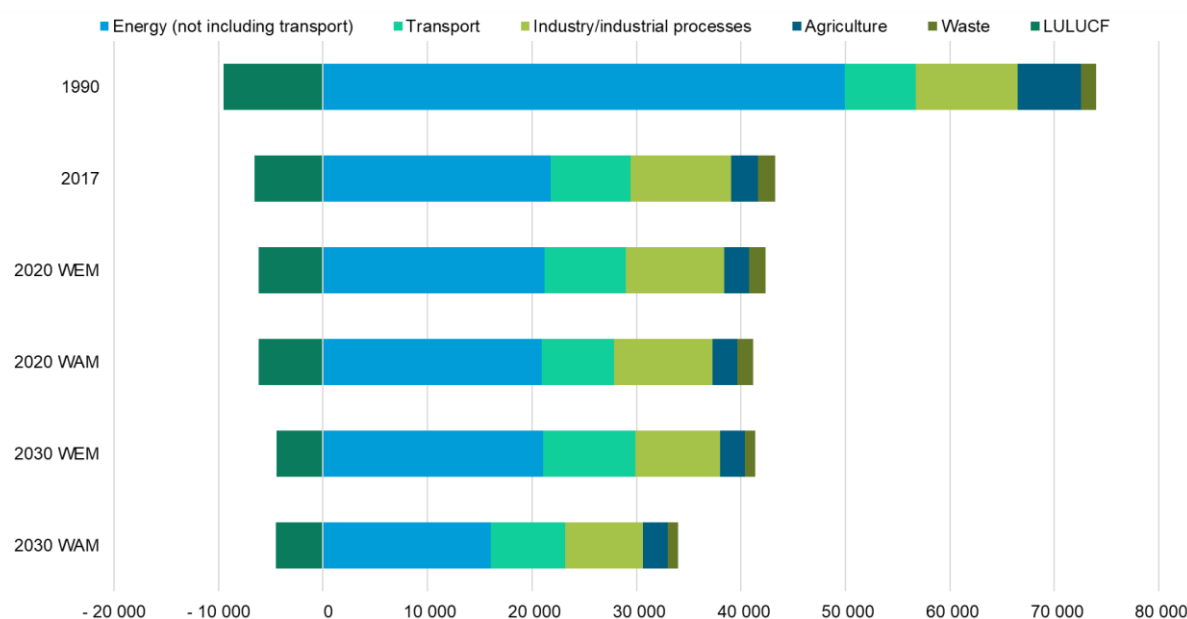
68. Slovakia's total GHG emissions excluding LULUCF in 2020 and 2030 are projected under the WEM scenario to decrease by 42.7 and 44.0 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 44.3 and 54.0 per cent, respectively.

69. Slovakia's target under the ESD is to limit its ESD emission growth to 13 per cent above the 2005 level by 2020 (see para. 17 above). Slovakia's AEAs, which correspond to its national emission target for ESD sectors, change linearly from 24,023.50 kt CO₂ eq in 2013 to 25,948.87 kt CO₂ eq for 2020. The projected level of emissions under the WEM and WAM scenarios is 11.2 and 3.4 per cent, respectively, above the AEAs for 2020. The ERT noted that this, together with the Party's cumulative surplus of AEAs of 21,340.27 kt CO₂ eq, suggests that Slovakia expects to meet its target under the WEM scenario.

70. Slovakia presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in figure 2 and table 7.

Figure 2
Greenhouse gas emission projections for Slovakia presented by sector

(kt CO₂ eq)



Source: Slovakia's BR4 CTF tables 1 and 6.

Table 7
Summary of greenhouse gas emission projections for Slovakia presented by sector

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	49 912.05	21 227.92	20 967.00	21 092.87	16 054.86	-57.5	-58.0	-57.7	-67.8
Transport	6 823.77	7 772.47	6 878.20	8 797.29	7 096.90	13.9	0.8	28.9	4.0
Industry/industrial processes	9 783.16	9 414.10	9 417.17	8 097.59	7 456.03	-3.8	-3.7	-17.2	-23.8
Agriculture	6 068.37	2 376.24	2 376.24	2 419.79	2 419.79	-60.8	-60.8	-60.1	-60.1
LULUCF	-9 545.63	-6 145.05	-6 159.85	-4 434.01	-4 482.77	-35.6	-35.5	-53.5	-53.0
Waste	1 392.62	1 564.01	1 564.01	991.49	991.49	12.3	12.3	-28.8	-28.8
Other	-	-	-	-	-	-	-	-	-
Total GHG emissions excluding LULUCF	73 979.97	42 354.74	41 202.63	41 399.02	34 019.06	-42.7	-44.3	-44.0	-54.0

Source: Slovakia's BR4 CTF table 6.

71. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy (not including transport) and agriculture sectors, amounting to projected reductions of 57.5 per cent (28,684.13 kt CO₂ eq) and 60.8 per cent (3,692.13 kt CO₂ eq) between 1990 and 2020, respectively. A significant reduction in GHG emissions from the energy sector is projected due to increased energy efficiency (see paras. 8 and 39 above) as well as decreasing energy intensity and an increasing share of gas and RES in the fuel mix. A significant reduction in GHG emissions from the agriculture sector is projected as a result of declining emissions from enteric fermentation and manure management, both due to the decreasing number of livestock and effective measures applied for manure management (manure storage options). Projected GHG emissions from the transport and waste sectors show an increase in emissions from 1990 (13.9 and 12.3 per cent, respectively, for 2020) due to the projected increase in fuel

consumption and number of passenger-kilometres (in relation to 2015 data) in the transport sector, while the projected increase in GHG emissions from the waste sector is based on the extrapolation of recent trends.

72. The pattern of projected emissions reported for 2030 under the same scenario remains almost the same for the energy sector (further decrease of 0.6 per cent between 2020 and 2030) and the agriculture sector (further increase of 1.8 per cent between 2020 and 2030) and the increase in transport sector emissions continues. However, a significant reduction of 36.6 per cent is observed in projected waste sector emissions for 2030 compared with 2020, mostly due to the reduction in residual municipal waste, the share of biodegradable waste and landfilling.

73. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector slightly change owing to the implementation of the EU2030 scenario (see para. 61 above) applied for the energy (including transport) sector. As a result, the 2020 emissions for the transport sector are projected to increase to a lesser extent compared with the WEM scenario.

74. Under the WAM scenario, the pattern of emission reductions by 2030 presented by sector changes significantly (reduction of 17.4 per cent compared with 2020) owing to a greater reduction in coal mining by 2030 compared with 2020 and decommissioning of solid fuel fired utility power plants by 2023 and 2025. The energy intensity of coal mining under the WAM scenario is projected to decline by nearly 50 per cent by 2025 and 2030 compared with the WEM scenario, with an additional reduction in GHG emissions (in terms of fugitive CH₄ emissions) related to the projected significant reduction in long-distance natural gas transmission. There is a significant reduction in GHG emissions projected for the transport sector (19.3 per cent by 2030) if additional measures are applied, compared with the WEM scenario projections. A projected reduction in GHG emissions with additional measures applied is related to planned increased efficiency in cars (decreasing consumption of gasoline and diesel) and electrification of transportation. A greater reduction in GHG emissions from the industry sector compared with the WEM scenario is related to the assumption that F-gases used in refrigerators will be supplied with gases having low GWP, and SF₆ emissions are projected as prohibited under the WAM scenario. For the other sectors there were no big changes identified between the WEM and the WAM scenario, taking into account that only the WEM scenario was developed for the agriculture and waste sectors.

75. Slovakia presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 8.

Table 8
Summary of greenhouse gas emission projections for Slovakia presented by gas

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO ₂ ^a	61 995.73	35 198.84	34 319.41	35 387.91	28 676.40	-43.2	-44.6	-42.9	-53.7
CH ₄	7 191.67	4 509.18	4 238.72	3 864.86	3 301.77	-37.3	-41.1	-46.3	-54.1
N ₂ O	4 477.65	1 847.52	1 845.47	1 963.62	1 910.55	-58.7	-58.8	-56.1	-57.3
HFCs	NO	785.06	785.06	167.58	115.81	NA	NA	NA	NA
PFCs	314.86	8.98	8.98	9.60	9.60	-97.1	-97.1	-97.0	-97.0
SF ₆	0.06	5.16	4.99	5.45	4.93	8 500.0	8 216.7	8 983.3	8 116.7
NF ₃	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total GHG emissions without LULUCF	73 979.97	42 354.74	41 202.63	41 399.02	34 019.06	-42.7	-44.3	-44.0	-54.0

Source: Slovakia’s BR4 CTF table 6.

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

76. For 2020, the most significant reductions are projected for CO₂ and N₂O emissions: 43.2 and 58.7 per cent between 1990 and 2020, respectively. In absolute terms the decrease in CO₂ emissions is equal to 26,796.89 kt CO₂ eq and the decrease in N₂O emissions is equal

to 2,630.13 kt CO₂ eq. While the relative reduction in PFC emissions seems substantial (97.1 per cent), in absolute terms it amounts to only 305.88 kt CO₂ eq. In contrast, SF₆ emissions are projected to increase significantly in relative terms (8,500.0 per cent) but the increase in absolute terms is only 5.10 kt CO₂ eq from 1990. In addition, it should be noted that a significant decrease in SF₆ emissions is projected compared with 2015 actual emissions (9.15 kt CO₂ eq in absolute terms and 63.9 per cent in relative terms in 2020). Projected GHG emissions for 2030 show the same pattern with slightly increased emissions, except for HFC emissions, which are projected to decrease substantially.

77. If additional measures are considered (i.e. under the WAM scenario), the patterns of CO₂ emission reductions by 2020 presented by gas slightly change owing to the planned decarbonization measures (increasing efficiency of cars, electrification of transportation) and a significant reduction is projected from 2020 to 2030, with a relative reduction in CO₂ emissions of 44.6 and 53.7 per cent, respectively. A gradual reduction in CO₂ emissions due to the decommissioning of coal-fired heating plants is projected and the deviation from the WEM scenario is more pronounced for 2030. There is also a slightly different emission reduction pattern projected for CH₄ emissions under the WAM scenario, with a projected relative emission reduction of 41.1 and 54.1 per cent for 2030 and 2030, respectively. The projected decrease in CH₄ emissions is related to reduced oil production and decreasing long-distance natural gas transmission. For the other gases the emissions under the WAM and WEM scenarios for 2020 are similar.

(d) Assessment of adherence to the reporting guidelines

78. The ERT assessed the information reported in the BR4 of Slovakia and identified issues relating to completeness, transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 9.

Table 9

Findings on greenhouse gas emission projections reported in the fourth biennial report of Slovakia

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 28 Issue type: transparency Assessment: encouragement	<p>The Party reported WAM projections for all sectors in its BR4, despite projected GHG emission values for the agriculture and waste sectors being the same for the WEM and the WAM scenario. A description of the WOM scenario was provided only for the LULUCF sector in the textual part and graphs of the BR4; there is no information about the availability of the WOM scenario for other sectors. The ERT also noted that in figure 5.20 of its BR4 Slovakia has indicated that the projections of the WEM and WAM scenarios for the LULUCF sector are equal, which differs from the information provided in BR4 tables 5.38, 5.39, 5.40 and 5.41.</p> <p>During the review Slovakia explained that because of the lack of consensus about future agricultural policy during the preparation of emission projections only a WEM scenario was developed for the agriculture sector. It also provided information on the recently adopted Low-Carbon Development Strategy, which lists the PaMs to be included in the preparation of the emission projections for the next submission. The Party also confirmed that only one scenario was developed for the waste sector, explaining that the WOM scenario was not developed for any other sector except LULUCF owing to insufficient expert capacity to develop the scenario using the new model implemented for the energy and IPPU sectors. The Party also explained that, because of the very small differences between the WEM and the WAM scenario in the LULUCF sector, the two scenarios were shown as the same in figure 5.20, where the projections reported in the BR3 and the BR4 are compared.</p> <p>The ERT encourages Slovakia, in order to increase the transparency of the reporting, to provide in its next submission a WAM scenario for the agriculture and waste sectors or provide an adequate explanation if such scenarios were not developed, and to provide estimates for the WOM scenario for all sectors or give reasons for not providing WOM projections for sectors other than LULUCF.</p>
2	Reporting requirement specified in paragraph 29	<p>The Party reported both WEM and WAM projections for all sectors in its BR4. However, projections for the agriculture and waste sectors are equal in the two scenarios. Projections for the waste sector show the same values for the scenarios in</p>

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
	Issue type: transparency Assessment: recommendation	<p>tables 5.42, 5.43, 5.44 and 5.45 in its BR4 and in CTF tables 6(a) and 6(c), even though Slovakia included information about the Waste Prevention Programme 2019–2025, which is under approval, in its description of the WAM projections scenario for the waste sector (under “Municipal Waste Disposal”) in section 5.3.6 of its BR4.</p> <p>During the review Slovakia explained that the Waste Prevention Programme 2019–2025 was originally included in the WEM scenario and it was mistakenly assigned to the WAM scenario in the BR4 text, which is why the values are equal for the two scenarios. The reference to the programme was changed to the WEM scenario in section 4.3.6 of the BR4 and in CTF table 3, but it is still discussed only under the WAM scenario in section 5.3.6.1 of the resubmitted BR4.</p> <p>The ERT recommends that Slovakia ensure that the information on the PaMs included in the WEM and WAM scenarios reported in the textual part of the BR is consistent with that reported in CTF table 3 of its next submission.</p>
3	Reporting requirement specified in paragraph 30 Issue type: completeness Assessment: encouragement	<p>The Party did not report any information about sensitivity analysis in its BR4.</p> <p>During the review Slovakia explained that the approach using the new CPS model for the energy and IPPU sectors did not allow a sensitivity analysis to be performed for the BR4 because of the complexity of the model and that no sensitivity analysis is available at present. However, Slovakia is continuously improving its projections and sensitivity analysis and indicated that a sensitivity analysis will be presented in the next BR.</p> <p>The ERT encourages Slovakia to provide a sensitivity analysis in its next BR or provide the reasons if this is not possible.</p>
4	Reporting requirement specified in paragraph 32 Issue type: transparency Assessment: encouragement	<p>The Party reported WEM and WAM scenario projections in its BR4 with the base year 2016. Slovakia explained in its BR4 that owing to methodological issues data from the 2018 national inventory submission (for 1990–2016) were used for estimating the projections instead of those from the 2019 inventory submission. However, in the section on projections in its BR4, the Party also indicated that “projections of GHG emissions were prepared for 2015–2040”.</p> <p>During the review Slovakia explained that emission projections reported in the BR4 were prepared before the April 2019 annual submission under the Convention. The Party also explained that the preparation of emission projections is a technically complex and time-consuming process and that, therefore, the preparation of new projections started a year and a half before submission of the 2019 inventory. For this reason projections are based on the 2018 submission, the last reviewed inventory at the time of the projections, and actual inventory data are used for 2015 and 2016. In addition, projections for this BR submission were prepared with the new CPS model, which was implemented in a project realized for three years, and therefore it was not possible to use the 2019 inventory for the modelling.</p> <p>The ERT encourages Slovakia to use the latest inventory year for which inventory data are available as the starting point for scenarios in the next BR or to provide information describing the timing and processes involved with the preparation of the projection reports and an explanation of why the latest year for which inventory data are available in the BR is not used as a starting point for projections.</p>
5	Reporting requirement specified in paragraph 35 Issue type: transparency Assessment: encouragement	<p>In response to an encouragement from the previous review report, the Party presented projections of non-methane volatile organic compounds in its BR4 for the energy sector, subcategory fugitive emission projections, for both the WEM and the WAM scenario (tables 5.11 and 5.12). However, the ERT noted that it is not clear in the BR4 whether estimates were also carried out for the other categories of the energy sector or for the other indirect GHGs.</p> <p>During the review Slovakia provided information on indirect GHGs (nitrogen oxides, sulfur oxides, ammonia, non-methane volatile organic compounds) estimated for the energy and other sectors, reported under the EU directive on national emissions ceilings (directive 2016/2284/EU).</p> <p>The ERT encourages Slovakia to provide projections in its next BR of the indirect GHGs such as carbon monoxide, nitrogen oxides, sulfur oxides and non-methane volatile organic compounds, covering all sectors and gases, and to include a link to the reports where further information on such projections can be found.</p>

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
6	Reporting requirement specified in paragraph 38 Issue type: transparency Assessment: encouragement	The ERT noted that Slovakia included diagrams showing unadjusted inventory data for 2016 and projections until 2040 for both the WEM and the WAM scenario for all sectors except LULUCF, where 2015 is used as a starting point. However, the diagrams in Slovakia's BR4 do not cover the period starting with 1990 as requested by the reporting guidelines. During the review Slovakia provided additional information in tabular and graphic format on historical unadjusted data for 1990–2016 and projections until 2040 and explained that the data for 2015 and 2016 are actual inventory data for the LULUCF sector as well. The ERT encourages the Party to provide unadjusted inventory data and WEM and WAM projections for all sectors starting from 1990 in the diagrams in the next BR.
7	Reporting requirement specified in paragraph 43 Issue type: completeness Assessment: encouragement	The Party provided information regarding the reporting requirement when it reported on the models and software tools used to estimate emission projections in its BR4, section 5.4. However, information about how models or approaches take into account any synergies or overlap that may exist between different PaMs was not presented in the BR4. During the review Slovakia explained that an analysis of synergies and overlaps was not possible since the approach of the new CPS model applied for the energy and IPPU sectors does not allow such an analysis to be performed. The ERT encourages the Party to explain how the models or approaches take into account any synergies or overlap that may exist between different PaMs or provide an explanation as to why it is not possible to provide such information.
8	Reporting requirement specified in paragraph 46 Issue type: completeness Assessment: encouragement	The Party did not report qualitative information about the projections' sensitivity to underlying assumptions in its BR4. During the review Slovakia explained that no sensitivity analysis is available and the new CPS model applied for projection estimations for the energy and IPPU sectors does not allow a sensitivity analysis to be performed (see issue 3 above). The ERT encourages Slovakia to report in its next BR on the sensitivity of projections to underlying assumptions, qualitatively and, where possible, quantitatively.

Note: Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs, as per para. 11 of the UNFCCC reporting guidelines on BRs. The reporting on the requirements not included in this table is considered to be complete, transparent and thus adhering to the UNFCCC reporting guidelines on NCs and on BRs.

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

79. Slovakia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3–5, of the Convention. However, Slovakia provided information in its BR4 on its provision of support to developing country Parties. The ERT commends Slovakia for reporting this information and suggests that it continue to do so in future BRs.

80. Slovakia has provided detailed information on the assistance that it has made available to developing country Parties that are particularly vulnerable to the adverse effects of climate change. Financed projects include climate change adaptation, GHG mitigation, and support and capacity-building projects focusing on water and sanitation, waste management, agriculture, health, education and energy. All the Slovak bilateral and multilateral climate finance support provided was channelled through official development assistance in accordance with the methodology of the Development Assistance Committee of the Organisation for Economic Co-operation and Development. Slovakia's development cooperation is focused on 10 priority countries. The Party is involved in programmes in three (Afghanistan, Kenya, Republic of Moldova) and projects in six of the countries (Albania, Belarus, Bosnia and Herzegovina, Georgia, Kosovo, Ukraine), and South Sudan is classified as a country with extra humanitarian and development aid needs. Slovakia also provided financial support to other countries, such as Ecuador, Peru and Serbia.

81. The total climate-specific financial contributions provided by Slovakia through multilateral channels in 2017 and 2018 were USD 1,927,576 and USD 1,018,153, respectively. The total climate-specific financial contributions provided through bilateral channels in 2017 and 2018 were USD 2,517,011 and USD 1,922,096, respectively. These contributions represent a notable increase in relation to 2015 and 2016. Slovakia has increased its contributions by about 17 per cent since the BR3. For 2017 and 2018, the Party provided more support for mitigation than for adaptation.

82. In 2017–2018 Slovakia supported 27 capacity-building projects, mainly in the form of bilateral cooperation. All of them have been realized under official development assistance on the basis of open calls of the Slovak Agency for International Development Cooperation.

83. The ERT noted some minor inconsistencies in the reporting in the BR4 (section 6.1) and CTF table 7(b) on the Parties with which Slovakia cooperates and the inclusion of Ukraine (an Annex I Party) in the Parties receiving support listed in CTF table 7(b). It notes that the transparency of the reporting could be further improved by ensuring consistency between the information provided in the BR and the relevant CTF tables and by closely observing the division between Annex I and non-Annex I Parties in reporting in CTF table 7(b).

III. Conclusions and recommendations

84. The ERT conducted a technical review of the information reported in the BR4 and CTF tables of Slovakia in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and provides an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; the progress of Slovakia towards achieving its target; and the Party's provision of support to developing country Parties.

85. In 2018, Slovakia's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 41 per cent below its 1990 level; total GHG emissions including LULUCF were also 41 per cent below the 1990 level. Emissions were at the highest point in 1990 and decreased thereafter with the lowest point reached in 2014. After 2014 the trend was stable, with a slight increase in emissions from transport, households, waste and some industrial categories. The changes in total emissions were driven mainly by macroeconomic factors (such as the transition from a centrally planned economy to a market-based economy with an increased share of services in Slovakia's GDP, the global economic and financial crises of 2009 and the debt crisis in the eurozone that began in 2012) in conjunction with structural changes in the national economy, changes in the fuel mix, improved energy efficiency and increased share of RES in the energy supply, the impact of national air protection legislation and the implementation of PaMs related to climate change.

86. Under the Convention, Slovakia committed to contributing to the achievement of the joint EU quantified economy-wide emission reduction target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms for compliance purposes up to an established limit and subject to a number of restrictions on the origin and the type of project.

87. Under the ESD, Slovakia has a target of limiting its emission growth to 13 per cent above the 2005 level by 2020. The 2013–2020 progression in Slovakia's AEAs (its national emission target under the ESD) is 24,053.50–25,948.87 kt CO₂ eq.

88. Slovakia reported on its further commitments under the EU 2020 climate and energy package, namely under the EU renewable energy directive (setting a target of a 14 per cent share of RES in gross final energy consumption in 2020) and the EU energy efficiency directive (setting a national indicative target to decrease final energy consumption to 378 PJ and primary energy consumption to 686 PJ by 2020). The Party also reported on its longer-

term targets that have been pledged under the Convention through the EU nationally determined contribution submitted under the Paris Agreement and adopted by the EU under the 2030 climate and energy framework. Slovakia's target under the 2030 climate and energy framework for the ESR sectors is a reduction in emissions of 12 per cent in relation to the 2005 level.

89. In February 2019, Slovakia approved the Envirostrategy 2030, which sets a more ambitious 2030 national target to reduce its GHG emissions under the ESR by at least 20 per cent in relation to the 2005 level. In the NECP Slovakia further strengthened some of its national goals and committed to achieving carbon neutrality by 2050, together with a 30.3 per cent energy efficiency improvement in 2030 and a 19.2 per cent share of RES in final energy consumption.

90. In 2017, Slovakia's ESD emissions were 15.1 per cent (3,791.79 kt CO₂ eq) below the AEA under the ESD. The Party has a cumulative surplus of 21,340.27 kt CO₂ eq with respect to its AEA. In line with the flexibility allowed under the ESD, Slovakia carried over its surplus AEA to 2020. The Party reported that it does not intend to use units from market-based mechanisms and other market-based mechanisms under the Convention to meet its commitment under the ESD. The ERT noted that Slovakia is also well on track for meeting its national targets for energy efficiency and RES under the 2020 EU climate and energy package.

91. The GHG emission projections provided by Slovakia in its BR4 correspond to the WEM, WAM (except for the agriculture and waste sectors, where no planned measures were available at the time of the preparation of the BR4 to develop a WAM scenario) and WOM (only for the LULUCF sector) scenarios. Under the WEM and WAM scenarios, emissions are projected to be 42.7 and 44.3 per cent, respectively, below the 1990 level by 2020. According to the projections under the WEM scenario, ESD emissions are estimated to reach 28,866.96 kt CO₂ eq by 2020. Under the WAM scenario, Slovakia's emissions from ESD sectors in 2020 are projected to be 26,825.09 kt CO₂ eq. The projected level of emissions under the WEM and WAM scenarios is 11.2 and 3.4 per cent, respectively, above the AEA for 2020. The ERT noted that this, together with the Party's cumulative surplus of AEA of 21,340.27 kt CO₂ eq, suggests that Slovakia expects to meet its target under the WEM scenario.

92. The EU ETS and ESD set the direction for Slovakia's mitigation actions. In addition to Slovakia's participation in the EU ETS, which covers 51 per cent of the Party's emissions, Slovakia's national actions are set out in four overarching policy documents: the Energy Policy, Envirostrategy 2030, the NECP and the Low-Carbon Development Strategy. The mitigation actions have evolved to take into account the excellent progress towards the 2020 ESD target, and strengthened national and energy sector targets for post-2020. For example, the NECP contains a new decarbonization pillar which concentrates on replacing solid fuel with RES, greater energy efficiency and use of alternative fuels in the transport sector. The Low-Carbon Development Strategy contains economic and policy analysis on steps needed to achieve climate neutrality by 2050. The Energy Policy is a key legislation supporting Slovakia's climate change goals in the energy sector, covering the mitigation actions with the most significant mitigation impact. The PaMs include the energy efficiency improvements (both implemented and planned) and planned actions from 2020 to decommission fossil fuel power plants and decarbonize electricity generation. During the review Slovakia indicated that a new climate change act is under preparation.

93. Slovakia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3–5, of the Convention. However, Slovakia continued to report on climate finance and capacity-building provided to developing countries in line with its climate finance programmes, focusing on the water and sanitation, waste management, agriculture, health, education and energy sectors in 10 priority countries in the Balkans, Eastern Europe and sub-Saharan Africa. Slovakia has increased its financial contributions by about 17 per cent since the BR3.

94. In the course of the review, the ERT formulated the following recommendations for Slovakia to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR, namely to improve the transparency of its reporting by:

(a) Providing, in its reporting on mitigation actions and their effects, data on all gases under both the EU ETS and the ESD in the BR and including a summary of the methodologies used for estimating mitigation impacts and any limitations they may have (e.g. not allowing the mitigation impact of non-CO₂ emissions to be determined) (see issue 1 in table 4);

(b) Ensuring that the information on the PaMs included in the WEM and WAM scenarios reported in the textual part of the BR is consistent with that reported in CTF table 3 (see issue 2 in table 9).

Annex

Documents and information used during the review

A. Reference documents

2019 GHG inventory submission of Slovakia. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2019>.

2020 GHG inventory submission of Slovakia. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2020>.

BR3 of Slovakia. Available at https://unfccc.int/sites/default/files/resource/976840315_Slovakia-NC7-1-AnnexI_3BR_SVK.pdf.

BR3 CTF tables of Slovakia. Available at https://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_report/application/pdf/72450391_slovakia-br3-1-annexi_ctf_svk_2018_v1.0.pdf.

BR4 of the EU. Available at <https://unfccc.int/BRs>.

BR4 CTF tables of the EU. Available at <https://unfccc.int/BRs>.

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

BR4 CTF tables of Slovakia. Available at <https://unfccc.int/BRs>.

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

European Green Deal. Available at https://ec.europa.eu/info/files/communication-european-green-deal_en.

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

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

NC7 of Slovakia. Available at https://unfccc.int/sites/default/files/resource/976840315_Slovakia-NC7-1-7NC_SVK.pdf.

Report on the individual review of the annual submission of Slovakia submitted in 2019. FCCC/ARR/2019/SVK. Available at https://unfccc.int/sites/default/files/resource/arr2019_SVK.pdf.

Report on the technical review of the third biennial report of Slovakia. FCCC/TRR.3/SVK. Available at https://unfccc.int/sites/default/files/resource/trr.3_SVK.pdf.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Miroslava Dančová (Ministry of Environment of Slovakia), including additional material. The following documents¹ were provided by Slovakia:

Ministry of Environment of Slovakia, 2007. National inventory system of the Slovak Republic for GHG emissions and sinks under Article 5 of the Kyoto Protocol. Vestník (Official Journal of the Ministry of Environment), XV, 3, 2007, p.19.

Ministry of Environment of Slovakia, 2015. *Waste Management Plan of the Slovak Republic for 2016 – 2020*. Available at https://www.minzp.sk/files/sekcia-enviromentalneho-hodnotenia-riadenia/odpady-a-obaly/registre-a-zoznamy/poh-sr-2016-2020_vestnik_en-2.pdf.

The World Bank, 2019. *A Low-Carbon Growth Study for Slovakia: implementing the EU 2030 climate and energy policy framework*. Available at https://www.minzp.sk/files/iep/2019_01_low-carbon-study.pdf.

Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050. Available at https://ec.europa.eu/clima/sites/lts/lts_sk_en.pdf.

Joint Research Centre: Energy Consumption and Energy Efficiency Trends in the EU-28 2000-2014 2016). p. 19. Available at <https://publications.jrc.ec.europa.eu/repository/bitstream/JRC101177/ldna27972enn.pdf>.

Slovak Ministry of Economy. 2019. *Integrated National Energy and Climate Plan for 2021 to 2030*. Available at https://ec.europa.eu/energy/sites/ener/files/sk_final_necp_main_en.pdf.

¹ Reproduced as received from the Party.