United Nations

FCCC/TRR.4/EU

Framework Convention on Climate Change

Distr.: General
26 June 2020

English only

Report on the technical review of the fourth biennial report of the European Union

Developed country Parties were requested by decision 2/CP.17 to submit their fourth biennial report to the secretariat by 1 January 2020. This report presents the results of the technical review of the fourth biennial report of the European Union, conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". The review took place from 9 to 13 March 2020 in Bonn remotely.

GE.20-08477(E)

2008477

Contents

Abbreviations and acronyms

AEA	annual emission allocation
Annex I Party	Party included in Annex I to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTCN	Climate Technology Centre and Network
CTF	common tabular format
ERT	expert review team
ESD	European Union effort-sharing decision
ESR	European Union effort-sharing regulation
EU	European Union
EU ETS	European Union Emissions Trading System
Eurostat	statistical office of the European Union
F-gas	fluorinated gas
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IE	included elsewhere
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NF_3	nitrogen trifluoride
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
N_2O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
SF_6	sulfur hexafluoride
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on CTF tables	“Common tabular format for UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This is a report on the centralized technical review of the BR4[1] of the EU. 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 EU, which provided comments that were considered and incorporated with revisions into this final version of the report.

3. The review was conducted together with the review of three other Annex I Parties from 9 to 13 March 2020 in Bonn remotely[2] by the following team of nominated experts from the UNFCCC roster of experts: Donnie Boodlal (Trinidad and Tobago), Olia Glade (New Zealand), Maria Jose Lopez (Belgium) and Karima Oustadi (Italy). Ms. Lopez was the lead reviewer. The review was coordinated by Karin Simonson and Davor Vesligaj (secretariat).

B. Summary

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

1. Timeliness

5. The BR4 was submitted on 20 December 2019, before the deadline of 1 January 2020 mandated by decision 2/CP.17. The CTF tables were also submitted on 20 December 2019. The CTF tables were resubmitted on 3 April 2020 to address issues raised during the review. The resubmission included changes to CTF tables 2(b), 2(e)I, 3, 6(a), 6(c) and 7(b) for 2018. Unless otherwise specified, the information and values from the latest submission are used in this report.

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

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

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

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendation(s)*
GHG emissions and removals	Complete	Transparent	–
Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	Complete	Transparent	–
Progress in achievement of targets	Complete	Mostly transparent	Issues 1 and 3 in table 4

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

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

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendation(s)*
Provision of support to developing country Parties	Complete	Mostly transparent	Issues 1–2 in table 12

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

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

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

1. Technical assessment of the reported information

7. Total GHG emissions[3] excluding emissions and removals from LULUCF decreased by 23.5 per cent between 1990 and 2017, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 24.8 per cent over the same period. Total emissions followed an overall downward trend, with some fluctuations in the beginning of the 1990s and in 2008–2009. Table 2 illustrates the emission trends by sector and by gas for the EU. Note that information in this paragraph and table 2 is based on the EU's CTF table 1 resubmitted on 3 April 2020. All emission data in subsequent chapters are based on the EU's BR4 CTF tables unless otherwise noted. The emissions reported in CTF table 1 are the same as reported in the 2019 annual submission, which was the latest available at the time of the review.

Table 2
Greenhouse gas emissions by sector and by gas for the European Union for 1990–2017

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2016*	*2017*	*1990–2017*	*2016–2017*	*1990*	*2017*
Sector									
1. Energy	4 348 665.27	4 020 633.33	3 798 121.33	3 354 721.96	3 367 824.37	–22.6	0.4	77.0	77.9
A1. Energy industries	1 675 653.11	1 511 185.11	1 450 938.98	1 197 913.86	1 179 303.96	–29.6	–1.6	29.7	27.3
A2. Manufacturing industries and construction	836 128.33	685 009.95	532 956.54	484 045.66	499 836.47	–40.2	3.3	14.8	11.6
A3. Transport	793 200.42	926 942.35	937 607.44	932 470.15	945 871.55	19.2	1.4	14.0	21.9
A4. and A5. Other	850 663.58	767 191.64	780 369.79	654 627.27	656 577.17	–22.8	0.3	15.1	15.2
B. Fugitive emissions from fuels	193 019.82	130 304.28	96 248.58	85 665.02	86 235.23	–55.3	0.7	3.4	2.0
C. CO_2 transport and storage	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NA	NA	NA	NA
2. IPPU	517 187.92	455 568.48	394 307.59	373 724.63	377 478.43	–27.0	1.0	9.2	8.7
3. Agriculture	543 254.95	461 255.34	423 381.31	434 836.62	438 994.20	–19.2	1.0	9.6	10.2
4. LULUCF	–244 976.24	–297 002.10	–314 939.86	–285 838.15	–258 074.40	5.3	–9.7	NA	NA
5. Waste	240 421.21	231 454.75	167 817.55	140 108.65	138 866.16	–42.2	–0.9	4.3	3.2
6. Other	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NA	NA	NA	NA

[3] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF and including indirect CO_2 emissions, unless otherwise specified.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2016*	*2017*	*1990–2017*	*2016–2017*	*1990*	*2017*
Indirect CO_2	4 218.43	2 872.56	2 179.75	1 716.03	1 705.29	–59.6	–0.6	NA	NA
Gas[a]									
CO_2	4 469 106.60	4 180 837.62	3 941 224.86	3 497 545.54	3 515 490.07	–21.3	0.5	79.1	81.3
CH_4	727 448.60	605 491.44	490 359.24	454 079.28	453 421.84	–37.7	–0.1	12.9	10.5
N_2O	380 965.67	302 512.90	237 134.69	232 931.50	237 732.53	–37.6	2.1	6.7	5.5
HFCs	29 140.94	54 925.49	103 844.77	107 067.32	104 900.12	260.0	–2.0	0.5	2.4
PFCs	25 707.04	11 766.58	3 736.66	3 958.21	3 178.87	–87.6	–19.7	0.5	0.1
SF_6	11 074.14	10 614.01	6 351.80	6 476.72	6 725.32	–39.3	3.8	0.2	0.2
NF_3	16.90	94.53	111.82	50.47	48.32	186.0	–4.3	0.0	0.0
Total GHG emissions excluding LULUCF	**5 649 529.34**	**5 168 911.90**	**4 783 627.79**	**4 303 391.87**	**4 323 163.15**	**–23.5**	**0.5**	**100.0**	**100.0**
Total GHG emissions including LULUCF	**5 404 553.10**	**4 871 909.80**	**4 468 687.93**	**4 017 553.71**	**4 065 088.75**	**–24.8**	**1.2**	**NA**	**NA**
Total GHG emissions excluding LULUCF, including indirect CO_2	**5 653 747.34**	**5 171 784.06**	**4 785 807.13**	**4 305 107.49**	**4 324 868.02**	**–23.5**	**0.5**	**100.0**	**100.0**
Total GHG emissions including LULUCF, including indirect CO_2	**5 408 771.54**	**4 874 782.37**	**4 470 867.68**	**4 019 269.75**	**4 066 794.04**	**–24.8**	**1.2**	**NA**	**NA**

Source: GHG emission data: CTF table 1 resubmitted on 3 April 2020.
[a] Emissions by gas without LULUCF.

8. The decrease in total emissions between 1990 and 2017 reflects the sum of the decreasing trends across EU member States, which were driven by a combination of economic and sector-specific factors. The key economic factors that affected emission trends during that period include the economic restructuring of many Central and Eastern European countries during the 1990s, an overall shift in the ratio of energy-intensive industries to services in the EU, and economic recession in 2008–2010. The most important sector-specific factors were the shift from coal to gas for electricity and heat production, the increased use of renewable energy sources, energy efficiency improvements, technological measures in industrial processes and improvements in waste management practices. The only major sector with increasing emissions between 1990 and 2017 is the transport sector.

9. Despite an 8 per cent increase in population and a 58 per cent increase in GDP between 1990 and 2017, GHG emissions decreased by almost 24 per cent, which illustrates a steady decoupling of economic and population growth from GHG emissions in the EU, owing mostly to reduced energy intensity as a result of technological improvements and the deployment of low-carbon technologies.[4]

10. In brief, the EU's inventory arrangements are set out in the EU monitoring mechanism regulation (regulation 525/2013). The regulation also sets out the mechanism for monitoring and reporting information at the national and EU level relevant to climate change, such as on low-carbon development strategies, PaMs, projections, and financial and technology support provided to developing countries. Substantive requirements for the EU inventory system are set out in EU regulation 666/2014, while the quality assurance/quality control provisions for the EU inventory system are outlined in a European Commission staff working document.[5]

[4] See https://ec.europa.eu/clima/sites/clima/files/strategies/progress/docs/dca_report_en.pdf.
[5] European Commission document SWD(2013) 308 final.

11. The EU regulation on the governance of the Energy Union and climate action (regulation 2018/1999), which entered into force in December 2018, will apply to reporting by member States from 2021 onward, including on GHG inventories. This regulation fully integrates the provisions of the existing monitoring mechanism regulation while aligning them with the provisions of the Paris Agreement.

12. The main institutions involved in the compilation of the EU GHG inventory are the competent authorities in EU member States, the European Commission's Directorate-General for Climate Action, the European Environment Agency and its European Topic Centre on Air Pollution and Climate Change Mitigation, Eurostat and the European Commission's Joint Research Centre.

13. The EU GHG inventory comprises the sum of the estimates of emissions from the national inventories compiled by all EU member States. The inventory process has stipulated timelines for all member States to fulfil their responsibilities at the beginning of every calendar year before the final inventory report of the EU is submitted to the UNFCCC.

2. Assessment of adherence to the reporting guidelines

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

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

1. Technical assessment of the reported information

15. For the EU the Convention entered into force on 21 March 1994. Under the Convention the EU 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.

16. The target for the EU and its member States is formalized in the EU 2020 climate and energy package,[6] which was adopted in 2009. The legislative package regulates emissions of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 using GWP values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Operators and airline operators can use such units to fulfil their requirements under the EU ETS, and member States can use such units for their national ESD targets, within specific limitations.

17. The EU 2020 climate and energy package includes the EU ETS and the ESD (see paras. 33–37 below). The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap has been put in place for 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from ESD sectors, such as buildings, transport excluding aviation, agriculture and waste, 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.

18. The ESD target has been broken down to targets at member State level, which range from 20 per cent below to 20 per cent above the 2005 level by 2020. The target levels have been set on the basis of the relative GDP per capita of the member States. In addition, different levels of development in the EU are taken into account through several flexibility provisions. The ESD targets were translated into AEAs by European Commission decision 2013/162/EU, and further adjusted by decisions 2013/634/EU and 2017/1471/EU. The total AEAs of the EU change following a linear path from 2,790,634 kt CO_2 eq in 2013 to

[6] See https://ec.europa.eu/clima/policies/strategies/2020_en.

2,618,168 kt CO_2 eq in 2020.[7] Up to a certain limitation, the ESD allows each member State to use the flexibility provisions for meeting its annual targets by carrying over overachievements to subsequent years and carrying forward an emission allocation from the following year, as well as transferring AEAs between member States, and using international credits (i.e. credits from joint implementation and the clean development mechanism). Since 2013, no member State has used any international credits for complying with their obligations under the ESD.

19. A further target has been pledged as part of the EU's NDC under the Paris Agreement to reduce emissions by at least 40 per cent below the 1990 level by 2030. The 2030 target is set by the EU 2030 climate and energy framework and is predicated on the revised EU ETS directive (directive 2018/410), the ESR (regulation 2018/842) and the EU LULUCF regulation (regulation 2018/841). For the 2030 target, the LULUCF sector is included for the first time, with the LULUCF regulation stipulating that each member State must ensure that the LULUCF sector does not produce net debits once specific accounting rules are applied.

20. The EU committed in 2019 to become climate neutral by 2050, and submitted in 2020 a long-term strategy that encompasses all sectors of the economy. The European Commissions's European Green Deal, launched in 2019, calls for increased ambition in the 2030 emission reduction target to at least 50 per cent and towards 55 per cent compared with the 1990 level in a responsible way.

2. Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the BR4 of the EU and recognized that the reporting is complete, transparent and thus adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review. However, the ERT considers that the transparency of the reporting regarding the contribution of market-based mechanisms could be improved, either by providing further detail in the custom footnote to CTF table 2(e)I, stating that the possible scale of contributions from market-based mechanisms could not be estimated at the time of reporting, or by reporting "NE" in CTF table 2(e)I.

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

22. The EU provided comprehensive and well-organized information on its package of PaMs implemented and adopted at the EU level, by sector and at the cross-sectoral level, in order to fulfil its commitments under the Convention. The EU reported on its policy context and the legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs at member State level. The ERT noted that national PaMs developed and implemented at member State level are outside the scope of the EU's BR4.

23. The EU provided information on a broader set of PaMs compared with those previously reported. A number of the key PaMs reported in the BR3 had recently been amended or revised in order to contribute towards the EU's NDC for 2021–2030, most notably PaMs targeting the EU ETS and ESD sectors, renewable energy, energy efficiency, energy performance of buildings, CO_2 emissions from vehicles and waste management. This indicates that the EU is shifting the focus of its PaMs beyond 2020 towards 2030 targets by expanding the scope of and strengthening its overall climate and energy policy framework.

24. In the BR4 the EU reported for the first time on a number of PaMs that had already been implemented at the time of preparation of previous BRs. The EU explained that it had

[7] According to the EU transaction log, available at http://ec.europa.eu/environment/ets/esdAllocations.do?languageCode=en.

taken a broader interpretation in identifying PaMs for inclusion in the BR4 in order to improve the completeness and transparency of its reporting. This led to the inclusion of PaMs that do not have GHG emission reduction as their primary objective (e.g. the EU directive on the limitation of emissions of certain pollutants into the air from medium combustion plants, ecodesign requirements, labelling of energy-related products, vehicle emissions and maintenance standards, the EU cross-compliance regulation and the EU direct payments regulation) but that nevertheless contribute towards the EU's quantified economy-wide emission reduction target and objectives.

25. The EU indicated that there have been no changes since its previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target.

26. In its reporting on its PaMs, the EU provided the estimated emission reduction impacts for some of its PaMs (for 24 out of 98 PaMs) for some years. Some earlier estimates refer to the former grouping of 15 EU member States, while more recent estimates are for the grouping of 27 or 28, as applicable, EU member States. The mitigation effects of proposed PaMs are assessed by the EU using ex ante methodologies as part of the impact assessment process. Impact assessments are required for European Commission initiatives that are likely to have significant economic, environmental or social impacts.

27. The principles that the European Commission follows when preparing new initiatives and proposals and when managing and evaluating existing legislation are described in the European Commission's better regulation guidelines.[8] The specific methodologies that are used in a policy impact assessment are tailored to the policy in question and the relevant impacts to be assessed. In addition, the European Commission considers the cumulative impact of EU policies on GHG emissions when preparing new policy and legislative proposals.

28. The ERT noted differences between the estimated impacts of mitigation actions related to the ecodesign regulations reported in CTF table 3 of the BR4 and those reported in the BR3. During the review, the EU explained that the impact estimates for the various ecodesign regulations had been updated following consultations with stakeholders (ex post assessments) since the BR3.

29. Where estimated impacts were not provided, the EU explained that the impacts were dependent on national action taken at member State level. The effects of these PaMs are reported in the BRs of individual member States. The ERT noted that, according to a 2019 report on PaMs in Europe published by the European Environment Agency, quantitative evidence on the effectiveness and costs of these PaMs remains insufficiently reported by member States, and methodologies for estimating the impacts of PaMs are not harmonized among member States.[9] The inconsistency of information on PaMs provided by member States under the regulation prevents its use for reporting information aggregated at the EU level and for quantitatively assessing the impacts of PaMs and the progress of the EU, as a Party to the UNFCCC, towards its targets.

30. The EU reported on its self-assessment of compliance with its emission reduction target and national rules for taking action against non-compliance. Under the ESD, EU member States report annually on their GHG emissions for 2013–2020. The European Commission reviews the emissions annually and checks that member States are complying with their annual AEAs. If a member State's emissions exceed its AEA for a given year, it will have to achieve the missing emission reductions in the next year, multiplied by a factor of 1.08, and submit a corrective action plan to the Commission detailing how it intends to get back on track towards meeting its 2020 target; and it will temporarily lose the right to transfer any AEAs to other member States.

[8] See https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en.

[9] See https://www.eionet.europa.eu/etcs/etc-cme/products/etc-cme-reports/etc-cme-report-5-2019-overview-of-reported-national-policies-and-measures-on-climate-change-mitigation-in-europe-in-2019.

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

32. The 2021–2030 EU-wide policies are operationalized through EU member States' national energy and climate plans, which should set out national objectives for each of the five dimensions of the Energy Union, namely energy security; the internal energy market; energy efficiency; decarbonization; and research, innovation and competitiveness. The integrated national energy and climate plans covering 2021–2030 should pay particular attention to the 2030 targets for GHG emission reductions, renewable energy, energy efficiency and electricity grid interconnection. The national energy and climate plans will be periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal.

33. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. In the third phase of the EU ETS, covering 2013–2020, its scope in terms of sectors and activities was enhanced to include aircraft operations (since 2012 and currently covering only flights within the European Economic Area), as well as N_2O emissions from chemical industry, PFC emissions from aluminium production and CO_2 emissions from some industrial processes that were not covered in the previous phases of the EU ETS (since 2013). Auctioning is the default method for allocating allowances; however, harmonized rules for free allocations, based on benchmark values achieved by the most efficient 10 per cent of installations, are still in place as a safeguard for the international competitiveness of industrial sectors at risk of carbon leakage. For 2030, an emission reduction target of 43 per cent below the 2005 level has been set for the EU ETS.

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

35. At the local level, the European Covenant of Mayors for Climate and Energy brings together more than 9,000 cities and towns in all EU member States (representing more than 200 million inhabitants) taking voluntary action on mitigation of and adaptation to climate change, as well as on energy poverty, with emission reductions already achieved of around 23 per cent below the 2005 level, and with a target of a 27 per cent emission reduction by 2020. In addition, over 1,000 cities have committed to reducing CO_2 emissions by at least 40 per cent below a base-year level by 2030.

36. The EU is committed to spending at least 20 per cent of its budget for 2014–2020 on climate-related action, amounting to approximately EUR 180 billion. In practice, this means integrating climate considerations into all main spending areas of the EU budget, such as the development of regions, the EU Common Agricultural Policy, and research and development. Specific finance instruments include the Horizon 2020 funding for research and innovation, the European Structural and Investment Funds, the European Fund for Strategic Investments, the InvestEU Fund, and the LIFE programme, which is the EU's

funding instrument for the environment and climate action. In addition, under the EU ETS, the EU established one of the largest funding programmes, NER 300, for the deployment of innovative renewables and carbon dioxide capture and storage through the sale of 300 million emission allowances from the New Entrants Reserve, with overall funding of around EUR 2.1 billion.

37. The EU provided information on new or revised PaMs related to the 2030 climate and energy framework, which builds on the EU 2020 climate and energy package and is in line with the EU's road map for moving to a competitive low-carbon economy by 2050, its Energy Roadmap 2050 and the EU white paper on transport. The framework sets three targets to be achieved by 2030: a GHG emission reduction of at least 40 per cent below the 1990 level, which is fully in accordance with the EU's NDC under the Paris Agreement; a share of at least 32 per cent of EU final energy consumption to be from renewable energy sources; and an improvement in energy efficiency of at least 32.5 per cent.

38. Critical for the achievement of the 2030 targets are the revision of the EU ETS in its fourth phase, the ESR and the EU regulation on the governance of the Energy Union and climate action. Since the BR3, the revised EU ETS directive establishing the framework of the EU ETS for 2021–2030 (directive 2018/410) entered into force on 8 April 2018. The preparation of implementing legislation based on the revised EU ETS directive is ongoing with the aim of ensuring that all necessary implementing provisions are adopted by January 2021. The main goals of the regulation on the governance of the Energy Union and climate action are to implement strategies and measures that ensure that the 2030 energy and climate targets and the long-term EU GHG emission commitments are consistent with the Paris Agreement; and to streamline existing energy and climate planning, reporting and monitoring requirements for EU member States.

39. The ESR was also adopted in 2018. It sets national emission reduction targets for 2030 (and trajectories with annual limits for 2021–2030) for all EU member States, ranging from 0 to 40 per cent below the 2005 level. The ESR retains many of the flexibilities of the ESD and the need for annual compliance in 2021–2030, in line with the current arrangements under the ESD. There is a new option for some member States to use a limited amount of allowances from the EU ETS. There are also some flexibilities in the new EU LULUCF regulation, which defines for the first time an EU target for the LULUCF sector and includes the 'no debit' rule. In total, member States can use up to 280 Mt worth of LULUCF credits for effort-sharing compliance and can use AEAs to cover LULUCF debits.

40. Table 3 provides a summary of the reported information on the main PaMs of the EU for achieving its 2020 emission reduction target.

Table 3
Summary of information on policies and measures reported by the European Union

Sector	*Key PaMs*	*Estimate of mitigation impact in 2020 (kt CO_2 eq)*	*Estimate of mitigation impact in 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	2020 climate and energy package (2009)	NE	NE
	EU ETS (2005)	NE	NE
	ESD (2013)	NE	NE
	2030 climate and energy framework (2018)	NE	NE
Energy	Energy Union strategy (2015)	NE	NE
Energy supply and renewable energy	Taxation on energy products and electricity (2003)	NE	NE
	Renewable energy directive (2009) and revised renewable energy directive (2018)	750 000	NE
Energy efficiency	Energy efficiency directive (2012)	NE	NE
	Energy performance of buildings directive (2010)	185 000	NE
	Energy labelling regulation (2017)	NE	NE
Transport	Regulation on CO_2 emissions from cars (2009)	NE	NE
	Fuel quality directive (2009)	48 000	NE

Sector	*Key PaMs*	*Estimate of mitigation impact in 2020 (kt CO_2 eq)*	*Estimate of mitigation impact in 2030 (kt CO_2 eq)*
	Regulation on CO_2 emissions from vans (2011)	NE	NE
IPPU	F-gas regulation (2014)	NE	NE
	Mobile air-conditioning systems directive (2006)	13 000	NE
	Industrial emissions directive (2011)	NE	NE
Agriculture	EU common agricultural policy climate objectives (2018)	NE	NE
	Regulation on support for rural development by the European Agricultural Fund for Rural Development (2013)	NE	NE
	European Structural and Investment Funds regulations (2013)	NE	NE
	Nitrates directive (1991)	NE	NE
	Soil thematic strategy (2006)	NE	NE
LULUCF	LULUCF regulation (2018)	NE	NE
Waste	Circular Economy Action Plan (2015)	NE	NE
	Landfill directive (1999) and revised landfill directive (2018)	44 000	NE
	Waste framework directive (2008) and revised waste framework directive (2018)	NE	NE
	EU policies targeting waste streams (1994)	NE	NE
	Urban wastewater treatment directive (1991)	NE	NE

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

(b) Policies and measures in the energy sector

41. **Energy efficiency.** A strategic target of the EU, as part of the 2020 climate and energy package, is a 20 per cent improvement in energy efficiency by 2020, which translates into indicative national efficiency targets for each member State (depending on country preferences these targets are based on primary or final energy consumption, primary or final energy savings, or energy intensity). The target is reinforced by cross-sectoral and sector-specific PaMs. The EU has implemented a set of key PaMs such as the EU directive on energy efficiency (directive 2012/27/EU) (2012), the EU directive on the energy performance of buildings (directive 2010/31/EU) (2010) and the EU regulation setting a framework for energy labelling and repealing directive 2010/30/EU (regulation 2017/1369) (2017). Illustrative PaMs include the dozens of ecodesign requirements already in place in the EU for household and office electrical goods and other products.

42. The most recent EU progress report on energy efficiency (published in 2019) states that energy consumption increased between 2014 and 2017 owing mainly to colder winters, increased economic activity and lower fuel prices in that period, and that both primary and final energy consumption have moved slightly above the fixed linear trajectory for the 2020 target. If the observed increasing trend in energy consumption continues, the achievement of the 2020 target for both primary and final energy consumption could be at risk. Therefore, there is a need to further intensify efforts to deliver energy savings in the short term.[10]

43. In October 2019, the European Commission adopted an additional 10 implementing regulations on ecodesign for appliances such as refrigerators, washing machines, dishwashers and televisions. Six of the product groups that are subject to new and revised ecodesign requirements are also covered by new energy labelling rules.

44. The amended EU directive on energy efficiency[11] with a view to 2030 entered into force in December 2018 and includes a new headline EU target of at least 32.5 per cent energy

[10] See https://ec.europa.eu/commission/sites/beta-political/files/report-2018-assessment-progress-energy-efficiency-targets-april2019_en.pdf.

[11] Directive 2012/27/EU on energy efficiency as amended by directive 2018/2002/EU.

efficiency in primary and/or final energy consumption, with a clause for an upward revision by 2023 in case of significant cost reductions due to economic or technological developments or due to the need to meet EU international commitments on decarbonization.

45. **Energy supply and renewables.** The most important policy in the energy supply sector is the EU ETS, which covers large point emissions sources such as thermal power plants and oil refineries. The security of energy supply and the decarbonization of the economy are mutually reinforcing dimensions of the Energy Union strategy, with an emphasis on the completion of the internal energy market and the diversification of energy sources, suppliers and routes. The EU energy taxation directive aims to be consistent in the treatment of electricity and energy products by providing common taxation rules and a common minimum level of taxation in the EU.

46. The EU has set a legally binding target of a share of at least 20 per cent of energy from renewable sources in the EU's gross final energy consumption in 2020. The target has been translated into legally binding national renewable energy targets for member States. The targets are implemented through cross-sectoral and sector-specific PaMs, including the EU climate and energy package and the EU renewable energy directive, which also includes sustainability criteria for biofuels. National renewable energy action plans have been prepared by the EU member States and contain measures and sectoral targets for reaching their legally binding national renewable energy targets. Every two years, the EU publishes a renewable energy progress report. The 2019 report[12] shows that the EU as a whole achieved a 17.5 per cent share of renewable energy in gross final energy consumption in 2017.

47. The European Commission's Clean Energy for All Europeans package was published in November 2016. One of its proposed instruments is the EU regulation on the governance of the Energy Union and climate action, which entered into force on 24 December 2018. It aims to implement strategies and measures to ensure that the objectives of the Energy Union, including in particular the EU's targets under the 2030 energy and climate framework and the EU's long-term GHG emission reduction commitments, are consistent with the Paris Agreement. It also aims to ensure consistent planning, reporting and monitoring by the EU and its member States under the Convention and the Paris Agreement, replacing the existing climate monitoring and reporting system from 2021 onward. As part of this process, member States are required to prepare and adopt integrated national energy and climate plans covering 10-year periods, starting with 2021–2030, as well as EU and national long-term strategies, and integrated implementation reports.

48. The EU 2030 energy and climate framework aims to further increase the share of renewable energy in final energy consumption to at least 27 per cent by 2030. In this regard, the EU directive on the promotion of the use of energy from renewable sources (directive 2009/28/EC) has been revised and amended by EU directive 2018/2001, which entered into force on 11 December 2018 and includes a new binding EU target of at least 32 per cent renewable energy in final energy consumption by 2030.

49. **Residential and commercial sectors.** The heating and cooling of buildings accounts for a significant portion of energy consumption in the EU and offers great potential for improving energy efficiency. Measures to reduce the space heating and cooling demand in buildings represent a significant part of this potential. Many of the measures (e.g. improved insulation) are highly cost-effective, but a number of barriers to their implementation exist, for example high cost of initial investment. The PaMs in the residential and commercial sectors aim to enhance the energy efficiency of the building stock. This is to be accomplished by implementing general and sector-specific energy performance policies such as the ESD and by introducing energy-efficient solutions for existing building stock and new house construction through the sector-specific EU directive on energy performance of buildings.

50. In its BR4 the EU emphasized the importance of ensuring full implementation of the existing legislation, as there have been delays in transposing and implementing both the EU directive on energy efficiency and the EU directive on the energy performance of buildings. This includes full achievement of the energy savings obligation under article 7 of the EU

[12] See https://ec.europa.eu/commission/sites/beta-political/files/report-progress-renewable-energy-april2019_en.pdf.

directive on energy efficiency and meeting the requirement to carry out regular inspections of heating and cooling systems under articles 14–15 of the EU directive on the energy performance of buildings.

51. In July 2018, directive 2018/844/EU on the energy performance of buildings, amending directive 2010/31/EU and directive 2012/27/EU, entered into force. The main goals of the amendments are to accelerate the renovation of the existing building stock towards its decarbonization by 2050 through strengthened long-term renovation strategies; support the modernization of all buildings with smart technologies; define requirements for the deployment of electromobility infrastructure in buildings' parking spaces; and include new provisions to enhance smart technologies and technical building systems.

52. According to the impact assessment accompanying the proposal to revise the EU directive on the energy performance of buildings, the provisions could lead to a 38 Mt CO_2 reduction in GHG emissions. The EU directive on the energy performance of buildings stipulates that all new buildings must be nearly zero-energy from 2021, meaning that they must be very highly energy-efficient, while the nearly zero or very low amount of energy they require should be covered to a very significant extent by energy from renewable sources.

53. **Transport sector.** This sector is the only major sector in the EU with increasing emissions (19.2 per cent increase in 1990–2017). The choice of PaMs for the transport sector is driven by the need to address the notable increase in transport activities and related GHG emissions. The sectoral PaMs represent a mix of regulations and standards for efficiency improvement and emission reduction, as well as infrastructure improvement and incentives for modal shift. The ESD is an overarching cross-sectoral policy that includes the mitigation of emissions from transport (except aviation and international maritime transport; GHG emissions from domestic aviation are included under the EU ETS).

54. The key implemented PaMs aimed at improving vehicle efficiency across the EU are the EU regulation setting emission performance standards for new passenger cars (regulation 443/2009), the EU regulation setting emission performance standards for new light commercial vehicles (regulation 510/2011), the EU regulations on car and tyre labelling (regulations 1999/94/EC and 1222/2009, respectively) and other legislation related to fuel efficiency (e.g. the EU regulation on tyre-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units (regulation 661/2009)).

55. In addition to the ESD, binding targets have been set for emissions from new passenger cars: 130 g CO_2/km by 2015, decreasing to 95 g CO_2/km by 2020. The average emission level of new cars sold within the EU in 2016 was 118.1 g CO_2/km. Similarly, the EU is planning to reduce CO_2 emissions from new vans from 175 g CO_2/km in 2017 to 147 g CO_2/km in 2020. Other PaMs include a 10 per cent target for renewable energy use in transport by 2020, applicable to all EU member States, with contributions from biofuels (with a cap on food-based biofuels), renewable fuels of non-biological origin and electricity. In addition, the EU directive on fuel quality (directive 2009/30/EC) introduced a binding target for fuel suppliers to reduce life-cycle GHG emissions per unit of energy by up to 6 per cent below the 2010 level by 2020.

56. The European Commission has adopted three 'mobility packages', which incorporate legislative initiatives to reduce CO_2 emissions from the transport and mobility sectors, and undertook an impact assessment of the revised directive on clean vehicles, which was finally adopted in 2019.[13] The mobility packages include new CO_2 emission standards to help manufacturers to embrace innovation and supply low-emission vehicles to the market, including targets for 2025 and 2030 to push the transition from conventional combustion-engine vehicles; the EU clean vehicles directive to promote clean mobility solutions in public procurement tenders; an action plan and investment solutions for the trans-European deployment of alternative fuels infrastructure; the revision of the EU combined transport directive, which promotes the combined use of different modes for freight transport (e.g. lorries and trains); the EU regulation on passenger bus and coach services to stimulate the

[13] Directive 2019/1161/EU amending directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles.

development of bus connections over long distances across Europe; and the battery initiative to promote electric vehicles and other mobility solutions with the aim of producing them in the EU.

57. In terms of fuel efficiency and technical standards for the period after 2020, stricter CO_2 emission standards will apply for new passenger cars and vans in accordance with the revised EU regulation on CO_2 emission performance standards for new passenger cars and vans (regulation 631/2019). Targets for 2025 onward are defined as percentage reductions from the 2021 level (15 per cent emission reduction by 2025 for cars and vans, and 37.5 and 31 per cent reductions by 2030 for cars and vans, respectively). The regulation also includes a mechanism for incentivizing the uptake of zero- and low-emission vehicles in a technology-neutral way.

58. CO_2 emission performance standards for new heavy-duty vehicles have been set for the first time in the EU through EU regulation 2019/1242, adopted on 13 June 2019. The regulation sets targets for fleet-wide average CO_2 emission reductions from new heavy-duty vehicles for 2025 and 2030 of 15 and 30 per cent, respectively, below the EU average in the reference period (July 2019–June 2020). The regulation includes financial penalties in case of non-compliance with the CO_2 emission targets.

59. The EU's level of ambition for transport over the long term is to reduce GHG emissions from the sector to meet the 2030 targets for the ESR sectors and then to further reduce those emissions to at least 60 per cent below the 1990 level by 2050. This is included in the low-emission mobility strategy adopted by the European Commission in July 2016 that provides for an integrated and comprehensive approach to addressing mobility and emissions by increasing efficiency and promoting low-emission alternative energy for transport and zero-emission vehicles.

(c) Policies and measures in other sectors

60. **Industrial processes and product use.** PaMs in the industrial processes sector are underpinned by the cross-sectoral EU ETS, which covers a large part of industrial process emissions, specifically those from the mineral, chemical and metal industries. Additional efforts have been undertaken to reduce air pollution with GHG mitigation as a co-benefit. The EU directive on industrial emissions (directive 2010/75/EU), which includes wider coverage of industrial emissions sources outside the scope of the EU ETS, regulates direct and indirect GHG emissions through the implementation of best available techniques. A key development in this area is the adoption of secondary legislation under the EU industrial emissions directive, to identify and draw conclusions on the best available techniques for different sectors. The most pertinent conclusions on best available techniques are those for large combustion plants (i.e. combustion plants with a total rated thermal input equal to or greater than 50 MW, including electricity and heat production) adopted in August 2017. Around half of the existing large combustion plants assessed to prepare a reference document on the best available techniques for large combustion plants would need to make investments to comply with these conclusions. Conclusions on best available techniques have since been adopted on the production of large volume organic chemicals (November 2017) and on waste treatment (August 2018), with further implementing decisions due to be adopted on the food and milk industries and waste incineration. These conclusions do not set GHG emission limits but are nonetheless likely to have an impact on emission levels through energy efficiency requirements and co-benefits.

61. To control F-gas emissions, including HFCs, the EU adopted two legislative acts: the EU directive on air-conditioning systems used in small motor vehicles (directive 2006/40/EC) and the EU F-gas regulation (regulation 517/2014), which covers all other key applications in which F-gases are used. The EU directive on air-conditioning systems used in small motor vehicles imposes a ban on F-gases with a high GWP for passenger cars and light-duty vehicles. The EU F-gas regulation aims to reduce HFC sales by 79 per cent by 2030 through a quota system and to phase out F-gases with a high GWP. The effectiveness of the legislation is demonstrated by a decline in emissions of F-gases since 2015 and a strong price signal that further disincentivizes consumption. Following 13 years of increasing emissions of F-gases, emissions declined in 2015, 2016 and 2017 compared with the previous-year level. As a result of the phase-down set out in the EU F-gas regulation, no

more than 63 per cent of the 2009–2012 baseline level of HFCs (in t CO_2 eq) was placed on the market in 2018. The EU has ratified the Kigali Amendment to the Montreal Protocol on a global phase-down of HFCs, which entered into force on 1 January 2019, and is on track to meeting the HFC emission limits set by the Kigali Amendment. The EU's policies are estimated to lead to cumulative emission savings of 1.5 Gt CO_2 eq by 2030 and 5 Gt CO_2 eq by 2050.

62. **Agriculture.** GHG emissions from agricultural activities in the EU are covered by the ESD. Although the EU Common Agricultural Policy is one of the main policy drivers of EU agricultural development, it establishes no agriculture-specific emission reduction targets; rather, it integrates climate objectives within broader provisions and provides funding to support practices that are broadly beneficial for the climate. As a result of the reform of the Common Agricultural Policy in 2013, GHG mitigation has since been added as a priority area, and the Common Agricultural Policy is now increasingly geared towards the joint objectives of sustainable management of natural resources and climate action. Policy instruments aimed at achieving these objectives include cross-compliance standards, green direct payments and rural development funding.

63. In June 2018 the EU agreed to further integrate climate change action into the Common Agricultural Policy by including the production of renewable energy and the improvement of energy efficiency among its nine post-2020 policy objectives. As part of these revisions, all direct payments under the Common Agricultural Policy will be made conditional on efforts to achieve environmental and climate objectives. As a result, up to 40 per cent of the Common Agricultural Policy funding (and at least 30 per cent of rural development funding) may be used in support of climate objectives.

64. A 2019 evaluation of the Common Agricultural Policy[14] indicated that annual emission reductions of 26.2 Mt CO_2 eq (using 2016 data) were helping the EU to reduce its overall emissions, but did not offer the complete picture of the policy's impacts, which includes other positive and negative (albeit unquantifiable) impacts.

65. Land use and agriculture are regarded as playing a key role in reaching climate neutrality by 2050 by removing carbon from the atmosphere, preserving carbon stocks and supplying feedstock as a substitute for fossil fuels. In addition, strong support for the bioeconomy and increasing natural carbon sinks will help the EU on its path to achieving climate neutrality by 2050 in an economically sustainable manner.

66. **LULUCF.** The EU LULUCF regulation, which was adopted in May 2018 and covers 2021–2030, is included as part of the 2030 climate and energy framework, alongside the ESR. The new regulation recognizes the critical role of the land sector in reaching long-term emission reduction objectives and sets a binding commitment to ensure that any emissions from the LULUCF sector are entirely compensated by equivalent CO_2 removals, a provision known as the 'no debit' rule. In exchange for ensuring that the sector contributes to the achievement of the 2030 target, EU member States are granted flexibility to use up to 280 Mt worth of LULUCF credits towards their national targets in 2030 (i.e. to offset a portion of emissions occurring in other sectors). Conversely, where the LULUCF sector produces net emissions, member States can use allocations from the ESR to comply with the 'no debit' rule. Thus, the regulation aims to provide EU member States with a framework to incentivize more climate-friendly land use, without being prescriptive as to its implementation. It is expected that the implementation of this regulation will facilitate the further adoption of climate-smart agriculture and enhance the visibility of the climate benefits of long-term carbon storage in wood and wood products. As the regulation will come into effect in 2021 and LULUCF is excluded from the EU 2020 target, the impacts are not yet being measured.

67. The EU supports REDD+ initiatives in developing countries. As part of this ongoing commitment, in July 2019 the European Commission adopted an EU communication on stepping up EU action to protect and restore the world's forests. The aim is to protect the health of forests through partnerships with producer and consumer countries, as well as business, the research community and civil society. A multi-stakeholder platform on

[14] See https://ec.europa.eu/agriculture/sites/agriculture/files/evaluation/market-and-income-reports/2019/cap-and-climate-evaluation-report_en.pdf.

deforestation and forest degradation and an EU observatory on deforestation and forest degradation were established, building on existing experience with forest law enforcement, governance and trade. The actions set out in the communication are based on five priorities addressing both the supply- and demand-side drivers of deforestation.

68. **Waste management.** In May 2018 the EU adopted a revised waste package, which consists of five waste directives, including the EU waste framework directive (directive 2018/851), the EU directive on the landfill of waste (directive 2018/850) and the EU directive on packaging and packaging waste (directive 2018/852). The revised waste package outlines quantitative targets for recycling municipal waste (i.e. 55 per cent in 2025, 60 per cent in 2030 and 65 per cent in 2035), together with a 10 per cent limit on the share of municipal waste sent to landfill by 2035. If implemented, these measures could result in avoided GHG emissions of between 13 and 62 Mt in 2030.

69. In 2015, as part of its broader efforts to address waste, the EU adopted its Circular Economy Action Plan,[15] the aim of which is to increase overall energy and material efficiency by targeting waste across the entire value chain, from design to disposal. In 2018 the EU added a Strategy for Plastics with the objective of ensuring that all plastic packaging on the EU market is either reusable or recyclable by 2030. In June 2019 the EU agreed on a directive on reducing the environmental impact of plastic, which sets out measures to address consumer behaviours and reduce the use of single-use plastic. Measures to limit the use of single-use plastic are estimated to reduce GHG emissions by 1.28–3.97 Mt CO_2 eq.

70. The EU amended its regulation on the landfilling of waste in May 2018 through the adoption of EU directive 2018/850. The key components of the new directive include limitations on landfilling of waste and an aspirational target for all recyclable or recoverable waste to be diverted from landfill by 2030. Additionally, by 2035, the EU is aiming to reduce the amount of landfilled municipal waste to 10 per cent or less of the total amount of municipal waste generated (by weight). Moreover, the revised waste framework will require separation of biodegradable waste from 2025 onward, which will further reduce landfilled waste.

(d) Response measures

71. The EU reported on the methodology used to assess the economic and social consequences of its response measures. Well-established guidelines on impact assessments referenced by the EU in the BR4 outline the key requirements of impact assessments and provide salient information such as what an impact assessment is, when it is required, the procedural steps to follow and how the assessment can be used for policymaking. The ERT noted that, although the European Commission's impact assessment covers the social, economic and environmental impacts of PaMs, the EU did not present actual results of the assessment of the economic and social consequences of its response measures in the BR4.

(e) Assessment of adherence to the reporting guidelines

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

Table 4
Findings on mitigation actions and their effects from the review of the fourth biennial report of the European Union

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in CTF table 3 Issue type: transparency	The EU reported impacts for most of its mitigation actions as "NE" in CTF table 3, including the most significant PaMs such as the EU ETS and the ESD, and did not provide adequate explanations in the textual part of the BR4 or in the footnotes to CTF table 3, as recommended by the previous ERT.

[15] See https://ec.europa.eu/environment/circular-economy/.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: recommendation	During the review, the EU explained that the impacts of individual mitigation actions are quantified as part of the impact assessment process, and the estimates, where available, are reported in CTF table 3. For some mitigation actions, the impact is dependent on national action taken at member State level. The effects of these mitigation actions are reported in the submissions of individual Parties. In addition, the European Commission considers the cumulative impact of the EU mitigation actions on GHG emissions when preparing new policy and legislative proposals. The ERT recommends that the EU include in its next BR further estimates of the impacts of its mitigation actions in CTF table 3 or provide a more comprehensive explanation in the textual part of the BR for its reporting of "NE", explaining why these estimations may not be possible due to specific circumstances, in accordance with information provided during the review.
2	Reporting requirement specified in paragraph 8 Issue type: completeness Assessment: encouragement	The EU did not report on the assessment of the economic and social consequences of its response measures in the BR4 but provided a reference to the BR3. The ERT noted that the BR3 does not provide information on the assessment of the economic and social consequences of the response measures but refers to section 4.10 of the BR1 and chapter 15 of the 2017 national inventory report of the EU. During the review the EU provided the weblink to the impact assessment guidelines that are used for assessing the social, economic and environmental impacts of its mitigation actions. The ERT noted that, although this document is quite comprehensive in providing guidelines for conducting the impact assessment, the EU did not provide in the BR4 actual results of the assessment of the impacts of any response measures. The ERT encourages the Party to provide, to the extent possible, more specific information on the assessment of the economic and social consequences of its response measures. This could be done at least for those mitigation actions with the highest potential to generate important economic and social consequences.
3	Reporting requirement specified in paragraph 6 Issue type: transparency Assessment: recommendation	According to the BR4 and CTF table 3, some legislative instruments have been reinforced and the legislation implementing the 2020 climate and energy package has been subject to a number of revisions in order to implement the 2030 climate and energy policy framework. For instance, the EU regulation on CO_2 emission performance standards for new heavy-duty vehicles (regulation 2019/1242) has replaced the Strategy for Reducing Heavy-Duty Vehicles' Fuel Consumption and CO_2 Emissions; and the Bioeconomy Strategy (2012) has replaced the Biomass Action Plan (2005). However, no estimates of impacts were reported for the Strategy on Heavy-Duty Vehicles or the Biomass Action Plan. In addition, older mitigation actions are reported together with their amendments; for example, the EU directive on the promotion of the use of energy from renewable sources (directive 2009/28/EC), as amended by directive 2018/2001, which entered into force in 2018. The ERT noted that including revised mitigation actions in place of or together with the older ones has led to a lack of transparency because the information provided in the columns of CTF table 3 mixes information on mitigation actions with different implementing periods and targets. The ERT also noted that, although the EU reported the recent 2030 climate and energy framework but not the previous 2020 climate and energy package, the relevant PaMs for both the 2020 climate and energy package and the 2030 climate and energy framework were included in CTF table 3. During the review the EU confirmed that transparency could be further enhanced by distinguishing mitigation actions corresponding to updates and/or strengthening of policy instruments aiming to achieve 2030 targets from mitigation actions that correspond to the implementation of the 2020 climate and energy package. The ERT recommends that, in its next BR, the EU distinguish between those mitigation actions that correspond to the 2020 climate and energy package or are aimed primarily at achieving the 2020 target and those recently revised mitigation actions that correspond to the 2030 climate and energy framework, which are aimed at implementing the EU's NDC in 2020–2030, and provide any necessary explanation.

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

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

(a) Technical assessment of the reported information

73. For 2016, the EU reported in CTF table 4 annual total GHG emissions excluding LULUCF and NF_3, and including international aviation and indirect CO_2, of 4,451,349.57 kt CO_2 eq, which is 22.2 per cent below the 1990 level.

74. For 2017, the EU reported in CTF table 4 annual total GHG emissions excluding LULUCF and NF_3, and including international aviation and indirect CO_2, of 4,481,383.13 kt CO_2 eq, which is 21.6 per cent below the 1990 level.

75. Given that the contribution of LULUCF activities is not included in the EU's target under the Convention, LULUCF values were reported as "NA" in CTF table 4. The EU reported that it intends to allow the use of units from market-based mechanisms under the Convention, subject to quantitative and qualitative limits applied separately to the EU ETS and ESD sectors. It reported in CTF table 4 that it used units from market-based mechanisms in 2016 and 2017 towards achieving its 2020 target in the amount of 12,234 and 11,829 kt CO_2 eq, respectively. Table 5 illustrates the EU's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 5
Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry by the European Union to achieve its target

Year	*Emissions excluding LULUCF (kt CO_2 eq)*[a]	*Contribution of LULUCF (kt CO_2 eq)*	*Use of units from market-based mechanisms (kt CO_2 eq)*[b]	*Net emissions including LULUCF and market-based mechanisms (kt CO_2 eq)*
1990	5 718 653.64	NA	NA	5 718 653.64
2010	4 915 228.19	NA	137 000.00	4 778 228.19
2011	4 761 679.42	NA	254 000.00	4 507 679.42
2012	4 696 505.80	NA	504 000.00	4 192 505.80
2013	4 603 595.10	NA	133 000.00	4 470 595.10
2014	4 434 460.75	NA	257 000.00	4 177 460.75
2015	4 468 478.36	NA	23 000.00	4 445 478.36
2016	4 451 349.57	NA	12 234.00	4 439 115.57
2017	4 481 383.13	NA	11 829.00	4 469 554.13
2020 target	NA	NA	NA	NA

Sources: The EU's BR4 and CTF tables 2(a), 4, 4(a)I, 4(a)II, 4(b) and 6(a).
[a] The EU's emission reduction target does not include emissions or removals from LULUCF but includes international aviation and indirect CO_2 emissions.
[b] Units from market-based mechanisms used by EU ETS operators.

76. In assessing the EU's progress towards achieving the 2020 target, the ERT noted that the EU's emission reduction target under the Convention is 20 per cent below the 1990 level (see para. 15 above). According to information provided in CTF table 4, in 2017 the EU's annual total GHG emissions excluding LULUCF and NF_3, and including international aviation and indirect CO_2, were 21.6 per cent (1,237,270.51 kt CO_2 eq) below the base-year level. In addition, the ERT noted that in 2017 the use of market-based mechanisms accounted for 11,829.00 kt CO_2 eq, resulting in net emissions of 4,469,554.13 kt CO_2 eq, or 105,368.78 kt CO_2 eq below the 2020 target.

77. The ERT noted that the EU is making progress towards its emission reduction target by implementing mitigation actions that are delivering significant emission reductions and by using units from the market-based mechanisms in the EU ETS. The emission reductions achieved up to 2017 are significant and already position the EU towards overachievement of the 2020 target. This assessment is also supported by the information on projections for the WEM scenario (see table 6).

(b) Assessment of adherence to the reporting guidelines

78. The ERT assessed the information reported in the BR4 of the EU and recognized that the reporting is complete, transparent and thus adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review. However, the ERT noted that the transparency of the EU's reporting could be enhanced by including a footnote to CTF table 4 outlining that the CO_2 eq emission reductions from the contribution of market-based mechanisms under the Convention do not include the ESD because EU member States have not used any international credits (certified emission reductions or emission reduction units) for complying with their ESD obligations in 2013–2017.

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

79. The EU reported updated projections for 2020 and 2030 relative to actual inventory data for 2017 under the WEM scenario. The WEM scenario reported by the EU includes implemented and adopted PaMs until 2017.

80. In addition to the WEM scenario, the EU reported the WAM scenario. The EU provided a definition of its scenarios, explaining that its WEM scenario represents a 'business as usual' scenario aggregated from 28 national WEM projections where only PaMs that have been adopted or already implemented in the member State are considered, in terms of those covered by national projections. The WEM projection does not yet include the revised EU legislation adopted in 2018 to achieve the 2030 EU ETS and ESR targets. The WAM scenario is an aggregation of additional national PaMs (i.e. those that are planned but not yet adopted). For some member States, the WAM projection already includes measures envisaged as part of their integrated national energy and climate plans, which were due at the end of 2019 under regulation 2018/1999. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on BRs.

81. With regard to the WOM scenario, during the review, the EU explained that information on the aggregate effects of PaMs in earlier historical years cannot be provided as no EU-wide WOM scenario has been compiled. The EU explained that the compilation of a WOM scenario would involve high costs, and that this backward-looking exercise would not provide value in steering forward-looking policy decisions. The EU projection is an aggregate of member States' projections, and only a few member States have provided a WOM scenario. A WOM scenario for the EU as a whole, compiled by aggregating member States' WOM scenarios, would therefore not be possible.

82. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively in each case) as well as NF_3 for 1990–2030. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4.

83. The EU did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds and sulfur oxides. The EU monitoring mechanism regulation does not require the reporting of indirect emissions for the projections and thus the EU has prioritized mandatory reporting on direct emissions. However, the European Commission is in the process of developing an implementing act under the EU regulation on the governance of the Energy Union and climate action that will replace the EU monitoring mechanism regulation. The draft act foresees the inclusion of indirect CO_2 emissions as a separate memo item in the reporting on projections (where available). The resulting detailed reporting rules will be applicable to emission projections from 2021 onward.

84. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the totals. The EU reported on factors and activities affecting emissions for each sector, except those affecting the projected growth in emissions from international transport. During the review the EU explained that, under the WEM scenario, the key factor influencing emission projections from international

aviation is the increase in demand for international travel, which has tripled since 1990 and is expected to increase further. The EU also explained that, under the WAM scenario, the key factor affecting the projected emission values was airline operating costs, which, as substantial costs, can become a strong incentive for airlines to manage their fuel consumption. Historically, as aircraft energy efficiency is driven by operator incentives to increase profitability, it has improved without any policy drivers. However, the extent of efficiency improvements has reduced over time. Increasing lead times required to develop, certify and introduce new technology has been identified as one possible cause for the decreasing rate of improvement. The ERT considers that the transparency of the reporting could be further improved by the Party specifying the factors influencing the GHG emissions projected for international aviation in its next submission in accordance with information provided during the review.

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

85. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the NC7. All EU member States except Romania submitted GHG projections with existing measures in 2019; information from Romania's 2017 submission was used to fill the gap. Some 17 member States reported WAM projections: Belgium, Croatia, Cyprus, Czechia, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Portugal, Slovakia, Spain and the United Kingdom of Great Britain and Northern Ireland. For the aggregation of the WAM scenario at the EU level, data gaps created where member States had not reported a WAM scenario were filled using the WEM scenario. The EU explained in the BR4 that changes to planned PaMs are likely to have led to the differences between the GHG emission levels under the WAM scenarios reported in the BR3 and BR4. The projected emission levels under the WAM scenario reported in the BR4 start slightly above those reported in the BR3 for 2020 but fall at a quicker rate over the time series. The projected emission levels reported in the BR4 are lower than those in the BR3 for 2023 onward. The projected levels for 2030 reported in the BR4 are approximately 5 per cent lower than those in the BR3, whereas those projected for 2035 are 7 per cent lower. One of the main reasons for these decreases is that a number of member States included measures envisaged in their upcoming integrated national energy and climate plans in their WAM projections submitted in 2019.

86. To prepare its projections, the EU relied on extensively substantiated, analysed and up-to-date key underlying assumptions relating to GDP, population, international oil price, international gas price, international coal price and the EU ETS price based on the results of the EU-wide reference scenario modelling carried out by the European Commission. The assumptions and the reference scenario were updated on the basis of the most recent economic developments known at the time of the preparation of the projections.

87. In order to improve the consistency of EU member States' projections, the European Commission provided them with recommended values for the evolution of the EU ETS CO_2 price and for international fuel import prices, as well as for GDP growth rates and population, based on the EU reference scenario 2016. The use of these parameters and assumptions by EU member States is voluntary. The EU acknowledged that reporting on additional aggregated parameters (e.g. aggregated sectoral parameters) would enhance the transparency of the reported projections. However, at present, the aggregation of such parameters is not considered feasible based on the data reported by EU member States.

88. The EU provided information on the changes since the submission of its NC7 and BR3 in the assumptions, methodologies, models and approaches used in the projection scenarios. The Party provided supporting documentation to explain the changes. The EU stated that the methodology used for the preparation of the projections in the BR4 has remained unchanged from that used for the BR3 and BR2. The quality assurance/quality control procedures also remain unchanged. The EU reported that one reason for the stability of the WEM projections is that new EU legislation adopted in 2018 has not yet been included in the EU's WEM projections based on the aggregation of national WEM projections. The GHG projections of the EU member States were aggregated using their submissions to the European Commission under regulation 525/2013/EU in 2019. The EU reported in CTF table 5 the key variables and assumptions used in the preparation of the projection scenarios.

89. The EU also provided information on sensitivity analyses. The European Commission recommended that the EU member States using different assumptions for the key parameters than those recommended use the Commission's recommended parameters for their sensitivity analyses instead. However, this is voluntary and some member States have not complied with the Commission's recommendation. In addition, EU member States' sensitivity analyses took into account different national circumstances. As a consequence, member States' sensitivity analyses are not based on a uniform set of assumptions and methodologies. For that reason, the sensitivity analysis results of individual member States were not aggregated into a single sensitivity projection scenario for all EU member States.

90. For the BR3, a sensitivity analysis was conducted by comparing the aggregated projections of the EU member States with the EU reference scenario 2016. As the compilation of the EU reference scenario 2016 was time-consuming, the scenario has not yet been updated. The projections for the WEM scenario presented in the BR4 are very similar in level and trend to those for the same scenario presented in the BR3. On that basis, the WEM scenario reported in the BR4 can still be considered comparable with the results of the EU reference scenario 2016. During the review, the EU provided the table showing the key parameters used for the EU reference scenario 2016 and the BR4 projections and explained that, for GDP and the international coal price, the parameter values used for the BR4 are both marginally (<10 per cent) higher than the values used for the EU reference scenario 2016. For population, international oil price, international gas price and the CO_2 prices under the EU ETS, the parameter values used for the BR4 are all lower than the values used for the EU reference scenario 2016; however, with regard to the general trend, there is still close alignment between price developments in both cases.

(c) Results of projections

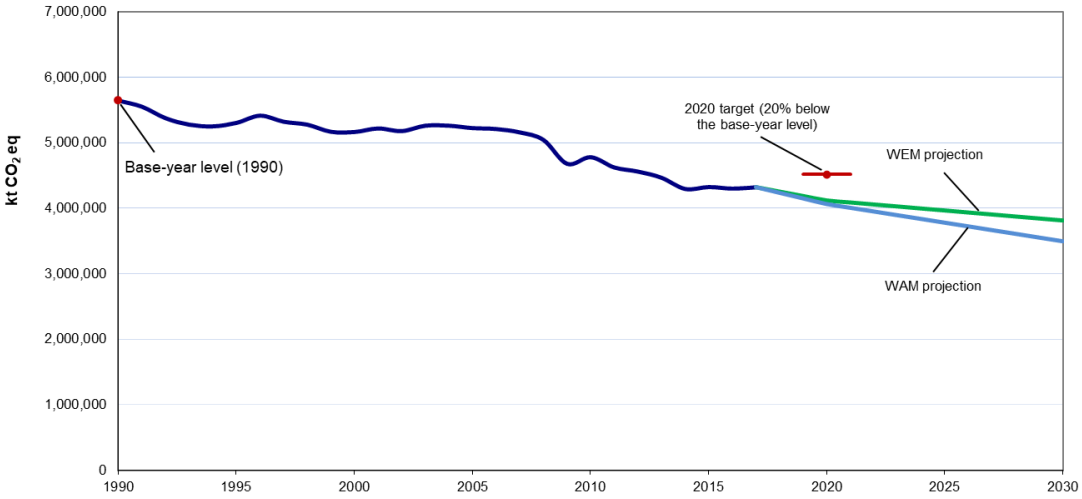
91. The projected emission levels under different scenarios and information on the quantified economy-wide emission reduction target are presented in table 6 and figure 1.

Table 6
Summary of greenhouse gas emission projections for the European Union

	GHG emissions (kt CO_2 eq per year)	*Change in relation to base-year level (%)*
Quantified economy-wide emission reduction target under the Convention[a]	Not available yet	–20.0
Inventory data 1990	5 649 529.34	NA
Inventory data 2017	4 323 163.15	–23.5
WEM projections for 2020	4 120 019.04	–27.1
WAM projections for 2020	4 063 597.72	–28.1
WEM projections for 2030	3 814 252.07	–32.5
WAM projections for 2030	3 491 273.57	–38.2

Source: The EU's BR4 and CTF table 6. Updated projections were provided by the EU during the review.
Note: The projections are for GHG emissions excluding international aviation, LULUCF and indirect CO_2.
[a] The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

Figure 1
Greenhouse gas emission projections reported by the European Union



Source: The EU's BR4 and CTF tables 1 and 6 (total GHG emissions excluding international aviation, LULUCF and indirect CO_2). Updated projections were provided by the EU during the review.

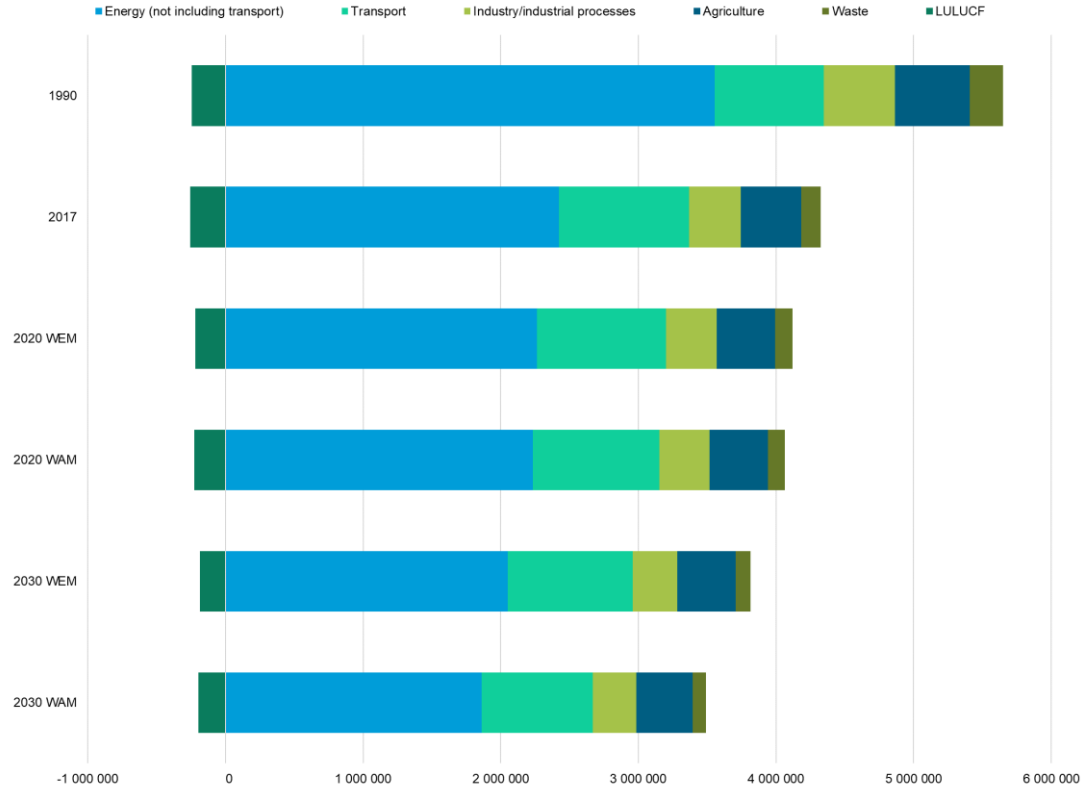
92. Total EU GHG emissions excluding international aviation, LULUCF and indirect CO_2 in 2020 and 2030 are projected to be 4,120,019.04 and 3,814,252.07 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 27.1 and 32.5 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 28.1 and 38.2 per cent and amount to 4,063,597.72 and 3,491,273.57 kt CO_2 eq, respectively. If GHG emissions from international aviation are taken into account, which are included in the EU 2020 target, total EU GHG emissions in 2020 and 2030 are projected to be 4,275.313.04 and 3,988,799.07 kt CO_2 eq, respectively, under the WEM scenario, which represents a decrease of 25.2 and 30.2 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 26.2 and 36.0 per cent, respectively. This suggests that the EU member States are expecting, collectively, to considerably overachieve the 2020 EU target.

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

94. 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 1,293,893.31 kt CO_2 eq (36.4 per cent) between 1990 and 2020. The pattern of projected emissions reported for 2030 under the same scenario remains the same. The decrease is due mainly to the increased use of renewables, the switch from coal to gas (which has also led to a reduction in fugitive CH_4 emissions from coal mining), increased energy efficiency and decreases in fuel combustion in manufacturing industries. Transport is the only sector where projected emissions in 2020 are higher than the 1990 level.

95. The emission reductions projected for the IPPU, agriculture and waste sectors follow the same pattern, with substantial emission reductions, but smaller absolute figures reflecting the emission levels for these sectors, amounting to 150,512.94 kt CO_2 eq (29.1 per cent), 116,682.11 kt CO_2 eq (21.5 per cent) and 115,481.47 kt CO_2 eq (48.0 per cent), respectively, by 2020, and 191,890.49 kt CO_2 eq (37.1 per cent), 117,625.35 kt CO_2 eq (21.7 per cent) and 134,547.94 kt CO_2 eq (56.0 per cent), respectively, by 2030. The key factors driving these reductions include the EU ETS and the EU F-gas regulation in the IPPU sector; reduced animal numbers, reduced nitrogen fertilizer production and use, and improved manure management resulting in reduced emissions from agricultural soils and livestock in the agriculture sector; and successful waste legislation such as increased recycling, bans on landfilling, objectives for the progressive reduction of biodegradable waste to landfill, landfill taxes and methane recovery from treated wastewater and landfill in the waste sector.

Figure 2
Greenhouse gas emission projections for the European Union presented by sector



Source: The EU's BR4 CTF table 6 (total GHG emissions excluding international aviation, LULUCF and indirect CO_2). Updated projections were provided by the EU during the review.

Table 7
Summary of greenhouse gas emission projections for the European Union presented by sector

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Sector	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
Energy (excluding transport)	3 555 465	2 261 572	2 233 921	2 049 400	1 862 447	–36.4	–37.2	–42.4	–47.6
Transport	793 200	940 260	918 389	908 052	805 343	18.5	15.8	14.5	1.5
Industry/industrial processes	517 171	366 675	364 667	325 297	317 667	–29.1	–29.5	–37.1	–38.6
Agriculture	543 255	426 573	423 215	425 630	408 261	–21.5	–22.1	–21.7	–24.8
LULUCF	–244 976	–219 631	–225 137	–184 701	–195 711	–10.3	–8.1	–24.6	–20.1
Waste	240 421	124 940	123 406	105 873	97 555	–48.0	–48.7	–56.0	–59.4
Total GHG emissions excluding international aviation, LULUCF and indirect CO_2	**5 649 529**	**4 120 019**	**4 063 598**	**3 814 252**	**3 491 274**	**–27.1**	**–28.1**	**–32.5**	**–38.2**

Source: The EU's BR4 CTF table 6. Updated projections were provided by the EU during the review.

96. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector slightly change, while the distribution between the key sectors contributing to emission reductions remains the same, with a further 5.3 per cent reduction in the energy sector reflecting planned PaMs included in the national energy and climate plans being prepared by the EU member States. There is also a notable reduction in transport emissions in 2030 projected under the WAM scenario in comparison with the WEM scenario, amounting to 102,708.89 kt CO_2 eq. During the review, the EU explained that this is due to the fact that the projections under the WAM scenarios submitted

by member States, which are aggregated in the EU's WAM scenario, include in many instances PaMs that are envisaged or planned in the integrated national energy and climate plans due under the EU regulation on the governance of the Energy Union and climate action. This is particularly evident in the transport sector, where additional measures are projected to result in significant emission reductions, with an increasing difference in emission levels between the WEM and WAM scenarios in the coming decade.

97. The EU presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 8.

Table 8
Summary of greenhouse gas emission projections for the European Union presented by gas

	GHG emissions and removals (kt CO_2 eq)					*Change (%)*			
		2020		*2030*		*1990–2020*		*1990–2030*	
Gas	*1990*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*	*WEM*	*WAM*
CO_2[a]	4 469 107	3 352 044	3 302 661	3 116 079	2 824 447	–25.0	–26.1	–30.3	–36.8
CH_4	727 449	433 416	428 532	409 084	388 722	–40.4	–41.1	–43.8	–46.6
N_2O	380 966	230 434	229 579	229 669	221 022	–39.5	–39.7	–39.7	–42.0
HFCs	35 210	93 455	92 117	52 469	50 119	165.4	161.6	49.0	42.3
PFCs	257 070	3 480	3 470	3 329	3 294	–86.5	–86.5	–87.1	–87.2
SF_6	11 074	7 130	7 130	3 560	3 560	–35.6	–35.6	–67.9	–67.9
NF_3	17	60	60	62	62	256.4	256.4	269.0	269.0
Total GHG emissions without international aviation and LULUCF	**5 649 529**	**4 120 019**	**4 063 598**	**3 814 252**	**3 491 274**	**–27.1**	**–28.1**	**–32.5**	**–38.2**

Source: The EU's BR4 CTF table 6. Updated projections were provided by the EU during the review.
[a] The EU did not include indirect CO_2 emissions in its projections.

98. Under the WEM scenario, for 2020, the most significant reductions are projected for CO_2 emissions, followed by CH_4 and N_2O emissions: 1,117,062.31 kt CO_2 eq (25.0 per cent), 294,032.70 kt CO_2 eq (40.4 per cent) and 150,532.00 kt CO_2 eq (39.5 per cent) between 1990 and 2020, respectively.

99. The projections by gas for 2030 under the WEM scenario continue the trend in projections for 1990–2020, showing further reductions in CO_2, CH_4 and N_2O emissions as follows: 1,353,028.06 kt CO_2 eq (30.3 per cent), 318,364.45 kt CO_2 eq (43.8 per cent) and 151,296.54 kt CO_2 eq (39.7 per cent) between 1990 and 2030, respectively.

100. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by gas remain the same for all reported GHGs.

(d) Assessment of adherence to the reporting guidelines

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

Table 9
Findings on greenhouse gas emission projections reported in the fourth biennial report of the European Union

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 35	The EU did not report projections of the indirect GHGs carbon monoxide, nitrogen oxides and non-methane volatile organic compounds, as well as sulfur oxides, in its BR4.
	Issue type: completeness	During the review, the EU explained that the EU monitoring mechanism regulation does not require the reporting of indirect emissions for the projections. The EU has prioritized mandatory reporting on direct emissions. However, the European Commission is in the process of developing an implementing act under the EU
	Assessment: encouragement	

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
		regulation on the governance of the Energy Union and climate action that will replace the EU monitoring mechanism regulation. An implementing regulation on the structure and format of reporting, including on projections, is under preparation, with a draft published for public consultation. The draft also foresees the inclusion of indirect CO_2 emissions as a separate memo item in the reporting of projections (where available). The resulting detailed reporting rules will be applicable to the reporting of emission projections from 2021 onward. The ERT encourages the EU to report projections of the indirect GHGs carbon monoxide, nitrogen oxides and non-methane volatile organic compounds, as well as sulfur oxides, in its next submission or provide the relevant explanations as presented during the review.
2	Reporting requirement specified in paragraph 46 Issue type: transparency Assessment: encouragement	The EU explained in the BR4 that some member States have not complied with the European Commission's recommendation to use the Commission's recommended parameters for their sensitivity analyses, as this was voluntary. Therefore, instead of a sensitivity analysis for the aggregate projections, the EU used a cross-check or benchmark system with an alternative modelling exercise for the EU projections using the EU reference scenario 2016. Although the EU reference scenario 2016 has not yet been updated, the WEM scenario reported in the BR4 can still be considered comparable with the results of the EU reference scenario 2016. However, the EU did not report the results of the sensitivity analysis against the reference scenario 2016 in relation to the key parameters used for the assumptions in its BR4. During the review, the EU provided information on the key parameters used for the EU reference scenario 2016 and the BR4 projections in tabular format. It stated that there is unlikely to be a direct linear impact of the key parameters used on the resulting emission estimates. The ERT encourages the EU to include the information on the results of the sensitivity analysis together with the explanatory note on the reference scenario used in its next submission.

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

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

1. Technical assessment of the reported information

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

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

103. The EU provided details on how the support it has provided is "new and additional", including how it has determined resources as being "new and additional". According to the EU's definition, support is considered "new and additional" when it has been committed after the submission of, and not included in, the previous NC or BR. Because EU budgets are determined on an annual basis, each annual commitment cycle is considered to represent new and additional resources.

104. The EU reported on how the support it has provided to non-Annex I Parties is allocated to either mitigation, adaptation or cross-cutting or other activities, and on the capacity-building elements of such support.

105. The EU explained that it tracks its multilateral climate finance provided by the European Investment Bank (reported in CTF table 7(a) using the joint multilateral development bank approach, as explained in the *2018 Joint Report on Multilateral*

Development Banks' Climate Finance[16]). For bilateral climate finance (reported in CTF table 7(b)), the EU uses the Organisation for Economic Co-operation and Development's Development Assistance Committee Rio markers to identify climate-related projects or components, and applies an additional 50 project markers to further refine tracking by location, sector, financial instrument or funding source.

106. The BR4 includes information on changes to the EU's approach to tracking the provision of support, indicators, delivery mechanisms and allocation channels. The EU included information on how it has refined its approach to tracking climate support and the methodologies used to categorize support provided through multilateral channels since its NC7 and BR3. For example, the provision of financial support by the European Investment Bank is now categorized as multilateral support rather than bilateral, because it is considered a multilateral development bank. The EU tracks multilateral financial support using the Common Principles for Climate Change Mitigation Finance Tracking and the Common Principles for Climate Change Adaptation Finance Tracking, as explained in the *2018 Joint Report on Multilateral Development Banks' Climate Finance*.

(b) Financial resources

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

108. The EU described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties in mitigating GHG emissions and adapting to the adverse effects of climate change and any economic and social consequences of response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, the EU reported that its climate finance has been allocated on the basis of needs and priorities of partner countries, both developing countries and EU candidate and potential candidate countries, as outlined in their respective development plans. The EU External Action Service and the European Commission develop strategy papers for and with countries (and regions); these actions are then implemented through yearly action plans.

109. The EU also reported on how it is using innovative approaches to deliver support that engage the private sector in adaptation and mitigation activities in developing countries. Through the use of blended finance mechanisms, the EU uses traditional public grants, loans and equity, as well as newer approaches such as investment grants, interest rate subsidies, technical assistance, risk mitigation and guarantees, to mobilize additional private sector investment for climate and other aid objectives. As a result, EU support is helping to show how international cooperation and financial support can be used to incentivize climate-resilient, low-carbon investment. Table 10 summarizes the information reported by the EU on its provision of financial support.

Table 10
Summary of information on provision of financial support by the European Union in 2017–2018
(Millions of United States dollars)

	Year of disbursement	
Allocation channel of public financial support	*2017*	*2018*
Official development assistance	23 293.90	23 188.50
Climate-specific contributions through multilateral channels: financial institutions, including regional development banks	2 976.73	3 509.37
Climate-specific contributions through bilateral, regional and other channels	3 182.31	3 131.63

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

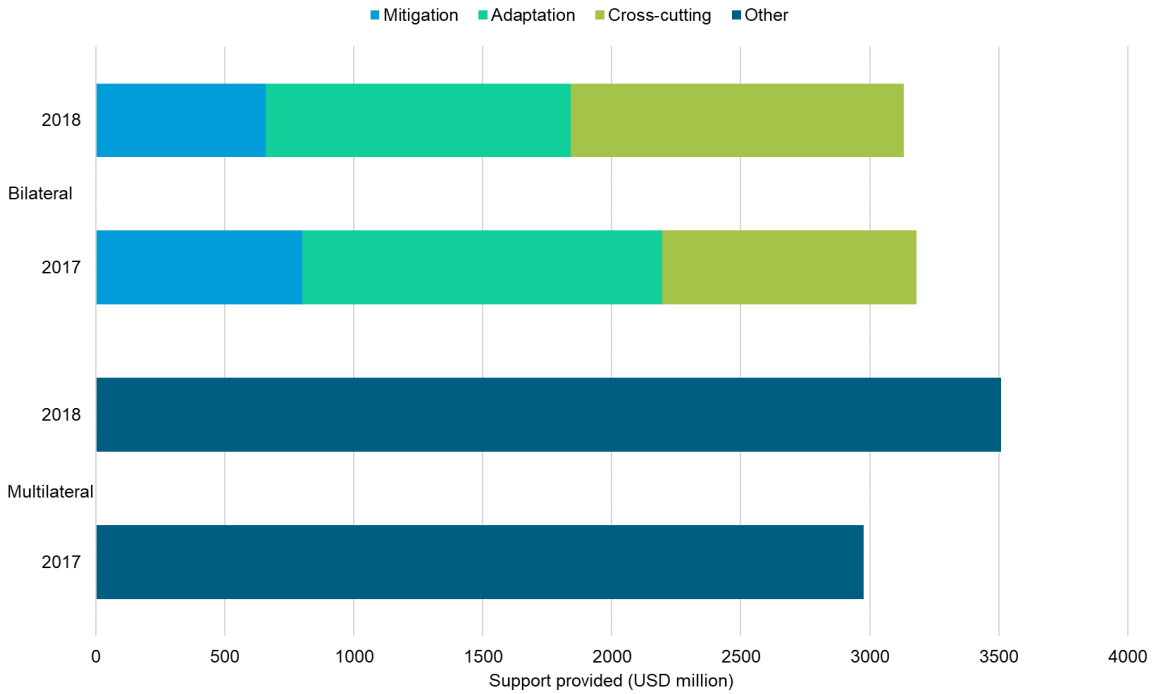
[16] See http://documents.worldbank.org/curated/en/247461561449155666/pdf/Joint-Report-on-Multilateral-Development-Banks-Climate-Finance-2018.pdf.

110. The EU reported on its climate-specific public financial support provided to non-Annex I Parties, totalling USD 6,159.04 million in 2017 and USD 6,641.00 million in 2018. According to these values, the EU has increased the level of its financial support by 26.7 per cent since the BR3. The EU has set out its strategy for mobilizing additional climate finance and, to this end, has committed to spending at least 20 per cent of the EU budget on climate action by 2020. The European Commission is on schedule to realize its pledge to provide at least EUR 14 billion in 2014–2020 (an average of EUR 2 billion per year) in public grants to support climate-related activities in developing countries. If fulfilled, this will mean that EU funding for international climate action has more than doubled (compared with the average level in 2012–2013). In general, the information provided in the BR4 covers support that has been committed in 2017 and 2018, where a commitment requires that a final decision has been taken on the allocation of the funds to a specific project or programme. Disbursement typically follows the commitment of funds, unless exceptional circumstances arise.

111. During the reporting period, the EU placed a particular focus on sub-Saharan African countries, to which it allocated 48 per cent of its bilateral climate finance (USD 1,534.93 million) in 2017. In 2018, the EU allocated 38 per cent of its bilateral climate finance (USD 1,191.95 million) to developing countries in Oceania. The EU reported in CTF table 7(b) its bilateral support allocated to Annex I Parties in 2017 and 2018.

112. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by target area is presented in figure 3 and table 11.

Figure 3
Provision of financial support by the European Union in 2017–2018



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

Table 11
Summary of information on channels of financial support used in 2017–2018 by the European Union
(Millions of United States dollars)

	Year of disbursement				*Share (%)*	
Allocation channel of public financial support	*2017*	*2018*	*Difference*	*Change (%)*	*2017*	*2018*
Detailed information by type of channel						
Multilateral channels						

Allocation channel of public financial support	Year of disbursement				Share (%)	
	2017	*2018*	*Difference*	*Change (%)*	*2017*	*2018*
Mitigation	2 829.07	3 235.36	406.30	14.4	95.0	92.2
Adaptation	147.66	274.01	126.34	85.6	5.0	7.8
Cross-cutting	0	0	NA	NA	NA	NA
Other	0	0	NA	NA	NA	NA
Total multilateral	**2 976.73**	**3 509.37**	**532.64**	**17.9**	**100.0**	**100.0**
Bilateral channels						
Mitigation	798.35	657.44	–140.91	–17.7	25.1	21.0
Adaptation	1 395.82	1 182.80	–213.02	–15.3	43.9	37.8
Cross-cutting	988.14	1 291.39	303.25	30.7	31.1	41.2
Other	0	0	NA	NA	NA	NA
Total bilateral	**3 182.31**	**3 131.63**	**–50.68**	**–2.3**	**100.0**	**100.0**
Total multilateral and bilateral	**6 159.04**	**6 641.00**	**481.96**	**15.6**	**100.0**	**100.0**

Source: The EU's BR4 (technical annex) and CTF tables 7, 7(a) and 7(b).

113. The BR4 includes detailed information on the financial support provided through multilateral, bilateral and regional channels in 2017 and 2018. More specifically, the EU contributed through multilateral channels, as reported in the BR4 and in CTF table 7(a), USD 2,976.73 million and 3,509.37 million for 2017 and 2018, respectively. The EU categorizes the provision of climate-relevant financial support by the European Investment Bank as multilateral as it considers it to be a multilateral development bank (see para. 106 above). The EU provides support to multilateral organizations and United Nations organizations, which is categorized as bilateral climate finance with multiple recipients, with the exception of core contributions to the UNFCCC, which are not reported for the biennium 2017–2018 in CTF table 7(a). Disaggregated information (i.e. at the project level) on the contributions of the European Investment Bank is provided in a technical annex to the BR4.

114. The BR4 and CTF table 7(b) include detailed information on the total financial support provided through bilateral and regional channels in 2017 (USD 3,182.31 million) and in 2018 (USD 3,131.63 million). Bilateral support from the EU was channelled to 184 projects in 2017 and 183 projects in 2018. The largest bilateral contribution in 2017 was to support productive investments for sustainable agriculture in Ghana through a grant of EUR 102 million, while in 2018 a grant of EUR 242.95 million was provided to the Neighbourhood Investment Platform in Southern Europe. Officially launched in 2008 as the Neighbourhood Investment Facility, it evolved into an integral part of the European Fund for Sustainable Development. It was relaunched in 2017 as the Neighbourhood Investment Platform with the aim of promoting additional investment in key infrastructure sectors, such as transport, energy, water and environment, and supporting social and private sector development in partner countries. Projects supported under the Platform operate in the eastern (Armenia, Azerbaijan, Georgia, Republic of Moldova and Ukraine) and southern (Egypt, Jordan, Lebanon, Morocco, State of Palestine and Tunisia) regions of the Neighbourhood.[17]

115. The BR4 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2017, the shares of public financial support allocated for mitigation, adaptation and cross-cutting projects were 25.1, 43.9 and 31.1 per cent, respectively. In 2017, 48.3 per cent of the total public financial support was allocated through multilateral channels and 51.7 per cent through bilateral, regional and other channels. In 2018, the shares of total public financial support allocated for mitigation, adaptation and cross-cutting projects were 21.0, 37.8 and 41.2 per cent, respectively. In 2018,

[17] See https://ec.europa.eu/neighbourhood-enlargement/neighbourhood/neighbourhood-wide/neighbourhood-investment-platform_en.

52.8 per cent of the total public financial support was allocated through multilateral channels and 47.2 per cent through bilateral, regional and other channels.

116. The ERT noted that, on the basis of the information reported in CTF table 7(a), it is not possible to disaggregate information on financial contributions by sector. However, further information was provided in a technical annex to the BR4. In both 2017 and 2018, the majority of financial contributions made through bilateral and regional channels were allocated to agriculture, as reported in CTF table 7(b) and in table 6-3 of the BR4. In 2017, support directed to agriculture amounted to 21 per cent of the total bilateral climate finance, while cross-cutting activities received 26 per cent and other sectors received 22 per cent. In 2018, bilateral support allocated to agriculture amounted to 14 per cent of the total, while support allocated to cross-cutting activities amounted to 24 per cent and other sectors received 19 per cent.

117. CTF tables 7(a) and 7(b) include information on the types of financial instrument used for providing assistance to developing countries, which include grants, concessional and non-concessional loans, credit lines and other. The ERT noted that 49.3 per cent of climate finance provided by the EU in 2017 and 2018 was in the form of grants and delivered through bilateral channels. The remaining 50.7 per cent of EU climate finance was channelled through the European Investment Bank in the form of concessional and non-concessional loans, credit lines and other instruments.

118. The EU provided extensive information on the role of private sector investment, innovative sources of funding and the importance of mobilizing private finance and aligning finance flows. It described how it is using innovative ways to deliver support that engages the private sector, including through direct investment in companies, use of collective investment vehicles, and support for the creation of enabling environments. For example, the European Commission has been working with multiple development partners to further accelerate sustainable energy investment in partner countries through the Electrification Financing Initiative, the Climate Investor One facility, the Africa Renewable Energy Scale-Up Facility, the Transferability and Convertibility Facility, and the Facility for Energy Inclusion. Through the use of such approaches, public investment by the European Commission in the amount of EUR 222 million in 2017 and EUR 152 million in 2018 successfully mobilized EUR 734 million in 2017 and EUR 144 million in 2018. The EU did not report on specific methodological aspects related to private climate finance mobilized.

119. The EU highlighted its success stories of where it has actively engaged the private sector in developing risk-sharing and other leveraging initiatives. Through initiatives such as Switch to Green, which have global reach through regional implementation, the EU is helping to facilitate the transition to an inclusive green economy by strengthening enabling environments in developing countries and to implement the 2030 Agenda for Sustainable Development (in particular the goal related to ensuring sustainable consumption and production patterns). The Switch to Green flagship initiative provides technical assistance and resources to support the elaboration and implementation of activities related to the green economy, focusing on three main areas of action: technical support to improve programme development; dialogue and exchange of experience to enhance coordination and contribute to knowledge-sharing; and knowledge creation and management. Among the aims of the initiative are to strengthen the linkages between macro-level initiatives (e.g. the Partnership for Action on Green Economy) and micro-level interventions (e.g. the green business components of the Switch to Green regional programmes) in order to reinforce synergies and create stronger enabling environments for green economies. Through shared networks and support for green commerce (including support provided by the private sector), Switch to Green helps to boost markets, spread knowledge and expertise, and open channels for public–private collaboration.[18]

120. The EU provided additional information on how it aims to implement Article 2, paragraph 1(c), of the Paris Agreement in the coming years, describing current policies and ongoing initiatives, the role of the European Investment Bank strategy and the importance of developing further metrics and monitoring methodologies for tracking progress towards aligning finance flows with the Paris Agreement. The EU initially pledged to make at least

[18] See https://www.switchtogreen.eu/.

20 per cent of EU expenditure climate related between 2014 and 2020, and is now considering whether to earmark at least 25 per cent for the next multi-annual financial framework period (2021–2027) while mainstreaming climate change mitigation and adaptation into all major EU spending programmes. Additionally, the EU is implementing a range of initiatives aimed at reconciling finance flows with EU climate objectives and those of the Paris Agreement. These would include the reallocation of subsidies that could indirectly contribute to higher emissions from land-use change, and initiatives on sustainable finance and climate-related financial disclosure.

(c) Technology development and transfer

121. The EU 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. The EU contributes to the CTCN, a global network that facilitates the transfer of technologies tailored to the needs of developing countries, providing technical assistance, creating access to information and knowledge on climate technologies, and fostering collaboration among countries. Through the Switch to Green flagship initiative, which aims at supporting sustainable consumption and production and the transition to a green economy, the EU facilitates the sharing of knowledge and best practices among small and medium-sized enterprises on sustainable solutions and resource efficiency. As part of its general approach, the EU has mainstreamed technology transfer activities into many development cooperation activities, often as a component of a larger project. The African, Caribbean and Pacific–EU Technical Centre for Agriculture and Rural Cooperation was provided as a specific example of EU support for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties. Through the Technical Centre, the EU (with support from the private sector) funded an agricultural innovation exercise and helped to build farmer and small-scale producer capacity to engage in international markets. However, the ERT noted that the EU provided only one example of support for the enhancement of endogenous capacities, and did not elaborate on its approach to evaluating how projects contribute to the long-term enhancement of endogenous capacities and technologies.

122. The ERT took note of the information provided in CTF table 8 on recipient countries, target areas, measures and focus sectors of technology transfer programmes. All of the seven projects and programmes described for 2017 and 2018 have been implemented and are focused on both adaptation and mitigation. Targeted technologies include sustainable transport (Mediterranean area) and agrifood systems (Nicaragua). The geographical distribution of the projects and programmes shows that the technology support provided by the EU has global reach: one project has been implemented in sub-Saharan Africa (Rwanda), one in Europe (Albania) and one in Central America (Nicaragua), and four initiatives have been implemented in a group of developing countries.

123. The EU reported on technology development and transfer, including on projects implemented or planned since its NC7 and BR3. The EU also reported on success stories in relation to technology transfer, as well as measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies in developing countries. Detailed information was provided on the EU's contribution to the CTCN, and the EU's support for the Switch Asia Green and Switch Africa Green initiatives. The EU reported that tailoring technology transfer to each country's needs was one of the key factors in the success of technology transfer through the CTCN, addressing barriers that hinder the development and transfer of climate technologies. For the Switch to Green initiatives, success was attributed to efforts to improve coordination among networks of actors, as well as efforts to build awareness and capacity to engage in the green economy.

(d) Capacity-building

124. In its BR4 and CTF table 9, the EU described 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. The EU reported on individual measures and activities related to capacity-building support in textual and tabular format. Examples include the Technical Cooperation and Capacity-building Facility in the Pacific region, which is

focused on building capacity for managing and receiving development cooperation funds from the EU; and the Strengthening Financial Resilience and Accelerating Risk Reduction in Central Asia project, co-financed by the World Bank and the United Nations Office for Disaster Risk Reduction, aimed at providing disaster risk financing solutions at the regional level.

125. The EU also reported on support provided to developing countries to reinforce administrative capacities and the development of legal and regulatory frameworks to address climate mitigation and adaptation. However, the EU further reported that, as capacity-building has been mainstreamed in all development assistance, it is not possible to identify the discrete financial component of any individual activity. In responding to the existing and emerging capacity-building needs of non-Annex I Parties, EU support is provided in line with the principles of national ownership, country-driven demand, and cooperation between donors and across programmes. As the provision of support is driven by the needs of partner countries, the EU relies on communications such as NCs to identify partner country needs and priorities.

2. Assessment of adherence to the reporting guidelines

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

Table 12
Findings on provision of support to developing country Parties from the review of the fourth biennial report of the European Union

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 17 Issue type: transparency Assessment: recommendation	The ERT noted that the approach used by the EU to distinguish between multilateral and bilateral support and to report both channels of support in CTF tables 7, 7(a) and 7(b) is not fully transparent. The approach used in the BR4 differs from that used by the EU previously and the reasons for the change in approach are not clearly explained. Although the EU reported information on the provision of financial support through bilateral, regional and multilateral channels, all support provided by the European Commission and EU funds is considered bilateral, even where it is delivered via a multilateral organization (in which case, it is considered as bilateral with multilateral recipients). Support provided through the European Investment Bank is considered multilateral, in contrast to how it was reported in the BR3. As a result, it is difficult to aggregate and/or compare trends over time, and the role of core/general funding to multilateral organizations remains unclear. The ERT also noted that the EU's approach to reporting on bilateral and multilateral support could be more transparently explained in the footnotes to the CTF tables. For example, further clarification in CTF tables 7 and 7(a) would help to explain why the EU provided only one aggregate value for multilateral financial institutions, whereas the BR text and documentation boxes indicate that core/general support was provided to a variety of global programmes and trust funds managed by multilateral organizations. The ERT further noted additional areas where transparency could be improved, for example by providing explanations for the use of terminology. CTF table 7 requires, in footnote (f), an explanation for the use of "other" when reporting on climate-specific support. Moreover, CTF table 7(a) requires information on the funding source, financial instrument, type of support and sector. In both cases, the ERT noted that no information was provided to explain the use of "other". Lastly, the ERT noted that for CTF table 7(b) the reported totals for support provided by the EU included support provided to Belarus, Europe (regional), Turkey and Ukraine, despite the UNFCCC reporting guidelines on BRs indicating that reporting should only include support provided to non-Annex I Parties. During the review, the EU explained that the approach to reporting on bilateral and multilateral channels, in particular the separate reporting of contributions made through the European Investment Bank in CTF table 7(a), had been revised to take into consideration aggregation issues and the risk of double counting in the context

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
		of the biennial assessment and overview of climate finance flows of the Standing Committee on Finance; only contributions provided to the UNFCCC and the European Investment Bank are included in CTF table 7(a); core/general contributions are not captured in CTF table 7(b), as this table covers only climate-specific shares; and the aggregate figure in CTF table 7 does include support provided to Annex I and non-Annex I Parties. The ERT recommends that the EU increase the transparency of its reporting on support provided by: (a) Explaining in more detail any methodological changes and related rationale for such changes; (b) Elaborating on the consequences of aggregating bilateral and multilateral contributions using different approaches; (c) Clarifying in the CTF documentation box that core/general contributions are not captured in the information provided in the CTF tables; (d) Specifying the use of "other" in CTF table 7, especially when reporting an aggregate figure for contributions through multilateral channels, and in the relevant additional information (technical annex) on funding sources and financial instruments; (e) Excluding support provided to Annex I Parties from the values for total support provided.
2	Reporting requirement specified in paragraph 21 Issue type: transparency Assessment: recommendation	In its BR4 the EU provided an example of one activity in relation to the measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties. However, the Party did not provide information on the measures taken to support non-Annex I Parties, and did not elaborate on its approach to evaluating how projects contribute to the long-term enhancement of endogenous capacities and technologies. During the review, the EU explained that the reported information was not the only activity supported for the development and enhancement of endogenous capacities and technologies, and provided further examples such as the support provided to the CTCN and a project targeting agriculture and adaptation in Nicaragua. The ERT recommends that the EU provide information on measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties. The ERT notes that in this context specific examples of where this has been implemented would be useful.

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

III. Conclusions and recommendations

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

128. The EU's total GHG emissions, excluding LULUCF and NF_3, and including international aviation and indirect CO_2, covered by its quantified economy-wide emission reduction target were estimated to be 21.6 per cent below its 1990 level in 2017. This trend was driven by a combination of economic and sector-specific factors. The key economic factors that have affected emission trends include the economic restructuring of many Central and Eastern European countries during the 1990s, an overall shift in the ratio of energy-intensive industries to services in the EU, and economic recession in 2008–2010. The most important sector-specific factors were the shift from coal to gas for electricity and heat production, the increased use of renewable energy sources, energy efficiency improvements, technological measures in industrial processes and improvements in waste management

practices. The decrease in emissions between 1990 and 2017 occurred against the backdrop of economic (GDP) and population growth of 58 and 8 per cent, respectively, illustrating a steady decoupling of economic and population growth from GHG emissions in the EU.

129. Under the Convention, the EU 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. Operators and airline operators can use such units to fulfil their requirements under the EU ETS, and member States can use such units for their national ESD targets, within specific limitations.

130. Under the ESD, the EU-wide target of reducing emissions by 10 per cent below the 2005 level by 2020 has been broken down to targets at the individual member State level, which range from 20 per cent below to 20 per cent above the 2005 level by 2020. The ESD targets were translated into AEAs by European Commission decision 2013/162/EU. The 2013–2020 progression in the total EU's AEAs is 2,790,634–2,618,168 kt CO_2 eq.

131. The GHG emission projections provided by the EU in its BR4 correspond to the WEM and WAM scenarios. Under these scenarios, emissions including international aviation are projected to be 25.2 and 26.2 per cent below the 1990 level by 2020, respectively. The ERT noted that this suggests that the EU member States are expecting, collectively, to considerably overachieve the 2020 EU target.

132. The EU's main policy framework relating to energy and climate change is the 2020 climate and energy package, which includes the revised EU ETS and the ESD. Efforts made by the EU member States under both the EU ETS and ESD contribute to achieving the EU-wide target. The package is supplemented by a number of cross-cutting and sectoral PaMs covering renewable energy, energy efficiency, 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. To support the implementation of PaMs, the EU is committed to spending at least 20 per cent of its budget for 2014–2020 on climate-related actions, amounting to approximately EUR 180 billion, which, in practice, means integrating climate considerations into all main spending areas of the EU budget.

133. It is expected that the EU ETS will guarantee that the ETS 2020 target will be achieved for sectors under the scheme. With regard to the ESD, the EU member States are currently on track to collectively achieving the overall ESD 2020 target, despite contrasting progress at the national level, with 10 of 27 member States projecting emissions above their annual target in 2020.

134. Many of the EU's key PaMs were recently amended or revised in order to contribute towards the EU's NDC for 2021–2030, most notably PaMs targeting the EU ETS and ESD sectors, renewable energy, energy efficiency, energy performance of buildings, CO_2 emissions from vehicles and waste management. This indicates that the EU is shifting the focus of its PaMs beyond 2020 towards 2030 targets by expanding the scope of and strengthening its overall climate and energy policy framework. These changes are based on the 2030 climate and energy framework, which sets three targets to be achieved by 2030: at least a 40 per cent reduction in GHG emissions below the 1990 level in accordance with the EU's NDC under the Paris Agreement; at least a 32 per cent share of EU final energy consumption to come from renewable energy sources; and at least a 32.5 per cent improvement in energy efficiency.

135. The European Union committed in 2019 to become climate neutral by 2050, and submitted in 2020 a long-term strategy that encompasses all sectors of the economy. The European Commissions's European Green Deal, launched in 2019, calls for increased ambition in the 2030 emission reduction target to at least 50 per cent and towards 55 per cent compared with the 1990 level in a responsible way.

136. Since 2013, the EU has continued to provide increasing levels of climate finance to developing countries, in line with its priorities of supporting the attainment of the Sustainable Development Goals and encouraging all countries to develop ambitious national responses to the 2030 Agenda for Sustainable Development. The EU, together with its member States and the European Investment Bank, are the largest providers of public climate finance to developing countries, with support targeting a number of key thematic areas such as developing resilience, food security, forestry and adaptation. Total multilateral and bilateral support provided by the EU in 2017–2018 increased by 26.7 per cent compared with 2015–2016, as reported in the BR3, and by 15.6 per cent in 2018 compared with 2017. When multilateral and bilateral support are combined for 2017–2018, more support was provided for mitigation than for adaptation, with the largest share provided to Africa (specifically, sub-Saharan Africa). Slightly more EU support was provided through bilateral than multilateral channels, with the majority of funding allocated to cross-cutting measures, followed by other, agriculture and energy projects. For 2017 and 2018, the EU was able to quantify the private climate finance mobilized by public support, which it estimated to be in the range of EUR 878 million. The EU continues its efforts to further refine its climate finance tracking systems.

137. The EU has mainstreamed technology transfer and capacity-building in many of its international activities, and supports a wide range of platforms and measures to build endogenous capacities in developing countries. Through joint research programmes and collaboration between the EU and partner countries, such as the Network for the Coordination and Advancement of Sub-Saharan Africa–EU Science and Technology Cooperation, and the African, Caribbean and Pacific–EU Technical Centre for Agricultural and Rural Cooperation, the EU has supported technology transfer with the aim of building local research capacity and facilitating innovation in both adaptation and mitigation. The EU also supports capacity-building in partner countries, with projects spanning Africa and Asia and covering both mitigation and adaptation. As part of its broader approach to capacity-building, the EU emphasizes the importance of national ownership, stakeholder participation, country-driven demand, and impact assessment and monitoring. On the basis of its success stories, the EU reported that tailoring support to individual country needs, scaling up innovative approaches, and facilitating networking and knowledge-sharing are key to successful project implementation.

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

(a) Providing further estimates of the impacts of its mitigation actions in CTF table 3 or providing a more comprehensive explanation in the textual part of the BR for its reporting of "NE", explaining why these estimations may not be possible due to specific circumstances (see issue 1 in table 4);

(b) Distinguishing between those mitigation actions that correspond to the 2020 climate and energy package or are aimed primarily at achieving the 2020 target and those recently revised mitigation actions that correspond to the 2030 climate and energy framework, which are aimed at implementing the EU's NDC in 2020–2030, and provide any necessary explanation (see issue 3 in table 4);

(c) Explaining in more detail any methodological changes and related rationale for such changes; elaborating on the consequences of aggregating bilateral and multilateral contributions using different approaches; clarifying in the CTF documentation box that core/general contributions are not captured in the information provided in the CTF tables; specifying the use of "other" in CTF table 7; and excluding support provided to Annex I Parties from the values for the total support provided (see issue 1 in table 12);

(d) Providing information on measures taken to support the development and enhancement of endogenous capacities and technologies of non-Annex I Parties, as well as providing specific examples of where this has been implemented (see issue 2 in table 12).

Annex

Documents and information used during the review

A. Reference documents

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

BR4 of the EU. Available at https://unfccc.int/sites/default/files/resource/European%20Union-BR4_C_2019_8832_and_SWD_2019_432.pdf.

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

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

"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.

Report on the individual review of the annual submission of the EU submitted in 2018. FCCC/ARR/2018/EU. Available at https://unfccc.int/sites/default/files/resource/arr2018_EU.pdf.

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

"UNFCCC biennial reporting guidelines for developed country Parties". FCCC/SBSTA/2014/INF.6. Annex I to decision 2/CP.17. Available at http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Olivier Juvyns (European Commission, Directorate-General for Climate Action), including additional material.