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Report on the technical review of the eighth national communication and the technical review of the fifth biennial report of the European Union

Parties included in Annex I to the Convention were requested by decision 6/CP.25 to submit their eighth national communication to the secretariat by no later than 31 December 2022. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the eighth national communication and relevant supplementary information under the Kyoto Protocol 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” and the “Guidelines for review under Article 8 of the Kyoto Protocol”.

Developed country Parties were requested by decision 6/CP.25 to submit their fifth biennial report to the secretariat by no later than 31 December 2022. This report presents the results of the technical review of the fifth 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 of these submissions took place in Brussels from 27 February to 3 March 2023.



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Abbreviations and acronyms

AEA	annual emission allocation
Annex I Party	Party included in Annex I to the Convention
Annex II Party	Party included in Annex II to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
C3S	Copernicus Climate Change Service
CER	certified emission reduction
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CTCN	Climate Technology Centre and Network
CTF	common tabular format
EEA	European Environment Agency
EIB	European Investment Bank
ERT	expert review team
ERU	emission reduction unit
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
ICAO	International Civil Aviation Organization
IE	included elsewhere
IMO	International Maritime Organization
IPPU	industrial processes and product use
LDC	least developed country
LULUCF	land use, land-use change and forestry
N ₂ O	nitrous oxide
NA	not applicable
NC	national communication
NE	not estimated
NF ₃	nitrogen trifluoride
NGO	non-governmental organization
NMVO	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
NO _x	nitrogen oxides
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OOF	other official flows
PaMs	policies and measures

PFC	perfluorocarbon
QA/QC	quality assurance/quality control
SEACRIFOG	Supporting European Union-African Cooperation on Research Infrastructures for Food Security and Greenhouse Gas Observations
SF ₆	sulfur hexafluoride
SIDS	small island developing State(s)
SO ₂	sulfur dioxide
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the NC8 and BR5 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” and “Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention” (annex to decision 13/CP.20), and the “Guidelines for review under Article 8 of the Kyoto Protocol” (annex to decision 22/CMP.1 and annex I to decision 4/CMP.1).

2. In accordance with decision 13/CP.20, a draft version of this report was transmitted to the EU, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

3. The review was conducted from 27 February to 3 March 2023 in Brussels by the following team of nominated experts from the UNFCCC roster of experts: Lucienne Frances Burnham (Australia), Nicolo Macaluso (Canada), Ekaterine Mikadze (Georgia), Marcela Itzel Olguin-Alvarez (Mexico) and Adriano Santhiago de Oliveira (Brazil). Nicolo Macaluso and Marcela Itzel Olguin-Alvarez were the lead reviewers. The review was coordinated by Davor Vesligaj and Ruta Bubniene (secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC8 of the EU in accordance with the UNFCCC reporting guidelines on NCs,¹ the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol² and of the information reported in the BR5 of the EU in accordance with the UNFCCC reporting guidelines on BRs.³

1. Timeliness

5. The NC8 was submitted on 20 December 2022, before the deadline of 31 December 2022 mandated by decision 6/CP.25.

6. The BR5 was submitted on 20 December 2022, before the deadline of 31 December 2022 mandated by decision 6/CP.25. The CTF tables were also submitted on 20 December 2022. The CTF tables were resubmitted on 20 March 2023 to address issues raised during the review. The resubmission included changes to CTF tables 3 and 4.

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

7. Issues and gaps identified by the ERT related to the information reported by the EU in its NC8 are presented in tables 1–2. The information reported, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs.

8. The EU made efforts to improve the reporting in its NC8 compared with that in its NC7 by addressing recommendations and encouragements from the previous review report. The ERT noted that the Party has improved:

- (a) The transparency and completeness of the information reported on PaMs by:

¹ Decision 6/CP.25, annex.

² Decision 15/CMP.1, annex, and decision 3/CMP.11, annex III.

³ Decision 2/CP.17, annex.

- (i) Providing comprehensive information, including examples, on how the EU’s PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistently with the objective of the Convention;
 - (ii) Explaining why the EU’s policies and practices will not lead to higher levels of GHG emissions than would otherwise occur;
 - (iii) Providing a clear explanation of why it is not feasible to provide quantitative estimates of the impact of all its PAMs;
 - (iv) Providing information on how the EU promotes and/or implements decisions of ICAO and IMO aimed at limiting or reducing emissions of GHGs not controlled by the Montreal Protocol from aviation and marine bunker fuels;
- (b) The transparency and completeness of the information reported on projections and the total effects of PaMs by:
- (i) Including indirect CO₂ emissions;
 - (ii) Including projected emissions of indirect gases (e.g. SO₂, NO_x and NMVOCs);
 - (iii) Updating the information on the strengths and weaknesses of methodologies and models used for projecting GHG emissions and removals, and on changes to the underlying assumptions compared with those applied for past reports;
- (c) The transparency of the information reported on education, training and public awareness by providing specific information on the extent of public participation in the preparation or domestic review of the NC8;
- (d) The completeness of the supplementary information related to the Kyoto Protocol by:
- (i) Including information on the institutional arrangements or decision-making procedures that the EU has in place to coordinate activities relating to participation in the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol;
 - (ii) Providing information on national legislative arrangements and administrative procedures in place (e.g. the EU directive on renewable energy) to ensure that the implementation of activities under Article 3 of the Kyoto Protocol takes into account the conservation of biodiversity and the sustainable use of natural resources.

Table 1
Assessment of completeness and transparency of mandatory information reported by the European Union in its eighth national communication

<i>Section of NC</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
Executive summary	Complete	Transparent	–
National circumstances relevant to GHG emissions and removals	Complete	Transparent	–
GHG inventory	Complete	Transparent	–
PaMs	Complete	Mostly transparent	Issue 2 in table I.1
Projections and the total effect of PaMs	Mostly complete	Transparent	Issues 1 and 3 in table I.2
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent	–
Financial resources and transfer of technology	Mostly complete	Mostly transparent	Issues 1–4 in table I.3
Research and systematic observation	Complete	Transparent	–
Education, training and public awareness	Complete	Transparent	–

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in annex I. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

Table 2

Assessment of completeness and transparency of mandatory supplementary information under the Kyoto Protocol reported by the European Union in its eighth national communication

<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of finding(s)</i>
National system	Complete	Transparent	–
National registry	Complete	Mostly transparent	Issue 1 in table I.4
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	–
PaMs in accordance with Article 2	Complete	Transparent	–
Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	–
Information under Article 10 ^a	Complete	Transparent	–
Financial resources	Complete	Transparent	–
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	–

Note: A list of findings pertaining to the completeness and transparency issues identified in this table is included in annex I. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

^a The assessment refers to information provided by the Party on the provisions contained in Article 4, paras. 3, 5 and 7, of the Convention, as reported under Article 10 of the Kyoto Protocol, which is relevant to Annex II Parties only. An assessment of the information on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

9. Issues and gaps identified by the ERT related to the reported information by the EU in its BR5 are presented in table 3. The information reported mostly adheres to the UNFCCC reporting guidelines on BRs. The ERT notes that issue 1 in table II.1 has been identified in three successive reviews.

10. The EU made efforts to improve the reporting in its BR5 compared with that in its BR4, including by addressing a number of the recommendations and encouragements from the previous review report. The ERT noted that the Party has improved:

(a) The transparency and completeness of the information reported on progress in achievement of quantified economy-wide emission reduction targets and relevant information by:

(i) Providing a comprehensive explanation of why the estimates of mitigation impact reported in CTF table 3 were reported as “NE” or “NA”;

(ii) Providing additional information on the assessment of the economic and social consequences of its response measures;

(iii) Providing a clear distinction between the mitigation actions that correspond to the 2020 EU climate and energy package and those that correspond to the EU 2030 climate and energy framework or long-term targets;

(b) The transparency and completeness of the information reported on projections and the total effects of PaMs by:

(i) Including indirect CO₂ emissions;

(ii) Including projected emissions of indirect GHGs (e.g. SO₂, NO_x and NMVOCs);

(iii) Updating the information on the strengths and weaknesses of methodologies and models used for projecting GHG emissions and removals, and on changes to the underlying assumptions compared with those applied for past reports;

(c) The transparency of the information reported on the provision of financial, technological and capacity-building support to developing country Parties by:

- (i) Explaining in more detail any methodological changes and related rationale for such changes;
- (ii) Elaborating on the consequences of aggregating bilateral and multilateral contributions using different approaches;
- (iii) Clarifying in the CTF documentation box that core/general contributions are not captured in the information provided in the CTF tables;
- (iv) 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 (the technical annex) on funding sources and financial instruments;
- (v) Providing information on measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

Table 3

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

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of finding(s)</i>
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	Mostly complete	Mostly transparent	Issue 1 in table II.1 and issue 2 in table II.3
Provision of support to developing country Parties	Mostly complete	Mostly transparent	Issues 1–5 in table II.4

Note: A list of findings pertaining to the completeness and transparency issues identified in this table is included in annex II. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

11. The resubmission of the CTF tables made during the review improved the information reported on PaMs in terms of estimates of mitigation impacts and the information reported on progress in achievement of quantified economy-wide emission reduction targets and relevant information, with “0” used instead of “NA” for use of units from market-based mechanisms under the Convention.

II. Technical review of the information reported in the eighth national communication and fifth biennial report

A. National circumstances relevant to greenhouse gas emissions and removals

1. Technical assessment of the reported information

12. The NC8 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater.

13. Between 1990 and 2020, the population and GDP of the EU-27⁴ increased by 6.8 and 52.0 per cent respectively, while GHG emissions per capita decreased by approximately 38

⁴ Since January 2020, the EU has comprised 27 member States.

per cent. Although the EU's economy still depends on imports of fossil fuels (e.g. oil and natural gas), over the past decade it has significantly enhanced energy efficiency and renewable energy generation; in 2020 renewable energy generation was more than 50 per cent higher than nuclear power energy generation, which was the second most important energy source in the EU.

14. For the purpose of reporting the EU contribution to GHG emissions from 1990 to 2020, the NC8 contains information on historical emission trends and climate change policies, including for the United Kingdom of Great Britain and Northern Ireland. For after 2020, the EU excludes the United Kingdom from its GHG projections and information on climate change policies.

2. Assessment of adherence to the reporting guidelines

15. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs. There were no issues raised during the review relating to the topics discussed in this chapter of the review report.

B. Greenhouse gas inventory information⁵

1. Technical assessment of the reported information

16. The EU reported information in its BR5 and NC8 on its historical GHG emissions and inventory arrangements. Total GHG emissions⁶ excluding emissions and removals from LULUCF decreased by 34.4 per cent between 1990 and 2020, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 36.1 per cent over the same period. Emissions have been decreasing at a relatively steady rate since 1990. The changes in total emissions were driven mainly by factors such as continued growth in the use of renewables; enhanced energy efficiency; a move towards use of less carbon-intensive fossil fuels; a decrease in solid waste disposal to landfills; reduced use of fertilizers; structural changes in the economy, which resulted in reduced activity in the industry sector and growth in the service sector; and the contraction in economic activity caused by the global economic crisis in 2008 and the coronavirus disease 2019 pandemic in 2019–2020.

17. Table 4 illustrates the emission trends by sector and by gas for the EU. The emissions reported in the 2022 annual submission are the same as those reported in CTF table 1.

Table 4

Greenhouse gas emissions by sector and by gas for the European Union for 1990–2020

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2019	2020	1990–2020	2019–2020	1990	2020
<i>Sector</i>									
1. Energy	4 319 452.18	3 990 298.40	3 790 637.45	3 108 866.79	2 797 785.09	–35.2	–10.0	76.6	75.6
A1. Energy industries	1 677 032.76	1 503 883.40	1 449 282.13	992 429.38	856 839.15	–48.9	–13.7	29.8	23.2
A2. Manufacturing industries and construction	804 644.82	662 167.10	532 610.65	470 636.32	444 954.83	–44.7	–5.5	14.3	12.0
A3. Transport	794 282.18	927 906.79	938 840.85	954 592.91	818 077.03	3.0	–14.3	14.1	22.1
A4. and A5. Other	850 360.41	765 840.50	775 063.82	615 627.05	607 831.79	–28.5	–1.3	15.1	16.4
B. Fugitive emissions from fuels	193 132.01	130 500.61	94 840.01	75 581.14	70 082.29	–63.7	–7.3	3.4	1.9

⁵ GHG emission data in this section are based on the EU's 2022 annual submission, version 2. All emission data in subsequent chapters are based on the EU's BR5 CTF tables unless otherwise noted.

⁶ In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF and including indirect CO₂ emissions, unless otherwise specified.

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2019	2020	1990–2020	2019–2020	1990	2020
C. CO ₂ transport and storage	NO, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	–	–	–	–
2. IPPU	547 474.54	478 769.83	404 859.73	379 275.94	348 239.89	–36.4	–8.2	9.7	9.4
3. Agriculture	531 333.43	455 493.55	418 262.25	423 590.50	422 842.69	–20.4	–0.2	9.4	11.4
4. LULUCF	–200 021.86	–291 060.43	–318 816.12	–233 190.70	–225 868.58	12.9	–3.1	NA	NA
5. Waste	237 457.35	226 687.74	165 235.26	132 451.68	129 985.71	–45.3	–1.9	4.2	3.5
6. Other ^a	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	–	–	–	–
<i>Gas^b</i>									
CO ₂	4 470 262.01	4 176 856.60	3 952 494.55	3 279 125.15	2 955 455.27	–33.9	–9.9	79.3	79.9
CH ₄	710 545.65	594 303.68	479 262.32	424 208.51	418 340.58	–41.1	–1.4	12.6	11.3
N ₂ O	383 119.38	302 548.60	237 725.28	229 859.19	226 933.99	–40.8	–1.3	6.8	6.1
HFCs	29 135.98	52 688.48	98 731.94	99 821.94	88 845.98	204.9	–11.0	0.5	2.4
PFCs	25 867.33	12 151.83	3 862.19	2 732.70	2 092.53	–91.9	–23.4	0.5	0.1
SF ₆	10 913.67	10 349.43	6 275.50	6 709.94	5 520.39	–49.4	–17.7	0.2	0.1
NF ₃	23.48	102.33	119.68	57.49	60.17	156.3	4.7	0.0	0.0
Total GHG emissions excluding LULUCF	5 635 717.50	5 151 249.51	4 778 994.70	4 044 184.92	3 698 853.38	–34.4	–8.5	100.0	100.0
Total GHG emissions including LULUCF	5 435 695.65	4 860 189.08	4 460 178.57	3 810 994.21	3 472 984.80	–36.1	–8.9	NA	NA
Total GHG emissions excluding LULUCF, including indirect CO₂	5 640 034.42	5 154 207.21	4 781 275.25	4 045 813.46	3 700 323.16	–34.4	–8.5	100.0	100.0
Total GHG emissions including LULUCF, including indirect CO₂	5 440 012.56	4 863 146.78	4 462 459.12	3 812 622.76	3 474 454.58	–36.1	–8.9	NA	NA

Source: GHG emission data: the EU’s 2022 annual submission, version 2.

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

^b Emissions by gas without LULUCF and including indirect CO₂.

18. In brief, the EU’s inventory arrangements were established in accordance with the EU monitoring mechanism regulation. Substantive requirements for the EU inventory system are defined by the European Commission delegated regulation, while further details on the system’s components, including its QA/QC programme, are described in a European Commission staff working document. For 2023 onward, the legal basis for inventory compilation, including detailed reporting obligations on GHG emissions to comply with the 2030 targets, is stipulated by the EU regulation on the governance of the Energy Union and climate action.

19. The compilation of the EU GHG inventory is coordinated by the Directorate-General for Climate Action of the European Commission, with support from EU member States, EEA and its European Topic Centre on Climate Change Mitigation and Energy, and Eurostat and the Joint Research Centre, both of which are part of the Directorate-General for Climate Action of the European Commission. There have been no changes in these arrangements since the BR4.

2. Assessment of adherence to the reporting guidelines

20. The ERT assessed the information reported in the NC8 and BR5 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

(a) Technical assessment of the reported information

21. The EU provided in the NC8 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1 in conjunction with decisions 3/CMP.11 and 4/CMP.11. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The NC8 also contains a reference to the description of the national system provided in the national inventory report of the 2022 annual submission.

(b) Assessment of adherence to the reporting guidelines

22. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. National registry

(a) Technical assessment of the reported information

23. In its NC8, the EU provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 in conjunction with decision 3/CMP.11 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems.

(b) Assessment of adherence to the reporting guidelines

24. The ERT assessed the information reported in the NC8 of the EU and identified an issue relating to transparency and thus adherence to the reporting guidelines for supplementary information. The ERT concluded that this potential problem of a mandatory nature does not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol. The finding is described in table I.4.

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

1. Technical assessment of the reported information

25. The EU reported information on its economy-wide emission reduction target in its BR5. 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.

26. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. The legislative package regulates emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ 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.

27. The EU-wide targets are primarily implemented through the EU ETS and the ESD. The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap was put in place for 2013–2020 for the EU ETS with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. For 2030, a reduction target of 43 per cent below the 2005 level has been set for emissions covered by the EU ETS. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding aviation and international maritime transport), residential and commercial buildings, agriculture and waste. The ESD is regulated through targets for each member State that add up to a reduction at the EU level of 10 per cent below the 2005 level

by 2020. The ESR, the successor to the ESD, was adopted in 2018 with the target of reducing emissions covered under the ESR by 30 per cent below the 2005 level by 2030.

28. The EU 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.

29. The European Commission set out its vision for a climate-neutral EU in November 2018, and in December 2019 presented the European Green Deal as a road map with actions for making the EU economy sustainable. The European Council endorsed in December 2019 the objective of making the EU climate-neutral by 2050. As part of the European Green Deal, the 2050 climate-neutrality target was made binding in the first European Climate Law, adopted in 2021. It also increased the ambition of the 2030 emission reduction target to at least 55 per cent below the 1990 level. Member States will set out any increased ambition in the update of their national energy and climate plans.

30. The EU reported information on its economy-wide emission reduction target in its BR5. The EU 2020 target has been broken down into 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 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 were further adjusted by decisions 2013/634/EU and 2017/147/EU. The total AEAs of the EU change following a linear path from 2,790,634 kt CO₂ eq in 2013 to 2,618,168 kt CO₂ eq in 2020. Up to a certain limit, the ESD allows member States to use the flexibility provisions for meeting their annual targets, such as carrying over overachievements to subsequent years, using a portion of the emission allocation from the next year, transferring AEAs between member States and using international credits (i.e. credits from joint implementation and the clean development mechanism).

31. The EU reported that a limited number of CERs, ERUs and units from new market-based mechanisms were used to achieve the targets under the EU ETS and the ESD. In the EU ETS directive, the use of international credits was allowed up to specific levels, amounting to more than 1,500 million CER and ERU entitlements up to 2020. In the ESD sectors, the annual use of international credits in 2013–2020 is limited to up to 3 per cent of each member State's ESD emissions in 2005, with a limited number of member States being permitted to use an additional 1 per cent from projects in the LDCs or SIDS, subject to conditions. The EU reported that from 2021 onward international credits will no longer be used for compliance under the ESD nor for compliance under the EU ETS. In absolute terms this means that, under the Convention, the EU has to reduce its emissions from 5,709,517.20 kt CO₂ eq in 1990⁷ to 4,567,613.76 kt CO₂ eq by 2020. The EU reported that it has exceeded its target, reducing its emissions by 34.4 per cent below the 1990 level (or 3,770,662.70 kt CO₂ eq) by 2020.

32. In addition to its 2020 target, the EU also has longer-term targets. The EU 2030 climate and energy framework increases the EU's 2030 target to at least 55 per cent below the 1990 level. Under the European Green Deal, there is a commitment to carbon neutrality by 2050.

2. Assessment of adherence to the reporting guidelines

33. The ERT assessed the information reported in the BR5 of the EU and recognized that the reporting is complete and transparent, and thus adheres 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.

⁷ The emission level in 1990 was calculated on the basis of the EU's national inventory report.

D. Information on policies and measures

1. Technical assessment of the reported information

34. The EU provided in its NC8 and BR5 and its CTF table 3 information on its PaMs⁸ implemented and adopted to fulfil its commitments under the Convention. The EU's set of PaMs is similar to that previously reported, with a few exceptions. The information on PaMs did not include some measures that were reported in the BR4 (e.g. on integrating maritime transport emissions into the EU's GHG reduction policies (COM(2013) 479 final) and EU regulation 2015/757; Horizon 2020 and the EU energy efficiency directive as amended by EU directive 2018/2002, which entered into force in December 2018), while reporting some PaMs that were announced after 2020 (e.g. the EU strategy to reduce methane emissions; the EU strategy for energy system integration; a hydrogen strategy for a climate-neutral Europe; the EU taxonomy regulation (2020/852), which provides direct investments for lower GHG emissions and climate-resilient development; and EU directive 2022/362 on a transition from a time-based charging model, for example vignettes, for heavy-duty vehicles, buses, vans, minibuses and passenger cars to distance-based charges, for example tolls). Information on new regulations that repealed existing regulations was also provided (e.g. EU regulation 2021/2116, repealing EU regulation 1306/2013 on the financing, management and monitoring of the Common Agricultural Policy and EU regulation 2021/2115 repealing EU regulations 1305/2013 and 1307/2013 and establishing rules on support for strategic plans to be developed by member States).

35. The EU reported on planned measures only within the context of how they would impact the projections. These planned measures are not explicitly identified. During the review, the EU noted that, while planned PaMs are not reported (i.e. in CTF table 3), the planned PaMs are intended to replace the current PaMs and this intent is reported in chapter 4 of the BR5.

36. The share of financing for implementing climate-related PaMs increased from 20.6 to 31.0 per cent over 2014–2020 compared with 2021–2027. Specifically, for 2014–2020, EUR 221 billion of the EU budget was dedicated to the response to climate change; that is, 20.6 per cent of the EU budget. For 2021–2027, the EU budget, including the EU's temporary instrument for supporting economic recovery from the pandemic and building a greener, more digital and more resilient future (Next Generation EU), is projected to deliver EUR 557 billion or 30 per cent of climate spending.

37. The EU reported on its policy context and legal and institutional arrangements in place for implementing its commitments and for monitoring and evaluating the effectiveness of its PaMs. It indicated that there have been no changes since the previous BR to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its emission reduction target.

38. The PaMs reported in CTF table 3 are categorized by implementing entity (i.e. the European Commission and member States; member States only; the European Commission only; and the European Commission and industry). Of the reported PaMs, 70 are implemented jointly by the EU and member States, 14 by member States only, 5 by the EU only and 1 jointly by the EU and industry. The monitoring and evaluation of the progress of PaMs is in accordance with the requirements of the EU regulation on the governance of the Energy Union and climate action. With the adoption of the Fit for 55 legislative package, implementing acts and revisions of existing regulations will ensure that EU rules are fit for planning, monitoring and reporting progress towards the EU's 2030 climate and energy targets and its international commitments under the Paris Agreement. The EU regulation on the governance of the Energy Union and climate action requires EU member States to communicate and implement integrated national energy and climate plans and to regularly report on the progress of their implementation. The regulation also lays out the detailed

⁸ The UNFCCC reporting guidelines on BRs use the term "mitigation actions", whereas the UNFCCC reporting guidelines on NCs use the term "policies and measures". The terms are used interchangeably in this report to refer to the relevant information in either the NC or BR.

reporting obligations for member States on GHG emissions, PaMs, projections, adaptation and support provided to developing countries.

39. The EU's assessment of the economic and social consequences of its response measures includes only qualitative statements on the importance of this assessment. The ERT noted that impact assessments are carried out for all initiatives that are expected to have significant economic, social or environmental impacts. The findings of the impact assessment process are summarized in an impact assessment report, which lays out the environmental, social and economic impacts, the stakeholders that will be affected by the initiative and the ways in which they are affected. The EU reported that the integrated nature of the EU climate and energy package, which helps to mitigate GHG emissions across all sectors, and the implementation of impact assessments, ensures that no policies are put in place that would encourage activities that lead to increases in GHG emissions.

40. In its reporting on PaMs, the EU provided the estimated emission reduction impacts for some of its PaMs (i.e. for 30 out of 71 reported in CTF table 3) for some years. Where estimated impacts were not provided, the EU explained that estimated emission reduction impacts were not reported owing to various issues, including that the final legislation may differ from the proposed legislation, that it may combine various options addressed by the impact assessment and that the impact of some PaMs depends on the energy mix. During the review, the EU reiterated the challenges related to the estimated reduction impacts for its PaMs.

41. The EU described its general methodology for estimating the impacts of its PaMs, which is described in the European Commission's communication on better regulation. The mitigation effects of proposed PaMs, both individual PaMs and groups of 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. In addition, the European Commission considers the cumulative impact of EU policies on GHG emissions when preparing new policy and legislative proposals.

42. The methodologies and approaches for estimating the mitigation effects of PaMs is not transparently described. The ERT noted the finding of an EEA report that the inconsistency of information on PaMs provided by member States under the EU regulation on the governance of the Energy Union and climate action 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 Convention, towards its targets. It is expected that the EU regulation on the governance of the Energy Union and climate action will facilitate the streamlining and integration of the reporting of climate and energy PaMs and their effects.

43. 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 CO₂ 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 2021 European Climate Law, which forms part of the European Green Deal, made climate neutrality by 2050 legally binding and increased the EU-wide 2030 emission reduction target to at least 55 per cent compared with the 1990 level. The Fit for 55 package of legislative proposals aims to introduce a series of policies intended to help achieve the new 2030 target (e.g. a number of legislative and policy proposals focusing on renewables, gas and hydrogen, CH₄ emissions and buildings to enable the EU to meet the target).

44. The 2021–2030 EU-wide policies are operationalized through the national energy and climate plans of EU member States. To meet the EU's energy and climate targets for 2030, EU member States need to establish a 10-year integrated national energy and climate plan for 2021–2030. The national plans outline how EU member States intend to address issues such as energy efficiency, renewables, GHG emission reductions, interconnections and research and innovation. This approach requires a coordination of purpose across all government departments and allows coordination and cooperation across all EU member

States. The national energy and climate plans are periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal.

45. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources, such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 and 2030 targets (emission reductions of 21 and 43 per cent respectively below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N₂O emissions from the chemical industry, PFC emissions from aluminium production and CO₂ 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 the benchmark values achieved by the most efficient 10 per cent of installations, are still in place to safeguard the international competitiveness of industrial sectors at risk of carbon leakage.

46. The ESD became operational in 2013 and the sectors it covers account for 55–60 per cent of the GHG emissions of the EU. The ESD includes binding annual targets for each member State for 2013–2020. The ESR, the successor to the ESD, sets national emission reduction targets for 2030 for all member States, ranging from 0–40 per cent below the 2005 level, and trajectories with annual limits for 2021–2030, and keeps many of the flexibilities of the ESD.

47. The ERT noted that the most significant EU PaMs in terms of estimated mitigation impact are the EU ETS, closely followed by the ESR. Other actions, such as the eco-design requirements for various energy-related products, are expected to make an important contribution to mitigation impact. While all mitigation actions make an important contribution, the ERT identified the EU strategy to reduce methane emissions and the European Green Deal as two mitigation actions that show promising potential to reinforce the EU's global leadership in the response to climate change.

48. The EU highlighted the mitigation actions that are under development and those that are being revised to align with the EU's more ambitious 2030 target of reducing domestic emissions by at least 55 per cent compared with the 1990 level. Among the mitigation actions that provide a foundation for significant additional action are the revisions being made to the stringency of the EU ETS, the ESR and the EU industrial emissions directive, as well as the extension of the scope of the EU ETS to include buildings, road transport, maritime and aviation. It is possible that other PaMs will contribute to emission reduction; however, the EU does not provide estimates of mitigation impacts for many of these PaMs. The Fit for 55 package pays specific attention to biodiversity protection and gender-related issues. Table 5 provides a summary of the reported information on the PaMs of the EU.

Table 5
Summary of information on policies and measures reported by the European Union

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimated mitigation impact in 2020 (kt CO₂ eq)</i>	<i>Estimated mitigation impact in 2030 (kt CO₂ eq)</i>	
Policy framework and cross-sectoral measures	EU climate and energy package (2009)	NE	NE	
	EU ETS (2005)	NE	888 000	
	ESR (2013)	NE	755 000	
	EU 2030 climate and energy framework (2018)	NE	NE	
Energy	Regulation on the governance of the Energy Union and climate action (2018)	NE	NE	
	Energy efficiency	EU energy efficiency directive – amended (2018)	NE	NE
		EU energy performance directive – amended (2018)	NE	NE
	EU energy labelling framework regulation – amended (2017)	NE	NE	

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimated mitigation impact in 2020 (kt CO₂ eq)</i>	<i>Estimated mitigation impact in 2030 (kt CO₂ eq)</i>
	EU eco-design requirements for various energy-related products (2009–2016)	292 470	747 900
Energy supply and renewable energy	EU energy taxation directive (2003)	NE	NE
	EU renewable energy directive (2018)	NE	NE
Transport	EU regulation on CO ₂ emission performance standards for new passenger cars and for new light commercial vehicles – amended (2020)	NE	NE
	EU regulation on CO ₂ emission performance standards for new heavy-duty vehicles – amended (2020)	NE	NE
	EU directive on the specification of petrol, diesel and gas-oil (2009)	NE	NE
IPPU	EU industrial emissions directive (2011)	NE	NE
	EU F-gas regulation (2015)	NE	72 000
	EU directive on mobile air-conditioning systems (2006)	NE	NE
Agriculture	Support from the European Agricultural Fund for Rural Development and from the European Agricultural Guarantee Fund (2021)	NE	NE
	EU nitrates directive (1991)	NE	NE
LULUCF	EU LULUCF regulation (2018)	NE	NE
Waste	EU waste framework directive – amended (2018)	NE	NE
	EU landfill directive – amended (2018)	44 000	NE
	EU policies targeting different waste streams (1994)	NE	NE
	EU management of biodegradable waste – amended (2018)	NE	NE
	EU urban wastewater treatment directive (1991)	NE	NE
	EU new circular economy action plan (2020)	NA	NE

Note: The estimated mitigation impacts are estimates of emissions of CO₂ eq avoided in a given year as a result of the implementation of mitigation actions, unless otherwise specified.

49. As illustrated in CTF table 3, the EU has implemented and adopted PaMs covering all sectors of the economy (i.e. energy, transport, IPPU, agriculture, LULUCF and waste) and all GHG emissions (i.e. CO₂, CH₄, N₂O, HFCs, PFCs and SF₆). In addition to the cornerstone cross-cutting PaMs identified in CTF table 3 (i.e. the EU ETS and the ESR), the EU has implemented, adopted or enhanced its various policy frameworks to help contribute to future EU targets. These include:

(a) The EU 2030 climate and energy framework, which is being strengthened to align with the updated nationally determined contribution of the EU and its member States and includes a commitment to a net GHG emission reduction of at least 55 per cent by 2030 compared with the 1990 level;

(b) The European Green Deal, which includes a package of initiatives to deliver on the Fit for 55 package;

(c) The European Climate Law, which enshrines the objective of carbon neutrality by 2050 and lays out the process for developing the 2040 climate target, which will take into account an indicative GHG budget for 2030–2050;

(d) The EU strategy to reduce methane emissions, approved in 2022, which sets out measures to cut CH₄ emissions in Europe. It presents legislative and non-legislative actions in the energy, agriculture and waste sectors, which account for around 95 per cent of CH₄ emissions associated with human activity worldwide;

(e) Policies for sustainable carbon cycles, which set out how to increase removals of carbon from the atmosphere. By 2030, carbon-farming initiatives should contribute 42 Mt CO₂ storage to Europe's natural carbon sinks;

(f) PaMs adopted in the context of regional or international efforts, which include the EU adaptation strategy; the Neighbourhood, Development and International Cooperation Instrument – Global Europe; the Just Energy Transition Partnership with South Africa; and the EU adaptation strategy.

50. Since the preparation and submission of its NC8 and BR5 in 2022, the EU has announced several policy updates to ensure that its ambitious 2030 target and carbon neutrality by 2050 can be achieved. The following policies have had their targets significantly increased to make them more in line with the 55 per cent below 1990 level target:

(a) A revision of the ESR provisionally agreed in November 2022, which increases the EU-27 target from a 30 per cent reduction to a 40 per cent reduction of GHG emissions compared with the 2005 level in 2030;

(b) A revision of the EU ETS, which was provisionally agreed in December 2022, which increases the 2030 target from a 43 per cent to a 62 per cent reduction of GHG emissions compared with the 2005 level. Several mechanisms have also been enhanced (i.e. reducing free allocation and strengthening the Market Stability Reserve, which is the mechanism to reduce the surplus of emission allowances in the carbon market);

(c) Extending the EU ETS to maritime transport. This includes a phase-in period for 2024 and 2025 emissions (40 and 70 per cent reduction compared with the 2005 level respectively) and then a full price signal for emissions from 2026;

(d) The new EU ETS 2 for buildings, road transport and industry fuels not covered by the EU ETS, which will be introduced in 2027, which will aim for a 42 per cent GHG emission reduction relative to the 2005 level by 2030;

(e) CO₂ standards for GHG emissions from trucks increased from 30 to 45 per cent below the 2019 level by 2030, 65 per cent below the 2019 level by 2035 and 90 per cent below the 2019 level by 2040.

2. Assessment of adherence to the reporting guidelines

51. The ERT assessed the information reported in the NC8 and BR5 of the EU and identified issues relating to transparency, and thus adherence to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The findings are described in tables I.1 and II.1.

3. Domestic and regional programmes and legislative arrangements and procedures related to the Kyoto Protocol

(a) Technical assessment of the reported information

52. In its NC8, the EU reported that the implementation of the Kyoto Protocol is underpinned by the EU climate and energy package, which includes cornerstone policies such as the EU ETS and the ESD, as well as others, to facilitate a 20 per cent reduction of GHG emissions in 2020 compared with the 1990 level. The overall responsibility for climate change policymaking lies with the European Parliament, the Council of the EU and the European Commission. The European Commission proposes policies, enforces legislation and implements policies. The policies proposed by the European Commission are approved, amended or rejected by the Council of the EU and the European Parliament and then implemented at the member State level. Other agencies, such as the Commission for Environment, Climate Change and Energy and EEA, also play key roles. For example, the Commission for Environment, Climate Change and Energy is responsible for coordinating the work of the European Committee of the Regions in fields related to the European Green Deal, which include the environment, biodiversity, the circular economy and zero pollution, climate change, energy and space policies. EEA plays a monitoring and coordination role in providing information on the environment. EEA is a major information source for those

involved in developing, adopting, implementing and evaluating environmental policy, and for the general public.

53. The EU has arrangements and enforcement procedures to meet its commitments under the Kyoto Protocol. With respect to non-compliance, the EU refers to the legislative documents for implementing the EU monitoring mechanism regulation, the ESD and the EU ETS directive. These legislative documents include a description on how non-compliance and penalties are assessed.

54. The EU has provisions in place to make information on legislative arrangements and administrative procedures related to compliance and enforcement publicly accessible, such as those stipulated in the EU monitoring mechanism regulation, particularly procedures related to compliance and enforcement of the assessment of the costs and effects of national PaMs, GHG inventory preparation and GHG projections.

55. The EU also has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. For example, the EU's renewable energy directive requires that the production of biofuels meets a set of sustainability criteria, including a minimum emission reduction, biodiversity aspects and requirements for various land types.

(b) Assessment of adherence to the reporting guidelines

56. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

4. Policies and measures in accordance with Article 2 and minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

(a) Technical assessment of the reported information

57. In the NC8, the EU reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. For example, the EU reported that the PaMs listed in the NC8 are aimed at reducing GHG emissions and/or increasing the capacity of sinks and thereby contribute to minimizing the adverse effects of climate change. The reporting includes information on cooperation on the development of technologies, assisting developing country Parties that are highly dependent on the export of fossil fuels in diversifying their economies and conducting relevant research. With respect to international trade, the EU's PaMs are aimed at contributing to economic recovery after the pandemic through support for the green and digital transformations, as well as a renewed focus on strengthening multilateralism and reforming global trade rules to ensure that they are fair and sustainable. The EU reported on the assessment of the economic and social consequences of its response measures, the adverse effects of climate change, the minimization of effects on international trade, and social, environmental and economic impacts on other Parties. The information that the EU provided in support of its assertion that the manner in which it implements its measures minimizes the effect on other Parties is laid out in the European Commission's 2021 trade strategy.

58. The NC8 includes information on how the EU promotes and implements the decisions of ICAO and IMO to limit emissions from aviation and marine bunker fuels. With respect to GHG emissions from international aviation, ICAO adopted CORSIA in 2016 with the aim of avoiding or offsetting CO₂ emission growth from international aviation from 2020 onward. The first voluntary phase of this scheme started in 2021, and all EU member States are implementing CORSIA in this first phase. For international maritime transport, IMO established a data collection system that requires large ships to report fuel consumption data. Large ships calling into EU ports report on their fuel consumption both under the IMO system

and under the EU internal monitoring, reporting and verification regulation. The EU reported that GHG emissions from international shipping will be included in the EU ETS from 2023 onward.

59. Further information on how the EU strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2022 annual submission. The EU reported on its approach to the minimization of adverse social, environmental and economic impacts on developing country Parties and reported an assessment of potential positive and negative impacts on developing country Parties, both of a direct and an indirect nature. These are achieved through approaches that include bilateral dialogue and different platforms in which the EU interacts with other countries, explains new policy initiatives and receives comments from other countries. The EU noted that the impacts on other countries are mostly indirect. Moreover, the impacts frequently cannot be directly attributed to a specific EU policy, nor directly measured in developing countries by the EU. Therefore, the reported information covers potential adverse social, environmental and economic impacts that result from complex assessments of effects based on accessible data sources in developing country Parties. The EU's impact assessment process ensures that potential adverse social, environmental and economic impacts are identified and minimized within the legislative procedures. The Party reported information on what it prioritized in implementing its commitments under Article 3, paragraph 14, including activities aimed at reducing emissions from fossil fuel technologies and reducing or phasing out market imperfections, fiscal incentives, tax and duty exemptions, and subsidies related to fossil fuels.

(b) Assessment of adherence to the reporting guidelines

60. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

E. Estimates of emission reductions and removals and the use of units from market-based mechanisms and land use, land-use change and forestry and progress in achieving the quantified economy-wide emission reduction target

1. Technical assessment of the reported information

61. The EU reported in its BR5 and CTF tables 4 and 4(b) that it did not use units from market-based mechanisms under the Kyoto Protocol and other market-based mechanisms to meet its commitment under the Convention. Given that the contribution of LULUCF activities is not included in the joint EU target under the Convention, reporting thereon is not applicable to the EU. Table 6 illustrates the EU's emissions and use of units from market-based mechanisms towards achieving its target.

Table 6

Summary of information on greenhouse gas emissions, use of units from market-based mechanisms and land use, land-use change and forestry by the European Union

(kt CO₂ eq)

<i>Year</i>	<i>Emissions excluding LULUCF</i>	<i>Contribution of LULUCF^a</i>	<i>Use of units from market-based mechanisms</i>	<i>Net emissions including LULUCF and market-based mechanisms</i>
1990	5 709 517.20	NA	0	5 709 517.20
2010	4 913 472.45	NA	0	4 913 472.45
2011	4 763 579.09	NA	0	4 763 579.09
2012	4 702 723.99	NA	0	4 702 723.99
2013	4 604 425.18	NA	0	4 604 425.18
2014	4 428 209.59	NA	0	4 428 209.59
2015	4 463 021.94	NA	0	4 463 021.94

<i>Year</i>	<i>Emissions excluding LULUCF</i>	<i>Contribution of LULUCF^a</i>	<i>Use of units from market-based mechanisms</i>	<i>Net emissions including LULUCF and market-based mechanisms</i>
2016	4 449 195.28	NA	0	4 449 195.28
2017	4 474 782.75	NA	0	4 474 782.75
2018	4 386 906.69	NA	0	4 386 906.69
2019	4 215 532.13	NA	0	4 215 532.13
2020	3 770 662.70	NA	0	3 770 662.70
			2020 target ^b	4 567 613.76

Sources: The EU’s BR5, CTF table 4, and information provided by the Party during the review.

^a The EU’s emission reduction target does not include emissions or removals from LULUCF.

^b The emission level that corresponds to the 2020 target is calculated on the basis of the GHG emissions excluding LULUCF in the base year and the Party’s target (i.e. reduction in emissions compared with the base year).

2. Assessment of adherence to the reporting guidelines

62. The ERT assessed the information reported in the BR5 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Assessment of achievement of the quantified economy-wide emission reduction target

63. In assessing the achievement of the quantified economy-wide emission reduction target by the EU on the basis of the information reported in its BR5, the ERT noted the joint EU target of reducing its GHG emissions by 20 per cent below the 1990 level by 2020 (see para. 25 above). In 2020 the annual total GHG emissions of the EU excluding LULUCF and NF₃, and including international aviation and indirect CO₂, were 34 per cent (1,938,854.50 kt CO₂ eq) below the base-year level. The ERT noted that the contribution of LULUCF is not included in the Party’s base or target year and that the EU did not use units from market-based mechanisms towards the achievement of its 2020 target. The ERT concluded that, on the basis of the information reported in the BR5 and provided during the review, the total GHG emissions of the EU, excluding LULUCF, did not exceed the emission level corresponding to the 2020 target, and thus that the EU has achieved its joint target.

F. Projections

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

64. The EU reported in its BR5 and NC8 updated projections for 2025–2035 under the WEM scenario. The WEM scenario reported by the EU includes PaMs implemented and adopted at the time of reporting (March 2021), as provided by the EU member States. The projected data were based on member State submissions, which were mandatory for 2021 and optional for 2022.

65. In addition to the WEM scenario, the EU reported the WAM scenario. The WAM scenario includes planned PaMs. The EU provided a definition of its scenarios, explaining that its WEM scenario is aggregated from 27 national WEM projections and is based on a recommended list of adopted or implemented PaMs, while its WAM scenario includes all planned measures and is aggregated from available national EU member State WAM projections. For member States that did not provide a WAM scenario (i.e. five member States), it was assumed that their WAM projections were equal to those under their WEM scenario. The definitions indicate that the scenarios were prepared in accordance with the UNFCCC reporting guidelines on BRs.

66. A WOM scenario was not reported. The EU explained that data are not available for all member States for this scenario because it is not a mandatory reporting requirement under the EU regulation on the governance of the Energy Union and climate action. Aggregation

of incomplete data would add to uncertainty, and thus the EU does not plan to include a WOM projection in the future.

67. 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 CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) as well as NF₃ for 2025–2035. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4.

68. The EU did not report on factors and activities affecting emissions for each sector. An explanation was provided in the BR5 stating that it is difficult to provide this information at the EU level as it is an aggregate of member States. Sector-specific data, such as electricity generation and transport volume, are not a mandatory reporting requirement under the European Commission implementing regulation, resulting in a varying number of member States reporting.

69. The EU-27 total reported includes indirect CO₂ emissions, which aligns with the requirements for presenting GHG inventory emissions. The EU included projected emissions of indirect gases SO₂, NO_x and NMVOCs. No projections were available for carbon monoxide. During the review, the EU explained that, since carbon monoxide emissions significantly decreased from 1990 to 2020, it is currently not considered a key pollutant/gas for which the development of projections should be prioritized.

70. International transport emission projections were reported separately. The EU explained that emissions from international aviation are projected to continue to increase in both the WEM and WAM scenarios. The EU stated that the assumed emission growth was due to an expected increase in demand for international travel. During the review, the EU confirmed that the explanation in the technical review report of the BR4 was still applicable; that is, that the demand for international travel in 2020 was triple that in 1990 and is expected to increase further by 2030 owing to increasing trade with emerging economies and cheaper passenger flights increasing their share of the market, which is in line with forecasts by the International Air Transport Association.

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

71. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the NC7. The EU provided information on changes since the submission of its NC7 in the assumptions, models and approaches used for the projection scenarios. The EU reported supporting information, including referencing reports from individual member States, further explaining the changes made since the NC7. Since the NC7, the United Kingdom has left the EU, meaning that aggregate data from member States reflect the EU-27.

72. The QA/QC procedures applied in compiling the projections of individual member States are the same as those used for the NC7. However, the legislative context was updated to take into account the EU regulation on the governance of the Energy Union and climate action, in particular articles 18 and 42. The updates were on integrated reporting on GHG projections on 15 March every odd year, and a mandate for EEA to perform QA/QC procedures. The latest European Topic Centre on Climate Change Mitigation report documents the QA/QA procedures to ensure that member State projection data are complete, transparent, consistent, accurate and comparable.

73. To prepare its projections, the EU relied on key underlying assumptions relating to population size, GDP, international import prices for oil, gas and coal, and the EU ETS allowance price. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. Monetary data assumptions (except GDP) were calculated as population-weighted averages. GDP and population data were included in figures in the chapter of the NC8 on national circumstances.

74. CTF table 5 includes the EU-27 key projection parameters, derived from aggregating the reporting of member States to the EU-27 level (GDP, population size) or by calculating the weighted average value for monetary data. The EU provided key parameters as guidance in table 30 of the NC8, but the decision on which parameters to use was made by individual

EU member States. The EU did not provide historical information in CTF table 5. During the review, the EU explained that assumptions for historical data at the EU-27 level were not used in the projections and were therefore reported as “NA” in CTF table 5.

75. For 2025–2035, a conservative annual GDP growth rate of 1.2 per cent, an annual population growth rate of 0.02 per cent and an annual import growth rate of 2.3 per cent for oil, 1.7 per cent for gas and 1.0 per cent for coal were assumed. The EU ETS carbon price had an assumed annual growth rate of 3.9 per cent.

76. Sensitivity analyses were conducted for a number of important assumptions, such as fuel import prices, the EU ETS certificate price, population size and GDP. Given the diversity of approaches and assumptions used to prepare the projections of the 27 individual member States, an approach of measuring one variable was not possible. Thirteen EU member States reported sensitivity scenarios on the variable ‘total GHG emissions without LULUCF’, with the results differing from the WEM scenario from –29 per cent to 11 per cent.

77. The EU’s geographical coverage and emission coverage has changed since the NC7 and therefore are not entirely comparable. The EU explained that the NC8 includes indirect CO₂ emissions in the total GHG emissions reported and no longer includes the United Kingdom in the projections, as it has left the EU. The WEM and WAM scenarios have a 3 per cent greater emission reduction projected from 1990 to 2030 compared with that in the NC7. The enhanced EU-wide and national legislation in individual member States, coupled with higher fuel import price assumptions, has resulted in a higher estimated emission reduction in the NC8.

(c) Results of projections

78. The projected emission levels under different scenarios and information on the quantified economy-wide emission reduction target are presented in table 7 and figure 1.

Table 7

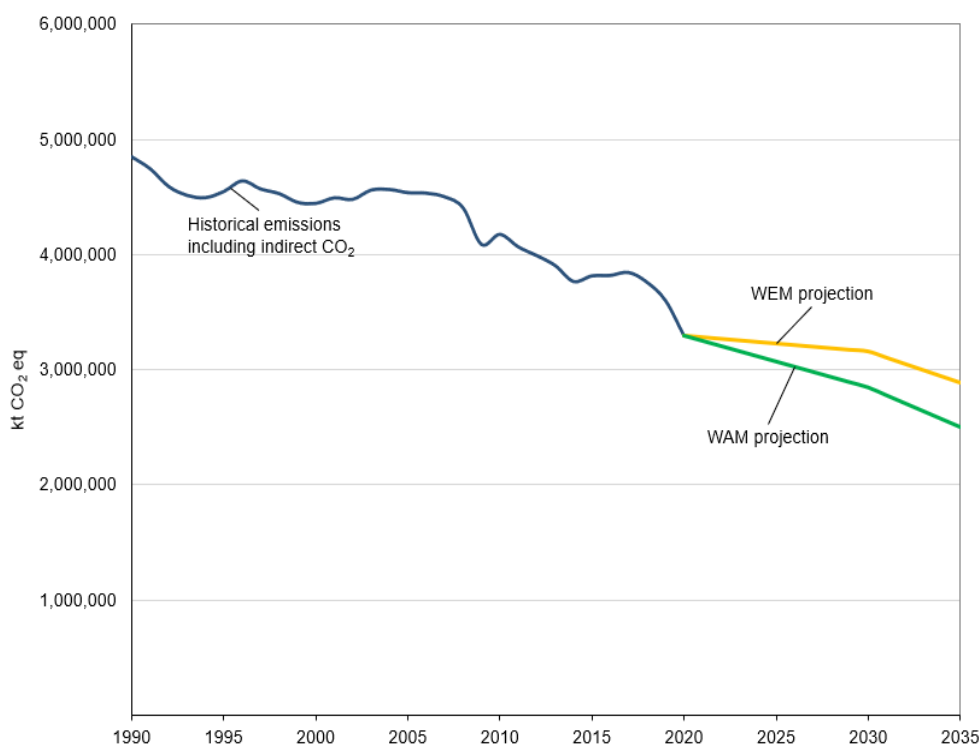
Summary of greenhouse gas emission projections for the European Union

	<i>GHG emissions (kt CO₂ eq/year)</i>	<i>Change in relation to 1990 level (%)</i>	<i>Change in relation to 2020 level (%)</i>
Inventory data 1990	4 846 616.62	NA	NA
Inventory data 2020	3 298 235.76	–31.9	NA
WEM projections for 2030	3 160 490.57	–34.8	–4.2
WAM projections for 2030	2 845 322.27	–41.3	–13.7
WEM projections for 2035	2 887 505.63	–40.4	–12.5
WAM projections for 2035	2 498 720.34	–48.4	–24.2

Sources: The EU’s BR5 and CTF table 6.

Note: The historical emissions and projections are of the GHG emissions of the EU’s 27 member States (without the United Kingdom) excluding LULUCF and including international aviation and indirect CO₂.

Figure 1
Greenhouse gas emission projections reported by the European Union



Sources: The EU's BR5, CTF tables 1 and 6 and information provided by the Party during the review.

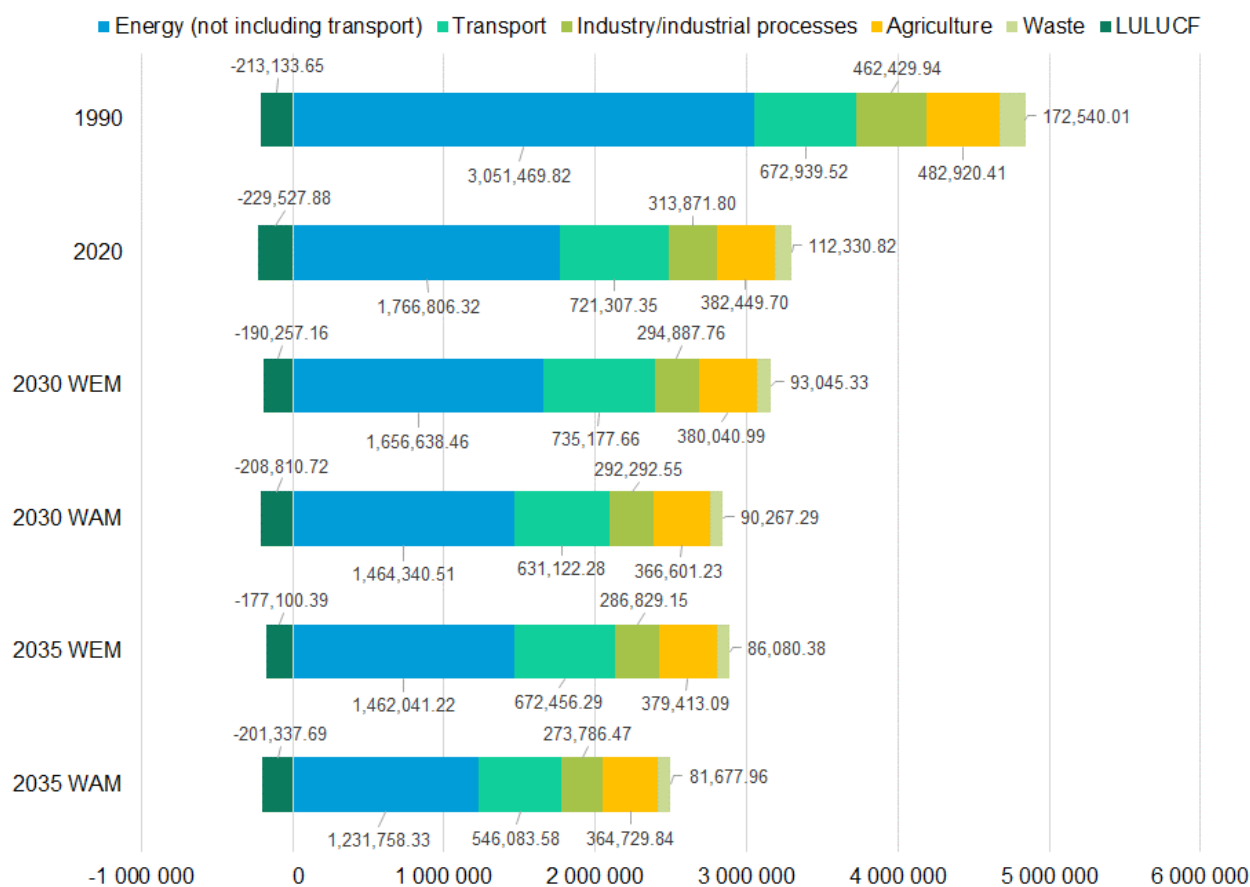
Note: The historical emissions and projections are of GHG emissions of the EU's 27 member States (without the United Kingdom) excluding LULUCF and including international aviation and indirect CO₂.

79. The EU's total GHG emissions excluding LULUCF and including indirect CO₂ are projected under the WEM scenario to decrease by 34.8 and 40.4 per cent respectively below the 1990 level in 2030 and 2035. When including LULUCF, total GHG emissions including indirect CO₂ are projected under the WEM scenario to decrease by 35.9 and 41.5 per cent respectively below the 1990 level in 2030 and 2035. Under the WAM scenario, total GHG emissions excluding LULUCF and including indirect CO₂ in 2030 and 2035 are projected to be lower than those in 1990 by 41.3 and 48.4 per cent respectively. Under both the WEM and WAM scenarios, the EU is expected to require a more ambitious suite of PaMs in order to achieve the 2030 target of a 55 per cent net GHG emission reduction in 2030 compared with the 1990 level.

80. The EU presented the WEM and WAM scenarios by sector for 2030 and 2035, as summarized in figure 2 and table 8.

Figure 2

Greenhouse gas emission projections for the European Union presented by sector

 (kt CO₂ eq)


Sources: The EU's BR5, CTF table 6 and information provided by the Party during the review.

Table 8

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

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2030		2035		1990–2030		1990–2035	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	3 051 469.82	1 656 638.46	1 464 340.51	1 462 041.22	1 231 758.33	-45.7	-52.0	-52.1	-59.6
Transport	672 939.52	735 177.66	631 122.28	672 456.29	546 083.58	9.2	-6.2	-0.1	-18.9
Industry/industrial processes	462 429.94	294 887.76	292 292.55	286 829.15	273 786.47	-36.2	-36.8	-38.0	-40.8
Agriculture	482 920.41	380 040.99	366 601.23	379 413.09	364 729.84	-21.3	-24.1	-21.4	-24.5
LULUCF	-213 133.65	-190 257.16	-208 810.72	-177 100.39	-201 337.69	-10.7	-2.0	-16.9	-5.5
Waste	172 540.01	93 045.33	90 267.29	86 080.38	81 677.96	-46.1	-47.7	-50.1	-52.7
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total GHG emissions excluding LULUCF and including indirect CO₂	4 846 616.62	3 160 490.57	2 845 322.27	2 887 505.63	2 498 720.34	-34.8	-41.3	-40.4	-48.4

Sources: The EU's BR5, CTF table 6 and information provided by the Party during the review.

81. According to the projections reported for 2030 under the WEM scenario, the most significant absolute emission reductions are expected to occur in the energy sector (excluding transport), amounting to projected reductions of 45.7 per cent between 1990 and 2030, owing mainly to the increased use of renewables and energy efficiency improvements. The pattern of projected emissions reported for 2035 under the same scenario remains the same. Noteworthy emission reductions are projected for the industrial processes, agriculture and waste sectors, with declines between 1990 and 2030 projected to be 36.2, 21.3 and 46.1 per cent respectively. These declines are driven by measures such as the EU ETS, waste legislation such as the EU waste framework directive and increased productivity in agriculture. In absolute terms, the GHG emission reductions for industrial processes, agriculture and waste are projected to be 167,542.18, 102,879.42 and 79,494.68 kt CO₂ eq respectively over that period. Only the domestic transport sector is projected to increase its emissions from 1990 to 2030, by 62,238.14 kt CO₂ eq (9.2 per cent), owing to an increase in the volume of road transport.

82. Projected emissions from 1990 to 2035 follow a similar trend to that of 1990–2030. The most significant emission declines are expected in the energy sector (excluding transport), decreasing by 1,589,428.60 kt CO₂ eq (52.09 per cent) between 1990 and 2035 owing to increased fuel switching from liquid fuels to gaseous fuels, increased uptake of renewables, improved energy efficiency and declines in fuel combustion in manufacturing.

83. One point of difference to the 1990–2030 trend is the domestic transport sector, for which GHG emissions from 2020 to 2035 are projected to decline, by 48,851.06 kt CO₂ eq (6.8 per cent). Domestic transport volume is projected to increase from 2020 to 2025 by 12.1 per cent, as transport use is expected to increase following the end of lockdown measures in place during the pandemic in 2019–2020. Transport emissions are then expected to decline from 2025 to 2035, owing to relevant PaMs. Emissions from the agriculture, industry and waste sectors are projected to decrease by 0.8, 8.6 and 23.4 per cent respectively between 2020 and 2035, while emissions from international aviation are projected to increase by 44.1 per cent (43,534.66 kt CO₂ eq) over the same period.

84. Under the WAM scenario, when additional measures are considered, emission reduction trends are similar to that of the WEM scenario. When additional measures are considered, between 1990 and 2030 emissions from the energy sector (excluding transport) are 52.0 per cent lower, agriculture 24.1 per cent lower, industry 36.8 per cent lower, waste 47.7 per cent lower and domestic transport 6.2 per cent lower. These reductions are due to a projected trend away from fossil fuels through fuel switching and electrification, reduced nitrogen fertilizer production, successful waste legislation and the projected impact of additional measures to increase the electric vehicle fleet.

85. In the WEM scenario, CO₂, CH₄ and N₂O emissions (excluding LULUCF) are projected to be responsible for the largest absolute reduction in emissions from 1990 to 2030, decreasing by 1,321,235.01 kt CO₂ eq (34.1 per cent), 225,450.41 kt CO₂ eq (38.8 per cent) and 130,021.25 kt CO₂ eq (38.7 per cent) respectively. These declines reflect PaMs across multiple sectors that encompass CO₂, CH₄ and N₂O emissions. For example, CO₂ declines are occurring in the energy sector because of an increase in the generation of renewables, while CH₄ emissions can be attributed to declines in the number of livestock owing to productivity improvements and N₂O declines are influenced by reduced nitrogen fertilizer production and use. Collectively, F-gas emissions began to decrease after 2016 and are projected to reach 10.6 per cent (5,802.82 kt CO₂ eq) below the 1990 level in 2030 under the WEM scenario. The majority of the declining trend in F-gases is attributed to PFCs, while HFC emissions increased from 1990 to 2015, then declined in the projection period owing to the EU F-gas regulation.

86. Under the WAM scenario, emission reductions by 2030, by gas, follow a similar pattern to the WEM scenario. CO₂, CH₄ and N₂O emissions (excluding LULUCF) are projected to be responsible for the largest absolute reduction in emissions from 1990 to 2030, decreasing by 1,609,514.55 kt CO₂ eq (41.6 per cent), 245,351.81 kt CO₂ eq (42.2 per cent) and 135,869.04 kt CO₂ eq (40.4 per cent) respectively. These declines can be attributed to changes in agricultural policy, a transition from solid and liquid fuels to gas, and regulations for landfilled waste. Collectively, emissions from F-gases are projected to decrease, reaching

12.7 per cent (6,940.43 kt CO₂ eq) below the 1990 level in 2030 under the WAM scenario. Measures driving this decline include the EU ETS and the EU F-gas regulation.

87. The EU presented the WEM and WAM scenarios by gas for 2030, as summarized in table 9.

Table 9

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

Gas ^a	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2030		2035		1990–2030		1990–2035	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO ₂	3 870 493.67	2 549 258.66	2 260 979.12	2 299 023.12	1 941 608.85	–34.1	–41.6	–40.6	–49.8
CH ₄	581 217.97	355 767.56	335 866.16	341 304.90	318 728.32	–38.8	–42.2	–41.3	–45.2
N ₂ O	336 047.63	206 026.38	200 178.59	205 479.88	198 655.75	–38.7	–40.4	–38.9	–40.9
HFCs	14 735.31	43 166.34	42 089.00	35 675.45	33 878.48	192.9	185.6	142.1	129.9
PFCs	24 218.69	2 704.79	2 705.21	2 662.97	2 662.62	–88.8	–88.8	–89.0	–89.0
SF ₆	9 713.07	2 529.09	2 468.40	2 363.95	2 192.30	–74.0	–74.6	–75.7	–77.4
NF ₃	23.36	40.54	40.54	41.82	41.82	73.5	73.5	79.0	79.0
Total GHG emissions excluding LULUCF and including indirect CO₂	4 846 616.62	3 160 490.57	2 845 322.27	2 887 505.63	2 498 720.34	–34.8	–41.3	–40.4	–48.4

Sources: The EU's BR5, CTF table 6 and information provided by the Party during the review.

^a The EU included indirect CO₂ emissions in its projections.

(d) Assessment of adherence to the reporting guidelines

88. The ERT assessed the information reported in the NC8 and BR5 of the EU and identified issues relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The findings are described in tables I.2 and II.3.

2. Assessment of the total effect of policies and measures**(a) Technical assessment of the reported information**

89. In its NC8, the EU presented the estimated and expected total effect of implemented and adopted PaMs in accordance with the WEM scenario. Information is presented in terms of GHG emissions avoided or sequestered, by gas (on a CO₂ eq basis), in 2025, 2030 and 2035. The EU reported that no attribution of the aggregate effects of PaMs in the WEM scenario for specific sectors was made as the reported PaMs could impact more than one sector and therefore would add to uncertainty in the analysis.

90. The EU did not include an estimate of the total aggregated effect of PaMs for the most recent inventory year. During the review, the EU explained that the aggregate effects of PaMs are not available for the most recent inventory year and there are no plans to include this information in future reports.

91. The EU reported that the total estimated effect of its implemented and adopted PaMs is expected to increase from 2025 to 2030 and decrease from 2030 to 2035. According to the information reported in its NC8, the largest total aggregated effect of PaMs in the WEM scenario was from CO₂, which is projected to deliver 69.0 per cent of the total aggregated effect of PaMs when split by gas in 2030. The total aggregated effect of PaMs is expected to be lower in 2035 than in 2030 by 16.3 per cent.

(b) Assessment of adherence to the reporting guidelines

92. The ERT assessed the information reported in the NC8 of the EU and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.2.

3. Supplementary relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol**(a) Technical assessment of the reported information**

93. In the NC8 the EU provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The EU reported information that demonstrates that the Kyoto Protocol mechanisms constituted a supplemental element only, and domestic action constituted the key element for the EU. This is demonstrated by the fact that the EU experienced substantial decreases in domestic GHG emissions in both commitment periods, and the targets both for the first and for the second commitment period have been largely achieved through domestic emission reductions. The ERT noted that the EU does not plan to use market-based mechanisms to meet its Kyoto Protocol target.

(b) Assessment of adherence to the reporting guidelines

94. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

G. 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**

95. In its NC8 and BR5, the EU reported information on its provision of financial, technological and capacity-building support to non-Annex I Parties.

96. The EU provided information on “new and additional” support that it committed in 2019–2020. According to the EU’s definition, support is considered “new and additional” when the support has been committed after the submission of, and not included in, the previous NC or BR. While the EU provided the information, the ERT noted that it was not transparent. For example, the EU indicated in the report that details on how support has been categorized as “new and additional” were provided in section 6.2.3 of the BR5. However, during the review, the EU clarified that those details were not provided in section 6.2.3 of the BR5, and that only the definition of “new and additional” was contained in paragraph 2 of section 6.2 of the BR5.

97. The EU reported the support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. The EU tracked its support by classifying it into mitigation, adaptation and capacity-building support.⁹

98. The EU’s methodology and approach to tracking the provision of support, including information on indicators, delivery mechanisms used and allocation channels tracked, is based on the Rio markers for bilateral climate finance (reported in CTF table 7(b) and table 33 of the BR5). The EU also tracks its multilateral climate finance provided by EIB, which is reported in CTF table 7(a). Detailed information and data on the support provided by the EU and EIB in 2019–2020 are included in CTF tables 7 (technology transfer) and 8 and 9 (capacity-building) and the CTF documentation box (appendix I) and in the list of finance

⁹ For more information, see <https://www.oecd.org/dac/financing-sustainable-development>.

committed by EIB (appendix II). This methodology, based on the Rio markers, is used to categorize and track the extent to which a project is deemed to provide support, alongside more than 50 additional project markers that allow for further support tracking, for example by geographical location, economic sector, financial instrument or funding source.

99. The ERT noted that the information provided in the NC8 and the BR5 does not clearly separate the methodology for tracking the provision of multilateral and bilateral climate finance. During the review, the EU noted that its statistical system categorizes most climate finance support as bilateral with multiple recipients, even where the finance is delivered through a multilateral organization. This support is reported in CTF table 7(b). Additionally, the Party explained that its support covers climate-specific contributions to multilateral institutions that are not earmarked for a specific purpose but that support climate action in developing countries. These contributions are reported as multilateral support in CTF table 7(a). The EU explained that this approach would allow for improved aggregation of the contributions of multilateral development banks. The EU also referred to the OECD methodology for differentiating between multilateral and bilateral support.

100. The ERT noted that the EU did not report on the approach to differentiating climate finance from support provided under other conventions, such as the Convention on Biological Diversity and the United Nations Convention to Combat Desertification. The ERT notes that this ability to differentiate is important to ensuring that there is no double counting. During the review, the EU explained that it does not have in place a specific formal mechanism for tracking possible double counting in contributions under the UNFCCC, the Convention on Biological Diversity and the United Nations Convention to Combat Desertification. Furthermore, the EU is of the view that if financial support is relevant and effective in addressing both climate change and biodiversity/desertification, it shows the value of that support. The EU also explained that separating the contributions is not a trivial matter because the Rio marker methodology is transversal.

(b) Financial resources

101. The EU reported in its NC8 and BR5 information on its provision of financial support to non-Annex I Parties as required under the Convention, including on financial support committed and disbursed, allocation channels and annual contributions.

102. The EU seeks to ensure that the resources it provides to non-Annex I Parties effectively address their adaptation and mitigation needs. The EU reported its recognition that climate action is most effective where support is designed and implemented in partnership with national Governments. The EU also reported that it works closely with partner governments to strengthen their institutional capacity to develop climate policy in line with their own national priorities. These include regional and sectoral plans, such as national adaptation programmes of action and national adaptation plans. In addition to the information provided in the NC8 and BR5, during the review the EU presented additional examples of support being designed and implemented in partnership with national Governments.

103. The EU described how the resources referred to in paragraph 102 above assist non-Annex I Parties in mitigating GHG emissions and adapting to the adverse effects of climate change, as well as in capacity-building and technology transfer in the areas of mitigation and adaptation. Detailed information was provided on specific programmes, thematic instruments and focus areas; for example, EU external cooperation implemented through the Neighbourhood, Development and International Cooperation Instrument – Global Europe and contributions to the Green Climate Fund and the Global Environment Facility. EU activities also focused on adaptation and resilience-related funding, such as the Special Climate Change Fund and the Adaptation Fund; the Sendai Framework for Disaster Risk Reduction 2015–2030; the EU joint communication on a strategic approach to resilience in the EU’s external action; and the European Forum for Disaster Risk Reduction. Programmes also target specific regions, such as the Pilot Program for Climate Resilience and the Global Alliance for Resilience Initiative in the Sahel and western Africa, and on funding disaster risk reduction projects in Africa, the Caribbean and the Pacific. EU programmes also target food security and forestry. While there are many contributions from those initiatives, some of note are eradicating poverty and promoting sustainable development, prosperity, peace

and stability; integrating climate policy goals into disaster risk reduction and resilience; and technical assistance directly for indigenous peoples and local communities.

104. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, the EU allocated its climate finance on the basis of strategies and programmes such as a new EU adaptation strategy, the Africa–EU Strategic Partnership, the Joint Declaration on Sustainable Energy and the Just Energy Transition Partnership with South Africa, and participated in other regional processes and supported relevant regional institutions. The EU reducing emissions from deforestation and forest degradation facility is an example of a project in which the EU supported partner countries to slow, halt and reverse deforestation. 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 2019–2020

(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Disbursement in 2019–2020</i>
ODA	36 322.50
Climate-specific contributions through multilateral channels, including:	6 780.33
Other multinational climate change funds	5.15
Financial institutions, including regional development banks	6 775.18
Climate-specific contributions through bilateral, regional and other channels	5 777.14

Sources: The EU’s BR5 CTF tables and Query Wizard for International Development Statistics, available at <http://stats.oecd.org/qwids/>.

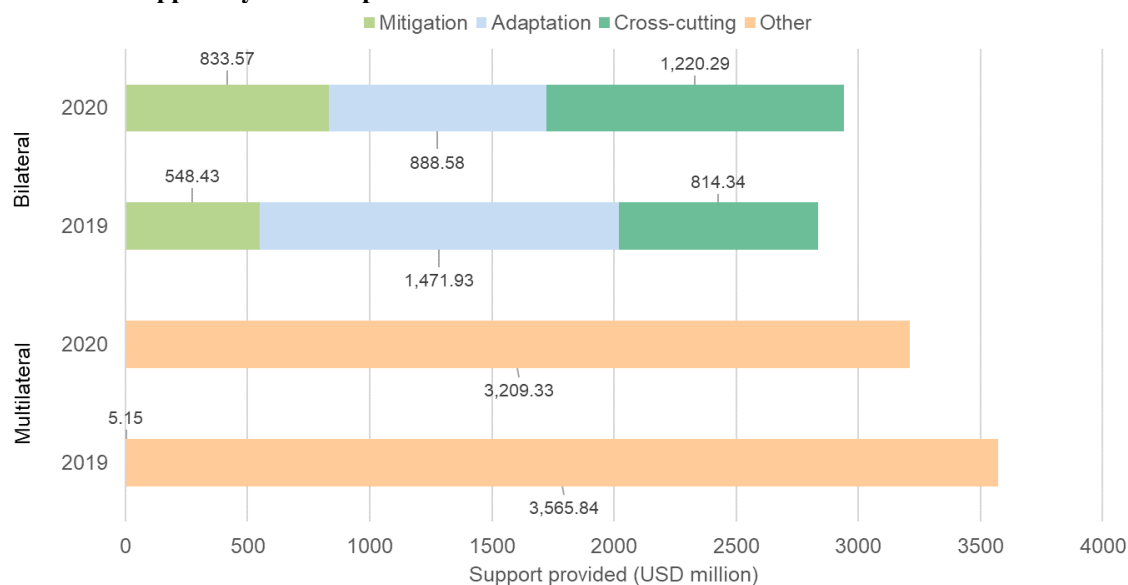
105. The EU’s climate-specific public financial support was USD 6,400.53 million in 2019 and USD 6,151.78 million in 2020. This represented a cumulative total of USD 12,552.31 million in 2019–2020, representing an increase of 943 per cent since the BR1 (2011–2012). Since the BR4 (2017–2018), the level of its financial support has slightly increased, from EUR 11,087.99 million to EUR 11,104.64 million as reported in its local currency. With regard to future financial pledges, the EU has committed to providing EUR 79.46 billion for 2021–2027 through the Neighbourhood, Development and International Cooperation Instrument – Global Europe, which has a spending target of 30 per cent for climate change.

106. The EU reported detailed information on the total financial support provided through bilateral and regional channels in 2019–2020 (USD 5,777.14 million). The ERT noted that the total bilateral finance provided by the EU has decreased by 8.5 per cent since the BR4. During the reporting period, the EU placed a particular focus on Europe, Africa and Asia in its bilateral climate finance, to which it allocated USD 3,815.90 million, which represents an allocation of 66 per cent of its bilateral climate finance. America (i.e. North, Central and South America) was a recipient of 5 per cent (2019) and 6 per cent (2020) of the EU’s bilateral climate finance, with South America receiving 1 per cent in both years. The ERT noted an important change on the focus of resource allocation since the BR4. According to the review of the BR4, during 2017–2018 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. In 2019 and 2020, the EU allocated 3 per cent and 1 per cent respectively of its bilateral climate finance to Oceania.

107. The ERT noted that the EU also reported its bilateral support allocated to Annex I Parties in 2019–2020, despite the requirement set out in the UNFCCC reporting guidelines on BRs and the previous findings of the ERT indicating that reporting should only include support provided to non-Annex I Parties. The EU explained that the support provided to those Annex I Parties is included because those Parties are also classified as developing countries by the OECD. The EU further explained that this approach, which it intends to follow for future reports, is adopted for consistency with previous reports. The EU reported in CTF table 7(b) its bilateral support allocated to Annex I Parties in 2017–2018, including support provided to Croatia, Greece, Türkiye, Ukraine and others. During the review, the EU clarified

that support provided to Croatia and Greece was not included in the reported EU climate finance for 2019–2020; for example, the EU clarified that the recipient of support for Greece–Albania cross-border cooperation is Albania. 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 support by the European Union in 2019–2020


Sources: The EU’s BR5 CTF tables 7, 7(a) and 7(b).

Table 11

Summary of information on channels of financial support reported by the European Union

(Millions of United States dollars)

Allocation channel of public financial support	Amount disbursed in 2019–2020	Comparison with amount disbursed in 2017–2018		Share of total (2019–2020) (%)
		Difference	Change (%)	
Detailed information by type of channel				
Multilateral channels				
Mitigation	0	NA	NA	0
Adaptation	0	NA	NA	0
Cross-cutting	5.2	NA	NA	0.07
Other	6 775.2	NA	NA	99.9
Total multilateral	6 780.3	294.2	4.5	100.0
Bilateral channels				
Mitigation	1 382.0	–73.8	–5.1	23.9
Adaptation	2 360.5	–218.1	–8.5	40.9
Cross-cutting	2 034.6	–244.9	–10.7	35.2
Other	0	NA	NA	NA
Total bilateral	5 777.1	–536.8	–8.5	100.0
Total multilateral and bilateral	12 557.5	–242.6	–1.9	100.0^a

Source: The EU’s BR5 CTF tables 7, 7(a) and 7(b), and FCCC/TRR.4/EU, table 11.

^a Note that variances in contribution amounts from year to year can occur that are not reflective of trends, owing to factors such as the biennial or triennial contribution cycles of some multilateral funds, the timing of approvals for individual bilateral projects or changes in exchange rates.

108. The EU contributed USD 6,775.17 million through multilateral channels in 2019–2020. The ERT noted that the total multilateral finance provided by the EU has increased by 5 per cent since the BR4. More specifically, the EU contributed USD 2,976.73 million and

3,509.37 million in 2017 and 2018 respectively (USD 6,486.10 in total) through multilateral channels, as reported in the BR4 and in CTF table 7(a). The EU reported that contributions were made to specialized multilateral climate change funds, such as the Least Developed Countries Fund, the Special Climate Change Fund, the Adaptation Fund and the Green Climate Fund, although that information is not disaggregated in CTF table 7(a). During the review, the EU highlighted the 79 per cent increase in climate finance provided in 2020 compared with 2013.

109. The NC8 and BR5 provide information on the types of support provided. In terms of the focus of public financial support, the information reported shows that in 2019–2020 the average shares of the total public financial support allocated to mitigation, adaptation and cross-cutting projects were 56 per cent (45 per cent multilateral and 11 per cent bilateral), 28 per cent (9 per cent multilateral and 19 per cent bilateral) and 16 per cent (bilateral) respectively. Of the total bilateral climate finance committed, EUR 1.2 billion was marked for mitigation, EUR 2.1 billion for adaptation and EUR 1.8 billion for cross-cutting projects. Of the total multilateral climate finance committed, EUR 5.0 billion was marked for mitigation, EUR 1.0 billion for adaptation and EUR 0.004 billion for cross-cutting projects. Of the total multilateral climate finance provided in 2019–2020, EUR 1.5 billion was channelled to developing countries as ODA and EUR 195 million was delivered as OOF. The remaining EUR 4.3 billion was reported as ‘other’.

110. The ERT noted that the EU did not provide disaggregated information on sectors with regard to financial contributions made through multilateral channels in 2019–2020, as required for CTF table 7(a). During the review, the EU reported that in 2019–2020 the majority of financial contributions through bilateral and regional channels was allocated to the cross-cutting sector (19 and 34 per cent in 2019 and 2020 respectively). In 2019, 16 and 13 per cent of financial contributions through bilateral and regional channels were allocated to the water and sanitation and agriculture sectors respectively. In 2020, 22 and 14 per cent of financial contributions through bilateral and regional channels were allocated to the energy and agriculture sectors respectively.

111. The EU reported information on the types of financial instrument used for providing assistance to developing countries, which were reported only as grants in CTF table 7(a) and (b). The ERT noted that the grants provided in 2019–2020 accounted for the total public financial support. However, the ERT noted that the EU reported in item 7.4 of the NC8 that all EIB funds that are reported as resources through multilateral channels are provided in the form of loans, alongside several equity investments, grants and guarantees. The ERT also noted that there is no information on the type of instrument used for providing assistance to developing countries in CTF table 7(a).

112. The EU reported that private finance is mainly mobilized for the energy sector and developing sustainable finance. It also reported on how it uses public funds to promote private sector financial support for developing countries to increase their mitigation and adaptation efforts by mobilizing private climate finance directly or supporting the development of credible sustainable finance frameworks and taxonomies.

113. An example of the EU’s support, detailed during the review, is the Global Climate Change Alliance Plus, which supports SIDS and the LDCs with their climate change action and increases their resilience to climate change. The initiative is based on country-level identified priorities and has funded more than 100 national, regional and global projects in Africa, Asia, the Caribbean and the Pacific. The EU’s contribution to the Global Climate Change Alliance Plus funding has exceeded EUR 737.5 million: EUR 317.5 million for 2007–2014 and EUR 420 million for 2014–2020, which encompasses the period of the report. Some of the main outcomes reported by the EU since 2007 include 70 national and 6 regional climate change strategies and plans elaborated, mainstreaming the issue in 130 sectoral policies and other instruments in 40 countries; 1,200 local adaptation plans elaborated and/or implemented; and 2,000 pilot projects funded through grants to NGOs, civil society organizations and universities. Regarding the Global Climate Change Alliance Plus, in addition to the specific information contained in table 39 of the BR5 related to western Africa as a recipient region, some of the main capacity-building outcomes since 2007 are more than 20 countries setting up national-level institutions or structures related to climate change, as well as climate data and knowledge management systems, and 54,000 national or subnational

government staff, 345,000 farmers and community leaders and 684,000 community members trained in climate change action.

(c) Technology development and transfer

114. The EU implements steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including activities undertaken by the public and private sector. One example of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties is support provided to the CTCN for providing technology solutions, capacity-building and advice on policy and legal and regulatory frameworks. A team of climate technology experts from the CTCN, its Consortium and Network works with governments, NGOs, the private sector, academia and research institutions to provide solutions tailored to the needs of the individual countries, which conveys the request to the CTCN. The technical support is provided through technical assessments and support for policy and planning; training; tools and methodologies; and implementation plans. The ERT noted that the CTCN initiative is an important example provided by the EU of supporting the development and long-term enhancement of the endogenous capacities and technologies of non-Annex I Parties, leading to 320 instances of climate technology transfer. However, as in the BR4, the Party did not provide general information on the measures taken to support the development and long-term enhancement of the endogenous capacities and technologies of non-Annex I Parties. During the review, the EU clarified that the example provided is not the only example that includes measures to support the development and enhancement of endogenous capacities and technologies. The EU referred to two additional examples, but without details on how those initiatives support the development and long-term enhancement of the endogenous capacities and technologies of non-Annex I Parties.

115. The EU focused the provision of its technology transfer support on the following recipient countries, target areas, measures and focus sectors: a technical cooperation project involving government and civil society targeted mitigation and adaptation in the Middle East and North Africa; a rural development programme in Europe (Albania) targeted mitigation and adaptation; and an agrifood system project in rural and urban areas in Central America (Nicaragua) targeted adaptation. Three initiatives have been implemented in a group of developing countries: one research project on agriculture targeted mitigation and adaptation and two initiatives targeted adaptation (one in sustainable transport and one in biodiversity and forestry conservation). The geographical distribution of the projects and programmes shows that the technology support provided by the EU has global reach.

116. Since its NC7 and BR4, the EU has not reported on implemented additional measures and activities in CTF table 8. It did not include in CTF table 8 one success story in relation to technology transfer described in table 38 of the BR5. During the review, the EU explained that chapter 6.4 of the BR5 describes the approach towards technology transfer in general and highlights exemplary success stories, including publicly funded initiatives for research and technology cooperation as well as public-private partnerships working on technology transfer and provision of support to the CTCN. According to the EU, CTF table 8 lists additional examples of support for technology development and transfer. The EU reported that chapter 6.4 of the BR5 and CTF table 8 are non-exhaustive lists, since the EU has mainstreamed technology transfer activities in many development cooperation activities.

117. The ERT noted that in CTF table 8 the EU did not distinguish between the public sector and the private sector regarding the sources of funding for technology transfer and the activities undertaken. During the review, the EU explained that the programmes and projects listed in CTF table 8 include the involvement of private sector actors and hence they were reported at an aggregate level.

(d) Capacity-building

118. In its BR5 and CTF table 9, the EU reported information on its capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties. It described individual measures and activities related to capacity-building support in a textual and tabular format. Examples include the Global Climate Change Alliance Plus in western Africa (see para. 113 above) and

Euroclima+. Euroclima+ offers support to partner countries to foster institutional strengthening processes on climate change mitigation and adaptation, resilience and investment. In total, more than 200 capacity-building processes have been carried out to date with the support of the initiative. Moreover, more than 250 Latin American public or private organizations have been involved in the development and implementation of plans, strategies and policies, and more than 60,000 people have been trained in many areas linked to climate change. In addition to the information provided in textual format, the ERT noted that the description of projects and programmes provided by the EU in CTF table 9 also indicated how those activities responded to the existing and emerging capacity-building needs of non-Annex I Parties. The activities encompass many elements of capacity-building to reinforce administrative capacities and the development of legal and regulatory frameworks to address and implement climate change mitigation and adaptation actions. These include building resilience to disasters and climate change; promoting capacity-building to mitigate GHG emissions from civil aviation; capacity-building on regulatory reforms and investments in sustainable energy; enhancing capacity in waste management; improving national development plans; and strengthening the capacity of stakeholders.

119. The EU has supported climate-related capacity development activities relating to adaptation, mitigation and multiple other areas. Since the BR4, the focus of support reported in CTF table 9 has remained the same, targeting mainly mitigation. Since its NC7 and BR4, the EU has not reported additional measures and activities in CTF table 9. Comparing the activities described in the BR4 and the BR5, the ERT noted that the EU did not report one of the adaptation programmes included in the BR4 (the Somalia Regional Corridors Infrastructure Programme).

120. The EU has responded to the existing and emerging capacity-building needs of non-Annex I Parties by following the principles of national ownership, country-driven demand and cooperation between donors and across programmes. The ERT noted that the EU reported that, since its support is driven by the partner country, information from partner countries (e.g. through their NCs) is the best means of obtaining a picture of capacity-building support activities and their effectiveness. The EU also reported that partner countries also benefit from capacity-building, research, innovation and analytical tools developed by EU-funded global and regional initiatives.

2. Assessment of adherence to the reporting guidelines

121. The ERT assessed the information reported in the NC8 and BR5 of the EU and identified issues relating to completeness and transparency, and thus adherence to the UNFCCC reporting guidelines on NCs and the UNFCCC reporting guidelines on BRs. The findings are described in tables I.4 and II.4.

3. Reporting on finance and capacity-building information related to the Kyoto Protocol

(a) Technical assessment of the reported information

122. In its NC8, the EU reported its activities, actions and programmes undertaken in fulfilment of its commitments under Article 10 of the Kyoto Protocol. The EU provided information on steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity in order to facilitate implementation of Article 10 of the Kyoto Protocol. In appendix I (table 16) to its NC8, the EU presented a summary of the reporting on supplementary information under Article 10(c) of the Kyoto Protocol and cross-referenced the reporting requirements to the respective section of the NC8 (section 7.6) (see paras. 114–117 above).

123. The EU provided information on its implementation of Article 11 of the Kyoto Protocol. In appendix I (table 16) to its NC8, the EU presented a summary of the reporting on supplementary information under Article 11 of the Kyoto Protocol and cross-referenced the reporting requirements to the respective sections of its NC8 (sections 7.2, 7.3, 7.4 and 7.5). The EU described how its contributions are “new and additional” (see para. 96 above).

124. The EU reported on its financial contributions to the Adaptation Fund, which consisted of USD 11,198,208.29 committed in 2019. This is the first support provided from the EU budget to the Adaptation Fund.

(b) Assessment of adherence to the reporting guidelines

125. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

H. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

126. In its NC8, the EU provided information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation.

127. The EU provided a description of climate change vulnerability and impacts on food production and supply, forestry, water resources and fisheries, infrastructure and urban settlements, transport, energy, biodiversity, ecosystems and ecosystem services, health, economic activity and employment, social issues and finance and highlighted the adaptation response actions taken and planned at different levels of government. These assessments and respective adaptation measures are provided in table 12. To address the vulnerability of the abovementioned sectors the EU reported that adaptation became a significant part of the European Green Deal package. Hence, in parallel to the achievement of the net zero target, the EU aims to reach the resilience society target by 2050. This commitment is embodied in the European Climate Law and is supported by the EU adaptation strategy up to 2030. The EU adaptation strategy aims to make adaptation smarter, faster and more systemic and to step up international action on adaptation to climate change. The European Climate Law provides the foundation for increased ambition and policy coherence on adaptation in order to minimize the current and future impacts of climate change and enhance adaptive capacity, strengthen resilience and reduce vulnerability in EU member States.

128. In terms of risks, the EU provided information on the increased frequency of extreme weather events and the hazards from warming and precipitation. It highlighted that the impacts vary across Europe but generally are more severe in the southern regions. In general, four key risks are evolving: heat leading to mortality and morbidity of people and ecosystem disruptions, reduced agricultural production owing to droughts and heat, water scarcity increasing in all sectors and coastal, riverine and pluvial flooding that harm people, economies and infrastructure. The ERT noted that the assessment of the vulnerability and risks is accompanied by an economic evaluation of the projected losses in the reported sectors and an economic quantification of loss and damage already sustained since 1980. For example, it is estimated that the cost of inaction in Europe in 2050 could be close to EUR 200 billion per year on a 4 °C pathway and more than EUR 100 billion per year on a 2 °C pathway. Additionally, slow onset sea level rise poses an increasing threat to coastal areas, which produce approximately 40 per cent of the EU's GDP and are home to almost 40 per cent of the EU's population. The ERT also noted that the vulnerable sectors cover a broad range of interconnected systems, hence the specific strategies and policies that were adopted or are proposed are very often cross-cutting in nature and cover mitigation and adaptation action. These documents include but are not limited to the Common Agricultural Policy, the EU nitrates directive, the sustainable and smart mobility strategy, the EU forestry strategy, the EU biodiversity strategy and the EU taxonomy for sustainable activities.

129. As mentioned in paragraph 127 above, impetus has been given to addressing adaptation matters with the adoption of the European Climate Law, which provided further direction to government agencies on enhancing preparedness for climate change. The EU

adaptation strategy provides four main directions to ensure that the EU is fully resilient by 2050. These directions include smarter adaptation to improve knowledge and manage uncertainty, more systemic adaptation to support policy development at all sectors and all levels, faster adaptation to speed up the action and stepping up through increasing international action on adaptation, with a focus on SIDS and the LDCs. The NC8 highlighted that the European Climate Law provides the foundation for increased ambition and policy coherence on adaptation in order to minimize the current and future impacts of climate change and enhance adaptive capacities, strengthen resilience and reduce the vulnerability of EU member States.

130. Since 2013, all member States have had a national adaptation strategy or plan and adaptation has been mainstreamed in the EU’s policies and long-term budgets. The Climate Adapt web platform is a key reference for knowledge on adaptation for EU member States to share their knowledge, assist the updating of information and support cooperation among sectors and governance levels. The platform hosts the European Climate and Health Observatory and the European Climate Data Explorer and includes country profiles to show information reported by countries under the EU governance regulation on adaptation. The European Climate and Health Observatory provides access to resources related to climate change and human health. The European Commission launched the Covenant of Mayors – Europe in 2008 to encourage local governments to voluntarily achieve the EU climate and energy targets. Covenant signatories commit to adopting an integrated approach to climate change mitigation and adaptation. In 2021, more than 3,400 cities and towns in the EU participated in the Covenant of Mayors – Europe. In 2021, the European Commission launched an EU mission on adaptation to foster adaptation at the subnational and regional level and support 150 European regions and communities to become climate-resilient by 2030. In 2020, the EU adopted the sustainable finance taxonomy regulation to create a common understanding of sustainable activities, including on adaptation. The aim is to provide companies and investors with the criteria under which certain economic activities can be considered environmentally sustainable. The EU also developed delegated acts to define the technical screening criteria under which selected economic activities could qualify as substantially contributing to the environmental objectives.

131. Since 2013, monitoring and reporting on adaptation has been governed by the EU monitoring mechanism regulation. However, in 2018 the EU adopted the EU regulation on the governance of the Energy Union and climate action, which imposes new reporting requirements on adaptation. The mechanism requires member States to adopt rules on reporting on national adaptation action. According to the regulation, from March 2021 member States are required to submit BRs to the European Commission with information on their national climate change adaptation planning and strategies in accordance with the reporting requirements agreed under the Convention and Paris Agreement. This information will be used to monitor progress and action in adapting to climate change, to inform and support the implementation and review of the EU adaptation strategy, to facilitate the assessment of the EU’s progress towards the adaptation goal of the Paris Agreement, to enable member States and the EU to exchange good practice and to evaluate their needs and level of preparedness to respond to climate change. In line with international reporting arrangements, member States also need to provide overviews or good practice examples on subnational activities with the aim of fostering awareness of adaptation action at other governance levels and to enable the EU to better promote such action.

132. Table 12 summarizes the information on vulnerability and adaptation to climate change presented in the NC8 of the EU.

Table 12
Summary of information on vulnerability and adaptation to climate change reported by the European Union

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Food production and supply	Vulnerability: A combination of heat and drought in summer, aggravated by compound effects of cold winters and excessive precipitation in autumn and spring. Projected decrease in the yields for grain maize and wheat. Increasing water scarcity and subsequent irrigation issues. Negative effects on the production of livestock. Expected

Vulnerable area	Examples/comments/adaptation measures reported
Biodiversity	<p>decrease in economic output from agriculture by 7 per cent across all of Europe and by 10 per cent in southern Europe.</p> <p>Adaptation: Measures at the national or regional level: awareness-raising, practical measures to decrease the impacts and risks of extreme weather events, risk-sharing strategies, developing and implementing infrastructure for irrigation and flood protection. At the farm level: management of soil and water.</p> <p>Vulnerability: Projected losses in native species and the establishment of non-native species in most European regions. Significant risk of species extinction in alpine habitat and the Pyrenees. Projected largest relative species losses for plants and insects. Gradual replacement of native species by warmth-adapted taxa in a 3 °C global warming level scenario.</p> <p>Adaptation: Enlarging the protected areas in the EU on land and at sea to at least 30 per cent of the land, with strict protection for land with a high biodiversity and climate value. Binding targets in the EU nature restoration plan to restore degraded ecosystems and improve sustainable management.</p>
Ecosystems and ecosystem services	<p>Vulnerability: Decrease in the suitable habitat space for current terrestrial and marine ecosystems occurring above 2 °C increase. Probability of heat and drought combined with land-use changes causing long-term effects to local climates, changes in pollination and soil protection services, making them carbon emitters. Projected expansion of fire-prone areas. Acceleration of non-climate impacts resulting in the decline of pollinators, causing habitat loss, pollution, increased use of pesticides, pathogens and invasive alien species. Increased soil erosion from non-climatic impacts such as land-use changes. Decrease in coastal fish stocks of between 10 and 60 per cent. Marine heatwaves and ocean acidification.</p> <p>Adaptation: Monitoring terrestrial ecosystems, adopting a restoration law with legally binding targets for nature restoration in different ecosystems through capturing and storing carbon, mitigating the impact of natural disasters and heatwaves, and the restoration of habitats and peatlands.</p>
Water resources and fisheries	<p>Vulnerability: Abundance of water (coastal, river and pluvial floods) and lack of water (drought, water scarcity). Negative effects on yields from fisheries owing to the northward movement of climatic zones, with losses of 15–35 per cent during the past decade. Overfishing and ocean acidification.</p> <p>Adaptation: Controlling overfishing, facilitating climate proofing of the Common Agricultural Policy, deficit irrigation strategies, water savings and a shift from conventional energy production to renewable energy production.</p>
Forestry	<p>Vulnerability: Drought, excessive rain and the compound hazards of drought and heat. Changes in temperature, precipitation and increased wildfires. Extreme heat and drought, increased forest mortality, water stress, exposure of people to high and extreme fire hazards.</p> <p>Adaptation: Promoting a sustainable forest bioeconomy for long-lived wood products, promoting a non-wood forest-based bioeconomy, protecting primary and old-growth forests, implementing forest restoration activities and reinforcing sustainable forest management, providing financial incentives for forest owners, monitoring, reporting and collecting forest data and investing in research and innovation to improve knowledge.</p>
Health	<p>Vulnerability: Projected decrease in thermal comfort hours by 74 per cent in southern Europe in a 3 °C global warming scenario. Increased pressure on health systems, increased health risks owing to an ageing population, projected increase in mortality from extreme heat, rise of vector-borne diseases and insufficient knowledge on the risks to human health.</p> <p>Adaptation: Improving understanding of effect of climate risks on human health, establishing a collaboration platform on the European Climate and Health Observatory, improving monitoring of vector-borne diseases, improving responses to climate change related disease outbreaks and implementing cross-sectoral policies.</p>
Infrastructure and urban settlements	<p>Vulnerability: High urbanization and extreme heat, floods, drought, wildfires and vector-borne diseases. Projected energy supply and transport infrastructure risks. Increased demand for water and air conditioning. Heatwaves and flooding.</p>

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Economic activity and employment	<p>Adaptation: Increasing understanding of the interaction of different risks, socioecological tipping points and limits to adaptation. Multilevel governance to improve urban adaptation, developing local adaptation plans, improving building cooling and heating systems, improving knowledge on risks and developing risk maps.</p> <p>Vulnerability: Combination of drought, heat and extreme events. Heatwaves and increased risk of occupational injuries resulting in changes in labour productivity. GDP decrease from reduced economic productivity. Loss and damage from climate and weather extremes, which have already amounted to EUR 450–520 billion between 1980 and 2020. Lack of assessment of the risks caused by specific environmental hazards (e.g. heavy precipitation, vector-borne diseases, shifts in biodiversity and ecosystem services) for many economic sectors.</p> <p>Adaptation: Increasing funding for adaptation measures to improve preparedness for extreme weather events and climate-related disasters. Exploring new employment opportunities, improving the understanding of an uneven distribution of climate risks and implementing just resilience policies at all levels.</p>
Social issues	<p>Vulnerability: Exacerbation of poverty and inequality, migration, loss and damage to livelihoods and cultural heritage. Energy poverty and flood vulnerability. Uneven distribution of adaptive capacity. Increased pressure for migration. Loss and damage among indigenous communities in polar regions. Increased risk of damage to the cultural heritage along the coasts of the North Sea and the Mediterranean. Income loss due to reduced tourism.</p> <p>Adaptation: Exemptions for certain products and home heating will be phased out, member States to increase action on overcoming energy poverty through investments in energy efficiency and funding opportunities for social issues from the Social Climate Fund, including gender equality and equal opportunities for all.</p>
Finance	<p>Vulnerability: Included as a sector for the first time. Lack of information on climate risks for finance. Risk that investment might shift towards climate risk-free activities, which might erode financing for climate-prone activities.</p> <p>Adaptation: Increasing understanding of impacts of climate risks on the financial sector, improving taxonomy through the EU taxonomy regulation and providing companies and investors with the criteria under which certain economic activities can be considered environmentally sustainable.</p>
Transport	<p>Vulnerability: Climate and non-climate risks owing to increased impacts of extreme heat, floods and drought, and the subsequent risks for businesses and the energy supply. Road melting, railway asset failures and speed restrictions resulting in the disruption of supply chains. Maritime transport effected by sea level rise, or non-operability due to changes in wave agitation. In the event of higher frequencies of freezing–thawing cycles, a rapid ageing of roads. Landslides. Possible negative effects on airborne transport caused by storm surges and consequent weight restrictions.</p> <p>Adaptation: Updating standards for climate-resilient infrastructure in the transport, energy and building sectors. Establishing a cohesion fund to support transport infrastructure. Adapting to new transport legislation and implementing the EU sustainable and smart mobility strategy.</p>
Energy	<p>Vulnerability: Effects on the availability, transformation, transmission, distribution, storage and demand for energy. Disruptions in the stability of energy systems, leading to curtailments or outages and increased electricity prices.</p> <p>Adaptation: Long-term energy strategies at the national and EU level. Promoting energy efficiency across the sectors, increasing the use of renewables in the production and final consumption of energy. Providing funds for the just/resilient transition towards diversified sources of energy.</p>

133. The EU provided a detailed description of international adaptation activities, including the EU's research framework programme Horizon 2020, the Network for the Coordination and Advancement of Sub-Saharan Africa–EU Science and Technology Cooperation, the Technical Centre for Agricultural and Rural Cooperation and the EU SWITCH to Green Flagship Initiative.

134. The EU reported that its member States were the largest block of contributors to the Green Climate Fund's first replenishment and as at 2019 some EU member States had provided about 95 per cent of their annual voluntary pledges to the Adaptation Fund. In addition, the EU provided information on the memorandum of understanding between EIB and the Global Center on Adaptation to strengthen cooperation on climate change adaptation in the most vulnerable regions. To improve access to direct and indirect insurance coverage against the impacts of climate change, the EU became a member of the InsuResilience Global Partnership for climate and disaster risk finance and insurance solutions, bringing countries, civil society, international organizations, the private sector and academia together.

135. The EU also provided information on bilateral cooperation with developing countries on adaptation. This includes financial support of the regional and sectoral plans, such as national adaptation programmes of action and national adaptation plans.

2. Assessment of adherence to the reporting guidelines

136. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

I. Research and systematic observation

1. Technical assessment of the reported information

137. In its NC8, the EU provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the UNFCCC, the Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the International Resources Panel, the Group on Earth Observation and its Global Earth Observation System of Systems, the Belmont Forum, Mission Innovation and Future Earth. The EU also provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.

138. The EU has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. The NC8 includes projects that are to be finalized in 2022 or later in order to avoid duplication with the NC7, in which the projects were listed up to 2021. The projects included in the NC8 include climate process and climate system studies (10 projects); climate modelling and prediction (9 projects); climate change impacts (8 projects); socioeconomic analysis (9 projects); and mitigation and adaptation approaches (11 projects).

139. During the review, the EU provided information on a recently launched programme, Horizon Europe, which has a time frame of 2021–2027 and which will address global challenges, including, among others, adaptation to climate change. It will support at least 150 European regions and communities in becoming climate resilient by 2030.

140. In terms of activities related to systematic observation, the EU reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. The EU also reported on challenges related to the maintenance of a consistent and comprehensive observation system. The NC8 provides information on the launch of Copernicus 2.0. The Copernicus programme and research infrastructure constitute the main European system for systematically observing the climate using satellites and includes in situ monitoring networks. The NC8 provided updated information on the development and launch of missions for ocean observing systems, terrestrial climate systems, the cryosphere and climate observing systems.

141. The NC8 reflects actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing

countries. The EU supported systematic observation in developing countries by providing access to Copernicus data and services and by supporting the development of climate-relevant research establishments in partner countries. Within the scope of the EU Global Action on Space, webinars targeting, inter alia, South-East Asian, South American and Central American stakeholders were organized to describe the opportunities and benefits of using Copernicus data for climate monitoring. In addition to this open data policy and outreach, Copernicus offers training on how to access and use the data. For example, the C3S User Learning Service co-organized a webinar on the use of the C3S Climate Data Store that targeted African climate and hydrology experts. The RI-VIS Horizon 2020 project aims to increase the visibility of European research establishments to new communities in Europe and beyond, and published white papers in 2021 on recommendations on how to increase collaboration between European research establishments and counterparts from Africa and Latin America. The EU reported that the SEACRIFOG Horizon 2020 project aims to build an integrative network for long-term and sustainable cooperation among African and European environmental research establishments, with a focus on GHG observations.

2. Assessment of adherence to the reporting guidelines

142. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

J. Education, training and public awareness

1. Technical assessment of the reported information

143. In its NC8, the EU provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness; primary, secondary and higher education; public information campaigns; training programmes; education materials; resource or information centres; the involvement of the public and NGOs; and its participation in international activities.

144. The EU reported that the key initiative in this area is the EU Council recommendation on learning for the green transition and sustainable development and the European competence framework on sustainability, adopted in 2022. The recommendation on learning highlights the role of education and training towards the goals of the European Green Deal. The recommendation aims to ensure a fairer, more inclusive and sustainable way of living and working and provides a road map for member States on supporting learning and teaching for the green transition and sustainable development. It calls on member States to make learning for the green transition and sustainable development a priority in education and training policies and programmes; provide all learners with opportunities to learn about the climate crisis and sustainability in both formal education and non-formal education; mobilize national and EU funds to invest in green and sustainable equipment, resources and infrastructure; support educators in developing their knowledge and skills to teach about the climate crisis and sustainability, including dealing with eco-anxiety among their students; create a supportive learning environments for sustainability that spans all activities and operations by an educational institution; enable teaching and learning that is hands-on, interdisciplinary and relevant to local contexts; and actively involve students and staff, local authorities, youth organizations and the research and innovation community in learning for sustainability. In addition, the new European competence framework on sustainability (GreenComp) was introduced to be used in education and training programmes and policies, which sets out the skills that all learners need to develop related to the environment and sustainability. Financial support is available through the Erasmus+, Horizon Europe and other EU funding programmes.

145. In addition, in 2022, the European Commission established a new EU working group on sustainability in school education, which is one of several working groups within the framework of European Education, a working group that has already produced several papers

on improving teaching and learning on sustainability in schools. In January 2022, the European Commission adopted a European strategy for universities. One of the four key objectives of the strategy is to engage universities in unfolding green and digital transitions. The strategy also calls on member States to support universities in their whole-institutional approaches to sustainability. The Education for Climate Coalition was launched in 2020 to support the changes needed for a climate-neutral society. The European Institute of Innovation & Technology Climate-KIC aims at accelerating the transition to net zero by creating networks of expertise through education components. A new phase of the Erasmus+ programme 2021–2027 has a strong focus on the green transition in education and training. Additionally, a new initiative flagged by the EU was the European Climate Pact, launched in 2020 to allow people, industry, civil society and public authorities at all levels to participate in climate action. It provides for individual pledges as well as pledges for businesses, organizations and cities. The first is a pathway pledge, which represents ranges of climate-friendly action; the second is the North Star Pledge, which involves measurable actions contributing to GHG reductions in three main areas: buildings and the workspace; work-related travel; and information technology infrastructure and needs. The European Commission itself pledged to the North Star Pledge and committed to be carbon-neutral by 2030.

146. In terms of public participation, the EU continues public information campaigns within the EU climate week and EU sustainability week and through various digital channels. The year 2022 was declared as youth year and the EU reported on the increased involvement of youth in climate activities, including through the EU youth dialogue process. The Covenant of Mayors – Europe remains a strong initiative that reports on local action. In addition, the EU reported on the monitoring of public opinion on climate change, which was carried out through Special Eurobarometer 490 on climate change in 2019 and Special Eurobarometer 513 on climate change in 2021.

2. Assessment of adherence to the reporting guidelines

147. The ERT assessed the information reported in the NC8 of the EU and recognized that the reporting is complete and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

III. Conclusions and recommendations

148. The ERT conducted a technical review of the information reported in the NC8 of the EU in accordance with the UNFCCC reporting guidelines on NCs. The ERT concluded that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC8 provides an overview of the climate policy of the EU.

149. The information provided in the NC8 includes all the elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. The EU reported on the national system, the national registry, supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, PaMs in accordance with Article 2 of the Kyoto Protocol, domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures, information under Article 10 of the Kyoto Protocol, and financial resources provided to developing country Parties. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol was provided by the EU in its 2022 annual submission.

150. The ERT conducted a technical review of the information reported in the BR5 and BR5 CTF tables of the EU in accordance with the UNFCCC reporting guidelines on BRs. The ERT concluded that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and that the BR5 and its CTF tables provide 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 EU's achievement of its target; and the Party's provision of support to developing country Parties.

151. In its NC8, the EU reported on its key national circumstances related to GHG emissions and removals, including government structure, population size, geographical and climate profile, economic indicators and information on each sector of the economy. The United Kingdom withdrew from the EU in 2020. However, up to 2020, the commitments observed by the EU included the United Kingdom. For after 2020, the EU excludes the United Kingdom from its GHG projections and information on climate change policies. Over the past decade, the EU has consolidated its arrangements, which resulted in a functional measurement, reporting and verification system that can facilitate its transition to the enhanced transparency framework and enable it to share key lessons learned with other countries and regions.

152. The EU-27 and the United Kingdom's total GHG emissions excluding LULUCF and including indirect CO₂ covered by its quantified economy-wide emission reduction target were estimated in 2020 to be 34.4 per cent below its 1990 level. Emissions have been decreasing at a relatively steady rate since 1990. The changes in total emissions were driven mainly by factors such as continued growth in the use of renewables; enhanced energy efficiency; a move towards use of less carbon-intensive fossil fuels; a decrease in solid waste disposal to landfills; reduced use of fertilizers; structural changes in the economy, which resulted in reduced activity in the industry sector and growth in the service sector; and the contraction in economic activity caused by the global economic crisis in 2008 and the pandemic in 2019–2020.

153. As reported in the BR5, under the Convention the EU committed to contributing to the achievement of the joint EU quantified economy-wide target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included. Under the ESD the EU has a target of reducing its emissions by 10 per cent below the 2005 level by 2020.

154. The EU has a joint 2030 emission reduction target of at least 55 per cent below the 1990 level. This will be primarily implemented through the EU ETS and ESR, which have targets to reduce emissions by 2030 by 43 and 30 per cent respectively compared with the 2005 level. The EU has a longer-term commitment of carbon neutrality by 2050.

155. The ERT noted that the total GHG emissions of the EU excluding LULUCF do not exceed the emission level corresponding to the target in 2020, and thus that the EU has achieved its joint target. In absolute terms, this means that under the Convention the EU had to reduce its emissions from 5,709,517.2 kt CO₂ eq (in 1990) to 4,567,613.76 kt CO₂ eq by 2020. The ERT therefore concluded that the EU has met its 2020 commitment under the Convention through domestic actions only and did not use market-based units.

156. The ERT noted that the Party not only has met its 2020 ESD and EU ETS target but that it has overachieved its target compared with 2005, by 18 per cent (instead of 10 per cent) and 43 per cent (instead of 21 per cent) respectively.

157. The GHG emission projections provided by the EU in its NC8 and BR5 correspond to the WEM and WAM scenarios. Under the WEM scenario, emissions excluding LULUCF in 2030 are projected to be 34.8 per cent below the 1990 level and 4.2 per cent below the 2020 level. Under the WAM scenario, emissions excluding LULUCF in 2030 are projected to be 41.3 per cent below the 1990 level and 13.7 per cent below the 2020 level. Under the WEM and the WAM scenarios, the EU is expected to require additional PaMs to achieve the 2030 target. The EU reported on the methodologies and key drivers underlying these projections.

158. The EU's main policy framework relating to energy and climate change is the EU 2030 climate and energy framework. This framework includes EU-wide targets and policy objectives for 2021–2030. The ambition level of the key PaMs under this framework (e.g. at least a 40 per cent cut in GHG emissions (from the 1990 level), at least a 32 per cent share for renewable energy and at least a 32.5 per cent improvement in energy efficiency) is currently being revised to increase the level of ambition. The EU described how the mitigation actions under the EU climate and energy package, most notably the EU ETS and the ESD, along with a number of cross-cutting and sectoral PaMs, have positioned the EU to overachieve its 2020 target and lay the foundation for the 2030 target. Some of these

mitigation actions include the use of renewable energy, energy efficiency, energy taxation, eco-design requirements for products, the 7th Environment Action Programme and the EU clean air policy package. The EU reported on actions to implement the 2030 EU climate and energy package that amended or revised PaMs targeting the EU ETS and ESD sectors, the use of renewable energy, energy efficiency, the energy performance of buildings, CO₂ emissions from vehicles and waste management. The EU also described its actions to support its continued commitment to enhance climate ambition. These actions included the European Green Deal, which commits to a target of at least a 55 per cent reduction compared with 1990 by 2030 and climate neutrality by 2050. These ambitious targets were enshrined in the European Climate Law. The EU's commitment to mitigation action and climate change is demonstrated by the actions to increase the share of financing to implement climate-related PaMs from 20.6 to 31 per cent from 2014–2020 compared with 2021–2027.

159. In its NC8 and BR5, the EU reported information on its provision of financial, technological and capacity-building support to non-Annex I Parties. The EU continued to provide climate financing to developing countries in line with its climate finance projects and programmes. It has slightly increased its contributions, from EUR 11,087.99 million to EUR 11,104.64 million since the BR4 as reported in its local currency; its public financial support in 2019–2020 totalled USD 12,557.47 million. For those years, when multilateral and bilateral support are combined for 2019–2020, the EU provided more support for mitigation, in particular for multilateral channels compared with bilateral finance. The EU provided more support for adaptation through bilateral finance. The overall total of multilateral and bilateral finance provided by the EU increased by 5.0 per cent and decreased by 8.5 per cent respectively since the BR4. The EU did not provide disaggregated information on sectors with regard to financial contributions through multilateral channels in 2019–2020. Regarding bilateral channels, the largest share of support was allocated to the cross-cutting sector, with a particular focus on Europe, Africa and Asia. An example of this support is the Global Climate Change Alliance Plus, with a commitment of EUR 432 million during 2014–2020, which supports adaptation and mitigation and disaster risk reduction efforts in developing countries, in particular the LDCs and SIDS, with a focus on education and research.

160. The EU continued to provide support for technology development and transfer and capacity-building. As shown in CTF table 9, priority for technological support was given to projects and programmes that target adaptation in agriculture in Albania, that boost both rural and urban economies in Nicaragua and that develop smart innovation through research in agriculture in a group of unspecified developing countries. Improvements were noted on the information provided on measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties; for example, support provided to the CTCN to provide technology solutions, capacity-building and advice on policy, legal and regulatory frameworks. A team of climate technology experts from the CTCN, its Consortium and Network works with the national designated entities of countries to provide solutions tailored to the needs of the individual countries, working in collaboration with governments, NGOs, the private sector, academia and research institutions. Since the last review, priority for capacity-building support has remained the same, targeted mainly on mitigation projects and programmes. The EU has not reported implemented additional measures and activities in CTF table 9; however, it provided two additional examples in the textual part of its BR5: on the Global Climate Change Alliance Plus, with regard to support to increase resilience in western Africa countries, and on Euroclima+, with regard to support to foster institutional strengthening processes on climate change mitigation and adaptation, resilience and investment in Latin America.

161. In its NC8, the EU provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. While all EU economic sectors are vulnerable, compared with the NC7 more emphasis was given in the NC8 to the risks to the financial sector and the impacts on food production and supply systems and estimates from loss and damage. Strategic adaptation actions are taken at the EU, member State and municipal level. The EU adaptation strategy aligns with the long-term goal of ensuring social resilience by 2050, whereby member States are mandated by the EU governance regulation to report on progress on adaptation action biennially and the local

authorities that are part of the Covenant of Mayors – Europe should consider adaptation in their 2030 targets. To enforce the adaptation measures, the European Climate Law mandates the EU and its member States to make continuous progress to boost adaptive capacity, strengthen resilience and reduce vulnerability to climate change and to report thereon. A number of funds were proposed to ensure just transition and just resilience for the implementation of climate legislation, such as the Social Climate Fund and funds allocated within Horizon Europe.

162. In its NC8, the EU provided information on its activities relating to research and systematic observation. The EU has launched a new research programme, Horizon Europe, which aims to address global challenges, including by the EU becoming a climate-resilient society by 2030. The EU continues to provide the necessary data and information services to observe and monitor the global environment.

163. In its NC8, the EU provided information on its actions relating to education, training and public awareness. The EU reported that in 2022 the European Council adopted a recommendation on learning for a green transition and sustainable development, which included tools such as the GreenComp framework. The EU also launched the European Climate Pact to incentivize people, businesses, cities and organizations to commit to climate action. Through the European Climate Pact, the European Commission committed to carbon neutrality by 2030. Another initiative launched in 2020 was the Education for Climate Coalition to co-create learning on climate resilience and to bridge the gap between education and science. The NC8 also highlights the use of various communication channels to improve public involvement and awareness on climate change topics. The EU continues to monitor public opinion through Eurobarometer surveys.

164. 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 NCs in its next NC:

- (a) To improve the completeness of its reporting by:
 - (i) Providing estimates of the total aggregated effect of PaMs for the most recent inventory year (see issue 1 in table I.2);
 - (ii) Providing an overview of the key sector-specific information, such as primary energy consumption, electricity generation and transport volume, in the GHG projections (see issue 3 in table I.2);
 - (iii) Providing information on the support that the EU has disbursed and committed for assisting non-Annex I Parties in addressing the economic and social consequences of response measures, where appropriate (see issue 2 in table I.3);
- (b) To improve the transparency of its reporting by:
 - (i) Providing quantitative estimates of the impact of its PAMs resulting from the impact assessment, as appropriate (see issue 2 in table I.1);
 - (ii) Providing information on support provided that excludes the support provided to Annex I Parties from the values for the total support provided (see issue 1 in table I.3);
 - (iii) Providing consistent information in the report and CTF table 7(b) on the types of funding source used for providing assistance to developing countries and on the types of financial instrument used for providing assistance to developing countries in the report and CTF table 7(a) and (b) (see issue 3 in table I.3);
 - (iv) Providing disaggregated information in CTF table 7(a) on the annual financial support that it has provided for the purpose of assisting developing countries, including information on funding source, financial instrument, type of support and sector (see issue 4 in table I.3).

165. In the course of the review of the EU's NC8, the ERT noted the following finding relating to adherence to the reporting guidelines for supplementary information, namely an issue with the transparency of its reporting relating to providing the name and contact information of the registry administrator designated by the Party to maintain the national registry (see issue 1 in table I.4). The ERT concludes that this potential problem of a

mandatory nature does not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol.

166. In the course of the review of the EU's BR5, the ERT noted the following findings relating to adherence to the UNFCCC reporting guidelines on BRs:

- (a) Issues with the completeness of its reporting relating to:
 - (i) Providing an overview of key sector-specific information, such as primary energy consumption, electricity generation and transport volume, in the GHG projections to the extent possible (see issue 2 in table II.3);
 - (ii) Providing, where appropriate, information on the support that it has disbursed and committed for assisting non-Annex I Parties in addressing the economic and social consequences of response measures (see issue 2 in table II.4);
- (b) Issues with the transparency of its reporting relating to:
 - (i) The quantitative estimates of the impacts of its mitigation actions in CTF table 3 (see issue 1 in table II.1);
 - (ii) Providing information on support provided that excludes the support provided to Annex I Parties from the values for the total support provided (see issue 1 in table II.4);
 - (iii) Providing consistent information in the report and CTF table 7(b) on the types of funding source used for providing assistance to developing countries and on the types of financial instrument used for providing assistance to developing countries in the report and CTF table 7(a) and (b) (see issue 3 in table II.3);
 - (iv) Providing disaggregated information in CTF table 7(a) on the annual financial support that it has provided for the purpose of assisting developing countries, including information on funding source, financial instrument, type of support and sector (see issue 4 in table II.3).

Annex I

Assessment of adherence to the reporting guidelines for the eighth national communication of the European Union

Tables I.1–I.4 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on NCs for the EU’s NC8.

Table I.1

Findings on policies and measures from the review of the eighth national communication of the European Union

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 11 Issue type: transparency Assessment: encouragement	<p>The EU did not explicitly report planned measures for 2020–2030 as the new Fit for 55 legislative package had not yet been adopted.</p> <p>During the review, the EU explained that, in most cases, planned PaMs replace PaMs that are currently under implementation. In order to avoid duplication, only the implemented directive is reported in CTF table 3. Information on planned PaMs can be found in the BR5 (e.g. section 4.3.1.2, on energy efficiency). In addition, new PaMs are proposed as part of strategies. As an example, the EU CH₄ strategy contains proposals for future measures. Such strategies are reported as adopted in CTF table 3 because the strategies themselves constitute final, published documents.</p> <p>The ERT encourages the EU to improve the transparency of its reporting in its next NC by explicitly identifying planned PAMs to the extent that its decision-making process allows.</p>
2	Reporting requirement specified in paragraph 20 Issue type: transparency Assessment: recommendation	<p>In its reporting on PaMs, the EU provided the estimated emission reduction impacts for some of its PaMs (i.e. 30 out of 71 reported in CTF table 3) for some years and included impacts for some significant PaMs, such as the EU ETS and the effort-sharing legislation, for 2030 only.</p> <p>During the review, the EU further elaborated on the challenges, noting that the most important challenge for not reporting estimated emission impacts is that the final legislation may differ from the proposed legislation, and it may combine various options addressed by the impact assessment. The EU also reported several other challenges, such as that the impact assessments consider the combination of several PaMs and the interactive impacts need to be isolated and the impacts of PaMs depend on the electricity mix, which is in turn affects the estimated impact of the emissions. However, the EU acknowledged that most of the PaMs are subject to an impact assessment and this impact assessment reports the estimated effects, albeit ex ante. Where estimated impacts were not provided, the Party explained the rationale: (1) many of the PaMs are strongly interlinked and therefore it is difficult to attribute a planned or achieved emission reduction to specific PaMs; (2) in many cases an estimate of the mitigation impact of individual PaMs is not available because the final legislation may differ from the proposed legislation; (3) the impact assessments consider the combination of several PaMs; and (4) some of the impact is uncertain, as it depends on the electricity mix, which is in turn affected by other European and national policies and which changes over time.</p> <p>The ERT recommends that the EU improve the transparency of its reporting in its next NC by providing quantitative estimates of the impact of its PaMs resulting from the impact assessment, as appropriate, and if such estimation is not possible, explain why in the NC. Presenting this information, even as a range if appropriate, would help to promote greater transparency.</p>

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

Table I.2

Findings on projections including aggregate effects of policies and measures reported in the eighth national communication of the European Union

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 37 Issue type: completeness Assessment: recommendation	<p>The EU did not provide an estimate of the total aggregated effect of PaMs for the most recent inventory year in the NC8.</p> <p>During the review, the EU explained that the aggregate effect of PaMs is not available for the most recent inventory year as a WOM scenario is not a mandatory reporting requirement under the EU regulation on the governance of the Energy Union and climate action, and there are currently no plans to include this information in future reports.</p> <p>The ERT recommends that the EU provide an estimate of the total aggregated effect of PaMs for the most recent inventory year in order to improve the completeness of its reporting in its next NC.</p>
2	Reporting requirement specified in paragraph 45 Issue type: completeness Assessment: recommendation	<p>The EU did not provide relevant information on factors and activities for each sector to provide the reader with an understanding of past and future emission trends. In the NC8, the EU included an explanation of why relevant information on factors and activities for each sector are difficult to compile as the EU projection is an aggregation of individual member States' projections, stating that sector-specific data such as electricity generation and transport volume are not a mandatory reporting requirement under the European Commission implementing regulation, resulting in a varying number of member States reporting.</p> <p>During the review, the EU further explained that sectoral parameters and drivers reported in the projections vary among member States. Since the EU projection is an aggregation of individual member States' projections, it is not possible to compile a homogeneous data set. The EU provided a link to information on sector-specific parameters, such as primary energy consumption, electricity generation and transport volume, from the EU reference scenario and the European Green Deal policy package.</p> <p>The ERT reiterates the recommendation from the previous review report that the EU improve the completeness of its reporting in its next NC by including an overview of key sector-specific information, such as primary energy consumption, electricity generation and transport volume, in the GHG projections to the extent possible or by referring to the sector-specific parameters available from the EU reference scenario.</p>

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

Table I.3

Findings on financial, technological and capacity-building support from the review of the eighth national communication of the European Union

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 48 Issue type: transparency Assessment: recommendation	<p>The ERT noted that the EU reported its bilateral support allocated to some Annex I Parties in 2019–2020, despite the UNFCCC reporting guidelines on NCs indicating that reporting should only include support provided to non-Annex I Parties. The ERT also noted that the EU did not follow the recommendation from the previous review on excluding support provided to Annex I Parties from the values for total support provided.</p> <p>During the review, the EU flagged that the support to Annex I Parties is reported because in its understanding those Parties are also developing countries, according to the OECD classification. The EU also explained that this approach was adopted for consistency with previous reports and intends to continue doing so in future reports.</p> <p>The ERT recommends that the EU increase the transparency of its reporting in the next NC by excluding support provided to Annex I Parties to the Convention from the values for total support provided.</p>

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
2	<p>Reporting requirement specified in paragraph 52</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>The ERT noted that the Party did not provide information on the financial support that it has disbursed and committed to address the economic and social consequences of response measures.</p> <p>During the review, the EU explained that its tracking and reporting of climate finance are not designed to provide granular information specifically on adaptation support and the economic and social consequences of response measures. The EU also noted that there are projects referenced either in the text of the BR5 or in the CTF tables that support developing countries in addressing the economic and social consequences of response measures; for example, the Global Climate Change Alliance Plus and the Latin American Investment Facility.</p> <p>The ERT recommends that the EU improve the completeness of its reporting in the next NC by including in its next report information on the support that it has disbursed and committed for the purpose of assisting non-Annex I Parties to address the economic and social consequences of response measures, where appropriate.</p>
3	<p>Reporting requirement specified in paragraph 53</p> <p>Issue type: transparency</p> <p>Assessment: recommendation</p>	<p>The EU reported in its NC8 that of the total multilateral climate finance provided in 2019–2020, EUR 1.5 billion was channelled to developing countries as ODA and EUR 195 million was delivered as OOF. The remaining EUR 4.3 billion was classified as ‘other’. However, the ERT noted that the EU included information on the types of funding source used for providing assistance to developing countries only as ODA in CTF table 7(b).</p> <p>The ERT also noted that the EU included information on the types of financial instrument used for providing assistance to developing countries, which was reported only as grants in CTF tables 7(a) and (b). However, the ERT noted that the EU reported in item 7.4 of the NC8 that all EIB funds that are reported as resources through multilateral channels are provided in the form of loans, alongside several equity investments, grants and guarantees.</p> <p>During the review, the EU reported that CTF table 7(b) includes the information on public financial support through bilateral channels that has been committed by the European Commission in the form of grants and is eligible as ODA. The EU also explained that it is not possible to establish whether a given loan is concessional or not at the time of signature, and therefore whether it is classified as ODA or OOF. Finally, the EU reported that all funds provided by the European Commission are grants. These funds are reported in CTF tables 7(a) and (b).</p> <p>The ERT recommends that the EU improve transparency by keeping consistency between the information provided in the NC and CTF table 7(b) on the types of funding source used for providing assistance to developing countries; and on the types of financial instrument used for providing assistance to developing countries in the NC and CTF tables 7(a) and (b).</p>
4	<p>Reporting requirement specified in paragraph 53</p> <p>Issue type: transparency</p> <p>Assessment: recommendation</p>	<p>The ERT noted that there is no disaggregated information in CTF table 7(a) on funding source, financial instrument, type of support and sector.</p> <p>During the review, the EU explained that disaggregated information on sectors and types and instrument for support by EIB is included in tables 40 and 41 in appendix II to the EU’s BR5. This is explained in field 4 of the documentation box related to CTF table 7. Details include the recipient country/region; funding instrument; classification of support (ODA/OOF, other); type of support (mitigation, adaptation, cross-cutting); operation name; and operation description.</p> <p>The ERT recommends that the EU increase the transparency of its next report by providing disaggregated information in CTF table 7(a) on the annual financial support that it has provided for the purpose of assisting developing countries, including information on funding source, financial instrument, type of support and sector, noting that this will also help it to avoid erroneous attribution and earmarking of projects under its financial support.</p>

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

Table I.4

Findings on minimization of adverse impacts and supplementary information related to the Kyoto Protocol reported in the eighth national communication of the European Union

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 32 Issue type: transparency Assessment: recommendation	<p>The EU did not include in its NC8 the name and contact information of the registry administrator designated by the Party to maintain the national registry. However, the Party reported that this information has not changed from the NC7.</p> <p>During the review, the EU reconfirmed that no changes were made in the registry administrator designated by the Party and the same administrator, the Directorate-General for Climate Action, continues to provide the services required.</p> <p>The ERT reiterates the recommendation from the previous review report. The ERT concludes that this potential problem of a mandatory nature does not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol.</p>

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

Annex II

Assessment of adherence to the reporting guidelines for the fifth biennial report of the European Union

The BR5 of the EU is the final BR under the measurement, reporting and verification system established under the Convention.¹ Nevertheless, the ERTs continue to provide recommendations and encouragements to Parties on completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. Parties may find these recommendations and encouragements relevant, as appropriate, when preparing their initial biennial transparency report under the enhanced transparency framework under the Paris Agreement. Tables II.1–II.3 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on BRs for the EU’s BR5.

Table II.1

Findings on mitigation actions and their effects from the review of the fifth biennial report of the European Union

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in CTF table 3 Issue type: transparency Assessment: recommendation	<p>In its reporting on PaMs, the EU provided the estimated emission reduction impacts for some of its PaMs (i.e. 30 out of 71 reported in CTF table 3) for some years and included impacts for some significant PaMs, such as the EU ETS and the effort-sharing legislation, for 2030 only.</p> <p>During the review, the EU further elaborated on the challenges, noting that the most important challenge for not reporting estimated emission impacts is that the final legislation may differ from the proposed legislation, and it may combine various options addressed by the impact assessment. The EU also reported several other challenges, such as that the impact assessments consider the combination of several PaMs and the interactive impacts need to be isolated and the impacts of PaMs depend on the electricity mix, which is in turn affects the estimated impact of the emissions. However, the EU acknowledged that most of the PaMs are subject to an impact assessment and this impact assessment reports the estimated effects, albeit ex ante. Where estimated impacts were not provided, the Party explained the rationale: (1) many of the PaMs are strongly interlinked and therefore it is difficult to attribute a planned or achieved emission reduction to specific PaMs; (2) in many cases an estimate of the mitigation impact of individual PaMs is not available because the final legislation may differ from the proposed legislation; (3) the impact assessments consider the combination of several PaMs; and (4) some of the impact is uncertain, as it depends on the electricity mix, which is in turn affected by other European and national policies and which changes over time.</p> <p>The ERT recommends that the EU improve the transparency of its reporting by providing quantitative estimates of the impact of its PaMs resulting from the impact assessment, as appropriate, and if such estimation is not possible, explain why. Presenting this information, even as a range if appropriate, would help to promote greater transparency.</p>

Note: Item listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on BRs or to the CTF table number from the “Common tabular format for ‘UNFCCC biennial reporting guidelines for developed country Parties’”. The reporting on the requirements not included in this table is considered to be complete and transparent, and thus adheres to the UNFCCC reporting guidelines on BRs.

¹ The Conference of the Parties, by decision 1/CP.24, decided that the final BRs shall be those submitted to the secretariat no later than 31 December 2022 and reaffirmed that, for Parties to the Paris Agreement, following the submission of the final BR, the modalities, procedures and guidelines contained in the annex to decision 18/CMA.1 will supersede the measurement, reporting and verification system established by decision 1/CP.16, paras. 40–47 and 60–64, and decision 2/CP.17, paras. 12–62.

Table II.2

Findings on projections reported in the fifth biennial report of the European Union

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 45 Issue type: completeness Assessment: recommendation	<p>The EU did not provide relevant information on factors and activities for each sector to provide the reader with an understanding of past and future emission trends. In the NC8, the EU included an explanation of why relevant information on factors and activities for each sector are difficult to compile as the EU projection is an aggregation of individual member States’ projections, stating that sector-specific data such as electricity generation and transport volume are not a mandatory reporting requirement under the European Commission implementing regulation, resulting in a varying number of member States reporting.</p> <p>During the review, the EU further explained that sectoral parameters and drivers reported in the projections vary among member States. Since the EU projection is an aggregation of individual member States’ projections, it is not possible to compile a homogeneous data set. The EU provided a link to information on sector-specific parameters, such as primary energy consumption, electricity generation and transport volume, from the EU reference scenario and the European Green Deal policy package.</p> <p>The ERT reiterates the recommendation from the previous review report that the EU improve the completeness of its reporting by including an overview of key sector-specific information, such as primary energy consumption, electricity generation and transport volume, in the GHG projections to the extent possible or by referring to the sector-specific parameters available from the EU reference scenario.</p>

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 and transparent, and thus adheres to the UNFCCC reporting guidelines on NCs and on BRs.

Table II.3

Findings on provision of financial, technological and capacity-building support to developing country Parties from the review of the fifth biennial report of the European Union

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 13 Issue type: transparency Assessment: recommendation	<p>The ERT noted that the EU reported its bilateral support allocated to some Annex I Parties in 2019–2020, despite the UNFCCC reporting guidelines on BRs indicating that reporting should only include support provided to non-Annex I Parties. The ERT also noted that the EU did not follow the recommendation from the previous review on excluding support provided to Annex I Parties from the values for total support provided.</p> <p>During the review, the EU flagged that the support to Annex I Parties is reported because in its understanding those Parties are also developing countries, according to the OECD classification. The EU also explained that this approach was adopted for consistency with previous reports and intends to continue doing so in future reports.</p> <p>The ERT recommends that the EU increase the transparency of its reporting by excluding support provided to Annex I Parties to the Convention from the values for total support provided.</p>
2	Reporting requirement specified in paragraph 17 Issue type: completeness Assessment: recommendation	<p>The EU described how the financial support provided assisted non-Annex I Parties in mitigating GHG emissions and adapting to the adverse effects of climate change and in capacity-building and technology transfer in the areas of mitigation and adaptation. However, the ERT noted that there is no information on financial support provided to address the economic and social consequences of response measures.</p> <p>During the review, the EU explained that its tracking and reporting of climate finance is not designed to provide granular data on adaptation to the economic and social consequences of response measures. The EU also reported that there are projects referenced either in the text of the BR or in the CTF tables that support developing countries in addressing the economic and social consequences of response measures; for example, the Global Climate Change Alliance Plus and the Latin American Investment Facility.</p>

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
3	Reporting requirement specified in paragraph 18 Issue type: transparency Assessment: recommendation	<p>The ERT recommends that the EU improve the completeness of its reporting by providing information on the support that it has disbursed and committed for the purpose of assisting non-Annex I Parties to address the economic and social consequences of response measures, where appropriate.</p> <p>The EU reported in its BR5 that of the total multilateral climate finance provided in 2019–2020, EUR 1.5 billion was channelled to developing countries as ODA and EUR 195 million was delivered as OOF. The remaining EUR 4.3 billion was classified as ‘other’. However, the ERT noted that the EU included information on the types of funding source used for providing assistance to developing countries only as ODA in CTF table 7(b).</p> <p>The ERT also noted that the EU included information on the types of financial instrument used for providing assistance to developing countries, which was reported only as grants in CTF tables 7(a) and 7(b). However, the ERT noted that the EU reported in item 6.3.2 of the BR5 that all EIB funds that are reported as resources through multilateral channels are provided in the form of loans, alongside several equity investments, grants and guarantees.</p> <p>During the review, the EU reported that CTF table 7(b) includes the information on public financial support through bilateral channels that has been committed by the European Commission in the form of grants and is eligible as ODA. The EU also explained that it is not possible to establish whether a given loan is concessional or not at the time of signature, and therefore whether it is classified as ODA or OOF. Finally, the EU reported that all funds provided by the European Commission are grants. These funds are reported in CTF tables 7(a) and (b).</p>
4	Reporting requirement specified in paragraph 18 Issue type: transparency Assessment: recommendation	<p>The ERT recommends that the EU improve transparency by keeping consistency between the information provided in the textual part and CTF table 7(b) on the types of funding source used for providing assistance to developing countries; and on the types of financial instrument used for providing assistance to developing countries in the textual part and CTF tables 7(a) and (b).</p> <p>The ERT noted that there is no disaggregated information in CTF table 7(a) on funding source, financial instrument, type of support and sector.</p> <p>During the review, the EU explained that disaggregated information on sectors and types and instrument for support by EIB is included in tables 40 and 41 in appendix II to the EU’s BR5. This is explained in field 4 of the documentation box related to CTF table 7. Details include the recipient country/region; funding instrument; classification of support (ODA/OOF, other); type of support (mitigation, adaptation, cross-cutting); operation name; and operation description.</p> <p>The ERT recommends that the EU increase transparency by providing disaggregated information in CTF table 7(a) on the annual financial support that it has provided for the purpose of assisting developing countries, including information on funding source, financial instrument, type of support and sector, noting that this will also help it to avoid erroneous attribution and earmarking of projects under its financial support.</p>

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 and transparent, and thus adheres to the UNFCCC reporting guidelines on BRs.

Annex III

Documents and information used during the review

A. Reference documents

2022 GHG inventory submission of the EU. Available at <https://unfccc.int/ghg-inventories-annex-i-parties/2022>.

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

BR5 CTF tables of the EU. Available at <https://unfccc.int/BRs>.

BR5 of the EU. Available at <https://unfccc.int/BRs>.

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

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

“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/2019/13/Add.1. Available at <https://unfccc.int/documents/210471>.

“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>.

NC8 of the EU. Available at <https://unfccc.int/NC8>.

Report on the technical review of the BR4 of the EU. FCCC/TRR.4/EU. Available at <https://unfccc.int/documents/228717>.

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

B. Additional information provided by the Party

Responses to questions during the review were received from Roxanne Lake and Olivier Juvyns (European Commission, Directorate-General for Climate Action), including additional material. The following references were provided by the European Union and may not conform to UNFCCC editorial style as some have been reproduced as received:

EU adaptation strategy, 2021. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082&from=EN>.

European Environment Agency. Climate change adaptation in the agriculture sector in Europe, Publications Office, 2019. Available at <https://data.europa.eu/doi/10.2800/537176E>.

Bisselink B et al. (2020) Climate change and Europe’s water resources, Office of the European Union, Luxembourg, ISBN 978-92-76-10398-1. Available at https://joint-research-centre.ec.europa.eu/system/files/2020-05/pesetaiv_task_10_water_final_report.pdf.

European Union forest strategy for 2030. COM(2021)572 final. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0572>.

European Environment Agency 2020. Urban adaptation in Europe. Available at <https://www.eea.europa.eu/publications/urban-adaptation-in-europe>.

European Union High-Level Expert Group on Sustainable Finance 2018. Financing a sustainable European economy. Available at https://finance.ec.europa.eu/system/files/2018-01/180131-sustainable-finance-final-report_en.pdf.

Sustainable and smart mobility strategy – putting European transport on track for the future. COM(2020) 789 final. Available at https://eur-lex.europa.eu/resource.html?uri=cellar:5e601657-3b06-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&format=PDF.

Proposal for a Council recommendation on learning for the green transition and sustainable development. Available at <https://data.consilium.europa.eu/doc/document/ST-9242-2022-INIT/en/pdf>.
