



United Nations

FCCC/TRR.3/EU



Framework Convention on
Climate Change

Distr.: General
20 August 2018

English only


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

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

GE.18-13650(E)



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Contents

	<i>Paragraphs</i>	<i>Page</i>
Abbreviations and acronyms		3
I. Introduction and summary	1–6	4
A. Introduction.....	1–3	4
B. Summary	4–6	4
II. Technical review of the information reported in the third biennial report	7–127	5
A. Information on greenhouse gas emissions and removals related to the quantified economy-wide emission reduction target.....	7–11	5
B. Assumptions, conditions and methodologies related to attainment of the quantified economy-wide emission reduction target.....	12–18	6
C. Progress made towards the achievement of the quantified economy-wide emission reduction target.....	19–94	8
D. Provision of financial, technological and capacity-building support to developing country Parties.....	95–127	22
III. Conclusions and recommendations	128–140	27
Annex		
Documents and information used during the review		30

Abbreviations and acronyms

AEA	annual emission allocation
AR4	Fourth Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
ESD	effort-sharing decision
EU	European Union
EU CAP	European Union Common Agricultural Policy
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IE	included elsewhere
IPPU	industrial processes and product use
LDC	least developed country
LULUCF	land use, land-use change and forestry
MMR	monitoring mechanism regulation
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NF ₃	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N ₂ O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2”
SF ₆	sulfur hexafluoride
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the BR3¹ of the EU. The review was organized by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention” (annex to decision 13/CP.20).

2. In accordance with the same decision, a draft version of this report was transmitted to the EU, which provided comments that were considered and incorporated with revisions into this final version of the report.

3. The review was conducted from 5 to 9 March 2018 in Brussels by the following team of nominated experts from the UNFCCC roster of experts: Mr. Marko Aunedi (Croatia), Ms. Eglantina Bruci (Albania), Ms. Baasansuren Jamsranjav (Mongolia), Mr. Tendayi Marowa (Zimbabwe) and Mr. Alexander Zahar (Australia). Ms. Bruci and Mr. Zahar were the lead reviewers. The review was coordinated by Ms. Katia Simeonova and Mr. Davor Vesligaj (UNFCCC secretariat).

B. Summary

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

1. Timeliness

5. The BR3 was submitted on 19 December 2017, before the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were also submitted on 19 December 2017.

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

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

Table 1

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

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
GHG emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Transparent	
Progress in achievement of targets	Mostly complete	Mostly transparent	Issue 1 in table 4 and issue 1 in table 9
Provision of support to developing country Parties	Complete	Transparent	

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

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

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

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

1. Technical assessment of the reported information

7. Total GHG emissions² excluding emissions and removals from LULUCF decreased by 23.7 per cent between 1990 and 2015, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 26.0 per cent over the same period. Table 2 illustrates the emission trends by sector and by gas for the EU.

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

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2014	2015	1990–2015	2014–2015	1990	2015
1. Energy	4 336 581.58	4 004 540.22	3 789 987.05	3 328 575.35	3 357 969.82	–22.6	0.9	76.9	77.9
A1. Energy industries	1 679 561.37	1 509 125.38	1 445 209.92	1 254 265.88	1 242 009.08	–26.1	–1.0	29.8	28.8
A2. Manufacturing industries and construction	836 387.05	679 482.24	537 375.09	481 604.01	483 402.49	–42.2	0.4	14.8	11.2
A3. Transport	781 807.81	918 012.20	931 307.42	891 609.21	905 887.84	15.9	1.6	13.9	21.0
A4. and A5. Other	847 781.72	766 627.95	780 282.59	611 733.33	637 407.88	–24.8	4.2	15.0	14.8
B. Fugitive emissions from fuels	191 043.63	131 292.44	95 812.03	89 362.92	89 262.53	–53.3	–0.1	3.4	2.1
C. CO ₂ transport and storage	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NA	NA	NA	NA
2. IPPU	516 886.29	452 490.84	390 007.58	378 030.51	373 937.41	–27.7	–1.1	9.2	8.7
3. Agriculture	548 269.51	464 472.12	425 548.98	433 853.16	436 748.31	–20.3	0.7	9.7	10.1
4. LULUCF	–231 763.20	–300 855.94	–320 231.10	–309 405.55	–304 854.82	31.5	–1.5	NA	NA
5. Waste	240 947.79	230 732.06	169 658.57	144 372.15	139 312.78	–42.2	–3.5	4.3	3.2
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Indirect CO ₂	4 394.60	2 707.55	2 012.36	1 646.91	1 661.88	–62.2	0.9	NA	NA
<i>Gas^a</i>									
CO ₂	4 457 424.17	4 162 645.82	3 930 649.49	3 468 722.54	3 498 051.30	–21.5	0.8	79.0	81.2
CH ₄	728 408.46	606 472.00	492 177.63	458 434.26	456 014.30	–37.4	–0.5	12.9	10.6
N ₂ O	384 989.38	305 219.75	239 234.14	235 046.56	235 991.55	–38.7	0.4	6.8	5.5
HFCs	29 125.49	53 224.22	102 222.61	112 694.77	107 610.61	269.5	–4.5	0.5	2.5
PFCs	25 870.24	12 188.07	3 878.08	3 502.40	3 575.98	–86.2	2.1	0.5	0.1
SF ₆	11 002.95	10 585.70	6 431.49	6 135.90	6 413.32	–41.7	4.5	0.2	0.1
NF ₃	23.78	103.44	119.45	74.34	69.18	191.0	–6.9	0.0	0.0

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified. Values in this paragraph were calculated on the basis of the EU’s 2017 annual GHG inventory submission, version 2.

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2014	2015	1990–2015	2014–2015	1990	2015
	Total GHG emissions without LULUCF	5 642 685.16	5 152 235.24	4 775 202.18	4 284 831.17	4 307 968.32	-23.7	0.5	100.0
Total GHG emissions with LULUCF	5 410 921.96	4 851 379.30	4 454 971.08	3 975 425.61	4 003 113.50	-26.0	0.7	NA	NA
Total GHG emissions without LULUCF, including indirect CO₂	5 647 079.76	5 154 942.80	4 777 214.54	4 286 478.07	4 309 630.20	-23.7	0.5	100.0	100.0
Total GHG emissions with LULUCF, including indirect CO₂	5 415 316.56	4 854 086.85	4 456 983.44	3 977 072.52	4 004 775.38	-26.0	0.7	NA	NA

Source: GHG emission data: the EU's 2017 annual GHG inventory submission, version 2.

^a Emissions by gas without LULUCF and without indirect CO₂.

8. The decrease in total emissions was driven mainly by factors such as the increased use of renewable energy sources, the shift from coal to gas for electricity and heat production, energy efficiency improvements, structural changes in the economy with reduced activity in the industrial sector and growth in the services sector, economic recession, changes in prevailing weather patterns, and policies at both EU and member State level. These drivers also led to the decoupling of GDP and GHG emissions in the EU. The only major sector with increased emissions between 1990 and 2015 was the transport sector.

9. During the review, the ERT was provided with information from an approximated EU GHG emission inventory for 2016, published in October 2017, which suggested a continuation of the existing decreasing emission trend at the EU level, whereby GHG emissions in 2016 declined by 0.7 per cent compared with the 2015 level.

10. The EU MMR (525/2013) provides the legal basis for the compilation of the EU GHG inventory. The EU inventory was compiled from data delivered by its 28 member States and Iceland by 15 March 2017, and was subsequently updated on the basis of any further data received by 8 May 2017. No changes were reported in the inventory arrangements since the BR2.

2. Assessment of adherence to the reporting guidelines

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

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

1. Technical assessment of the reported information

12. For the EU the Convention entered into force on 21 March 1994. The EU and its member States communicated an independent quantified economy-wide emission reduction target of a 20 per cent emission reduction by 2020 compared with the 1990 level. Under the conditions set out by the European Council in December 2009 and as part of a global and comprehensive agreement for the period beyond 2012, the EU reiterated its conditional offer to move to a 30 per cent emission reduction by 2020 compared with the 1990 level provided that other developed countries commit themselves to comparable emission reductions and

that developing countries contribute adequately according to their responsibilities and respective capabilities.

13. The emission reduction target for the EU and its member States is formalized in the EU 2020 climate and energy package, which was adopted in 2009. 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. The EU member States are generally allowed to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU ETS. The EU 2020 climate and energy package also includes targets of a 20 per cent share of renewable energy in gross final energy consumption and a 20 per cent improvement in energy efficiency by 2020.

14. The EU 2020 climate and energy package includes the EU ETS and the ESD (see chapter II.C.1 below). The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emissions cap has been put in place for the period 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from non-ETS sectors are regulated through member State specific targets that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020.

15. National emission targets for non-ETS sectors for 2020 have been translated into binding quantified AEAs for the period 2013–2020. The 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 2020.³

16. The EU target has been broken down to targets at the individual member State level, which range from 20 per cent below to 20 per cent above the 2005 level by 2020. The 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 decision 2013/162/EU. Up to a certain limitation, the ESD allows member States to use the flexibility provisions for meeting their annual targets by carrying over overachievements to subsequent years within each member State, transferring AEAs between member States and using international credits (i.e. credits from joint implementation and the clean development mechanism). Since the publication of the BR2, the AEAs have been adjusted by decisions 2013/634/EU and 2017/1471/EU.

17. During the review, the EU provided information to the ERT on its NDC under the Paris Agreement, which represents a binding target of at least a 40 per cent emission reduction by 2030 compared with the 1990 level and has to be fulfilled jointly by the EU and its member States. Most of the recent climate and energy policies are forward looking towards delivering on the EU's NDC, including the new 2030 climate and energy framework and the regulation of the governance of the Energy Union (see para. 27 below).

2. Assessment of adherence to the reporting guidelines

18. The ERT assessed the information reported in the BR3 of the EU and recognized that the reporting on the quantified economy-wide emission reduction target is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

³ According to the EU transaction log, available at <http://ec.europa.eu/environment/ets/esdAllocations.do?languageCode=en>.

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

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

19. The EU provided comprehensive and well-organized information on its package of PaMs implemented, adopted and planned by sector and by gas at the EU level, in order to fulfil its commitments under the Convention and its Kyoto Protocol. The EU reported on its policy context and legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs. The ERT noted that national PaMs developed and implemented at the member State level are outside the scope of the EU's BR3.

20. The EU provided information on a set of PaMs that is to a large extent similar to that previously reported in the BR2. However, the ERT noted that the EU reported on a number of new PaMs that were implemented or adopted or had been in the planning stage since the BR2, which suggests that it is expanding the scope of and strengthening its overall climate and energy policy framework, including PaMs on heating and cooling, clean energy innovation, the circular economy, low-emission mobility, energy labelling, combined transport of goods, and eco-design requirements for different consumer products. The ERT noted that many of the new PaMs have been launched to contribute towards the EU's NDC for the period 2021–2030, including the 2030 climate and energy framework.

21. There were no changes made since the previous submission to the institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target.

22. The EU reported on its self-assessment of compliance with its emission reduction target and national rules for taking action against non-compliance.

23. 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 directive,⁴ the ESD⁵ and the directives on renewable energy⁶ and carbon capture and storage.⁷ The package is complemented by two further legislative acts: the regulation on the 2020 targets for CO₂ emissions from cars⁸ and a directive on fuel quality.⁹ The regulation on the 2020 targets for CO₂ emissions from vans was adopted in 2011¹⁰ and the energy efficiency directive in 2012.¹¹ These legislative acts are crucial for attaining the EU-wide emission reduction target by 2020 and are supplemented by two general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

24. The EU ETS is a cap-and-trade system that operates in all of the 28 EU member States as well as in three non-EU countries (Iceland, Liechtenstein and Norway). It covers approximately 11,000 energy-intensive installations (mainly large point emissions sources such as thermal power plants, oil refineries and industrial facilities), which produce between 40–45 per cent of the total GHG emissions of the EU. It is expected that the EU ETS 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for the sectors covered. The third phase of the EU ETS started in 2013. Aviation activities were included in 2012, and the EU ETS now includes slightly over 500 aircraft operators flying within the European Economic Area in addition to stationary installations. Moreover, in addition to CO₂ emissions, the EU ETS in its third phase covers N₂O emissions from certain chemical

⁴ Directive 2009/29/EC amending directive 2003/87/EC.

⁵ Decision 406/2009/EC.

⁶ Directive 2009/28/EC.

⁷ Directive 2009/31/EC.

⁸ Regulation (EC) 443/2009.

⁹ Directive 2009/30/EC.

¹⁰ Regulation (EC) 510/2011.

¹¹ Directive 2012/27/EU.

industries (all nitric, adipic and glyoxylic acid production) and PFC emissions from aluminium production

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

26. The ERT noted that the EU is committed to spending at least 20 per cent of its budget for 2014–2020 on climate-related actions, amounting to approximately EUR 200 billion. In practice this means integrating climate considerations into all main spending areas of the EU budget, such as the development of regions, the EU CAP and research and development. Specific finance instruments include the Horizon 2020 funding for research and innovation, the European Fund for Strategic Investments, and LIFE Climate Action. Also, under the EU ETS, the EU established one of the largest funding programmes, NER 300, for innovative large-scale low-carbon demonstration projects, with overall funding of around EUR 2.1 billion. So far, 39 projects have been selected, mostly in the areas of wind energy, bioenergy and energy efficiency.

27. During the review, the ERT was provided with information on the 2030 climate and energy framework, which builds upon the EU 2020 climate and energy package and is in line with the EU’s road map for moving to a competitive low-carbon economy by 2050, its Energy Roadmap 2050 and the EU white paper on transport. The framework sets three targets to be achieved by 2030: at least a 40 per cent reduction of GHG emissions from the 1990 level, which is fully in accordance with the EU’s NDC under the Paris Agreement; at least a 27 per cent share of EU energy consumption to come from renewable energy sources; and at least a 27 per cent improvement in energy efficiency. Critical for the achievement of the 2030 targets is a set of legislative proposals for the revision of the EU ETS in its fourth phase, the effort-sharing regulation and the governance of the Energy Union. Table 3 provides a summary of the reported information on the PaMs of the EU.

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

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	2020 climate and energy package (2009)	NE	NE
	EU ETS (2005)	NE	NE
	ESD (2013)	NE	NE
	2030 climate and energy framework	NE	NE
Energy	Energy Union strategy (2015)	NE	NE
Transport	Regulation on CO ₂ emissions from cars (2009)	NE	NE
	Fuel quality directive (2009)	48 000	NE
	Regulation on CO ₂ emissions from vans (2011)	NE	NE
Renewable energy	Renewable energy directive (2009)	NE	NE
Energy efficiency	Energy efficiency directive (2012)	NE	NE
	Energy performance of buildings directive (2012)	185 000	NE
	Energy labelling regulation (2017)	NE	NE

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO₂ eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO₂ eq)</i>
IPPU	F-gas regulation (2014)	NE	72 000
	Mobile air-conditioning systems directive (2006)	13 000	NE
	Industrial emissions directive (2011)	NE	NE
Agriculture	EU CAP	NE	NE
	Rural development policy (an EU CAP pillar)	NE	NE
	Nitrates directive (1991)	NE	NE
	Soil thematic strategy (2006)	NE	NE
LULUCF	LULUCF accounting decision (2013)	NE	NE
Waste	Landfill directive (1999)	44 000	NE
	Waste framework directive (2008)	40 100	NE

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

(b) Policies and measures in the energy sector

28. The energy sector contributed 77.9 per cent of the total GHG emissions of the EU in 2015. Total emissions from the sector decreased by 22.5 per cent from 1990 to 2015, from 4,341 Mt CO₂ eq to 3,362 Mt CO₂ eq. The main reasons for the decrease are the fuel shift from coal to natural gas for electricity and heat production, the increased deployment of renewable energy sources and improvements in energy efficiency.

29. With the energy sector being its largest sectoral source of emissions, the EU has put in place a comprehensive climate and energy framework to mitigate emissions from the sector. The EU ETS is the key cross-sectoral PaM in the energy sector and it is complemented by PaMs to increase the use of renewable energy, increase energy efficiency and decrease transport emissions.

30. **Energy supply.** In 2015, final energy consumption in the EU was approximately 0.03 per cent lower than in 1990. From 1990 to 2015 there was a decrease of 40 per cent in the consumption of carbon-intensive coal and lignite, and of 11 per cent in the consumption of oil. At the same time, there was an increase of over 20 per cent in the consumption of gas. Oil currently accounts for the largest share of fossil fuel consumption in the EU (47 per cent), followed by natural gas (30 per cent) and solid fuels (22 per cent). The majority of the oil and gas consumed is imported (up to 55 per cent of primary energy supply). In 2015, power was generated by coal, oil and lignite (in total 26 per cent), nuclear processes (31 per cent) and natural gas (17 per cent).

31. The share of renewable energy sources has increased by more than 300 per cent since 1990, and in 2015 they accounted for approximately 30 per cent of total power generation. Total power production has increased because of increased demand for electricity. While the fuel mix for power generation has become less carbon intensive because of the substitution of coal for natural gas and enhancements in energy efficiency and renewable energy use, this was partially offset by an overall rise in electricity production of approximately 25 per cent between 1990 and 2015.

32. The most important PaM in the energy supply sector is the EU ETS, which covers large point emissions sources such as thermal power plants and oil refineries. Security of energy supply and the decarbonization of the economy are mutually reinforcing dimensions

of the Energy Union strategy,¹² with an emphasis on the completion of the internal energy market and the diversification of energy sources, suppliers and routes. The energy taxation directive¹³ aims to be consistent in the treatment of electricity and energy products by providing common taxation rules and a common minimum level of taxation in the EU.

33. **Renewable energy sources.** The share of gross energy consumption from renewables has increased since 1990 to around 13 per cent in 2015 in the EU. Electricity production from renewables almost tripled in that period and now accounts for 30 per cent of generation compared with 13 per cent in 1990. Large increases have occurred in generation from wind power generation and solar photovoltaics, with significant growth as well in solar thermal, biomass and geothermal energy production. Energy production from hydropower, tidal, wave and ocean technologies has remained constant. Two thirds of renewable energy consumed is renewable heat (from solar, biomass, geothermal and waste). Hydropower is the second largest, providing about 14 per cent of total renewable energy in 2015, with wind power in third place, contributing 12 per cent. Consumption of energy produced from solar photovoltaics has also grown substantially, with output almost 8,000 times higher in 2015 than in 1990, and the share of this source increasing from 0.002 per cent of renewable energy consumed in 1990 to 4.2 per cent in 2015.

34. The EU has set a legally binding target of at least a 20 per cent share of energy from renewable sources in the EU's gross final energy consumption in 2020. The target has been translated into legally binding national renewable energy targets for member States. The targets are implemented through cross-sectoral and sector-specific PaMs, including the climate and energy package and the renewable energy directive, which also includes sustainability criteria for biofuels. National renewable energy action plans have been prepared by the EU member States and contain measures and sectoral targets for reaching their legally binding national renewable energy targets.

35. The EU has reported that it is on track to meet its renewable energy target, with the share of energy from renewable sources in the EU's gross final energy consumption having reached 16.7 per cent in 2015. The EU 2030 energy and climate framework aims to further increase use of renewable energy to at least 27 per cent by 2030. In this regard, the European Commission made a proposal for a revised directive on the promotion of the use of energy from renewable sources in 2016.

36. **Energy efficiency.** A strategic target of the EU, as part of the 2020 climate and energy package, is a 20 per cent improvement in energy efficiency by 2020, which translates into indicative national energy efficiency targets for each member State. The target is reinforced by cross-sectoral and sector-specific PaMs (see table 3). Illustrative PaMs include the dozens of eco-design requirements already in place in the EU for household and office electrical goods and other products.

37. The EU is on track to meet its target of a 20 per cent improvement in energy efficiency by 2020. In 2015, primary energy consumption in the EU was 3.2 per cent above the 2020 primary energy consumption target. The EU 2030 climate and energy framework target is to improve energy efficiency by at least 27 per cent.

38. **Residential and commercial sectors.** The heating and cooling of buildings accounts for a significant portion of energy consumption in the EU and has one of the highest potentials for improved energy efficiency. Measures to reduce the space heating/cooling demand in buildings represent a significant part of this potential. Many of the measures (e.g. improved insulation) are highly cost-effective, but a number of barriers to their implementation exist, for example high cost of initial investment.

39. The PaMs in the residential and commercial sectors aim to enhance the energy efficiency of the building stock. This is to be accomplished by implementing general and sector-specific energy performance policies such as the ESD and introducing energy-efficient solutions for existing building stock and new house construction through the sector-specific energy performance of buildings directive. In the longer term, a proposed amendment to the

¹² See https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF.

¹³ Directive 2003/96/EC.

energy performance of buildings directive includes provisions to help achieve a decarbonized building stock by 2050.

40. A significant decrease in average unit consumption of total energy and space heating per m² has been achieved since 1990. However, owing to an increasing stock of electrical appliances, total electricity consumption per dwelling has increased by 3 per cent and electricity consumption for lighting and appliances has increased by 12 per cent, caused by an increasing stock of electrical appliances and larger homes. However, the upward trend observed since 1990 has been reversed since 2010, with consumption falling due to the improved energy efficiency of lighting and appliances.

41. **Transport sector.** The transport sector accounted for 27.6 per cent of GHG emissions from the energy sector and 21.0 per cent of total GHG emissions excluding LULUCF in the EU in 2015. Between 1990 and 2015, emissions from the transport sector increased by 15.9 per cent (127,856.02 kt CO₂ eq).

42. In 2015, transport accounted for the largest share (33 per cent) of final energy consumption in the EU. The level of car ownership in the EU increased by 34 per cent between 1995 and 2015. Passenger transport increased by 23.8 per cent in the same period, with car transport increasing by 20.9 per cent. Of the total passenger kilometres, 71.5 per cent were travelled in passenger cars and 9.8 per cent were by air (domestic and intra-EU). Freight transport volume increased by 23.6 per cent between 1990 and 2015.

43. The choice of PaMs for the transport sector is driven by the need to address the notable increase in transport activities and related GHG emissions. The sectoral PaMs represent a mix between regulations and standards for efficiency improvement and emission reduction, as well as infrastructure improvement and incentives for modal shift.

44. The ESD is an overarching cross-sectoral policy that includes mitigation of emissions from transport (except aviation and international maritime transport). GHG emissions from domestic aviation are included under the EU ETS.

45. In addition to the ESD, binding targets have been set for emissions from new passenger cars: 130 g CO₂/km by 2015, reducing to 95 g CO₂/km by 2020. The average emission level of new cars sold in 2016 was 118.1 g CO₂/km. Similarly, the EU plans for CO₂ emissions from new vans to fall from 175 g CO₂/km in 2017 to 147 g CO₂/km in 2020.

46. Other PaMs include a 10 per cent target for renewable energy use in transport by 2020, applicable to EU member States, with contributions from biofuels (with a cap on food-based biofuels), renewable fuels of non-biological origin and electricity. In addition, the fuel quality directive introduced a binding target for fuel suppliers to reduce life-cycle GHG emissions per unit of energy by up to 6 per cent by 2020 compared with the 2010 level.

47. The EU's level of ambition for transport over the long term is that GHG emissions from the sector be reduced to meet the 2030 targets for the sectors covered by the effort-sharing regulation and then those emissions be reduced further to at least 60 per cent lower by 2050 compared with the 1990 level. This is included in the low-emission mobility strategy adopted by the European Commission in July 2016 that provides for an integrated and comprehensive approach in addressing mobility and emissions by increasing efficiency, promoting low-emission alternative energy for transport and zero-emission vehicles. Other objectives include a decrease in oil dependency and enhancing innovation and competitiveness in the transport industry.

48. Improving the efficiency of the transport system is geared towards digital mobility solutions, fair and efficient pricing to manage transport demand and promoting multimodality. Promoting low-emission alternative energy and decarbonizing transport fuels is to be achieved through an incentive framework to promote advanced biofuels, renewable electricity and synthetic fuels, relevant infrastructure for alternative fuels and directives on fuel quality and renewable energy.

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

49. **Industrial processes.** The IPPU sector is the third largest source of emissions in the EU. It contributed 8.7 per cent of total GHG emissions in 2015. Emissions from the sector

decreased by 27.4 per cent, from 518 Mt CO₂ eq in 1990 to 376 Mt CO₂ eq in 2015, owing mainly to emission reduction measures taken in relation to the production of adipic acid, nitric acid and halocarbons.

50. The GHG mitigation policies in the industrial processes sector are underpinned by the cross-sectoral EU ETS and ESD, which cover all major installations. The sector-specific PaMs, such as the F-gas regulation, are aimed at reducing F-gas emissions. Additional efforts have been undertaken to reduce general air pollution with GHG mitigation as a co-benefit.

51. The F-gas regulation aims to reduce HFC sales by 79 per cent by 2030 through a quota system as well as to phase out F-gases with high GWP. Its effectiveness is demonstrated by an F-gas emission decline since 2015 and a strong price signal that further disincentivizes consumption. Also notable in this regard is the mobile air-conditioning systems directive, which imposes a ban on F-gases with high GWP for passenger cars and light-duty vehicles. The ERT notes that the EU is on track to meet the HFC limits set by the Kigali Amendment to the Montreal Protocol.

52. Additionally, the EU ETS directive covers a large part of industrial process emissions, specifically those from the mineral, chemical and metal industries, and the industrial emissions directive covers the remaining industrial emissions sources outside the scope of the EU ETS; for example, direct and indirect GHG emissions are regulated through the implementation of best available techniques.

53. **Agriculture.** The agriculture sector is the second largest source of emissions in the EU. It contributed 10.1 per cent of total GHG emissions in 2015. Emissions from the sector decreased by 23.3 per cent, from 548.27 Mt CO₂ eq in 1990 to 436.75 Mt CO₂ eq in 2015, reflecting the decreasing cattle population as well as improvements in farm management practices (lower fertilizer and manure use on agricultural soils) and the implementation of agricultural and environmental policies.

54. The EU CAP, initiated in 1962, is one of the main policy drivers of EU agricultural development. The EU CAP is a multifaceted policy platform that provides for viable food production, sustainable natural resources management and climate action through a new greening architecture and balanced territorial development. As a result of the EU CAP reform in 2013, the EU CAP now includes GHG mitigation as a priority area and it is increasingly geared towards the sustainable management of natural resources and climate action through a new greening architecture. The EU relies on the combined effect of various EU CAP instruments, including cross-compliance standards, green direct payments and rural development funding.

55. In addition to the EU CAP, the EU implements a number of agricultural policies that promote sustainable land management, such as the EU timber regulation, the EU forest strategy, the EU biodiversity strategy to 2020, the NATURA 2000 directives, the waste framework directive, the soil thematic strategy and the nitrates directive. While the agricultural policies, except for the nitrates directive, are voluntary, they are supported by robust incentives. In particular, the EU CAP has a pillar related to income support and financial incentives that encourage farmers to implement better land management activities.

56. There is a policy trend in the EU of increasingly moving towards more integrated approaches to climate action in the area of land use and agriculture that take into account both mitigation and adaptation and also links to other sustainable development and resource efficiency objectives, such as soil and water management, restoring and preserving biodiversity, supporting a climate-resilient economy, organic farming, and reduced pollution and pesticide use.

57. **LULUCF.** Net removals from LULUCF increased by 32.9 per cent in the EU over the period 1990–2015. In 2015, net removals from the LULUCF sector in the EU amounted to 295 Mt CO₂ eq. The key driver for the increase in net removals was a significant build-up of carbon stocks in forests. Overall, the total forested area across the EU increased by 5 per cent between 1990 and 2015. Moreover, environmental policies resulted in less-intensive agricultural practices and an increase in forest and woodland conservation areas for the purpose of preserving biodiversity and landscapes. In 2015, cropland and grassland were sources of emissions in the EU as a whole.

58. While afforestation and reforestation efforts in the EU are overseen by member States, a number of policies in place at the EU level enable mitigation in the LULUCF sector. For example, the EU forest strategy comprises eight linked priority areas, one of which concerns the relationship between climate and forests. The EU reported 679 PaMs mostly on forest management and other Kyoto Protocol activities, but also on protection against natural disturbances, carbon soil protection and biomass for energy use.

59. The 2013 LULUCF decision on accounting brought together different policy and accounting streams in the sector. The decision introduced mandatory requirements for reporting on national actions and their impacts. It also established accounting rules to incentivize actions that are consistent with the Convention and its Kyoto Protocol and to provide for fairness across EU member States.

60. There is an EU proposal from 2016 to integrate GHG emissions and removals from LULUCF into the 2030 climate and energy framework. The proposal reflects the prominence given to LULUCF in the post-2020 framework in helping the EU to reach its long-term mitigation objectives as well as the need to integrate it into various strategies (e.g. the Energy Union). The 2016 proposal strengthens reporting obligations through a stepwise approach and sets the “no-debit rule” as a binding commitment for EU member States to entirely compensate for any net emissions from LULUCF by means of an equivalent removal of CO₂ and ensures that only additional action provides credits to meet the emission reduction target for 2030.

61. An array of policies on biodiversity, soil, energy, agriculture, forestry and land management continue to be implemented in the EU. They influence emissions and removals from LULUCF that are subject to accounting under the LULUCF decision.

62. **Waste management.** GHG emissions from the waste sector contributed 3.2 per cent of total EU emissions in 2015. Emissions from the sector saw the most sizable decrease compared with other sectors, that is by 42.1 per cent, from 240.95 Mt CO₂ eq in 1990 to 139.31 Mt CO₂ eq in 2015.

63. GHG mitigation in this sector is mostly a co-benefit of the efficient waste management PaMs that aim to enhance solid waste treatment, minimization and disposal methods. The waste management PaMs are described in the BR3 and additional information was provided to the ERT during the review.

64. The circular economy action package (2015) and the enhanced waste management hierarchy (prevention, reuse, recycling, recovery and disposal) are the key recent developments in the waste sector in the EU. PaMs are in place to target various waste streams such as plastic, electrical/electronic equipment, packaging, vehicles and batteries. There is also a regulation of waste treatment methods such as landfilling, incineration and management of biodegradable waste.

65. The EU is considering proposals for quantitative targets for 2030, including a common EU target for recycling 65 per cent of municipal waste, a common EU target for recycling 75 per cent of packaging waste and a binding landfill target to reduce landfill to a maximum of 10 per cent of municipal waste.

(d) Response measures

66. In its BR3 the EU presented two key approaches to assessing the economic and social consequences of its response measures. The first is to use an internal impact assessment to evaluate new policy initiatives that are enforced through legislative proposals. It is based on an integrated approach that analyses costs and benefits and addresses all significant economic, social and environmental impacts of those policy initiatives (e.g. the EU 2020 climate and energy package). The second is to assess the impacts of policies on external countries that are implemented through bilateral and regional cooperation, mostly at the overarching political or sectoral level (e.g. free trade agreements).

(e) Assessment of adherence to the reporting guidelines

67. The ERT assessed the information reported in the BR3 of the EU and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 4.

Table 4

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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	<p>Reporting requirement specified in paragraph 6</p> <p>Issue type: transparency</p> <p>Assessment: recommendation</p>	<p>The EU did not report in CTF table 3 the estimated effects of most of its mitigation actions for 2020, including for some significant PaMs such as the EU ETS and the ESD; nor did it provide an explanation for not reporting thereon in its BR3 or CTF table 3.</p> <p>During the review, the EU provided additional information, elaborating on the reasons why it did not report the estimated effects of all its mitigation actions. Owing to the complexity of the EU policymaking system and the particularities of each EU policy, aggregated data per EU policy implemented by member States cannot be compiled at the EU level. This is mainly because of the different ways policies are implemented and reported by individual member States, and the way member States report on the impact of PaMs, which is not always consistent across member States. However, the estimated mitigation impacts of PaMs are, in many cases, reported in the BR of each member State.</p> <p>The ERT recommends that the EU improve the transparency of its reporting in its next BR and/or CTF tables by reporting consistent information on its mitigation actions in the BR and CTF table 3 and, in cases where the estimated mitigation impacts of some PaMs are not reported in CTF table 3, provide explanations as to why such information is not reported. The latter information could be provided in either the BR or in the footnotes to CTF table 3.</p>

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

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

(a) Technical assessment of the reported information

68. For 2014 the EU reported in CTF table 4 annual total GHG emissions excluding LULUCF and NF₃, and including domestic and international aviation and indirect CO₂, at the level of 4,423,664.05 kt CO₂ eq, which is 22.6 per cent below the 1990 level.

69. For 2015 the EU reported in CTF table 4 annual total GHG emissions of 4,451,743.38 kt CO₂ eq, which is 22.1 per cent below the 1990 level.

70. Given that the contribution of LULUCF activities is not included in the target under the Convention of the EU, LULUCF values were not reported in CTF tables 4, 4(a)I and 4(a)II. The EU reported that it intends to allow the use of units from market-based mechanisms under the Convention, subject to quantitative and qualitative limits applied separately to the EU ETS and ESD sectors. It reported in CTF tables 4 and 4(b) that it used units from market-based mechanisms in 2014 and 2015 towards the achievement of its 2020 target in the amount of 257,000 and 23,000 kt CO₂ eq, respectively. Table 5 illustrates the EU's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

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

<i>Year</i>	<i>Emissions excluding LULUCF (kt CO₂ eq)^a</i>	<i>Contribution of LULUCF (kt CO₂ eq)^b</i>	<i>Emissions including contribution of LULUCF (kt CO₂ eq)</i>	<i>Use of units from market-based mechanisms (kt CO₂ eq)</i>
1990	5 716 339.84	NA	5 716 339.84	NA
2011	4 758 537.38	NA	4 758 537.38	254 000.00
2012	4 693 146.64	NA	4 693 146.64	504 000.00
2013	4 598 776.70	NA	4 598 776.70	133 000.00
2014	4 423 664.05	NA	4 423 664.05	257 000.00
2015	4 451 743.38	NA	4 451 743.38	23 000.00

Sources: The EU’s BR3 and CTF tables 1, 4, 4(a)I, 4(a)II and 4(b).

^a Emissions exclude emissions/removals from LULUCF but include international aviation and indirect CO₂ emissions.

^b The EU’s unconditional commitment to reduce GHG emissions by 20 per cent below the 1990 level by 2020 does not include emissions/removals from LULUCF.

71. In assessing the progress towards the achievement of the 2020 target, the ERT noted that the emission reduction target of the EU under the Convention is 20 per cent below the 1990 level (see para. 12 above). As discussed above, in 2015 the annual total GHG emissions in the EU excluding LULUCF and NF₃ and including international aviation and indirect emissions were 22.1 per cent (1,264,596.46 kt CO₂ eq) below the 1990 level. In addition, the ERT noted that in 2015 the use of market-based mechanisms accounted for 23,000 kt CO₂ eq.

72. The ERT noted that the EU is making progress towards its emission reduction target by implementing mitigation actions that are delivering significant emission reductions and to a limited extent by using units from the market-based mechanisms under the Convention. On the basis of the results of the projections (see para. 87 below), the ERT also noted that the Party is making progress towards achieving its target under the Convention, and that it is likely to overachieve it given that the projected GHG emissions in 2020 are expected to be 26.2 per cent lower than the 1990 level with existing measures and 26.8 per cent lower with additional measures.

73. In the light of the information reported on GHG emissions, trends and projections, including the fact that the EU’s GHG emissions in 2015 were already below its 2020 target, the EU seems to be well on track to meet its target. The ERT commends the EU’s detailed annual reporting on GHG emission trends, projections and its progress towards its targets.

(b) Assessment of adherence to the reporting guidelines

74. The ERT assessed the information reported in the BR3 of the EU and recognized that the reporting on estimates of emission reductions and removals and the use of units from the market-based mechanisms and LULUCF is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

75. The EU reported updated projections for 2020 and 2030 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by the EU includes PaMs that had been implemented and adopted by May 2016, although this was not strictly enforced but rather recommended to member States as a guideline for preparing their individual projections.

76. In addition to the WEM scenario, the EU also 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 28 national WEM projections and based on a recommended list of adopted or implemented PaMs to be covered. Its WAM scenario includes all planned measures and is aggregated from available national WAM projections. During the review, the ERT was informed that 18 out of 28 member States reported a WAM scenario in 2017. For member States that did not provide a WAM scenario, it was assumed that their WAM projections were equal to those under their WEM scenario. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on NCs. The ERT was also informed that, because only five member States provided a ‘without measures’ scenario, it was not possible to construct such a scenario at the EU level.

77. 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, HFCs, PFCs, SF₆ and NF₃ over the period 2020–2035. The projections are also provided in an aggregated format for each sector as well as for an EU total using GWP values from the AR4.

78. The EU did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides, as the MMR does not require the reporting of projections of indirect GHG emissions.

79. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately; emission projections for international aviation were included in the totals given that they fall within the scope of the Convention target for the EU. The EU qualitatively discussed factors and activities affecting emissions for each sector; however, no quantitative information was provided except for weighted-average assumptions on global parameters such as GDP and population growth or the evolution of fuel and carbon prices.

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

80. The methodology used for the preparation of the projections as well as the QA/QC procedures applied in the compilation of individual member States’ projections are identical to those used for the preparation of the emission projections for the BR2. The EU provided further information, and references to publicly available reports, on its approach to compiling EU-level projections from individual member States’ submissions under the MMR. The EU’s GHG projections are aggregated from national projections, and the individual member States are responsible for choosing the methods and models used for preparing their projections.

81. The European Environment Agency and its European Topic Centre on Air Pollution and Climate Change Mitigation compile the national projections and apply QA/QC procedures to ensure that the projections data reported by member States are complete, transparent, consistent, accurate and comparable. If needed, additional data are requested from member States, or corrective actions such as data gap filling are performed to produce a final EU projections data set. The ERT commends the EU for the level of transparency and information available on the process of compiling GHG projections and applying QA/QC.

82. As the basis for its projections, the EU reported the following key underlying assumptions as weighted averages of the values used across member States: population growth, international fuel prices (oil, gas and coal), EU ETS carbon price and GDP growth. These variables and assumptions were also reported in CTF table 5. The EU provided only recommendations on these assumptions to its member States; the final decision on the assumptions used for preparing GHG projections was made by each member State. According to the weighted-average assumptions for the period 2020–2030, the projections assumed an annual GDP growth rate of 1.9 per cent; annual fuel price growth rates of 3.3 per cent for oil, 2.4 per cent for gas and 3.8 per cent for coal; an EU ETS carbon price increase of 10.7 per cent annually; and an annual population growth rate of 0.14 per cent.

83. The EU provided information on the sensitivity analysis carried out when developing the GHG projections. Given the diversity of approaches and input assumptions used to prepare the 28 individual member States’ projections, a standard sensitivity analysis where only one parameter is varied while others are kept fixed was not feasible. Therefore, the EU carried out a sensitivity analysis by benchmarking the aggregated GHG emissions against its 2016 reference scenario RS2016. RS2016 covers the EU energy system, transport and GHG

emission developments across all sectors in all 28 EU member States individually and accounts for policy interactions. Its time-horizon is until 2050 with five-year steps. It assumes that the policies are adopted and implemented with December 2014 as the cut-off date. RS2016 is based on a suite of interlinked technical and economic models, at the centre of which is the PRIMES modelling suite. Models are calibrated against historical Eurostat data. The key parameters and assumptions used in the RS2016 were the same as those provided to the member States as recommended assumptions when developing their main projections. If member States used different assumptions, they were encouraged to use the recommended values for the sensitivity analysis of their national projections.

84. RS2016 starts from a 3 per cent higher GHG emission level than the reported WEM and WAM projections. Until 2020, emissions under RS2016 remain 1.5 per cent higher than under the WEM scenario. Beyond 2020, the RS2016 emissions drop at a faster rate than under the WEM scenario, so that from about 2023 the RS2016 emissions drop below the WEM projections. In 2030, the RS2016 emissions are projected to be 6.4 per cent lower than the WEM emissions. Differences between RS2016 and the WEM and WAM scenarios can be attributed to several factors, such as differences in modelling approach, using different data for the starting year, different coverage of EU-wide measures, and different assumptions on GDP, population, and fuel and carbon prices.

(c) Results of projections

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

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

	<i>GHG emissions (kt CO₂ eq per year)</i>	<i>Changes in relation to base-year^a level (%)</i>	<i>Changes in relation to 1990 level (%)</i>
Quantified economy-wide emission reduction target under the Convention ^b	Not available yet	NA	-20.0
Inventory data 1990 ^c	5 711 969	NA	NA
Inventory data 2015 ^c	4 450 150	-22.1	-22.1
WEM projections for 2020 ^d	4 212 961	-26.2	-26.2
WAM projections for 2020 ^d	4 179 457	-26.8	-26.8
WEM projections for 2030 ^d	3 987 737	-30.2	-30.2
WAM projections for 2030 ^d	3 871 984	-32.2	-32.2

Note: The projections are for GHG emissions without LULUCF.

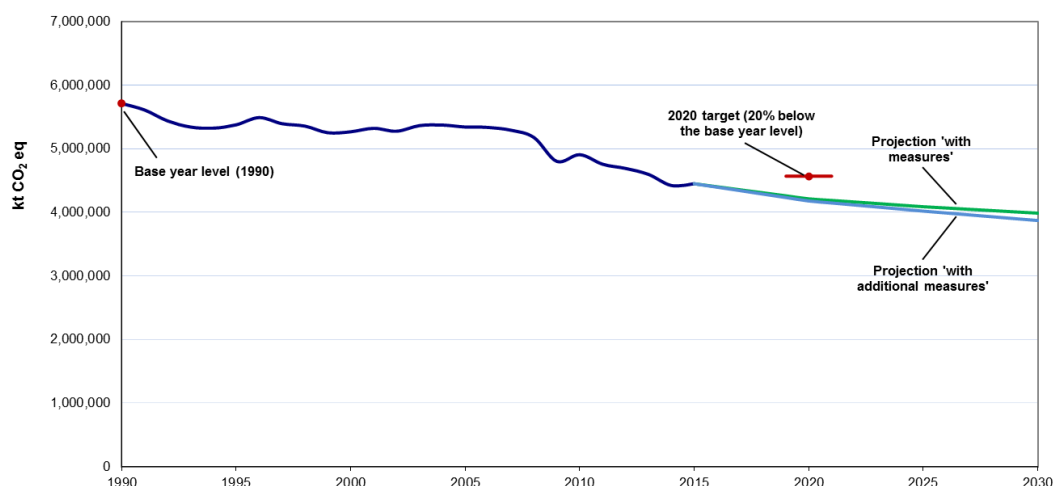
^a “Base year” in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

^b The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

^c From the EU’s 2017 GHG inventory submission; the emissions are without LULUCF and indirect GHG emissions, but include international aviation.

^d From the EU’s NC7 and/or BR3.

Greenhouse gas emission projections reported by the European Union



Sources: (1) data for the years 1990–2015: the EU’s 2017 annual inventory submission, version 2; total GHG emissions excluding LULUCF but including international aviation; (2) data for the years 2015–2030: the EU’s NC7 and BR3; total GHG emissions excluding LULUCF but including international aviation.

86. The total EU GHG emissions excluding LULUCF but including international aviation in 2020 and 2030 are projected to be 4,212,961.07 and 3,987,736.85 kt CO₂ eq, respectively, under the WEM scenario, which represents a decrease of 26.2 and 30.2 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 26.8 and 32.2 per cent and amount to 4,179,456.57 and 3,871,983.62 kt CO₂ eq, respectively. The reported 2020 projections suggest that the 28 EU member States are expecting to collectively achieve the 2020 EU target.

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

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

Sector	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	3 554 774	2 255 541	2 235 680	2 069 293	1 990 351	-36.5	-37.1	-41.8	-44.0
Transport	781 808	889 971	881 280	886 373	859 180	13.8	12.7	13.4	9.9
Industry/industrial processes	516 886	373 009	372 052	339 655	337 448	-27.8	-28.0	-34.3	-34.7
Agriculture	548 270	431 482	427 764	430 503	425 290	-21.3	-22.0	-21.5	-22.4
LULUCF	0	0	0	0	0	-	-	-	-
Waste	240 948	117 675	117 024	99 034	96 463	-51.2	-51.4	-58.9	-60.0
International aviation	69 284	145 282	145 657	162 879	163 251	109.7	110.2	135.1	135.6
Total GHG emissions without LULUCF including aviation	5 711 969	4 212 961	4 179 457	3 987 737	3 871 984	-26.2	-26.8	-30.2	-32.2

Source: GHG emission data: the EU’s 2017 annual inventory submission, version 2.2; projection data: BR CTF tables 6(a) and 6(c).

88. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector, amounting to projected reductions of 1,299,232.63 kt CO₂ eq (36.5 per cent) between 1990 and 2020.

Significant GHG emission reductions are also projected for 2020 for the agriculture, industry and waste sectors at the levels of 21.3, 27.8 and 51.2 per cent, respectively, below the 1990 level. The absolute contributions of those sectors to the projected GHG emission reductions are 116,787.46, 143,877.29 and 123,272.46 kt CO₂ eq, respectively. The only sectors with projected emissions in 2020 still higher than in 1990 are the transport sector, where emissions are projected to be 108,163.32 kt CO₂ eq (or 13.8 per cent) higher relative to 1990, and international aviation, which is projected to increase its GHG emissions by 75,998.56 kt CO₂ eq (or 109.7 per cent) compared with the 1990 level. The pattern of projected emissions reported for 2030 under the same scenario remains similar, with the most significant declines in GHG emissions in the energy sector (41.8 per cent below the 1990 level), owing to the continued effects of existing PaMs, as well as in the agriculture, industry and waste sectors (decreasing by 21.5, 34.3 and 58.9 per cent, respectively). Transport emissions are projected to stabilize by 2030 at 13.4 per cent above the 1990 level, while emissions from international aviation are projected to continue growing by 2030 to 135.1 per cent above the 1990 level.

89. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector remain very similar to under the WEM scenario, with the emissions from the energy and agriculture sectors 0.9 per cent lower, industry 0.3 per cent lower, waste 0.6 per cent lower and transport 1.0 per cent lower than under the WEM scenario.

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

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

Gas	GHG emissions and removals (kt CO ₂ eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO ₂	4 526 071	3 462 842	3 434 621	3 298 603	3 192 949	-23.5	-24.1	-27.1	-29.5
CH ₄	728 435	417 522	415 431	394 804	390 177	-42.7	-43.0	-45.8	-46.4
N ₂ O	385 600	231 159	228 454	233 194	229 240	-40.1	-40.8	-39.5	-40.5
HFCs	34 966	90 915	90 427	54 038	52 524	160.0	158.6	54.5	50.2
PFCs	25 870	3 431	3 431	3 387	3 387	-86.7	-86.7	-86.9	-86.9
SF ₆	11 003	7 006	7 006	3 605	3 600	-36.3	-36.3	-67.2	-67.3
NF ₃	24	86	86	107	107	263.2	263.2	348.2	348.3
Total GHG emissions without LULUCF	5 711 969	4 212 961	4 179 457	3 987 737	3 871 984	-26.2	-26.8	-30.2	-32.2

Source: GHG emission data: the EU’s 2017 annual inventory submission, version 2; projection data: BR CTF tables 6(a) and 6(c).

91. For 2020 the most significant absolute reductions are projected for CO₂, CH₄ and N₂O emissions: 1,063,228.95 kt CO₂ eq (23.5 per cent), 310,912.88 kt CO₂ eq (42.7 per cent) and 154,441.45 kt CO₂ eq (40.1 per cent) between 1990 and 2020, respectively. Collectively, emissions of F-gases are projected to increase by 29,575.34 kt CO₂ eq (41.2 per cent) by 2020 relative to 1990, mainly driven by higher HFC emissions.

92. The 2030 WEM scenario projections envisage similar trends continuing beyond 2020, with a continued decline in CO₂ and CH₄ emissions (to 27.1 and 45.8 per cent below the 1990 level, respectively), stagnation in N₂O emissions (at 39.5 per cent below the 1990 level) and a reversal of the emission trend for F-gases (to 14.9 per cent lower than in 1990) driven by the reduced HFC emissions due to the new F-gas regulation.

93. If additional measures are considered (i.e. in the WAM scenario), the patterns of emission reductions by 2020 presented by gas remain very similar to under the WEM

scenario, with CO₂, CH₄ and N₂O emissions 24.1, 43.0 and 40.8 per cent, respectively, below the 1990 level and F-gas emissions 40.5 per cent above the 1990 level. Similar trends also continue towards 2030, when emissions of CO₂, CH₄ and N₂O are projected to be 29.5, 46.4 and 40.5 per cent, respectively, below the 1990 level, while similar to under the WEM scenario, F-gas emissions are projected to reverse their growth and drop to 17.0 per cent below the 1990 level.

(d) Assessment of adherence to the reporting guidelines

94. The ERT assessed the information reported in the BR3 of the EU and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 9.

**Table 9
Findings on greenhouse gas emission projections reported in the third 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 paragraph 48 Issue type: completeness Assessment: recommendation	The BR3 does not include the relevant information on factors and activities for each sector to provide the reader with an understanding of the emission trends. During the review, the EU explained the difficulties associated with compiling such data from the individual member States' reports. The ERT recommends that an overview of key sector-specific information, such as primary energy consumption, electricity generation and transport volume, be included in the GHG projections in future NCs to the extent possible, or alternatively that an explanation be provided as to why such information is difficult to compile.
2	Reporting requirement specified in paragraph 31 Issue type: transparency Assessment: encouragement	The ERT noted that projections are presented relative to actual inventory data for the preceding years but with a different scope than in the GHG inventory chapter, thus decreasing transparency. During the review, the EU clarified that the inventory data in the projections chapter did not include indirect CO ₂ emissions, whereas the inventory information reported in the GHG inventory chapter as well as in quantified progress to 2020 targets (BR CTF table 4) did include indirect CO ₂ emissions. The ERT encourages the EU to present GHG projections in future NCs and BRs using the same scope as when presenting inventory and quantified progress data.
3	Reporting requirement specified in paragraph 43 Issue: transparency Assessment: encouragement	The information reported in the BR is not transparent on the following elements: the strengths and weaknesses of modelling approaches and how the approaches used account for any overlap or synergies that may exist between different PaMs. During the review, the ERT was presented with details on the approach used to compile member States' projections into an aggregated EU submission, along with the challenges due to inevitable variations in approaches between countries. The ERT encourages the EU to include more information about the modelling approaches used, their strengths and weaknesses, and the treatment of synergies and overlaps between PaMs in future BRs.
4	Reporting requirement specified in paragraph 45 Issue type: completeness Assessment: encouragement	There was no information reported on the main differences in the assumptions, methods and results between the projections in the BR3 and those in earlier BRs (there was only a statement that no change in methodology had occurred since the BR2). The ERT encourages the EU to report changes in assumptions, approaches and results between current and previous BRs in its future submissions, noting any changes that may make comparison difficult or not entirely consistent.

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

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

1. Approach and methodologies used to track support provided to Parties not included in Annex I to the Convention

(a) Technical assessment of the reported information

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

96. The EU provided details on what “new and additional” support it has provided and clarified how this support is “new and additional” (see para. 103 below).

97. The EU reported the financial support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. It explained how it tracks finance for adaptation and mitigation using the Rio markers (which are policy indicators not originally intended to accurately quantify climate finance) and more than 50 other project markers that allow for further climate finance tracking.

98. The BR3 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. The EU included information on how it has refined its approach to tracking climate support and methodologies. Its tracking system reported in the BR3 allows climate finance to be considered as cross-cutting, besides mitigation and adaptation, whereas the tracking system reported in the BR2 could only track projects as either mitigation or adaptation using the Rio markers. Cross-cutting finance contributed 30 and 24 per cent in 2015 and 2016, respectively.

99. The EU described the methodology and underlying assumptions used for collecting and reporting information on financial support on the basis of the Common Principles for Climate Change Mitigation Finance Tracking and Common Principles for Climate Change Adaptation Finance Tracking. The methodology used for preparing information on international climate support was described in the annex to the sixth edition of the *Joint Report on Multilateral Development Banks' Climate Finance*. The report provides an overview of financing committed by the African Development Bank, the Asian Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank Group and the World Bank Group to climate change mitigation and adaptation projects and activities on the basis of data for 2011–2016.

(b) Assessment of adherence to the reporting guidelines

100. The ERT assessed the information reported in the BR3 of the EU and recognized that the reporting on the approach and methodologies used to track support provided to non-Annex I Parties is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

2. Financial resources

(a) Technical assessment of the reported information

101. The EU reported information on the provision of financial support required under the Convention and its Kyoto Protocol, including on financial support provided, committed and pledged, allocation channels and annual contributions.

102. The EU indicated what “new and additional” financial resources it has provided and clarified how it has determined such resources as being “new and additional”. The definition provided by the EU is that the resources reported in the BR3 are “new and additional” because they were committed in 2015 and 2016 and as such they were not included in the previous BR.

103. The EU described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation. The EU reported information on the assistance that it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. Of the total climate finance provided by the EU in 2015 and 2016, at least EUR 1.4 billion (33 per cent) was provided to the LDCs. The provided information shows that support provided is tailored to their needs, as 60 per cent of the climate finance provided to the LDCs went to adaptation activities, while mitigation and cross-cutting activities received 30 per cent and 10 per cent, respectively.

104. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, the EU reported that its climate finance has been allocated on the basis of programmes such as the Pan-African Programme. The Development Cooperation Instrument covers the majority of developing countries and its thematic programme on the global public good and challenges has a focus on climate change. No less than 25 per cent of the programme’s budget will be spent on achieving climate change and environment objectives. The Development Cooperation Instrument budget for 2014–2020 is EUR 19.6 billion, including EUR 7 billion for the thematic programmes. Table 10 includes some of 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 2015–2016
(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Year of disbursement</i>	
	<i>2015</i>	<i>2016</i>
Official development assistance ^a	20 206.4	23 282.7
Climate-specific contributions through multilateral channels	0.436	0.448
Climate-specific contributions through bilateral, regional and other channels	4 204.68	5 174.65

^a Sources: (1) Query Wizard for International Development Statistics, available at <http://stats.oecd.org/qwids/> for EU institutions; (2) the EU’s BR3 CTF tables.

105. The EU is developing public initiatives to mobilize private climate finance directly and to support the creation of appropriate enabling environments. The EU supports middle-range electrification projects through ElectriFI, whose first call for applications generated 290 proposals requesting EUR 800 million to leverage a total investment amount of EUR 8.5 billion for 3.7 GW renewable energy capacity in 55 countries. However, the EU mentioned that there are barriers to private sector low-carbon investments in developing and recipient countries.

106. The EU reported on its climate-specific public financial support, totalling USD 4.205 billion in 2015 and USD 5.175 billion in 2016, according to CTF table 7. With regard to future financial support aimed at enhancing the implementation of the Convention by developing countries, the EU will be providing USD 15.526 billion (EUR 14 billion) between 2014 and 2020. Climate finance provided by the EU continued to increase in 2015 and 2016 from the 2013 and 2014 levels. Public financial support provided in 2013 and 2014 amounted to USD 3.998 billion and USD 3.680 billion, respectively. During the reporting period, the EU placed a focus on the LDCs, for which it allocated USD 1.551 billion (33 per cent of the total). The ERT noted that the EU reported in CTF table 7(b) that part of its bilateral support was also allocated to Parties included in Annex I to the Convention in 2015 and 2016. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support by priority is presented in table 11.

Table 11
Summary of information on channels of financial support used in 2015–2016 by the European Union

(Millions of United States dollars)

Allocation channel of public financial support	Year of disbursement				Share (%)	
	2015	2016	Difference	Change (%)	2015	2016
Support through bilateral and multilateral channels allocated for:						
Mitigation	2 901.24	3 052.73	151.49	5.2	69.0	59.0
Adaptation	799.56	1 404.24	604.69	75.6	19.0	27.1
Cross-cutting	503.88	717.68	213.80	42.4	12.0	13.9
Other	0	0	NA	NA	NA	NA
Total	4 204.68	5 174.65	969.97	23.1	100.0	100.0
Detailed information by type of channel						
Multilateral channels						
Mitigation	0	0	NA	NA	NA	NA
Adaptation	0	0	NA	NA	NA	NA
Cross-cutting	0	0	NA	NA	NA	NA
Other	0	0	NA	NA	NA	NA
Total					100.0	100.0
Bilateral channels						
Mitigation	2 901.24	3 052.73	151.49	5.2	69.0	59.0
Adaptation	799.56	1 404.24	604.69	75.6	19.0	27.1
Cross-cutting	503.88	717.68	213.80	42.4	12.0	13.9
Other	0	0	NA	NA	NA	NA
Total	4 204.68	5 174.65	969.97	23.1	100.0	100.0
Multilateral compared with bilateral channels						
Multilateral	0	0	NA	NA	NA	NA
Bilateral	4 204.68	5 174.65	969.97	23.1	100.0	100.0
Total	4 204.68	5 174.65	969.97	23.1	100.0	100.0

Source: CTF tables 7, 7(a) and 7(b) of the BR3 of the EU.

107. The BR3 includes detailed information on the financial support provided through multilateral, bilateral and regional channels in 2015 and 2016. More specifically, the EU contributed through multilateral channels, as reported in the BR3 and in CTF table 7(a), USD 436,075 and 447,690 in 2015 and 2016, respectively. The contributions were made to specialized United Nations bodies.

108. The BR3 and CTF table 7(b) also include detailed information on the total financial support provided through bilateral (USD 1.682 and 3.020 billion) and regional (USD 2.523 and 2.155 billion) channels in 2015 and 2016, respectively.

109. The BR3 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2015, the shares of the total public financial support allocated for mitigation, adaptation and cross-cutting projects were 69, 19 and 12 per cent, respectively. In 2016, the shares of the total public financial support allocated for mitigation, adaptation and cross-cutting projects were 59, 27 and 14 per cent, respectively.

110. The ERT noted that in 2015 the majority of financial contributions were allocated to agriculture (17 per cent), energy (15 per cent), transport (6 per cent), water and sanitation (4 per cent) and forestry (2 per cent). The corresponding allocations in 2016 were directed

mostly to agriculture (23 per cent), energy (16 per cent), transport (5 per cent), water and sanitation (5 per cent) and forestry (2 per cent).

111. CTF tables 7(a) and 7(b) include information on the types of financial instrument used in the provision of assistance to developing countries, which include grants and other. The ERT noted that the grants provided in 2015 and 2016 accounted for most of the total public financial support.

112. The EU is among the largest contributors of climate finance to developing countries, with an amount of EUR 20.2 billion reached in 2016, and it has already set out its strategy for mobilizing further climate finance by 2020. At least EUR 14 billion of the EU budget will be spent on climate action between 2014 and 2020 (an average of EUR 2 billion per year) in the form of public grants to support activities in developing countries. This represents more than double the average level of funding in 2012–2013, and importantly is expected to mobilize projects with total funding of around EUR 50 billion.

113. The EU's overall approach to climate finance is to provide grants directly to the poorest and most vulnerable countries, while using grant funding to mobilize private investment by combining grants with loans, equities, interest rate subsidies and capital risk management and guarantees from public and private sources, including bilateral and multilateral development banks. In its BR3 the EU clarified that private finance is mainly mobilized for technologies and services in the energy sector. It reported on how it uses public funds to promote the provision of private sector financial support to developing countries, which it sees as pivotal to effectively increasing mitigation and adaptation efforts in developing countries by 2030.

114. The EU has designed a number of programmes and blending facilities that combine grants with loans that could promote the increase of private sector investment. ElectrIFI, which supports middle-range electrification projects, generated 290 proposals requesting EUR 800 million to leverage a total investment amount of EUR 8.5 billion for 3.7 GW renewable energy capacity in 55 countries. Also, the African Renewable Energy Scale-Up facility was launched in March 2017 by the AFD Group, in partnership with the EU, to boost private sector investment in on-grid and off-grid renewable energy production in Africa.

115. Another example is the Global Energy Efficiency and Renewable Energy Fund, an innovative 'fund of funds', designed to catalyse private sector capital for clean energy projects in developing countries. The fund invests in private equity funds that focus on private sector renewable energy and energy efficiency projects that also deliver a strong positive environmental and economic impact. The fund successfully concluded its fundraising from private sector investors in May 2015, which brought the total funds under its management to EUR 222 million. It is estimated that over EUR 10 billion could be mobilized through the fund.

116. The EU reported on the difficulty of collecting information and reporting on private financial flows leveraged by bilateral climate finance for mitigation and adaptation activities in non-Annex I Parties, which is due to the lack of information on initiatives undertaken by the private sector and the established practice of reporting by private organizations.

(b) Assessment of adherence to the reporting guidelines

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

3. Technology development and transfer

(a) Technical assessment of the reported information

118. The EU provided information on steps, measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public and private sectors. The EU provided examples of support

provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

119. The ERT took note of the information provided in CTF table 8 on recipient countries, target areas, measures and focus sectors of technology transfer programmes. The analysis of the 13 projects or programmes reported in CTF table 8 shows that the EU is promoting technology transfer in all parts of the world. The geographical distribution shows that the technology endeavours of the EU are global. In total, 15 per cent of the projects and programmes listed in BR3 CTF table 8 are global, 15 per cent are in Africa, 15 per cent are in Europe, 8 per cent are in Asia and 8 per cent are in Oceania, while 38 per cent cannot be assigned to a region. Furthermore, 69 per cent of the projects and programmes are mitigation related. The energy sector has the highest number of projects and programmes. The majority of the projects and programmes will be funded and implemented by public-private partnerships.

120. The ERT noted that the EU reported on its PaMs as well as success and failure stories in relation to technology transfer, and in particular on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. The EU has mainstreamed technology transfer activities into all development support. The BR3 included the following examples of programmes to promote technology development and transfer: the Horizon 2020 research framework programme, which promotes research collaboration and the mobility of researchers between the EU and third countries, including developing countries, in areas of common interest; and the Technical Centre for Agricultural and Rural Cooperation, which supports the development and enhancement of the endogenous capacities and technologies of developing country Parties, combined with facilitating innovation in the private sector.

121. The EU provided information on selected projects or programmes that promote practicable steps to facilitate and/or finance the transfer of, or access to, climate-friendly technologies. Both selected projects were success stories, and information on factors that led to the project's success was provided for one project. Information on the impact on GHG emissions or sinks was not provided as it was unavailable.

122. 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 the implementation of Article 10 of the Kyoto Protocol.

123. The EU recognizes that the private sector is critical to the successful transfer of technologies to developing countries. The private sector is able to mobilize larger amounts of capital and is a key driver of technological innovation. However, public funds are needed to leverage private finance. The EU has devised innovative ways of engaging the private sector and raising the needed climate finance. It designed the Global Energy Efficiency and Renewable Energy Fund to catalyse private sector capital for clean energy projects in developing countries.

(b) Assessment of adherence to the reporting guidelines

124. The ERT assessed the information reported in the BR3 of the EU and identified an issue relating to transparency. The finding is described in table 12.

Table 12

Findings on technology development and transfer from the review of the third 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 paragraph 21 Issue type: transparency	Although the EU provided information on success and failure stories in relation to technology transfer, the ERT felt that the information was not transparent. For a project to be deemed successful, the performance indicators and hence success factors must be known.

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
	Assessment: encouragement	The ERT encourages the EU to increase the transparency of its reporting on success and failure stories by substantiating its assessment through the use of appropriate factors and/or indicators and through the monitoring of projects relating to technology transfer.

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

4. Capacity-building

(a) Technical assessment of the reported information

125. In the BR3 and CTF table 9 the EU supplied information on how it has provided capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties. The EU described individual measures and activities related to capacity-building support in textual and tabular format. Examples include the Low Emission Capacity Building Programme, which strengthens institutional capacities and promotes integrated governance; and the Global Climate Change Alliance, which supports country-driven processes, building capacity, enhancing the integration of climate and disaster risk reduction into national planning and aligning development and climate change policies, including strong support for the implementation of the Paris Agreement.

126. The EU reported that it has supported climate-related capacity development activities relating to adaptation and mitigation. The EU also reported that it has responded to the existing and emerging capacity-building needs of non-Annex I Parties by following the principles of national ownership, stakeholder participation, country-driven demand, cooperation between donors and across programmes, impact assessment and monitoring. The EU has mainstreamed capacity-building activities into all development assistance.

(b) Assessment of adherence to the reporting guidelines

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

III. Conclusions and recommendations

128. The ERT conducted a technical review of the information reported in the BR3 and CTF tables of the EU in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and provides an overview of emissions and removals related to the EU's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; progress made by the EU in achieving its target; and the EU's provision of support to developing country Parties.

129. The total GHG emissions of the EU excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 23.7 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 26.0 per cent below its 1990 level, in 2015. The decrease in the total emissions was driven by a combination of economy-wide, sector-specific and climate-related drivers, including (1) structural changes in the economy, with an increased share of services on account of the reduced share of energy-intensive industrial activities, and the effects of the economic recession in the first decade of the 2000s; (2) the increased decarbonization of the fuel supply mix resulting from the shift from coal to gas for electricity and heat production, the increased use of renewable energy sources for power generation and energy efficiency improvements, which altogether have

been influenced by a number of climate and energy policies at both the EU and member State level; and (3) variation in climatic conditions in Europe and related changes in the demand for heating. These drivers also led to the decoupling of the GDP and GHG emission trends in the EU. The only major sector with increased emissions between 1990 and 2015 was the transport sector.

130. Under the Convention, the EU committed to contributing to the achievement of the joint EU quantified economy-wide emission reduction target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms and new market mechanisms for compliance purposes up to an established limit and subject to a number of restrictions on the origin and the type of project. Companies can make use of such units to fulfil their requirements under the EU ETS.

131. Under the ESD, the EU has a target of reducing its emissions by 10 per cent below the 2005 level by 2020. The 2015–2020 linear progression in the AEA of the EU (its emission target for non-ETS sectors) is 2,790,634–2,618,168 kt CO₂ eq.

132. For 2015 the EU reported in CTF table 4 total GHG emissions excluding LULUCF of 4,451,743.38 kt CO₂ eq. The EU reported on its use of units from market-based mechanisms to achieve its target. The ERT noted that the EU is making progress towards its emission reduction target by implementing mitigation actions that are delivering significant emission reductions and to a limited extent by using units from the market-based mechanisms under the Convention.

133. The GHG emission projections provided by the EU in its BR3 correspond to the WEM and WAM scenarios. Under the WEM and WAM scenarios, emissions are projected to be 26.2 and 26.8 per cent below the 1990 level by 2020, respectively. On the basis of the reported information, the ERT concludes that the EU expects to meet its 2020 target under the WEM and WAM scenarios.

134. The ERT noted that the EU's progress towards its emission reduction target is to a large extent defined by the comprehensive climate and energy PaMs implemented since the mid-2000s, notably the EU 2020 climate and energy package. The package introduced the economy-wide emission reduction target for 2020 and supporting targets on the share of renewable energy and improvement of energy efficiency by 2020. The package also introduced the landmark EU ETS, which ensures emission reduction by 21 per cent by 2020 for sectors covered, and the ESD for the remaining sectors with an overall limit of 10 per cent emission reduction. The effect of the package has been reinforced by a number of cross-cutting and sectoral PaMs covering renewable energy, energy efficiency, heating and cooling, energy taxation, eco-design requirements for products, energy labelling, low-emission mobility, CO₂ emission standards for cars and vans, F-gases, carbon capture and storage, LULUCF accounting, the circular economy, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package.

135. The ERT noted that many of the new policies are forward looking beyond 2020 and have been launched to contribute towards the EU's NDC for the period between 2020 and 2030. During the review, the ERT was provided information on the EU's NDC, which represents a binding target of at least a 40 per cent emission reduction by 2030 compared with the 1990 level, which has to be fulfilled jointly by the EU and its member States.

136. The most prominent new policies were included in the new 2030 climate and energy framework and the governance of the Energy Union. These provide for even closer integration of climate and energy by addressing: the increase in the share of renewables and improved energy efficiency by 2030 as per the 2030 climate and energy framework as well as electricity market reform through the full integration of the internal market; security, solidarity and trust to promote long-term certainty and predictability for investors; and research, innovation and competitiveness, supporting breakthroughs in low-carbon and clean energy technologies by prioritizing research and innovation to drive the energy transition and improve competitiveness. The policies also support a more prominent and clear role of the

LULUCF sector through the “no-debit” rule and more integrated approaches to climate action in the area of land use and agriculture that takes into account both mitigation and adaptation as well as sustainable development and efficient use of resources.

137. On the basis of the results of the projections for 2020 under the WEM and WAM scenarios, the ERT noted that the EU may overachieve its emission reduction target by 2020.

138. The EU continues to provide climate financing to developing countries in line with its climate finance instruments such as the Development Cooperation Instrument, the European Neighbourhood and Partnership Instrument and the European Development Fund. It has increased its contributions by 22.1 per cent since the BR2 and its public financial support in 2015 and 2016 totalled USD 4.205 and 5.175 billion, respectively. In those years the EU provided more support for mitigation than for adaptation. The biggest share of financial support went to projects in the agriculture, energy and transportation sectors, followed by the water and sanitation and forestry sectors.

139. The EU is promoting technology transfer in all parts of the world. The geographical distribution shows that the technology endeavours of the EU are global. In total, 15 per cent of the projects or programmes listed in BR3 CTF table 8 are global, 15 per cent in Africa, 15 per cent in Europe, 8 per cent in Asia and 8 per cent in Oceania, while 38 per cent cannot be assigned to a region. Furthermore, 69 per cent of the projects or programmes are mitigation related. The energy sector has the highest number of projects and programmes. The majority of the projects and programmes will be funded and implemented by public–private partnerships. It is important to note that the EU has mainstreamed capacity-building activities into all development assistance.

140. In the course of the review, the ERT formulated the following recommendations for the EU to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:¹⁴

(a) To improve the transparency of its reporting by reporting consistent information on its mitigation actions in the BR and CTF table 3 and, in cases where the estimated mitigation impacts of some PaMs are not reported in CTF table 3, providing explanations as to why such information is not reported (see table 4, issue 1);

(b) To improve the completeness of its reporting by providing relevant information on factors and activities driving emission trends for each sector (see table 9, issue 1).

¹⁴ The recommendations are given in full in the relevant chapters of this report.

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of the EU. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/10116.php.

BR3 of the EU. Available at http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/459381_european_union-nc7-br3-1-nc7_br3_combined_version.pdf.

BR3 CTF tables of the EU. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/vnd.openxmlformats-officedocument.spreadsheetml.sheet/459381_european_union-nc7-br3-1-copy_of_eua_2018_v1.0.xlsx.

European Commission. 2017. *Two Years After Paris – Progress Towards Meeting the EU’s Climate Commitments*. Available at https://ec.europa.eu/clima/sites/clima/files/strategies/progress/docs/swd_2017_xxx_en.pdf.

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

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

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex to decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex III to decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Annex to decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf>.

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

NC7 of the EU. Available at http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/459381_european_union-nc7-br3-1-nc7_br3_combined_version.pdf.

Report on the individual review of the annual submission of the EU submitted in 2016. FCCC/ARR/2016/EU. Available at <http://unfccc.int/resource/docs/2017/arr/eu.pdf>.

Report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of the EU. FCCC/IRR/2016/EU. Available at <http://unfccc.int/resource/docs/2017/arr/eu.pdf>.

Report of the technical review of the second biennial report of the EU. FCCC/TRR.2/EU. Available at <http://unfccc.int/resource/docs/2016/trr/eu.pdf>.

Report on the technical review of the sixth national communication of the EU.
FCCC/IDR.6/EU. Available at <http://unfccc.int/resource/docs/2014/idr/eu06.pdf>.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to
decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

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

B. Additional information provided by the Party

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