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

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

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Contents

Abbreviations and acronyms

AEA	annual emission allocation
AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
BMUB	Federal Ministry of the Environment, Nature Conservation, Building and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
BR	biennial report
CAP 2020	Climate Action Programme 2020
CAP 2050	Climate Action Plan 2050
CH_4	methane
CHP	combined heat and power
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NF_3	nitrogen trifluoride
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N_2O	nitrous oxide
OECD	Organisation for Economic Cooperation 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 in-country technical review of the BR3[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 provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. The review was conducted from 12 to 17 March 2018 in Berlin by the following team of nominated experts from the UNFCCC roster of experts: Ms. Rehab Ahmed Hassan (Sudan), Mr. Vincent Camobreco (United States of America), Ms. Maya Fukuda (Japan), Ms. Karin Simonson (Canada) and Mr. Hongwei Yang (China). Ms. Simonson and Mr. Yang were the lead reviewers. The review was coordinated by Mr. Javier Hanna and Ms. Karen Ortega (UNFCCC secretariat).

B. Summary

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

1. Timeliness

5. The BR3 was submitted on 20 December 2017, before the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were submitted on 22 December 2017.

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

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Germany in its BR3 mostly adheres to the UNFCCC reporting guidelines on BRs.

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

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
GHG emissions and trends	Complete	Transparent	NA
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Transparent	NA
Progress in achievement of targets	Complete	Transparent	NA
Provision of support to developing country Parties	Complete	Mostly transparent	Tables 9 and 12

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

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

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

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

1. Technical assessment of the reported information

7. Total GHG emissions[2] excluding emissions and removals from LULUCF decreased by 27.9 per cent between 1990 and 2015, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 27.2 per cent over the same period. Table 2 illustrates the emission trends by sector and by gas for Germany.

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

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
Sector									
1. Energy	1 036 736.02	869 936.54	801 652.68	764 409.27	762 231.35	–26.5	–0.3	82.9	84.5
A1. Energy industries	427 353.07	357 414.65	356 325.99	347 269.77	335 396.50	–21.5	–3.4	34.2	37.2
A2. Manufacturing industries and construction	186 700.09	130 060.64	125 254.85	121 394.55	127 060.77	–31.9	4.7	14.9	14.1
A3. Transport	164 403.87	182 766.95	154 209.81	160 124.98	160 806.92	–2.2	0.4	13.1	17.8
A4. and A5. Other	220 311.86	173 397.53	154 580.88	125 076.32	128 263.78	–41.8	2.5	17.6	14.2
B. Fugitive emissions from fuels	37 967.13	26 296.77	11 281.15	10 543.64	10 703.39	–71.8	1.5	3.0	1.2
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	96 642.84	76 894.77	62 534.27	61 445.93	61 534.49	–36.3	0.1	7.7	6.8
3. Agriculture	79 581.56	67 562.78	62 853.35	66 590.89	66 955.17	–15.9	0.5	6.4	7.4
4. LULUCF	–31 311.74	–37 960.40	–16 368.63	–14 877.28	–14 579.84	–53.4	–2.0	NA	NA
5. Waste	37 955.05	28 563.55	14 709.97	11 816.13	11 210.50	–70.5	–5.1	3.0	1.2
6. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indirect CO_2	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA	NA	NA	NA
Gas									
CO_2	1 052 246.81	899 286.37	832 436.65	794 828.97	792 054.50	–24.7	–0.3	84.1	87.8
CH_4	120 293.33	87 736.38	58 259.55	56 008.97	55 616.08	–53.8	–0.7	9.6	6.2
N_2O	64 989.04	43 088.37	36 793.78	38 590.32	39 078.19	–39.9	1.3	5.2	4.3
HFCs	50.32	6 010.19	10 263.64	10 962.51	11 113.43	21 985.5	1.4	0.0	1.2
PFCs	3 060.42	958.68	345.89	234.60	253.67	–91.7	8.1	0.2	0.0
SF_6	4 428.00	4 072.50	3 100.04	3 396.17	3 561.67	–19.6	4.9	0.4	0.4
NF_3	6.88	8.92	61.43	20.28	11.89	72.8	–41.4	0.0	0.0
Total GHG emissions without LULUCF	**1 250 915.47**	**1 042 957.64**	**941 750.27**	**904 262.22**	**901 931.51**	**–27.9**	**–0.3**	**100.0**	**100.0**

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

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2014*	*2015*	*1990–2015*	*2014–2015*	*1990*	*2015*
Total GHG emissions with LULUCF	**1 219 603.72**	**1 004 997.24**	**925 381.64**	**889 384.93**	**887 351.67**	**–27.2**	**–0.2**	**NA**	**NA**

Source: GHG emission data: Germany's 2017 annual inventory submission, version 7.

8. The decrease in total emissions was driven mainly by factors such as a change from the use of solid fuels to lower-emission liquid and gaseous fuels since 1990; an increase in use of renewable energy sources and the resulting substitution of fossil fuels; commissioning of more efficient industrial plants and facilities; changes in livestock raising conditions and reduction in livestock population; and compliance with statutory provisions on waste management, which significantly reduced CH_4 emissions.

9. In brief, Germany's national inventory arrangements were established at the ministerial level, based on a 2007 agreement between the undersecretaries of the participating ministries, with BMUB as leading agency. The inventory arrangements were updated in 2013 to improve emission estimates related to the LULUCF sector and in 2014 to meet the requirements of the second commitment period of the Kyoto Protocol. The BR3 indicated that inventory arrangements are continuously reviewed to ensure that they meet the requirements and that, for the current reporting period, the focus was on further institutional consolidation of the national system for the estimation of GHG emissions and removals to meet the requirements of the second commitment period of the Kyoto Protocol.

10. During the review, Germany presented additional information on the national inventory arrangements and indicated that there have been no changes to the inventory arrangements since its BR2.

2. Assessment of adherence to the reporting guidelines

11. The ERT assessed the information reported in the BR3 of Germany and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

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

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 GWP values from AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU ETS.

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

by 2020. Emissions from non-ETS sectors are regulated through member State specific targets that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020.

15. Under the ESD, Germany has a target of reducing its total emissions to 14.0 per cent below the 2005 level by 2020 for non-ETS sectors. National emission targets for non-ETS sectors for 2020 have been translated into binding quantified AEAs for the period 2013–2020. The AEAs for each member State and year were adopted by the European Commission in March 2013. In October 2014 the AEAs were adjusted to ensure consistency with the enlarged EU ETS scope for the period 2013–2020. In 2017, an EU decision was taken to update the AEAs for the period 2017–2020 in order to be consistent with international reporting guidance. As a result, Germany will now have to comply with a tighter emissions limit during this period. The revised 2013 value is 472,527.65 kt CO_2 eq and the revised 2020 value is 410,908.76 kt CO_2 eq.

16. Germany has also set itself a national target of at least a 40.0 per cent reduction by 2020 compared with the 1990 level, which does not include emission reductions from the LULUCF sector or use of market-based mechanisms. This target is more ambitious than the German target within the joint EU target. Germany also has long-term targets to reduce its GHG emissions by at least 55.0 per cent by 2030, by at least 70.0 per cent by 2040 and by 80.0–95.0 per cent by 2050 below the 1990 level. Additionally, as part of its commitment to the Paris Agreement, Germany has adopted the guiding principle of attaining GHG neutrality by mid-century. To reach these mitigation objectives CAP 2050 (a German Government long-term low GHG emission development strategy that confirms and specifies the climate target of becoming extensively GHG neutral by 2050) establishes specific 2030 emission reduction targets (applicable to relevant sectors), sets out a process for monitoring and public participation in mitigation actions, and commits to elaborating a detailed programme of measures by the end of 2018. Owing to political uncertainty resulting from the 2017 parliamentary elections, a new federal government had not been officially formed prior to this review. However, preliminary discussions between the coalition parties appeared to confirm a commitment to fulfilling Germany's existing emission reduction targets. The ERT commends Germany for reporting on its ambitious domestic targets.

2. Assessment of adherence to the reporting guidelines

17. The ERT assessed the information reported in the BR3 of Germany and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

18. 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. Germany also reported on its policy context and the legal and institutional arrangements in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs.

19. Germany provided information on a set of PaMs similar to those previously reported and provided information indicating where PaMs had been either amended or newly introduced since the BR2 submission. Germany also confirmed that there were no changes since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target.

20. Germany reported on its self-assessment of compliance with its emission reduction target. To assess compliance with member States' contributions towards the EU target, a

universal monitoring and review process is already in place for all EU member States (Monitoring Mechanism Regulation; EU regulation 525/2013), which is described in detail in the BR3 of the EU.[3] To assess compliance with its national target, Germany produces an annual climate action report, as well as reporting focused specifically on the impacts of the *Energiewende* (Germany's "energy transition"), including an annual monitoring report and a periodic progress report entitled *Energy of the Future* (published every four years). All three reports are available online.[4] Progress in implementing CAP 2050 (i.e. progress towards Germany's 2030 target) will also be reported on a regular basis starting in 2020. Information on progress made in the establishment of national rules for taking action against non-compliance with targets was not provided in the BR3. However, during the review, Germany clarified that as part of the draft agreement between the governing parties in the new coalition government, the government aims to adopt a legally binding implementation act in 2019 that ensures compliance with the 2030 climate protection targets for 2030.

21. The key, overarching cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO_2 emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

22. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities) that produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013, and the system now includes aircraft operations (since 2012) as well as N_2O emissions from chemical industries, PFC emissions from aluminium production and CO_2 emissions from industrial processes (since 2013).

23. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and includes binding annual targets for each member State for 2013–2020.

24. Germany highlighted the EU-wide mitigation actions that are under development, such as the pending comprehensive package of EU legislation involving changes to the fourth trading period of the ETS (2021–2030), further revisions to the Effort Sharing Regulation, and enhanced use of renewable energy sources and energy efficiency targets for 2030. The mitigation action most critical for Germany's contribution to attaining the EU-wide 2020 emission reduction target is the EU ETS, with a projected mitigation impact of 9,000 kt CO_2 eq in 2020.

25. In addition to EU policies (i.e. the ETS and ESD), Germany has introduced a number of national-level policies to achieve its national target (40.0 per cent reduction below the 1990 level by 2020), as elaborated in CAP 2020, *Energiewende* and CAP 2050. The key policies reported in the BR3 include the Renewable Energy Sources Act, electricity-saving measures and various measures funded by proceeds of ETS trading via the Special Energy and Climate Fund, the Energy Efficiency Fund and the National Climate Initiative. The mitigation effect of the Renewable Energy Sources Act is the most significant, with a projected mitigation impact of 147,000 kt CO_2 eq in 2020. Other policies that are expected to deliver significant emission reductions include putting lignite-fired

[3] Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i.

[4] The full text of Germany's climate and energy-related monitoring and assessment reports is available at www.bmu.de/en.

power plants on standby for reserve capacity (10,000 kt CO_2 eq in 2020), market incentives for renewable energy sources (3,900 kt CO_2 eq in 2020), energy conservation regulations (3,100 kt CO_2 eq in 2020) and electricity saving measures (3,000 kt CO_2 eq in 2020).

26. Germany highlighted the domestic mitigation actions under development over the longer term, such as the programme of measures to be elaborated under CAP 2050 by the end of 2018 and the implementation of sectoral targets to be achieved by 2030, as well as the pending climate legislation that Germany expects to pass in 2019. This legislation is expected to set out legal measures to ensure that Germany meets its 2030 target.

27. During the review, Germany noted that according to current projections it will have difficulty meeting its target for the non-ETS sectors target, and the national 2020 target without the implementation of additional, far-reaching measures. Germany did not provide further information on planned PaMs that could help to close the gap by 2020, but noted the significant challenge of attempting to simultaneously phase out nuclear power and coal-fired power plants in the near term. During the review, Germany also highlighted the planned procedures to develop further measures to ensure that the 2030 target will be met.

Table 3
Summary of information on policies and measures reported by Germany

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	CAP 2020	67 000–78 000	–
	Energiewende (“Energy Transition”)	–	–
	CAP 2050	–	–
	Special Energy and Climate Fund	–	–
	EU ETS	9 003	–
Energy			
Renewable energy	Renewable Energy Sources Act	147 000	–
Energy efficiency	National Action Plan on Energy Efficiency	25 000–30 000	–
Energy supply	Combined Heat and Power Act	2 000	–
	Security reserve (lignite plants)	10 000	–
IPPU	EU regulation 517/2014	NE	–
Agriculture	EU Common Agricultural Policy	NE	–
LULUCF	Maintaining Germany’s forest sink	NE	–
Waste	Further improvements to recycling and packaging regulations	NE	–

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

28. During the review, Germany provided detailed information on how it is assessing the impacts of its mitigation measures and revising its climate policies accordingly. For example, in 2017 a research consortium was commissioned to prepare projection scenarios to predict how emission trends in Germany might develop to 2035. The resulting *2017 Projections Report*[5] included an analysis of a WEM scenario reflecting the new climate and energy policy measures introduced to date. This information was then used to further inform the development of CAP 2050, which includes the establishment of guiding principles, key measures and transformative pathways for all sectors by 2050 (including interim sectoral targets for 2030). The pending programme of measures under CAP 2050, which will be developed in further detail at a later date, is intended to ensure that the 2030 target will be achieved and, as part of this effort, environmental, social and economic impacts of each proposed programme will be assessed. Additionally, the programme of

[5] Available at http://cdr.eionet.europa.eu/de/eu/mmr/art04-13-14_lcds_pams_projections/projections/envwqc4_g/170426_PB_2017_-_final.pdf.

measures under CAP 2050 and the associated assessment of impacts are to be developed in consultation with a wide range of stakeholders, including through the Climate Action Alliance, established in 2015, which will continue to provide stakeholder input to the German Government from representatives of groups of all parts of society, the Länder and local authorities. Another example of Germany's efforts regarding impact assessment is the inclusion of a "learning system" approach as part of CAP 2050. This approach involves an iterative policy cycle in which agenda setting, policy formulation, decision-making, policy implementation and policy evaluation are integrated to ensure that Germany's climate policy can effectively adapt to any changing circumstances (i.e. technological advancements, scientific findings or social behaviours).

(b) Policies and measures in the energy sector

29. **Energy supply**. *Energiewende* continues to be Germany's primary long-term measure to address the energy sector. The approach under *Energiewende* involves lowering GHG emissions through a combination of increased use of renewable energy sources and increased energy efficiency.

30. The Combined Heat and Power Act (2002), a key measure for promoting CHP plants in Germany, was last amended in 2016. The act establishes a financial bonus for CHP electricity generation above the existing electricity price, particularly where CHP plants are used to replace coal-fired generation. Funding to support CHP measures has recently doubled, from EUR 750 million to EUR 1.5 billion per year. The measure is expected to produce a mitigation contribution of 2,000 kt CO_2 eq in 2020, although larger reductions are possible if further efficiencies can be found (e.g. by avoiding emissions occurring outside the electricity sector).

31. In 2015, Germany decided to put a number of lignite-fired power plants on standby for reserve capacity only. Although this measure reduces the overall energy supply and shrinks Germany's energy exports, the associated mitigation impact of this measure is significant at an estimated net contribution of 10,000 kt CO_2 eq in 2020. During the review, Germany stated that it faces a significant challenge reducing its GHG emissions as a result of attempting to simultaneously phase out nuclear energy and coal-fired electricity over the coming years.

32. **Renewable energy sources**. Under the Renewable Energy Sources Act (2000), Germany provides incentives for increased production of energy from renewable sources (e.g. feed-in tariffs) and encourages annual increases in energy supply through predefined capacity objectives for both onshore and offshore wind generation and solar generation. During the review, Germany stated that as a result of this programme, renewable energy sources are proving to be attractive to private investment. In turn, financing has facilitated further expansion of renewable energy sources while simultaneously providing a range of social benefits such as stable energy prices and domestic employment. Germany expects a mitigation contribution of 147,000 kt CO_2 eq in 2020 from this programme.

33. **Energy efficiency**. As this is one of the two main pillars of *Energiewende*, Germany places a high importance on energy efficiency measures. The National Action Plan on Energy Efficiency was implemented in 2014 in recognition of the need to extend and expand the existing energy efficiency policy in order to address an anticipated gap in meeting the 2020 target. More than 30 different measures are coordinated under the plan, which include establishing energy efficiency practices in buildings, emphasizing energy saving as a business opportunity and a way of generating returns, and increasing individual awareness and responsibility for energy efficiency. The plan is supported by funding amounting to more than EUR 17 billion and is expected to achieve an emission reduction of between 25,000 and 35,000 kt CO_2 eq in 2020. However, during the review, Germany also noted that energy efficiency measures are taking time to show results, in part because of the challenges associated with measurement of impacts, data availability and changing consumer behaviours.

34. **Residential and commercial sectors**. In its BR3, Germany provided information on a number of PaMs targeting emission reduction in the residential and commercial sectors, several of which overlap with the energy efficiency PaMs described above. Specific

examples of buildings-related PaMs are the CO_2 Building Rehabilitation Programme which encourages energy-efficient construction and renovation of residential and non-residential buildings, the Energy Efficiency Incentive Programme which targets the replacement of inefficient heating and ventilation systems, the Market Incentive Programme which promotes the use of renewable energies for heating and cooling, and the National Efficiency Label which helps consumers to identify efficient replacement heating systems. During the review, Germany clarified that the responsibility for enforcing regulatory PaMs in this sector falls to the Länder. Germany also noted that the latest measures in this sector tend to focus on an "envelope" approach in which the entire energy demand of the building is considered as a system when assessing efficiencies and impacts.

35. **Transport sector**. In its BR3 Germany provided an overview of key measures in this sector, including the establishment of CO_2 emissions standards for light commercial vehicles, the expansion of a toll on heavy goods vehicles and incentives for the purchase of electric vehicles. Together, these measures are expected to produce a mitigation impact in the order of 600 kt CO_2 eq in 2020. During the review, Germany explained that emissions from the transport sector have remained relatively stable since 1990, despite an increase in kilometres travelled by passengers and a growth in goods transport over the past 50 years. Germany also noted an increase in vehicle ownership compared with previous years. As a result, it is proving difficult to achieve a further reduction in emissions from this sector, and future sectoral targets (i.e. in 2030) may be challenging to meet given that both GDP and population are also steadily increasing.

36. **Industrial sector**. Germany also provided information on specific PaMs being implemented in the industrial sector. One of the measures highlighted involves the provision of grant funding to eligible companies to cover the costs of improvements related to energy efficiency (up to EUR 1.5 million to cover up to 20 per cent of the capital cost) for commercial and industrial production processes. These investments have targeted three areas: conversion of production processes, waste heat utilization and further improvements to the production process. This PaM was launched in 2014 and receives support via the Special Energy and Climate Fund.

(c) Policies and measures in other sectors

37. **Industrial processes**. The main measure to address emissions from industrial processes is the implementation of EU regulation 517/2014, which involves a reduction of emissions of F-gases to 70 per cent below the 1990 level by 2030. The regulation also bans the production of certain products containing F-gases and bans the use of SF_6 while establishing requirements for the maintenance and inspection of equipment containing certain levels of these gases. In the BR3 Germany stated that, by 2015, emissions from the industrial processes sector had been reduced by 36.3 per cent since 1990, and have reached stable levels in recent years.

38. **Agriculture**. PaMs in this sector are mainly determined as a result of market trends, EU policy and national regulatory law. The key PaM for agriculture in Germany continues to be the EU Common Agricultural Policy. In implementing the Common Agricultural Policy, Germany has employed a system of direct payments to farmers that is fully decoupled from production quotas. As a result, there are no longer incentives for overproduction. Rather, payments under this policy are now increasingly tied to "greening" and other environmental requirements. Under this approach, 30 per cent of payments are now dependent on maintaining permanent grassland, crop diversification and allocating a minimum area (5 per cent) of arable land to "ecological focus areas". Other PaMs focus on the promotion of organic agriculture, including reaching a target share of 20 per cent of all agricultural land by 2030 and increasing the use of manure-based biogas to 30 per cent of farm manure produced by 2025. During the review, Germany explained that, in addition to producing mitigation benefits by 2020 and beyond, PaMs in this sector are providing a range of social and environmental co-benefits and are producing synergies with PaMs in other sectors (e.g. increased manure usage in biogas plants, increase in organic farming and reduced land use for urban development and transport).

39. **LULUCF**. Germany's efforts to maintain grasslands are discussed in paragraph 38 above because they are also directly linked to agricultural PaMs. Additionally, Germany

has implemented a number of measures aimed at maintaining its forest sink, including funding for climate-smart forestry, funding for expanding the forested area and support for efforts to conserve, restore and sustainably manage forests internationally. Although Germany does not intend to directly account for the reduction of emissions resulting from its forest activities, it did note during the review that indirect mitigation benefits are captured in other sectors (e.g. the reduced use of other construction materials owing to the increased use of harvested wood products).

40. **Waste management**. The BR3 noted that Germany intends to adopt a regulation on the anaerobic digestion of waste to further reduce the amount of CH_4 generated in waste digestion plants. This measure will also encourage the use of any biogas generated as a result of digestion as an additional energy source (noting that a share of the emission reduction resulting from this will be reflected in other sectors). Other key measures in this sector include increasing the rate of recovery of secondary raw materials through improved recycling and further revisions to the Packaging Act (2017) that will come into effect in 2019. The revisions aim to reduce emissions by reducing the use of primary raw materials. Although significant mitigation reductions have already been achieved in this sector, during the review Germany stated that the added impact of these new measures is not yet known. Moreover, as Germany shifts away from an approach focused on reducing waste to an approach more focused on generating improved inputs for a circular economy, some of these mitigation impacts will be captured in other sectors. In addition to describing actions taken domestically, Germany also provided information during the review on its international outreach efforts in this sector to explain how some of its innovative waste policies can be replicated in other countries, in particular developing countries.

(d) Response measures

41. Germany reported on the assessment of the economic and social consequences of response measures. Most measures in Germany are not expected to have direct adverse effects, and others are expected to have positive impacts on developing countries according to qualitative analysis. Almost all the possible indirect effects are also considered to be positive. During the review, Germany presented several measures aimed at minimizing adverse impacts, which are related to, among other issues, the promotion of sustainability criteria for biofuels, the elimination of coal subsidies and supporting developing countries in diversifying their energy supplies.

(e) Assessment of adherence to the reporting guidelines

42. The ERT assessed the information reported in the BR3 of Germany and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

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

(a) Technical assessment of the reported information

43. For 2014 Germany reported in CTF table 4 annual total GHG emissions excluding LULUCF of 904,262.22 kt CO_2 eq, which is 27.7 per cent below the 1990 base-year level. In 2014 emissions from non-ETS sectors relating to the target under the ESD amounted to 438,254.03 kt CO_2 eq.

44. For 2015 Germany reported in CTF table 4 annual total GHG emissions excluding LULUCF of 901,931.51 kt CO_2 eq, which is 27.9 per cent below the 1990 base-year level.

45. On its use of units from LULUCF activities, Germany reported blank cells in CTF tables 4 and 4(a) for 2014 and 2015, and further confirmed during the review that, although the LULUCF sector reduced its total national emissions in 2014 and 2015 (as reported in the national inventory), it does not intend to account for these emission reductions. Similarly, Germany reported that it does not intend to use units from market-based mechanisms under the Convention towards either the EU joint target or its national target.

It reported in CTF tables 4 and 4(b) blank cells for its use of units from market-based mechanisms in 2014 and 2015. Table 4 illustrates Germany's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 4
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry by Germany to achieve its target

Year	*Emissions excluding LULUCF (kt CO_2 eq)*	*Contribution of LULUCF (kt CO_2 eq)* [a]	*Emissions including contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*
1990	1 250 915.47	NA	NA	NA
2010	941 750.27	NA	NA	NA
2011	922 363.37	NA	NA	NA
2012	926 849.80	NA	NA	NA
2013	945 185.95	NA	NA	NA
2014	904 262.22	NA	NA	NA
2015	901 931.51	NA	NA	NA

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

[a] The EU's unconditional commitment to reduce GHG emissions by 20 per cent below the 1990 level by 2020 does not include emissions/removals from LULUCF. Similarly, Germany's national target of a 40 per cent reduction below the 1990 level by 2020 does not include emissions/removals from LULUCF.

46. In assessing the progress towards the achievement of the 2020 joint EU target, the ERT noted that Germany's emission reduction target for non-ETS sectors is 14.0 per cent below the 2005 level (see para. 15 above). As reported in the BR3, in 2015, Germany's emissions from non-ETS sectors were 2.3 per cent (10,400 kt CO_2 eq) below the AEA under the ESD, indicating that Germany was complying with the AEAs for the years 2013 to 2015. However, according to projections reported in the BR3 and confirmed during the review, Germany is not currently on track to meet the 14.0 per cent reduction by 2020, with emissions exceeding the target by an estimated 4.7 per cent. Germany also indicated that it is not intending to account for a contribution from LULUCF or the use of market-based mechanisms.

47. The ERT noted that, although Germany has made significant progress to date, it continues to face challenges in implementing mitigation actions that deliver the emission reductions needed to make sufficient progress towards its ESD 2020 target. On the basis of the results of the projections (see para. 67 below), the ERT also noted that the Party may face challenges in the achievement of its ESD target and would need to further strengthen mitigation actions in the near term in order to reach the target. Regarding its national target of a 40 per cent reduction below the 1990 level by 2020, Germany also confirmed that, despite the progress made to date, it is not expecting to meet this target. In comparing the WAM scenario total emissions in 2020 with the 1990 base-year emissions, the projections indicate that Germany's emissions will be 7.3 per cent (55,074 kt CO_2 eq) above the national target (see para. 68 below). During the review, Germany emphasized that it is now focusing its efforts on elaborating measures to ensure compliance with the 2030 target.

(b) Assessment of adherence to the reporting guidelines

48. The ERT assessed the information reported in the BR3 of Germany and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

49. Germany reported updated projections for 2020, 2025, 2030 and 2035 relative to actual inventory data for 2014 under the WEM scenario. The WEM scenario reported by Germany includes implemented and adopted PaMs launched by 31 July 2016.

50. In addition to the WEM scenario, Germany reported in its BR3 and CTF tables 6(b) and 6(c) a WAM scenario. The WAM scenario includes planned PaMs. Germany provided a definition of its scenarios, explaining that its WEM scenario includes all new climate and energy measures launched by 31 July 2016 and existing ones that had been substantially modified by the same date, while its WAM scenario primarily includes the PaMs that are set out in CAP 2020 and the National Action Plan on Energy Efficiency, but which have not yet been implemented. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on NCs and on BRs.

51. Germany did not report a WOM scenario. During the review, Germany provided further information regarding the difficulty of producing a WOM scenario, including that for each PaM there are different assumptions for assessing the impact of the measure. For example, different policies have different start years, so depending on when the start year of an overall WOM scenario was chosen, it would lead to different results as compared to an individual PaM analysis.

52. In the BR3 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 1990–2014, 2020, 2025, 2030 and 2035. The projections are also provided in an aggregated format for each sector and for total emissions using GWP values from the AR4. Results were presented disaggregated by emissions covered under the ESD and by the EU ETS for the WEM scenario.

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

54. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately, as were emissions and removals for the LULUCF sector. Neither was included in the national totals. Germany reported on factors and activities affecting emissions and removals for each sector.

55. Germany implemented recommendations made in the previous review report, namely to provide projected emissions and removals for the LULUCF sector, to include projected emissions from sectors covered by the ESD and by the EU ETS and to include a WAM scenario. The ERT commends Germany for its improved reporting.

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

56. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the BR2. Germany reported supporting information further explaining the methodologies. One difference is that the previous projections used the methods set out in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* and the GWPs from the IPCC Second Assessment Report to calculate GHG emissions, whereas the current GHG emission calculations were prepared in accordance with the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* using GWPs from the AR4.

57. During the review, Germany presented additional information on the modelling approach, including the approach used in the *2017 Projections Report* (see para. 28 above). The analysis was conducted by linking detailed sectoral analyses through an energy system model which then feeds into an emissions calculation model to generate GHG emission estimates consistent with Germany's GHG inventory. Germany also described the challenges related to the timing and processes involved with developing projection reports every other year (i.e. on alternate years), noting in particular the fact that projections are developed prior to the availability of the final inventory data in a given year. Therefore, in

the BR3 Germany presented projections relative to actual inventory data for 2014 and not relative to inventory data for 2015, which were available later, before the time of the submission of the BR3.

58. To prepare its projections, Germany relied on the following key underlying assumptions: the German resident population rises minimally between 2012 and 2014, then decreases slightly but steadily in the years to follow, with just under 79 million inhabitants expected for 2035; relatively steady growth for economic development to 2035; gross value added in the manufacturing sector experiences strong growth in the same period, rising from EUR 473 billion (2010) in 2015 to EUR 542 billion (2035); and the price for crude oil in 2035 is significantly higher than in 2015. These variables and assumptions were reported in CTF table 5. The assumptions used to produce the projections were based on the recommendations under the EU Monitoring Mechanism Regulation for the trends in resident population, GDP, crude oil prices and the price of EU emission allowances.

59. Germany provided information in CTF table 5 on the key variables and assumptions used in the preparation of the projection scenarios. Germany did not provide information on changes to the assumptions in CTF table 5 or the BR3.

60. During the review, Germany provided additional information on the selection of key variables and included information on how the variables changed from the previous projections report. Germany also provided information on sensitivity analyses in its BR3.

61. Sensitivity analyses were conducted for a number of important assumptions, such as demographic and economic trends. The assumed economic growth was increased and the decline in the population was reduced in both the WEM and the WAM scenarios. For both scenarios, the calculation showed that varying the demographic and economic variables did not have a significant impact on the results (less than 1 per cent). The effect of lower electricity exports under the WEM and WAM scenarios was also examined, which resulted in a considerable reduction of emissions by 36 Mt CO_2 eq in 2020 and a change in overall reductions of around 3 per cent.

(c) Results of projections

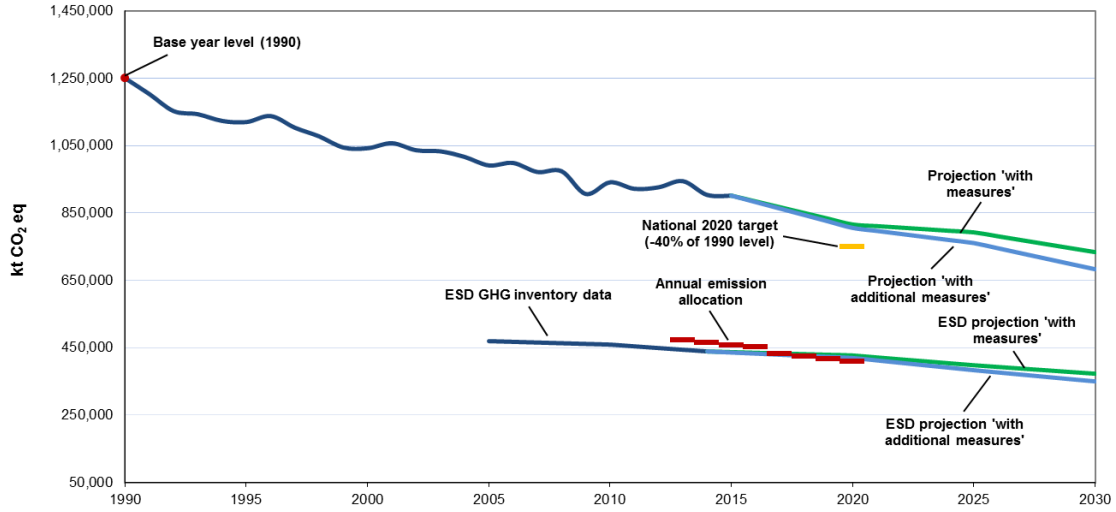
62. The projected emission levels under different scenarios, and information on the quantified economy-wide emission reduction target, are presented in table 5 and the figure below. Germany's national emission reduction target, as well as projected ESD emissions and AEAs under the ESD, are also presented in the figure below.

Table 5
Summary of greenhouse gas emission projections for Germany

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year[a] level (%)*	*Changes in relation to 1990 level (%)*
Quantified economy-wide emission reduction target under the Convention[b]	NA	NA	NA
Domestic target	750 549.28	–40.0	–40.0
Inventory data 1990[c]	1 250 915.47	NA	NA
Inventory data 2015[c]	901 931.51	–27.9	–27.9
WOM projections for 2020[d]	NE	NE	NE
WEM projections for 2020[d]	816 368.00	–34.7	–34.7
WAM projections for 2020[d]	805 623.00	–35.6	–35.6
WOM projections for 2030[d]	NE	NE	NE
WEM projections for 2030[d]	734 524.00	–41.3	–41.3
WAM projections for 2030[d]	682 048.00	–45.5	–45.5

[a] "Base year" in this column refers to the base year used for the target under the Convention, which for Germany is 1990.
[b] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.
[c] From Germany's 2017 annual inventory submission, version 7.
[d] From Germany's NC7 and BR3.

Greenhouse gas emission projections reported by Germany



Sources: (1) data for the years 1990–2015: Germany's 2017 annual inventory submission; total GHG emissions excluding LULUCF; (2) data for the years 2015–2030: Germany's NC7 and BR3; total GHG emissions excluding LULUCF.

63. During the review, Germany provided additional information on the most recent emission trends and projections. Germany's GHG emissions in 2016 were 2,548.99 kt CO_2 eq more than in 2015 (0.3 per cent), which represents the second emissions increase in successive years. Furthermore, the projections in the BR3 were based on GDP growth assumptions of 1.3 per cent between 2015 and 2020. Actual annual GDP growth was 2.2 per cent in 2017 and is projected to be 2.4 per cent in 2018, indicating that it will be increasingly difficult to reach the national target in 2020.

64. During the review, Germany further highlighted measures under way to ensure that the 2030 national target will be met. These measures include the programme of measures to be elaborated under CAP 2050 by the end of 2018 and the implementation of sectoral targets to be achieved by 2030, as well as the pending climate legislation that Germany expects to pass in 2019.

65. Under the Convention, Germany's target is a joint target for the EU and its 28 member States: a 20.0 per cent reduction by 2020 compared with 1990. The EU targets are split into the EU ETS (which is an EU-wide target, and it is expected that the market mechanism of the EU ETS will guarantee that emissions from sectors under this scheme will achieve the 2020 target) and the ESD for sectors not covered by the EU ETS (see paras. 14 and 15 above). In addition, Germany has set itself an ambitious national target of a 40.0 per cent reduction by 2020 compared with the 1990 level.

66. Germany's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 816,368.00 and 734,524.00 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 34.7 and 41.2 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 35.5 and 45.4 per cent, amounting to around 805,623 and 682,048 kt CO_2 eq, respectively. The 2020 projections suggest that Germany will continue contributing to the achievement of the EU target under the Convention (see para. 12 above).

67. Germany's target for non-ETS sectors is to reduce its total emissions by 14.0 per cent below the 2005 level by 2020 (see para. 15 above). Germany's AEAs, which correspond to its national emission target for non-ETS 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, emissions from non-ETS sectors are estimated to reach 426,298.00 kt CO_2 eq by 2020. Under the WAM scenario, Germany's emissions from non-ETS sectors in 2020 are projected to be 418,785.00 kt CO_2 eq. The projected level of emissions under the WEM and WAM scenarios are 3.7 and 1.9 per cent, respectively, above the AEA for 2020. The ERT noted that this suggests that, without the

implementation of new, far-reaching measures, Germany may face challenges in meeting its target under both the WEM and the WAM scenarios (see para. 47 above).

68. In addition to its target for non-ETS sectors, Germany committed itself to achieving a domestic target of a 40.0 per cent reduction in emissions below the 1990 level by 2020. The projections indicate that Germany may also face challenges in achieving its domestic target without the implementation of additional measures. Germany's total GHG emissions in 2020 are projected to be only 34.7 per cent and 35.5 per cent below the 1990 level under the WEM and WAM scenarios respectively.

69. Germany presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 6.

Table 6
Summary of greenhouse gas emission projections for Germany presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
	1990	*2020*		*2030*		*1990–2020*		*1990–2030*	
Sector		*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (not including transport)	684 598	408 946	403 590	365 193	327 367	–40.3	–41.0	–46.7	–52.2
Transport	164 404	159 100	158 430	150 033	139 009	–3.2	–3.6	–8.7	–15.4
Industry/industrial processes	283 089	173 414	170 927	148 318	147 038	–38.7	–39.6	–47.6	–48.1
Agriculture	79 770	66 276	64 202	65 115	63 142	–16.9	–19.5	–18.4	–20.8
LULUCF	–31 279	29 081	29 081	19 174	19 174	–193.0	–193.0	–161.3	–161.3
Waste	37 966	8 633	8 473	5 866	5 494	–77.3	–77.7	–84.5	–85.5
Other (specify)									
Total GHG emissions without LULUCF	**1 249 829**	**816 368**	**805 623**	**734 524**	**682 048**	**–34.7**	**–35.5**	**–41.2**	**–45.4**

Source: Germany's BR3 CTF table 6.

70. 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), amounting to projected reductions of 275,652.00 kt CO_2 eq (40.3 per cent) between 1990 and 2020. The second largest amount of reductions is projected to occur in the industry/industrial processes sector with reductions of 109,675.00 kt CO_2 eq (38.7 per cent) between 1990 and 2020. The agriculture and waste management/waste sectors are projected to reduce emissions by 13,494.00 kt CO_2 eq (16.9 per cent) and 29,333.00 kt CO_2 eq (77.3 per cent) between 1990 and 2020, respectively. Finally, the transportation sector has the lowest projected reduction with 5,304.00 kt CO_2 eq (3.2 per cent) between 1990 and 2020.

71. The pattern of projected emissions reported for 2030 under the WEM scenario remains the same: the most significant emission reductions are expected to occur in the energy sector (excluding transport), amounting to projected reductions of 319,405.00 kt CO_2 eq (46.7 per cent) between 1990 and 2030. The second largest reductions are projected to occur in the industry/industrial processes sector with reductions of 134,771.00 kt CO_2 eq (47.6 per cent) between 1990 and 2030. The agriculture and waste management/waste sectors are projected to reduce emissions by 14,655.00 kt CO_2 eq (18.4 per cent) and 32,100.00 kt CO_2 eq (84.5 per cent) between 1990 and 2030, respectively. The transportation sector still has the lowest projected reductions in 2030, but represents a significant improvement over the 2020 reduction projections due to the increasing implementation of measures over time (e.g. increased electrification). The transportation sector projected emission reductions are 14,371.00 kt CO_2 eq (8.7 per cent) between 1990 and 2030.

72. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 and 2030 presented by sector and by gas generally remain the same. The most significant emission reductions are still expected to occur in the energy sector (excluding transport), amounting to projected reductions of 281,008.00 kt CO_2 eq (41.0 per cent) and 357,231.00 kt CO_2 eq (52.2 per cent) between 1990 and 2020 and between 1990 and 2030, respectively. The biggest difference between the WEM and the WAM scenarios occurs in the transportation sector in 2030 where, under the WAM scenario, transportation is no longer projected to be the sector contributing the lowest amount of emission reductions. The transportation sector projected emission reductions are 25,395.00 kt CO_2 eq (15.4 per cent) between 1990 and 2030 under the WAM scenario.

73. Germany presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 7.

Table 7
Summary of greenhouse gas emission projections for Germany presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
	1990	*2020*		*2030*		*1990–2020*		*1990–2030*	
Gas		*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2	1 052 238	713 243	704 796	646 059	595 871	–32.2	–33.0	–38.6	–43.4
CH_4	119 235	51 223	51 109	46 707	46 528	–57.0	–57.1	–60.8	–61.0
N_2O	65 189	37 811	35 837	36 638	34 529	–42.0	–45.0	–43.8	–47.0
HFCs	50	9 358	9 148	3 553	3 553	18 616.0	18 196.0	7 006.0	7 006.0
PFCs	3 060	242	242	230	230	–92.1	–92.1	–92.5	–92.5
SF_6	4 344	4 319	4 319	1 165	1 165	–0.6	–0.6	–73.2	–73.2
NF_3	7	20	20	20	20	185.7	185.7	185.7	185.7
Total GHG emissions without LULUCF	**1 249 829**	**816 368**	**805 623**	**734 524**	**682 048**	**–34.7**	**–35.5**	**–41.2**	**–45.4**

Source: Germany's BR3 CTF table 6.

74. For 2020 the most significant reductions are projected for CO_2 emissions: 338,995.00 kt (32.2 per cent) between 1990 and 2020. Reductions are also projected for CH_4 with 68,012.00 kt CO_2 eq (57.0 per cent) between 1990 and 2020 and for N_2O with 27,378.00 kt CO_2 eq (42.0 per cent) between 1990 and 2020. HFCs are expected to increase by 9,308.00 kt CO_2 eq (18,616.0 per cent) between 1990 and 2020.

75. The pattern of projected emissions reported for 2030 under the WEM scenario remains the same, with the most significant reductions projected for CO_2 emissions: 406,179.00 kt (38.6 per cent) between 1990 and 2030. Reductions for CH_4 are projected to be 72,528.00 kt CO_2 eq (60.8 per cent) between 1990 and 2030, and reductions in N_2O are projected to be 28,551.00 kt CO_2 eq (43.8 per cent) between 1990 and 2030. HFCs are only expected to increase by 3,503.00 kt CO_2 eq (7,006.0 per cent) between 1990 and 2030.

76. If additional measures are considered (i.e. in the WAM scenario), the patterns of emission reductions by 2020 and 2030 presented by gas remain the same.

77. The ERT noted that in the BR2 under the WEM scenario, Germany projected total GHG emission reductions excluding LULUCF of 33.4 and 43.5 per cent below the 1990 level in 2020 and 2030, respectively. As shown in table 7 above, in the BR3 under the WEM scenario, Germany projected reductions in total GHG emissions excluding LULUCF of 34.7 and 41.2 per cent below the 1990 level in 2020 and 2030, respectively. This represents a slight increase in projected GHG emission reductions for 2020, but less of a reduction in 2030 under the WEM scenario. Under the WAM scenario in the BR3, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 35.5 and 45.4 per cent, respectively. Germany did not report a WAM scenario in the BR2.

(d) Assessment of adherence to the reporting guidelines

78. The ERT assessed the information reported in the BR3 of Germany and identified four issues relating to transparency. The findings are described in table 8.

Table 8
Findings on greenhouse gas emission projections reported in the third 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 Issue type: transparency Assessment: encouragement	The ERT noted that Germany did not report a WOM scenario. The ERT also 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. During the review, Germany provided information describing the difficulty of producing a WOM scenario, including the fact that for each PaM there are different assumptions for assessing the impact of the measure. To enhance the transparency of the reporting, the ERT encourages Germany to provide information in its next BR describing the difficulties involved in developing a WOM scenario that would be consistent across all the PaMs considered.
2	Reporting requirement[a] specified in paragraph 32 Issue type: transparency Assessment: encouragement	The ERT noted that Germany reported 2015 inventory data in the BR3, but projections were based on 2014 data as the starting point. The ERT also noted that, according to the UNFCCC reporting guidelines on NCs and on BRs, the starting point for the WEM and WAM projections should generally be the latest year for which inventory data are available in the BR. During the review, Germany described the challenges related to the timing and processes involved with developing projection reports every other year (i.e. on alternate years), noting in particular the fact that projections are developed prior to the availability of the final inventory data in a given year. To improve the transparency of the reporting, the ERT encourages Germany to provide, in its next BR, information describing the timing and processes involved with the preparation of the projection reports and to provide an explanation for why the latest year for which inventory data are available in the BR is not used as a starting point for projections.
3	Reporting requirement[a] specified in paragraph 43 Issue type: transparency Assessment: encouragement	The ERT noted that Germany did not explain in its BR3 how the modelling approach used for the projections accounts for any overlap or synergies that may exist between different PaMs as indicated by the UNFCCC reporting guidelines on NCs and on BRs. During the review, Germany provided explanations on how the modelling approach accounts for overlaps or synergies between different PaMs and between different sectors. To enhance the transparency of its reporting, the ERT encourages Germany to provide information in its next BR describing how the projections modelling approach accounts or does not account for any overlap or synergies that may exist between different PaMs and specifically between different sectors.
4	Reporting requirement[a] specified in paragraph 45 Issue type: transparency Assessment: encouragement	The ERT noted that Germany reported on the assumptions used in the BR3 projections, but not how they differed from those reported in the BR2. The ERT also noted that, according to the UNFCCC reporting guidelines on NCs and on BRs, Parties should report the main differences in the assumptions, methods employed and results between projections in the current BR and those in earlier BRs. During the review, Germany indicated that it will provide more complete information in its next NC describing how the main assumptions used in the projections differ from those used in previous reported projections. To enhance the transparency of the reporting, the ERT encourages Germany to provide information in its next BR describing how the main assumptions used in the BR projections differ from those used in previous BR projections, for example on GDP growth rate.

Note: The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs and on BRs.

[a] Paragraph numbers listed under reporting requirement refer to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

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

1. Approach and methodologies used to track support provided to non-Annex I Parties

(a) Technical assessment of the reported information

79. In the BR3 Germany reported information on the provision of financial, technological and capacity-building support required under the Convention.

80. Germany provided details on financial support it has provided and clarified how this support is "new and additional" by including the definition of "new and additional climate finance" in the documentation box of CTF tables 7. The ERT noted that the BR3 neither included a definition of "new and additional" financial resources nor provided a clear reference to the relevant definition in CTF tables 7. During the review, Germany explained that its definition of "new and additional" is newly committed or disbursed climate finance during the corresponding reporting years (2015 and 2016) for the BR3 (see issue 3 in table 12 below).

81. Germany reported the financial 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. Germany also explained how it tracks finance for adaptation and mitigation using the OECD Rio Markers and categorizes the support activities in accordance with the relevant implementation agencies.

82. The BR3 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. Germany included information on how it has refined its approach to tracking climate support and methodologies.

83. Germany described the methodology and underlying assumptions used for collecting and reporting information on financial support, including underlying assumptions and guidelines. The methodology used for preparing information on international climate support is based on the OECD Rio Markers for climate change mitigation and adaptation.

(b) Assessment of adherence to the reporting guidelines

84. The ERT assessed the information reported in the BR3 of Germany and identified one issue relating to transparency. The finding is described in table 9.

Table 9
Findings on the approach and methodologies used to track support provided to non-Annex I Parties from the review of the third 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 15 Issue type: transparency Assessment: recommendation	The ERT commends Germany for its reporting on finance. However, the ERT noted that in the BR3 the reported underlying assumptions and methodologies used to produce information on finance were not fully transparent, because it was not evident that Germany provided this information as part of the textual information complementing CTF tables 7. During the review, Germany explained that the financial support activities were reported by implementation agency in order to avoid potential double counting. To enhance the transparency of its reporting, the ERT recommends that Germany provide in its next BR information explaining its approach, including assumptions and methodologies, for reporting on finance per implementation agency in order to avoid potential double counting as part of the chapter on provision of financial, technological and capacity-building support to developing country Parties.

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

2. Financial resources

(a) Technical assessment of the reported information

85. Germany reported information on the provision of financial support required under the Convention, including on financial support provided, committed and pledged, allocation channels and annual contributions. The ERT commends Germany for adopting a more systematic and streamlined framework for reporting on its provision of financial, technological and capacity-building support, as a follow-up to recommendations made in the previous review report.

86. Germany indicated the financial resources it has provided to date pursuant to Article 4, paragraph 3, of the Convention and clarified in the documentation box of CTF tables 7 how it has determined such resources as being "new and additional". This information was also provided during the review (see para. 80 above for further information on "new and additional" financial resources).

87. 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 to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation. Germany reported information on the assistance that it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. Germany confirmed that this assistance includes a financial contribution to the Adaptation Fund.

88. 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, such as efforts to reduce GHG emissions, adapt to the impacts of climate change and protect forests and biodiversity, including REDD-plus activities.[6] As stated in a BMUB official document "Climate Action in Figure – Facts, Trends and Incentives for German Climate Policy"(2017 edition), Germany provided developing and emerging countries with financial support from its budget and grant elements in development loans of the German development bank (KfW).[7] Financed measures for development and implementation of ambitious climate action and adjustment measures include funding for the largest and most modern solar complex in Ouarzazate, Morocco; forest and species conservation in Colombia and coastal protection measures in Viet Nam. Table 10 includes some of the information reported by Germany on its provision of financial support.

Table 10
Summary of information on provision of financial support by Germany in 2015–2016
(Millions of United States dollars)

	Year of disbursement	
Allocation channel of public financial support	*2015*	*2016*
Official development assistance[a]	21 264.3	28 655.8
Climate-specific contributions through multilateral channels, including:	418.0	602.7
Global Environment Facility	49.2	65.0
Least Developed Countries Fund	33.3	27.7
Special Climate Change Fund	3.3	–

[6] In decision 1/CP.16, paragraph 70, the Conference of the Parties encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks.

[7] https://www.kfw.de/kfw.de-2.html.

Allocation channel of public financial support	*Year of disbursement*	
	2015	*2016*
Adaptation Fund	55.5	55.3
Green Climate Fund	20.1	78.3
Financial institutions, including regional development banks	207.4	245.5
United Nations bodies	9.5	61.5
Other	39.7	69.4
Climate-specific contributions through bilateral, regional and other channels	7 792.9	8 837.7

[a] *Sources*: (1) Query Wizard for International Development Statistics, available at http://stats.oecd.org/qwids/; (2) BR3 CTF tables; (3) table 17 of the NC7 and (4) revised data provided by Germany during the review.

89. Germany reported on its climate-specific, public financial support, totalling USD 7,792.9 million in 2015 and USD 8,837.7 million in 2016. With regard to future financial pledges aimed at enhancing the implementation of the Convention by developing countries, Germany is aiming at providing EUR 4,000 million by 2020, starting from a target level of EUR 2,000 million in 2014. Towards the EUR 4,000 million goal, Germany will count budgetary resources and grant elements of development loans. In addition to public climate finance from budgetary sources and grant elements of development loans, substantial amounts of mobilized public climate finance is provided by KfW and the German Investment and Development Corporation (DEG); however, these will not be counted towards the EUR 4,000 million goal. During the reporting period, Germany placed a particular focus on African countries, for which it allocated USD 2.44 billion and 2.47 billion in 2015 and 2016, respectively. The ERT noted that Germany reported in CTF table 7(b) its bilateral support allocated to Annex I Parties in 2015 and 2016, which amounted to EUR 49.3 million (USD 54.7 million) and EUR 95.3 million (USD 105.4 million), respectively. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by priority is presented in table 11.

Table 11
Summary of information on channels of financial support used in 2015–2016 by Germany
(Millions of United States dollars)

Allocation channel of public financial support	*Year of disbursement*				*Share (%)*	
	2015	*2016*	*Difference*	*Change (%)*	*2015*	*2016*
Support through bilateral and multilateral channels allocated for:						
Mitigation	6 015.0	6 416.6	401.6	6.7	73.3	68.0
Adaptation	1 346.5	1 610.5	263.9	19.6	16.4	17.1
Cross-cutting	849.3	1 413.3	564.0	66.4	10.3	15.0
Other	–	–	–	–	–	–
Total	**8 210.8**	**9 440.4**	**1 229.5**	**15.0**	**100.0**	**100.0**
Detailed information by type of channel						
Multilateral channels						
Mitigation	215.7	259.1	43.4	20.1	51.6	43.0
Adaptation	173.4	231.6	58.2	33.5	41.5	38.4
Cross-cutting	28.9	112.0	83.1	288.0	6.9	18.6
Other	–	–	–	–	–	–

Allocation channel of public financial support	*Year of disbursement*				*Share (%)*	
	2015	*2016*	*Difference*	*Change (%)*	*2015*	*2016*
Total	**418.0**	**602.7**	**184.7**	**44.2**	**100.0**	**100.0**
Bilateral channels						
Mitigation	5 799.3	6 157.5	358.2	6.2	74.4	69.7
Adaptation	1 173.1	1 378.9	205.8	17.5	15.1	15.6
Cross-cutting	820.4	1 301.3	480.9	58.6	10.5	14.7
Other	–	–	–	–	–	–
Total	**7 792.9**	**8 837.7**	**1 044.9**	**13.4**	**100.0**	**100.0**
Multilateral compared with bilateral channels						
Multilateral	418.0	602.7	184.7	44.2	5.1	6.4
Bilateral	7 792.9	8 837.7	1 044.9	13.4	94.9	93.6
Total	**8 210.8**	**9 440.4**	**1 229.5**	**15.0**	**100.0**	**100.0**

Sources: (1) CTF tables 7, 7(a) and 7(b) of the BR3 of Germany; (2) Revised data provided by Germany during the review.

90. The BR3 includes detailed information on the financial support provided through multilateral, bilateral and regional channels in 2015 and 2016. More specifically, Germany contributed through multilateral channels, as reported in the BR3, in CTF table 7(a) and clarified during the review, USD 418.0 million and 602.6 million for 2015 and 2016, respectively. The contributions were made to specialized multilateral climate change funds, such as the Global Environment Facility, the Least Developed Countries Fund, the Special Climate Change Fund, the Green Climate Fund and the Adaptation Fund.

91. The BR3 and CTF table 7(b) also include detailed information on the total financial support provided through bilateral and regional channels, with the total amount of USD 7,792.9 million and 8,837.7 million in 2015 and 2016, respectively. If the amount of support provided to Annex I Parties (see para. 89 above) is deducted, then the total should be revised to USD 7,738.2 million and 8,732.3 million in 2015 and 2016, respectively.

92. The BR3 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2015, the shares of the total public financial support allocated for mitigation, adaptation and cross-cutting projects were 73.3, 16.4 and 10.3 per cent, respectively. In addition, 5.1 per cent of the total public financial support was allocated through multilateral channels and 94.9 per cent through bilateral, regional and other channels. In 2016, the shares of total public financial support allocated for mitigation, adaptation and cross-cutting projects were 68.0, 17.1 and 15.0 per cent, respectively. Furthermore, 6.4 per cent of the total public financial support was allocated through multilateral channels and 93.6 per cent through bilateral, regional and other channels.

93. The ERT noted that sector-specific information was reported as “not applicable” in CTF table 7(a) for 2015 and 2016. During the review, Germany explained that as the methodology adopted by Germany for producing climate finance information is based on execution by implementation agencies, sector-specific information is not available. The ERT noted that in 2015 and 2016 financial contributions made through multilateral channels were allocated to a variety of sectors. The largest part was directed to adaptation-focused funds such as the Least Developed Countries Fund, the Special Climate Change Fund and the Adaptation Fund; climate risk insurances; activities related to the NDC Partnership; and the energy sector.

94. CTF tables 7(a) and 7(b) include information on the type of financial instrument used in the provision of assistance to developing countries, which includes grants, concessional loans, non-concessional loans and equity. The ERT noted that the grants and

concessional loans provided in 2015 and 2016 accounted for most of the total public financial support.

95. In the BR3 Germany clarified that private finance is mainly mobilized for climate change mitigation and adaptation with the highest possible transformative impacts in developing countries. It reported on how it uses public funds to promote private sector financial support to developing countries, which it sees as pivotal to effectively increasing mitigation and adaptation efforts in developing countries by promoting direct mobilization effect and structural changes in the economy. The German Government supports advisory services for policymakers in establishing guidelines and regulations that facilitate private investment. It also provides capital to institutions such as local banks for adaptation and mitigation actions, and promotes capacity-building for various national public and private sector institutions, which is often a fundamental requirement for making private investment possible.

96. 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 methodologies (as developed by the OECD Research Collaborative). Germany also reported a planned improvement related to the launch of the German Climate Marker Guidelines in 2019, which aim to address an identified challenge in that the choice of OECD Rio Markers for individual projects is often decided by programme managers who are typically not climate specialists.

(b) Assessment of adherence to the reporting guidelines

97. The ERT assessed the information reported in the BR3 of Germany and identified three issues relating to completeness and transparency. The findings are described in table 12.

Table 12
Findings on financial resources from the review of the third 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 17	The ERT noted that Germany reported in CTF table 7(b) its bilateral support allocated to Annex I Parties in 2015 and 2016, which amounted to EUR 49.3 million (USD 54.7 million) and EUR 95.3 million (USD 105.4 million), respectively.
	Issue type: transparency	During the review, Germany confirmed that the information provided in CTF table 7(b) included bilateral support to Annex I Parties and that in its next BR it will remove this information.
	Assessment: recommendation	The ERT recommends that Germany in its next BR 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 developing countries.
2	Reporting requirement specified in paragraph 17	The ERT noted that the information reported in CTF tables 7, 7(a) and 7(b) was expressed in EUR only, and only the total amounts of multilateral and bilateral support were presented in USD in chapter 5.1.2 of the BR3 and chapters 6.1 and 6.2 of the NC7.
	Issue type: transparency	During the review, Germany explained that the official OECD exchange rate for each corresponding year can be readily applied in the CTF tables to obtain information corresponding to the one presented in the BR.
	Assessment: recommendation	The ERT recommends that, for its next BR, Germany provide information on financial support in USD in CTF tables 7, 7(a) and 7(b) by applying the relevant official exchange rates for each corresponding year.
3	Reporting requirement specified in paragraph 18	The ERT noted that the BR3 does not include information on how Germany has determined that financial resources provided are “new and additional”. The ERT also noted that Germany included the definition of “new and additional climate finance” in the documentation box of CTF tables 7.
	Issue type: transparency	During the review, Germany explained that its definition of “new and additional”

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: recommendation	refers to "newly committed or disbursed climate finance during the corresponding reporting years" (2015 and 2016). To enhance the transparency of the reporting, the ERT recommends that Germany include in its next BR information on how it has determined that financial resources provided are "new and additional", including its definition of "new and additional" financial resources.

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

3. Technology development and transfer

(a) Technical assessment of the reported information

98. 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.

99. The ERT took note of the information provided in CTF table 8 on recipient countries, target areas, measures and activities, sectors, sources of funding and status of technology transfer programmes. Most of the reported support activities focused on mitigation through the development of renewable energy sources in developing countries from Asia, Africa and Latin America.

100. The ERT noted that Germany reported on its PaMs as well as success and failure stories in relation to technology transfer, and in particular on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. For example, through the German Climate Technology Initiative, BMZ is financing modern, climate-friendly and climate-adapted infrastructure measures in emerging economies and developing countries. BMZ is also very active in making contributions to renewable energy development in Africa through the Africa-EU Renewable Energy Cooperation Programme and the Africa-EU Energy Partnership.

(b) Assessment of adherence to the reporting guidelines

101. The ERT assessed the information reported in the BR3 of Germany and identified an issue relating to transparency, completeness or adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 13.

Table 13
Findings on technology development and transfer from the review of the third 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 22 Issue type: transparency Assessment: encouragement	The ERT noted that Germany has made progress in its reporting by providing more examples of measures and activities related to technology development and transfer support in CTF table 8. However, within this information there is no information on when these measures and activities were implemented or are planned to be implemented. To enhance the transparency of the reporting, the ERT encourages Germany to provide detailed information in its next BR on measures and activities related to technology development and transfer support, including when these measures and activities were implemented or are planned to be implemented since the last NC or BR.

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

4. Capacity-building

(a) Technical assessment of the reported information

102. In the BR3 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. Germany described individual measures and activities related to capacity-building support in textual and tabular format. Examples of these measures and activities include support to regional science service centres for climate change and adaptive land management in Africa, support to selected partner countries in developing their intended nationally determined contributions and the promotion of a renewable energy and energy efficiency programme in Uganda.

103. Germany reported that it has supported climate-related capacity development activities relating to adaptation, mitigation, climate financing and other sectors. Germany also reported that it has responded to the existing and emerging capacity-building needs of non-Annex I Parties by following an approach that is context-specific, results-based and consistent with national priorities. Germany conducted capacity-building activities through bilateral and multilateral cooperation, as well as through various partnerships with private sector, academia and civil society. The support measures for capacity-building implemented by Germany are designed to be context-specific, results-based and consistent with national priorities.

(b) Assessment of adherence to the reporting guidelines

104. The ERT assessed the information reported in the BR3 of Germany and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

III. Conclusions and recommendations

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

106. Germany's total GHG emissions in 2015 excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 27.9 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 27.2 per cent below its 1990 level. Emission decreases were driven mainly by factors such as a change from the use of solid fuels to lower-emission liquid and gaseous fuels since 1990; an increase in the use of renewable energy sources and the resulting substitution of fossil fuels; commissioning of more efficient industrial plants and facilities; changes in livestock raising conditions and reduction in livestock population; and compliance with statutory provisions on waste management, which significantly reduced CH_4 emissions.

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

108. Under the ESD, Germany has a target which is equivalent to reducing its emissions by 14.0 per cent below the 2005 level by 2020. The 2015–2020 linear progression in Germany's AEAs (its national emission target for non-ETS sectors) is 472,527.65–410,908.76 kt CO_2 eq. In addition, Germany has committed itself to achieving a domestic target of a 40.0 per cent reduction in emissions below the 1990 level by 2020. Germany also has interim long-term targets to reduce its GHG emissions by at least 55.0 per cent by 2030, by at least 70.0 per cent by 2040 and by 80.0–95.0 per cent by 2050 below the 1990 level. Additionally, as part of its commitment to the Paris Agreement, Germany has adopted the guiding principle of attaining GHG neutrality by mid-century.

109. Germany's main policy framework relating to energy and climate change is CAP 2050. As part of CAP 2050, interim sectoral targets have been established to 2030, and a specific programme of measures to reduce emissions to 2030 will be further elaborated in 2018. Presently, the mitigation actions with the most significant mitigation impact include CAP 2020, *Energiewende*, the EU ETS and the Renewable Energy Sources Act. Germany also intends to pass additional legislation to support its climate change goals in 2019.

110. For 2015, Germany reported in CTF table 4 total GHG emissions excluding LULUCF of 901,931.51 kt CO_2 eq, clarifying that no reductions from LULUCF or market-based mechanisms would be used to achieve its target. The ERT noted that Germany has made significant progress in reducing its emissions to date.

111. The GHG emission projections provided by Germany in the BR3 correspond to the WEM and WAM scenarios. Under these scenarios, emissions are projected to be 34.7 and 35.5 per cent below the 1990 level by 2020, respectively. On the basis of the reported information, the ERT concludes that Germany may face challenges in achieving its national 2020 target (40.0 per cent reduction below the 1990 level by 2020) under the WEM and WAM scenarios. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 426,298.00 kt CO_2 eq by 2020. Under the WAM scenario, Germany's emissions from non-ETS sectors in 2020 are projected to be 418,785.00 kt CO_2 eq. The projected level of emissions under the WEM and WAM scenarios are 3.7 and 1.9 per cent, respectively, above the AEAs for 2020. On the basis of the reported information, the ERT concludes that Germany may face challenges in achieving its target for non-ETS sectors.

112. The ERT noted that although Germany has made considerable progress reducing its emissions to date, it continues to face challenges in meeting its 2020 emission reduction targets. On the basis of the results of the projections for 2020 under the WEM and WAM scenarios, the ERT noted that Germany may face challenges in achieving its target even if all additional PaMs are implemented by 2020, including further strengthening existing PaMs. In this regard, Germany would need to implement far-reaching measures in the short-term in order to reach its 2020 target, particularly given that it has indicated that it will not use emission reductions from LULUCF or market-based mechanisms. As a result, Germany has placed an emphasis on reaching its 2030 target. During the review, Germany highlighted the measures already under way to ensure that the 2030 target will be met, such as the programme of measures to be elaborated under CAP 2050 by the end of 2018 and the implementation of sectoral targets to be achieved by 2030, as well as the pending climate legislation that Germany expects to pass in 2019.

113. Germany continues to provide climate financing to developing countries in line with its climate finance programmes such as the NDC Partnership, InsuResilience (the G7 climate risk insurance initiative), the Africa Renewable Energy Initiative, the NAMA Facility and the AFR100 initiative. It has increased its contributions by 140.0 per cent since the BR2; its public financial support in 2015 and 2016 totalled USD 7,969.6 million and USD 9,232.2 million per year, respectively. For those years, Germany provided more support for mitigation than for adaptation. The largest share of financial support went to projects in the energy sector, followed by measures that cut across various sectors.

114. In the course of the review, the ERT formulated the following recommendations for Germany to improve the transparency of its reporting and its adherence to the UNFCCC reporting guidelines on BRs in its next BR[8] by:

(a) Providing information explaining its approach, including assumptions and methodologies, for reporting on finance per implementation agency in order to avoid potential double counting as part of the chapter of the BR on provision of financial, technological and capacity-building support to developing country Parties (see table 9);

(b) Removing information on the support allocated to Annex I Parties from CTF table 7(b) and deducting the relevant amount from the total support provided to developing countries (see para. 91 above and issue 1, table 12);

(c) Providing information on financial support in USD in CTF tables 7, 7(a) and 7(b) by applying the relevant official exchange rates for each corresponding year (see issue 2, table 12);

(d) Including information on how it has determined that financial resources provided are "new and additional" and its definition of "new and additional" financial resources (see paras. 80 and 86 above and issue 3, table 12).

(a)

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

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Germany. Available at https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/submissions/national-inventory-submissions-2017.

BR3 of Germany. Available at https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/submitted-biennial-reports-brs-from-annex-i-parties.

BR3 CTF tables of Germany. Available at https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/submitted-biennial-reports-brs-from-annex-i-parties.

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

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

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

NC7 of Germany. Available at http://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/26795831_germany-nc7-1-171220_7_natcom_to_unfccc.pdf.

Report of the technical review of the second biennial report of Germany. FCCC/TRR.2/DEU. Available at https://unfccc.int/documents/9269#beg.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Ilka Wagner (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety), including additional material. The following documents[1] were provided by Germany:

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.

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/climate-action-plan-2050-principles-and-goals-of-the-german-governments-climate-policy.

2017 Projections Report for Germany, pursuant to Regulation (EU) No. 525/2013.

[1] Reproduced as received from the Party.