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

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 Germany, 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 16 to 20 March 2020 remotely.

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Contents

Abbreviations and acronyms

AEA	annual emission allocation
Annex I Party	Party included in Annex I to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
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	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
HFC	hydrofluorocarbon
IE	included elsewhere
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NECP	National Energy and Climate Plan
NF_3	nitrogen trifluoride
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
N_2O	nitrous oxide
OECD	Organisation for Economic Co-operation and Development
PaMs	policies and measures
PFC	perfluorocarbon
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 BR4[1] of Germany. 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 Germany, which did not provide any comments.

3. The review was conducted together with the review of five other Annex I Parties from 16 to 20 March 2020 remotely[2] by the following team of nominated experts from the UNFCCC roster of experts: Parvana Babayeva (Azerbaijan), Souhila Bouilouta (Algeria), Hakima Chenak (Algeria), Kenel Delusca (Haiti), Ryan Deosaran (Trinidad and Tobago), Craig William Elvidge (New Zealand), Raul Jorge Garrido Vazquez (Cuba), Matej Gasperic (Slovenia), Liviu Gheorghe (Romania), Maria Ana Gonzalez Casartelli (Argentina), Yamikani Idriss (Malawi), Jean Claude Kabamba Lungenyi (Democratic Republic of the Congo), Christopher Manda (Malawi), Tendayi Marowa (Zimbabwe), Naoki Matsuo (Japan), Esther Mertens (Belgium), Detelina Petrova (Bulgaria), Mohan Poudel (Nepal), Janis Rekis (Latvia), Orlando Ernesto Rey Santos (Cuba), Kristina Saarinen (Finland), Mayuresh Sarang (Zimbabwe), Marina Shvangiradze (Georgia) and Robin White (Canada). Mr. Gasperic, Ms. Gonzalez Casartelli, Ms. Petrova, Mr. Rey Santos, Ms. Saarinen and Ms. Shvangiradze were the lead reviewers. The review was coordinated by Hajar Benmazhar, Veronica Colerio, Claudia do Valle Costa, Nalin Srivastava, Sevdalina Todorova and Sina Wartmann (secretariat).

B. Summary

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

1. Timeliness

5. The BR4 was submitted on 20 December 2019, before the deadline of 1 January 2020 mandated by decision 2/CP.17. The CTF tables were also submitted on 20 December 2019. The CTF tables were resubmitted on 20 March 2020 to address issues raised during the review. The resubmission included changes to the reporting of the national target, PaMs, the Party's progress in achieving its targets, and projections. Unless otherwise specified, the information and values from the latest submission are used in this report.

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

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Germany in its BR4 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.

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

Table 1
Summary of completeness and transparency of mandatory information reported by Germany in its fourth biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendation(s)*
GHG emissions and removals	Complete	Mostly transparent	Issue 1 in table 3
Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	Complete	Partially transparent	Issues 1–2 in table 4
Progress in achievement of targets	Complete	Mostly transparent	Issue 1 in table 6 Issue 1 in table 8 Issues 2 and 6 in table 12
Provision of support to developing country Parties	Complete	Mostly transparent	Issues 1–2 in table 15

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

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

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

1. Technical assessment of the reported information

7. Total GHG emissions[3] excluding emissions and removals from LULUCF decreased by 27.5 per cent between 1990 and 2017, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 26.9 per cent over the same period. Emissions for the period were the highest in 1990 and decreased thereafter, with some annual variation. The changes in the total emissions were driven mainly by economic factors and the implementation of climate change policies. The emission reductions in the early 1990s stemmed primarily from the German reunification and the subsequent restructuring of the economy in the former East Germany (including switching to cleaner fuels and decommissioning obsolete facilities) as well as from the impacts of the global economic crisis in 2008. Germany implemented climate change policies early on, such as a feed-in tariff that has boosted renewable energy use since the 1990s, and these policies have been strengthened over time. The impact of mitigation measures – such as substituting solid fuels with lower-emission liquid and gaseous fuels, increasing the use of renewable energy, enhancing energy efficiency in plants and facilities, reducing livestock populations while improving livestock management, and managing waste more stringently – have increasingly been manifested in downward emission trends over the past decade.

8. Emission reductions are observed in all sectors with the exception of transport, where emissions have remained broadly at the base-year (1990) level. Energy-related emissions dominate, where the relative contributions of individual categories have remained largely constant, with a slight increase in the share of emissions from transport in 1990–2017. A marked reduction in emissions (73.5 per cent) can be seen in the waste management sector, where regulations designed to encourage the recycling of reusable materials and composting have resulted in a steep decline in the amount of waste being landfilled, leading to a steady reduction in landfill emissions.

[3] 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.

9. Table 2 illustrates the emission trends by sector and by gas for Germany. Note that information in this paragraph and table 2 is based on Germany's 2019 annual submission, version 1. All emission data in subsequent chapters are based on Germany's BR4 CTF tables unless otherwise noted. The emissions reported in the 2019 annual submission are the same as reported in CTF table 1.

Table 2
Greenhouse gas emissions by sector and by gas for Germany for 1990–2017

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2016*	*2017*	*1990–2017*	*2016–2017*	*1990*	*2017*
Sector									
1. Energy	1 036 607.68	870 345.65	801 237.11	770 912.25	765 661.15	–26.1	–0.7	82.9	84.5
A1. Energy industries	427 353.07	358 027.85	356 236.86	332 882.60	313 447.01	–26.7	–5.8	34.2	34.6
A2. Manufacturing industries and construction	186 708.77	130 080.01	125 135.49	130 356.32	135 562.01	–27.4	4.0	14.9	15.0
A3. Transport	164 267.43	182 551.81	153 996.16	165 973.99	167 951.77	2.2	1.2	13.1	18.5
A4. and A5. Other	220 311.28	173 389.21	154 588.30	131 793.58	138 801.10	–37.0	5.3	17.6	15.3
B. Fugitive emissions from fuels	37 967.13	26 296.77	11 280.31	9 905.76	9 899.27	–73.9	–0.1	3.0	1.1
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	96 837.71	78 018.08	63 092.30	62 903.34	64 495.90	–33.4	2.5	7.7	7.1
3. Agriculture	79 195.50	68 186.57	63 621.14	66 536.07	66 272.90	–16.3	–0.4	6.3	7.3
4. LULUCF	–31 311.74	–37 960.40	–16 368.63	–13 909.49	–15 185.21	–51.5	9.2	NA	NA
5. Waste	38 351.73	28 637.14	14 591.34	10 697.34	10 181.51	–73.5	–4.8	3.1	1.1
6. Other[a]	NO	NO	NO	NO	NO	NA	NA	NA	NA
Gas[b]									
CO_2	1 052 520.13	900 376.26	832 387.68	801 654.83	797 966.40	–24.2	–0.5	84.1	88.0
CH_4	120 944.08	88 788.86	59 352.65	55 924.06	55 246.60	–54.3	–1.2	9.7	6.1
N_2O	64 133.73	42 744.73	36 362.01	37 858.00	37 666.23	–41.3	–0.5	5.1	4.2
HFCs	NO, IE, NA	6 008.86	10 332.13	11 258.48	11 010.81	NA	–2.2	NA	1.2
PFCs	2 897.21	546.17	206.55	103.21	90.12	–96.9	–12.7	0.2	0.0
Unspecified mix of HFCs and PFCs	6 069.46	2 650.06	844.67	706.91	796.97	–86.9	12.7	0.5	0.1
SF_6	4 428.00	4 072.50	3 002.52	3 543.52	3 834.33	–13.4	8.2	0.4	0.4
NF_3	NO, IE	NO, IE	53.66	NO, IE	NO, IE	NA	NA	NA	NA
Total GHG emissions excluding LULUCF	**1 250 992.61**	**1 045 187.43**	**942 541.89**	**911 049.01**	**906 611.46**	**–27.5**	**–0.5**	**100.0**	**100.0**
Total GHG emissions including LULUCF	**1 219 680.87**	**1 007 227.03**	**926 173.26**	**897 139.52**	**891 426.25**	**–26.9**	**–0.6**	**NA**	**NA**

Source: GHG emission data: Germany's 2019 annual submission, version 1.
[a] Emissions and removals reported under the sector other (sector 6) are not included in the total GHG emissions.
[b] Emissions by gas without LULUCF. The Party did not report indirect CO_2 emissions.

10. In brief, Germany's national inventory arrangements were established at the ministerial level in accordance with a 2007 agreement signed by undersecretaries from participating ministries and outlined in a state secretaries' policy paper.[4] BMU was identified

[4] The "National emissions reporting system" policy paper of 5 June 2007 (see Germany's 2019 national inventory report, p.876).

as the lead for the National System of Emissions Inventories, with support from the Federal Ministry of Food and Agriculture, the Federal Ministry for Economic Affairs and Energy, the Federal Ministry of Transport and Digital Infrastructure, the Federal Ministry of the Interior, Building and Community, the Federal Ministry of Finance and the Federal Ministry of Defence. The same agreement established the German Environment Agency as Germany's single national entity coordinating and integrating input from other institutions and organizations involved in emission estimate preparation and reporting. There have been no changes in these arrangements since the BR3. For details on the inventory system and any improvements thereto, the BR4 refers to the Party's 2019 national inventory report.

2. Assessment of adherence to the reporting guidelines

11. The ERT assessed the information reported in the BR4 of Germany and identified an issue relating to transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 3.

Table 3
Findings on greenhouse gas emissions and removals from the review of the fourth biennial report of Germany

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 3 Issue type: transparency Assessment: recommendation	Germany indicated that the national system had been fully consolidated since the 2016 in-country review and included a reference to the 2019 national inventory report for further details (BR4, section 1.3.1, p.18). However, it was not clear in the BR4 whether any changes had been made to Germany's national inventory arrangements since its previous NC or BR, as these cover a different time frame compared with the time frame since the national inventory report. During the review, Germany clarified that there had been no changes to its national arrangements since its previous NC and BR. The ERT recommends that the Party increase the transparency of the reporting by clearly stating in the relevant BR section whether there have been any changes to its national inventory arrangements since its last NC or BR.

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

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

1. Technical assessment of the reported information

12. For Germany the Convention entered into force on 21 March 1994. Under the Convention Germany 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_2, CH_4, N_2O, HFCs, PFCs and SF_6 using global warming potential 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. 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. 25–27 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. 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.

15. The European Green Deal, launched in 2019, represents a commitment by the EU to become climate-neutral by 2050, and presents a road map that encompasses all sectors of the economy. It calls for increased ambition in the 2030 emission reduction target to at least 50 per cent below the 2005 level. Member States will translate any increased ambition into action through their revised NECP.

16. Germany has a national target of reducing its total GHG emissions to 14 per cent below the 2005 level by 2020 for emissions under the ESD. This target has been translated into binding quantified AEAs for 2013–2020. Germany's AEAs change following a linear path from 472,527.65 kt CO_2 eq in 2013 to 410,908.76 kt CO_2 eq in 2020.[5]

17. As part of the EU 2020 climate and energy package, EU member States have also adopted collective targets for attaining 20 per cent of energy from renewables[6] and a 20 per cent improvement in energy efficiency.[7] Member States have also agreed on measures to reduce indirect land-use change for biofuels and bioliquids[8] and phase down HFC use.[9] To fulfil its commitments, Germany has transposed the relevant EU regulations and adopted a renewable energy target of 18 per cent by 2020 and primary and final energy targets of 276.6 and 194.3 Mtoe, respectively, by 2020.[10]

18. Germany has also committed to a national economy-wide target of a 40 per cent reduction in emissions by 2020 compared with the 1990 level, excluding any contributions from the LULUCF sector or the use of market-based mechanisms. This target is more ambitious than the German contribution towards achievement of the joint EU target.

19. As part of its commitments under the 2030 EU climate and energy framework, which sets an overall 2030 target of cutting GHG emissions by at least 40 per cent in relation to the 1990 level (43 per cent for sectors covered under the EU ETS and 30 per cent for sectors covered under the ESR (see paras. 26–27 below)), Germany has a target to reduce its total GHG emissions to 38 per cent below the 2005 level by 2030 for emissions from the ESD sectors. The Party has also committed to a renewable energy target of 30 per cent by 2030. In its BR4, Germany presented its long-term targets to reduce its GHG emissions by 55 per cent by 2030 and by 70 per cent by 2040 compared with the 1990 level. Furthermore, the country is committed to attaining GHG neutrality by mid-century. Germany's Climate Action Plan 2050 details the process for meeting this goal, which includes setting sector-specific 2030 emission reduction targets.[11]

2. Assessment of adherence to the reporting guidelines

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

[5] European Commission decision 2017/1471 amended decision 2013/162/EU to revise member States' AEAs for 2017–2020.

[6] EU directive on the promotion of the use of energy from renewable sources (directive 2009/28/EC).

[7] EU directive on energy efficiency (directive 2012/27/EU).

[8] EU directive on the quality of petrol and diesel fuels (directive 2015/1513).

[9] EU regulation 517/2014 on F-gases and EU directive on emissions from air-conditioning systems in motor vehicles (directive 2006/40/EC).

[10] See European Environment Agency. 2019. *Trends and projections in Europe 2019: Tracking progress towards Europe's climate and energy targets.* European Environment Agency Report No 15/2019. Copenhagen: European Environment Agency. Available at https://www.eea.europa.eu/publications/trends-and-projections-in-europe-1.

[11] See https://www.bmu.de/en/topics/climate-energy/climate/national-climate-policy/greenhouse-gas-neutral-germany-2050/.

Table 4
Findings on the assumptions, conditions and methodologies related to the quantified economy-wide emission reduction target from the review of the fourth biennial report of Germany

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 4 Issue type: transparency Assessment: recommendation	Germany reported on its quantified economy-wide emission reduction target under the Convention in its BR4, including any conditions or assumptions related to attaining that target, as communicated to the secretariat (FCCC/SB/2011/INF.1/Rev.1), and on other national targets. With regard to the description of the target for emissions under the ESD, the Party reported in its BR4 (p.22) an ESD allocation for 2020 of 425 Mt CO_2 eq, while the EU transaction log indicates that the allocation is 411 Mt CO_2 eq (see https://ec.europa.eu/clima/ets/esdAllocations.do). During the review, Germany confirmed that the ESD allocation for 2020 is 411 Mt CO_2 eq. The ERT recommends that the Party increase the transparency of its reporting in its next BR by ensuring that ESD allocations are consistent with those reported in the EU transaction log.
2	Reporting requirement specified in paragraph 5 Issue type: transparency Assessment: recommendation	Germany reported on the joint EU target under the Convention in its BR4 (section 2.2, table 1). However, the information in this table is not consistent with the information in CTF tables 2(b), 2(c) and 2(e). More specifically, the table does not include PFC emissions for EU countries, while CTF tables 2(b) and 2(c) suggest that PFC emissions are included in Germany's 2020 target. Furthermore, CTF table 2(e)I suggests that market-based mechanisms will not be used ("0.00" is reported), while BR4 table 1 indicates that their use is permitted under certain conditions under the ESD and the EU ETS. During the review, Germany explained that PFC emissions had been omitted from table 1 of the BR4 (section 2.2) in error. The Party confirmed that it is not planning to use market-based mechanisms under the ESD. The ERT recommends that Germany improve the transparency of its reporting by ensuring that the description of its target in its next BR is consistent throughout the text and CTF tables and is also consistent with the EU target under the Convention. The ERT notes that the transparency of the reporting in CTF tables 2 could be improved by using clearly defined notation keys (e.g. "NA" for the base year for NF_3 emissions) and footnotes (e.g. to explain the use of market-based mechanisms under the ESD and EU ETS, including reference to the EU BR).

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

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

21. Germany 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. The Party reported on its policy context and legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs.

22. Germany provided information on a set of PaMs similar to those previously reported, with a few exceptions. The BR4 provided information only on PaMs that had been either amended or introduced since the submission of its BR3. Germany also indicated that there have been no 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.

23. In its reporting on its PaMs, Germany provided the estimated emission reduction impacts for most of its PaMs, both in the BR and in CTF table 3. Where estimated impacts

were not provided, the Party supplied some explanations in the BR, and supplemented them with further explanation during the review. The Party described the methodologies used to estimate the impacts of its individual measures or groups of PaMs. For example, the avoidance of emissions as a result of using renewables is calculated on a net basis offset against the gross emissions avoided by replacing fossil fuels.

24. Germany reported on its self-assessment of compliance with its emission reduction targets as part of the uniform monitoring and review process applied to all EU member States (EU monitoring mechanism regulation 525/2013) to assess compliance with the EU target. A number of publications provide assessments of whether Germany's performance is compliant with its national climate targets: the annual climate action report (published since 2015), the annual monitoring report and a progress report on the energy of the future (published every four years). The Party's progress in implementing the Climate Action Plan 2050 will also be reported on regularly from 2020. The Party did not report on its progress in establishing national rules for taking action against non-compliance with its emission reduction targets.

25. 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_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. The 2030 climate and energy framework, adopted in 2014, includes more ambitious targets, which are expected to be revised further upwards owing to the European Green Deal.

26. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N_2O emissions from chemical industry, PFC emissions from aluminium production and CO_2 emissions from some industrial processes that were not covered in the previous phases of the EU ETS (since 2013). For 2030, an emission reduction target of 43 per cent below the 2005 level has been set for the EU ETS.

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

28. Germany highlighted the EU-wide mitigation actions that are under development, such as the amendment to the EU ETS legislation regarding the trading period 2021–2030, the implementation of the ESR (and its national target to reduce emissions by 38 per cent by 2030 compared with the 2005 level), the enhanced use of renewable energy sources and the setting of energy efficiency targets for 2030 pertaining to the 2030 climate and energy framework. Among the mitigation actions implemented at the EU level with a significant impact on Germany's current and future emissions is the EU ETS, with a projected mitigation impact of 5,600.00 kt CO_2 eq in 2020 and 10,000.00 kt CO_2 eq in 2030.

29. Germany introduced national-level policies to achieve its targets under the ESD and domestic emission reduction targets. The key policies reported are the Climate Action Programme 2020, which was adopted in December 2014, and the Climate Action Plan 2050, which was approved in 2016, both of which were discussed in the previous NC and BR. In addition, a number of EU regulations that have been transposed into national acts together with other national legislation lead the restructuring of the energy and other sectors. Some

examples include the Renewable Energy Sources Act, the Energy Conservation Ordinance, the Combined Heat and Power Act, the transposition of EU regulation 517/2014 on F-gases and the fertilizer application regulation. The mitigation effect of the Renewable Energy Sources Act is the most significant (113,000.00 kt CO_2 eq in 2020 and 148,000.00 kt CO_2 eq in 2030). Other policies resulting in significant emission reductions include placing lignite-fired power plants on standby for reserve capacity only (11,800.00 kt CO_2 eq in 2020), the revision of the road traffic licensing regulation to limit HFCs in the air-conditioning systems of passenger cars (3,211.00 kt CO_2 eq in 2020), the HFC phase-down in accordance with the EU regulation on F-gases (2,744.00 kt CO_2 eq in 2020) and the fertilizer application regulation (2,713.00 kt CO_2 eq in 2020).

30. Germany highlighted in its BR4 a few domestic mitigation actions that are under development, such as the KfW Efficiency Programme and the conservation of peatlands. The KfW Efficiency Programme, which is an extension of the soft loan programme by KfW and which supports investment in energy efficiency, is the only planned measure with a quantified mitigation impact (1,300.00 kt CO_2 eq in 2020) presented in CTF table 3.

31. During the review, the Party informed the ERT that the German Government's climate cabinet prepared specific instruments and measures in the course of 2019 with the aim of achieving the 2030 sector targets while helping to comply with the emission budgets set by the ESR and the national mitigation targets. In September 2019, the German Government passed a resolution on the key elements of Germany's climate policy for the next decade as part of the national climate and energy package. Adopted in October 2019, the Climate Action Programme 2030 specifies a suite of climate programmes to achieve national targets, including a proposal for a carbon pricing system covering transportation and buildings, a coal-fired generation phase-out by 2038 at the latest, a target of 65 per cent share of renewables in 2030, fiscal incentives for electric vehicles, expansion of public transport, electrification of freight, support for fuel cells, tax incentives for retrofitting buildings, fertilizer regulations, support for practices that reduce agricultural emissions, and increased reforestation and shifting forest composition to species that are more resilient to climate change. The bulk of legal amendments addressed under the Climate Action Programme 2030 are still subject to the parliamentary process. Some of the new regulations mentioned by Germany during the review include the Climate Action Law, which sets the framework for climate change policy and enshrines the 2030 reduction target into law, a law introducing carbon pricing in the heat and transport sectors, and a law for phasing out coal use in power production. The decisions and legislation adopted in late 2019 and 2020 are of great importance to the medium- and long-term national climate change strategy. These and other adopted and planned measures will form part of the PaMs to be discussed in the BR5.

32. Table 5 provides a summary of the reported information on the PaMs of Germany.

Table 5
Summary of information on policies and measures reported by Germany

Sector	*Key PaMs*	*Estimate of mitigation impact in 2020 (kt CO_2 eq)*	*Estimate of mitigation impact in 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	EU ETS	5 600.00	10 000.00
Energy	Placing lignite-fired power plants on standby for reserve capacity only	11 800.00	NE
	Combined Heat and Power Act	1 000.00	2 000.00
Transport	Toll for heavy goods vehicles	700.00	800.00
	Subsidies for electric mobility	300.00	100.00
	Strengthening public transport	100.00	200.00
Renewable energy	Renewable Energy Sources Act	113 000.00	148 000.00
	Market Incentive Programme for Renewable Energies	2 323.00	10 065.00
Energy efficiency	Energy Conservation Ordinance	1 936.00	7 298.00
	CO_2 Building Rehabilitation Programme	1 545.00	6 694.00
	Energy Efficiency Incentive Programme	223.00	1 381.00

Sector	*Key PaMs*	*Estimate of mitigation impact in 2020 (kt CO_2 eq)*	*Estimate of mitigation impact in 2030 (kt CO_2 eq)*
IPPU	Road traffic licensing regulation on emissions from air-conditioning systems in motor vehicles	3 211.00	6 052.00
	HFC phase-down	2 744.00	5 663.00
Agriculture	Fertilizer application regulation	2 713.00	2 519.00
	EU directive on the reduction of national emissions of certain atmospheric pollutants and National Air Pollution Control Programme	225.00	770.00
LULUCF	Maintaining permanent grassland	790.20	2 556.80
	Reduced land take for settlements and transport	97.40	648.80
Waste	Funding for landfill aeration	62.00	403.00

Note: The estimates of mitigation impact are estimates of emissions of 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

33. **Energy efficiency.** Germany has an indicative national target of final energy consumption of 194.3 Mtoe (276.6 Mtoe for primary energy consumption) in accordance with the EU energy efficiency target of a 20 per cent reduction in energy use by 2020. To attain its target, Germany relies on various regulations such as the Energy Conservation Ordinance based on the Energy Conservation Act, which administers minimum energy requirements for new builds and existing buildings undergoing major refurbishment. The Energy Efficiency Incentive Programme of the Federal Office for Economic Affairs and Export Control began in 2015 and includes four priority areas: a heating package that funds the replacement of inefficient heating units and optimizes the entire heating system, a ventilation package that funds the installation of ventilation systems, an information campaign and the market launch of fuel cell heating. The German Government has promoted the market launch of innovative fuel cell heating for residential buildings since August 2016, and for non-residential buildings since July 2017.

34. Small and medium-sized enterprises are offered financial assistance to seek adequate energy advice under a programme run by the Federal Ministry for Economic Affairs and Energy. The funding guidelines meet the requirements for energy audits set out in the EU directive on energy efficiency (directive 2012/27/EU). Under the amendment to the Energy Services Act of 22 April 2015, large companies (enterprises with more than 250 employees, a turnover of more than EUR 50 million, or an annual balance sheet total of more than EUR 43 million) were also required to implement an energy audit following standard DIN EN 16247-1 by 5 December 2015 and to conduct audits at maximum intervals of four years.

35. **Energy supply and renewables.** The Combined Heat and Power Act, which was last amended in 2017, is a crucial measure for improving cogeneration plants in Germany. The combined heat and power expansion target has been adjusted; a minimum of 110 TWh of Germany's annual net electricity production is to be met by combined heat and power plants by 2020, reaching 120 TWh by 2025. During the review, Germany noted that cogeneration plants had produced 117 TWh of electricity in 2018, which is above the 2020 target, and the 2025 target is also likely to be met.

36. In accordance with the EU directive on the promotion of the use of energy from renewable sources (directive 2009/28/EC), 18 per cent of Germany's national final energy consumption should come from renewable sources by 2020. In 2018, the share of renewable sources in final gross energy consumption across all sectors reached 16.7 per cent (14.2 per cent in total heat and cooling consumption and 5.7 per cent in the transport sector) and a total of 187.3 Mt CO_2 eq emissions was avoided as a result of increased use of renewable energy sources. A recent amendment to the Renewable Energy Sources Act further determined expansion paths for the most important renewable energy sources. Most of these paths involve offering procedures for funding. The goal is to increase the share of renewable electricity to 40–45 per cent in 2025 and to 55–60 per cent in 2035. During the review, Germany noted that a new amendment to the Renewable Energy Sources Act is planned for

2020, which will reflect the target of a 65 per cent share of renewable energy in 2030. Improvements are planned to increase the shares and expand the tendering volumes for each source of renewable energy to help reach that goal.

37. **Residential and commercial sectors.** The CO_2 Building Rehabilitation Programme promotes energy-efficient construction and renovation for residential and non-residential buildings. EUR 2 billion a year was available in 2017 and 2018 to fund new measures for the following subprogrammes: Energy-Efficient Refurbishment and Energy-Efficient Construction (private consumers), Energy-Efficient Construction and Refurbishment (commercial buildings) and Energy-Efficient Construction and Refurbishment (municipal and social infrastructure). Furthermore, the Energy Efficiency Incentive Programme (see para. 33 above) aims to replace inefficient heating and ventilation systems. Under the heating network systems 4.0 funding programme, the Federal Government has been supporting the installation of innovative heating networks since 1 July 2017. These fourth-generation heating networks are intended to provide a sustainable supply of low-temperature heat (up to a maximum of 95 °C) to residential and non-residential buildings via integrating renewable energy sources (especially solar thermal and ambient heat). The funding measures under the Market Incentive Programme for Renewable Energies improve the application of systems that employ renewable energy sources for heating and cooling, heat storage facilities or local heating networks in both residential and non-residential buildings. Eligibility is mainly limited to systems in existing buildings, with funding for systems in new buildings only available in exceptional cases that involve a certain level of innovation. Funds from the federal budget and the Energy and Climate Fund of approximately EUR 418 million were available for the Market Incentive Programme for Renewable Energies in 2018.

38. **Transport sector.** Germany provided a summary of key measures in the transport sector, including developing a toll on heavy goods vehicles, funding electric vehicles and improving public transport. A toll has been applied to heavy goods vehicles with a maximum permissible gross laden weight of more than 12 t on Germany's autobahn system since 2005. For most vehicles, tolls have increased since January 2019, while electric heavy goods vehicles are exempt from tolls. A range of other measures have been put in place by the German Government to promote electric mobility, such as subsidies to facilitate the market penetration of hybrid and battery electric vehicles. Germany has a target of 1 million electric vehicles in use by 2020, increasing to 6 million by 2030. EUR 300 million is provided by the Federal Government for 2017–2020 under a funding programme to increase publicly accessible infrastructure for charging electric vehicles throughout Germany. The Federal Ministry of Transport and Digital Infrastructure, municipalities and local authorities are responsible for planning, designing, organizing and funding public transport, with the aim of achieving a modal shift towards it. The Federal Government supports public transport through tax breaks (e.g. lower rates of value added tax) and through compensation (e.g. for the transport of people with severe disabilities). Furthermore, a regulation was introduced on 1 January 2018 under the Electricity Tax Act according to which electricity for electric vehicles used in public transport is subject to tax relief (EUR 9.08/MWh on a normal tax rate of EUR 20.50/MWh).

39. **Industrial sector.** The Waste Heat Prevention Campaign, which entered into force in 2016, includes guidelines for promoting the prevention or use of waste heat. The guidelines were amended on 25 August 2017 to include financial assistance for measures to avoid or use industrial waste heat. Germany noted that this financial support is available as either an investment grant or a repayment subsidy for KfW loans for up to 40 per cent of the eligible costs. The programme will subsidize capital investments to encourage the modernization or development of existing plants or the instalment of new plants where no waste heat is produced or previously unused waste heat can be used more efficiently. It is estimated that annual funding under the measures will increase to EUR 100 million by 2020.

(c) Policies and measures in other sectors

40. **Industrial processes.** The revision of the road traffic licensing regulation to limit HFCs in the air-conditioning systems of passenger cars,[12] which was implemented in 2011,

[12] EU directive on emissions from air-conditioning systems in motor vehicles (directive 2006/40/EC).

remains one of the major measures in the sector, with an expected reduction impact of 3,211.00 kt CO_2 eq in 2020. The EU regulation on F-gases, which aims to reduce the quantity of HFCs in the EU, is implemented in Germany with the Chemicals Climate Protection Ordinance and the federal support scheme for commercial air-conditioning and cooling systems under the National Climate Initiative. The regulation prohibits the production of certain products containing F-gases, introduces bans for SF_6 and sets requirements for maintaining and inspecting equipment containing certain levels of these gases. The BR4 does not include a discussion of any additional measures for addressing emissions from industrial processes.

41. **Agriculture.** Along with the increased use of manure in biogas plants and the expansion of organic farming, which were reported in the BR3, the measures in the agriculture sector discussed in the BR4 are the fertilizer application regulation, and the EU directive on national emission ceilings and the National Air Pollution Control Programme. Many features of the fertilizer application regulation (amended in 2017 to meet the key provision of the EU nitrates directive) impact the control of nutrients, especially farm manure. The federal states are currently able to include additional measures such as shorter incorporation times, more extended closed periods for using fertilizer, and lower allowable nutrient excesses in fields with high nitrate inputs and high phosphorus loads in surface waters. Since December 2016, the new EU directive on national commitments to reduce emissions of certain atmospheric pollutants (directive 2016/2284) specifies a 29 per cent reduction in ammonia emissions by 2030 compared with the 2005 level. This reduction can be accomplished by executing a series of measures (such as covering liquid manure storage units, incorporating or injecting farm manure without delay, applying urease inhibitors in urea-based fertilizers and making greater use of exhaust air filters in pig and poultry houses), which will result in a reduction in N_2O emissions.

42. **LULUCF.** Germany has adopted an ambitious strategy that aims to maintain grassland and conserve peatland in line with the Climate Action Programme 2020. Before permanent grassland can be converted into arable land, official authorization is required and evidence must be presented of a replacement piece of land of equal size where new permanent grassland will be established. In addition, Germany plans to limit land converted for settlement and transport purposes in order to fulfil the commitments set out in its national Sustainable Development Strategy. In line with the strategy, the Government set a goal of reducing the construction of new built-up areas and transport infrastructure from over 120 ha/day to a maximum of 30 ha/day in 2030. For 2050 the target in the German Climate Action Plan 2050 is no net land take, as set out in European Commission communication COM(2011) 571 titled “Roadmap to a Resource Efficient Europe”.

43. **Waste management.** The waste sector had the highest decrease in emissions (73.5 per cent) from 1990 to 2017 relative to other sectors. The BR4 outlines some additional measures that will contribute to the further reduction in emissions from this sector. One such measure involves promoting recycling through the Packaging Act, which has enhanced the rate of recovery of secondary raw materials from waste, making it a priority to recycle them or use them for energy generation. Another measure in this sector is implemented through a commercial waste regulation in which a five-stage waste management hierarchy is applied to commercial and municipal waste, in addition to certain types of construction and demolition waste. Additionally, since 2013, 43 landfill aeration projects that aim to reduce the potential for CH_4 generation have been approved under local authority guidelines as part of the National Climate Initiative. This measure has been continued and the aeration of four additional landfills per year between 2021 and 2026 is planned, with an estimated annual decrease of a further 1.2 Mt CO_2 eq from 2025. However, the measure is technologically demanding and scaling it up is not realistic.

(d) Response measures

44. Germany reported on its assessment of the economic and social consequences of its response measures. The Party referred to its 2016 national inventory report, where individual measures aimed at minimizing adverse impacts are described. Most measures are not expected to have direct negative consequences for developing countries, while others are expected to have positive effects. Positive indirect effects are anticipated for measures

involving the promotion of biofuels, the removal of coal subsidies, the EU ETS and the provision of support to allow developing countries to diversify their energy supplies.

(e) Assessment of adherence to the reporting guidelines

45. The ERT assessed the information reported in the BR4 of Germany and identified issues relating to completeness and transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 6.

Table 6
Findings on mitigation actions and their effects from the review of the fourth biennial report of Germany

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	Germany reported on its mitigation actions, including on PaMs implemented or planned since its previous NC and BR, in both its BR4 and CTF table 3. However, the Party did not clearly indicate why some of the measures previously reported in the BR3 and NC7 were not reported in this BR and why there are no references to them in the BR4. The mitigation impacts of some of the reported measures have been revised in CTF table 3 compared with those in the previous submission (e.g. PaMs 5, 12, 14, 17, 26–28 and 37–38) without any explanation, and the start year of some measures is different from that given in the BR3 (i.e. PaMs 6, 11, 14, 17 and 38). The ERT noted inconsistency between CTF table 3 and BR4 text in the start year of one mitigation measure. Although CTF table 3 gives 2018 as the start year for the implementation of measure 18 (adjustment of GHG quota and implementation of a lower bound for advanced biofuels), it was stated in the BR4 (p.28) that this measure brought the regulations on GHG reduction quotas into line with EU law dating from 2015.
	Issue type: completeness Assessment: encouragement	The ERT also noted inconsistency between CTF table 3 and the BR4 text in that some measures reported in CTF table 3 are not mentioned in the BR, for example measure 34 (row 45) on the separate collection of biological waste (Circular Economy Act), and the KfW Efficiency Programme (row 26). In addition, Germany did not provide information on the estimated emission reduction impacts for some of its PaMs, reporting them in CTF table 3 as "NE" or "IE" (without indicating where the impact had been included). The ERT noted that the reasoning behind the use of the notation keys in CTF table 3 is explained only to some extent in the text of the BR4. During the review, Germany confirmed that the BR4 only presents PaMs that have been updated or implemented since the NC7 and BR3 were finalized. It also includes PaMs whose GHG mitigation impact had been updated in the 2019 Projections Report, even though there were no changes to the regulation or funding programme as such. The Party explained that changes in the mitigation impacts of some PaMs may be due to new interrelations with other updated or new PaMs or to changes in assumptions, for example with regard to energy prices or economic development. The Party confirmed that it mistakenly omitted clear references to the measures from the NC7 and BR3 that have neither been changed nor remodelled with regard to mitigation impact. Regarding the adjustment of the GHG quota (row 37), the corresponding EU directive on calculation methods and reporting requirements in relation to petrol and diesel fuels (directive 2015/652 (see https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015L0652)) from 2015 had to be transposed into national law before taking effect in Germany. The BR4 gives 2018 as the start year of implementation as this is when the regulation entered into force in Germany. The Party acknowledged the inconsistency regarding measures reported in rows 26 and 45 of CTF table 3. The ERT recommends that Germany further elaborate its reporting on PaMs in the next BR by: (a) Including transparent and consistent information on the mitigation actions that have been put in place since the previous BR to achieve the target as well as those that were reported in the previous BR and are still functional;

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		(b) Providing information on the reasons for the differences in the start year between the BR and CTF table 3, including on the base year of measure 18 (row 37); (c) Ensuring that the PaMs are consistently reported between the BR text and CTF table 3. The ERT notes that Germany could improve the transparency of its reporting by elaborating in its next BR the reasons for the differences in estimated mitigation impacts of measures and for making other updates to the description of the PaMs reported in CTF table 3 between BRs. The ERT also notes that the transparency of the reporting in CTF table 3 could be improved by clarifying the use of "NE" and "IE" in footnotes to the table.
2	Reporting requirement specified in paragraph 24 Issue type: completeness Assessment: encouragement	In the BR4 (p.39), Germany explained that the Government mandated the Commission on Growth, Structural Change and Employment to make recommendations when it was discovered that a target would not be achieved on schedule. However, the Party did not report on the establishment of national rules for taking local action against domestic non-compliance with emission reduction targets in its BR4. During the review, Germany explained that in late December 2019, after the BR4 had been completed, the new Federal Climate Change Act mandated new monitoring and non-compliance mechanisms. In particular, the Act defines annual emission budgets for each sector between 2020 and 2030, stipulates annual monitoring and foresees the development of action programmes to address exceedances of the annual budgets. The ERT encourages Germany to report, to the extent possible, on the establishment of national rules for taking local action against domestic non-compliance with emission reduction targets in its next BR.

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

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

(a) Technical assessment of the reported information

46. For 2016, Germany reported in CTF table 4 annual total GHG emissions excluding LULUCF of 911,049.01 kt CO_2 eq, which is 27.2 per cent below the 1990 level. In 2016, emissions from sectors relating to the target under the ESD amounted to 454,157.41 kt CO_2 eq.

47. For 2017, Germany reported in CTF table 4 annual total GHG emissions excluding LULUCF of 906,611.46 kt CO_2 eq, which is 27.5 per cent below the 1990 level. In 2017, emissions from sectors relating to the target under the ESD amounted to 466,857.28 kt CO_2 eq.

48. Germany reported that it does not intend to use units from market-based mechanisms under the Convention to meet its commitment under the ESD. The ERT noted that using flexible mechanisms to meet emission reduction targets is possible under both the EU ETS and the ESD for EU member States. Germany reported on its use of units from market-based mechanisms by using the notation key "NA" in and adding a footnote to CTF table 4 and leaving cells blank in CTF table 4(b). 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 to Germany. On its use of units from LULUCF activities, the Party reported "NA" and left blank cells in CTF table 4 for 2016 and 2017 and left blank cells in CTF table 4(a), explaining that it is not using units from the LULUCF sector to achieve its target under the Convention.

49. Table 7 illustrates Germany's total GHG emissions and the use of units from market-based mechanisms to achieve its target.

Table 7
Summary of information on the use of units from market-based mechanisms by Germany to achieve its target

Year	*ESD emissions (kt CO_2 eq)*	*AEA (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*	*Annual AEA surplus/deficit (kt CO_2 eq)*[a]	*Cumulative AEA surplus/deficit (kt CO_2 eq)*
2013	460 204.91	472 527.65	NA	12 322.74	12 322.74
2014	436 790.19	465 830.46	NA	29 040.28	41 363.02
2015	444 080.62	459 133.27	NA	15 052.66	56 415.68
2016	454 157.41	452 436.08	NA	–1 721.33	54 694.36
2017	466 857.28	432 348.86	NA	–34 508.42	20 185.92
2018	NA	425 202.16	NA	NA	NA
2019	NA	418 055.46	NA	NA	NA
2020	NA	410 908.76	NA	NA	NA

Sources: Germany's BR4 and CTF table 4(b), information provided by the Party during the review and EU transaction log (AEAs).
[a] A positive number (surplus) indicates that ESD emissions were lower than the AEA, while a negative number (deficit) indicates that ESD emissions were greater than the AEA.

50. In assessing the progress towards the achievement of the 2020 joint EU target, the ERT noted that Germany's emission reduction target under the ESD is 14 per cent below the base-year level (see para. 16 above). In 2017, Germany's ESD emissions were 8.0 per cent (34,508.42 kt CO_2 eq) above the AEA under the ESD. Germany has a cumulative surplus of 20,185.92 kt CO_2 eq with respect to its AEAs between 2013 and 2017. The ERT noted that ESD emissions need to decrease strongly in the remaining years up until 2020 in order for Germany to comply with its ESD target without having to purchase AEAs from other member States.

51. The ERT noted that Germany faces challenges in implementing mitigation actions that will deliver the emission reductions needed to make sufficient progress towards achieving its ESD target. Further, the ERT noted that, to achieve its target under the ESD, Germany plans to purchase surplus AEAs from EU member States that have overachieved their target, under the flexibility allowed under the ESD, to cover the potential cumulative AEA deficit.

52. Regarding its national target to reduce emissions to 40 per cent below the 1990 level by 2020, Germany also confirmed that, despite its progress to date, it does not expect to meet this target. The Party noted in the BR4 that it is unlikely to meet its 2020 national targets and is focusing its attention on a suite of climate programmes under the Climate Action Plan 2050 to attain its more ambitious reduction goals for 2030 and 2040.

(b) Assessment of adherence to the reporting guidelines

53. The ERT assessed the information reported in the BR4 of Germany and identified an issue relating to transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 8.

Table 8
Findings on estimates of emission reductions and removals and on the use of units from market-based mechanisms and land use, land-use change and forestry from the review of the fourth biennial report of Germany

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation*
1	Reporting requirement specified in paragraph 10 Issue type: transparency Assessment: recommendation	Germany indicated in its BR4 (section 2.1, p.20) that it would not be using LULUCF or flexible mechanisms such as the clean development mechanism or joint implementation to meet its target, suggesting that the country would not be using market-based mechanisms to meet the ESD targets. Up to and including 2018, Germany did not use any market-based mechanisms to achieve its targets (BR4, section 3.1.5, p.38). Germany clarified that emission allowances would be purchased from other EU member States in 2019 and 2020 if necessary (BR4, section 3.2.2, p.41). In the BR4 Germany did not report specifically on the use of market-based mechanisms by operators under the EU ETS, for example by providing an explanation on the use of units from market-based mechanisms by its operators under the EU ETS or by including a reference to this information in the EU BR4. The Party provided a general explanation of the EU ETS target. During the review, Germany provided information on the market-based mechanisms used by operators under the EU ETS for 2013–2018. The ERT recommends that Germany increase the transparency of the reporting by providing information in its next BR clarifying the use of international market-based mechanisms by EU ETS operators in Germany.

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

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

54. Germany reported updated projections for 2020, 2025, 2030 and 2035 relative to actual inventory data for 2016 under the WEM scenario. The WEM scenario reported by Germany covers implemented and adopted PaMs until 31 August 2018 included on the basis of calculations from 2018 used in Germany's 2019 Projections Report,[13] which was prepared under EU regulation 525/2013. Germany explained that because the complex modelling work was carried out in 2018, the 2018 GHG inventory, which provided the most up-to-date estimates at the time, was used as the basis for the projections. The definition of the WEM scenario indicates that it was prepared according to the UNFCCC reporting guidelines on BRs.

55. Germany did not report WOM or WAM scenarios. In the BR4 (p.45), the Party explained that the PaMs have already been in place for a long time and it is difficult to produce a projection of a development for the WOM scenario without these PaMs' influence.

56. 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 (treating PFCs and HFCs collectively in each case) as well as NF_3 for 2020, 2025, 2030 and 2035. The projections are also provided in an aggregated format for each sector and for a Party total using global warming potential values from the AR4.

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

58. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals.

[13] See http://cdr.eionet.europa.eu/de/eu/mmr/art04-13-14_lcds_pams_projections/projections/envxnw7wq/.

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

59. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the NC7, although there have been minor updates to the underlying data. Germany made reference to the NC7 and the 2019 Projections Report for additional information on the methodology used. During the review, Germany provided summary information on the modelling approach, including the approaches used in the 2019 Projections Report (see para. 54 above) for each of the sectors, in addition to information on changes made since the NC7, such as minor model improvements.

60. To prepare its projections, Germany relied on key underlying assumptions relating to population, number of households, GDP and its growth rate, energy prices, lignite production and GHG emission allowances. The Party reported in CTF table 5 the key variables and assumptions used in preparing the projections under the scenarios.

61. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. The population projection is based on the latest forecast of the Federal Statistical Office. A slight increase in the number of inhabitants is projected for both 2020 and 2025 (83.22 million), whereas in the BR3 a declining population trend was assumed. The 2019 Projections Report, in contrast with the BR3, assumes higher growth rates in GDP (1.3 per cent in both 2020 and 2025). Energy prices (oil, gas, coal) and prices of GHG emission allowances are slightly higher in the BR4 than in the BR3. During the review, Germany provided further information on the changes since the submission of its NC7 in the assumptions, methodologies, models and approaches used in the projection scenarios. The Party provided supporting documentation to explain the changes, referencing the 2019 Projections Report.

62. Germany also provided brief information on sensitivity analyses and a summary of the results of the analyses in the BR4. If these results are taken into account, there is a reduction in emissions in 2020 and 2030 of up to 34.3 and 43.6 per cent, respectively, compared with the 1990 level (BR4, p.46). The 2019 Projections Report includes sensitivity analyses conducted for a number of important assumptions, such as GDP growth, energy intensity and energy prices, under the WEM scenario.

(c) Results of projections

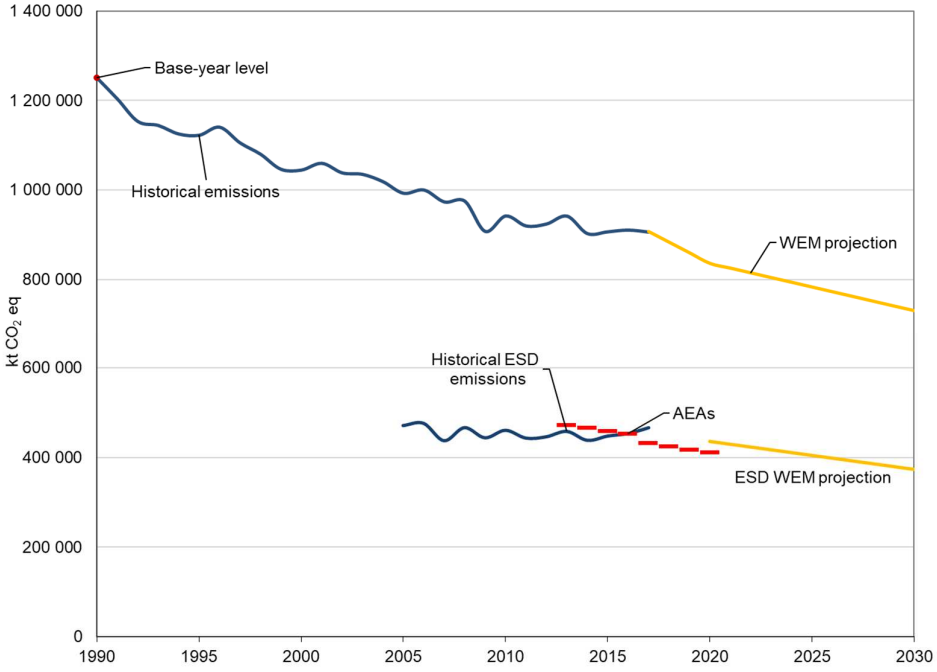
63. The projected emission levels under different scenarios and information on the quantified economy-wide emission reduction target are presented in table 9 and figure 1.

Table 9
Summary of greenhouse gas emission projections for Germany

	Total GHG emissions		*Emissions under the ESD*	
	GHG emissions (kt CO_2 eq per year)	*Change in relation to 1990 level (%)*	*ESD emissions (kt CO_2 eq per year)*	*Comparison with 2020 AEA (%)*
2020 AEA under the ESD[a]	NA	NA	410 908.76	100.0
Inventory data 1990	1 250 992.61	NA	NA	NA
Inventory data 2017	906 611.46	–27.5	466 857.28	13.6
WEM projections for 2020	835 607.56	–33.2	436 631.90	6.3
WEM projections for 2030	730 031.46	–41.6	373 562.30	NA

Source: Germany's BR4 and CTF table 6.
Note: The projections are for GHG emissions excluding LULUCF.
[a] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. The Party's target under the ESD is 14 per cent below the 2005 level by 2020.

Figure 1
Greenhouse gas emission projections reported by Germany



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

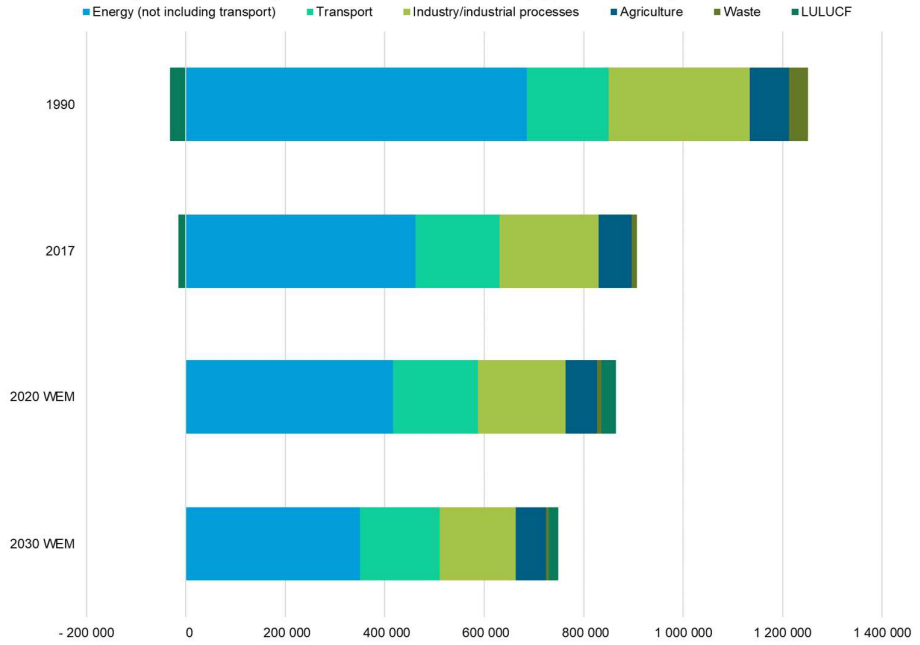
64. Germany's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 835,607.56 and 730,031.46 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 33.2 and 41.6 per cent, respectively, below the 1990 level.

65. Germany's target under the ESD is to reduce ESD emissions by 14 per cent below the 2005 level by 2020 (see para. 16 above). Germany's AEAs, which correspond to its national emission target for ESD sectors, change linearly from 472,527.65 kt CO_2 eq in 2013 to 410,908.76 kt CO_2 eq for 2020. According to the projections under the WEM scenario, ESD emissions are estimated to reach 436,631.90 kt CO_2 eq by 2020. The projected level of emissions under the WEM scenario is 6.3 per cent above the AEAs for 2020. The ERT noted that the Party's cumulative surplus of AEAs in 2017 is 20,185.92 kt CO_2 eq, which suggests that Germany may need to use the flexibility allowed under the ESD to meet its target under the WEM scenario.

66. In addition to its target under the ESD, Germany committed itself to achieving a domestic target of a 40 per cent reduction in emissions below the 1990 level by 2020, and a 55 per cent reduction by 2030. The projections indicate that Germany may face challenges in achieving its domestic target. Nevertheless, with its 2030 programme (see para. 31 above) and additional measures, Germany intends to achieve its reduction targets for 2030 (BR4, p.20).

67. Germany presented the WEM scenarios by sector for 2020 and 2030, as summarized in figure 2 and table 10.

Figure 2
Greenhouse gas emission projections for Germany presented by sector



Source: Germany's BR4 CTF table 6.

Table 10
Summary of greenhouse gas emission projections for Germany presented by sector

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
Sector	*1990*	*2020 WEM*	*2030 WEM*	*1990–2020*	*1990–2030*
Energy (not including transport)	685 631.48	416 317.78	350 252.99	–39.3	–48.9
Transport	164 267.43	171 218.58	160 343.67	4.2	–2.4
Industry/ industrial processes	283 546.47	176 192.65	152 458.94	–37.9	–46.2
Agriculture	79 195.50	63 247.33	61 489.45	–20.1	–22.4
LULUCF	–31 311.74	29 527.84	18 989.81	194.3	160.6
Waste	38 351.73	8 631.21	5 486.40	–77.5	–85.7
Other (specify)	–	–	–	–	–
Total GHG emissions excluding LULUCF	**1 250 992.61**	**835 607.56**	**730 031.46**	**–33.2**	**–41.6**

Source: Germany's BR4 CTF table 6. Corrected values for projections were provided by Germany during the review.

68. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector (excluding transport) and in industry/industrial processes, amounting to projected reductions of 269,313.48 kt CO_2 eq (39.3 per cent) and 107,353.47 kt CO_2 eq (37.9 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario remains the same (i.e. projected reductions of 355,378.48 kt CO_2 eq (48.9 per cent) and 131,087.47 kt CO_2 eq (46.2 per cent) for energy (excluding transport) and industry/industrial processes, respectively). The level of emissions from the transport sector is expected to remain relatively stable, with emissions slightly increasing up until 2020 and showing a minor reduction compared with the 1990 level by 2030. Significant emission reductions from buildings are expected from 2025 onward: about 10,000 kt CO_2 eq every five years. This is mainly related to increased efficiency in heating and cooling appliances in private households and in the trade, commerce and services sectors. In the industrial processes sector, most historical GHG emission reductions were achieved in the chemical

industry, followed by metal production. However, considerably smaller changes in emissions are projected for the sector. The EU directive on emissions from air-conditioning systems in motor vehicles, which restricts the use of HFCs in this sphere, will continue to impact future emissions. Agriculture shows moderate projected emission reductions resulting from improved management practices in the sector, while waste continues to be the sector with the highest emission reductions in relative terms (a projected reduction of 77.5 per cent by 2020) owing to the reduction in landfill emissions.

69. Germany presented the WEM scenarios by gas for 2020 and 2030, as summarized in table 11.

Table 11
Summary of greenhouse gas emission projections for Germany presented by gas

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
Sector	*1990*	*2020 WEM*	*2030 WEM*	*1990–2020*	*1990–2030*
CO_2[a]	1 052 520.13	735 540.80	644 500.70	–30.1	–38.8
CH_4	120 944.08	50 333.90	46 105.07	–58.4	–61.9
N_2O	64 133.73	35 552.58	34 244.47	–44.6	–46.6
HFCs	IE	9 398.74	3 558.44	–	–
PFCs	2 897.21	265.01	259.58	–90.9	–91.0
Unspecified mix of HFCs and PFCs	6 069.46	184.63	184.63	–97.0	–97.0
SF_6	4 428.00	4 320.75	1 167.42	–2.4	–73.6
NF_3	NO, IE	11.15	11.15	–	–
Total GHG emissions without LULUCF	**1 250 992.61**	**835 607.56**	**730 031.46**	**–33.2**	**–41.6**

Source: Germany's BR4 CTF table 6.
[a] Germany did not include indirect CO_2 emissions in its projections.

70. For 2020, the most significant reductions are projected for CO_2 and CH_4 emissions: 316,979.33 kt CO_2 eq (30.1 per cent) and 70,610.18 kt CO_2 eq (58.4 per cent) between 1990 and 2020, respectively. As a percentage, the biggest decrease between 1990 and 2020 is observed for an unspecified mix of HFCs and PFCs (97.0 per cent) and PFCs (90.9 per cent) owing to the implementation of EU regulations in this area. However, the PFC and SF_6 emissions are expected to be higher than the 2017 values by 2020.

71. The pattern for emission reductions for 2030 remains the same, as the most significant reductions are projected for CO_2 followed by CH_4 emissions: 408,019.43 kt CO_2 eq (38.8 per cent) and 74,839.01 kt CO_2 eq (61.9 per cent) between 1990 and 2030, respectively. Compared with the 2020 projections, a significant emission reduction is projected for SF_6, which is expected to decrease to 73.6 per cent below the 1990 level and 69.6 per cent below the 2017 level by 2030 owing to the continued implementation of relevant legislation.

72. The ERT notes that the projections take into account forecasts for GDP, population, energy prices and the implementation of PaMs for 2020 and 2030.

(d) Assessment of adherence to the reporting guidelines

73. The ERT assessed the information reported in the BR4 of Germany and identified issues relating to completeness and transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 12.

Table 12
Findings on greenhouse gas emission projections reported in the fourth biennial report of Germany

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement[a] specified in paragraph 28	The ERT noted that, according to the UNFCCC reporting guidelines on NCs and on BRs, Parties are required to report a WEM projection and may report WOM and WAM projections. However, Germany only included in its BR4 a WEM scenario and an

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Issue type: completeness Assessment: encouragement	explanation as to why it did not report a WOM scenario in response to the previous review. No information has been provided in the report to explain why the WAM projections were not provided. During the review, Germany explained that by mid-2018 it had already been decided that additional climate PaMs would be agreed by the Government. However, these measures were not yet specified, and it was unclear which of the measures under consideration should be included in a WAM scenario and what quantitative assumptions would be appropriate. Under the circumstances it was agreed not to model a WAM scenario. However, the Party expects a WAM scenario to be included in the next projections report, which will be included in the BR5. The ERT encourages the Party to include the WAM scenario in the next BR or provide a clear explanation as to why its national circumstances prevent this.
2	Reporting requirement[a] specified in paragraph 29 Issue type: transparency Assessment: recommendation	According to the UNFCCC reporting guidelines on BRs, the WEM projection encompasses PaMs that are currently implemented and adopted. It is not clear from the BR4 which of the measures included in CTF table 3 are included in the projections and what the cut-off date is for including measures in the WEM scenario. For example, in CTF table 3, measure 31 (row 46) with start year 2019 is marked as implemented and included in the WEM scenario. Also in CTF table 3, two measures, one in row 32 (conservation of peatland (LULUCF), measure 30b) and one in row 33 (conservation of peatland (agriculture), measure 30a), that start in 2020 are described as planned and both have asterisks to indicate that they are included in the WEM scenario. Meanwhile, 2016 is noted as the starting point of the projections. During the review, Germany clarified that the WEM scenario corresponds to all measures that had been adopted by 31 August 2018 (2019 Projections Report, section 1.2). The base year for the modelling is 2016, since these were the latest inventory data available at the modelling start date and the schedule for preparing the projections lacked flexibility as the projections report had to be finalized by 15 March 2019 and the final inventory data for the latest inventory year 2017 became available on 15 January 2019, just two months before. This two-month period was not enough time for modelling and finalizing the projections report. The Party further clarified the status of specific measures in CTF table 3. The ERT recommends that Germany include clear and consistent information on the cut-off date for the scenarios and on the availability of the latest year of inventory data for the projections used in the WEM scenario and report consistently between the projection and the PaMs sections of the BR and CTF table 3.
3	Reporting requirement[a] specified in paragraph 35 Issue type: completeness Assessment: encouragement	The Party did not report emission projections for indirect GHGs in its BR4. During the review, the Party clarified that it reports these under the United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution and under the EU directive on the reduction of national emissions of certain atmospheric pollutants and provided weblinks to the reports (https://cdr.eionet.europa.eu/de/eu/nec_revised/projected/envxo1gpq/ and https://cdr.eionet.europa.eu/de/eu/nec_revised/programmes/envxptbfg/). Germany indicated that it may consider including a reference to the projections under this Convention and directive in future BRs. The ERT encourages Germany to provide in the next BR emission projections for the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides and/or to include a link to the reports where such projections can be found.
4	Reporting requirement[a] specified in paragraphs 43 Issue type: transparency Assessment: encouragement	The Party reported information on models and approaches used to develop projections in an external document (2019 Projections Report) and included a reference to the document in the BR4. The BR4 does not contain sufficient information to allow the reader to gain a basic understating of the models used. Furthermore, there is no description in the BR4 of the models or how the modelling approach used for the projections accounts for any possible overlap or synergies between different PaMs, as indicated in the UNFCCC reporting guidelines on NCs (para. 43). This was noted in the report on the technical review of the third biennial report of Germany, when the Party was encouraged to enhance the transparency of its reporting by providing

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		information in its next BR describing how the projection modelling approach accounts for or does not account for any overlap or synergies that may exist between different PaMs and specifically between different sectors. Further, the ERT noted that the source document for the projection section of the BR4 is only available in German. During the review, Germany provided information on the models used for each sector and included detailed model descriptions. The Party explained that it plans to translate the 2021 Projections Report into English. The ERT encourages the Party to provide in its next BR sufficient information to allow the reader to gain a basic understanding of the models and/or approaches used, including a brief description of the models, as required by paragraph 43 of the UNFCCC reporting guidelines on NCs. The ERT notes that the information in the BR could be further enhanced by including specific references to the relevant sections and/or pages of a background document that contains additional information.
5	Reporting requirement[a] specified in paragraph 46 Issue type: transparency Assessment: encouragement	The BR4 contains limited information on the sensitivity analysis, although it does refer to the 2019 Projections Report. In the 2019 Projections Report, sensitivity is discussed both quantitatively and qualitatively; however, a clear compilation of results is missing. During the review, Germany explained that the parameters and results of the sensitivity analysis are discussed in section 4.4 of the 2019 Projections Report and elaborated on the sensitivity related to some of the main factors (GDP growth, energy intensity). The Party explained that results of sensitivity analyses based on lower fuel and energy prices are included in tables 104 and 105 of the 2019 Projections Report. A quantitative summary of the results of the sensitivity analyses are included in table 106 of the 2019 Projections Report. The ERT, welcoming the information provided by the Party during the review, encourages Germany to provide a summary of the sensitivity of the projections in relation to underlying assumptions in the BR and/or to include specific references to the sections of external reports that contain this information.
6	Reporting requirement[a] specified in paragraph 48 Issue type: transparency Assessment: recommendation	The Party reported information on 1990–2020 trends in the BR4 (section 1.2.1) for aggregated gases and by gas, but not by sector. Some sector-specific information is provided in the sections of chapter 4.2 and for a varying set of years in the 2019 Projections Report. The ERT found it difficult to develop a general picture of the factors and activities impacting trends since activities by sector are not described, and noted that Parties shall present relevant information on factors and activities for each sector. During the review, Germany provided numerical data on factors and activities for the agriculture sector extracted from the 2019 Projections Report (e.g. the impacts of projected animal population, crop residues, spread of organic fertilizers and mineral fertilizer use on agriculture sector projections). The ERT recommends that Germany provide in its next BR information on the key factors and activities impacting the trend for each sector (e.g. projected animal population and fertilizer use for agriculture), along with relevant data in tabular format.
7	Reporting requirement[a] specified in paragraph 47 Issue type: transparency Assessment: encouragement	The Party did not report complete historical data for all key variables and assumptions used in projections in CTF table 5. During the review, Germany explained that the modelling starts from the base year 2016 and that, for this purpose, all input data are elaborated from 2016 onward, or in some cases from 2015 or 2017 onward, and that as ex post evaluation is not carried out, historical values of these data are not needed for the modelling. Historical data are only available for GHG emissions and related data such as activity data. The ERT encourages the Party to provide historical data on key variables and assumptions used in projections in CTF table 5 or clearly define in the BR or in table footnotes why data for some historical years are not included.

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
8	Reporting requirement[b] specified in paragraph 12	Germany did not report in its BR4 on changes to the models or methodologies used to prepare projections since its most recent NC.
	Issue type: completeness	During the review, Germany explained that information is provided in the 2019 Projections Report.
	Assessment: encouragement	The ERT encourages Germany to provide in the BR a short summary of the main changes to models or methodologies used for projections since the most recent NC, including, where appropriate, references to external supporting documentation.

Note: 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.

[a] Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs, as per para. 11 of the UNFCCC reporting guidelines on BRs.

[b] Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs.

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

1. Technical assessment of the reported information

(a) Approach and methodologies used to track support provided to non-Annex I Parties

74. In its BR4 Germany reported information on its provision of financial, technological and capacity-building support to non-Annex I Parties.

75. Germany provided details on how the support it has provided is "new and additional", including how it has determined resources as being "new and additional". Germany's definition includes all newly pledged or disbursed funds and the process for determining resources as "new and additional" is based on calculations that consider exclusively the new commitments and resources disbursed in the reported year.

76. Germany reported the support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. It explained how it tracks finance for adaptation and mitigation. Since 2011, Germany has used OECD climate markers, also known as Rio markers, which distinguish between GHG reduction, adaptation to climate change, and forest and biodiversity conservation.

77. The BR4 includes information on the national approach to tracking the provision of support, delivery mechanisms used and allocation channels tracked. Germany included information on how it has refined its approach to tracking climate support and methodologies as compared with what was reported in its NC7. Germany provided its support through a broad range of instruments and institutions, as bilateral financial, technical and academic cooperation (average of 85 per cent of the budgetary resources allocated to climate finance during the reported biennium) and as multilateral cooperation (the Green Climate Fund, the Climate Investment Funds, the Adaptation Fund, the Global Environment Facility and the Forest Carbon Partnership Facility, cooperation with multilateral development banks and United Nations organizations). Germany explained that it has reported its bilateral climate finance on a project-specific basis in order to capture individual projects in as much detail as possible, also indicating that more information is available on the websites of the Federal Ministry for Economic Cooperation and Development,[14] BMU[15] and the German Federal Ministry of Education and Research.[16]

78. Germany described the methodology and underlying assumptions used for collecting and reporting information on financial support, including underlying assumptions, guidelines, eligibility criteria and indicators (see para. 76 above).

[14] http://www.bmz.de/en/issues/klimaschutz/climate-finance/index.html.

[15] https://www.international-climate-initiative.com/en/projects.

[16] https://www.fona.de/en/.

79. Germany explained that it mobilizes two types of public climate finance: (1) public financing from budgetary funds, including grant equivalents in KfW development loans and mobilized public finance (the climate-related loan finance from KfW market funds and the German Investment and Development Corporation's own resources generated from public budgetary funds); and (2) private climate finance mobilized by public funds (in the form of revolving credit lines to local (development) banks and investments in structured funds and public–private partnerships). Germany elaborated on the methodology used for tracking and monitoring public finance developed by the OECD Joint Network on Environment and Development Co-operation and the Working Party on Development Finance Statistics Task Team to Improve Rio Markers, Environment and Development Finance Statistics. For private finance, Germany explained that it only reported finance instruments for which reporting methods have already been agreed with OECD.

(b) Financial resources

80. Germany reported information on its provision of financial support to non-Annex I Parties as required under the Convention, including on financial support provided, committed and pledged, allocation channels and annual contributions.

81. Germany described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties in mitigating GHG emissions and adapting to the adverse effects of climate change and any economic and social consequences of response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation.

82. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Germany reported that its climate finance has been allocated on the basis of priority areas and programmes, such as providing support for international initiatives related to the implementation of the Paris Agreement. In particular, the Party elaborated on the NDC Partnership, the InsuResilience Global Partnership for climate and disaster risk finance and insurance solutions to support the most vulnerable countries (Vulnerable Twenty Group), the Africa Renewable Energy Initiative, the NAMA Facility and the African Forest Landscape Restoration Initiative. Specific adaptation projects focus on ecosystem-based adaptation, adaptation of agricultural production and food security, water management, risk management instruments, and the development and implementation of national adaptation plans and NDCs for adaptation. Regarding mitigation, Germany provides support to partner countries for developing low-emission economic and supply structures, including those involving the use of renewable energy, increasing energy efficiency, reducing climate-damaging F-gases and promoting sustainable urban planning. Table 13 summarizes the information reported by Germany on its provision of financial support.

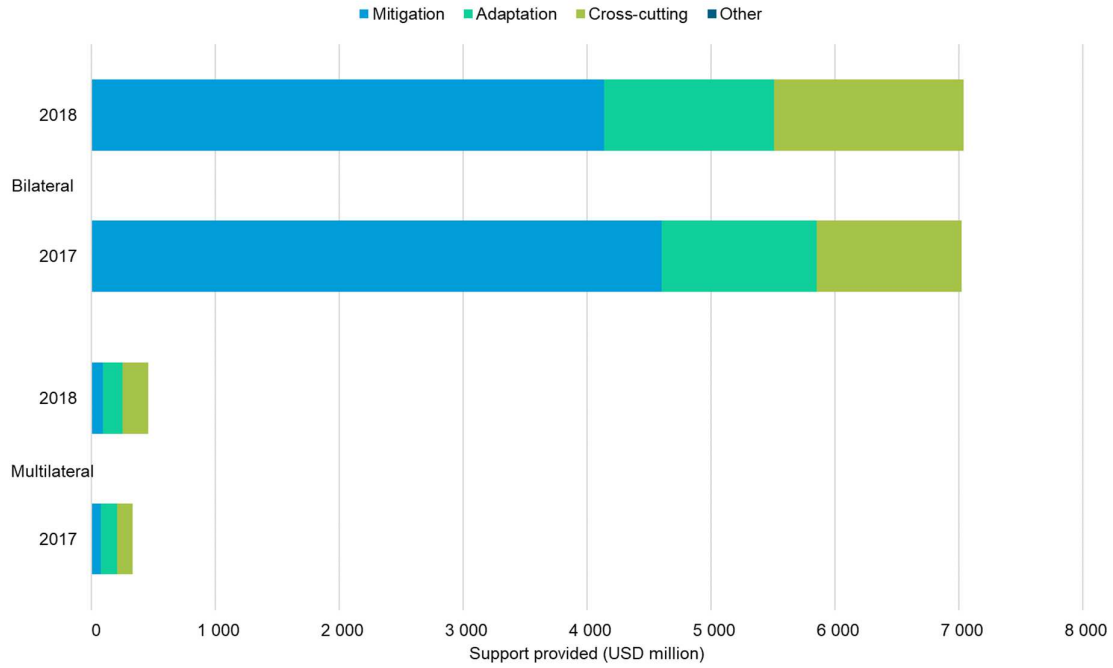
Table 13
Summary of information on provision of financial support by Germany in 2017–2018
(Millions of United States dollars)

Allocation channel of public financial support	*Year of disbursement*	
	2017	*2018*
Climate-specific contributions through multilateral channels, including:	332.17	455.42
Least Developed Countries Fund	28.18	29.51
Adaptation Fund	56.37	82.61
Green Climate Fund	105.86	165.23
Other multinational climate change funds	19.47	42.91
Financial institutions, including regional development banks	81.41	109.17
United Nations bodies	40.88	25.99
Climate-specific contributions through bilateral, regional and other channels	7 018.26	7 033.61

Sources: BR4 CTF tables and Query Wizard for International Development Statistics, available at http://stats.oecd.org/qwids/.

83. Germany reported on its climate-specific public financial support, totalling USD 7,350.42 million in 2017 and USD 7,489.02 million in 2018. It has slightly reduced the level of its financial support since the BR3. Most of the funds are committed. The ERT noted that Germany remains committed to its pledge to double its contribution to international climate finance by 2020 from the 2014 target value of EUR 2 billion to EUR 4 billion (budgetary sources and grant equivalents from development loans) and that the Party has increased its contribution to climate finance from budgetary sources almost sevenfold since 2005, managing to mainstream climate-related issues in its development cooperation efforts. Several countries in the African continent benefitted from approximately USD 2.261 billion of German climate finance over the 2017–2018 biennium, which is almost equal to the USD 2.268 billion directed to the Asia, Middle East and South-Eastern Europe regions. The ERT noted that Germany reported in CTF table 7(b) its bilateral support allocated to Annex I Parties in 2017 and 2018. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by target area is presented in figure 3 and table 14.

Figure 3
Provision of financial support by Germany in 2017–2018



Source: Germany's BR4 CTF tables 7, 7(a) and 7(b).

Table 14
Summary of information on channels of financial support used in 2017–2018 by Germany
(Millions of United States dollars)

	Year of disbursement				*Share (%)*	
Allocation channel of public financial support	*2017*	*2018*	*Difference*	*Change (%)*	*2017*	*2018*
Detailed information by type of channel						
Multilateral channels						
Mitigation	76.02	89.17	13.15	17.3	22.9	19.6
Adaptation	129.92	162.28	32.36	24.9	39.1	35.6
Cross-cutting	126.22	203.97	77.75	61.6	38.0	44.8

Allocation channel of public financial support	Year of disbursement		Difference	Change (%)	Share (%)	
	2017	2018			2017	2018
Other	–	–	–	–	–	–
Total multilateral	**332.17**	**455.42**	**123.25**	**37.1**	**100.0**	**100.0**
Bilateral channels						
Mitigation	4 599.50	4 132.22	–467.28	–10.2	65.5	58.7
Adaptation	1 248.10	1 375.87	127.77	10.2	17.8	19.6
Cross-cutting	1 170.66	1 525.52	354.86	30.3	16.7	21.7
Other	–	–	–	–	–	–
Total bilateral	**7 018.26**	**7 033.61**	**15.35**	**0.2**	**100.0**	**100.0**
Total multilateral and bilateral	**7 350.42**	**7 489.03**	**138.61**	**1.9**	**100.0**	**100.0**

Source: Germany's BR4 CTF tables 7, 7(a) and 7(b).

84. The BR4 includes detailed information on the financial support provided though multilateral, bilateral and regional channels in 2017 and 2018. More specifically, Germany contributed through multilateral channels, as reported in the BR4 and in CTF table 7(a), USD 332.17 million and 455.42 million for 2017 and 2018, respectively. The contributions were made to specialized multilateral climate change funds, such as the Green Climate Fund, the Adaptation Fund, the Multilateral Fund for the Implementation of the Montreal Protocol, the Least Developed Countries Fund and the Special Climate Change Fund.

85. The BR4 and CTF table 7(b) also include detailed information on the total financial support provided though bilateral channels (USD 7,018.26 million and 7,033.61 million) in 2017 and 2018, respectively. About 17.8 per cent of bilateral climate finance was invested in adaptation measures and roughly 65.5 per cent in mitigation measures in 2017. In 2018, 19.6 per cent of the budgetary funds made available went into adaptation projects and 58.7 per cent went into mitigation projects. Germany has also reported on mobilized public climate finance for the years since 2013 (i.e. climate-related credit financed by KfW and the German Investment Corporation that uses market funds). The financed initiatives include the Renewable Energy for Africa Development and Investment Holding; projects on market entry into renewable energy and energy efficiency for the productive sector in Ghana, strengthening drought resilience in Ethiopia, and improving water retention and flood protection for adaptation to climate change in Morocco; and disbursements for bilateral and regional programmes financed by the German Energy and Climate Fund.

86. The BR4 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2017, the shares of the total public financial support allocated for mitigation, adaptation and cross-cutting projects were 63.6, 18.7 and 17.6 per cent, respectively. In addition, 4.5 per cent of the total public financial support was allocated through multilateral channels and 95.5 per cent through bilateral, regional and other channels. In 2018, the shares of total public financial support allocated for mitigation, adaptation and cross-cutting projects were 56.4, 20.5 and 23.1 per cent, respectively. Furthermore, 6.1 per cent of the total public financial support was allocated through multilateral channels and 93.9 per cent through bilateral, regional and other channels.

87. The ERT noted that in 2017 a majority of financial contributions made through multilateral channels were allocated to the agriculture and energy sectors, in cases where the sector is defined in CTF table 7(a). The corresponding allocations for 2018 were directed mostly to the energy sector. However, for many of the contributions for both years, sector-specific information is not available in CTF table 7(a). In 2017 a majority of financial contributions made through bilateral and regional channels were allocated to agriculture, energy, forestry and other sectors or to several sectors simultaneously, as reported in CTF table 7(b). The corresponding allocations for 2018 were directed mostly to the agriculture, energy and other sectors or a mix of sectors, as for the preceding year.

88. CTF tables 7(a) and 7(b) include information on the types of financial instrument used for providing assistance to developing countries, which include grants, concessional loans,

composite loans, non-concessional loans, direct investments and equity. The ERT noted that the grants provided in 2017 and 2018 accounted for most of the total public financial support.

89. Germany clarified that private finance is mainly mobilized for revolving credit lines to local development banks, investments in structured funds and public–private partnerships. It reported on how it uses public funds to promote private sector financial support for developing countries, which it sees as pivotal to effectively increase mitigation and adaptation efforts in developing countries. The Party promotes a range of multi-actor dialogues to facilitate exchange between the public and private sectors, for example, by making governments' climate strategies accessible to private financiers and project developers. In this regard, KfW mobilized USD 259.33 million in 2017 and USD 296.79 million in 2018 in private climate finance.

90. Germany explained its approach to reporting on private financial flows leveraged by bilateral climate finance for mitigation and adaptation activities in non-Annex I Parties, which involves applying the internationally agreed OECD methodologies. Germany described some of the instruments used for mobilizing private financing, including supporting advisory services for policymakers in establishing guidelines and regulations that facilitate private investment, assisting in project development and the preparation of funding proposals, and providing capital to institutions such as local banks for adaptation and mitigation actions and building their capacity to develop adapted financial products and assemble a portfolio over the long term.

(c) Technology development and transfer

91. Germany provided information on steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public and private sectors. Germany provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties, such as the Transformative Urban Mobility Initiative, which consists of more than a dozen innovative pilot projects (including on electric mobility, digital solutions, transport safety and urban design) in Brazil, India, Tunisia and other countries.

92. The ERT took note of the information provided in CTF table 8 on recipient countries, target areas, measures and focus sectors of technology transfer programmes. However, CTF table 8 is limited to projects with a special focus on technology transfer, while technology transfer and capacity-building are components of virtually all of the German Government's bilateral cooperation projects, as indicated in the BR4 (p.59). All the reported support activities in the table targeted mitigation actions in the transport and energy sectors in Asia, Latin America and Africa. The measures are mainly funded by public channels.

93. The ERT noted that Germany reported on its measures and activities, including on activities implemented or planned since its NC7 and BR3, in relation to technology transfer, and in particular on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. A number of these measures and activities have a particular focus on the energy sector, concentrating on aspects such as the promotion of renewable energy. Through the GET.invest programme, for example, 42 renewable energy projects are currently under development and are expected to reduce emissions by 680 kt CO_2 eq. Germany supports the creation of decentralized energy systems in rural regions of Africa through the Green People's Energy for Africa project. Launched in early 2019, this activity involves local stakeholders and the private sector. In addition, the German Partnership for Sustainable Mobility acts as a pilot project and is a key contact partner for sustainable mobility and logistics solutions from Germany.

94. The private sector is also involved in cooperation projects that aim to establish a better technical and policy framework in partner countries. The Project Development Programme for developing countries and emerging economies (part of the Energy Export Initiative of the Federal Ministry for Economic Affairs and Energy) helps companies, especially small and medium-sized enterprises, selling climate-friendly energy technologies enter difficult markets in developing countries, with projects in Africa, South and South-East Asia and the Middle East.

(d) Capacity-building

95. Germany reported that it has supported climate-related capacity development activities relating to adaptation, mitigation and other sectors. The Party is involved in capacity-building through bilateral and multilateral cooperation in addition to various partnerships involving the private sector, academia and civil society. As mentioned above (see para. 92 above), Germany explained that technology transfer and capacity-building are components of all the German Government's bilateral cooperation projects. The capacity-building measures encompass a broad range of climate-related topics, such as GHG reduction, adaptation to climate change, technology development and transfer, and access to climate finance, as well as specific sectors and cross-cutting aspects such as reporting.

96. In its BR4 and CTF table 9, Germany supplied information on how it has provided capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties, namely, that it responds to country-driven demand following the principles of a results-based approach that is consistent with national priorities. Germany described individual measures and activities related to capacity-building support in textual and tabular format. Examples of capacity-building projects consistent with the national needs and priorities of non-Annex I Parties include the Bush Control and Biomass Utilisation project in Namibia, which provides capacity-building and training for farmers to enable them to produce animal feed from encroacher bush and increases their resilience to climate conditions, and the Rehabilitation and Prevention of Climate Caused Damage project in Peru, which aims to prevent climate-related damage and aid rehabilitation by putting infrastructure in place and implementing capacity development measures in water systems management. This involves installing remote sensor and system control technologies and promoting the use of climate-resilient material in urban systems.

97. The German Federal Ministry of Education and Research programme Science Partnerships for the Assessment of Complex Earth System Processes is an example of a project that carries out academic cooperation projects with partner institutions and universities in the priority countries in Southern Africa (e.g. Namibia and South Africa) with the aim of drafting science-based recommendations on managing natural systems and ensuring the sustainable use and conservation of ecosystem services in the region. The German Federal Ministry of Education and Research also launched a study programme in conjunction with the German Academic Exchange Service that aims to provide training and continuing professional development to African university students and young researchers with a focus on environmental sciences, landscape ecology, geology and oceanography.

2. Assessment of adherence to the reporting guidelines

98. The ERT assessed the information reported in the BR4 of Germany and identified issues relating to completeness and transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 15.

Table 15
Findings on provision of support to developing country Parties from the review of the fourth biennial report of Germany

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 14	The ERT noted that Germany did not provide clear information in the BR4 on the indicators and delivery mechanisms used in its national approach to tracking the provision of support to non-Annex I Parties.
	Issue type: transparency Assessment: recommendation	During the review, Germany explained that with regard to climate finance, information on indicators is provided in the documentation box of CTF table 7. However, the content of the documentation boxes for CTF table 7 for 2017 and 2018 was lost during the upload and the Party provided the documentation boxes during the review. The documentation box was still missing in the resubmitted tables. The measurement of climate finance is based on the application of Rio markers in combination with a clearly defined calculation method. No such indicators are applicable for technology and capacity-building support, which are core elements of all cooperation projects (see BR4, pp.77 and p.80).

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
		The ERT recommends that Germany provide a description of the indicators relevant to the tracking of financial, technological and capacity-building support in both its BR and CTF table 7, as appropriate, or provide relevant explanations if this is not possible.
2	Reporting requirement specified in paragraph 17 Issue type: transparency Assessment: recommendation	Germany reports a sum offered as a grant to "Other (Asia regional)/capacity development for climate policy in the western Balkan countries, the Eastern Partnership, the Russian Federation and Central Asia" (line 512, CTF table 7(b)) for 2017. In the report on the technical review of the third biennial report of Germany, it was recommended that in its next BR Germany remove information on the support allocated to Annex I Parties from CTF table 7(b) and deduct the relevant amount from the total support provided to developed Parties such as the Russian Federation. During the review, Germany explained that when its reporting under the EU monitoring mechanism regulation is compared with its reporting under the Convention, it becomes evident that the Party has excluded all projects located only in Annex I Parties from the latter. The BMU project on capacity development for climate policy in the western Balkan countries, the Eastern Partnership, the Russian Federation and Central Asia supports the following countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kosovo,[a] Kyrgyzstan, Mongolia, Montenegro, North Macedonia, Republic of Moldova, Russian Federation, Serbia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. With the exception of Belarus, the Russian Federation and Ukraine, all of these countries are non-Annex I Parties and are therefore eligible for reporting. Since German reporting is based on commitments, it is not possible to specify at this time how much money each of the countries will receive during implementation. Therefore, financial flows to the Annex I Parties Belarus, the Russian Federation and Ukraine cannot be subtracted from the amount reported. Nevertheless, substantial means will flow into non-Annex I Parties and therefore Germany includes the project in its reporting. The ERT recommends that Germany improve the transparency of the reported information by deducting the support provided to Annex I Parties from the support reported in CTF table 7(b) or explaining the challenge of such separation in the BR and footnote to CTF table 7(b).
3	Reporting requirement specified in paragraph 21 Issue type: completeness Assessment: encouragement	Germany did not report success or failure stories in its BR4. The CTF tables highlight project or programme objectives for some specific projects, but do not provide all the required information. During the review, Germany confirmed that it does not explicitly report on success or failure stories; however, the BR4 illustrates sectoral activities with various examples of lighthouse projects or initiatives, for example the InsuResilience Global Partnership (p.67), the International Climate Initiative (p.71), the Transformative Urban Mobility Initiative (p.72) and the Global Energy Transformation Programme (p.78). Germany further clarified that a simple categorization in terms of failure or success would not add value given project complexities and the actors involved. Moreover, a distinct assessment of the failure or success of measures would require a clear definition and criteria for evaluation. According to the Party, the unique nature of each project does not allow for such comparisons. The ERT encourages Germany to include in its next BR information on its assessment of the success or failure of at least one project and/or to provide explanatory information on the difficulties of doing so as outlined to the ERT during the review.

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

[a] This designation is without prejudice to positions on status, and is in line with United Nations Security Council resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

III. Conclusions and recommendations

99. The ERT conducted a technical review of the information reported in the BR4 and CTF tables of Germany in accordance with the UNFCCC reporting guidelines on BRs. The

ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and provides an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; the progress of Germany towards achieving its target; and the Party's provision of support to developing country Parties.

100. Germany's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 27.5 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 26.9 per cent below its 1990 level, in 2017. Emission decreases were driven by factors such as economic restructuring in the former East Germany in the early 1990s supplemented late in the decade by the impacts of the implementation of mitigation PaMs such as changing the fuel mix to include lower-emission liquid and gaseous fuels, increasing the use of renewable energy, improving energy efficiency in plants and facilities, and enhancing livestock and waste management.

101. Under the Convention, Germany 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 global warming potential values from the AR4. Emissions and removals from the LULUCF sector are not included. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms for compliance purposes up to an established limit and subject to a number of restrictions on the origin and the type of project. Companies can make use of such units to fulfil their requirements under the EU ETS.

102. Under the ESD, Germany has a target of reducing its emissions by 14 per cent below the 2005 level by 2020. The 2013–2020 linear progression in Germany's AEAs (its national emission target for ESD sectors) is 472,527.65–410,908.76 kt CO_2 eq. In addition, Germany committed to achieving a domestic target of a 40 per cent reduction in emissions below the 1990 level by 2020 and set long-term targets to reduce its GHG emissions by 55 per cent by 2030 and by 70 per cent by 2040 below the 1990 level. Furthermore, the country is committed to attaining GHG neutrality by mid-century.

103. In 2017, Germany's ESD emissions were 8.0 per cent (34,508.42 kt CO_2 eq) above the AEA under the ESD. In addition, the ERT noted that Germany does not plan to use market-based mechanisms to achieve its target under the Convention. Taking this into account, Germany has a cumulative surplus of 20,185.92 kt CO_2 eq with respect to its AEAs for 2013–2017. The ERT noted that, to achieve its target under the ESD, Germany plans to purchase surplus AEAs from EU member States that have overachieved their target, under the flexibility allowed under the ESD, to cover the potential cumulative AEA deficit.

104. The GHG emission projections provided by Germany in its BR4 correspond to the WEM scenario. Under this scenario, emissions are projected to be 33.2 per cent below the 1990 level by 2020. According to the projections under the WEM scenario, emissions from ESD sectors are estimated to reach 436,631.90 kt CO_2 eq by 2020. The projected level of emissions under the WEM scenario is 6.3 per cent above the AEAs for 2020, which suggests that Germany may need to use the flexibility provided under the ESD to meet its target under the WEM scenario.

105. The ERT noted that although Germany has made considerable progress in reducing its emissions to date, it does not expect to meet its national economy-wide target of 40 per cent below the 1990 level by 2020. Therefore, Germany is focusing on a suite of climate programmes under the Climate Action Plan 2050 to attain its more ambitious reduction goals in 2030 (55 per cent below the 1990 level) and 2040 (70 per cent below the 1990 level).

106. Germany's main policy framework relating to energy and climate change stems from the Climate Action Programme 2020, the Climate Action Programme 2030 and the Climate Action Plan 2050, which are supported by a number of EU directives and regulations and national acts that direct the restructuring of the energy and other sectors towards a low-emission economy. The mitigation action with the most significant mitigation impact is the Renewable Energy Sources Act. Under the Climate Action Programme 2030, adopted at the end of 2019, Germany's goal is to reach its specified climate targets with a package of new measures, including a proposed carbon pricing system, additional renewable energy targets, and incentives for sustainable transportation and the retrofitting of buildings.

107. Germany continues to provide climate financing to developing countries in line with its climate finance programmes such as the NDC Partnership, the InsuResilience Global Partnership, the Africa Renewable Energy Initiative, the NAMA Facility and the African Forest Landscape Restoration Initiative. It has slightly reduced the level of its financial support since the BR3; its public financial support in 2017 and 2018 totalled USD 7,350.42 million and 7,489.02 million per year, respectively. For those years, Germany provided more support for mitigation than for adaptation. The biggest share of financial support went to projects in the energy and agriculture sectors, followed by cross-cutting projects.

108. Technology development and transfer and capacity-building support are components of all the German Government's bilateral cooperation projects. Priority in technological support was given to programmes that have targeted actions in Africa, Asia and Latin America with a focus on the transport and energy sectors, concentrating on areas such as the promotion of renewable energy, sustainable mobility and decentralized energy systems in rural areas. Priority in capacity-building support was given to activities that aim to provide training and continuing support in a range of climate-related areas such as GHG emission reduction, adaptation to climate change, technology development and transfer, access to climate finance and reporting under the Convention and the Paris Agreement. An example of a project integrating technology transfer and capacity-building aspects having a significant GHG mitigation potential is the Transformative Urban Mobility Initiative, which consists of more than a dozen innovative pilot projects and capacity-building activities introducing sustainable transport into several developing countries and emerging economies.

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

(a) Clearly stating in the relevant BR section whether there have been any changes to its national inventory arrangements since its previous NC or BR (see issue 1 in table 3);

(b) Precising the description of its quantified economy-wide emission reduction target and ensuring that ESD allocations reported in the BR are consistent with those reported in the EU transaction log (see issue 1 in table 4);

(c) Ensuring that the description of the quantified economy-wide emission reduction target is consistent in both the text of the BR and the CTF tables and is also consistent with the EU target under the Convention (see issue 2 in table 4);

(d) Elaborating its reporting on PaMs (see issue 1 in table 6) by:

(i) Including transparent and consistent information on the mitigation actions that have been put in place since the previous BR to achieve the target as well as on those that were reported in the previous BR and are still in place;

(ii) Providing a rationale for the differences in the start year of mitigation actions between BR and CTF table 3;

(iii) Ensuring that the PaMs are consistently reported between the BR text and CTF table 3;

(e) Clarifying, when explaining progress made towards achievement of the quantified economy-wide emission reduction target, the use of international market-based mechanisms by EU ETS operators in Germany (see issue 1 in table 8);

(f) Including clear and consistent information on the cut-off date for the projection scenarios and on the availability of the latest year of inventory data for the purpose of preparing the projection scenarios, and reporting consistently between the projection and the PaMs sections of the BR and CTF table 3 (see issue 2 in table 12);

(g) Providing information on the key factors and activities impacting the trend in projections for each sector (e.g. projected animal population and fertilizer use for agriculture) (see issue 6 in table 12);

(h) Providing a description of the indicators relevant to the tracking of financial, technological and capacity-building support in both its BR and CTF table 7, as appropriate, or providing relevant explanations if this is not possible (see issue 1 in table 15);

(i) Separating the support provided to Annex I Parties as reported in CTF table 7(b) or explaining the challenges preventing such separation in the BR text and footnote to CTF table 7(b) (see issue 2 in table 15).

Annex

Documents and information used during the review

A. Reference documents

2019 GHG inventory submission of Germany. 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.

BR4 of the EU. Available at https://unfccc.int/documents/204815.

BR4 CTF tables of the EU. Available at https://unfccc.int/documents/204816.

BR3 of Germany. Available at https://unfccc.int/sites/default/files/resource/BR%20Germany-br3-1-171220_3__biennial_report_to_unfccc.pdf.

BR4 of Germany. Available at https://unfccc.int/sites/default/files/resource/191220_%204%20Biennial%20Report_englisch_final%20_sauber.pdf.

BR4 CTF tables of Germany. Available at https://unfccc.int/documents/210563.

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. Available at https://unfccc.int/topics/mitigation/workstreams/pre-2020-ambition/compilation-of-economy-wide-emission-reduction-targets-to-be-implemented-by-parties-included-in-annex-i-to-the-convention.

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

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

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

NC7 of Germany. Available at https://unfccc.int/sites/default/files/resource/26795831_Germany-NC7-1-171220_7%20NatCom%20to%20UNFCCC.pdf.

Report on the individual review of the annual submission of Germany submitted in 2018. FCCC/ARR/2018/DEU. Available at https://unfccc.int/sites/default/files/resource/arr2018_DEU.pdf.

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

"UNFCCC biennial reporting guidelines for developed country Parties". FCCC/SBSTA/2014/INF.6. 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 Diana Nissler (BMU) and Dirk Günther (German Environment Agency), including additional material. The following documents[1] were provided by Germany:

Germany. 2016. Climate Action Plan 2050 – Principles and goals of the German government's climate policy. Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety. Available at https://www.bmu.de/en/publication/climateaction-plan-2050-principles-and-goals-of-the-german-governments-climate-policy.

Climate Action Plan 2050 – Germany's long-term emission development strategy. Available at https://www.bmu.de/en/topics/climate-energy/climate/national-climate-policy/greenhouse-gas-neutral-germany-2050/.

Germany. *Climate Action Programme 2030 of the German government for implementation of the Climate Action Plan 2050*.

2019 Projections Report for Germany, pursuant to Regulation (EU) No. 525/2013. Available at http://cdr.eionet.europa.eu/de/eu/mmr/art04-13-14_lcds_pams_projections/projections/envxnw7wq/.

Climate Action Programme 2030. Available at https://www.bmu.de/download/klimaschutzprogramm-2030-zur-umsetzung-des-klimaschutzplans-2050/.

Federal Climate Change Act. Available at https://www.bmu.de/en/law/federal-climate-change-act/.

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, 2017. Climate Action Report 2017. Available at https://www.bmu.de/fileadmin/Daten_BMU/Pools/Broschueren/klimaschutzbericht_2017_aktionsprogramm_en_bf.pdf.

Law introducing carbon pricing in the heat and transport sectors (In German). Available at https://www.bmu.de/gesetz/gesetzesentwurf-ueber-einen-nationalen-zertifikatehandel-fuer-brennstoffemissionen/.

EEA Report No 15/2019. Trends and projections in Europe 2019. Tracking progress towards Europe's climate and energy targets. Available at https://www.eea.europa.eu/publications/trends-and-projections-in-europe-1.

Germany. 2014. Climate Action Programme 2020. Federal Ministry for the Environment, Nature Conservation, Building, and Nuclear Safety. Available at https://www.bmu.de/en/publication/climate-action-programme-2020.

Federal Ministry for Economic Affairs and Energy. 2016. The annual monitoring report. Available at https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/sechster-monitoring-bericht-zur-energiewende.pdf?__blob=publicationFile&v=37.

Federal Ministry for Economic Affairs and Energy. 2017. *The Energy of Future*. Available at https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/fortschrittsbericht-monitoring-energiewende.pdf?__blob=publicationFile&v=19.

[1] Reproduced as received from the Party.