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

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

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Abbreviations and acronyms

AEA	annual emission allocation
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
ESD	European Union effort-sharing decision
EU	European Union
EU ETS	European Union Emissions Trading System
GHG	greenhouse gas
HFC	hydrofluorocarbon
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NECP	National Energy and Climate Plan
NF ₃	nitrogen trifluoride
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
non-ETS	not covered by the European Union Emissions Trading System
N ₂ O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
RNC2050	Roadmap for Carbon Neutrality 2050 of Portugal
SF ₆	sulfur hexafluoride
SPeM	National System of Policies and Measures of Portugal
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on CTF tables	common tabular format for the “UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This is a report on the centralized technical review of the BR4¹ of Portugal. The review was organized by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention” (annex to decision 13/CP.20).

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

3. The review was conducted together with the review of one other Party included in Annex I to the Convention from 9 to 13 March 2020 remotely² by the following team of nominated experts from the UNFCCC roster of experts: Isaac Nyaneyon Kannah (Liberia), Juan Luis Martin Ortega (El Salvador), Daniel Perczyk (Argentina), Ioannis Sempos (Greece), Hansrajie Sukhdeo (Guyana), Caroline Tagwireyi (Zimbabwe), Mark Eassah Tambah (Liberia), Ioanna Tsalakanidou (Greece) and Hannah Wanjiru (Kenya). Mr. Sempos and Ms. Tagwireyi were the lead reviewers. The review was coordinated by Lisa Hanle and James Howland (secretariat).

B. Summary

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

1. Timeliness

5. The BR4 was submitted on 30 December 2019, before the deadline of 1 January 2020 mandated by decision 2/CP.17. The CTF tables were also submitted on 30 December 2019. The CTF tables and BR4 were resubmitted on 1 April 2020 to address issues raised during the review. The resubmission included changes to the reporting on Portugal’s target and use of market-based mechanisms, and additions to the reporting on PaMs and projections. Unless otherwise specified, the information and values from the latest submission are used in this report.

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

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

Table 1

Summary of completeness and transparency of mandatory information reported by Portugal in its fourth biennial report

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation(s)</i>
GHG emissions and removals	Complete	Transparent	–
Quantified economy-wide emission reduction target and	Complete	Transparent	–

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

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

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendation(s)</i>
related assumptions, conditions and methodologies			
Progress in achievement of targets	Complete	Mostly transparent	Issue 1 in table 4 Issue 1 in table 6
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. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

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

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

1. Technical assessment of the reported information

7. Total GHG emissions³ excluding emissions and removals from LULUCF increased by 19.5 per cent between 1990 and 2017, whereas total GHG emissions including net emissions or removals from LULUCF and indirect CO₂ emissions increased by 29.2 per cent over the same period. Table 2 illustrates the emission trends by sector and by gas for Portugal. Note that information in this paragraph and table 2 is based on Portugal’s 2019 annual submission, version 2, which has not yet been subject to review. All emission data in subsequent chapters are based on Portugal’s BR4 CTF tables unless otherwise noted. The emissions reported in the 2019 annual submission are the same as reported in CTF table 1.

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

	<i>GHG emissions (kt CO₂ eq)</i>					<i>Change (%)</i>		<i>Share (%)</i>	
	<i>1990</i>	<i>2000</i>	<i>2010</i>	<i>2016</i>	<i>2017</i>	<i>1990–2017</i>	<i>2016–2017</i>	<i>1990</i>	<i>2017</i>
<i>Sector</i>									
1. Energy	41 474.10	60 767.76	48 752.46	47 116.25	51 201.74	23.5	3.2	70.2	72.6
A1. Energy industries	16 347.67	21 592.44	14 530.89	17 396.33	20 803.17	27.3	2.1	27.7	29.5
A2. Manufacturing industries and construction	9 794.02	12 535.77	9 198.33	7 343.95	7 578.06	–22.6	0.1	16.6	10.7
A3. Transport	10 217.35	19 544.38	18 930.02	16 787.55	17 148.26	67.8	0.1	17.3	24.3
A4. and A5. Other	4 787.96	6 531.06	5 398.34	4 412.30	4 415.61	–7.8	–0.2	8.1	6.3
B. Fugitive emissions from fuels	327.11	564.11	694.88	1 176.12	1 256.64	284.2	6.8	0.6	1.8
C. CO ₂ transport and storage	NO	NO	NO	NO	NO	–	–	–	–
2. IPPU	5 906.05	7 654.59	7 617.66	7 307.36	7 780.83	31.7	6.5	10.0	11.0
3. Agriculture	7 157.17	7 519.24	6 622.23	6 784.10	6 897.13	–3.6	1.7	12.1	9.8
4. LULUCF	1 155.02	–5 678.39	–10 910.43	–5 394.12	7 230.44	526.0	234.0	NA	NA
5. Waste	4 554.28	6 140.36	5 808.33	4 728.02	4 666.61	2.5	–1.3	7.7	6.6
6. Other ^a	NO	NO	NO	NO	NO	–	–	–	–
<i>Gas^b</i>									

³ In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF and including indirect CO₂ emissions, unless otherwise specified.

	GHG emissions (kt CO ₂ eq)					Change (%)		Share (%)	
	1990	2000	2010	2016	2017	1990–2017	2016–2017	1990	2017
	CO ₂	45 630.69	66 128.01	52 936.81	50 368.37	54 657.74	19.8	8.5	77.2
CH ₄	9 605.78	11 161.66	10 347.83	9 431.36	9 476.99	–1.3	0.5	16.3	13.4
N ₂ O	3 855.13	4 348.99	3 370.25	3 038.28	3 112.35	–19.3	2.4	6.5	4.4
HFCs	NO, NE, NA	425.55	2 103.17	3 058.93	3 257.10	–	6.5	–	4.6
PFCs	NO, NE, NA	1.13	7.93	15.30	16.87	–	10.2	–	0.0
SF ₆	NO, NE, NA	16.61	34.69	23.49	25.25	–	7.5	–	0.0
NF ₃	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	–	–	–	–
Total GHG emissions excluding LULUCF	59 091.60	82 081.96	68 800.68	65 935.73	70 546.30	19.4	7.0	100.0	100.0
Total GHG emissions including LULUCF	60 246.61	76 403.57	57 890.26	60 541.61	77 776.73	29.1	28.5	NA	NA
Total GHG emissions excluding LULUCF, including indirect CO₂	59 206.69	82 303.77	68 999.47	66 091.68	70 736.56	19.5	7.0	NA	NA
Total GHG emissions including LULUCF, including indirect CO₂	60 361.71	76 625.38	58 089.04	60 697.57	77 967.00	29.2	28.5	NA	NA

Source: GHG emission data: Portugal's 2019 annual submission, version 2.

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

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

8. The increase in total emissions was driven mainly by growth in the Portuguese economy, which resulted in increased energy demand: emissions from energy generation increased by 27.3 per cent from 1990 to 2017. Specifically, this was due to increases in transportation (67.8 per cent) and industrial activity (31.7 per cent) and a small increase in waste generation (2.5 per cent). The 19.8 per cent increase in CO₂ emissions over the same period was mainly driven by growth in the energy industries and transport, reflecting the country's dependence on fossil fuels for electricity generation and transportation. The 7.0 per cent increase in emissions between 2016 and 2017 reflects the unfavourable hydrological conditions in that period, which reduced hydroelectric production, resulting in an increase in the use of coal and natural gas in the electricity production sector.

9. Transport emissions grew as a result of an increase in the vehicle fleet as family incomes and road infrastructure improved in the country in the 1990s. Moderate increases in emissions occurred in the early 2000s. Emissions from transport began to decline in 2005 mainly owing to the penetration of biofuels and implementation of a 'green' tax reform for vehicles. However, the downward trend was disrupted, with emissions increasing by 8.4 per cent from 2013 to 2017. Passenger transport experienced an increase in person-kilometres travelled during this time. Emissions from IPPU grew mostly owing to increases in cement, lime and glass production, road paving, and limestone and dolomite use. The increase in waste generation was primarily associated with improved family incomes and increased urbanization. Although emissions and removals from LULUCF are not included in the joint EU quantified economy-wide emission reduction target, Portugal's emissions from this sector increased by 526.0 per cent from 1990 to 2017 owing to severe forest wildfire events in 2003, 2005 and 2017 associated with drought, heatwaves and unusually strong winds.

10. In brief, Portugal's national inventory arrangements were established in accordance with Council of Ministers resolution 20/2015, which updated the previous Council of Ministers resolution from 2005 on the inventory arrangements (68/2005). This resolution takes into account the international obligations relating to the Convention and the Kyoto Protocol, and the monitoring and reporting requirements at the EU level set out in EU regulation 525/2013. The resolution also takes into account European Commission implementing regulation 749/2014 on structure, format, submission processes and review of information reported by member States pursuant to EU regulation 525/2013, as well as the requirements under the Convention on Long-range Transboundary Air Pollution and the EU directive on national emission ceilings for certain atmospheric pollutants.

11. Council of Ministers resolution 20/2015 restructured the National System for the Estimation of Emissions by Sources and Removals by Sinks and Air Pollutants and specified the functions of the entities (e.g. the coordinating entity, the sectoral focal points, the participating entities) that make up the system. The Portuguese Environment Agency is the coordinating entity responsible for the overall coordination and updating of the national emissions inventory. The Agency is also responsible for approving the inventory, following consultation with the sectoral focal points and participating entities, and subsequently submitting the inventory to the European Commission and international bodies such as the UNFCCC and the United Nations Economic Commission for Europe (in respect of the Convention on Long-range Transboundary Air Pollution).

12. The Climate Change Department, which is under the Portuguese Environment Agency, is responsible for the general administration of the inventory of air emissions, including GHG sources and sinks, acidifying substances and other pollutants. The Department is also responsible for all aspects related to the annual compilation of the inventory and related reporting, including quality management. Calculation files and reported tables, underlying data, scientific documentation, studies used in compiling the inventory and other inventory material are stored and archived electronically at a server on the premises of the Portuguese Environment Agency. All organizations participating in the National System for the Estimation of Emissions by Sources and Removals by Sinks and Air Pollutants support the annual production of the national inventory and the fulfilment of the reporting requirements. There have been no major changes to these arrangements since the BR3.

2. Assessment of adherence to the reporting guidelines

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

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

1. Technical assessment of the reported information

14. For Portugal the Convention entered into force on 21 March 1994. Under the Convention Portugal committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020.

15. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. The legislative package regulates emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ using global warming potential values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Operators and airline operators can use such units to fulfil their requirements under the EU ETS, and member States can use such units for their national ESD targets, within specific limitations.

16. The EU 2020 climate and energy package includes the EU ETS and the ESD (see paras. 33–34 below). The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap has been put in place for 2013–2020 with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from ESD sectors are regulated through member State specific targets that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020.

17. The European Green Deal, launched in 2019, represents a commitment by the EU to become climate-neutral by 2050, and presents a road map that encompasses all sectors of the economy. It calls for increased ambition in the 2030 emission reduction target to at least 50

per cent below the 2005 level. Member States will translate any increased ambition into action through their revised NECP.

18. Portugal has a national target of limiting its emission growth to 1 per cent above the 2005 level by 2020 for emissions under the ESD. This target has been translated into binding quantified AEAs for 2013–2020. Portugal's AEAs change following a path from 49,310.77 kt CO₂ eq in 2013 to 49,080.26 kt CO₂ eq in 2020.⁴

19. In addition to its ESD target, Portugal has established domestic targets through its National Programme for Climate Change 2020/2030 of emission reductions of 18–23 per cent by 2020 and 30–40 per cent by 2030 compared with the 2005 level. In 2016, the Portuguese Government committed to achieving carbon neutrality by 2050, and in this context drafted RNC2050, which serves as Portugal's national strategy for long-term low-GHG development. In 2019, Portugal submitted RNC2050 as part of its reporting under the UNFCCC process pursuant to the Paris Agreement and to the European Commission pursuant to EU regulation 2018/1999 on the governance of the Energy Union and climate action. A national target has been set to reduce GHG emissions by 85–90 per cent by 2050 compared with the 2005 level and to offset the remaining emissions through land use and forests. This target is to be achieved through a trajectory of emission reductions: 45–55 per cent by 2030 and 65–75 per cent by 2040 compared with the 2005 level.

20. Under the EU 2020 climate and energy package, the 20 per cent emission reduction target was coupled with the establishment of EU targets of a 20 per cent share of renewable energy in final energy consumption (Portugal's contribution to this amounts to a 31 per cent share of renewables in its final energy consumption) and an increase in energy efficiency of 20 per cent. The latter objective applies to all EU member States.

21. In addition to its target under the Convention, the EU also committed to a legally binding quantified emission limitation and reduction commitment for the second commitment period of the Kyoto Protocol (2013–2020). Another target was pledged under the Paris Agreement through the nationally determined contribution of the EU and has been adopted by the EU under the 2030 climate and energy framework (spanning 2021–2030). The emission reduction target is a pledge to reduce emissions by at least 40 per cent by 2030 compared with the 1990 level. To achieve this target, EU ETS sectors will have to reduce emissions by 43 per cent compared with the 2005 level by 2030. ESD sectors will need to reduce emissions by 30 per cent by 2030 compared with the 2005 level, which has been translated into individual binding targets for member States. For Portugal the target is a reduction of 17 per cent compared with the 2005 level. Emissions and removals from LULUCF are included in the EU climate target for the first time through EU regulation 2018/841 on accounting rules on GHG emissions and removals relating to LULUCF.

22. Separate targets for renewable energy and energy efficiency were set under the EU 2030 climate and energy framework. A binding target of at least a 32 per cent share of renewables in the final energy consumption by 2030 has been set; in this context, Portugal has a target of a 47 per cent share of renewables in its final energy consumption. For energy efficiency, a target of at least 32.5 per cent of final energy consumption has been set, though Portugal has committed to a more ambitious national energy efficiency target of 35 per cent by 2030.

2. Assessment of adherence to the reporting guidelines

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

⁴ European Commission decision 2017/1471 amended decision 2013/162/EU to revise member States' AEAs for 2017–2020.

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

1. Mitigation actions and their effects

(a) Technical assessment of the reported information

24. Portugal provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention. Portugal reported on its policy context and legal and institutional arrangements in place for implementing its commitments and monitoring and evaluating the effectiveness of its PaMs.

25. Portugal provided information on a set of PaMs similar to those previously reported in its BR3, however, many of the PaMs have been renamed or regrouped as part of the Party's climate planning for 2030, leading to increases in scale and differences in reporting (see para. 27 below). Portugal also provided information on changes since its previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting and archiving of information and evaluation of progress towards its target (see para. 28 below).

26. Portugal reported that since its BR3 it has expanded its main policy framework relating to energy and climate change. More specifically, Portugal maintained the National Programme for Climate Change 2020/2030, the National Plan of Action for Renewable Energy 2013–2020 and the National Plan of Action for Energy Efficiency 2013–2016, while developing RNC2050 in order to fulfil its 2016 pledge to ensure the neutrality of the country's emissions by the end of 2050. RNC2050 was approved in 2019 through a Council of Ministers resolution. It identifies the main decarbonization vectors in all sectors of the economy (i.e. power generation, mobility and transport, industry/industrial processes, building, agriculture, LULUCF), the options for PaMs and the emission reduction path to achieve carbon neutrality under various socioeconomic development scenarios. RNC2050 sets the overarching policy direction for climate policies up to 2050.

27. Portugal's main policy instrument to achieve carbon neutrality is the NECP. The NECP identifies the main priority areas for action in the coming decade (2021–2030) and was developed in conjunction with RNC2050. Portugal reported that additional mitigation actions have been identified in response to the ambition increase in the national targets in the NECP and RNC2050. During the review, the Party explained that the development of RNC2050 and the NECP resulted in the renaming and/or regrouping of some previously reported PaMs as well as in the reinforcement of measures already under way in order to increase their efficiency and scale; for example, measures supporting increased sales of electric vehicles, encouraging public transport use and promoting renewable energy. The relationship between the individual renamed or regrouped PaMs in the BR4 and their predecessors reported in the BR3 was not described in the BR4.

28. Portugal reported that SPeM – established in 2016 – is being adjusted to reflect the new reality of increasingly integrated energy and climate policies. The Party has been developing, under SPeM, a platform for monitoring and reporting the impacts of energy- and climate-related cross-sectoral PaMs. This platform was originally planned to keep track of progress in implementing the National Programme for Climate Change 2020/2030, but it will also be used (with some adjustments) to track progress under the NECP. During the review Portugal mentioned that the responsibility for coordinating the platform will be transferred to the Portuguese Environment Agency and the Directorate-General for Energy. The Party reported in the BR4 that the responsibility for energy matters had been transferred from the Ministry of Economy to the Ministry of Environment and Energy Transition in 2018, and that the latter had changed its name to the Ministry of Environment and Climate Action in 2019.

29. In its reporting on its PaMs, Portugal did not provide the estimated emission reduction impacts for any of them. Estimated emission reduction impacts were also not included in its BR3. However, in the BR4, Portugal explained that the analysis of the mitigation potential of concrete measures will need to be undertaken from 2020 onward because the Party was unable to develop indicators for estimating emission reduction impacts before finalizing its

package of mitigation PaMs in December 2019. SPeM will be used to this end (see para. 28 above).

30. Portugal reported on its self-assessment of compliance with its emission reduction targets and national rules for taking action against non-compliance. More specifically, Portugal provided information on its Interministerial Commission on Air, Climate Change and the Circular Economy, established in 2016, which monitors compliance with commitments at the national level and within the context of the EU and the United Nations, and ensures compliance with emission reduction targets. In addition, Portugal reported that SPeM facilitated the assessment of compliance with national commitments, including compliance with the sectoral targets under the EU 2020 climate and energy package and the National Programme for Climate Change 2020/2030.

31. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO₂ emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package. The 2030 climate and energy framework, adopted in 2014, includes more ambitious targets, which are expected to be revised further upwards owing to the European Green Deal.

32. The 2021–2030 EU-wide policies are operationalized through the NECP (see para. 27 above). The NECP will be periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal.

33. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N₂O emissions from chemical industry, PFC emissions from aluminium production and CO₂ emissions from some industrial processes that were not covered in the previous phases of the EU ETS (since 2013). For 2030, an emission reduction target of 43 per cent below the 2005 level has been set for the EU ETS.

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

35. Portugal highlighted the EU-wide mitigation actions that are under development, such as the EU regulation on the governance of the Energy Union and climate action, under which Portugal developed the NECP and RNC2050. Among the mitigation actions that will have a significant impact on future emissions are those related to implementing this regulation, namely the creation of the NECP and national long-term strategies, which resulted in the development of new PaMs and the renaming, regrouping and reinforcement of existing ones.

36. Portugal introduced national-level policies to achieve its targets under the ESD and its domestic emission reduction targets. Under the National Programme for Climate Change 2020/2030 Portugal implemented EU targets for non-ETS sectors and set national sectoral targets for services, residential, transport, agriculture and wastewater for 2020 and 2030. The National Programme for Climate Change 2020/2030 has been replaced by the NECP, which set more ambitious targets for 2030. No emission estimates were provided in the BR4 that would enable the evaluation of which PaMs have delivered the most significant mitigation effects or how the new targets set under the NECP have affected Portugal's contribution to attaining the EU-wide 2020 emission reduction target.

37. Portugal highlighted the domestic mitigation actions that are under development in the context of the NECP, such as promoting new renewable energy storage solutions, developing an industry for green hydrogen and renewable fuels, phasing out coal-fired power plants, and promoting digitalization, eco-innovation and cleaner production processes in the industry sector. However, no emission estimates were reported that would enable the evaluation of which of Portugal's mitigation actions have provided the foundation for significant additional action. Table 3 provides a summary of the reported information on the PaMs of Portugal.

Table 3

Summary of information on policies and measures reported by Portugal

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact in 2020 (kt CO₂ eq)</i>
Policy framework and cross-sectoral measures	EU ETS Carbon tax for non-ETS sectors Tax incentives for efficiency and low-carbon options	NE
Energy		
Transport	Electric mobility and alternative fuels Public Transport Tariff Reduction Programme Efficiency and expansion of the public transport network National Active Mobility Strategy Promoting rail and maritime cargo transport	NE
Renewable energy	National Plan of Action for Renewable Energy 2013–2020 Phasing out coal-fired power plants Developing a domestic industry for green hydrogen and renewable fuels Using hydroelectric plants for renewable energy storage	NE
Energy efficiency	National Plan of Action for Energy Efficiency 2013–2016 Action Plan for Energy Efficiency in Public Administration Energy rehabilitation of buildings and constructing near zero-energy buildings Using energy-efficient equipment	NE
IPPU	System for the Management of Energy-Intensive Consumer Installations Electrification and increased use of renewable energy sources Action plan for a circular economy Enforcing EU regulation 517/2014 on fluorinated GHGs Implementing the EU directive on mobile air conditioning	NE
Agriculture	Reducing nitrogen fertilizer use Increasing soil organic content to increase carbon sequestration Improving the feed digestibility of livestock Reducing emissions from livestock effluents Increasing the production and use of renewable energy sources (bioenergy) in rural areas	NE
LULUCF	Remunerating the provision of ecosystems services (e.g. erosion control, carbon sequestration, fire protection) Increasing carbon capture potential and soil sequestration	NE

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact in 2020 (kt CO₂ eq)</i>
Waste	Managing agroforestry	
	Increasing resilience to climate change	
	National Waste Management Plan	NE
	Strategic Plan for Urban Waste	
	National Strategy to Combat Food Waste	
	Implementing the EU landfill directive	
Other	Improving the energy management of wastewater networks	
	Research and Innovation Strategy for Smart Specialization 2014–2020	NE
	Research and Innovation Thematic Agendas 2030	
	Urban regeneration	

38. As Portugal did not provide estimates of the mitigation impacts of PaMs, it is not possible to assess the assumptions, methods and data used in the estimation of mitigation impacts, the plausibility of estimates or the likelihood of a given mitigation action achieving the expected impact by the date stated. Portugal reported that further analysis of the mitigation potential of PaMs will be undertaken from 2020 onward. To this end, SPeM will be used to monitor and report on the effects of PaMs that have been implemented, as well as the expected effects of the PaMs being implemented or to be implemented (i.e. a set of dedicated indicators and methodologies will be used in the coming years).

(b) Policies and measures in the energy sector

39. **Energy efficiency.** Portugal has set targets for energy efficiency (with respect to final energy consumption) of 20 per cent by 2020 and 35 per cent by 2030. Portugal’s main PaMs in the area of energy efficiency are the National Plan of Action for Energy Efficiency 2013–2016 and the Action Plan for Energy Efficiency in Public Administration. The latter calls for measures such as instituting energy certification for State buildings, establishing energy efficiency management contracts, adopting low-carbon requirements in public procurement, increasing the efficiency of the transport fleet and installing more efficient public lighting. Public lighting accounts for a large portion of electricity consumption in the country’s municipalities, and the State therefore promotes investments in efficient, next-generation public lighting. Energy efficiency PaMs targeting individual sectors are discussed below.

40. **Energy supply and renewables.** Portugal’s energy vision includes the decentralization, digitalization and decarbonization of the electricity system, with a focus on consumers and energy producers as active participants in the system and on adequate quality of service and security of supply. Portugal aims to achieve this vision by phasing out its two remaining coal-fired power plants (by 2021 and 2023), increasing the use of endogenous renewable energy resources, improving interconnections with other EU member States and improving the intelligence and flexibility of the power system by applying tools and measures such as smart grids, management support systems, bidirectional smart meters, storage systems, local energy production, and supply and demand management.

41. Portugal seeks to increase the share of renewables in the national energy mix to 31 per cent by 2020 and 47 per cent by 2030, mostly by expanding the use of solar (centralized, decentralized and community-based), wind (onshore and offshore) and hydroelectric (with and without pumped storage) energy. The National Plan of Action for Renewable Energy 2013–2020 is Portugal’s main measure to achieve the 2020 targets. Other key measures include maximizing renewable energy storage through the promotion of renewable fuels and the exploitation of hydroelectric potential. More specifically, Portugal reported that it has been promoting an industrial policy on hydrogen and renewable fuels (particularly biomethane) aimed at guiding, coordinating and mobilizing public and private investments in the production, storage, transport and consumption of renewable fuels, and developing a green hydrogen production industry. With regard to hydroelectric energy, Portugal reported its plans to establish rigorous site selection criteria for deploying new major hydroelectric

facilities that can also be used as storage. The National Plan for the Promotion of Biorefineries and the Industrial Strategy and Action Plan for Renewable Ocean Energy are also important PaMs.

42. **Residential and commercial sectors.** Portugal aims to decrease domestic GHG emissions from the residential sector by 14 per cent by 2020 and 70 per cent by 2030. PaMs will be implemented to promote near zero-energy buildings and energy rehabilitation, in particular with a view to improving the thermal insulation of residential buildings. Measures also include electrification and increasing the use of energy-efficient equipment and renewable energy systems. Portugal also reported on introducing energy efficiency solutions, low-carbon materials and renewable energy sources into the residential sector through urban regeneration. With regard to the services sector, Portugal seeks to decrease GHG emissions by 65 per cent by 2020 and 70 per cent by 2030 through PaMs that exploit the remaining electrification potential and promote the use of renewables and energy-efficient equipment.

43. **Transport sector.** Portugal's transport sector is the fastest growing contributor to domestic GHG emissions, accounting for about 25 per cent. This sector includes road, rail and maritime transport and aviation (national components) and can be divided into passenger and freight transport. Road transport accounts for 96 per cent of sector emissions, and car use accounts for 60 per cent of the total road transport emissions. Portugal aims to decrease transport emissions by 14 per cent by 2020 and 40 per cent by 2030. The PaMs to decrease emissions from passenger cars include those supporting a shift to electric mobility and promoting the efficiency and expansion of the public transport system. Specifically, Portugal reported that PaMs to strengthen the charging infrastructure and encourage the acquisition of electric and hybrid vehicles are already in place, including tax exemptions. The Public Transport Tariff Reduction Programme and the National Active Mobility Strategy 2020–2030, both approved in 2019, are the two main PaMs to promote alternative mobility. Other PaMs to promote a modal shift towards alternative mobility include the expansion of the train and metro networks, the renewal of the public transport fleet (i.e. purchase of electric and hydrogen-fuelled vehicles), and the promotion of information technologies, eco-driving monitoring technologies, teleworking and vehicle-sharing services.

44. In other transport subsectors, PaMs include shifting cargo transport from road to rail and maritime routes, electrifying and expanding the rail network, improving the connections and interoperability of rail freight with commercial ports, improving logistical management and promoting clean alternative fuels, in particular advanced biofuels and hydrogen, for the long-haul, heavy-passenger road haulage, freight and aviation sectors.

45. **Industrial sector.** The EU ETS is the main GHG emission mitigation policy for the industrial sector in Portugal. Another significant policy is the System for the Management of Energy-Intensive Consumer Installations, which seeks to promote energy efficiency and monitor energy consumption. PaMs related to the automation and digitalization of the industrial sector, increased electrification and increased use of renewable energy sources (i.e. biomass, biofuels, renewable gases and solar thermal energy) are expected to significantly contribute to reducing the sector's GHG emissions.

46. **Energy research and development.** Portugal highlighted the need to support research and technological innovation in priority areas such as hydrogen storage, smart grids, advanced biofuels, deep geothermal energy, solar thermal concentration, ocean energy, energy integration, energy conservation and storage, low-carbon processes, circular economy and precision agriculture. The main PaMs to promote research and development projects that support the transition to a carbon-neutral economy are the Research and Innovation Strategy for Smart Specialization 2014–2020 and the Research and Innovation Thematic Agendas 2030, which are under development by the Science and Technology College of the New University of Lisbon.

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

47. **Industrial processes.** The EU ETS is the main GHG emission mitigation policy for the industrial processes sector in Portugal. Two other important policies reported and implemented by Portugal are EU regulation 517/2014, which promotes the substitution of fluorinated GHGs with other substances that have a lower or zero global warming potential,

and the EU directive on mobile air conditioning, which applies restrictions to fluorinated gases used in cars and vans. Other PaMs reported for industrial processes are the national action plan for a circular economy, which promotes industrial symbioses and the reuse of resources, and the Industry 4.0 initiative on industry digitalization.

48. **Agriculture.** Portugal has set GHG emission reduction targets of 65 per cent by 2020 and 70 per cent by 2030 for the agriculture sector. Under the good agricultural practices code, the EU national ceilings directive and the EU regulation on fertilizers, Portugal has provided incentives to reduce the use of nitrogen fertilizers. PaMs have also been used to replace nitrogen fertilizers with organic compost, increase soil organic content and expand precision and organic farming in order to reduce N₂O emissions and increase carbon sequestration in soil. In addition, incentives have been provided for implementing energy efficiency measures coupled with improvements in water efficiency, particularly in irrigation, and resource-efficient and regenerative agricultural practices are supported. Portugal also reported PaMs to develop local biomass chains in order to increase the production and use of renewable energy sources (e.g. bioenergy) in rural areas. In addition, under the National Strategy for Agricultural and Agro-Industrial Effluents, Portugal has implemented policies to reduce emissions from livestock effluents. To reduce the carbon intensity of livestock farming, improvements in the feed digestibility of animals produced in both intensive and extensive systems are planned.

49. **LULUCF.** Portugal's Rural Space Ecosystem Services Remuneration Programme, launched in 2019, aims to enhance the competitiveness of rural territories and ensure a more environmentally sustainable model, with less exposure to risks, particularly from fires. In particular, the Programme seeks to compensate for non-market benefits, such as erosion control, carbon sequestration and reduced susceptibility to fire. To enhance carbon capture potential and soil sequestration, Portugal aims to implement measures such as installing permanent biodiverse pastures, maintaining permanent crops and other fertility and soil structure improvement operations, and planting crops appropriate to local soil characteristics. Also reported as a measure is agroforestry management, which aims to progressively reduce burned areas, increase productivity and reinforce the commitment to the ecosystem services that contribute to the fight against desertification. In addition, Portugal reported PaMs, for instance the Rural Space Ecosystem Services Remuneration Programme, to increase the resilience of forest areas to climate change induced risks, such as forest fires and soil degradation.

50. **Waste management.** Portugal aims to reduce GHG emissions from the waste and wastewater sector by 14 per cent by 2020 and 30 per cent by 2030. Under the National Waste Management Plan, the Strategic Plan for Urban Waste, the National Strategy to Combat Food Waste and the EU landfill directive, Portugal has applied measures to prevent waste generation, strengthen selective urban waste, promote the biological treatment of biowaste, increase reuse and recycling, and reduce landfilling. PaMs to reduce waste production and landfilling also include optimizing the waste management network and promoting power generation at waste management facilities. Portugal plans to identify synergies and assess the application of the extended producer responsibility principle to emerging flows in order to increase reuse and recycling. With regard to the wastewater sector, PaMs to improve the energy management and efficiency of wastewater and water supply networks have been reported.

(d) Response measures

51. Portugal reported on its assessment of the economic and social consequences of its response measures. It highlighted that under its National Programme for Climate Change 2020/2030, the PaMs it has adopted and implemented, which cover all sectors of the economy, not only address climate change but also aim to minimize any adverse effects. Through SPeM, Portugal assesses the economic and social consequences of climate policy measures and the related costs for all sectors. Portugal's assessment of its response measures has allowed it to cooperate with some developing countries (Portuguese-speaking African countries and Timor-Leste) to integrate adaptation and vulnerabilities and risks associated with climate change into several sectoral policies in these countries. This enables the developing countries to better plan and prepare for the effects of the implementation of

response measures by Portugal, especially when joint trade agreements and other bilateral or multilateral arrangements are affected.

(e) Assessment of adherence to the reporting guidelines

52. The ERT assessed the information reported in the BR4 of Portugal and identified an issue relating to transparency and thus 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 fourth biennial report of Portugal

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 6 Issue type: transparency Assessment: recommendation	Portugal did not transparently report in its BR4 on the PaMs that were put in place to achieve its economy-wide emission reduction target. More specifically, mitigation actions phrased in the future tense in the BR4 text (i.e. future plans or intentions) are similar to actions reported as already in place in the NC7 and BR3 text. In addition, for the policy framework of each sector, Portugal provided lists with the titles of plans and strategies, often without describing the concrete mitigation actions they involve or generally how and why these strategies and plans contribute to achieving the target. During the review Portugal explained that the PaMs were renamed or regrouped in accordance with RNC2050 and the NECP, which were approved in 2019. The ERT recommends that Portugal improve the transparency of its reporting by including in its next BR explanations for how its PaMs have changed compared with the information on them included in the previous NC and BR, and by providing brief descriptions of its PaMs, as per the heading for CTF table 3 in the UNFCCC reporting guidelines on CTF tables, rather than only their titles.

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

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

(a) Technical assessment of the reported information

53. For 2016, Portugal reported in CTF table 4 annual total GHG emissions excluding LULUCF of 65,935.73 kt CO₂ eq, which is 11.6 per cent above the 1990 level. In 2016, emissions from sectors relating to the target under the ESD amounted to 41,579.90 kt CO₂ eq.

54. For 2017, the Party reported in CTF table 4 annual total GHG emissions excluding LULUCF of 70,546.30 kt CO₂ eq, which is 19.4 per cent above the 1990 level. In 2017, emissions from sectors relating to the target under the ESD amounted to 40,186.37 kt CO₂ eq.

55. Given that the contribution of LULUCF activities is not included in the joint EU target under the Convention, the reporting of contributions of LULUCF activities is not applicable for Portugal. The Party reported that it does not intend to use units from market-based mechanisms under the Convention to achieve its ESD target. Table 5 illustrates Portugal’s ESD emissions and the use of units from market-based mechanisms to achieve its ESD target.

Table 5
Summary of information on the use of units from market-based mechanisms by Portugal to achieve its target

Year	ESD emissions (kt CO ₂ eq)	AEA (kt CO ₂ eq)	Use of units from market-based mechanisms (kt CO ₂ eq) ^a	Annual AEA surplus or deficit (kt CO ₂ eq) ^b	Cumulative AEA surplus or deficit (kt CO ₂ eq)
2013	38 610.32	49 310.77	NA	10 700.45	10 700.45
2014	38 836.64	49 586.65	NA	10 750.01	21 450.46
2015	40 614.10	49 862.53	NA	9 248.43	30 698.89

Year	ESD emissions (kt CO ₂ eq)	AEA (kt CO ₂ eq)	Use of units from market- based mechanisms (kt CO ₂ eq) ^a	Annual AEA surplus or deficit (kt CO ₂ eq) ^b	Cumulative AEA surplus or deficit (kt CO ₂ eq)
2016	41 579.90	50 138.40	NA	8 558.50	39 257.39
2017	40 186.37	47 909.60	NA	7 723.23	46 980.62

Sources: Portugal's BR4, information provided by the Party during the review and EU transaction log (AEAs).

^a The use of "NA" indicates that the Party stated in its BR that it does not intend to use market-based mechanisms to achieve its target.

^b A positive number (surplus) indicates that ESD emissions were lower than the AEA, while a negative number (deficit) indicates that ESD emissions were greater than the AEA.

56. In assessing progress towards achieving the 2020 joint EU target, the ERT noted that Portugal's emission reduction target for the ESD is 1 per cent above the 2005 level (see para. 18 above). In 2017, the Party's emissions covered by the ESD were 16.1 per cent (7,723.23 kt CO₂ eq) below the AEA under the ESD. In addition, the ERT noted that Portugal indicated that it does not plan to use market-based mechanisms to meet its target in 2020. The Party has a cumulative surplus of 46,980.62 kt CO₂ eq with respect to its AEAs between 2013 and 2017.

57. The ERT noted that Portugal is making progress towards its ESD target by implementing mitigation actions that are delivering significant emission reductions.

(b) Assessment of adherence to the reporting guidelines

58. The ERT assessed the information reported in the BR4 of Portugal and identified an issue relating to transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The finding is described in table 6.

Table 6

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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation
1	Reporting requirement specified in paragraph 10 Issue type: transparency Assessment: recommendation	Portugal reported inconsistent information on its use of market-based mechanisms in CTF table 4 and 4(b). In CTF table 4, the Party indicates use of market-based mechanisms under the Convention for 2016 of 38,021 units (38.02 kt CO ₂ eq) and for 2017 of 41,639 units (41.64 kt CO ₂ eq), which are the same values reported in CTF table 4(b) as Kyoto Protocol units but for different years: 2017 (38,021 units; 38.02 kt CO ₂ eq) and 2018 (41,639 units; 41.64 kt CO ₂ eq). During the review, Portugal indicated that there was an error in the resubmitted CTF table 4 and that the market-based mechanisms used under the Convention should be reported as 30,247 units (30.24 kt CO ₂ eq) for 2016 and 38,021 units (38.02 kt CO ₂ eq) for 2017. The ERT recommends that Portugal improve the transparency of its reporting by reporting consistent information on its use of market-based mechanisms in its next BR.

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

3. Projections overview, methodology and results

(a) Technical assessment of the reported information

59. Portugal reported updated projections for 2020 and 2030 relative to actual inventory data for 2017 under the WEM scenario. The WEM scenario reported by Portugal includes PaMs approved and published until 31 December 2017.

60. In addition to the WEM scenario, Portugal reported the WAM scenario. Portugal provided a definition of its scenarios, explaining that its WEM scenario includes policies such as the commitment it made to end the production of electricity from coal. The Party explained that the WAM scenario has been built imposing the condition of carbon neutrality

by 2050, allowing assessment of the additional efforts required by each sector, but not translating into a typical scenario where the impacts of specific PaMs are identified. The BR4 references RNC2050 for details about the scenarios, assumptions, sectoral drivers and results. The efforts required include decarbonizing electricity production, bringing about large reductions in emissions from the transport and buildings sectors, improving the efficiency of industrial processes, improving agricultural practices and reinforcing the role of forest sinks. The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on BRs.

61. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO₂, CH₄, N₂O, PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case) for 2020–2030. The projections are also provided in an aggregated format for each sector and for a Party total using global warming potential values from the AR4. Portugal reported on factors and activities affecting emissions for each sector.

62. Portugal reported emission projections for the indirect GHGs nitrogen oxides, non-methane volatile organic compounds and sulfur oxides.

63. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately and were not included in the totals. Portugal explained in its BR4 that the focus of the modelling exercise was on its carbon-neutrality commitment, and that it was not feasible to allocate resources to developing a methodology for projecting emissions related to ship and aircraft fuel. Portugal indicated that it would consider performing this projection in future modelling exercises.

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

64. The methodology used for the preparation of the projections is different from that used for the preparation of the emission projections in the NC7. The projections were developed during the elaboration of the NECP and RNC2050. The starting point was the development of coherent socioeconomic scenarios. The proposed scenarios were subject to a consultation and validation process by organizations specializing in economic forecasting. The TIMES_PT model was used for preparing projections of emissions from the energy, transport, and industry and industrial processes sectors. Regarding the models used for the agriculture, LULUCF, and waste and wastewater sectors, Portugal reported that spreadsheets based on inventory methodology were used. Lastly, for fluorinated gases, emission projections were based on the implementation of the relevant EU regulations.

65. To prepare its projections, Portugal relied on key underlying assumptions resulting from the socioeconomic scenarios developed relating to, among other factors, population, energy prices, energy production and consumption, economic development, number of households, livestock population and use of nitrogen as a fertilizer. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. The assumptions are presented in CTF table 5. Portugal stated that the projections of emissions are based on a socioeconomic scenario named Platoon. This scenario is characterized by the development and application of new technologies, but without significant changes to the production structure of the economy or the lifestyle of the population. Both the WEM and the WAM projections are based on the Platoon socioeconomic scenario, and for the WAM projection, the condition of carbon neutrality by 2050 was adopted.

66. Portugal did not provide information on the changes since the submission of its NC7 and BR3 in the assumptions, methodologies, models and approaches used in the projection scenarios. The Party did not provide supporting documentation to explain the changes. Portugal reported in CTF table 5 the key variables and assumptions used in the preparation of the projection scenarios.

67. Portugal also did not provide information on sensitivity analyses.

(c) Results of projections

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

Table 7

Summary of greenhouse gas emission projections for Portugal

	Total GHG emissions		Emissions under the ESD	
	GHG emissions (kt CO ₂ eq per year)	Change in relation to 1990 level (%)	ESD emissions (kt CO ₂ eq per year)	Comparison to 2020 AEA (%)
2020 AEA under the ESD ^a	NA	NA	49 080.26	100.0
Inventory data 1990	59 091.60	NA	NA	NA
Inventory data 2017	70 546.30	19.4	40 186.72	81.9
WEM projections for 2020	63 288.91	7.1	37 241.50	75.9
WAM projections for 2020	63 288.91	7.1	37 241.50	75.9
WEM projections for 2030	42 303.15	-28.4	29 309.20	NA
WAM projections for 2030	38 940.74	-34.1	27 606.80	NA

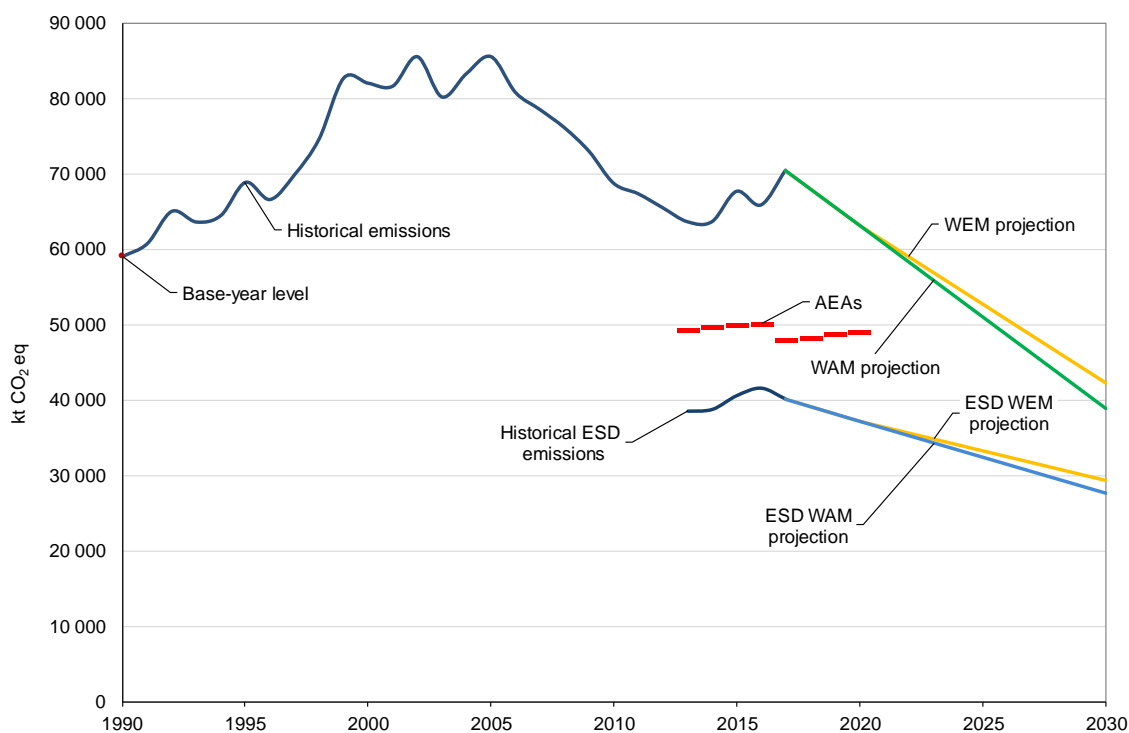
Source: Portugal’s BR4 and CTF table 6.

Note: The projections are for GHG emissions excluding LULUCF.

^a The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020. Portugal’s target under the ESD is to limit its emission growth to 1 per cent above the 2005 level by 2020.

Figure 1

Greenhouse gas emission projections reported by Portugal



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

69. Portugal’s total GHG emissions excluding LULUCF and indirect CO₂ in 2020 and 2030 are projected to be 63,288.91 and 42,203.15 kt CO₂ eq, respectively, under the WEM scenario, which represent an increase of 7.1 per cent and a decrease of 28.4 per cent, respectively, compared with the 1990 level. Under the WAM scenario, emissions in 2020 are projected to be the same as in the WEM scenario, and in 2030, emissions are projected to be lower than those in 1990 by 34.1 per cent and amount to around 38,940.74 kt CO₂ eq.

70. Portugal’s target under the ESD is to limit its ESD emission growth to 1 per cent above the 2005 level by 2020 (see para. 18 above). Portugal’s AEAs, which correspond to its

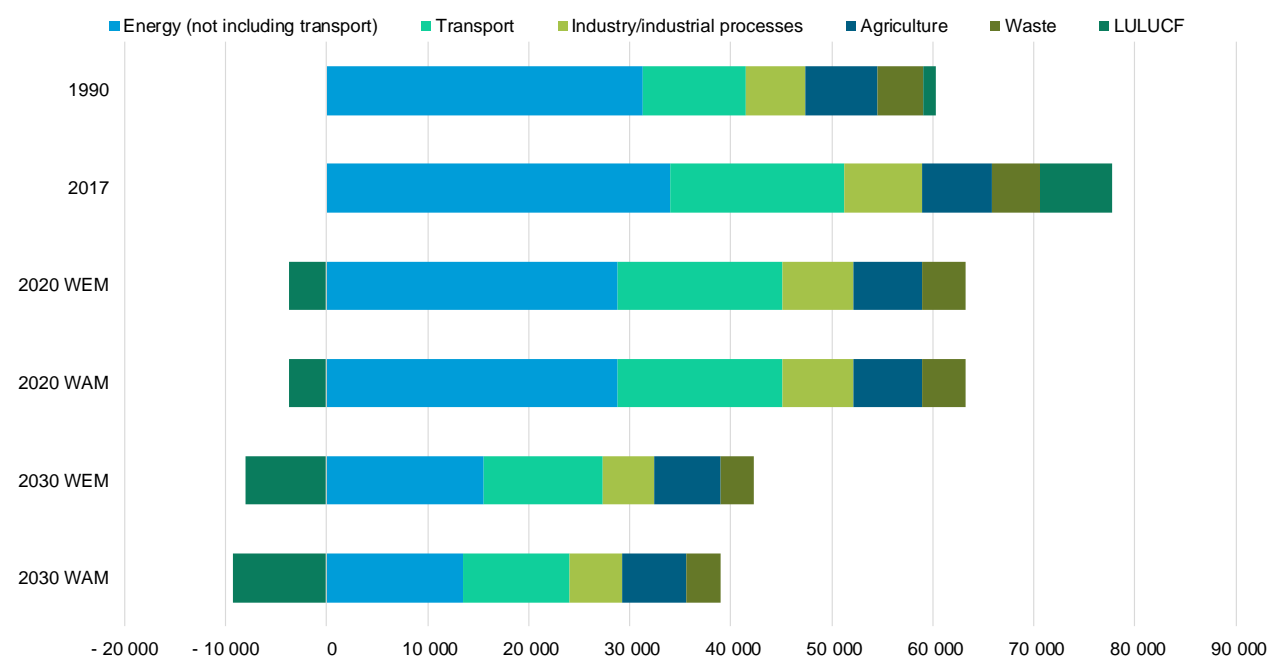
national emission target for ESD sectors, change from 49,310.77 kt CO₂ eq in 2013 to 49,080.26 kt CO₂ eq for 2020. According to the projections under the WEM and WAM scenarios, ESD emissions are estimated to reach 37,241.50 kt CO₂ eq by 2020. The projected level of emissions under the WEM and WAM scenarios is 24 per cent below the AEAs for 2020. The ERT noted that the Party's cumulative surplus of AEAs is 46,980.62 kt CO₂ eq, which suggests that Portugal expects to meet its target under the WEM and WAM scenarios.

71. In addition to its target under the ESD, Portugal committed itself to achieving a domestic target of an 18–23 per cent reduction in emissions below the 2005 level by 2020. The projections indicate that Portugal expects to meet its domestic target, as the reduction projected is 29 per cent.

72. Portugal presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in figure 2 and table 8.

Figure 2

Greenhouse gas emission projections for Portugal presented by sector



Source: Portugal's BR4 CTF table 6.

Table 8

Summary of greenhouse gas emission projections for Portugal 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)	31 256.75	28 778.15	28 778.15	15 563.91	13 460.72	-7.9	-7.9	-50.2	-56.9
Transport	10 217.35	16 272.14	16 272.14	11 699.11	10 611.10	59.3	59.3	14.5	3.9
Industry/industrial processes	5 906.05	7 042.81	7 042.81	5 157.46	5 157.46	19.2	19.2	-12.7	-12.7
Agriculture	7 157.17	6 791.07	6 791.07	6 566.02	6 394.81	-5.1	-5.1	-8.3	-10.7
LULUCF	1 155.02	-3 778.43	-3 778.43	-8 082.46	-9 248.86	-427.1	-427.1	-799.8	-900.8
Waste	4 554.28	4 404.75	4 404.75	3 316.65	3 316.65	-3.3	-3.3	-27.2	-27.2
Other	-	-	-	-	-	-	-	-	-
Total GHG emissions excluding LULUCF^a	59 091.60	63 288.91	63 288.92	42 303.15	38 940.74	7.1	7.1	-8.4	-34.1

Source: Portugal's BR4 CTF table 6.

^a Portugal did not include indirect CO₂ emissions in its projections.

73. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy and LULUCF sectors, amounting to projected reductions of 2,479 kt CO₂ eq (7.9 per cent) and 4,933 kt CO₂ eq (427.1 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario is different; almost all sectors, with the exception of transport, contribute to reductions. The most significant reductions are still in the energy sector (15,693 kt CO₂ eq or 50.2 per cent) and the LULUCF sector (9,237 kt CO₂ eq or 799.8 per cent). Portugal provided information on the main sectors contributing to reductions. The sectors with the largest projected reductions, relative to the 2005 level, between 2005 and 2030 are transport and mobility (41 per cent, owing to the increased number of electric vehicles), service (62 per cent, owing to improved energy efficiency) and waste (49 per cent, owing to compliance with the EU landfill directive).

74. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 and by 2030 presented by sector are similar. The projected reductions in 2020 are identical to those under the WEM scenario. The projected reductions in 2030 are 17,796 kt CO₂ eq (56.9 per cent) in the energy sector and 10,404 kt CO₂ eq (900.8 per cent) in the LULUCF sector. The sectors with the largest relative projected reductions between 2005 and 2030 are electricity generation (95 per cent), transport (46 per cent), buildings (46 per cent) and industry (47 per cent).

75. Portugal presented the WEM and WAM scenarios by gas for 2020 and 2030, as summarized in table 9.

Table 9

Summary of greenhouse gas emission projections for Portugal 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 ^a	45 630.69	48 497.06	48 497.06	30 442.78	27 298.87	6.3	6.3	–33.3	–40.2
CH ₄	9 605.78	9 171.94	9 171.94	7 977.59	7 834.32	–4.5	–4.5	–17.0	–18.4
N ₂ O	3 855.13	3 393.72	3 393.72	3 014.42	2 939.18	–12.0	–12.0	–21.8	–23.8
HFCs	–	2 131.54	2 131.54	703.11	703.11	–	–	–	–
PFCs	–	15.29	15.29	15.29	15.29	–	–	–	–
SF ₆	–	79.36	79.36	149.97	149.97	–	–	–	–
NF ₃	–	–	–	–	–	–	–	–	–
Total GHG emissions without LULUCF	59 091.60	63 288.91	63 288.91	42 303.16	38 940.74	7.1	7.1	–28.4	–34.1

Source: Portugal's BR4 CTF table 6.

^a Portugal did not include indirect CO₂ emissions in its projections.

76. For 2020, the most significant reductions (excluding net CO₂ from LULUCF) are projected for CH₄ and N₂O emissions: 434 kt CO₂ eq (4.5 per cent) and 461 kt CO₂ eq (12.0 per cent) between 1990 and 2020, respectively. For this period, increases of emissions of other GHG gases are projected for CO₂ (excluding net CO₂ from LULUCF) and HFCs: 2,866 kt CO₂ eq (6.3 per cent) and 2,132 kt CO₂ eq. CO₂ from LULUCF is projected to decrease by 6,938 kt CO₂ eq between 1990 and 2020.

77. The projections for 2030 present a change in the pattern. The most significant reductions compared with the 1990 level are for CO₂ emissions (excluding net CO₂ from LULUCF), CH₄ and N₂O: 15,188 kt CO₂ eq (33.3 per cent), 1,628 kt CO₂ eq (17.0 per cent) and 841 kt CO₂ eq (21.8 per cent), respectively. CO₂ from LULUCF is projected to decrease by 10,576 kt CO₂ eq between 1990 and 2030.

78. The patterns of emission reductions by 2020 projected by gas under the WAM scenario remain the same as the WEM, but greater reductions are projected for 2030. The

most significant reductions between 1990 and 2030 are for CO₂ (excluding net CO₂ from LULUCF) and CH₄: 18,332 kt CO₂ eq (40.2 per cent) and 1,771 kt CO₂ eq (18.4 per cent), respectively. CO₂ from LULUCF is projected to decrease by 11,743 kt CO₂ eq between 1990 and 2030.

79. Portugal concluded that the results of the projection exercise confirm the technical and economic feasibility of pursuing a low-carbon pathway to achieve carbon neutrality by 2050. The analysis of emissions trajectories shows that all sectors have significant GHG emission reduction potential.

(d) Assessment of adherence to the reporting guidelines

80. The ERT assessed the information reported in the BR4 of Portugal and identified issues relating to completeness and transparency and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 10.

Table 10

Findings on greenhouse gas emission projections reported in the fourth biennial report of Portugal

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 28 Issue type: completeness Assessment: encouragement	The Party reported projections under the WEM and WAM scenarios in its BR4. The ERT noted that, as in previous reports, the Party did not report projections of emissions under a WOM scenario. During the review Portugal confirmed that a projection for a WOM scenario was not produced. The ERT reiterates the encouragement from the previous review report for the Party to include in its next NC a projection of emissions under a WOM scenario. The ERT noted that the WOM scenario could be useful to Portugal in assessing the effect of its PaMs.
2	Reporting requirement specified in paragraph 30 Issue type: completeness Assessment: encouragement	The Party did not provide a sensitivity analysis in its BR4. During the review Portugal explained that a sensitivity analysis is included in RNC2050 for the most critical factors for the evolution of emissions, revealing the impact of variations in some of the assumptions (e.g. in technology costs) on the modelling results. The ERT encourages the Party to include a sensitivity analysis in its next BR.
3	Reporting requirement specified in paragraph 45 Issue type: transparency Assessment: encouragement	Portugal explained in its BR4 that the key difference from its earlier NC is that the projections of emissions now include the national commitment to achieve carbon neutrality by 2050. However, no information was provided on other differences in assumptions and results. During the review Portugal explained that there were differences in the use of the TIMES_PT model related to the update of the technologies available and their costs. Portugal also explained that macroeconomic and demographic parameter projections were updated. The ERT encourages Portugal to include in its next BR the main differences between current projections (assumptions, models and results) and those in its previous NC.
4	Reporting requirement specified in paragraph 46 Issue type: transparency Assessment: encouragement	Portugal did not provide a discussion of the sensitivity of its projections to underlying assumptions. During the review Portugal explained that a sensitivity analysis is included in RNC2050 for the most critical factors in the evolution of emissions, revealing the impact of variations in some of the assumptions (e.g. technology costs) on the modelling results. The ERT encourages the Party to include in its next BR a discussion of the sensitivity of projections to underlying assumptions.

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

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

1. Technical assessment of the reported information

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

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

82. Portugal provided details on how the support it has provided is “new and additional”, including how it has determined resources as being “new and additional”. Portugal defined additional resources as funds that are not included in its conventional official development assistance. Specifically, these are resources under the Environment Fund. The Environment Fund was established by decree-law 42-A of 2016. The Environment Fund aims to support environmental policies and sustainable development objectives. The Party indicates that although the Environment Fund focuses more on activities at the domestic level, it can also be used to support environmental cooperation for international development programmes, projects and actions on climate change.

83. Portugal reported the support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. The Party explained how it tracks finance for adaptation and mitigation using the Rio markers for climate finance flow. As a member of the Organisation for Economic Co-operation and Development, Portugal tracks development financing according to the Creditor Reporting System directives, which are available online.⁵

84. The BR4 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. Portugal uses the Rio markers to categorize projects if they have a principal or significant objective. Portugal only reported projects with principal objectives. Projects with principal objectives accounted for 64.4 per cent in 2017 and 38.5 per cent in 2018 of bilateral official development assistance funds for mitigation. With regard to bilateral official development assistance for adaptation, projects with principal objectives accounted for 27.5 per cent of allocations in 2017 and 33.7 per cent in 2018.

85. Portugal described the methodology and underlying assumptions used for collecting and reporting information on financial support. The methodology used for preparing information on international climate support is based on the Rio markers, and the data are compiled by the Camões Institute for Cooperation and Language. The Institute works with sectoral ministries to collate all the data and provide the information via a web portal. The same data are shared with the Organisation for Economic Co-operation and Development. The data are disaggregated by country and activity.

(b) Financial resources

86. Portugal reported information on its provision of financial support to non-Annex I Parties as required under the Convention, including on financial support provided, committed and pledged, allocation channels and annual contributions. Portugal’s focus has been on Portuguese-speaking countries and Timor-Leste and its efforts in this area are guided by the 2014–2020 Portuguese Cooperation Strategic Concept, which adopted a unified strategic approach to its priority countries and sectors. Over time, new beneficiary countries in North Africa and Latin America have been added. The partner countries are least developed countries and small island developing States.

87. Portugal described how its resources address the adaptation and mitigation needs of non-Annex I Parties, including by giving partner countries the opportunity to design their own projects or programmes. Portugal stated that when the proposals are submitted to the 2014–2020 Portuguese Cooperation Strategic Concept, the partner country must demonstrate how the proposal contributes to meeting its country-specific policies, priorities and strategies.

⁵ <https://stats.oecd.org/Index.aspx?DataSetCode=CRS1>.

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

88. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Portugal reported that its climate finance has been allocated on the basis of programmes, projects and actions on disaster risk reduction, climate resilience, clean energy access, agriculture, and water and sanitation. The focus of Portugal's official development assistance has been, with a view to fighting poverty, on education, health, security and justice. The Party has worked to integrate climate change and environmental issues into these priority areas. Portugal has also fostered a strong relationship between the Ministry of Foreign Affairs and the Ministry of Environment and Climate Action. Table 11 summarizes the information reported by Portugal on its provision of financial support.

Table 11

Summary of information on provision of financial support by Portugal in 2017–2018

(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Year of disbursement</i>	
	<i>2017</i>	<i>2018</i>
Official development assistance	380.74	387.79
Climate-specific contributions through multilateral channels	0.00	0.00
Climate-specific contributions through bilateral, regional and other channels	2.44	1.94

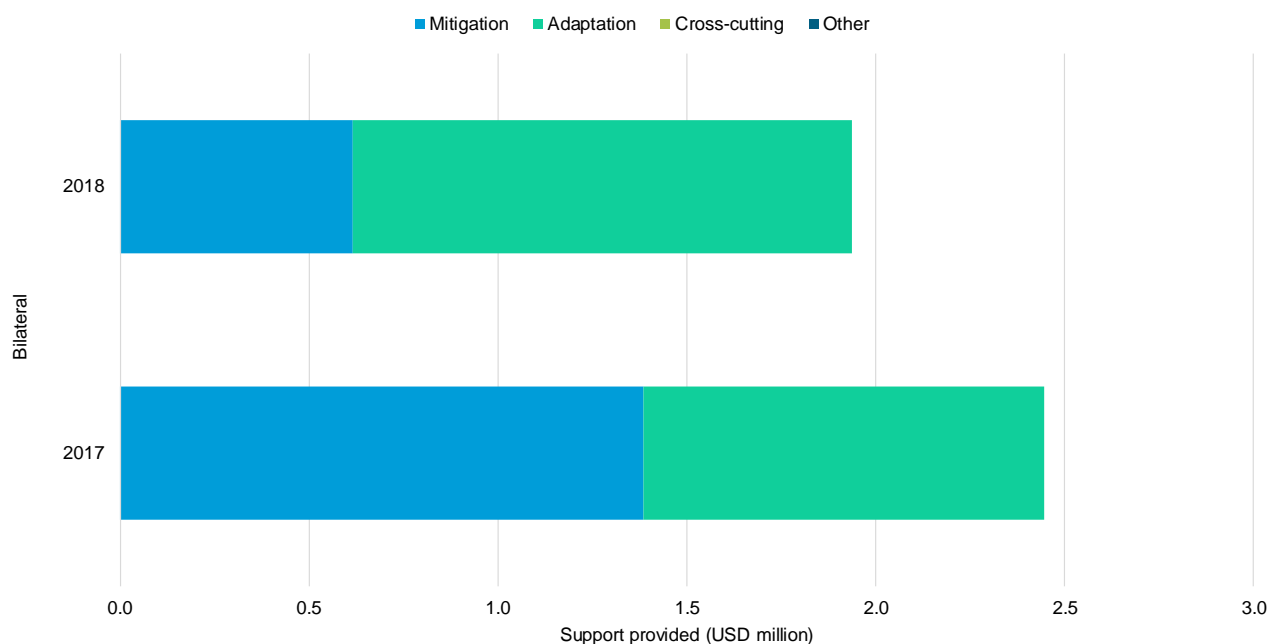
Sources: BR4 CTF tables and Query Wizard for International Development Statistics, available at <http://stats.oecd.org/qwids/>.

Note: All of Portugal's climate-specific contributions were made through bilateral channels.

89. Portugal reported on its climate-specific public financial support, totalling USD 2.44 million in 2017 and USD 1.93 million in 2018. It has reduced the level of its financial support since the BR3 by 54 per cent, as reported in its local currency. With regard to future financial pledges aimed at enhancing the implementation of the Convention by developing countries, Portugal has committed to continue mobilizing 0.15 to 0.20 per cent of its gross national income.

90. Portugal's expansion of support to other countries in North Africa and Latin America shows its continued commitment. The main beneficiaries include Angola, Cabo Verde, Cuba, Guinea-Bissau and Mozambique, to which Portugal allocated USD 4.38 million. The ERT noted that Portugal reported in CTF table 7(b) its bilateral support allocated to non-Annex I Parties in 2017 (USD 2.44 million) and 2018 (USD 1.94 million). Information on climate-specific financial support from the public sector provided and the allocation of that support by target area is presented in figure 3 and table 12. Note that variances in contribution amounts from year to year can occur that are not reflective of trends owing to factors such as biennial or triennial contribution cycles of some multilateral funds, timing of approval of individual bilateral projects or changes in exchange rates.

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



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

Note: All of Portugal's climate-specific contributions were made through bilateral channels.

Table 12
Summary of information on channels of financial support used in 2017–2018 by Portugal

(Millions of United States dollars)

Allocation channel of public financial support	Year of disbursement				Share (%)	
	2017	2018	Difference	Change (%)	2017	2018
Detailed information by type of channel						
Total multilateral	0.00	0.00	–	–	–	–
Bilateral channels						
Mitigation	1.39	0.62	–0.77	–55.5	56.7	31.8
Adaptation	1.06	1.32	0.26	24.7	43.3	68.2
Cross-cutting	–	–	–	–	–	–
Other	–	–	–	–	–	–
Total bilateral	2.44	1.94	–0.51	–20.7	100.0	100.0
Total multilateral and bilateral	2.44	1.94	–0.51	–20.7	100.0	100.0

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

Note: All of Portugal's climate-specific contributions were made through bilateral channels.

91. The BR4 includes detailed information on the climate-specific financial support provided through bilateral and regional channels in 2017 and 2018. More specifically, Portugal provided no climate-specific contributions through multilateral channels, as reported in the BR4 and in CTF tables 7 and 7(a). Portugal provided information on multilateral official development assistance that was not climate-specific but had climate-related aspects.

92. The BR4 and CTF table 7(b) also include detailed information on the total financial support provided through bilateral channels in 2017 and 2018, which amounts to USD 2.44 million and 1.94 million, respectively.

93. The BR4 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2017, the shares of the total public

financial support allocated for mitigation and adaptation projects were 56.7 and 43.3 per cent, respectively. In 2018, the shares of total public financial support allocated for mitigation and adaptation projects were 31.8 and 68.2 per cent, respectively.

94. The ERT noted that in 2017 a majority of financial contributions were allocated to water and sanitation, agriculture, energy and cross-cutting areas such as environmental policy, as reported in CTF table 7(b). The corresponding allocations in 2018 were directed mostly to the water and sanitation and energy sectors, and to cross-cutting areas such as rural development and disaster preparedness.

95. CTF tables 7(a) and 7(b) include information on the types of financial instrument used for providing assistance to developing countries, which consist of grants only. The ERT noted that the grants provided in 2017 and 2018 accounted for all public financial support.

96. Portugal did not report information on the mobilization of private finance. However, the Party in its BR4 recognized that some projects could be more effective if undertaken by the private sector. To encourage this, the 2020 Portuguese Cooperation Strategic Concept has expressed openness for private sector actors to seek partnerships with either the public sector or local communities. Portugal explained during the review some of the difficulties in collecting information and reporting on private financial flows leveraged by bilateral climate finance for mitigation and adaptation activities in non-Annex I Parties.

(c) Technology development and transfer

97. Portugal 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 sector. Portugal provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties, such as energy access combined with renewable generation and water sanitation.

98. The ERT took note of the information provided in CTF table 8 on technology transfer. Portugal reported a total of seven projects in five countries; four of the projects were on mitigation and three on adaptation. The primary sectors involved were energy, agriculture, and water and sanitation. The Party provided a breakdown of recipient countries, target areas, measures and focus sectors of the technology transfer programmes.

99. Portugal highlighted several technology transfer projects. In Cabo Verde, in 2017–2018, membrane biological reactor technology was introduced to enhance the reuse of effluents in the Palmerejo area, and communities in Planalto Norte were provided with potable water and photovoltaic systems with the aim of promoting sustainable development. Farmers in Guinea-Bissau were provided with improved and adapted rice farming techniques in order to increase resilience.

100. The ERT noted that while Portugal reported on its measures and activities, it did not report success and failure stories in relation to technology transfer. Information provided in tables VII.8 and VII.9 of the BR4 highlights the objectives of some specific projects but does not show whether the results were achieved. In response, as described in paragraph 96 above, the Party indicated that it does not have in place specific criteria or a system for systematic project evaluation and that it only evaluates established strategic cooperation programmes.

(d) Capacity-building

101. In its BR4 and CTF table 9, Portugal 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. Portugal described measures and activities related to capacity-building support in textual and tabular format. Portugal indicated that the programmes, projects and actions have a technical assistance component at the national level. Specific projects are focused on capacity-building or are embedded within an adaptation or mitigation project or programme. In 2017 and 2018, the Party implemented nine projects (two on mitigation and seven on adaptation) focused on capacity-building.

102. To ensure that its partner countries' cooperation projects have a capacity-building element, Portugal appraises the proposals submitted by countries and assesses them on the

basis of the following criteria: relevance, efficiency, problems addressed, viability, sustainability, results expected to be achieved, accountability, adequacy of technology, capacity-building components and proposed indicators for monitoring and evaluation.

103. Portugal reported that it has supported climate-related capacity development activities relating to adaptation and mitigation in the areas of water and urban sanitation, waste management, drought resilience and disaster risk reduction. Portugal also reported on how it has responded to the existing and emerging capacity-building needs of non-Annex I Parties by ensuring that partner countries lead and control the implementation of the projects; this is meant to further strengthen the capacity of the national institutions of those Parties.

104. Examples of capacity-building initiatives by Portugal include a project to assist the Cabo Verde national water and sanitation agency in strengthening its regulatory framework and to provide training on risk management for the water supply. The Party also supported Cuba in improving early warning, adaptation, preparedness and response actions to increase drought resilience in order to increase food and water security. In Mozambique, the Party supported the development of policies and strategies on urban sanitation and training by relevant institutions. Mozambique also received support to develop a nationally determined contribution implementation road map and received capacity-building assistance through a project on increasing food and environmental resilience in vulnerable communities.

2. Assessment of adherence to the reporting guidelines

105. The ERT assessed the information reported in the BR4 of Portugal and identified issues relating to completeness and thus adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 13.

Table 13

Findings on provision of support to developing country Parties from the review of the fourth biennial report of Portugal

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 19 Issue type: completeness Assessment: encouragement	The Party did not report in its BR4 on private financial flows leveraged by bilateral climate finance towards mitigation and adaptation activities in non-Annex I Parties. The BR4 also does not include reporting on PaMs that promote the scaling up of private investment in mitigation and adaptation activities in developing country Parties. During the review Portugal explained that at this stage such information is not available as the country is not undertaking any systematic data collection. The Party further explained that it is developing a strategy to involve the private sector in cooperation efforts. The strategy will aim to identify concrete approaches and instruments that encourage investment by the national private sector in Portuguese cooperation partner countries. The ERT encourages Portugal to include in the next BR information on private financial flows leveraged by bilateral climate finance towards mitigation and adaptation activities and to include information on the PaMs it has put in place to promote the scaling up of private investment in mitigation and adaptation activities in developing countries. The ERT notes that Portugal could include data-collection mechanisms in the strategy mentioned by the Party that is being developed for PaMs.
2	Reporting requirement specified in paragraph 21 Issue type: completeness	Portugal did not report information on success or failure stories in its BR4. The information provided in tables VII.8 and VII.9 highlights project or programme objectives for some specific projects but does not show whether the results were achieved.

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
Assessment: encouragement	<p data-bbox="512 253 1431 454">During the review, Portugal explained that it does not have specific success criteria in place or a system for systematic project evaluation. The projects are monitored on the basis of implementation reports, feedback from development cooperation staff at Portuguese embassies and occasional field trips to evaluate the results achieved during the implementation phase. However, the Party evaluates the strategic cooperation programmes, including climate projects, every four or five years with the priority country recipients.</p> <p data-bbox="512 465 1431 557">The ERT encourages Portugal to include in the next BR information on success and failure stories. The ERT notes that Portugal could use data from implementation reports or field trips for this purpose.</p>	

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

III. Conclusions and recommendations

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

107. Portugal's total GHG emissions excluding LULUCF and including indirect CO₂ covered by its quantified economy-wide emission reduction target were estimated to be 19.5 per cent above its 1990 level, whereas total GHG emissions including LULUCF and including indirect CO₂ were 29.2 per cent above its 1990 level, in 2017. Emission increases were driven mainly by the growth of the energy industries and transport using fossil fuels. Further increases in GHG emissions were due to increases in cement, lime and glass production, road paving, and limestone and dolomite use. Improved family incomes and increased urbanization resulted in a rise in waste generation and subsequent emission increases. Portugal's emissions from the LULUCF sector increased by 526.0 per cent from 1990 to 2017 owing to severe forest wildfire events associated with drought, heatwaves and unusually strong winds in 2003, 2005 and 2017.

108. Under the Convention, Portugal 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 global warming potential values from the AR4. Emissions and removals from the LULUCF sector are not included. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms 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.

109. Under the ESD, Portugal has a target of limiting its emission growth to 1 per cent above the 2005 level by 2020. The 2013–2020 progression in the Party's AEA (its national emission target under the ESD) is 49,310.77–49,080.26 kt CO₂ eq.

110. In addition to the ESD target, Portugal committed to achieving a domestic economy-wide target of an 18–23 per cent reduction in emissions below the 2005 level by 2020. Portugal reported on the EU's joint 2030 targets under the EU ETS and effort-sharing regulation. Portugal reported on its long-term carbon-neutrality goal to reduce GHG emissions by 85–90 per cent below the 2005 level by 2050 and to offset the remaining emissions through better managing land use and forests.

111. In 2017, Portugal's ESD emissions were 16.1 per cent (7,723.23 kt CO₂ eq) below the AEA under the ESD. For 2013–2017, Portugal has a cumulative surplus of 46,980.62 kt CO₂ eq with respect to its AEA. The ERT noted that Portugal is making progress towards its ESD

target by implementing mitigation actions that are delivering significant emission reductions. Portugal indicated that it does not plan to use market-based mechanisms to meet its target in 2020.

112. The GHG emission projections provided by Portugal in its BR4 correspond to the WEM and WAM scenarios. Under these scenarios, emissions are projected to be 7.1 per cent above the 1990 level by 2020. According to the projections under the WEM and WAM scenarios, ESD emissions are estimated to reach 37,341.50 kt CO₂ eq by 2020. The projected level of emissions under the WEM and WAM scenarios is 24.1 per cent below the AEA for 2020. The ERT noted that the Party's cumulative surplus of AEAs is 46,980.62 kt CO₂ eq, which suggests that Portugal expects to meet its target under the WEM and WAM scenarios.

113. Portugal's policy framework relating to energy and climate change includes the National Programme for Climate Change 2020/2030, the National Plan of Action for Renewable Energy 2013–2020 and the National Plan of Action for Energy Efficiency 2013–2016, as well as the NECP and RNC2050. Key legislation supporting Portugal's climate change goals includes the EU ETS, the carbon tax for non-ETS sectors and tax incentives for efficiency and low-carbon options. No emission estimates were provided to evaluate which PaMs have delivered the most significant mitigations effects, or how the new targets set under the NECP affected Portugal's contribution to attaining the EU-wide 2020 emission reduction target.

114. Portugal continues to provide climate financing to developing countries in line with its climate finance programmes in the areas of water and sanitation, waste management, water resources conservation, agriculture, climate resilience, clean energy access and rural development. The Party reported on its climate-specific public financial support, totalling USD 2.44 million in 2017 and USD 1.94 million in 2018. It has reduced the level of its financial support since the BR3, as reported in its local currency. In 2017 and 2018, Portugal provided more support for adaptation than for mitigation. The biggest share of financial support went to projects in the water and sanitation sector, with a focus on policy development, waste management and water resources conservation. Water and sanitation projects accounted for 71 per cent of support in 2017 and 69 per cent in 2018. Other projects were in the areas of agriculture, energy and climate resilience.

115. Portugal provided information on support for technology development and transfer and capacity-building. The Party reported a total of seven projects focused on technology transfer in five countries; four of the projects were on mitigation and three on adaptation. Portugal had a total of nine projects focused on capacity-building; two of the projects were on mitigation and seven on adaptation. Portuguese development cooperation places emphasis on technical assistance for national capacity-building. Capacity-building support is offered through stand-alone projects as well as being incorporated into mitigation and adaptation projects.

116. Portugal continues to provide information on support for technology development and transfer and capacity-building. Priority in technological support was given to mitigation and adaptation projects in Cabo Verde, Cuba, Guinea-Bissau and Mozambique. A highlight is a project in Cabo Verde on using membrane biological reactor technology to enhance the reuse of effluents. Priority in capacity-building support was given to mitigation and adaptation projects in Angola, Cabo Verde, Cuba and Mozambique. A good example of support for capacity-building is a project in Cuba on improving early warning, adaptation, preparedness and response actions to increase drought resilience in order to increase food and water security.

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

(a) Including explanations for the status changes of its PaMs compared with the information on them provided in the previous NC and BR, as well as descriptions of its PaMs rather than only their titles (see issue 1 in table 4);

(b) Providing consistent information on its use of market-based mechanisms (see issue 1 in table 6).

Annex

Documents and information used during the review

A. Reference documents

2019 GHG inventory submission of Portugal. Available at <https://unfccc.int/documents/194464>.

BR3 of Portugal. Available at <https://unfccc.int/documents/198285>.

BR4 of Portugal. Available at <https://unfccc.int/documents/208370>.

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

BR4 CTF tables of Portugal. Available at <https://unfccc.int/documents/208371>.

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

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

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

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

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

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

National Energy and Climate Plan of Portugal. Available at https://ec.europa.eu/energy/sites/ener/files/documents/pt_final_necp_main_en.pdf.

Report on the individual review of the annual submission of Portugal submitted in 2018. FCCC/ARR/2018/PRT. Available at https://unfccc.int/sites/default/files/resource/arr2018_PRT.pdf.

Report on the technical review of the third biennial report of Portugal. FCCC/TRR.3/PRT. Available at <https://unfccc.int/documents/196169>.

“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 Joana Vieira da Silva (Portuguese Environment Agency), including additional material. The following documents¹ were provided by Portugal:

¹ Reproduced as received from the Party.

Roadmap for Carbon Neutrality 2050 (RNC2050). Available at https://unfccc.int/sites/default/files/resource/RNC2050_EN_PT%20Long%20Term%20Strategy.pdf.

Assumptions and scenarios used in developing the RNC2050 (Portuguese only). Available at https://descarbonizar2050.pt/uploads/181220_Cenarios_RNC2050.pdf.
