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

Developed country Parties were requested by decision 2/CP.17 to submit their third biennial report to the secretariat by 1 January 2018. This report presents the results of the technical review of the third 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".

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Abbreviations and acronyms

AEA	annual emission allocation
Annex II Party	Party included in Annex II to the Convention
AR4	Fourth 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
CTF	common tabular format
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
GDP	gross domestic product
GHG	greenhouse gas
GIC	gross inland energy consumption
GWP	global warming potential
HFC	hydrofluorocarbon
IE	included elsewhere
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
NF_3	nitrogen trifluoride
NO	not occurring
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N_2O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
RES	renewable energy sources
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 BR3[1] 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 no comments to be considered and incorporated into this final version of the report.

3. The review was conducted from 12 to 17 March 2018 in Bonn, Germany, by the following team of nominated experts from the UNFCCC roster of experts: Ms. Asia Adlan (Sudan), Mr. Menouer Boughedaoui (Algeria), Mr. Christo Christov (Bulgaria), Ms. Nancy Liliana Gamba Cabezas (Colombia), Mr. Domenico Gaudioso (Italy), Mr. Liviu Gheorghe (Romania), Mr. Dirk Günther (Germany), Ms. Fui Pin Koh (Malaysia), Ms. Sangchan Limjirakan (Thailand), Mr. Juan Luis Martin Ortega (Spain), Mr. Engin Mert (Turkey), Ms. Gherghita Nicodim (Romania), Mr. Koki Okawa (Japan), Ms. Marcela Itzel Olguin-Alvarez (Mexico), Mr. Brian Quirke (Ireland), Ms. Kristina Saarinen (Finland), Ms. Marina Shvangiradze (Georgia) and Ms. Caroline Tagwireyi (Zimbabwe). Mr. Gaudioso, Ms. Saarinen and Ms. Shvangiradze were the lead reviewers. The review was coordinated by Ms. Veronica Colerio, Ms. Suvi Monni and Ms. Sevdalina Todorova (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the BR3 of Slovakia in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR3 was submitted on 15 December 2017, before the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were also submitted on 15 December 2017.

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 BR3 mostly adheres to the UNFCCC reporting guidelines on BRs.

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

Table 1
Summary of completeness and transparency of mandatory information reported by Slovakia in its third biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
GHG emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Mostly transparent	Issues 1 and 2 in table 3
Progress in achievement of targets	Complete	Mostly transparent	Issues 1 and 3 in table 5; issue 4 in table 10
Provision of support to developing country Parties[a]	NA	NA	NA

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below.

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

II. Technical review of the information reported in the third 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 emissions[2] excluding emissions and removals from LULUCF decreased by 44.6 per cent between 1990 and 2015, while total GHG emissions including net emissions or removals from LULUCF decreased by 46.8 per cent over the same period. Table 2 illustrates the emission trends by sector and by gas for Slovakia.

Table 2
Greenhouse gas emissions by sector and by gas for Slovakia for the period 1990–2015

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
Sector									
1. Energy	56 667.66	36 539.52	32 741.10	27 089.27	27 445.21	–51.6	1.3	76.1	66.5
A1. Energy industries	19 159.93	12 218.46	9 141.57	7 136.78	7 652.16	–60.1	7.2	25.7	18.5
A2. Manufacturing industries and construction	15 890.35	9 313.75	7 645.83	7 289.66	6 755.27	–57.5	–7.3	21.3	16.4
A3. Transport	6 823.77	5 649.36	7 376.83	6 493.46	6 704.75	–1.7	3.3	9.2	16.2
A4. and A5. Other	12 381.02	7 012.26	6 680.19	4 686.88	4 730.15	–61.8	0.9	16.6	11.5
B. Fugitive emissions from fuels	2 412.60	2 345.69	1 896.68	1 482.49	1 602.89	–33.6	8.1	3.2	3.9
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated based on the 2017 annual submission, version 3.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
2. IPPU	9 813.05	8 594.17	9 609.94	9 064.43	9 285.16	–5.4	2.4	13.2	22.5
3. Agriculture	6 587.01	3 378.74	2 813.38	3 047.13	3 014.46	–54.2	–1.1	8.8	7.3
4. LULUCF	–8 991.25	–9 718.90	–6 012.61	–6 121.76	–6 428.80	–28.5	5.0	NA	NA
5. Waste	1 392.62	1 350.64	1 395.27	1 476.96	1 524.67	9.5	3.2	1.9	3.7
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Gas[a]									
CO_2	61 935.05	41 265.80	38 536.13	33 442.47	33 816.79	–45.4	1.1	83.2	81.9
CH_4	7 198.63	5 355.32	4 531.00	4 215.96	4 352.44	–39.5	3.2	9.7	10.5
N_2O	5 011.74	3 108.95	2 850.69	2 340.21	2 342.56	–53.3	0.1	6.7	5.7
HFCs	NO	105.04	597.24	653.84	734.88	–	–	–	1.8
PFCs	314.86	14.91	25.01	11.15	8.50	–97.3	–23.7	0.4	0.0
SF_6	0.06	13.04	19.62	14.17	14.31	24 423.5	1.0	0.0	0.0
NF_3	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions without LULUCF	**74 460.34**	**49 863.07**	**46 559.69**	**40 677.79**	**41 269.49**	**–44.6**	**1.5**	**100.0**	**100.0**
Total GHG emissions with LULUCF	**65 469.09**	**40 144.17**	**40 547.07**	**34 556.04**	**34 840.70**	**–46.8**	**0.8**	**NA**	**NA**

Source: GHG emission data: Slovakia's 2017 annual submission, version 3.

[a] Emissions by gas without LULUCF and without indirect CO_2.

8. The decrease in total emissions was driven by the transition to a market-based economy with an increased share of services in the GDP and technological and structural changes of the economy, as well as by the reduced energy intensity for some industrial sectors, increased share of gas and RES in the fuel mix and improved energy efficiency. The decrease in emissions can also be attributed to the impact of implemented air protection legislation and PaMs related to climate change.

9. In brief, Slovakia's national inventory arrangements were established in accordance with a decision of the Ministry of Environment of the Slovak Republic on 1 January 2007 published in the official bulletin, "Vestnik".[3] The changes in the arrangements since the BR2, as described in the BR3, include the establishment of the Directorate for Climate Change and Air Protection in the Ministry of Environment (in June 2016), the establishment of the Department of Emissions and Biofuels in the Slovak Hydrometeorological Institute (in January 2017) and the enforcement of the single national entity (which operates under the Department of Emissions and Biofuels and is responsible for the compilation of the national inventory report) with new (permanent) experts responsible for the agriculture and transport sectors (since 2016). The Department of Emissions and Biofuels is responsible for emissions inventories under the UNFCCC, the National Emission Ceiling Directive and the Convention on Long-Range Transboundary Air Pollution and the National System of Biofuels and for developing and maintaining the National Emission Information System. These changes are expected to lead to a higher degree of robustness of the national system for the preparation of the inventories and an increase in the capacity involved in the preparation of the annual GHG inventory.

2. Assessment of adherence to the reporting guidelines

10. The ERT assessed the information reported in the BR3 of Slovakia and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting

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

guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

1. Technical assessment of the reported information

11. 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. The EU offered to move to a 30 per cent reduction target on the condition that other developed countries commit to a comparable target and developing countries contribute according to their responsibilities and respective capabilities under a new global climate change agreement.

12. 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 CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 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 as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU ETS.

13. The EU 2020 climate and energy package includes the EU ETS and the ESD (see chapter II.C.1 below). The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emissions cap has been put in place for the period 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from non-ETS 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.

14. Under the ESD, Slovakia has a target of limiting its emission growth to 13 per cent above the 2005 level by 2020 for non-ETS sectors. National emission targets for non-ETS sectors for 2020 have been translated into binding quantified AEAs for the period 2013–2020. Slovakia's AEAs change following a linear path from 24,023.50 kt CO_2 eq in 2013 to 25,948.87 kt CO_2 eq in 2020.[4] Table 3.3 in the BR provides the emissions and EU ETS/ESD ratio for 2013–2015, which shows that ESD emissions represent about 49 per cent of the total GHG emissions of Slovakia. The use of flexible mechanisms to meet the emission reduction target is possible under both the EU ETS and the ESD for the EU member States.

15. Regarding the use of international credits, Slovakia specified that its use under the EU ETS is based on the quantitative and qualitative limits set in EU regulation 1123/2013.[5] As part of the flexibilities allowed under the ESD, member States that do not exceed their AEAs are able to (1) carry over their overachievements to subsequent years within each member State, (2) make transfers of AEAs between member States and (3) use international credits (joint implementation and clean development mechanism projects) limited to up to 3 per cent of each member State's ESD emissions in 2005. The use of flexible mechanisms in Slovakia currently involves only operators in the EU ETS. Slovakia is not planning to use international credits in the ESD scheme for meeting the annual trajectory target, but the Party has already used the carry-over flexibility in 2017.

[4] European Commission decision 2017/1471 amending decision 2013/162/EU to revise member States' AEAs for the period from 2017 to 2020.

[5] See https://publications.europa.eu/en/publication-detail/-/publication/ae0737c9-4940-11e3-ae03-01aa75ed71a1/language-en.

16. In the BR3 Slovakia also reported on further targets under the EU 2020 climate and energy package, namely under the EU renewable energy directive (directive 2009/28/EC),[6] setting a target for the share of RES in the gross final energy consumption of Slovakia to 14 per cent by 2020, and the EU energy efficiency directive (directive 2012/27/EU),[7] setting national indicative targets for Slovakia for a decrease of final energy consumption to 387 PJ and primary energy consumption to 686 PJ in 2020.

2. Assessment of adherence to the reporting guidelines

17. The ERT assessed the information reported in the BR3 of Slovakia and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 3.

Table 3
Findings on the quantified economy-wide emission reduction target from the review of the third biennial report of Slovakia

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 5 Issue type: transparency Assessment: recommendation	The ERT noted that NF_3 was included in the gases covered under the economy-wide emission reduction target in CTF table 2(b) and a corresponding GWP value reported in CTF table 2(c), while according to the EU economy-wide emission reduction target the gases covered under the EU ETS and ESD do not include NF_3. During the review, Slovakia explained that NF_3 is included in the Kyoto Protocol inventories but not in the EU 2020 climate and energy package. The ERT recommends that Slovakia improve the transparency of its reporting in the next BR, by ensuring that the description of its economy-wide emission reduction target reported in the CTF tables is consistent with the gases covered by the EU economy-wide emission reduction target.
2	Reporting requirement specified in paragraph 5 Issue type: transparency Assessment: recommendation	The ERT noted that the notation key "NO" was used by Slovakia to report the possible scale of contributions of the market-based mechanisms in CTF table 2(e)i. The use of "NO" in CTF table 2(e)i was not explained in the table. During the review, Slovakia explained that, in place of "NO" in CTF table 2(e)i, it was supposed to have put the value 0.00. The ERT recommends that Slovakia improve the transparency of its reporting by providing the correct values or notation keys in table 2(e)i along with any relevant explanations. The ERT notes that the notation key "NA" could be used when a Party does not plan to use units from market-based mechanisms.

Note: Paragraph number 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 adhering to the UNFCCC reporting guidelines on BRs.

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

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

18. Slovakia provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. The Party provided information on a set of PaMs similar to those previously reported with a few exceptions. Slovakia reported that none of the PaMs with a significant effect on GHG emission reduction have been cancelled without replacement.

[6] See http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0028.
[7] See http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1399375464230&uri=CELEX%3A32012L0027.

19. Further, the Party reported on its policy context and the legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs. Following a recommendation made in the previous review report,[8] Slovakia mentioned in the BR3 that it has not made changes to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target since the BR2. The national inventory system (which also provides the framework for the domestic system for developing PaMs/projections) and the changes in national inventory arrangements since the BR2 were described in chapter 2 of the BR3.

20. The ERT noted that Slovakia makes reference to the monitoring process that is harmonized for all EU member States, laid down in the EU monitoring mechanism regulation (525/2013), adopted in May 2013, which aims to improve the quality of the data reported and to assist the EU member States with tracking their progress towards emission targets for 2013–2020. In 2014, an EU implementing regulation (749/2014) and delegated regulation (666/2014) were adopted to enable the implementation of the monitoring mechanism regulation and several of its provisions, specifying in more detail the structure of the information, reporting formats and submission procedures.

21. Slovakia did not report on its self-assessment of compliance with the emission reduction target and national rules for taking action against non-compliance. However, the requirement relates to changes in domestic institutional arrangements for monitoring and reporting emissions that occurred due to the reform of the EU ETS Phase III (2013–2020) as stipulated in the BR2. In particular, the Party has to comply with the strict rules and principles of the EU regulations on monitoring and reporting (601/2012) and on verification and accreditation (600/2012). These regulations have a direct legal effect in the member States, and their provisions apply directly to EU ETS participants that are required to have approved monitoring plans.

22. The key overarching 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 CO_2 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.

23. 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) that 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), N_2O emissions from chemical industries, PFC emissions from aluminium production and CO_2 emissions from industrial processes (since 2013). In 2015, the EU ETS share in the total GHG emission of Slovakia was 51.3 per cent.

24. The ESD became operational in 2013 and covers sectors outside the EU ETS, including 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. Under the ESD, Slovakia has a target of limiting its emission growth to 13 per cent above the 2005 level by 2020 for non-ETS sectors.

25. In the BR3 Slovakia also highlighted the EU-wide mitigation actions that are under development, such as a legislative proposal by the European Commission to reform the EU ETS for the period after 2020. The proposal is currently being discussed in the 'trilogues'

[8] FCCC/TRR.2/SVK, paragraph 22.

process with the goal of reaching a common position between the European Parliament and the Council before it can be adopted.

26. Slovakia introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The Energy Policy of the Slovak Republic adopted in 2014 (Resolution No. 548/2014) sets the main priorities in the central policy of the energy sector to 2035 with a view to 2050. It is aimed at ensuring the sustainability of the energy sector by contributing to the sustainable growth of the national economy and its competitiveness. Reliable and stable energy supply, efficient energy utilization at optimum costs and environmental protection are priority areas of the policy. The Energy Efficiency Action Plan is aimed at increasing energy efficiency across the relevant sectors, and the National Renewable Energy Action Plan is aimed at increasing the share of RES in heat and electricity generation. The mitigation effect of the Energy Efficiency Action Plan for the period 2014–2016 with an outlook towards 2020 is estimated to be the most significant among the PaMs, with a mitigation potential of 333.82 kt CO_2 eq for 2020 and 297.65 kt CO_2 eq for 2030. Government Regulation No. 246/2006 Coll. is aimed at increasing the share of bioethanol and biodiesel blended gasoline and diesel in Slovakia. EU regulations 2009/443/EC and 2011/510/EC are aimed at increasing the efficiency of cars and reducing GHG emissions. Ordinance of the Government of the Slovak Republic No. 342/2014 Coll. lays down the rules for granting agricultural aid in respect of the direct payment schemes on animal feeding, reduction in the number of dairy cattle and agricultural soils. Slovakia did not provide the quantified estimated impact of implemented PaMs in the agriculture, LULUCF and waste sectors.

27. Slovakia highlighted the domestic mitigation actions that are under development, such as Act No. 414/2012 Coll. on emissions trading and its amendments (adding lime and cement production) or the next phase of the Energy Efficiency Action Plan for the period 2017–2019 with an outlook towards 2020. This plan, which is reported under the planned measures, contains a group of measures aimed at increasing energy efficiency across different sectors, such as residential buildings, family houses, industry and public sector buildings. The combined mitigation impact of the planned measures under the action plan is 1,341.5 kt CO_2 eq and 1,239.16 kt CO_2 eq for 2020 and 2030, respectively.

28. Table 4 provides a summary of the reported information on the PaMs of Slovakia.

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

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	EU ETS; ESD	IE	IE
Energy	National Energy Policy (Resolution No. 548/2014)	NE	NE
Transport	Government Regulation No. 246/2006 Coll. on the minimum quantity of fuels produced from renewable sources in the petrol and diesel fuels placed on the market in the Slovak Republic (implemented)	145.29	299.51
	Effect of EU legislation – regulations 2009/443/EC and 2011/510/EC – which sets limits for CO_2 emissions from cars and vans (implemented)	163.41	751.24
Renewable energy	National Renewable Energy Action Plan (Resolution No. 677/2010) (implemented)	292.42	480.97
	Emissions trading, the new allocation – Act No. 414/2012 – energy supply (implemented)	226.03	211.15
Energy efficiency	Energy Efficiency Action Plan (2014–2016) with an outlook towards 2020 (implemented)	333.82	297.65

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
	Energy Efficiency Action Plan for the period 2017– 2019 with an outlook towards 2020 (planned)	1 341.5	1 239.16
IPPU	Act No. 414/2012 Coll. on emissions trading and its amendments – nitric acid production, aluminium and iron and steel production (implemented)	290.10	238.06
	Act No. 414/2012 Coll. on emissions trading and its amendments – nitric acid production, cement production, aluminium and lime production (planned)	89.66	177.52
Agriculture	Ordinance of the Government of the Slovak Republic No. 342/2014 Coll. laying down the rules for the granting of agricultural aid in respect of the direct payments schemes (planned)	208.77	171.4
LULUCF	Rural Development Programme for 2014–2020 (implemented)	NE	NE
Waste	Act No. 79/2015 Coll. on waste and amendments to certain acts (implemented)	NE	NE

Note: The estimates of mitigation impact are estimates of emissions of CO_2 or CO_2 eq avoided in a given year as a result of the implementation of mitigation actions

(b) Policies and measures in the energy sector

29. **Energy supply**. Slovakia has a balanced proportion of nuclear fuel, fossil fuels and RES in its GIC. Shares of primary energy sources in GIC in 2015 were as follows: natural gas 23.8 per cent, coal 20.0 per cent, nuclear fuel 23.7 per cent, oil 20.4 per cent and RES including hydropower 10.9 per cent. The focus of Slovakia's energy policy approved by its Government in 2014 is optimizing the energy mix in terms of energy security. According to the BR3, GIC has a long-term downward trend in Slovakia, along with the growth of GDP. The GIC decline occurred mainly as a result of industrial restructuring, with higher added value and wider application of the principles of energy efficiency. The overall decrease of 7.3 per cent in GIC in Slovakia occurred in the period 1995–2015. The energy intensity (ratio of GIC to GDP) of Slovakia over the same period dropped by 57.0 per cent.

30. **Renewable energy sources**. Slovakia reported on regulatory and strategic measures for promoting the use of RES in transport, and for generating heat and electricity. The National Renewable Energy Action Plan (Resolution No. 677/2010) was adopted in 2010 with the aim of increasing the share of electricity from RES in the power system and increased consumption of biomass for producing heat and electricity. The National Action Plan for Biomass Use (Resolution No. 130/2008) is in place to increase biomass use in the fuel mix. As a result of the implemented measures, the share of RES in gross final energy consumption in 2015 was 12.9 per cent, which means that Slovakia outperformed not only its interim target for 2015–2016 (10 per cent) but the 2017–2018 target (11.4 per cent) as well, and it is on track to meet its 2020 target (14 per cent).

31. **Energy efficiency**. In its BR3, Slovakia included the implemented measures under the Energy Efficiency Action Plan for the period 2014–2016 with an outlook towards 2020 and the planned Energy Efficiency Action Plan for the period 2017–2019 with an outlook towards 2020. The energy efficiency action plans include existing as well as new measures to increase energy efficiency across the residential and industrial sectors. Slovakia is well on track to meet its 2020 targets on energy efficiency set under the EU energy efficiency directive. Its primary energy consumption (15.4 Mtoe in 2015) is already below the 2020 target of 16.4 Mtoe. The final energy consumption (10.1 Mtoe in 2015) is still higher than the 2020 target of 9 Mtoe. Both numbers marked a slight increase in 2015 compared with the previous year (with 0.8 per cent and 3.0 per cent, respectively). The general energy

consumption trend over the past 10 years was decreasing (with some 13.0 per cent for final energy consumption). However, the limits on decreasing the country's energy consumption were clearly visible in the last two years. Therefore, further efforts are needed to lower final energy consumption in Slovakia.

32. **Residential and commercial sectors**. Slovakia reported on the State Housing Development Fund, which is in place to support the expansion and modernization of housing units in the form of favourable long-term loans. The loans are used for improving the thermal performance of residential buildings. The energy efficiency action plans for the periods 2014–2016 and 2017–2019 with an outlook towards 2020 focus on improving the thermal performance of public sector buildings such as office buildings, wholesale and retail trade, schools and hospitals with the target of reducing energy use by at least 20 per cent. Unlike those for residential buildings, the measures for public sector buildings are expected to be financed from their own resources.

33. **Transport sector**. Slovakia reported on several policies and strategic measures relating to reducing emissions from the transport sector. Government Regulation No. 246/2006 Coll. on the minimum quantity of fuels produced from renewable sources in petrol and diesel fuels ensures a continuous increase in the share of bioethanol and biodiesel blended in gasoline and diesel. Measures supporting hybrid transport in cities and a modal shift to public transport are contained in the Energy Efficiency Action Plan and Government Resolution No. 301/2011 Coll. The Strategy of Development of Electromobility in Slovakia deal with support for electric vehicles. Other measures include implementation of EURO 6 emission standards contained in the Transport Policy of the Slovak Republic and improving transport behaviour and road infrastructure. As a result of the implementation of the EU white paper on transport,[9] it is expected that 30 per cent of goods currently transported by road for distances over 300 km will be transported by rail.

34. The BR3 includes information on how Slovakia promotes and implements the decisions of the International Civil Aviation Organization. Act No. 414/2012 Coll. on emissions trading includes an allocation for civil aviation to set the decrease of GHG emissions from civil aviation through the EU ETS cap-and-trade system. However, Slovakia did not provide updated information on why the provisions of the International Maritime Organization to limit emissions from marine bunker fuels are not applicable to it because of national circumstances.

35. **Industrial sector**. The share of industry in the GDP of Slovakia was 25.8 per cent in 2000, and it decreased to 24.6 per cent in 2016. Manufacturing represented 21.4 per cent of GDP in 2000, and its share decreased to 20.6 per cent in 2016. The share of industry in the final energy consumption of fuel, electricity and heat in the national economy in 2001 was 35.8 per cent, and in 2015 this share increased to 36.2 per cent. The Energy Efficiency Action Plan for the period 2017–2019 with an outlook towards 2020 includes measures for efficiency improvement and reducing the energy consumption of the industrial sector.

(c) Policies and measures in other sectors

36. **Industrial processes**. Total emissions from the IPPU sector were 9,285.16 kt CO_2 eq in 2015, which was a decrease of 5.4 per cent compared with the base year and an increase of 2.4 per cent compared with the previous year. The decrease in GHG emissions was caused mainly by the implementation of Act No. 414/2012 Coll. on emissions trading and its amendments. In addition to nitric acid, aluminium and iron and steel production, the two new sectors included under the act are lime and cement production. The act provides for the inclusion of abatement technologies, increased efficiency in order to control emissions and raw material substitution. Thus, the estimated mitigation impact of installing abatement technology in iron and steel production is 213.74 kt CO_2 eq for 2020 and 223.32 kt CO_2 eq for 2030.

[9] Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0144&from=EN.

37. The other measures in the sector include use of best available technologies in servicing electrical equipment, increased use of new HFC gases with lower GWP and a decrease in the content of N_2O in aerosol cans. The quantified estimated impact of the implemented major policy for the industrial processes (Act No. 414/2012 Coll. on emissions trading and its amendments) is 290.10 kt CO_2 eq for 2020 and 238.06 kt CO_2 eq for 2030.

38. **Agriculture**. Emissions from the agriculture sector were estimated to be 3,014.46 kt CO_2 eq in 2015. This corresponds to a 54.2 per cent decrease in emissions compared with the base year and a 1.1 per cent decrease compared with 2014. Slovakia did not provide the quantified estimated impact of the implemented measures in the sector. However, some estimates are provided for the planned measures under the Ordinance of the Government of the Slovak Republic No. 342/2014 Coll. on laying down the rules for granting agricultural aid in respect of the direct payments schemes. Thus, the expected mitigation impacts of the new animal feeding policy, improved treatment of soil and new manure management practices are 143.81, 44.70 and 20.26 kt CO_2 eq, respectively, in 2020. Another reported measure is the EU nitrates directive, which protects water quality by preventing nitrates from agricultural sources polluting ground- and surface water by promoting good farming practices.

39. **LULUCF**. Slovakia reported on its PaMs within the LULUCF, which include the Forest Action Plan, the Rural Development Programme for the period 2014–2020, the Forestry Measure within the Rural Development Policy and LULUCF accounting. The actions within these PaMs include promotion of forest biomass for energy generation, EU compliance with UNFCCC and Kyoto Protocol obligations, protection of EU forests, sustainable management of forests and collection of reliable data by robust accounting and reporting in a standardized manner.

40. **Waste management**. Emissions from the waste sector were estimated to be 1,524.67 kt CO_2 eq in 2015, which corresponded to a contribution of 3.7 per cent of total GHG emissions. The PaMs implemented within the sector include Act No. 79/2015 Coll. on waste and amendments to certain acts, which focuses on packaging and recycling, limits waste disposal to permitted managed sites, bans the disposal of garden waste and requires the separate collection of kitchen waste. The Water Plan for the period 2009–2015 focuses on the need for the reduction of organic pollution of surface water, reconstruction and development of wastewater treatment plants and development of sewer systems in municipalities. The Strategy on the Reduction of the Biodegradable Waste Deposition to Landfills aims to increase the separation of recyclables and composting, while Act No. 309/2009 Coll. on the support of renewable sources of energy and highly effective cogeneration as amended regulates the use of landfill gas and biogas from wastewater treatment. Slovakia did not estimate the impact of any of the PaMs in the waste sector.

(d) Response measures

41. Slovakia reported on the assessment of the economic and social consequences of response measures. The Party presented several initiatives aimed at minimizing adverse impacts. In the BR3 Slovakia reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties, as a result of implemented measures such as fiscal policy instruments, biofuels policy and GHG reduction policies.

(e) Assessment of adherence to the reporting guidelines

42. The ERT assessed the information reported in the BR3 of Slovakia and identified issues relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 5.

Table 5
Findings on the mitigation actions and their effects from the review of the third 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	Slovakia provided information on its mitigation actions, including on the PaMs it has implemented or plans to implement to achieve its economy-wide emission reduction target. To the extent appropriate, it organized the reporting of mitigation actions by sector and by gas. However, there were some inconsistencies relating to status of implementation of the PaMs, a few blank spaces in the objectives of PaMs and differences in the GHGs affected in some PaMs in the textual part of the BR3 compared with information in CTF table 3. During the review, Slovakia reported that the inconsistencies in the gases affected or in the status of implementation of PaMs and blank spaces were due to human error. In order to enhance the transparency of its reporting, the ERT recommends that Slovakia ensure that each PaM is presented under the required subject heading in CTF table 3 and that there is consistency between the textual part of the BR and the CTF table 3 in its next submission.
2	Reporting requirement specified in CTF table 3 Issue type: completeness Assessment: encouragement	Slovakia has provided brief descriptions of its PaMs in CTF table 3. However, the Party has not provided additional information on the cost of mitigation actions and the relevant timescale, as suggested in footnote (e) of the table. During the review, Slovakia explained that it does not have and cannot provide an economic analysis of the cost of individual PaMs. The ERT encourages Slovakia to improve the completeness of its reporting by including in the next BR information on the cost and timescale of the mitigation actions or an explanation of why additional information on the cost of mitigation actions and the relevant timescale could not be provided.
3	Reporting requirement specified in CTF table 3 Issue type: transparency Assessment: recommendation	Slovakia reported on the estimated mitigation impact of some PaMs for 2020 and 2030. However, it did not give an estimated mitigation impact for several of its PaMs, mostly in the waste and LULUCF sectors. The ERT noted that, following the recommendation made in the previous review report (FCCC/TRR.2/SVK, para. 25), Slovakia has included a footnote to CTF table 3 explaining that some of the measures are not quantified but a positive effect on emission reduction is expected. During the review, Slovakia explained that it could not quantify some impacts because of a lack of some indicators or parameters for PaMs that could be used for estimating emission reductions for the particular PaMs. Therefore, any expert estimate would have a high level of uncertainty. The ERT therefore recommends that Slovakia improve the transparency of its reporting by providing in its next BR the estimated impact of the PaMs for each individual PaM and year or provide clear explanations as to why this may not be possible.
4	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 it does not have domestic arrangements established for the process of self-assessing compliance or national rules for taking action against non-compliance with emission reduction targets. Noting the improbability of non-compliance with the emission reduction commitments by Slovakia, the ERT reiterates the encouragement made in the previous review report (FCCC/TRR.2/SVK, para. 27) that the Party 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: Paragraph number 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 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

43. For 2014 Slovakia reported in CTF table 4 annual total GHG emissions excluding LULUCF of 40,677.79 kt CO_2 eq, which is 45.4 per cent below the 1990 level. In 2014 emissions from non-ETS sectors relating to the target under the ESD amounted to 19,782.14 kt CO_2 eq.

44. For 2015 Slovakia reported in CTF table 4 annual total GHG emissions excluding LULUCF of 41,269.49 kt CO_2 eq, which is 44.6 per cent below the 1990 level. In 2015 emissions from non-ETS sectors relating to the target under the ESD amounted to 20,084.62 kt CO_2 eq.

45. On its use of units from LULUCF activities, Slovakia reported in CTF tables 4 and 4(a) for 2015 and 2016 the notation key "NA" for units from LULUCF, because the LULUCF sector is not included in its target under the Convention. The explanation for the notation key is included in the BR. Furthermore, Slovakia reported in CTF tables 4 and 4(b) the units from market-based mechanisms in 2015 and 2016 towards the achievement of its 2020 target as zero. The ERT noted that the use of flexible mechanisms to meet the emission reduction target is possible under both the EU ETS and the ESD for the EU member States. Slovakia is not planning to use market-based mechanisms in the ESD scheme for meeting the annual trajectory target. The ERT notes that the notation key "NA" could be used when a Party does not plan to use units from market-based mechanisms; and the value "0" when the Party intends to use units from market-based mechanisms but does not use units in a given year. Table 6 illustrates Slovakia's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 6
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry by Slovakia to achieve its target

Year	*Emissions excluding LULUCF (kt CO_2 eq)*	*Contribution of LULUCF (kt CO_2 eq)*[a]	*Emissions including contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*[b]
1990	74 460.34	NA	NA	NA
2010	46 559.69	NA	NA	NA
2011	45 455.58	NA	NA	NA
2012	43 251.41	NA	NA	NA
2013	42 885.65	NA	NA	0.00
2014	40 677.79	NA	NA	0.00
2015	41 269.49	NA	NA	0.00
2016	NA	NA	NA	0.00

Sources: Slovakia's BR3 and CTF tables 1, 4, 4(a)I, 4(a)II and 4(b).

[a] The EU's unconditional commitment to reduce GHG emissions by 20 per cent below the 1990 level by 2020 does not include emissions/removals from LULUCF.

[b] Slovakia reported "NA" for 2013 and 2014 in CRF table 4.

46. In assessing the progress towards the achievement of the 2020 target, the ERT noted that Slovakia's emission reduction target for non-ETS sectors is 13 per cent above the 2005 level (see para. 14 above). In 2015 Slovakia's emissions from non-ETS sectors were 23.2 per cent (6,079.23 kt CO_2 eq) below the AEA under the ESD. According to results of the

compliance cycle for 2013 and 2014 ESD emissions, Slovakia carried over its surplus AEAs. The 2013 surplus AEAs (2,943.25 kt CO_2 eq) were carried over to 2020 and the 2014 surplus AEAs (4,601.39 kt CO_2 eq) were carried over to 2016.

47. The ERT noted that Slovakia is making progress towards its emission reduction target by implementing mitigation actions that are delivering significant emission reductions. On the basis of the trend in the GHG emissions over the period 1990–2015 and the results of the projections (see para. 59 below), the ERT also noted that the Party is making progress towards achieving its target under the Convention.

(b) Assessment of adherence to the reporting guidelines

48. The ERT assessed the information reported in the BR3 of Slovakia and recognized that the reporting is complete, transparent and 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

49. Slovakia reported updated projections for 2020 and 2030 relative to actual inventory data for 2014 under the WEM scenario. The WEM scenario reported by Slovakia includes implemented and adopted PaMs until 31 December 2016.

50. In addition to the WEM scenario, Slovakia reported the WAM and WOM scenarios. The WAM scenario includes planned PaMs (PaMs not adopted before 1 January 2017), while the WOM scenario excludes all PaMs implemented, adopted or planned after 1 January 2015. Slovakia provided a definition of its scenarios, explaining that its WEM scenario includes policies such as the EU ETS, the ESD, the National Renewable Energy Action Plan and the Energy Efficiency Action Plan for the period 2014–2016 with an outlook towards 2020 (adopted in July 2014), while its WAM scenario includes measures from the Energy Efficiency Action Plan for the period 2017–2019 with an outlook towards 2020 (adopted in April 2017), aimed at improving the thermal performance of family house buildings, residential buildings, public buildings and industry. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on NCs.

51. 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 CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 for 2014–2040. The projections are also provided in an aggregated format for each sector as well as for a Party total using GWP values from the AR4.

52. Slovakia did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.

53. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals. Slovakia reported on factors and activities affecting emissions for each sector.

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

54. The methodology used for preparing the projections is identical to that used for preparing the emission projections for the BR2. Slovakia used a top-down approach in determining its emission projections, and the models used to generate them include the MESSAGE[10] model, which was used for stationary emissions sources, and the TREMOVE[11] model, which was used for the transport sector, in combination with the

[10] See http://www.iiasa.ac.at/web/home/research/researchPrograms/Energy/MESSAGE.en.html and http://www.iiasa.ac.at/publication/more_RR-81-031.php.

[11] See http:\\www.tmleuven.be\\methode\\tremove\\home.htm.

COPERT[12] model, used for individual types of vehicles in road transport. In its BR3, Slovakia explained that, in addition to modelling tools, it also used expert judgment (transport) and expert software tools (Excel-based tools) for modelling emission projections for the IPPU, agriculture, LULUCF and waste sectors.

55. To prepare its projections, Slovakia relied on the following key underlying assumptions for the change between 2015 and 2040: population growth of 2.3 per cent, energy price growth for international oil of 54.1 per cent, international coal price growth of 78.9 per cent and international gas price growth of 49.2 per cent, GDP growth of 66.6 per cent and EU ETS carbon price growth of 833.3 per cent (from EUR 4.5 to 42/t CO_2). These variables and assumptions were reported in CTF table 5 for 2015–2040. The assumptions were updated on the basis of the most recent economic developments known when preparing the projections and are in agreement with the EU Reference Scenario 2016.[13] The parameters and PaMs used under each scenario, together with the calculation model or tool, are presented for each sector or subsector.

56. Slovakia has not provided information about changes since the submission of its BR2 in the assumptions used in preparing the projection scenarios or a comparison of the projection results. In response to a question raised during the review, Slovakia provided changes in the values of some key parameters compared with the BR2. Thus, annual GDP growth in 2020/2030 in the BR3 (3.3 per cent/2.9 per cent) is higher than in the BR2 (2.6 per cent/2.2 per cent), population was expected to be 5.414 million (BR2) and 5.503 million in 2020 (BR3), international energy prices (coal and gas) are expected to be significantly lower (more than 70 per cent in the case of coal) in 2020 and 2030 in the BR3 compared with the BR2, and the price of oil is expected to be 0.7 per cent higher in 2030 in the BR3 compared to the BR2. During the review, Slovakia provided supporting documentation to explain the changes.

57. Sensitivity analyses were conducted for changes in the GDP for the WEM scenario for 2015, 2020, 2025, 2030 and 2035. Low and high GDP sensitivity analyses were run with results on GHG emissions of ±5.0 per cent for 2020 and 2030.

(c) Results of projections

58. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 7 and the figure below.

Table 7
Summary of greenhouse gas emission projections for Slovakia

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year level (%)*	*Changes in relation to 1990 level (%)*
Quantified economy-wide emission reduction target under the Convention[a]	59 417.21	NA	NA
Inventory data 1990[b]	74 460.34	NA	NA
Inventory data 2015[b]	41 269.49	–44.6	–44.6
WOM projections for 2020[c]	41 819.13	–43.8	–43.8
WEM projections for 2020[c]	40 335.69	–45.8	–45.8
WAM projections for 2020[c]	38 879.83	–47.8	–47.8
WOM projections for 2030[c]	42 789.99	–42.5	–42.5

[12] See http://emisia.com/products/copert/versions.
[13] See https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf.

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year level (%)*	*Changes in relation to 1990 level (%)*
WEM projections for 2030[c]	40 744.33	–45.3	–45.3
WAM projections for 2030[c]	38 647.22	–48.1	–48.1

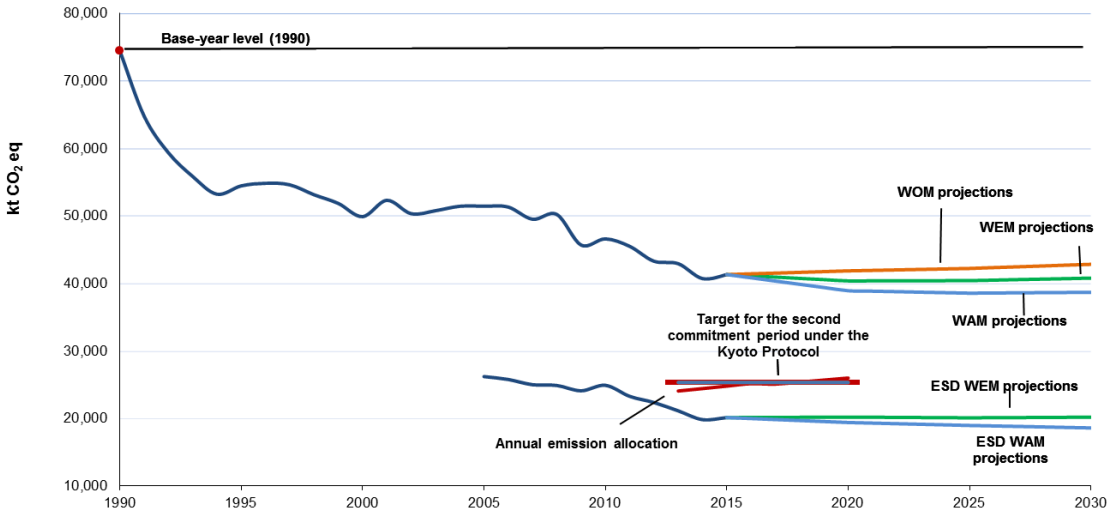
Note: The projections are for GHG emissions without LULUCF.

[a] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

[b] From Slovakia's BR3 CTF table 6.

[c] From Slovakia's BR3.

Greenhouse gas emission projections reported by Slovakia



Sources: (1) data for 1990–2015: Slovakia's 2017 annual inventory submission, version 3; total GHG emissions excluding LULUCF; (2) data for 2016–2030: Slovakia's BR3; total GHG emissions excluding LULUCF; (3) data for historic ESD emissions 2005–2014 and projected ESD emissions 2015–2030 provided by the Party during the review.

59. Slovakia's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 40,335.69 and 40,744.33 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 45.8 and 45.3 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 47.8 and 48.1 per cent and amount to around 38,879.83 and 38,647.22 kt CO_2 eq, respectively. The 2020 projections suggest that Slovakia will continue contributing to the achievement of the EU target under the Convention (see para. 11 above).

60. Slovakia's target for non-ETS sectors is to limit its emission growth to 13 per cent above the 2005 level by 2020 (see para. 14 above). Slovakia's AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 24,023.50 kt CO_2 eq in 2013 to 25,948.87 kt CO_2 eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 20,152.70 kt CO_2 eq by 2020. Under the WAM scenario, Slovakia's emissions from non-ETS sectors in 2020 are projected to be 19,349.70 kt CO_2 eq. The projected level of emissions under the WEM and WAM scenarios is 22.3 and 25.4 per cent, respectively, below the AEAs for 2020. The ERT noted that this suggests that Slovakia expects to meet its target under the WEM scenario.

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

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

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
	1990	*2020*		*2030*		*1990–2020*		*1990–2030*	
Sector		*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (not including transport)	49 843.89	19 950.41	18 648.88	19 384.19	18 522.13	–60.0	–62.6	–61.1	–62.8
Transport	6 823.77	7 008.74	7 152.26	7 988.09	7 170.41	2.7	4.8	17.1	5.1
Industry/industrial processes	9 813.05	8 912.07	8 823.01	9 234.04	8 988.06	–9.2	–10.1	–5.9	–8.4
Agriculture	6 587.01	2 976.74	2 767.97	2 672.93	2 501.54	–54.8	–58.0	–59.4	–62.0
LULUCF	–8 991.25	–5 265.26	–5 265.26	–4 530.45	–4 530.45	–41.4	–41.4	–49.6	–49.6
Waste	1 392.62	1 487.72	1 487.72	1 465.09	1 465.09	6.8	6.8	5.2	5.2
Other (specify)	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total GHG emissions without LULUCF	**74 460.34**	**40 335.68**	**38 879.84**	**40 744.34**	**38 647.23**	**–45.8**	**–47.8**	**–45.3**	**–48.1**

Source: Slovakia's BR3 CTF table 6. The ERT calculated the values for energy (not including transport), because the value reported by Slovakia included transport under energy.

62. 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 29,893.48 kt CO_2 eq (60.0 per cent) and 3,610.27 kt CO_2 eq (54.8 per cent) between 1990 and 2020. The pattern of projected emissions reported for 2030 under the same scenario remains the same for the energy sector (a decrease of 61.1 per cent) and does not change much in the case of agriculture (a decrease of 59.4 per cent), indicating a trend for further decreasing emissions compared with the base year. The emission reductions in the energy sector are due to the decarbonization of energy industries (increase in the share of RES in electricity generation) and further improvements in energy efficiency of final consumption. Projections of GHG emissions in the transport sector highlight an expected increase in transportation needs, for both passengers and freight, but with a higher increase in privately owned cars.[14] In agriculture, emission reductions are due to measures that aim at better manure management and improved timing in the fertilization of crops.

63. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector and by gas slightly change owing to the implementation of the additional PaMs, especially in the energy sector (e.g. improved energy efficiency across the economy). There are no changes for the LULUCF and waste sectors between the scenarios.

64. Slovakia presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 9.

Table 9
Summary of greenhouse gas emission projections for Slovakia presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
	1990	*2020*		*2030*		*1990–2020*		*1990–2030*	
Gas		*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2	61 935.05	32 808.43	31 587.48	33 879.52	32 049.34	–47.0	–49.0	–45.3	–48.3

[14] See https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf, p.192.

CH_4	7 198.63	4 475.94	4 317.72	4 232.21	4 093.24	–37.8	–40.0	–41.2	-43.1
N_2O	5 011.74	2 388.74	2 312.05	2 283.27	2 218.68	–52.3	–53.9	–54.4	–55.7
HFCs	0.00	637.69	637.69	322.46	264.43	NA	NA	NA	NA
PFCs	314.86	8.14	8.14	9.23	9.23	–97.4	–97.4	–97.1	–97.1
SF_6	0.06	16.75	16.75	17.64	12.30	27 816.7	27 816.7	29 300.0	20 400.0
NF_3	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA
Total GHG emissions without LULUCF	**74 460.34**	**40 335.69**	**38 879.83**	**40 744.33**	**38 647.22**	**–45.8**	**–47.8**	**–45.3**	**–48.1**

Source: Slovakia's BR3 CTF tables 6(a) and 6(c).

65. For 2020 the most significant reductions are projected for CO_2, CH_4 and N_2O emissions: 29,126.62 kt CO_2 eq (47.0 per cent), 2,722.69 kt CO_2 eq (37.8 per cent) and 2,623.00 kt CO_2 eq (52.3 per cent), respectively, between 1990 and 2020. In the case of HFCs and SF_6, although the amount of CO_2 eq emissions is not significant, the ERT has noted a significant increase (from negligible values in 1990 to dozens or hundreds of tonnes in 2020), whereas there is a decreasing trend for PFCs (by 97.4 and 97.1 per cent for 2020 and 2030, respectively).

66. For 2030 the most significant reductions are also projected for CO_2, CH_4 and N_2O emissions: 28,055.53 kt CO_2 eq (45.3 per cent), 2,966.42 kt CO_2 eq (41.2 per cent) and 2,728.69 kt CO_2 eq (54.4 per cent), respectively, between 1990 and 2030. Regarding the use of fluorinated gases, the same trend as for 2020 appears in the 2030 projections.

67. If additional measures are considered (i.e. for the WAM scenario), the patterns of emission reductions by 2020 presented by sector and by gas slightly change, allowing the achievement of a total emission reduction of about 2 per cent higher than for the WEM scenario; this is mainly due to the longer period of application of the measures, especially in the energy sector (i.e. Energy Efficiency Action Plan).

68. The ERT noted that the emission projections of the Party for both WEM and WAM scenarios for 2020 and 2030 are expected to be lower than those presented in its BR2. In the WEM scenario the difference is 3,797.30 kt CO_2 eq (40,335.68 kt CO_2 eq versus 44,132.98.31 kt CO_2 eq) in 2020 and 5,474.60 kt CO_2 eq (40,744.34 kt CO_2 eq versus 46,218.94 kt CO_2 eq) in 2030. The changes are not discussed by the Party in the BR and are considered to be driven by the updated assumptions and new measures used in the projections.

(d) Assessment of adherence to the reporting guidelines

69. The ERT assessed the information reported in the BR3 of Slovakia and identified issues relating to transparency, completeness and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 10.

Table 10
Findings on greenhouse gas emission projections reported in the third 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 35 Issue type: completeness Assessment: encouragement	The ERT noted that projections shall be presented for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively in each case), and Parties may provide projections of the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides. Slovakia did not provide projections of the indirect GHGs in its submission. Noting the complete submission regarding the reporting of the direct GHG emissions, the ERT encourages Slovakia to further improve the completeness of its reporting by including in its next BR projections of the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds

		and sulfur oxides.
2	Reporting requirement specified in paragraph 43 Issue: transparency Assessment: encouragement	The ERT noted that Slovakia reported on the models or approaches used for preparing projections in the different scenarios. However, some of the elements required, such as type of model, strengths and weaknesses of the model or approach used, and how the model or approach used accounts for any overlap or synergies that may exist between different PaMs, were not presented. During the review, Slovakia submitted supplementary information and explanations, references to some of the models used and information on how it accounts for overlaps and synergies. The ERT took note of the information provided and encourages Slovakia to improve the transparency of its reporting by including in its next BR the information required by paragraph 43 of the UNFCCC reporting guidelines on NCs, particularly by providing details on the type of model used, strengths and weaknesses of the model or approach used and how the model or approach used accounts for any overlap or synergies that may exist between different PaMs.
3	Reporting requirement specified in paragraph 45 Issue type: transparency Assessment: encouragement	Slovakia reported on assumptions, methods employed and projections in the current BR. However, the ERT noted that the differences between key indicators used in the projections, methods applied and results of the projections compared with the previous submission are not presented. During the review, Slovakia explained that there were no significant changes in methods and models and the data sources of input data between the current and previous BR, and the differences in the reported projections for 2020 and 2030 are mainly caused by the new data for new parameters and new measures used. The ERT took note of the information provided and encourages Slovakia to improve the transparency of its reporting by including in its next BR the main differences in the assumptions, methods employed and results between projections in the current BR and those in earlier NCs/BRs.
4	Reporting requirement specified in paragraph 48 Issue: transparency Assessment: recommendation	According to the UNFCCC reporting guidelines on NCs, Parties shall present relevant information on factors and activities for each sector to provide the reader with an understanding of emission trends for 1990–2020. The ERT noted that Slovakia reported key underlying assumptions and values of variables such as GDP growth, population growth and international fuel prices in table 5.1 of the BR. In the BR the Party includes information on other parameters such as final energy demand per sector and number of passengers per kilometre. However, the historical evolution (1990–2014) of these variables was not presented in table 5.1 included in the BR or in the CTF table 5. During the review, Slovakia submitted supplementary information, but it did not cover this requirement. The ERT took note of the information provided and recommends that Slovakia improve the transparency of its reporting in the next BR and provide the reader with an understanding of emission trends for 1990–2020 by presenting relevant information on factors and activities for each sector, particularly by providing details using the relevant textual and tabular information on the historical evolution of its key underlying assumptions and values of variables such as GDP growth, population growth and energy demand.

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

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

70. Slovakia is not an Annex II Party and is therefore not obliged to report its fulfilment of obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, the Party provided information in the BR3 on its provision of financial, technology transfer and capacity-building support to developing country Parties. The ERT commends Slovakia for reporting this information and suggests that it continue to do so in future BRs.

71. 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 regarding water, waste management, agriculture, food security, afforestation and renewable energy. The total climate-specific financial contributions provided by Slovakia through multilateral channels in 2015 and 2016 were USD 2,592,606 and USD 3,526,032, respectively, mainly in the form of bilateral cooperation. All support 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 has also developed legislative and strategic frameworks as well as monitoring and evaluation systems for providing effective development cooperation.

72. In 2015–2016 Slovakia supported more than 35 capacity-building projects, mainly in the form of bilateral cooperation. The BR3 reported that in 2015 and 2016 the Party did not support any technology transfer projects.

73. Slovakia indicated that it did not make a direct contribution to the Adaptation Fund, established in accordance with decision 10/CP.7.

III. Conclusions and recommendations

74. The ERT conducted a technical review of the information reported in the BR3 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; progress made by Slovakia in achieving its target; and the Party's provision of support to developing country Parties.

75. Slovakia's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 44.6 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 46.8 per cent below its 1990 level in 2015. Emission decreases were driven by the transition to a market-based economy with related technological and structural changes of the economy, as well as by the reduced energy intensity for some industrial sectors, changes in the fuel mix and improved energy efficiency. The decrease in emissions can also be attributed to the impact of implemented air protection legislation and PaMs related to climate change.

76. 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 CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, 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 and new market mechanisms for compliance purposes up to an established limit and subject to a number of restrictions on the origin and the type of project. Companies can make use of such units to fulfil their requirements under the EU ETS.

77. Under the ESD, Slovakia has a target of limiting its emission growth to 13 per cent above the 2005 level by 2020. The 2015–2020 linear progression in Slovakia's AEAs (its national emission target for non-ETS sectors) is 24,023.50–25,948.87 kt CO_2 eq.

78. Slovakia's main policy framework relating to energy and climate change is the implementation of the 2020 climate and energy package for the EU. The EU ETS was reported as one of the most effective cross-sectoral policies, covering over 51 per cent of the total emissions of Slovakia. The Party also reports on the national PaMs, such as the Energy Policy of the Slovak Republic (Regulation No. 548/2014), which is aimed at ensuring the sustainability of the energy sector by contributing to the sustainable growth of the national economy and its competitiveness; the National Renewable Energy Action Plan, aimed at increasing the share of RES in heat and electricity generation; the National Action Plan for Biomass Use, aimed at increasing the share of overall energy demand met by biomass; and the Action Plan for Energy Efficiency, aimed at increasing energy efficiency across the relevant sectors. From the mitigation actions with reported quantified impact, the individual mitigation measures with the most significant mitigation impact are the improvements of thermal performance of both residential and commercial buildings and the increase of RES in heat and electricity generation.

79. For 2015 Slovakia reported in CTF table 4 total GHG emissions excluding LULUCF of 41,269.49 kt CO_2 eq. The Party is not planning to make use of market-based mechanisms to achieve its target.

80. The GHG emission projections provided by Slovakia include those under the WOM, WEM and WAM scenarios. In the three scenarios, emissions are projected to be 43.8, 45.8 and 47.8 per cent below the 1990 level in 2020, respectively. On the basis of the reported information, the ERT concludes that Slovakia expects to meet its 2020 target under the WOM, WEM and WAM scenarios. Slovakia's target for non-ETS sectors is to limit its emission growth to 13 per cent above the 2005 level by 2020. Slovakia's AEA, which corresponds to its national emission target for non-ETS sectors, is 25,948.87 kt CO_2 eq for 2020. The projected levels of emissions under the WEM and WAM scenarios are 22.3 and 25.4 per cent below the AEAs for 2020, respectively. On the basis of the reported information, the ERT concludes that Slovakia expects to meet its target for non-ETS sectors.

81. Slovakia is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Slovakia continued to report on climate finance, technology transfer and capacity-building to developing countries in line with its climate finance programmes.

82. In the course of the review, the ERT formulated recommendations for Slovakia to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR.[15] The Party could improve the transparency of its reporting by:

(a) Providing a description of its economy-wide emission reduction target in the CTF tables that is consistent with the gases covered by the EU economy-wide emission reduction target (issue 1, table 3);

(b) Providing the correct values or notation keys in table 2(e)i along with any relevant explanations (issue 2, table 3);

(c) Ensuring that each PaM is presented under the required subject heading in CTF table 3 and that there is consistency between the textual part of the BR and the CTF table 3 (issue 1, table 5);

(d) Providing the estimated impact of each individual PaM and year or provide clear explanations as to why this may not be possible (issue 3, table 5);

(e) Enhancing the transparency and providing the reader with an understanding of emission trends for 1990–2020 by presenting relevant information on factors and activities for each sector, particularly by providing details in the text and in tabular format on the historical evolution of its key underlying assumptions and values of variables such as GDP growth, population growth and energy demand (issue 4, table 10).

[15] The recommendations are given in full in the relevant chapters of this report.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Slovakia. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php.

BR3 of Slovakia. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/72450391_slovakia-br3-1-3br_svk.pdf.

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

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories". Annex to decision 24/CP.19. Available at http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf.

"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 http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/976840315_slovakia-nc7-1-7nc_svk.pdf.

Report on the individual review of the annual submission of Slovakia submitted in 2017. FCCC/ARR/2017/SVK. Available at http://unfccc.int/resource/docs/2018/arr/svk.pdf.

Report of the technical review of the second biennial report of Slovakia. FCCC/TRR.2/SVK. Available at http://unfccc.int/resource/docs/2016/trr/svk.pdf.

Report on the technical review of the sixth national communication of Slovakia. FCCC/IDR.6/SVK. Available at http://unfccc.int/resource/docs/2015/idr/svk06.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 Ms. Jana Kianicka (Ministry of Environment), including additional material. The following document[1] was provided by Slovakia:

[1] Reproduced as received from the Party.

Various. 2016. *EU Reference Scenario 2016. Energy, transport and GHG emissions. Trends to 2050.* publication prepared for the Directorate-General for Energy, the Directorate-General for Climate Action and the Directorate-General for Mobility and Transport, https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf.