



United Nations

FCCC/TRR.4/SVN



Framework Convention on  
Climate Change

Distr.: General  
12 May 2021

English only

---

## **Report on the technical review of the fourth biennial report of Slovenia**

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 Slovenia, 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 25 to 29 January 2021 remotely.



## 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
III. Conclusions and recommendations .....	20
Annex	
Documents and information used during the review .....	23

## Abbreviations and acronyms

AEA	annual emission allocation
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CHP	combined heat and power
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
CTF	common tabular format
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
IE	included elsewhere
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LIFE	Programme for the Environment and Climate Action
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NECP	National Energy and Climate Plan
NF <sub>3</sub>	nitrogen trifluoride
NO	not occurring
N <sub>2</sub> O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
SF <sub>6</sub>	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 BR4<sup>1</sup> of Slovenia. 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 Slovenia, which did not provide any comments.

3. The review was conducted together with the review of one other Party included in Annex I to the Convention from 25 to 29 January 2021 remotely<sup>2</sup> by the following team of nominated experts from the UNFCCC roster of experts: Cathy Conzemius (United Kingdom of Great Britain and Northern Ireland), Agita Gancone (Latvia), Hadeel Ikhmais (State of Palestine), Traute Koether (Austria), Natalya Parasyuk (Ukraine) and Yasna Rojas Ponce (Chile). Ms. Parasyuk and Ms. Rojas Ponce were the lead reviewers. The review was coordinated by Marion Vieweg-Mersmann and Veronica Colerio (secretariat).

### B. Summary

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

#### 1. Timeliness

5. The BR4 was submitted on 16 April 2020, after the deadline of 1 January 2020 mandated by decision 2/CP.17. The BR4 CTF tables were also submitted on 16 April 2020. The CTF tables were resubmitted on 4 February 2021 to address issues raised during the review. The resubmission included changes in the gases covered by PaMs in CTF table 3 and additional footnotes to clarify the contribution of LULUCF activities and use of units from market-based mechanisms in CTF table 4.

6. Slovenia did not inform the secretariat about its difficulties with making a timely submission. In accordance with decision 13/CP.20, a Party should inform the secretariat thereof by the due date of the submission in order to facilitate the arrangement of the review process. The ERT noted with great concern the delay in the submission and recommended that Slovenia make its next submission on time.

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

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

Table 1

**Summary of completeness and transparency of mandatory information reported by Slovenia 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	–

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

<sup>2</sup> Owing to the circumstances related to the coronavirus disease 2019, the technical review of the BR submitted by Slovenia 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	Issues 1–2 in table 4
Provision of support to developing country Parties <sup>a</sup>	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.

<sup>a</sup> Slovenia is not a Party included in Annex II to the Convention 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

8. Total GHG emissions<sup>3</sup> excluding emissions and removals from LULUCF decreased by 6.0 per cent between 1990 and 2018, whereas total GHG emissions including net emissions or removals from LULUCF increased by 24.5 per cent over the same period. Emissions peaked in 2008 and decreased thereafter. The changes in total emissions were driven mainly by factors such as economic and political conditions. After declining in the years after 1990 as a result of Slovenia gaining its independence, leading to a reduction of emissions from the manufacturing industry, emissions increased until 1997 owing to increasing economic growth and the resulting revival of industrial production. This was followed by a two-year decline attributable to measures taken by neighbouring countries to curb ‘gasoline tourism’, which previously accounted for 25 per cent of total fuel sales in Slovenia, and to increased supplies of electrical energy from the Krško nuclear power plant. Emissions subsequently increased again in line with continued economic growth and the associated rise in electricity consumption until the financial crisis in 2008, after which they resumed a downward trajectory until 2014 before increasing again, driven by emissions in the transport sector, which have been on the rise since 2007.

9. Table 2 illustrates the emission trends by sector and by gas for Slovenia. Note that information in this section and table 2 is based on Slovenia’s 2020 annual submission, version 5, which has not yet been subject to review. All emission data in subsequent chapters are based on Slovenia’s BR4 CTF tables unless otherwise noted. The emissions reported in the 2020 annual submission differ from the data reported in CTF table 1, mainly in the forest land category, in that the annual submission used final data from the national forest inventory while the BR4 estimates were based on preliminary data.

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

<i>Sector</i>	<i>GHG emissions (kt CO<sub>2</sub> eq)</i>					<i>Change (%)</i>		<i>Share (%)</i>	
	<i>1990</i>	<i>2000</i>	<i>2010</i>	<i>2017</i>	<i>2018</i>	<i>1990–</i>	<i>2017–</i>	<i>1990</i>	<i>2018</i>
						<i>2018</i>	<i>2018</i>		
1. Energy	14 664.70	15 281.80	16 310.92	13 978.69	14 152.17	–3.5	1.2	78.8	80.9

<sup>3</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified.

	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share (%)	
	1990	2000	2010	2017	2018	1990– 2018	2017– 2018	1990	2018
	A1. Energy industries	6 374.89	5 594.44	6 339.70	4 915.34	4 799.91	–24.7	–2.3	34.3
A2. Manufacturing industries and construction	3 151.09	2 276.95	1 916.08	1 678.56	1 827.79	–42.0	8.9	16.9	10.4
A3. Transport	2 727.85	3 807.98	5 262.58	5 547.40	5 824.01	113.5	5.0	14.7	33.3
A4. and A5. Other	1 899.22	3 130.13	2 270.81	1 429.00	1 310.77	–31.0	–8.3	10.2	7.5
B. Fugitive emissions from fuels	511.65	472.30	521.75	408.40	389.69	–23.8	–4.6	2.7	2.2
C. CO <sub>2</sub> transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. IPPU	1 392.86	1 162.50	1 013.10	1 190.11	1 186.59	–14.8	–0.3	7.5	6.8
3. Agriculture	1 855.44	1 821.70	1 696.40	1 720.98	1 721.71	–7.2	0.0	10.0	9.8
4. LULUCF	–4 360.28	–4 061.03	–6 125.46	–175.11	243.14	–105.6	–238.9	NA	NA
5. Waste	696.60	771.60	534.79	476.98	441.66	–36.6	–7.4	3.7	2.5
6. Other <sup>a</sup>	NO	NO	NO	NO	NO	NO	NO	NO	NO
<i>Gas<sup>b</sup></i>									
CO <sub>2</sub>	15 093.84	15 444.90	16 376.44	14 264.75	14 487.84	–4.0	1.6	81.1	82.8
CH <sub>4</sub>	2 543.98	2 498.41	2 157.64	1 994.41	1 936.16	–23.9	–2.9	13.7	11.1
N <sub>2</sub> O	754.35	903.36	735.56	735.20	753.48	–0.1	2.5	4.1	4.3
HFCs	NO	46.17	257.95	339.14	293.23	NO	–13.5	NO	1.7
PFCs	207.59	129.75	9.64	17.45	15.59	–92.5	–10.6	1.1	0.1
SF <sub>6</sub>	9.83	15.01	17.99	15.81	15.83	61.0	0.1	0.1	0.1
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	NO
<b>Total GHG emissions excluding LULUCF</b>	<b>18 609.59</b>	<b>19 037.60</b>	<b>19 555.22</b>	<b>17 366.76</b>	<b>17 502.14</b>	<b>–6.0</b>	<b>0.8</b>	<b>100.0</b>	<b>100.0</b>
<b>Total GHG emissions including LULUCF</b>	<b>14 249.31</b>	<b>14 976.57</b>	<b>13 429.75</b>	<b>17 191.66</b>	<b>17 745.28</b>	<b>24.5</b>	<b>3.2</b>	<b>NA</b>	<b>NA</b>

Source: GHG emission data: Slovenia's 2020 annual submission, version 5.

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

<sup>b</sup> Emissions by gas without LULUCF. The Party did not report indirect CO<sub>2</sub> emissions.

10. In brief, Slovenia's national inventory arrangements were established in accordance with its obligations to international institutions. The Slovenian Environment Agency is responsible for the overall coordination of the activities necessary for preparing the Party's inventories reported to the UNFCCC and the European Commission, and for reporting emissions defined in the Convention on Long-Range Transboundary Air Pollution. In preparing these inventories, the Environment Agency cooperates with other institutions and administrative bodies, which relay the necessary activity data and other data within the framework of a memorandum of understanding. The main data source for this process is the Statistical Office of the Republic of Slovenia. Statistics compilation is regulated by relevant legislation at the national and EU level and by some agreements concluded at the national level. There have been no significant changes to these arrangements since the BR3.

## 2. Assessment of adherence to the reporting guidelines

11. The ERT assessed the information reported in the BR4 of Slovenia 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**

12. For Slovenia the Convention entered into force on 29 February 1996. Under the Convention Slovenia 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.

13. 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<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub> 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.

14. The EU 2020 climate and energy package includes the EU ETS and the ESD (see paras. 24–25 below). The EU ETS covers mainly 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. For 2030, a reduction target of 43 per cent below the 2005 level has been set for emissions covered by the EU ETS. 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. The ESR, successor to the ESD, was adopted in 2018 with a target of reducing covered emissions by 30 per cent below the 2005 level by 2030.

15. 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 increasing the ambition of 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.

16. Slovenia has a national target of limiting its emission growth to 4 per cent above the 2005 level by 2020 for ESD sectors. This target has been translated into binding quantified AEAs for 2013–2020. Slovenia's AEAs change following a linear path from 12,323.92 kt CO<sub>2</sub> eq in 2013 to 12,307.24 kt CO<sub>2</sub> eq in 2020.<sup>4</sup> Under the ESR, Slovenia has a national target of reducing emissions from the covered sectors to 7 per cent below the 2005 level by 2030.

### **2. Assessment of adherence to the reporting guidelines**

17. The ERT assessed the information reported in the BR4 of Slovenia 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.

---

<sup>4</sup> According to the EU transaction log.

## **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**

18. Slovenia provided information on its package of PaMs implemented and adopted, by sector and by gas, in order to fulfil its commitments under the Convention. Slovenia 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.

19. Slovenia's set of PaMs is similar to that previously reported, with the exception of one new measure aimed at improving wastewater management. Slovenia also provided information on changes since its previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target. Implementation of the Party's PaMs is now monitored using Climate Action Mirrors within the framework of the LIFE ClimatePath2050 project,<sup>5</sup> covering all emissions sources including the EU ETS. These Climate Action Mirrors are the basis on which the Ministry of the Environment and Spatial Planning, which has overall responsibility for climate change related policymaking, will prepare the report on the implementation of the Operational Programme for Reducing Greenhouse Gas Emissions by 2020. Furthermore, the Environmental Protection Act plays an important legislative role in achieving national climate objectives, as it provides a legal basis for all other environmental protection legislation with a direct or indirect influence on GHG emissions.

20. In its reporting on its PaMs, Slovenia provided the estimated emission reduction impacts for most of its PaMs. Where estimated impacts were not provided, the Party reported them as "IE" or "NE" without explaining where the impacts were included or why emissions were not estimated. During the review, Slovenia provided details of where such impacts were included.

21. Slovenia's self-assessment of compliance with its emission reduction targets and national rules for taking action against non-compliance include the preparation of Climate Action Mirrors, which are documents, prepared on an annual basis, presenting the main findings of efforts to monitor the implementation of PaMs using certain indicators. Selected PaMs are presented in more detail, with an overview provided of additional benefits and barriers identified during implementation, including proposals for addressing these barriers.

22. 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 CO<sub>2</sub> emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7<sup>th</sup> 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.

23. 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. Slovenia's NECP, adopted in 2020, specifies the following key objectives and targets to be achieved by 2030: (1) improving energy and material efficiency in all sectors; (2) reducing GHG emissions in sectors not covered by the EU ETS by at least 20 per cent compared with 2005 (sector-specific targets are set); (3) reducing use of fossil energy sources and dependence on imported fossil fuels by reducing coal consumption by at least 30 per cent by 2030, with a strategy for phasing out coal

---

<sup>5</sup> LIFE is the EU funding instrument for the environment and climate action. Details of Slovenia's project can be found at [https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n\\_proj\\_id=6308](https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6308).



consumption in Slovenia guided by just transition principles due to be adopted by 2021, and by banning the sale and installation of new fuel-oil boilers by 2023; (4) achieving an indicative 10 per cent share of carbon-neutral CH<sub>4</sub> or hydrogen in the transmission and distribution network; (5) achieving at least a 27 per cent renewable energy share in gross final energy consumption (sector-specific targets are set); (6) improving energy efficiency by at least 35 per cent compared with the 2007 level; (7) ensuring systematic implementation of the PaMs adopted to ensure that final energy consumption does not exceed 54.9 TWh/year; and (8) reducing final energy consumption in buildings by 20 per cent and GHG emissions from buildings by at least 70 per cent compared with the 2005 level.

24. 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 and 2030 targets (a 21 and 43 per cent emission reduction below the 2005 level, respectively) 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 N<sub>2</sub>O emissions from chemical industry, PFC emissions from aluminium production and CO<sub>2</sub> 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.

25. 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 ESD includes binding annual targets for each member State for 2013–2020. The ESR 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.

26. Slovenia highlighted the EU-wide mitigation actions that are under development, such as the Long-Term Climate Strategy under the Paris Agreement, which provides the main guidelines and objectives for individual sectors until 2050. The NECP and the Long-Term Climate Strategy aim to achieve close to net zero emissions in the building sector by 2050 by renovating a large number of buildings to improve energy efficiency, installing centralized heating systems and deploying renewable energy technologies.

27. Slovenia introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policies reported are, in addition to the NECP, the Resolution on the National Environment Protection Programme for 2020–2030, the Energy Concept of Slovenia, the Long-Term Strategy for Promoting Investments in the Energy Renovation of Buildings (adopted in 2015 and currently under revision), the National Action Plan for Nearly Zero-Energy Buildings up to 2020, the Transport Development Strategy until 2030 and the Resolution on the National Programme for the Development of Transport until 2030. The mitigation effect of reducing landfilled biodegradable waste is the most significant. Other policies that have delivered significant emission reductions are the promotion of efficient energy use in industry and the technological modernization of thermal power plants. The ERT identified the promotion of vehicle efficiency improvements, energy-efficient driving, higher vehicle occupancy rate and the use of fuels with low CO<sub>2</sub> emissions as a mitigation action of particular interest because of its potential to achieve a high mitigation impact by 2030 and because it addresses emissions from the transport sector, which is the only sector with sustained emission growth. All national-level policies for achieving Slovenia's targets under the ESD and its domestic emission reduction targets are presented in table 4 of its BR4.

28. Slovenia did not report any domestic mitigation actions that are under development but clarified during the review that additional mitigation impacts could be achieved by expediting the implementation of reported PaMs compared with the WEM scenario and that

these expedited efforts are reflected in the WAM scenario. Table 3 provides a summary of the reported information on the PaMs of Slovenia.

Table 3

**Summary of information on policies and measures reported by Slovenia**

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact in 2020 (kt CO<sub>2</sub> eq)</i>	<i>Estimate of mitigation impact in 2030 (kt CO<sub>2</sub> eq)</i>
Policy framework and cross-sectoral measures	Environmental tax on air pollution due to CO <sub>2</sub> emissions	IE	IE
	Energy taxes and charges (on fuels and electricity used for heating and transport purposes)	IE	IE
	Green Economic Growth	NE	NE
	EU ETS	IE	IE
Energy			
Energy efficiency	Promotion of efficient energy use in industry	436.00	910.00
	Technological modernization of the thermal power sector	420.00	1 834.00
Energy supply and renewables	Promotion of efficient energy use and renewable energy sources in households	179.00	266.00
	Promotion of efficient energy use and renewable energy sources in the public sector	91.00	471.00
	Promotion of electricity generation from renewable energy sources and high-efficiency electricity and heat cogeneration	IE	IE
Transport	Promotion of increase in vehicle efficiency, energy-efficient driving, higher vehicle occupancy rate and promotion of the use of fuels with low CO <sub>2</sub> emissions	407.00	1 620.00
	Sustainable freight transport	34.00	238.00
	Promotion of public passenger transport	4.00	339.00
IPPU	Reduction of F-gas emissions from mobile air-conditioning systems	154.00	226.00
	Reduction in the emissions of F-gases from stationary equipment	66.00	287.00
Agriculture	Increase in the efficiency of domestic animal production	9.00	55.00
LULUCF	Sustainable forest management and CO <sub>2</sub> emission sinks	NE	NE
Waste	Reduction of landfilled biodegradable waste	466.00	739.00
	Improvement of wastewater management	87.00	180.00

*Note:* The estimates of mitigation impact are estimates of emissions of CO<sub>2</sub> 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 efficiency.** Besides the Energy Act, which is the legal basis for activities in the energy sector, the main policies in the energy sector are the Long-Term Strategy for Promoting Investments in the Energy Renovation of Buildings, the decree on energy savings requirements, the Energy Efficiency Action Plan 2014–2020 and the Long-Term Strategy for Supporting the Renovation of Buildings by 2050 (currently under preparation), which implement the corresponding EU directives. As of 2020, energy efficiency policies are grouped under the NECP, the aim of which is to improve energy efficiency by at least 35 per cent compared with the 2007 level. Energy efficiency PaMs targeting individual sectors are discussed below.

30. Slovenia has adopted and is implementing a range of PaMs focused on achieving primary energy savings and increasing energy efficiency both in the energy supply system

and in final energy consumption in the industrial, construction, services, agriculture and residential sectors. These PaMs are aimed at improving the thermal performance of buildings, modernizing district heating infrastructure for transportation and distribution of heat, and improving public lighting.

31. **Energy supply and renewables.** Slovenia's adopted and implemented PaMs in this area include the EU ETS, designed to bring about GHG emission reductions, especially in large combustion plants. A total of 49 installations in Slovenia were included in the third phase of the EU ETS, representing 38 per cent of the country's total GHG emissions in 2017. In 2018, emissions from EU ETS installations in the country had decreased by 27 per cent in energy industries and by 22 per cent in manufacturing industries compared with 2005 levels, thanks in part to the establishment and operation of a market stability reserve for the EU ETS.

32. Other key PaMs include the modernization of thermal power plants, which was driven by the EU ETS, the EU industrial emissions directive (directive 2010/75/EU) and the efficient operation of a scheme promoting cogeneration of heat and electricity using highly efficient renewable energy. In recent years, several thermal power units, such as at the Šoštanj thermal power plant, have been closed down permanently or replaced by new ones. In addition, some power plants are transitioning to using cleaner fuels. For example, the Ljubljana thermal power plant has invested in a gas steam unit, which will replace two of its coal units in 2022. Under the NECP, at least 75 per cent of the country's electricity requirements must be met by electricity generated domestically by 2030.

33. Slovenia introduced a scheme aimed at increasing the share of electricity produced using renewable energy sources in 2002, while a decree enabling the self-supply of electricity from renewable energy sources entered into force in 2016 and was later amended to cover households, small-business consumers, and owners and tenants. As a result of these PaMs, 1,302 new installations were connected to the grid in 2018, with a total capacity of 13.12 MW. Since the start of the scheme, 2,156 installations have been connected to the grid with a total capacity in excess of 20 MW. Most of these installations are solar power plants, nine are small hydropower plants, and the first wind power plant was connected in 2018.

34. **Residential and commercial sectors.** Slovenia has in place PaMs aimed at promoting energy efficiency in buildings and households. The Action Plan for Nearly Zero-Energy Buildings up to 2020 sets out measures, such as a renovation programme, for improving energy efficiency in residential and public buildings and includes targets for nearly zero-energy new buildings. The technical guidelines to supplement this plan are being updated. The Long-Term Strategy for Promoting Investments in the Energy Renovation of Buildings also aims to significantly improve energy efficiency, while the NECP specifies targets to reduce final energy use in buildings by 20 per cent and reduce emissions from buildings by at least 70 per cent by 2030 compared with the 2005 level.

35. The Energy Act defines a mandatory share for heat generated using renewable energy sources. By 2020, heat distributors must (1) generate at least 50 per cent of their heat using renewable energy sources; (2) generate at least 50 per cent of their heat using waste heat; (3) generate at least 75 per cent of their heat using high-efficiency CHP sources; and/or (4) generate at least 75 per cent of their heat using a combination of the above. An analysis by the Energy Agency showed that 52 of the country's 90 district heating systems met these requirements in 2018. The NECP also includes a target to increase the renewable energy share and proportion of surplus heat and cold in district heating and cooling systems by 1 per cent each year in accordance with EU directive 2018/2001.

36. **Transport sector.** Against the background of rising GHG emissions from transport and their increasing overall share in total national GHG emissions (see table 2), Slovenia reported on several PaMs aimed at reducing emissions from the transport sector, including promoting use of public transport; increasing sustainability of freight transport; and promoting vehicle efficiency improvements, energy-efficient driving, higher vehicle occupancy rate and the use of fuels associated with low CO<sub>2</sub> emissions.

37. Public transport is governed by the Road Transport Act and the Railway Transport Act, with subsidized tickets available to some user groups and operators compensated for losses due to low ticket prices. The amendment of the Road Transport Act in 2019 introduced further measures targeting public transport, such as expanding the scope of eligibility for

subsidized tickets and introducing a single electronic ticket that covers different modes of public transport and carriers. In 2019 and 2020, funds for Slovenia under the EU cohesion policy were earmarked for improving public transport infrastructure, with additional funds awarded through the integrated territorial investments mechanism.

38. For freight transport, PaMs are focused on co-modality,<sup>6</sup> which requires the construction and modernization of existing infrastructure. The Transport Development Strategy until 2030, the National Programme for the Development of Transport and the NECP have the objective of developing efficient railway transport, including by electrifying and modernizing the entire Slovenian railway network to enable higher speeds and heavier load capacities, and efficient road freight transport, including by deploying electronic tolls for cargo vehicles and information technology to enable higher-capacity utilization of existing roads, as well as modernizing and developing intermodal transport infrastructure. Railway measures planned up to 2030 are expected to almost double railway freight and transport activity.

39. Slovenia aims to promote energy-efficient driving and car-sharing by offering training to drivers and managers of vehicle fleets by authorized transport operators, as well as to raise awareness of fuel consumption and vehicle emissions and increase the fuel consumption efficiency of vehicles through tax-related measures. The objective of increasing vehicle efficiency is underlined by the EU regulation setting CO<sub>2</sub> emission performance standards for new passenger cars and vans (regulation 2019/631).

40. **Industrial sector.** The EU ETS is one of the key measures for the industrial sector, which accounts for a significant part of the country's CO<sub>2</sub> emissions. The EU ETS, coupled with the use of best available techniques for improving energy efficiency through systematic energy audits, has contributed to reducing GHG emissions in Slovenia and modernizing the technologies deployed in this sector. Slovenia strives to improve energy efficiency by supporting use of highly efficient CHP and through other energy efficiency measures in industry. A scheme designed to promote CHP electricity production was introduced in 2002 and amended in 2014. In 2017, installed CHP capacity was 82.4 MW, generating electricity in the amount of 295 GWh. In 2018, this capacity decreased slightly to 80.8 MW, but resulted in 320 GWh electricity generated. GHG emission reductions as a result of using these high-efficiency CHP plants were estimated to be 224.3 kt CO<sub>2</sub> eq in 2017 and 216.3 kt CO<sub>2</sub> eq in 2018. Efficient energy use in industry has been promoted via the EU Cohesion Fund and a scheme under which companies selling electricity are required to reduce final energy consumption.

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

41. **Industrial processes.** The EU ETS is the key measure in this sector, resulting in significant reductions in GHG emissions in industrial processes. Additionally, the EU directive on industrial emissions (directive 2010/75/EU) requires best available techniques to be prioritized, which led to the closure of an electrolysis unit in the country, causing PFC emissions to fall by approximately 85 per cent. The other two PaMs reported for this sector are the national implementation of the EU F-gas regulation (regulation 2014/517/EC), which lays down the phasing out of F-gases and bans the use of F-gases in certain applications, and the EU directive on mobile air-conditioning systems (directive 2006/40/EC).

42. **Agriculture.** The main measure in the agriculture sector is the implementation of the Rural Development Programme, which includes measures aimed at increasing efficiency in animal production, such as by funding breeding programmes for cattle and small ruminants and funding public advisory services for farmers in regard to forage production, animal nutrition and general cattle production.

43. One of the Party's measures is focused on fertilizing agricultural plants with nitrogen in order to promote more efficient use of minerals and livestock manure. Additionally, Slovenia identified four fields of action, including sustainable and competitive food production and

<sup>6</sup> Co-modality is a term defined by the European Commission as the efficient use of different transport modes on their own and in combination (<https://ec.europa.eu/inea/en/ten-t/ten-t-projects/projects-by-transport-mode/co-modality>).

processing, the priority of which is to ensure production of safe, high-quality and affordable food, and sustainable management of natural resources, which is focused on climate change adaptation and mitigation efforts. Slovenia highlighted that reducing emissions per unit of food produced is vital to ensuring food safety and reducing GHG emissions.

44. **LULUCF.** Slovenia reported PaMs related to sustainable, multifunctional forest management, with the aim of conserving carbon in existing forests by requiring forestry management plans and prohibiting clear-cutting and deforestation without authorization. These PaMs are set out in the Resolution on the National Forest Programme adopted in 2007 and were updated with the five-year Operational Programme for the Implementation of the National Forest Programme 2017–2021. The main objective in the forestry sector is to promote the sustainable development of the whole ecosystem in terms of biodiversity and ecological, economic and social functions.

45. The Forest Service plays an important role in managing all forest areas regardless of ownership (around 76 per cent of national forests are privately owned). However, tree felling is governed by 10-year forest management plans for all forest management areas, according to which felling may amount to up to 7.5 million m<sup>3</sup>/year (75 per cent forest growth each year) without endangering forest and habitat stability. Furthermore, private owners receive government subsidies to carry out forestry and conservation works and maintain the environment of wild animals, in accordance with forestry plans prepared by the Forest Service.

46. **Waste management.** The key overarching policies for the waste sector are the Waste Management Plan and the Waste Prevention Programme, which serve as the basis for achieving ambitious EU objectives to reduce landfilled biodegradable waste, reduce waste volume and minimize the negative impact of waste on the environment. The EU circular economy package, which includes revised legislative proposals on waste, includes the goal of increasing the share of recycled municipal waste to 55 per cent by 2025 and 65 per cent by 2035, and the binding target to limit the amount of municipal waste that ends up in landfill to 10 per cent by 2035. The regulatory instruments are the EU landfill directive, the revised EU waste framework directive and the EU packaging and packaging waste directive, which have been transposed into national law. In Slovenia, all landfill operators were required to build landfill gas capture facilities by the end of 2005. In 2017, 21 per cent of the CH<sub>4</sub> generated by landfills was captured and used predominantly for electricity generation.

**(d) Response measures**

47. Slovenia’s assessment of the economic and social consequences of its response measures is based on the EU impact assessment system, which is built on an integrated approach, analyses benefits and costs and addresses all of the significant economic, social and environmental impacts of possible initiatives before any legislation is passed.

**(e) Assessment of adherence to the reporting guidelines**

48. The ERT assessed the information reported in the BR4 of Slovenia and identified issues relating to completeness and 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 Slovenia**

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	Slovenia reported information on the PaMs it has implemented or adopted in its BR4, organized by sector and gas, but did not report on any planned PaMs, although it did include a WAM projection scenario without any further explanation. As per the UNFCCC reporting guidelines on NCs (para. 29), this seems to suggest that the Party has planned PaMs. Further, different sectors are reported in the BR4 and in CTF table 3 (e.g. “waste” is reported in the BR4 and “waste management/waste” is reported in CTF table 3), but the Party did not explain whether these sectors differ in definition or in terms of terminology only.  During the review, the Party clarified that it does not have additional planned PaMs and that the PaMs under the WEM and WAM scenarios are essentially the same,

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		with some exceptions. The difference between the scenarios is due to the rates at which the PaMs are implemented under each scenario. It also reported that CTF table 3 contains more general sector categories, while the BR4 refers to more detailed sector categories, but that these categories are consistent.
		The ERT recommends that Slovenia improve the transparency of its reporting by ensuring consistency in the sectors reported for PaMs across CTF table 3 and the BR and by reporting planned PaMs or explaining why it did not do so in its next BR.
2	Reporting requirement specified in CTF table 3 Issue type: transparency Assessment: recommendation	Slovenia reported the estimated impact of some PaMs as “IE” without providing an explanation of where their impacts are included. During the review, Slovenia provided details of where such impacts were included, for example, it explained that the impact of the measure “Collection of landfill gas” is included under the impact for the measure “Reduction of landfilled biodegradable waste”. The ERT recommends that Slovenia improve the transparency of its reporting by explaining where the impacts of PaMs reported as “IE” are included.
3	Reporting requirement specified in CTF table 3 Issue type: transparency Assessment: encouragement	Slovenia provided brief descriptions of its PaMs in CTF table 3, but did not include additional information on the costs and relevant timescales of mitigation actions as suggested in footnote (e) to CTF table 3. During the review, Slovenia explained that it included this additional information in the textual part of the BR to keep the description in CTF table 3 brief. The ERT reiterates the previous encouragement for Slovenia to improve the completeness of its reporting by including in its next BR information on the costs and relevant timescales of mitigation actions or explaining why such additional information could not be provided.

*Note:* Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs or to the CTF table number from the “Common tabular format for ‘UNFCCC biennial reporting guidelines for developed country Parties’”. 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

49. Slovenia does not intend to use units from market-based mechanisms under the Kyoto Protocol and other market-based mechanisms under the Convention to meet its commitment under the ESD. Given that the contribution of LULUCF activities is not included in the joint EU target under the Convention, the reporting of contributions of LULUCF activities is not applicable for Slovenia. Table 5 illustrates Slovenia’s ESD emissions and use of units from market-based mechanisms for achieving its ESD target.

Table 5

#### Summary of information on the use of units from market-based mechanisms by Slovenia for achieving its target

Year	ESD emissions (kt CO <sub>2</sub> eq)	AEA (kt CO <sub>2</sub> eq)	Use of units from market-based mechanisms (kt CO <sub>2</sub> eq) <sup>a</sup>	Annual AEA surplus/deficit (kt CO <sub>2</sub> eq)	Cumulative AEA surplus/deficit (kt CO <sub>2</sub> eq)
2013	10 925.25	12 323.92	NA	1 398.67	1 398.67
2014	10 472.37	12 353.72	NA	1 881.35	3 280.02
2015	10 719.61	12 383.52	NA	1 663.91	4 943.93
2016	11 236.89	12 413.32	NA	1 176.43	6 120.36
2017	10 881.77	12 203.09	NA	1 321.32	7 441.68
2018	11 033.84	12 237.81	NA	1 203.97	8 645.65

*Sources:* Slovenia’s BR4 and BR4 CTF table 4(b), information provided by the Party during the review and EU transaction log (AEAs).

*Note:* For a given year, a positive number (surplus) indicates that annual or cumulative ESD emissions were lower than the corresponding AEA or cumulative AEAs, while a negative number (deficit) indicates annual or cumulative ESD emissions were higher than the AEA or cumulative AEAs.

<sup>a</sup> “NA” indicates that the Party stated in its BR4 that it does not intend to use market-based mechanisms for achieving its target.

50. In assessing the progress towards achieving the 2020 joint EU target, the ERT noted that Slovenia’s emission reduction target for the ESD is 4 per cent above the 2005 level (see para. 16 above). In 2018 Slovenia’s ESD emissions were 9.8 per cent (1,203.97 kt CO<sub>2</sub> eq) below the AEA. Taking the use of market-based mechanisms into account, Slovenia has a cumulative surplus of 8,645.65 kt CO<sub>2</sub> eq with respect to its AEAs between 2013 and 2018.

51. The ERT noted that Slovenia is making progress towards its ESD target by planning mitigation actions that will deliver significant emission reductions.

**(b) Assessment of adherence to the reporting guidelines**

52. The ERT assessed the information reported in the BR4 of Slovenia 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**

53. Slovenia reported updated projections for 2020 and 2030 relative to actual inventory data for 2017 under the WEM scenario. The WEM scenario reported by Slovenia includes PaMs implemented and adopted by the end of 2018.

54. In addition to the WEM scenario, Slovenia reported the WAM and WOM scenarios. The WAM scenario includes planned PaMs aimed at achieving carbon neutrality by 2050, while the WOM scenario excludes all PaMs implemented, adopted or planned after 2005, with some exceptions. Slovenia provided a definition of its scenarios, explaining that its WEM scenario includes policies such as gradually phasing out electricity production in coal units, improving the energy efficiency of industrial processes and maintaining the current level of renovations of the building stock. The WAM scenario includes policies such as more rapidly reducing electricity production in coal units, replacing inefficient industrial technologies at a faster pace, increasing the current level of building renovations and accelerating investments in rail infrastructure. The definitions indicate that the scenarios were prepared in accordance with the UNFCCC reporting guidelines on BRs.

55. 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<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub> (treating PFCs and HFCs collectively in each case) for 2020–2030. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4. Slovenia reported on factors and activities affecting emissions for each sector.

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

56. The methodology used for the preparation of the projections is similar to that used for the preparation of the emission projections for the NC7. Slovenia provided information on the changes since the submission of its NC7 in the assumptions, methodologies, models and approaches used for the projection scenarios. Slovenia reported supporting information further explaining the methodologies and the changes made since the NC7. For example, the Party significantly upgraded the linear network model underlying its emission projections in the energy-use sectors, such as energy use in industry, transport and buildings, extending the time frame to enable projections up to 2050, applying a new base year, extending the set of technologies deployed and enabling analysis of the potential of various PaMs. Additionally, it applied new projections of external circumstances, such as GDP growth, fuel prices and prices of allowances and transport activity (also adjusting the underlying transport model to extend the time frame). Other sectoral models for industrial processes, waste and agriculture

were also upgraded to cover up to 2050, and new measures envisaged to achieve more significant emission reductions were included. A new Canadian model was used for preparing LULUCF projections, enabling projections up to 2050. This model implements the tier 3 approach according to the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* for reporting on carbon stocks and carbon stock changes resulting from LULUCF.

57. To prepare its projections, Slovenia relied on key underlying assumptions relating to population, GDP, energy prices, economic development indicators, gross inland consumption and gross electricity production. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. According to the assumptions reported in CTF table 5, GDP (at constant 2005 prices) is expected to grow from EUR 39.06 billion in 2017 to EUR 40.29 billion in 2020 and to EUR 46.76 billion in 2030. Between 2017 and 2020 the population is projected to increase by 2.0 per cent, from 2.07 million to 2.08 million, while the number of households is expected to rise by 0.2 per cent (from 800,078 to 802,053). Gross inland consumption is expected to decrease by 3.0 per cent over the same period (from 290.68 to 282.03 PJ), while gross electricity production is expected to fall by 1.3 per cent (from 16.33 to 16.12 TWh). International coal, oil and gas prices are expected to be USD 17.61, USD 81.97 and USD 36.08/barrel of oil equivalent, respectively, in 2020.

58. A sensitivity analysis was performed for the transport sector, which has a high level of uncertainty and represents the most important source of emissions from sectors not included in the EU ETS (accounting for 51 per cent of all such emissions in 2017). In this context, Slovenia provided information on this sensitivity analysis, conducted for a number of important assumptions, such as the level of transit transport, the share of biofuel and the share of fuel purchased by vehicles visiting or transiting Slovenia from abroad. The sensitivity analysis focused on the range of different scenarios of projections with additional measures. Total projected emissions in 2030 ranged from 13.8 Mt CO<sub>2</sub> eq in the scenario with reduced scope for implementing additional measures (the upper sensitivity limit), which is 21 per cent below the 2017 emission level, to 12.0 Mt CO<sub>2</sub> eq in the scenario with a significant reduction in the sale of fuel to vehicles visiting or transiting Slovenia from abroad (the lower sensitivity limit), which is 31 per cent below the 2017 emission level.

### (c) Results of projections

59. 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 Slovenia

	<i>Total GHG emissions</i>		<i>Emissions under the ESD</i>	
	<i>GHG emissions (kt CO<sub>2</sub> eq/year)</i>	<i>Change in relation to 1990 level (%)</i>	<i>ESD emissions (kt CO<sub>2</sub> eq/year)</i>	<i>Difference from 2020 AEA (%)</i>
2020 AEA under the ESD <sup>a</sup>	NA	NA	12 307.24	NA
Inventory data 1990	18 639.29	NA	NA	NA
Inventory data 2017	17 453.49	-6.4	10 881.77	-10.8
WEM projections for 2020	17 128.40	-8.1	10 946.00	-11.1
WAM projections for 2020	16 702.86	-10.4	10 727.00	-12.8
WEM projections for 2030	16 874.12	-9.5	10 621.00	NA
WAM projections for 2030	13 078.89	-29.8	8 660.00	NA

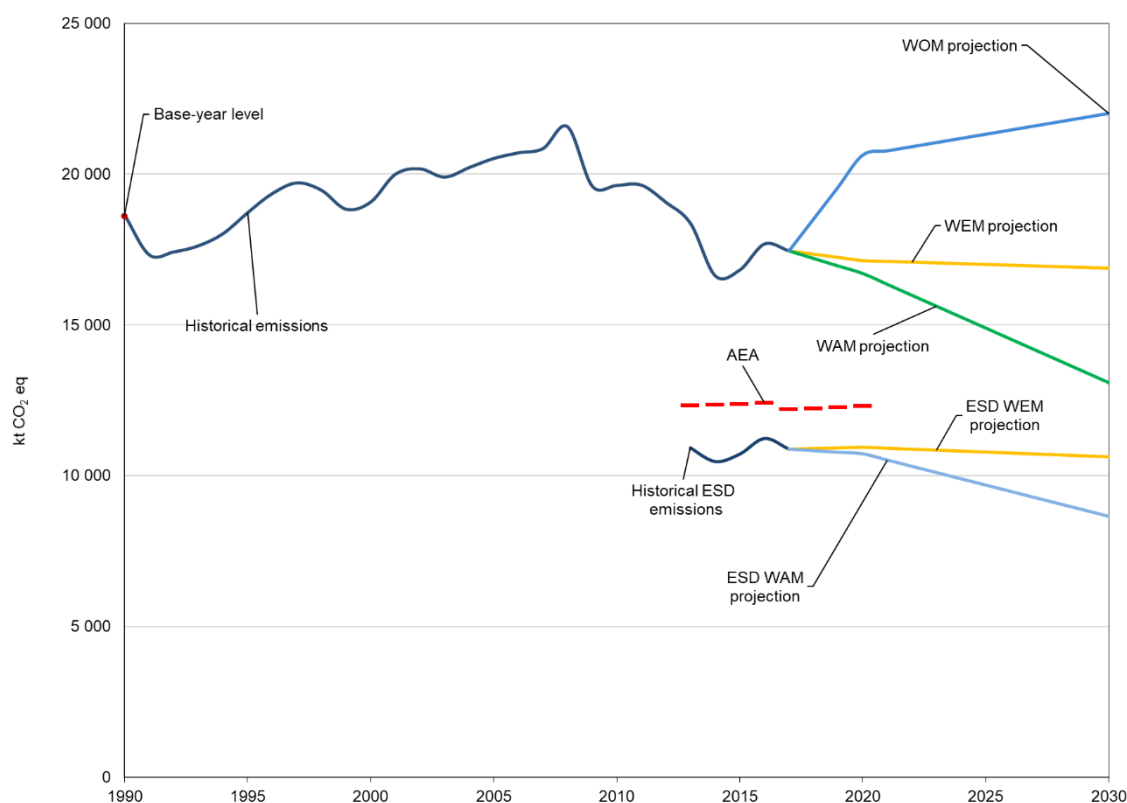
*Sources:* Slovenia's BR4 and BR4 CTF table 6, and EU transaction log (AEAs).

*Note:* The projections are for GHG emissions excluding LULUCF and indirect CO<sub>2</sub>.

<sup>a</sup> 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. Slovenia's target under the ESD is 4 per cent above the 2005 level by 2020.



Figure 1  
Greenhouse gas emission projections reported by Slovenia



Sources: EU transaction log (AEAs) and Slovenia's BR4 and BR4 CTF tables 1 and 6.

60. Slovenia's total GHG emissions excluding LULUCF in 2020 and 2030 are projected under the WEM scenario to decrease by 8.1 and 9.5 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 10.4 and 29.8 per cent, respectively. Under the WOM scenario, emissions in 2020 and 2030 are projected to be higher than those in 1990 by 10.1 and 18.1 per cent, respectively.

61. Slovenia's target under the ESD is to limit its ESD emission growth to 4 per cent above the 2005 level by 2020 (see para. 16 above). Slovenia's AEAs, which correspond to its national emission target for ESD sectors, change from 12,323.92 kt CO<sub>2</sub> eq in 2013 to 12,307.24 kt CO<sub>2</sub> eq for 2020. The projected level of emissions under the WEM and WAM scenarios is 11.1 and 12.8 per cent, respectively, below the AEAs for 2020. The ERT noted that the Party's cumulative surplus of AEAs is 8,645.65 kt CO<sub>2</sub> eq, which suggests that Slovenia expects to meet its target under the WEM scenario.

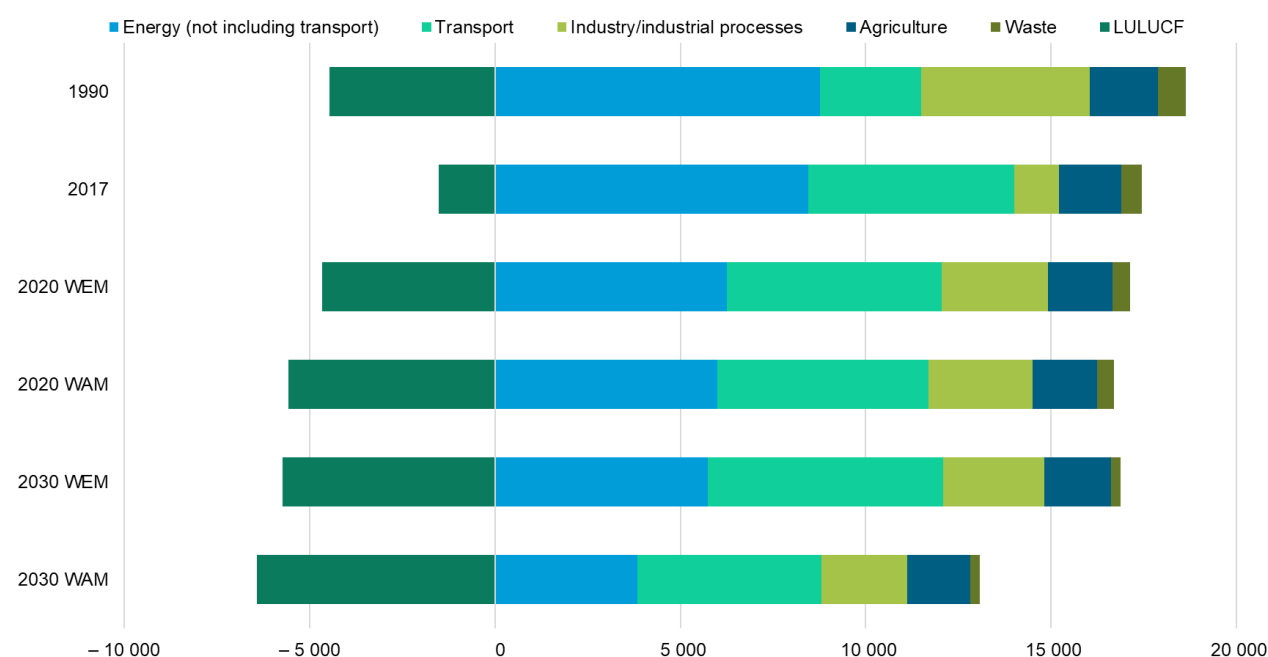
62. Slovenia presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in figure 2 and table 7.

63. According to the projections reported for 2020 under the WEM scenario, the most significant absolute emission reductions are expected to occur in the energy and industrial processes sectors, amounting to projected reductions of 28.6 per cent and 36.8 per cent between 1990 and 2020, respectively. The decrease in emissions in the energy sector is mostly dependent on reduced electricity production by coal-based units and their replacement with gas-powered units, including small CHP units. In the industrial processes sector the decrease in emissions depends on improving energy efficiency, implementing the EU F-gas regulation and the EU directive on mobile air-conditioning systems and increasing renewable energy use. The projected increase in emissions from the transport sector is 111.9 per cent by 2020 compared with the 1990 level, owing mainly to the increase in domestic passenger vehicle and freight transport. Further, the estimated emission reduction for the waste sector

is 38.6 per cent over the same period, which depends on policies targeting landfilled biodegradable waste and mixed waste volumes.

Figure 2  
Greenhouse gas emission projections for Slovenia presented by sector

(kt CO<sub>2</sub> eq)



Source: Slovenia's BR4 CTF table 6.

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

Sector	GHG emissions and removals (kt CO <sub>2</sub> eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	8 769.72	6 264.40	6 000.83	5 738.74	3 839.52	-28.6	-31.6	-34.6	-56.2
Transport	2 727.85	5 779.05	5 698.66	6 354.58	4 962.44	111.9	108.9	133.0	81.9
Industry/industrial processes	4 543.95	2 873.46	2 808.88	2 722.70	2 320.33	-36.8	-38.2	-40.1	-48.9
Agriculture	1 840.76	1 746.78	1 729.79	1 796.19	1 694.70	-5.1	-6.0	-2.4	-7.9
LULUCF	-4 462.55	-4 668.43	-5 570.01	-5 721.20	-6 421.34	4.6	24.8	28.2	43.9
Waste	757.01	464.71	464.71	261.90	261.90	-38.6	-38.6	-65.4	-65.4
Other	-	-	-	-	-	-	-	-	-
<b>Total GHG emissions excluding LULUCF</b>	<b>18 639.29</b>	<b>17 128.40</b>	<b>16 702.86</b>	<b>16 874.12</b>	<b>13 078.89</b>	<b>-8.1</b>	<b>-10.4</b>	<b>-9.5</b>	<b>-29.8</b>

Source: Slovenia's BR4 CTF table 6.

64. The pattern of projected emissions reported for 2030 under the WEM scenario generally remains the same but involves a larger decrease in emissions from the energy (34.6 per cent) and industrial processes sectors (40.1 per cent) below the 1990 level. Emissions from the agriculture sector increase slightly between 2020 and 2030, but show a decrease by 2.4 per cent by 2030 compared with the 1990 level under the WEM scenario, while emissions from the waste sector are expected to decrease by 65.4 per cent between 1990 and 2030. Emissions from the transport sector are expected to increase further by 2030 (133.0 per cent), for the same reasons highlighted in paragraph 63 above.

65. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector generally remain the same. For the energy sector, emissions are expected to fall by 31.6 per cent by 2020 and by 56.2 per cent by 2030 compared with the 1990 level. The additional progress expected by 2030 is due to swifter phasing out of coal production and the higher contribution of renewable energy, particularly solar power, to meeting additional electricity demand. The patterns of emission increases by 2020 for the transport sector generally remain the same (108.9 per cent), but differ significantly by 2030 compared with the WEM scenario (81.9 per cent), mainly due to increased investments in rail infrastructure, rapid electrification of passenger cars and light-duty vehicles and an increase in the share of biofuels used in transportation to 11 per cent.

66. Slovenia 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 Slovenia presented by gas**

Gas	GHG emissions and removals (kt CO <sub>2</sub> eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO <sub>2</sub> <sup>a</sup>	15 093.82	13 987.48	13 593.77	14 116.87	10 513.58	–7.3	–9.9	–6.5	–30.3
CH <sub>4</sub>	2 590.81	2 022.18	1 996.13	1 785.72	1 637.73	–21.9	–23.0	–31.1	–36.8
N <sub>2</sub> O	737.24	758.14	752.36	790.87	746.92	2.8	2.1	7.3	1.3
HFCs	0.00	329.87	329.87	149.11	149.11	NA	NA	NA	NA
PFCs	207.59	15.60	15.60	15.60	15.60	–92.5	–92.5	–92.5	–92.5
SF <sub>6</sub>	9.83	15.13	15.13	15.95	15.95	53.9	53.9	62.3	62.3
NF <sub>3</sub>	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total GHG emissions without LULUCF</b>	<b>18 639.29</b>	<b>17 128.40</b>	<b>16 702.86</b>	<b>16 874.12</b>	<b>13 078.89</b>	<b>–8.1</b>	<b>–10.4</b>	<b>–9.5</b>	<b>–29.8</b>

Source: Slovenia's BR4 CTF table 6.

<sup>a</sup> Slovenia did not include indirect CO<sub>2</sub> emissions in its projections.

67. For 2020 and 2030, the most significant absolute reductions are projected for CO<sub>2</sub> and CH<sub>4</sub> emissions: 7.3 and 21.9 per cent between 1990 and 2020, respectively, and 6.5 and 31.1 per cent between 1990 and 2030, respectively. The main reason for the decreasing trend in CO<sub>2</sub> emissions is the reduction in the use of fossil fuels and the increase in energy efficiency in the industry and construction sectors, while the decrease in projected CH<sub>4</sub> emissions is attributable mainly to policies targeting landfilled biodegradable waste in the waste sector. N<sub>2</sub>O emissions are expected to increase by 2.8 per cent between 1990 and 2020, and by 7.3 per cent between 1990 and 2030, owing to measures in the agriculture sector.

68. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by gas remain the same for CO<sub>2</sub> and CH<sub>4</sub> emissions, but change significantly by 2030 (with emissions falling by 30.3 and 36.8 per cent, respectively, compared with the 1990 level). For CO<sub>2</sub> emissions this is due to much faster phasing out of coal production and rapid growth in use of renewable energy sources, and for CH<sub>4</sub> emissions to accelerated construction of anaerobic digesters and an increase in low-emission fertilization.

**(d) Assessment of adherence to the reporting guidelines**

69. The ERT assessed the information reported in the BR4 of Slovenia and identified issues relating to completeness and 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 Slovenia**

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 35  Issue type: completeness  Assessment: encouragement	<p>The Party did not report on the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides in its BR4.</p> <p>During the review, Slovenia explained that the emission projections for indirect GHG emissions were not finalized at the time of preparing the BR4, but provided these projections for the WEM and WAM scenarios to the ERT in an Excel file. For carbon monoxide no projections are available.</p> <p>The ERT reiterates the previous encouragement for Slovenia to 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.</p>
2	Reporting requirement specified in paragraph 43  Issue type: transparency  Assessment: encouragement	<p>In its BR4, Slovenia reported that a broad range of models are presented in detail in the NC7 and provided an overview of changes in the models used for the most recent projections. However, the information provided did not sufficiently describe the type of models or approaches used and their characteristics, including the gases and/or sectors for which the model or approach was used; the original purpose for which the model or approach was designed and any further modifications; the strengths and weaknesses of the model or approach used for the various sectors; and how the model or approach used accounts for any overlaps or synergies between different PaMs.</p> <p>During the review, Slovenia provided a detailed description of the models used in an Excel file. The description provided for all models is complete and transparent.</p> <p>The ERT reiterates the previous encouragement for Slovenia to report in its next BR information on the model or approach used for projections for each sector and their characteristics, including the gases and/or sectors for which the model or approach was used; the original purpose for which the model or approach was designed and any further modifications; the strengths and weaknesses of the model or approach used for the various sectors; and how the model or approach used accounts for any overlaps or synergies between different PaMs.</p>
3	Reporting requirement specified in paragraph 47  Issue type: transparency  Assessment: encouragement	<p>Slovenia reported information on the key underlying assumptions and values of variables such as GDP, population growth and international fuel prices in CTF table 5, but “NA” was reported for a few parameters for 1990, 1995, 2000, 2005 and 2010 and for all parameters for 2016 and 2018, without any explanation of why those years were excluded.</p> <p>During the review, Slovenia explained that parameters for 2016 and 2018 were not reported because they were in the part of the table where projected parameters were supposed to be filled in. The base year for the projections was 2017, with projections performed for 2020, 2025, 2030, 2035, 2040, 2045 and 2050.</p> <p>The ERT reiterates the previous encouragement that Slovenia improve the transparency of its reporting for its next submission by providing information on all key variables and assumptions for the historical period for the projections analysis and supplying an explanation in cases where historical data cannot be provided in a footnote to CTF table 5 and/or in the BR.</p>

*Note:* Paragraph number 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.

### III. Conclusions and recommendations

70. The ERT conducted a technical review of the information reported in the BR4 and BR4 CTF tables of Slovenia 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; and the progress of Slovenia towards achieving its target.

71. Slovenia's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 6.0 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 24.5 per cent above its 1990 level, in 2018. Emissions peaked in 2008 and decreased thereafter. After declining in the years after 1990 as a result of Slovenia gaining its independence, leading to a reduction of emissions from the manufacturing industry, emissions increased until 1997 owing to increasing economic growth and the resulting revival of industrial production. This was followed by a two-year decline attributable to measures taken by neighbouring countries to curb 'gasoline tourism', which previously accounted for 25 per cent of total fuel sales in Slovenia, and to increased supplies of electrical energy from the Krško nuclear power plant. Emissions subsequently increased again in line with continued economic growth and the associated rise in electricity consumption until the financial crisis in 2008, after which they resumed a downward trajectory until 2014 before increasing again, driven by emissions in the transport sector, which have been on the rise since 2007.

72. Under the Convention Slovenia committed to contributing to the achievement of the joint EU quantified economy-wide target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub>, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included.

73. Under the ESD Slovenia has a target of limiting its emission growth to 4 per cent above the 2005 level by 2020. The 2013–2020 progression in Slovenia's AEA (its national emission target under the ESD) is 12,323.92–12,307.24 kt CO<sub>2</sub> eq.

74. In 2018 Slovenia's ESD emissions were 9.8 per cent (11,033.84 kt CO<sub>2</sub> eq) below the AEA. The ERT noted that Slovenia does not intend to make use of market-based mechanisms. Taking this into account, Slovenia has a cumulative surplus of 8,645.65 kt CO<sub>2</sub> eq with respect to its AEA between 2013 and 2018. The ERT noted that Slovenia is making progress towards its ESD target by planning mitigation actions that will deliver significant emission reductions.

75. The GHG emission projections provided by Slovenia in its BR4 correspond to the WOM, WEM and WAM scenarios. Under the WOM scenario, emissions are projected to be 10.1 per cent above the 1990 level by 2020. Under the WEM and WAM scenarios, emissions are projected to be 8.1 and 10.4 per cent below the 1990 level by 2020, respectively. According to the projections under the WEM scenario, ESD emissions are estimated to reach 10,946.00 kt CO<sub>2</sub> eq by 2020. Under the WAM scenario, Slovenia's ESD emissions in 2020 are projected to be 10,727.00 kt CO<sub>2</sub> eq. The projected level of emissions under the WEM and WAM scenarios is 11.1 and 12.8 per cent, respectively, below the AEA for 2020. The ERT noted that the Party's cumulative surplus of AEA is 8,645.65 kt CO<sub>2</sub> eq, which suggests that Slovenia expects to meet its target under the WEM scenario.

76. Slovenia's main policy framework relating to energy and climate change is based on EU climate policy. The Party described the mitigation actions that it has implemented to help it achieve its 2020 targets, which include the Energy Concept, the Long-Term Strategy for Promoting Investments in the Energy Renovation of Buildings, and the National Action Plan for Nearly Zero-Energy Buildings up to 2020.

77. The Party highlighted the mitigation actions for 2020–2030 that it has recently implemented and plans to implement to help achieve its medium- and long-term emission reduction targets. These PaMs include the NECP and the Long-Term Climate Strategy, which aim to achieve close to net zero emissions in the building sector by 2050, the Transport Development Strategy until 2030 and the Resolution on the National Programme for the Development of Transport until 2030, which supports various PaMs in the sector. Many planned PaMs are focused on the transport sector given its significance as the main GHG-emitting sector, while efforts in the energy supply and building sectors are ongoing.

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

- (a) To improve the transparency of its reporting by:
  - (i) Ensuring consistency in the sectors reported for PaMs across CTF table 3 and the BR and by reporting planned PaMs or explaining why it did not do so (see issue 1 in table 4);
  - (ii) Explaining where the impacts of PaMs reported as “IE” are included (see issue 2 in table 4);
- (b) To improve the timeliness of its reporting by submitting its next BR on time (see para. 6 above).

## Annex

### Documents and information used during the review

#### A. Reference documents

2019 GHG inventory submission of Slovenia. 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 Slovenia. Available at <https://unfccc.int/ghg-inventories-annex-i-parties/2020>.

BR3 of Slovenia. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/biennial-report-submissions/third-biennial-reports-annex-i>.

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

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

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

“Common tabular format for ‘UNFCCC biennial reporting guidelines for developed country Parties’”. Annex to decision 19/CP.18. Available at <https://unfccc.int/resource/docs/2012/cop18/eng/08a03.pdf>.

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

European Green Deal. Available at [https://ec.europa.eu/info/files/communication-european-green-deal\\_en](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 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>.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

NECP of Slovenia. Available at [https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans\\_en](https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en).

Report on the individual review of the annual submission of Slovenia submitted in 2018. FCCC/ARR/2018/SVN. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/inventory-review-reports/inventory-review-reports-2018>.

Report on the technical review of the BR3 of Slovenia. FCCC/TRR.3/SVN. Available at [https://unfccc.int/review-reports-BR3\\_and\\_NC7](https://unfccc.int/review-reports-BR3_and_NC7).

“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 Zorana Komar (Ministry of the Environment and Spatial Planning), including additional material. The following documents<sup>1</sup> were provided by Slovenia:

*Celoviti Nacionalni Energetski in Podnebni Načrt Republike Slovenije* (National Energy and Climate Plan). Available at [https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/dokumenti/nepn\\_5.0\\_final\\_feb-2020.pdf](https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/dokumenti/nepn_5.0_final_feb-2020.pdf)

*Energetski Zakon* (Energy Act). Available at <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO6665>.

Republic of Slovenia. 2016. *Framework Programme for the Transition to a Green Economy*. Ljubljana: Ministry of the Environment and Spatial Planning. Available at <https://www.oneplanetnetwork.org/resource/framework-programme-transition-green-economy-slovenia>.

*Resolucija o Nacionalnem programu varstva okolja za obdobje 2020–2030* (National Environmental Action Programme 2020-2030). Available at <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ODLO1985>.

*Program Razvoja Podeželja* (Rural Development Programme). Available at <https://www.program-podezelja.si/sl/>.

*Zelena Proračunska Reforma* (Green Budget Reform report). Available at <https://www.gov.si/assets/ministrstva/MF/Davcni-direktorat/DOKUMENTI/Zelena-proracunska-reforma-Okoljski-in-javnofinancni-vidik-spodbud-v-Sloveniji.pdf>.

*Osnutek Dolgoročna Podnebna Strategija Slovenije do Leta 2050* (Draft Long-term Climate Strategy of Slovenia 2050). Available at [https://www.gov.si/assets/ministrstva/MOP/Javne-objave/Javne-obravnave/podnebna\\_strategija\\_2050/dolgorocna\\_podnebna\\_strategija\\_2050.pdf](https://www.gov.si/assets/ministrstva/MOP/Javne-objave/Javne-obravnave/podnebna_strategija_2050/dolgorocna_podnebna_strategija_2050.pdf).

---

<sup>1</sup> References reproduced as received from the Party.