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## **Report on the technical review of the eighth national communication and the technical review of the fifth biennial report of Spain**

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

Developed country Parties were requested by decision 6/CP.25 to submit their fifth biennial report to the secretariat by no later than 31 December 2022. This report presents the results of the technical review of the fifth biennial report of Spain, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”.

The review of these submissions took place in Madrid from 13 to 17 March 2023.



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## Abbreviations and acronyms

AEA	annual emission allocation
AEMET	State Meteorological Agency of Spain
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CAP	Common Agricultural Policy of the European Union
CER	certified emission reduction
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
COP	Conference of the Parties
CORDEX	Coordinated Regional Climate Downscaling Experiment
CTF	common tabular format
ERT	expert review team
ERU	emission reduction unit
ESD	European Union effort-sharing decision
ESR	European Union effort-sharing regulation
EU	European Union
EU ETS	European Union Emissions Trading System
FIIAPP	International and Ibero-American Foundation for Administration and Public Policies
GCF	Green Climate Fund
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MITECO	Ministry for the Ecological Transition and the Demographic Challenge
N <sub>2</sub> O	nitrous oxide
NA	not applicable
NC	national communication
NE	not estimated
NF <sub>3</sub>	nitrogen trifluoride
NECP	Integrated National Energy and Climate Plan 2021–2030
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
ODA	official development assistance
PaMs	policies and measures
PFC	perfluorocarbon
PIMA Adapta	Environmental Promotion Plan for Adaptation to Climate Change in Spain
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. Part II: Reporting of supplementary information under Article 7, paragraph 2”
RIOCC	Ibero-American Network of Climate Change Offices
SEI	Spanish Emissions Inventory System
SF <sub>6</sub>	sulfur hexafluoride

TIMES	The Integrated Market Allocation–Energy Flow Optimization Model System
UNFCCC reporting guidelines on BRs	“UNFCCC biennial reporting guidelines for developed country Parties”
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’

## I. Introduction and summary

### A. Introduction

1. This is a report on the in-country technical review of the NC8 and BR5 of Spain. The review was organized by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention” and “Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention” (annex to decision 13/CP.20), and the “Guidelines for review under Article 8 of the Kyoto Protocol” (annex to decision 22/CMP.1 and annex I to decision 4/CMP.1).
2. In accordance with decision 13/CP.20, a draft version of this report was transmitted to the Government of Spain, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.
3. The review was conducted from 13 to 17 March 2023 in Madrid by the following team of nominated experts from the UNFCCC roster of experts: Laura Elena Dawidowski (Argentina), Ferdinand Mwapopi (Namibia), Aglaia (Glasha) Obrekht (Canada), Detelina Petrova (Bulgaria) and Lilia Taranu (Republic of Moldova). Laura Elena Dawidowski and Aglaia (Glasha) Obrekht were the lead reviewers. The review was coordinated by Federico Brocchieri and Veronica Colerio (secretariat).

### B. Summary

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

#### 1. Timeliness

5. The NC8 was submitted on 14 December 2022, before the deadline of 31 December 2022 mandated by decision 6/CP.25. A corrigendum was submitted on 30 March 2023 to address issues raised during the review. The corrigendum included changes and additions related to GHG emissions (revision of the inconsistency in PFC emissions reported), PaMs (addition of information on replicable and innovative PaMs and clarification regarding the impacts of PaMs), GHG projections (correction of the projections for HFC and CO<sub>2</sub> emissions from biomass), the provision of financial, technological and capacity-building support to developing country Parties (correction of values for the amount of financial resources provided) and vulnerability assessment, climate change impacts and adaptation measures (addition of an explicit reference to the support provided to developing countries to address the impacts of climate change). Unless otherwise specified, the information and values from the latest submission are used in this report.
6. The BR5 was submitted on 14 December 2022, before the deadline of 31 December 2022 mandated by decision 6/CP.25. The CTF tables were also submitted on 14 December 2022. The CTF tables were resubmitted on 30 March 2023 to address issues raised during the review. The resubmission included changes and additions related to the quantified economy-wide emission reduction target (description of the use of market-based mechanisms under the Convention) and the provision of financial, technological and capacity-building

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<sup>1</sup> Decision 6/CP.25, annex.

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

<sup>3</sup> Decision 2/CP.17, annex.

support to developing country Parties (addition of information on the exchange rate applied and clarification of the difference in the reporting of contributions through bilateral, regional and other channels in 2019–2020).

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

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

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

(a) The transparency of the GHG inventory information reported by including emission trend tables;

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

(i) Describing all PaMs that have been adopted or are in the planning stage at the national, regional and local level;

(ii) Organizing the information on PaMs by sector, subdivided by gas;

(iii) Providing information on the non-GHG mitigation benefits of PaMs and on how the policy or measure interacts with other PaMs;

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

(i) Including the WAM scenario;

(ii) Including information on the total effects of planned PaMs;

(d) The transparency and completeness of the information reported on financial, technological and capacity-building support by:

(i) Identifying regions or countries for which support was provided as well as including details of projects or descriptions of the financial support provided and activities carried out by Spain;

(ii) Providing consistent information in the BR5 and NC8 regarding the classification of financial support provided;

(iii) Reporting success stories;

(e) The transparency and completeness of the information reported on research and systematic observation by:

(i) Including explicit information on action taken to support capacity-building-related research and systematic observation in developing countries;

(ii) Including information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome those barriers;

(iii) Including relevant summary information on the support provided to developing countries for establishing and maintaining observing systems and related data and monitoring systems;

(f) The transparency of the supplementary information related to the Kyoto Protocol reported by:

(i) Providing an explicit reference to an up-to-date description of the national system;

(ii) Providing the name and contact information of the registry administrator.

Table 1

**Assessment of completeness and transparency of mandatory information reported by Spain in its eighth national communication**

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

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

Table 2

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

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

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

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

9. Issues and gaps identified by the ERT related to the reported information by Spain in its BR5 are presented in table 3. The information reported mostly adheres to the UNFCCC reporting guidelines on BRs. The ERT notes that the information reported by Spain in its BR5 is complemented by information contained in the NC8; the BR5 includes references to the relevant sections of the NC8.

10. Spain did not submit an English translation of its BR5. The ERT notes that, in paragraph 26 of the UNFCCC reporting guidelines on BRs, Parties are encouraged to submit an English translation of the BR to facilitate its use in the review process.

11. Spain made improvements to the reporting in its BR5 compared with that in its BR4 by addressing many recommendations and encouragements from the previous review report. The ERT noted that the Party has improved:

(a) The completeness of the information reported on PaMs by providing a clear explanation of the reasons for not reporting the mitigation impacts of some PaMs;

(b) The completeness of the information reported on projections by providing projections of indirect GHG emissions;

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

(i) Identifying regions or countries for which support was provided as well as including details of projects or descriptions of the financial support provided and activities carried out by Spain;

(ii) Reporting success stories;

(iii) Identifying in CTF table 8 which activities that support technology development and transfer have been implemented or planned since the submission of the BR4.

Table 3

**Summary of completeness and transparency of mandatory information reported by Spain in its fifth biennial report**

<i>Section of BR</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of finding(s)</i>
GHG emissions and removals	Mostly complete	Transparent	Issue 1 in table II.1
Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies	Complete	Transparent	–
Progress in achievement of targets	Complete	Transparent	–
Provision of support to developing country Parties	Complete	Transparent	–

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

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

**A. National circumstances relevant to greenhouse gas emissions and removals**

**1. Technical assessment of the reported information**

12. The NC8 contains a detailed description of Spain’s national circumstances and of the framework legislation for and key policy documents on climate change, as well as information on government structure, economic developments, geography, climate, energy, transport, industry, the waste sector, the buildings sector and urban infrastructure, agriculture, forestry and tourism.

13. Since the submission of its NC7, Spain has made substantial institutional changes relevant to climate change. Under Law 7/2021 on Climate Change and Energy Transition, approved on 20 May 2021, MITECO was established. MITECO includes the main



administrative bodies linked to climate action, namely the Secretariat for Energy, the Secretariat for the Environment, the Office of the Secretary-General for the Demographic Challenge and the Office of the Under-Secretary-General for the Ecological Transition. Also, under this law, the Committee of Experts on Climate Change and Energy Transition was created to integrate sectoral and social views from different levels of the administration and the Citizens’ Assembly for Climate was created as a forum for citizen participation and deliberation. Information on the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.D.1 below.

## 2. Assessment of adherence to the reporting guidelines

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

## B. Greenhouse gas inventory information<sup>4</sup>

### 1. Technical assessment of the reported information

15. Spain reported information in its BR5 and NC8 on its historical GHG emissions and inventory arrangements. Total GHG emissions<sup>5</sup> excluding emissions and removals from LULUCF decreased by 5.3 per cent between 1990 and 2020, while total GHG emissions including net emissions or removals from LULUCF decreased by 5.9 per cent over the same period. Emissions peaked in 2007 and decreased thereafter. In 2008, emissions started to decrease, at first mostly owing to the global financial crisis of 2007–2008 but later as a result of PaMs implemented by Spain. Since 2013, Spain has been experiencing a period of economic recovery and GDP growth. The associated expected growth in emissions has been counterbalanced by the impacts of PaMs, resulting in the stabilization of emission levels. In 2020, Spain’s emissions significantly decreased; this was mostly attributable to the impact of the coronavirus disease 2019 pandemic on economic growth and transport.

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

Table 4

### Greenhouse gas emissions by sector and by gas for Spain for 1990–2020

Sector	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share (%)	
	1990	2000	2010	2019	2020	1990–2020	2019–2020	1990	2020
	1. Energy	213 038.23	290 097.87	266 385.46	236 768.33	199 319.27	–6.4	–15.8	73.4
A1. Energy industries	78 881.27	105 846.02	75 374.93	57 084.95	43 556.43	–44.8	–23.7	27.2	15.9
A2. Manufacturing industries and construction	45 286.42	58 768.74	49 780.89	46 319.56	40 210.76	–11.2	–13.2	15.6	14.6
A3. Transport	58 669.99	86 572.65	91 987.87	91 625.15	74 255.79	26.6	–19.0	20.2	27.0
A4. and A5. Other	26 647.80	35 726.69	46 286.32	37 877.97	37 547.98	40.9	–0.9	9.2	13.7
B. Fugitive emissions from fuels	3 552.76	3 183.78	2 955.44	3 860.70	3 748.31	5.5	–2.9	1.2	1.4
C. CO <sub>2</sub> transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	29 659.24	41 977.07	40 524.49	26 123.05	23 709.13	–20.1	–9.2	10.2	8.6

<sup>4</sup> GHG emission data in this section are based on Spain’s 2022 annual submission, version 1, which has not yet been subject to review. All emission data in subsequent chapters are based on Spain’s BR5 CTF tables unless otherwise noted.

<sup>5</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified.

	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share (%)	
	1990	2000	2010	2019	2020	1990–2020	2019–2020	1990	2020
	3. Agriculture	35 066.32	41 814.58	36 168.80	37 643.82	38 481.37	9.7	2.2	12.1
4. LULUCF	–35 996.98	–39 553.71	–36 724.72	–37 105.29	–35 548.79	–1.2	–4.2	NA	NA
5. Waste	12 339.89	14 201.73	15 077.90	13 293.28	13 233.12	7.2	–0.5	4.3	4.8
6. Other <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA	NA
<i>Gas<sup>b</sup></i>									
CO <sub>2</sub>	231 328.44	311 674.62	284 282.68	251 825.15	213 339.72	–7.8	–15.3	79.7	77.7
CH <sub>4</sub>	36 641.89	42 203.64	39 409.57	37 828.27	37 738.77	3.0	–0.2	12.6	13.7
N <sub>2</sub> O	17 865.06	21 189.14	17 702.57	17 920.09	18 233.67	2.1	1.7	6.2	6.6
HFCs	3 039.92	12 342.79	16 421.80	4 532.51	3 727.19	22.6	–17.8	1.0	1.4
PFCs	1 164.38	494.73	105.12	52.88	31.96	–97.3	–39.6	0.4	0.0
SF <sub>6</sub>	63.99	186.33	234.89	227.97	230.64	260.4	1.2	0.0	0.1
NF <sub>3</sub>	NO, NA	NO, NA	NO, NE, NA	NO, NA	NO, NA	NA	NA	NA	NA
Unspecified mix of HFCs and PFCs	NO, NA	NO, NA	NO, NA	1 441.61	1 440.94	NA	NA	NA	NA
<b>Total GHG emissions excluding LULUCF</b>	<b>290 103.67</b>	<b>388 091.26</b>	<b>358 156.64</b>	<b>313 828.49</b>	<b>274 742.89</b>	<b>–5.3</b>	<b>–12.5</b>	<b>100.0</b>	<b>100.0</b>
<b>Total GHG emissions including LULUCF</b>	<b>254 106.69</b>	<b>348 537.54</b>	<b>321 431.93</b>	<b>276 723.20</b>	<b>239 194.10</b>	<b>–5.9</b>	<b>–13.6</b>	<b>NA</b>	<b>NA</b>

Source: GHG emission data: Spain's 2022 annual submission, version 1.

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

<sup>b</sup> Emissions by gas without LULUCF and excluding indirect CO<sub>2</sub>. The Party did not report indirect CO<sub>2</sub> emissions.

17. In brief, Spain's national inventory arrangements were established in 2007 in accordance with Law 34/2007 on Air Quality and Atmospheric Protection, under which a GHG and atmospheric pollution inventory system, SEI, was established. The changes in these arrangements since the BR4 include those implemented under Royal Decree 818/2018, which revised and updated in detail the regulation and operation of SEI. Among the major new arrangements introduced under the Royal Decree is the procedure for approval of the national GHG inventory by the Directorate-General for Biodiversity and Environmental Quality under MITECO. The Royal Decree also ratifies the obligation for data providers to provide data and information to SEI for preparation of the national emissions inventory.

## 2. Assessment of adherence to the reporting guidelines

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

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

### (a) Technical assessment of the reported information

19. Spain provided in the NC8 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1 in conjunction with decisions 3/CMP.11 and 4/CMP.11. The information provided in the NC8 includes a reference to the description of the national system provided in the national inventory report of the 2022 annual submission and together these submissions include all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2021 annual submission of Spain.

**(b) Assessment of adherence to the reporting guidelines**

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

**4. National registry****(a) Technical assessment of the reported information**

21. In its NC8 Spain provided information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 in conjunction with decision 3/CMP.11 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2021 annual submission of Spain.

**(b) Assessment of adherence to the reporting guidelines**

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

**C. Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies****1. Technical assessment of the reported information**

23. Spain reported information on its economy-wide emission reduction target in its BR5. For Spain the Convention entered into force on 21 March 1994. Under the Convention Spain 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.

24. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. The legislative package regulates emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub> using GWP values from the AR4 to aggregate the GHG emissions of the EU until 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention.

25. The EU-wide targets are primarily implemented through the EU ETS and ESD. The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. An EU-wide emission cap was put in place for 2013–2020 for the EU ETS with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. For 2030, a reduction target of 62 per cent below the 2005 level has been set for emissions covered by the EU ETS. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding aviation and international maritime transport), residential and commercial buildings, agriculture, small industry and waste. The ESD is regulated through targets for each member State that add up to a reduction at the EU level of 10 per cent below the 2005 level by 2020. The ESR, the successor to the ESD, was adopted in 2018 and amended in 2023 with the target of reducing emissions covered under the ESR by 40 per cent below the 2005 level by 2030.

26. The ERT noted that, in table 3 of the BR5, Spain reported that national and international aviation is included under the EU ETS target and that part of its domestic aviation sector – covering operators below the minimum threshold of emissions – is included under the ESD target. During the review, in response to a question raised by the ERT, the Party explained that table contains an error and clarified that the entire national aviation sector is included under the EU ETS target.

27. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Operators and airline operators can use such units to fulfil their requirements under the EU ETS, and member States can use such units for compliance with their national ESD targets, within specific limitations.

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

29. Spain has a national target of reducing its emissions to 10 per cent below the 2005 level by 2020 for ESD sectors. This target has been translated into binding quantified AEAs for 2013–2020. Spain’s AEAs change following a linear path from 227,563.76 kt CO<sub>2</sub> eq in 2013 to 212,390.48 kt CO<sub>2</sub> eq in 2020.<sup>6</sup> Under the ESR, Spain has a national target of reducing emissions from covered sectors to 26 per cent below the 2005 level by 2030 under current legislation. As part of the package of legislative proposals adopted by the European Commission in 2021 to deliver the European Green Deal, a proposal for a regulation updating member States’ emission reduction targets under the ESR in line with the revised 2030 climate target is under consideration. The proposal updates Spain’s target of reducing emissions from covered sectors under the ESR to 37.7 per cent below the 2005 level by 2030.

## 2. Assessment of adherence to the reporting guidelines

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

## D. Information on policies and measures

### 1. Technical assessment of the reported information

31. Spain provided in its NC8 and BR5 information on its PaMs<sup>7</sup> implemented, adopted and planned to fulfil its commitments under the Convention. Spain’s set of PaMs is similar to that previously reported, with a few exceptions. The Party provided information on PaMs by sector and by GHG in the NC8 and the BR5.

32. Spain 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. Spain also provided information on changes to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards its target. Overall responsibility for the formulation of national climate change policies lies with the Secretary of State for the Environment, a position created by Royal Decree 500/2020, within MITECO. MITECO was constituted through a restructuring of ministerial departments, as the ministry responsible for the proposal and execution of the Spanish Government’s climate, energy and environmental policy for transitioning to a greener productive and social model, as well as for the elaboration and development of the Government’s policy for responding to the demographic challenge and territorial depopulation. Falling under the responsibility of the Secretary of State for the Environment, the Spanish Climate Change Office is the body in charge of formulating national policy on climate change, proposing regulations and the development of the planning

<sup>6</sup> According to the EU transaction log.

<sup>7</sup> The UNFCCC reporting guidelines on BRs use the term “mitigation actions”, whereas the UNFCCC reporting guidelines on NCs use the term “policies and measures”. The terms are used interchangeably in this report to refer to the relevant information in either the NC or BR.

and administrative instruments for monitoring, implementation and coordination among different institutions. The National Climate Council oversees the implementation of climate change mitigation policies in Spain, and is involved in elaborating the principles of implementation, monitoring and evaluating the process and results of implementation, and advancing proposals and recommendations.

33. During the review, the Party explained that the Directorate-General for Environmental Quality and Assessment, under MITECO, is the competent authority for the Spanish inventory and projection system for atmospheric emissions, while the Secretariat for Energy directs and coordinates the formulation and implementation of energy policies, including the monitoring and verification of the international commitments subscribed to by Spain in relation to its NECP and Long-Term Decarbonization Strategy. Coordination on climate change matters between the national government and autonomous communities, local entities and other stakeholders is carried out through the National Climate Council and the Climate Change Policy Coordination Commission through three working groups: (1) the emissions trading working group, which deals with matters related to the application of the EU ETS; (2) the impacts and adaptation working group, which coordinates and integrates national and regional climate change adaptation strategies and plans; and (3) the mitigation and inventory working group, which focuses on the estimation of GHG emissions and removals and the prevention and reduction of emissions.

34. Spain's assessment of the economic and social consequences of its response measures includes the assessment of initiatives to reduce market imperfections; eliminate subsidies associated with the use of environmentally unsound or hazardous technologies; cooperate in technology development for non-energy uses of fossil fuels; and provide support to developing country Parties, thereby promoting the implementation of mitigation actions, cooperation for development, and the dissemination and transfer of technology. Spain reported on its policies and practices that may encourage activities that lead to greater levels of emissions as a result of its international and national measures. Examples of such measures include those increasing the use of renewable energies and biofuels, measures increasing energy savings and improving energy efficiency, sector-specific measures such as reducing GHG emissions from the LULUCF, agriculture and waste sectors, and other cross-sectoral measures. The assessment was performed using a qualitative evaluation that described in general the main impacts of the measures, including on other countries.

35. In its reporting on PaMs, Spain provided the estimated emission reduction impacts for some of its PaMs. Where estimated impacts were not provided, the Party did not supply an explanation. The Party explained during the review that estimated impacts were not provided for some PaMs because they have not yet been quantified. Quantification is difficult because some of the measures establish general or strategic frameworks, whose aggregated positive effects in reducing GHG emissions are difficult to calculate, and because the cross-cutting measures have impacts on different sectors, which often overlap. Spain estimated the impacts of some of its PaMs in groups. The Party explained during the review that impacts were estimated for groups of PaMs in some cases because many of the reported measures are designed to achieve the overall mitigation effect defined in the NECP, albeit with their own structure and level of aggregation.

36. Spain described its general methodology for estimating the impacts of its PaMs, which aligns with the methodology described in the National Greenhouse Gas Policies and Measures report pursuant to the EU regulation on the governance of the Energy Union and climate action.

37. The key overarching cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO<sub>2</sub> emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7<sup>th</sup> Environment Action Programme and the clean air policy package. The 2021 European Climate Law, which forms part of the European Green Deal, made climate neutrality by 2050 legally binding and raised the EU-wide 2030 emission reduction target to at least 55 per cent compared with the 1990 level. In 2023, the European Parliament adopted a series of legislative proposals, collectively referred to as Fit for 55, intended to help achieve the new

2030 target. These new regulations strengthened both the ESR and EU ETS 2030 targets, extended the EU ETS to include maritime shipping in 2024 and established the Social Climate Fund to address equitability of mitigation impacts. The regulations also created the EU ETS 2 to cover at the point of distribution most fuel used in sectors not covered by the EU ETS, beginning in 2027.

38. The 2021–2030 EU-wide policies are operationalized through the national energy and climate plans of EU member States, which should set out national objectives for each of the five dimensions of the Energy Union, namely energy security; the internal energy market; energy efficiency; decarbonization; and research, innovation and competitiveness. The national energy and climate plans are periodically updated to reflect changes to EU policy, such as the implementation of the European Green Deal. Spain’s national energy and climate plan (i.e. the NECP) specifies the following goals for achievement by 2030: 23 per cent reduction in GHG emissions compared with the 1990 level, 42 per cent share of renewables in final energy consumption, 39.5 per cent improvement in energy efficiency and 74 per cent of renewable energy in electricity generation.

39. Spain introduced national-level policies to achieve its targets under the ESD, the ESR and domestic emission reduction targets. The key policies reported are Law 7/2021 on Climate Change and Energy Transition, the NECP, the Climate Projects initiative, the voluntary carbon footprint registry, carbon offsetting and CO<sub>2</sub> absorption projects. The mitigation effects of the energy mix package and road transport measures under the NECP are the most significant, as they lead to the largest estimated mitigation impact. Other policies that have delivered significant emission reductions are the national tax on fluorinated gases and Royal Decree 1085/2015 on the promotion of biofuels. The ERT identified the voluntary carbon footprint registry, carbon offsetting and CO<sub>2</sub> absorption projects as mitigation actions of particular interest because they can be implemented at the national, regional and local level and they involve various actors and stakeholders.

40. Spain highlighted the domestic mitigation actions that are under development, such as those being revised to align with the more ambitious 2030 target of the EU to reduce domestic emissions by at least 55 per cent compared with the 1990 level. Mitigation actions under development include reducing the Spanish islands’ dependence on oil and coal; integrating renewables in electricity grids; establishing and implementing specific programmes for the use of biomass, for low-emission zones and for a modal transport shift; promoting the efficient use of transport; renewing the national automobile fleet; promoting electric vehicles; promoting the use of renewable gases in the residential sector; establishing and implementing a programme for the use of biomass in the residential sector; establishing standards for sustainable nutrition in agricultural soils; and establishing basic standards for the management of cattle farms. Specific policies include CAP 2023–2027, the Spanish Forest Plan 2022–2032, a food loss and waste prevention bill and the first Circular Economy Action Plan, for 2021–2023. Among the mitigation actions that provide a foundation for significant additional action are the Hydrogen Roadmap and the promotion of renewable gases. Table 5 provides a summary of the reported information on the PaMs of Spain.

Table 5  
**Summary of information on policies and measures reported by Spain**

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimated mitigation impact in 2020 (kt CO<sub>2</sub> eq)</i>	<i>Estimated mitigation impact in 2030 (kt CO<sub>2</sub> eq)</i>
Policy framework and cross-sectoral measures	Emission reduction projects under the Carbon Fund for a Sustainable Economy (the FES-CO <sub>2</sub> fund): purchase of verified emission reductions	NE	1 638.00
	Multiregional Operational Program 2014–2020	NE	NE
Energy			
Energy efficiency	NECP measures 2.6–2.7: improvement of energy efficiency in buildings (partial implementation)	NE	700.00
	Law 8/2013 on Urban Rehabilitation, Regeneration and Renewal	NE	312.00
Energy supply and renewable energy	Measures for improving the energy mix	NE	23 645.34

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimated mitigation impact in 2020 (kt CO<sub>2</sub> eq)</i>	<i>Estimated mitigation impact in 2030 (kt CO<sub>2</sub> eq)</i>
Transport	Energy measures for the industrial sector	NE	3 008.96
	Energy measures for the residential sector	NE	2 871.80
	Energy measures for the commercial and institutional sector	NE	2 585.43
	Measures for road transport	NE	32 799.53
	Royal Decree 1085/2015 on the promotion of biofuels	NE	4 000.00
	Infrastructure, Transportation and Housing Plan (transport component)	NE	1 800.00
IPPU	National tax on fluorinated GHGs under article 5 of Law 16/2013 of 29 October on Environmental Taxation Measures and Other Tax and Financial Measures	NE	11 000.00
	Royal Decree–Law 20/2018 on boosting economic competitiveness in the industry and commerce sector in Spain	NE	700.00
Agriculture	NECP measure 1.21: promotion of emission reductions in the agriculture sector (livestock farming)	NE	3 659.60
	NECP measure 1.21: promotion of emission reductions in the agriculture sector (crops)	NE	557.52
	CAP 2015–2020 (up until 2022): green payments (or ‘greening’) (payment for agricultural practices beneficial to the climate and the environment)	NE	NE
	CAP 2015–2020 (up until 2022): National Rural Development Programme	NE	NE
LULUCF	Spanish Forest Plan	NE	NE
	Annual action plans to prevent and fight forest fires	NE	NE
	NECP measures 1.24–1.25: encouragement of emission removals in natural sinks	NE	614.40
Waste	NECP measure 1.22: promotion of emission reductions in the waste sector	NE	1 725.10
	Law 7/2022 on Waste and Contaminated Soil for a Circular Economy	NE	NE

*Note:* The estimated mitigation impacts are estimates of emissions of CO<sub>2</sub> eq avoided in a given year as a result of the implementation of mitigation actions.

41. Spain does not consider most of its PaMs as innovative because they are in most cases derived from EU regulations and plans and hence have been adopted by most European countries. Nevertheless, Spain reported a list of PaMs that include an innovative component, for example the PREE 5000 programme, which not only improves the building stock but also aims to curb rural population decline and, hence, improve territorial balance; Law 8/2013 on Urban Rehabilitation, Regeneration and Renewal, which focuses on the existing urban infrastructure rather than on the application of the production model that has governed urban growth thus far; and programmes under the NECP for promoting renewable gases in the industry sector (measure 1.8) and using biomass for applications in the industrial sector (measure 1.11), which contribute to the development of new technologies and systems capable of substituting fossil fuels with renewable sources. Spain considers all reported PaMs as replicable because they are designed for actions in a specific sector and, therefore, could be implemented by other Parties.

## 2. Assessment of adherence to the reporting guidelines

42. The ERT assessed the information reported in the NC8 and BR5 of Spain and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting

guidelines on NCs and the UNFCCC reporting guidelines on BRs. The finding is described in table I.2.

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

#### **(a) Technical assessment of the reported information**

43. In its NC8 Spain reported that the implementation of the Kyoto Protocol is underpinned by ensuring the implementation of relevant EU regulations at several levels of national government. The legislative arrangements and procedures for implementing the Kyoto Protocol correspond to those in place for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress towards Spain's target, as well as for the formulation of climate change policies (see para. 32 above for details on the overall responsibility for climate change policymaking and national institutions involved in policy implementation).

44. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Spain committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year level (see para. 23 above).

45. The Party has arrangements and enforcement procedures to meet its commitments under the Kyoto Protocol, including procedures for addressing non-compliance. As an EU member State, Spain's commitments under the Kyoto Protocol are based primarily on compliance with and observance of EU legislation addressed to the member States. The European Commission monitors member States' measures and ensures their compliance with EU legislation, in accordance with the Treaty on the Functioning of the European Union. If a member State fails to comply with EU legislation, the European Commission may initiate infringement proceedings and, if necessary, bring the case to the European Court of Justice.

46. Spain has provisions in place to make information on legislative arrangements and administrative procedures related to compliance and enforcement publicly accessible. All relevant information on actions and matters related to the Kyoto Protocol is published on the MITECO website.

47. Spain has national legislative arrangements and administrative procedures in place that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and the sustainable use of natural resources. The Spanish Forest Plan, developed under article 30 of Law 43/2003, is a long-term policy planning instrument that indicates that forest production in Spanish forests must be compatible with the protective and regulating functions of water, soil, biodiversity and landscape. In addition, EU directives on the conservation of natural habitats and of wild fauna and flora (directive 92/43/EEC) and on the conservation of wild birds (directive 2009/147/EC) have been transposed into Spanish law by Law 42/2007 on Natural Heritage and Biodiversity. This law enforces the incorporation of conservation measures for natural habitats and wild fauna and flora by the forest management sector. Regarding cropland management, Spain elected, under Article 3, paragraph 4, of the Kyoto Protocol, that the CAP should include subsidies that are conditional on the application of environmental good practices.

#### **(b) Assessment of adherence to the reporting guidelines**

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



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

##### **(a) Technical assessment of the reported information**

49. In the NC8 Spain reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. Spain reported the potential social, environmental and economic impacts on other Parties for the following national measures: increasing the use of biofuels, increasing the use of renewable energy (including gas), increasing the implementation of energy efficiency initiatives, reducing emissions from the LULUCF sector, reducing emissions from the waste sector, and calculating and compensating for carbon footprints. Spain also identified the potential impacts on other countries of the following international measures: development (by companies under the EU ETS) of more efficient technologies that have the potential to be transferred to other countries and development of emission reduction projects in third countries promoted through the support of international financial institutions to which Spain contributes.

50. The NC8 includes information on how Spain promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels. Since the enactment of EU directive 2008/101/CE, the EU ETS has included national and international (within the EU) aviation. This directive was transposed into Spain's national legislation by Law 13/2010. In addition, a revision of the EU ETS to incorporate maritime shipping and revise the rules on aviation emissions has been included as part of the Fit for 55 package (see para. 37 above).

51. Further information on how Spain strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2022 annual submission. Spain reported on the actions taken to minimize the adverse effects on other countries of its response measures, including measures to reduce or gradually eliminate market imperfections, tax incentives, tax exemptions and subsidies, particularly those associated with the use of environmentally unsound or hazardous technologies. The Party reported information on what it prioritized in implementing its commitments under Article 3, paragraph 14, including actions taken to minimize the adverse effects related to its cooperation in technology development for non-energy uses of fossil fuels and in the dissemination and transfer of technology. Furthermore, in the NC8 Spain reported on the actions it has taken to strengthen the capacity of developing country Parties and on its provision of financial support, through international financial institutions, to emission reduction projects in third countries (see chap. II.G below).

##### **(b) Assessment of adherence to the reporting guidelines**

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

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

##### **1. Technical assessment of the reported information**

53. Spain reported in its BR5 that it does not intend to use units from market-based mechanisms under the Kyoto Protocol and other market-based mechanisms under the Convention to meet its commitment under the ESD. The Party reported in CTF tables 4 and 4(b) that it did not use any units from market-based mechanisms in 2019 or 2020. Given that

the contribution of LULUCF activities is not included in the joint EU target under the Convention, reporting thereon is not applicable to Spain. Table 6 illustrates Spain’s ESD emissions and use of units from market-based mechanisms for achieving its ESD target.

Table 6

**Summary of information on emissions covered by the European Union effort-sharing decision annual emission allocation and use of units from market-based mechanisms by Spain**

(kt CO<sub>2</sub> eq)

<i>Year</i>	<i>ESD emissions</i>	<i>AEA</i>	<i>Use of units from market-based mechanisms</i>	<i>AEAs transferred to (–) or from (+) other Parties</i>	<i>Annual AEA surplus/deficit</i>	<i>Cumulative AEA surplus/deficit</i>
2013	200 277.68	227 563.76	NA	NA	27 286.08	27 286.08
2014	199 755.02	225 648.30	NA	NA	25 893.28	53 179.36
2015	196 153.20	223 732.84	NA	NA	27 579.65	80 759.01
2016	198 472.21	221 817.38	NA	NA	23 345.18	104 104.19
2017	201 107.41	218 263.21	NA	NA	17 155.80	121 259.99
2018	203 029.78	216 305.63	NA	NA	13 275.85	134 535.84
2019	201 878.75	214 348.06	NA	NA	12 469.31	147 005.15
2020	184 188.34	212 390.48	NA	NA	28 202.14	175 207.28

*Sources:* Spain’s BR5 and BR5 CTF table 4(b) and EU transaction log (AEAs).

*Note:* For a given year, a positive number (surplus) indicates that annual or cumulative ESD emissions were lower than the corresponding AEA or cumulative AEAs, while a negative number (deficit) indicates that annual or cumulative ESD emissions were higher than the corresponding AEA or cumulative AEAs.

## 2. Assessment of adherence to the reporting guidelines

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

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

55. In assessing the Party’s contribution towards achievement of the 2020 joint EU target on the basis of the information reported in its BR5, the ERT noted that, under the EU 2020 climate and energy package, Spain committed to reducing its emissions under the ESD to 10 per cent below the 2005 level by 2020 (see para. 25 above). This target has been translated into binding quantified AEAs for 2013–2020. In 2020, Spain’s ESD emissions were 13.3 per cent (28,202.14 kt CO<sub>2</sub> eq) below the AEA. Spain has a cumulative surplus of 175,207.27 kt CO<sub>2</sub> eq with respect to its AEAs between 2013 and 2020. The ERT noted that the Party did not make use of units from market-based mechanisms in 2020.

56. The ERT noted that the Party reported that the total GHG emissions excluding LULUCF of the EU and including the use of units from market-based mechanisms do not exceed the emission level corresponding to the target in 2020, and thus that the EU has achieved its joint target. See the report on the review of the BR5 of the EU for further details. Therefore, the ERT concluded that, on the basis of the information reported in the BR5, Spain has met its 2020 commitment under the Convention through its contribution to achieving the joint EU target. The ERT noted that the Party’s ESD emissions in 2020 do not exceed its AEA for 2020.

## F. Projections

### 1. Projections overview, methodology and results

#### (a) Technical assessment of the reported information

57. Spain reported in its BR5 and NC8 projections for 2025–2040, which were developed on the basis of actual inventory data for 2019 (from its 2021 annual submission) under the WEM scenario. The WEM scenario reported by Spain includes PaMs implemented and

adopted before 18 February 2021. However, Spain used its latest GHG inventory (2022 annual submission) for the historical data up until 2020 reported in CTF tables 6(a) and 6(c) and NC8 tables 49–50.

58. In addition to the WEM scenario, Spain reported a WAM scenario. The WAM scenario includes planned PaMs. Spain provided a definition of its scenarios, explaining that its WEM scenario includes policies implemented and adopted, such as the EU ETS, the national tax on fluorinated GHGs and measures in the transport sector, while its WAM scenario includes policies and measures in its NECP and Long-Term Decarbonization Strategy. The definition reported indicates that the scenarios were prepared in accordance with the UNFCCC reporting guidelines on BRs.

59. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub> (treating PFCs and HFCs collectively in each case) for 2025–2040. The projections are also provided in an aggregated format for each sector and for a Party total using GWP values from the AR4. Spain reported on factors and activities affecting emissions for each sector in table 40 of the NC8, while the corresponding CTF table 5 was missing from the submission owing to a technical issue. During the review, the Party resubmitted the CTF tables; the resubmission included the missing CTF table 5.

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

60. The methodology used for the preparation of the projections is slightly different from that used for the preparation of the emission projections for the NC7. Spain provided information on changes since the submission of its NC7 in the assumptions, methodologies, models and approaches used for the projection scenarios, but not on the differences in the projections between the NC7 and BR4. The changes mainly affected the WAM scenario and are associated with changes in planned policies, including the final NECP and the new Long-Term Decarbonization Strategy. The methodology for developing projections involved using the TIMES-Sinergia model for the energy sector (electricity, transport, buildings and industry) and specific models developed by Spain in Excel worksheets for each of the non-energy sectors (waste, agriculture, LULUCF, product use). All of these models were also used to produce GHG inventory emission estimates, meaning that Spain used a consistent methodology and consistent input parameters for the GHG inventory and projections.

61. To prepare its projections, Spain relied on key underlying assumptions relating to population, GDP, energy consumption, animal and crop production, and waste generation. The assumptions were updated on the basis of the most recent economic developments known at the time of the preparation of the projections. Spain reported macroeconomic and other assumptions up until 2040, assuming population growth of 1.2 per cent between 2020 and 2030 and 2.4 per cent between 2030 and 2040. GDP is expected to increase in the projection period by 16.2 per cent between 2020 and 2030 (owing to recovery from the pandemic) and by 11.3 per cent between 2030 and 2040. Animal (including poultry) production is expected to decrease over 2020–2040, with the exception of swine and goat production.

62. Sensitivity analyses were conducted on a sector-by-sector basis, with different sensitivity variables being chosen for each sector. For example, for the energy sector, the sensitivity of projections was estimated considering a variation of  $\pm 25$  per cent in all fossil fuel prices; however, the ERT noted that the impact of this variation on emissions was not reported. For the agriculture sector, sensitivity around assumed growth in livestock herds of  $\pm 10$  per cent by 2040 resulted in a  $\pm 0.32$  to  $\pm 0.37$  per cent variation in national total emissions in 2030. For the waste sector, population growth variation of about  $\pm 5$  per cent by 2040 resulted in Spain's total GHG emissions changing by  $\pm 0.02$  and  $\pm 0.03$  per cent for the WEM and WAM scenario respectively in 2030 and by  $\pm 0.04$  and  $\pm 0.11$  per cent for the WEM and WAM scenario respectively in 2040.

**(c) Results of projections**

63. 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.

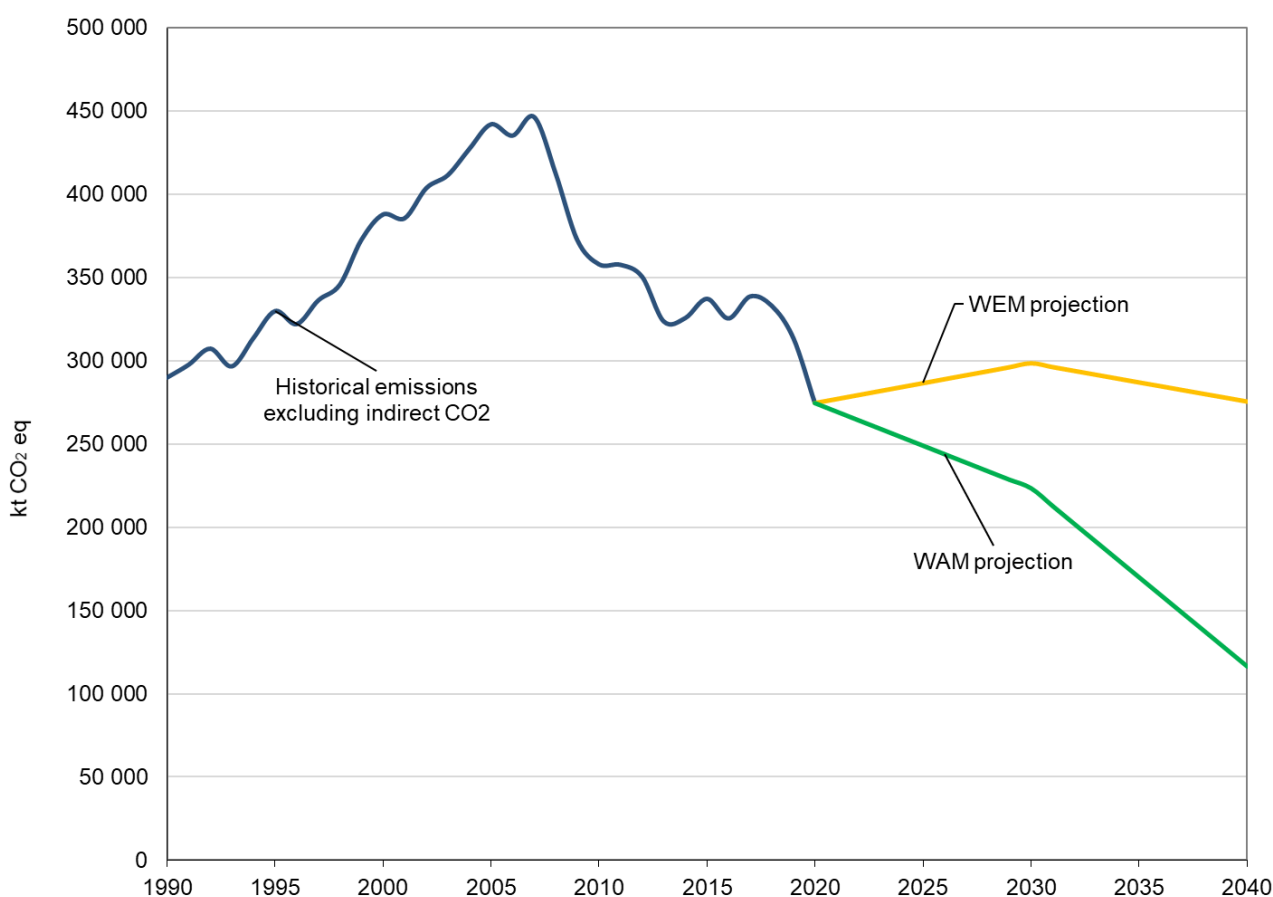
Table 7  
**Summary of greenhouse gas emission projections for Spain**

	<i>GHG emissions (kt CO<sub>2</sub> eq/year)</i>	<i>Change in relation to 1990 level (%)</i>	<i>Change in relation to 2020 level (%)</i>
Inventory data 1990	290 103.68	NA	NA
Inventory data 2020	274 742.89	-5.3	NA
WEM projections for 2030	298 778.12	3.0	8.7
WAM projections for 2030	223 535.46	-22.9	-18.6
WEM projections for 2040	275 642.00	-5.0	0.3
WAM projections for 2040	116 356.00	-59.9	-57.6

Sources: Spain’s BR5, BR5 CTF table 6 and NC8 tables 49–50.

Note: The projections are of GHG emissions excluding LULUCF and excluding indirect CO<sub>2</sub>.

Figure 1  
**Greenhouse gas emission projections reported by Spain**



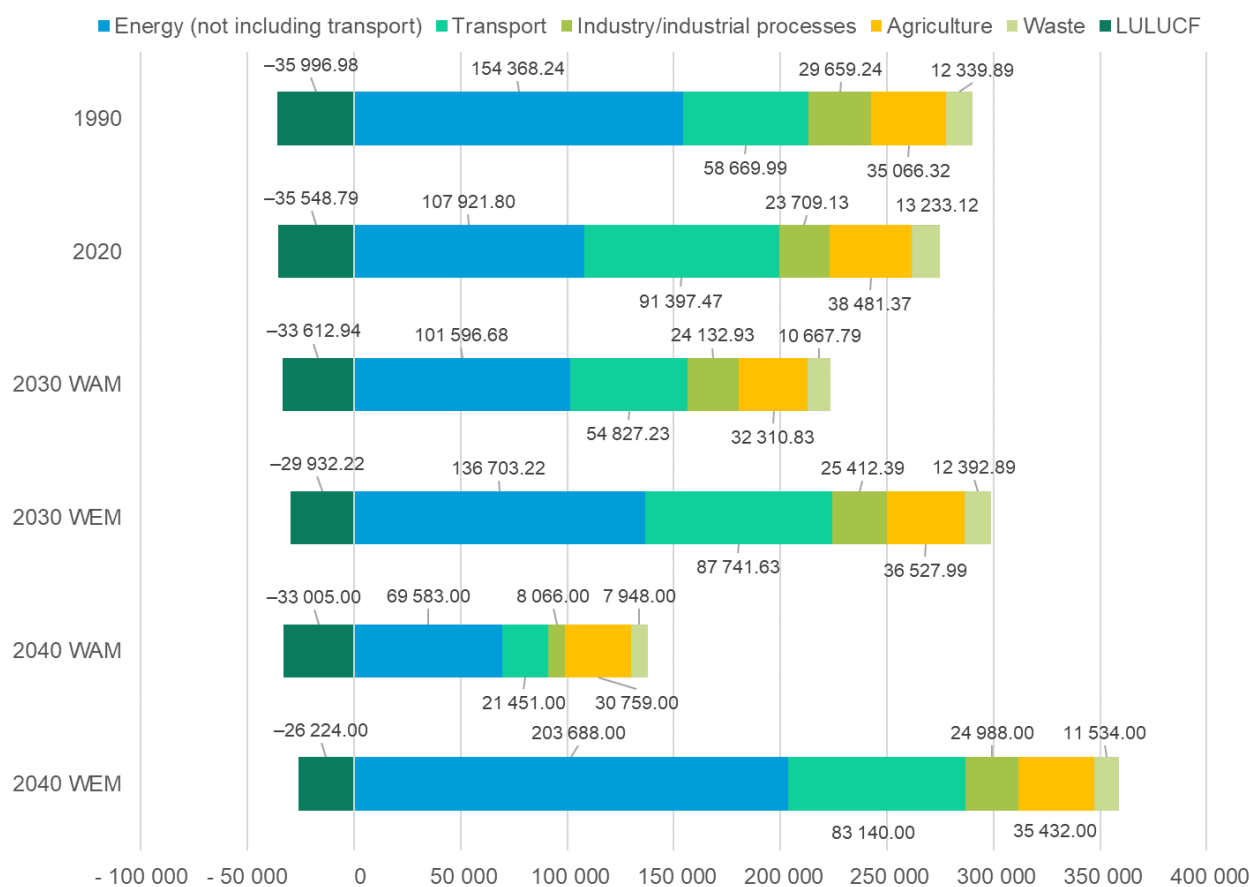
Sources: Spain’s BR5 CTF tables 1 and 6 and NC8 tables 49–50 (total GHG emissions excluding LULUCF and excluding indirect CO<sub>2</sub>).

64. Spain’s total GHG emissions excluding LULUCF are projected under the WEM scenario to increase by 3.0 per cent and decrease by 5.0 per cent respectively in comparison with the 1990 level in 2030 and 2040. When including LULUCF, total GHG emissions are projected under the WEM scenario to increase by 5.8 per cent and decrease by 1.8 per cent respectively in comparison with the 1990 level in 2030 and 2040. Under the WAM scenario, total GHG emissions excluding LULUCF are projected to decrease by 22.9 and 59.9 per cent respectively below the 1990 level in 2030 and 2040. When including LULUCF, emissions in 2030 and 2040 are projected to be lower than those in 1990 by 25.2 and 67.2 per cent respectively.

65. Spain presented the WEM and WAM scenarios by sector for 2030 and 2040, as summarized in figure 2 and table 8.

Figure 2  
Greenhouse gas emission projections for Spain presented by sector

(kt CO<sub>2</sub> eq)



Sources: Spain's BR5 CTF table 6 and NC8 tables 49–50.

Table 8  
Summary of greenhouse gas emission projections for Spain presented by sector

Sector	GHG emissions and removals (kt CO <sub>2</sub> eq)					Change (%)			
	1990	2030		2040		1990–2030		1990–2040	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	154 368.24	136 703.22	101 596.68	120 548.00	48 132.00	-11.4	-34.2	-21.9	-68.8
Transport	58 669.99	87 741.63	54 827.23	83 140.00	21 451.00	49.6	-6.5	41.7	-63.4
Industry/industrial processes	29 659.24	25 412.39	24 132.93	24 988.00	8 066.00	-14.3	-18.6	-15.7	-72.8
Agriculture	35 066.32	36 527.99	32 310.83	35 432.00	30 759.00	4.2	-7.9	1.0	-12.3
LULUCF	-35 996.98	-29 932.22	-33 612.94	-26 224.00	-33 005.00	-16.8	-6.6	-27.1	-8.3
Waste	12 339.89	12 392.89	10 667.79	11 534.00	7 948.00	0.4	-13.6	-6.5	-35.6
Other <sup>a</sup>	34 864.54	86 262.02	87 452.99	90 442.00	89 229.00	147.4	150.8	159.4	155.9
<b>Total GHG emissions excluding LULUCF<sup>b</sup></b>	<b>290 103.68</b>	<b>298 778.12</b>	<b>223 535.46</b>	<b>275 642.00</b>	<b>116 355.00</b>	<b>3.0</b>	<b>-22.9</b>	<b>-5.0</b>	<b>-59.9</b>

Sources: Spain's BR5 CTF table 6 and NC8 tables 49–50.

<sup>a</sup> Other includes indirect emissions of CO<sub>2</sub> from biomass, international navigation and aviation.

<sup>b</sup> Emissions and removals reported under the sector other (sector 6) are not included in the total GHG emissions.

66. According to the projections reported for 2030 under the WEM scenario, the most significant absolute emission reductions are expected to occur in the energy sector (excluding transport), amounting to a projected reduction of 11.4 per cent between 1990 and 2030.

Industry/industrial processes emissions are also expected to decrease, by 14.3 per cent between 1990 and 2030. In contrast, emissions for all other sectors are expected to increase under the WEM scenario, with the largest increase (49.6 per cent between 1990 and 2030) to be seen in transport owing to the large increase in freight being transported and passenger journeys between 1990 and 2030 not being sufficiently compensated for in the WEM scenario through decarbonization measures (a modal shift from road to rail, among others). The capacity of the LULUCF sector as a sink is expected to reduce by 16.8 per cent between 1990 and 2030.

67. The pattern of projected emissions reported for 2040 under the same scenario remains similar, although overall emissions are expected to start declining between 2030 and 2040 owing to the PaMs with longer-term impacts, such as electrification of the transport sector, for which the vehicle stock needs to be replaced for emission reductions to be realized. Slower assumed GDP growth in 2030–2040 also contributes to the decline in emissions over that period: GDP is expected to increase by 11.3 per cent between 2030 and 2040, down from a 16.2 per cent increase between 2020 and 2030 (the higher rate being largely attributable to recovery from the pandemic). For comparison, over the last three decades Spain’s real GDP doubled in 1990–2000, increased by 67.0 per cent in 2000–2010 and increased by 13.0 per cent in 2010–2020.

68. Spain assumed population growth of 1.2 per cent between 2020 and 2030, and greater growth, 2.4 per cent, between 2030 and 2040. For comparison, over the last three decades Spain’s population increased by 3.6 per cent in 1990–2000 and by 15.6 per cent in 2000–2010, and virtually did not grow in 2010–2020.

69. Under the WAM scenario the most significant emission reductions are projected for the energy sector (excluding transport) and the transport sector, both up until 2030 and in 2030–2040. By 2040, the WAM scenario projects that emissions in the energy (excluding transport), transport and industry/industrial processes sectors will decline to about one third of their corresponding 1990 level.

70. Spain presented the WEM and WAM scenarios by gas for 2030 and 2040, as summarized in table 9.

Table 9

**Summary of greenhouse gas emission projections for Spain presented by gas**

Gas <sup>a</sup>	GHG emissions and removals (kt CO <sub>2</sub> eq)					Change (%)			
	1990	2030		2040		1990–2030		1990–2040	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO <sub>2</sub>	231 328.44	240 850.56	172 119.90	221 806.00	72 793.00	4.1	–25.6	–4.1	–68.5
CH <sub>4</sub>	36 641.89	35 740.03	30 631.25	33 597.00	25 640.00	–2.5	–16.4	–8.3	–30.0
N <sub>2</sub> O	17 865.06	18 281.32	16 878.10	18 008.00	15 846.00	2.3	–5.5	0.8	–11.3
HFCs	3 039.92	3 456.12	3 456.12	1 806.00	1 806.00	13.7	13.7	–40.6	–40.6
PFCs	1 164.38	69.06	69.06	72.00	70.00	–94.1	–94.1	–93.8	–94.0
SF <sub>6</sub>	63.99	271.06	271.06	302.00	148.00	323.6	323.6	371.9	131.3
NF <sub>3</sub>	0.00	0.00	0.00	0.00	0.00	–	–	–	–
Unspecified mix of HFCs and PFCs	NO, NA	109.97	109.97	52.00	52.00	NA	NA	NA	NA
<b>Total GHG emissions without LULUCF</b>	<b>290 103.68</b>	<b>298 778.12</b>	<b>223 535.46</b>	<b>275 642.00</b>	<b>116 355.00</b>	<b>3.0</b>	<b>–22.9</b>	<b>–5.0</b>	<b>–59.9</b>

Sources: Spain’s BR5 CTF table 6 and NC8 tables 49–50.

<sup>a</sup> Spain did not include indirect CO<sub>2</sub> emissions in its projections.

71. The changes to the WEM projection methodology since the BR4 have not produced significant changes in results. The updated WAM projections for 2031–2040 do, however, show a significant downward shift owing to the addition of new policies, such as the NECP

and the Long-Term Decarbonization Strategy. With respect to 2030, the revisions result in slightly lower emission projections being reported in the NC8 than in the BR4. For the WEM scenario, the NC8 reports that emissions are projected to grow by 3.0 per cent from the 1990 level (the projected growth is reported as 7.7 per cent in the BR4), and for the WAM scenario, the NC8 reports that emissions are projected to decline by 22.9 per cent compared with the 1990 level (the projected decline is reported as 21.4 per cent in the BR4). The biggest downward revisions in emissions occur in the energy and industry sectors.

**(d) Assessment of adherence to the reporting guidelines**

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

**2. Assessment of the total effect of policies and measures**

**(a) Technical assessment of the reported information**

73. In its NC8 Spain did not present the estimated and expected total effect of implemented and adopted PaMs. However, it presented relevant information on factors and activities for each sector for 1990–2030.

74. According to the information reported in its NC8, PaMs implemented in the transport sector will deliver the largest emission reductions. Table 10 provides an overview of the total effect of PaMs as reported by Spain.

Table 10

**Projected effects of Spain's planned, implemented and adopted policies and measures in 2030 and 2040**

(kt CO<sub>2</sub> eq)

Sector	2030		2040	
	Effect of implemented and adopted measures	Effect of planned measures	Effect of implemented and adopted measures	Effect of planned measures
Energy (without transport)	NE	35 106.54	NE	72 416.00
Transport	NE	32 914.40	NE	61 689.00
Industry/industrial processes	NE	1 279.46	NE	16 922.00
Agriculture	NE	4 217.16	NE	4 673.00
Land-use change and forestry	NE	3 680.72	NE	6 781.00
Waste management	NE	1 725.10	NE	3 586.00
<b>Total</b>	<b>NE</b>	<b>78 923.38</b>	<b>NE</b>	<b>166 067.00</b>

Sources: Spain's NC8 (tables 49–51) and BR5.

Note: The total effect of implemented and adopted PaMs was not estimated by Spain; the total effect of planned PaMs is defined as the difference between the WEM and the WAM scenarios.

**(b) Assessment of adherence to the reporting guidelines**

75. The ERT assessed the information reported in the NC8 of Spain and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.3.

**3. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol**

**(a) Technical assessment of the reported information**

76. In the NC8 Spain provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that Spain did not use market-based mechanisms to meet its Kyoto Protocol target.

**(b) Assessment of adherence to the reporting guidelines**

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

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

**1. Technical assessment of the reported information**

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

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

79. Spain has provided support that it considers to be “new and additional”. Its definition of “new and additional” is climate finance linked to new contributions committed or disbursed each year. For 2019–2020, through bilateral and multilateral contributions, Spain provided new support for climate change projects, programmes and funds, as well as support for the continuity of existing projects.

80. Spain reported on the support that it has provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities, as well as distinguishing support for cross-cutting activities, which address both mitigation and adaptation, and identifying the capacity-building elements of such support. For bilateral ODA contributions, Spain used the Rio markers from the Development Assistance Committee of the Organisation for Economic Co-operation and Development. For multilateral ODA contributions, Spain accounted for contributions to specific climate change funds and programmes (e.g. the GCF and the Adaptation Fund). The Party noted that most of its multilateral contributions were for cross-cutting activities, except for those provided to the Adaptation Fund, which is a fund specifically for adaptation. For other contributions under multilateral ODA, Spain estimated the percentage contribution to climate change. Spain reported that several organizations, for example the Spanish Agency for International Development Cooperation, that are focused on capacity-building activities, report and provide information on these activities.

81. Spain’s national approach to tracking the provision of support, including information on indicators, delivery mechanisms used and allocation channels tracked, is well established. For ODA contributions, each financial instrument or agency has its own monitoring and evaluation methodology. Multilateral agencies submit periodic reports for approval by their governing bodies, which Spain is a member of. During the review, the Party explained that it is working on reinforcing the coordination of all actors working in international cooperation. Changes to its approach since the previous report include the Spanish International Strategy for Climate Finance, the development of which was mandated by Law 7/2021 on Climate Change and Energy Transition, which will support this coordination.

82. Spain’s methodology and underlying assumptions used for collecting and reporting information on financial support consider climate finance and climate-specific financial contributions as eligible support; together, this support covers all finance flows channelled towards development in general, and more specifically to programmes, projects, plans and other initiatives with decarbonization and adaptation goals and objectives. It also covers finance flows channelled to support the transfer of climate technologies and to support capacity-building in the areas of enhancing mitigation and adapting to the adverse impacts of climate change. During the review, Spain explained how it mobilized private sector support for climate action; namely, by providing an enabling environment for such mobilization (through policies, financial instruments, capacity-building initiatives, etc.). The Party noted the difficulty in accounting for and tracking financial contributions from the private sector, which arose from the lack of agreed methodologies for doing so. However,



the Party mentioned that it is working on applying the Paris Agreement reporting requirements in order to improve the accounting of private sector contributions.

**(b) Financial resources**

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

84. Spain described how it seeks to ensure that the resources it provides to non-Annex I Parties effectively address their adaptation and mitigation needs. For bilateral ODA contributions, Spain, jointly with the recipient country, identifies needs and documents them in the Country Partnership Framework for that country. For multilateral ODA contributions, the needs of recipient countries are identified by the multilateral organization in question, of which Spain is a part of. The needs identification process considers the priorities of recipient countries, including their nationally determined contribution targets. For other official flows, sectoral or geographical priorities are considered by the respective financial instruments or institutions.

85. Spain also described how the resources it provides to non-Annex I Parties assist them 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. Spain reported that part of its support for capacity-building and technology transfer is provided to countries that produce petroleum and part is provided to countries interested in cooperation for development and a just transition.

86. The most recent financial contributions that Spain made with the aim of enhancing implementation of the Convention by developing countries was provided to particularly vulnerable countries. The focus was on geographical areas prioritized in Spain's Master Plan for Spanish Cooperation and sectors for which the support showed added value in adaptation (such as water, agriculture, infrastructure and energy). The recipients included countries in Asia, Latin America and the Caribbean, North Africa and sub-Saharan Africa. Table 11 summarizes the information reported by Spain on its provision of financial support.

Table 11

**Summary of information on provision of financial support by Spain in 2019–2020**

(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Disbursement in 2019–2020</i>
ODA	5 991.35
Climate-specific contributions through multilateral channels, including:	453.01
Global Environment Facility	3.32
Adaptation Fund	2.26
GCF	175.45
Trust Fund for Supplementary Activities	0.86
Other multinational climate change funds	14.87
Financial institutions, including regional development banks	238.77
United Nations bodies	17.47
Climate-specific contributions through bilateral, regional and other channels	954.63

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

87. Spain's climate-specific public financial support<sup>8</sup> totalled USD 1,407.64 million in 2019–2020, representing a decrease of 1.2 per cent compared with that reported in the BR4

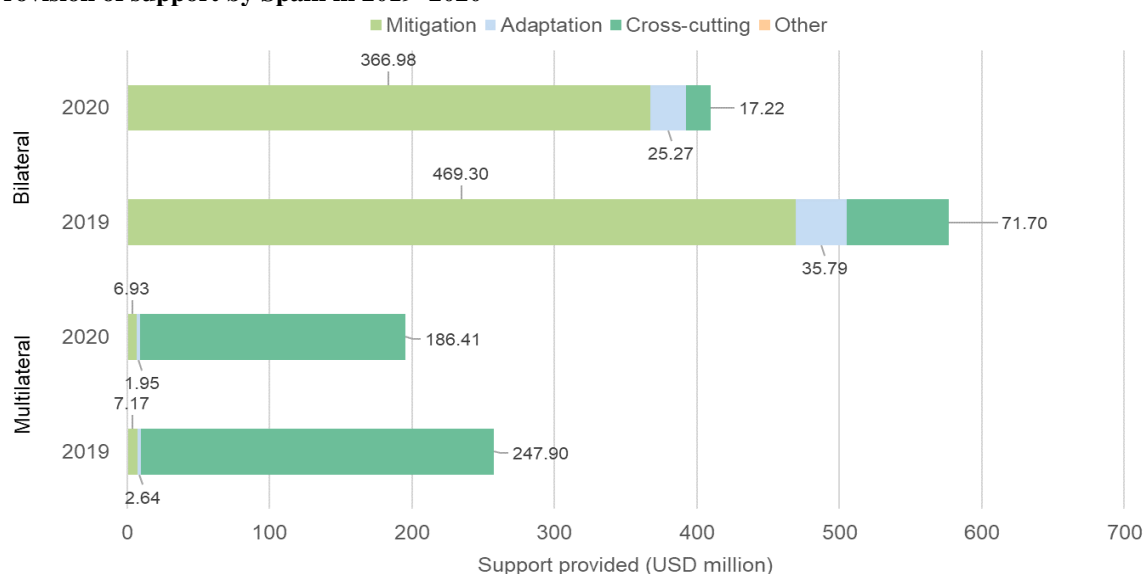
<sup>8</sup> For the remainder of this chapter, the term "financial support" means climate-specific financial support, unless otherwise noted.

(2017–2018).<sup>9</sup> For 2019–2023, Spain committed to contributing EUR 150 million to the GCF and has already disbursed EUR 126 million. The Party also reported in its NC8 that it has contributed EUR 78 million to the Adaptation Fund since its launch, with EUR 30 million disbursed in 2022.

88. Spain contributed through multilateral channels USD 453.01 million in 2019–2020. The contributions were made to specialized multilateral climate change funds, such as the GCF, and to multilateral financial institutions and regional development banks, such as the World Bank and the African Development Bank. During the reporting period, Spain focused on supporting countries particularly vulnerable to the adverse impacts of climate change, placing emphasis on financing the transfer of technologies, information and knowledge networks, training, innovation and research. Information on financial support from the public sector provided through multilateral and bilateral channels and the allocation of that support to target area is presented in figure 3 and table 12.

Figure 3

### Provision of support by Spain in 2019–2020



Source: Spain's BR5 CTF tables 7, 7(a) and 7(b).

Table 12

### Summary of information on channels of financial support reported by Spain

(Millions of United States dollars)

Allocation channel of public financial support	Amount disbursed in 2019–2020	Amount disbursed in 2017–2018	Change (%)	Share of total (2019–2020) (%)
<b>Detailed information by type of channel</b>				
<b>Multilateral channels</b>				
Mitigation	14.1	12.6	12.3	3.1
Adaptation	4.6	1.6	187.5	1.1
Cross-cutting	434.3	262.4	65.5	95.8
Other	0.0	0.0	NA	NA
<b>Total multilateral</b>	<b>453.0</b>	<b>276.6</b>	<b>63.8</b>	<b>100.0</b>
<b>Bilateral channels</b>				
Mitigation	804.7	928.5	–13.3	84.3
Adaptation	61.1	88.5	–30.9	6.4
Cross-cutting	88.9	131.4	–32.4	9.3
Other	0.0	0.0	NA	NA

<sup>9</sup> Comparisons with data from previous years have been calculated directly without adjusting for inflation.

<i>Allocation channel of public financial support</i>	<i>Amount disbursed in 2019–2020</i>	<i>Amount disbursed in 2017–2018</i>	<i>Change (%)</i>	<i>Share of total (2019–2020) (%)</i>
<b>Total bilateral</b>	<b>954.7</b>	<b>1 148.4</b>	<b>–16.9</b>	<b>100.0</b>
<b>Total multilateral and bilateral</b>	<b>1 407.7</b>	<b>1 425.0</b>	<b>–1.2</b>	<b>100.0<sup>a</sup></b>

*Sources:* Spain's BR5 CTF tables 7, 7(a) and 7(b); report on the review of Spain's BR4 for 2017–2018 data.

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

89. The Party reported detailed information on the total financial support provided through bilateral (USD 954.7 million) channels in 2019–2020. During the reporting period, Spain placed a particular focus on Africa and Latin America, the regions that received most of its bilateral support.

90. The NC8 and the BR5 provide information on the types, sectors and instruments of support provided. The information reported shows that in 2019–2020 the average shares of bilateral financial support allocated to mitigation, adaptation and cross-cutting projects were 84.3, 6.4 and 9.3 per cent respectively. From these figures it is clear that most of the support was channelled to mitigation. During the review, Spain indicated that it is planning to shift some of its focus to adaptation. In 2019–2020, the majority of financial contributions through bilateral and regional channels were allocated to the energy, transport, agriculture, forestry, industry, water and sanitation, and cross-cutting sectors in support of the efforts and priorities of recipient countries. The Party included in its reporting information on the types of financial instruments used for providing assistance to developing countries, which include grants, concessional credits, concessional loans, insurance, loan guarantees, non-concessional credits, capital contributions, export credits and export credit insurance. The ERT noted that the grants provided in 2019–2020 accounted for most of the total bilateral financial support.

91. Spain explained that private finance is mobilized for exporting goods, technologies and services for climate action and commercial activities in the environment, energy, transport and agriculture sectors. Spain has created an enabling environment in terms of policies and investment schemes that promote private sector participation in and financing of climate-change-related projects. It also reported on how it uses public funds to promote private sector financial support for developing countries to increase mitigation and adaptation efforts by promoting a paradigm shift in line with Article 2, paragraph 1(c), of the Paris Agreement. This entails promoting innovative financing, co-financing schemes, and green and social bonds, as well as encouraging the private sector and the financial sector to increase their climate finance commitments.

92. Spain reported that under the Development Promotion Fund, several co-financing framework agreements with international financial institutions have been established. The Fund also contributes to strengthening European financial cooperation through its membership of the Association of European Development Finance Institutions. The Fund also supports the EU green bond initiative.

93. An example of Spain's provision of support to non-Annex I Parties is the ARAUCLIMA programme, which provides technical and financial support for mitigation and adaptation actions in countries in Latin America and the Caribbean.

**(c) Technology development and transfer**

94. Spain reported on its measures and activities related to technology transfer, access and deployment benefiting developing countries, including activities undertaken by the public and private sector. A number of State-level agencies (FIIAPP, MITECO, the Spanish Agency for International Development Cooperation, the Spanish Patent and Trademark Office, and several agencies attached to the Ministry of Science and Innovation) lead or are involved in international activities and initiatives that promote training and the development and transfer of technology in developing countries. Examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties include a bilateral cooperation project between Ecuador and Spain on the use of models for identifying mitigation measures in the waste sector. From 2019 to 2021, the Spanish Climate Change Office, making use of Spain's experience in modelling mitigation measures in the

waste sector, provided technical assistance to the Ministry of Environment and Water of Ecuador in order to assist Ecuador in implementing its priority objectives, as set out in its nationally determined contribution.

95. Spain focused the provision of its technology transfer support on the following recipient countries, which it considers to be particularly vulnerable to the adverse impacts of climate change: in Latin America and the Caribbean, Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Paraguay and Peru; in North Africa, Egypt, Morocco and Tunisia; in other regions of Africa, Equatorial Guinea, Ethiopia, Mali, Mozambique, Niger, Senegal and South Africa; in Asia, India, Malaysia, the Philippines, Singapore and Thailand; in Europe, Malta; and in the Middle East, Israel and Jordan. The technology support covers mitigation and adaptation, with many projects targeting the energy, agriculture, waste, and water and sanitation sectors.

96. Since its last NC and BR, Spain has implemented or has planned to implement additional measures and activities. Spain also described success stories in relation to strengthening capacity and the exchange of knowledge, technology and experience in climate change adaptation and mitigation in Latin America and the Caribbean.

**(d) Capacity-building**

97. Spain reported on its capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties. It described individual measures and activities related to capacity-building support in textual and tabular format. The capacity development support provided addresses partner developing countries' needs, as identified through bilateral (on a project basis) or multilateral (by multilateral organizations to which Spain belongs) means.

98. Spain has supported climate-related capacity development activities relating to the adaptation, mitigation, climate financing and cross-cutting sectors. Priority for capacity-building support was given to projects and programmes in the agriculture, forestry, water and cross-cutting sectors. During the review, Spain indicated that it will shift more of the focus of its support to adaptation in order to help partner developing countries, as well as itself (the country being vulnerable to climate change), build resilience and adapt to the adverse impacts of climate change. Spain's support has responded to the existing and emerging capacity-building needs of non-Annex I Parties by following the principles of national ownership, stakeholder participation, country-driven demand, and cooperation between donors and across programmes.

**2. Assessment of adherence to the reporting guidelines**

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

**3. Reporting on finance, capacity-building and technology transfer information related to the Kyoto Protocol**

**(a) Technical assessment of the reported information**

100. In its NC8 Spain reported its activities, actions and programmes undertaken in fulfilment of its commitments under Article 10 of the Kyoto Protocol. Spain provided information on steps taken to promote, facilitate and finance the transfer of technology to developing countries and to build their capacity in order to facilitate implementation of Article 10 of the Kyoto Protocol (see paras. 94–98 above).

101. Spain provided information on its implementation of Article 11 of the Kyoto Protocol. In table 78 of its NC8, Spain presented a summary of its reporting on supplementary information under Article 11 of the Kyoto Protocol (financial resources), cross-referencing

the reporting requirements to the relevant section of the NC8 (section 7.1). The Party described how its contributions are “new and additional” (see para. 79 above).

102. Spain reported on its financial contributions to the Adaptation Fund, which amount to EUR 78 million since the launch of the Fund, of which EUR 30 million was disbursed in 2022.

**(b) Assessment of adherence to the reporting guidelines**

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

**H. Vulnerability assessment, climate change impacts and adaptation measures**

**1. Technical assessment of the reported information**

104. In its NC8 Spain provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Spain provided a description of climate change vulnerability and impacts and highlighted the adaptation response actions taken and planned at different levels of government. Spain is highly vulnerable to climate change, in particular to significant variations in precipitation, which can lead to drought. A decrease in interannual rainfall has been recorded in the Mediterranean coastal area. Average sea level rise has been observed along the Spanish coast, with the increase being greater along the northern coast. Recent trends indicate that the mean annual temperature in all regions of the country has increased by 1.5 °C over the past 50 years. Among the expected impacts, Spain included a reduction in water resources, an increased risk of desertification, the deterioration of ecosystems, an increase in the occurrence of wildfires, the loss of coastal resources, the loss of cultural heritage, changes in energy production and consumption, changes in human health and changes in society. Spain highlighted the adaptation response actions taken and planned at different levels of the national government, by 15 autonomous communities and by two municipalities (Madrid and Valencia) in accordance with the National Climate Change Adaptation Plan 2021–2030, as well as numerous projects funded under PIMA Adapta.

105. Spain has addressed adaptation matters through the adoption of the National Climate Change Adaptation Plan for 2021–2030, which provided further direction to government agencies on enhancing preparedness for climate change. The Plan defines seven cross-cutting aspects of adaptation to be promoted: territorial vulnerability; social vulnerability; cross-border effects; gender mainstreaming; preventing maladaptation and eliminating perverse incentives; costs and benefits of adaptation and inaction; and orientation towards action.

106. Progress has been made on risk analysis for coastal areas by autonomous communities through PIMA Adapta (coasts), including the development of a regional viewer of impacts in coastal areas and open access data on criteria for and indicators of flood and coastal erosion risk in the face of climate change. Spain reported on the assessment of the climate change impacts, vulnerabilities and adaptation measures for the financial and insurance system, and on the promotion of cooperation frameworks for climate change adaptation among the various stakeholders involved in the financial system. Table 13 summarizes the information on vulnerability and adaptation to climate change presented in the NC8 of Spain.

Table 13

**Summary of information on vulnerability and adaptation to climate change reported by Spain**

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	Vulnerability: Phenological changes; increase in water stress; limitations on water resources available for irrigated crops; risk of crop loss and damage from heat and extreme

Vulnerable area	Examples/comments/adaptation measures reported
Biodiversity and natural ecosystems	<p>events; for livestock farming, increase in costs of water, food and accommodation; and destruction of infrastructure due to extreme events.</p> <p>Adaptation: In 2021, PIMA Adapta launched an ecosystems component, which provides grants for practices demonstrating the benefits of adaptive management in agricultural ecosystems; in 2020, the Union of Small Farmers and Cattle Ranchers developed a manual to guide its members in adapting to climate change; and in 2022, the Spanish Association of Beef Cattle Producers launched a project on beef cattle adaptation to climate change.</p> <p>Vulnerability: Changes in the distribution of terrestrial and aquatic species, loss of biodiversity and resilience of ecosystems, deterioration of ecosystem services, and expansion of invasive species and pest ranges.</p> <p>Adaptation: Habitat restoration, adaptive forest management, research and monitoring of changes in national parks, and environmental education on climate change, which are being carried out by PIMA Adapta (national parks) under the management of the National Parks Autonomous Agency; incorporation of climate change adaptation criteria in the management of protected natural areas; and updating of national species atlases.</p>
Coastal zones	<p>Vulnerability: Sea level rise and increase in the destructive power of coastal storms, resulting in diverse impacts on the coastline, including shoreline retreat and changes in sedimentation and erosion, with negative effects on coastal ecosystems (such as sandbanks, deltas and estuaries) and also on infrastructure.</p> <p>Adaptation: Monitoring of the evolution of the coastline; recovery of coastal ecosystems; awareness-raising at conferences and through publications carried out by PIMA Adapta (coasts) under the management of the Directorate-General for the Coast and the Sea; and risk analysis, development of an online viewer of the sea levels and preparation of adaptation plans for land in the maritime–terrestrial public domain assigned to the autonomous regions carried out by PIMA Adapta (coasts).</p>
Drought and desertification	<p>Vulnerability: Increase in the number of droughts (research indicates that droughts of two years and five years in duration will be more frequent and will have a shorter return period for the same deficit); increase in the risk of soil desertification; and expansion of areas with a semi-arid climate (areas with a semi-arid climate have already increased by about 30,000 km<sup>2</sup>, which is about 6 per cent of the surface of Spain, with the most affected areas being Castilla-La Mancha, the Ebro River valley and the south-east part of the Iberian peninsula).</p> <p>Adaptation: The National Strategy to Combat Desertification 2022 includes numerous proposals for the prevention of desertification and soil conservation, including the development of a national soil inventory, the implementation of a national law on the conservation and sustainable use of soils, and the preparation of a plan to restore land affected by desertification.</p>
Fisheries	<p>Vulnerability: Increase in water temperature, acidification, loss of oxygen, changes in the distribution and abundance of species of marine flora and fauna, phenological changes, possible increase in the number of invasive species, and decrease in fishing and aquaculture potential.</p> <p>Adaptation: Research into the spatial patterns of vulnerability to climate change of fisheries and fishery resources, and their associated ecosystems, in the Spanish Iberian shelf has been carried out; and a report was published in 2021 on the findings of a project investigating the impacts on and vulnerability and adaptation to climate change in the hunting and inland fisheries sector.</p>
Forests	<p>Vulnerability: Changes in the distribution of arboreal and supra-arboreal forests, structural and functional modifications to forests, alterations in certain forest health parameters, increase in vulnerability to extreme weather events and wildfires, and changes in the flow of environmental goods and services provided by forests.</p> <p>Adaptation: Comprehensive assessment reports on models for assessing forest production under different climate change scenarios, risk analysis, and analysis of impacts, vulnerability and adaptation to climate change of the timber industry were produced as part of the project Climate Change Adaptation Techniques in Forest Management and the Timber Industry (conducted by the Forest Stewardship Council Spain) in 2020.</p>
Human health	<p>Vulnerability: Increase in the duration of heatwaves (the least vulnerable areas of the country will be Galicia (autonomous community), the Cantabrian coast and La Rioja (autonomous community), and the most vulnerable will be in eastern Spain (e.g. Murcia</p>

Vulnerable area	Examples/comments/adaptation measures reported
Infrastructure and economy	<p>city), the Balearic Islands and, especially, the Canary Islands; changes in the distribution of disease-transmitting vectors; decrease in water or food quality; and increase in air pollution and aeroallergens.</p> <p>Adaptation: Identification and assessment of new climate risks that may pose a risk to human health; development of the most effective measures to prevent and control the effects of climate change on human health; fulfilment of commitments made under the Paris Agreement and the World Health Organization’s Global Strategy on Health, Environment and Climate Change; and promotion of the ‘Health in All Policies’ approach in key sectors that have an impact on health, which was established in the Health and Environment Strategic National Plan 2021. Spain’s National Plan of Preventive Actions to Combat the Effects of Excessive Temperatures on Health (reviewed annually) for 2022 introduced reference thresholds based on maximum mortality trigger temperatures for each of the 52 provincial capitals in Spain.</p> <p>Vulnerability: Negative effects on cultural heritage and the tourism sector of sea level rise, high temperatures in summer, desertification and extreme weather events; loss of operability of transport infrastructure due to wind and waves; increase in energy consumption associated with cooling; and conflict associated with the use of natural resources and with social inequality, including gender-related inequality.</p> <p>Adaptation: The National Strategy for Green Infrastructure and Ecological Connectivity and Restoration 2021, which proposes measures to improve the resilience of green infrastructure favouring mitigation and adaptation; PIMA Adapta (climate change, launched in 2020), which focuses on promoting and supporting adaptation to climate change in urban and peri-urban areas, enhancing synergies between adaptation and mitigation strategies at the local level; and the NECP, which identifies the potential impacts of climate change on the energy system, analyses the interrelationships between the energy system and the national adaptation plan, and highlights the adaptive value of its decarbonization measures and the changes to the energy mix.</p>
Water resources	<p>Vulnerability: Changes in the natural water cycle, affecting the quantity and quality of available water resources.</p> <p>Adaptation: Implementation of river nature reserve management and adaptation measures; adaptation to extreme hydrometeorological events; assessment of the impacts of climate change on water resources and development of adaptation strategies; development of projects in the public hydraulic domain (carried out by PIMA Adapta (water)), and assessment of the risk associated with climate change and the definition of adaptation measures in the Júcar River basin demarcation project.</p>

107. Spain provided a detailed description of international adaptation activities, including those under RIOCC, the Conference of Ibero-American Water Directors and the Conference of Directors of Ibero-American Meteorological and Hydrological Services. Such activities include developing regional early warning systems for hydrometeorological disasters; assessing the impacts of climate change on the water sector, in terms of both the availability of renewable resources and the state of aquatic ecosystems; identifying adaptation policies and measures, monitoring systems and indicators for adaptation to climate change; developing regulations for hydrometeorological event management and plans for water resources management, and considering climate change therein; strengthening national meteorological and hydrological services, river basin organizations and climate change offices; and enabling access to international financial instruments.

**2. Assessment of adherence to the reporting guidelines**

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

## **I. Research and systematic observation**

### **1. Technical assessment of the reported information**

109. In its NC8 Spain provided information on its general policy and funding relating to research and systematic observation and both domestic and international activities, including contributions to the World Climate Programme, the Global Climate Observing System and the IPCC. Spain also provided information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.

110. Spain has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. In June 2020, the Government approved the Spanish Strategy for Science, Technology and Innovation 2021–2027, a national framework aligned with the science and innovation framework programme of the EU, Horizon Europe (2021–2027).

111. In 2017–2020, the funding of projects by the State Investigation Agency directly or indirectly related to climate change exceeded EUR 136.7 million. For 2023–2027, the European Association for Innovation in Productive and Sustainable Agriculture programmed a total public expenditure of EUR 168.3 million for “cooperation-innovation” interventions, to be implemented at the regional level by 14 autonomous communities and at the supra-autonomous community level by the Ministry of Agriculture, Fisheries and Food of Spain.

112. In terms of activities related to systematic observation, Spain reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Spain also reported on challenges related to the maintenance of a consistent and comprehensive observation system owing to problems with national coordination. In order to improve the national coordination of systematic observation, several initiatives have been undertaken, including the establishment of national networks such as the Spanish Oceanographic Observation Committee and the AEMET OpenData portal. The National Climatological Data Bank under AEMET has more than 450 million records of data and observations for more than 200 years and a complete climatic series from numerous meteorological stations.

113. The Spanish Institute of Oceanography has identified opportunities for and barriers to free and open international exchange of data and information. The Institute collaborates with data integrators such as the International Oceanographic Data and Information Exchange, the Global Sea Level Observing System, the European Sea Level Service, the Permanent Service for Mean Sea Level and Copernicus. Barriers to free and open international exchange of data include restrictive data access policies; independent or insufficiently coordinated data centres, resulting in data providers needing to make a greater effort to supply data; the linking of some programmes to specific projects, resulting in data providers only contributing to those portals in whose development they have participated; the duplication of stations, sometimes with different codes, in the various data portals, with different levels of quality control; and difficulties in accessing metadata that are essential for the correct interpretation of historical series.

114. The NC8 reflects actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Spain provided funding for scientists from developing countries working on global climate change research. Under the Conference of Directors of Ibero-American Meteorological and Hydrological Services, AEMET has organized training courses on the calibration and maintenance of automatic weather stations; satellite applications; communications; forecasting; global numerical weather prediction; and GHG monitoring. AEMET also implements capacity-building activities funded jointly by EUROCLIMA+ and FIIAPP related to the use of CORDEX data for elaborating climate change scenarios.

115. During the review, Spain informed the ERT that AEMET is involved in the Systematic Observations Financing Facility initiative, a United Nations multi-partner trust fund



established by the United Nations Development Programme, the United Nations Environment Programme and the World Meteorological Organization. The main objective of the Fund is to support the least developed countries and small island developing States in developing sustained climate observations and exchanging them internationally following the Global Basic Observing Network regulations. Spain has invested EUR 3 million in the Fund and AEMET has contributed EUR 100,000 to support the secretariat in facilitating the first phase of the Fund during 2023.

## **2. Assessment of adherence to the reporting guidelines**

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

## **J. Education, training and public awareness**

### **1. Technical assessment of the reported information**

117. In its NC8 Spain provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness; primary, secondary and higher education; public information campaigns; training programmes; education materials; resource or information centres; the involvement of the public and non-governmental organizations; and its participation in international activities. Spain's national objectives for education are set out in its Organic Law 3/2020 on Education and its Environmental Education Action Plan for Sustainability 2021–2025. Autonomous communities develop their own climate action plans and environmental education instruments that incorporate commitments to education, training, participation and awareness-raising relating to climate issues.

118. Spain has an extensive network of facilities dedicated to environmental education, which include nature classrooms, farm schools and environmental education centres. A growing number of these facilities focus on energy saving, renewable energy and climate change. Numerous public and private entities have developed environmental education initiatives and programmes, for example the Environmental Education and Environmental Volunteering Programme (Government of the Cantabria autonomous community) and the Forest of the Zaragozanos programme, which have developed web portals with information on the subject.

119. In recent years, the number of web pages and the amount of information accessible online related to climate change in Spain has grown exponentially, complemented by numerous publications and public awareness-raising campaigns. Examples of successful practices and innovative approaches to awareness-raising include the voluntary carbon footprint registry, which encourages the estimation and reduction of GHG emissions from Spanish organizations and incentivizes society to move towards a low-carbon economy.

120. In the area of public participation, in response to the mandate in article 39 of Law 7/2021 on Climate Change and Energy Transition, the first Spanish Citizens' Assembly for Climate was established and began its work in December 2021 in a virtual format with the participation of 100 randomly selected people reflecting the main social features and demography of the Spanish population. In May 2022, the Assembly approved its final report, which contains 172 recommendations on moving towards "a fairer Spain in the face of climate change". The report was presented to the President of the Government.

121. Noteworthy examples of Spain's participation in international activities include its organization in 2019 of the United Nations Climate Change Conference in Madrid, including the COP 25 Green Zone, and the joint EUROCLIMA+ and FIIAPP programme for strengthening national climate policy, governance and institutional capacities in the area of Action for Climate Empowerment in Latin America.

## 2. Assessment of adherence to the reporting guidelines

122. The ERT assessed the information reported in the NC8 of Spain and identified an issue relating to completeness, and thus adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table I.4.

## III. Conclusions and recommendations

123. The ERT conducted a technical review of the information reported in the NC8 of Spain, including its corrigendum, in accordance with the UNFCCC reporting guidelines on NCs. The ERT concluded that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC8 provides an overview of the national climate policy of Spain.

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

125. The ERT conducted a technical review of the information reported in the BR5 and BR5 CTF tables of Spain in accordance with the UNFCCC reporting guidelines on BRs. The ERT concluded that the reported information mostly adheres to the UNFCCC reporting guidelines on BRs and that the BR5 and its CTF tables provide an overview of emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; the progress of Spain towards achieving its target; and the Party's provision of support to developing country Parties.

126. In its NC8 Spain reported on its key national circumstances related to GHG emissions and removals, including information on government structure, economic developments, geography, climate, energy, transport, industry, the waste sector, the buildings sector and urban infrastructure, agriculture, forestry and tourism. Since the submission of its NC7, Spain has made substantial institutional changes relevant to climate change. Under Law 7/2021 on Climate Change and Energy Transition, MITECO was established. MITECO includes the main administrative bodies implementing climate action, namely the Secretariat for Energy, the Secretariat for the Environment, the Office of the Secretary-General for the Demographic Challenge and the Office of the Under-Secretary-General for the Ecological Transition. The law also included the development of the Spanish International Strategy for Climate Finance.

127. Spain's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 5.3 per cent below its 1990 level in 2020. Emissions peaked in 2007 and decreased thereafter. In 2008, emissions started to decrease, at first mostly owing to the global financial crisis of 2007–2008 but later as a result of PaMs implemented by Spain. In 2013–2019 Spain experienced a period of economic recovery and GDP growth. The associated expected growth in emissions has been counterbalanced by the impacts of PaMs, resulting in the stabilization of emission levels. In 2020, Spain's emissions significantly decreased; this was mostly attributable to the impact of the pandemic on economic growth and transport.

128. As reported in the BR5, under the Convention Spain committed to contributing to the achievement of the joint EU quantified economy-wide target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub>, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included. Under the ESD Spain has a target of reducing its emissions by 10 per cent below the 2005 level by 2020.

129. The EU has a joint 2030 emission reduction target of 55 per cent below the 1990 level. This will be primarily implemented through the EU ETS and ESR, which have targets to reduce emissions by 2030 by 62 and 40 per cent respectively compared with the 2005 level. Under the ESR, Spain has a national target of reducing emissions from covered sectors to 26 per cent below the 2005 level by 2030 under current legislation. As part of the package of legislative proposals adopted by the European Commission in 2021 to deliver the European Green Deal, a proposal for a regulation updating member States' emission reduction targets under the ESR in line with the revised 2030 climate target is under consideration. The proposal updates Spain's target of reducing emissions from covered sectors under the ESR to 37.7 per cent below the 2005 level by 2030.

130. The ERT noted that the total GHG emissions of the EU excluding LULUCF do not exceed the emission level corresponding to the target in 2020, and thus that the EU has achieved its joint target. The ERT therefore concluded that Spain has met its 2020 commitment under the Convention through its contribution to achieving the joint target of the EU. See the report on the review of the BR5 of the EU for further details. The ERT noted that the Party met its 2020 ESD target because its ESD emissions in 2020 do not exceed its AEA for 2020.

131. The GHG emission projections provided by Spain in its NC8 and BR5 correspond to the WEM and WAM scenarios. Under the WEM scenario, emissions in 2030 are projected to be 3.0 per cent above the 1990 level and 8.7 per cent above the 2020 level. Under the WAM scenario, emissions in 2030 are projected to be 22.9 per cent below the 1990 level and 18.6 per cent below the 2020 level.

132. Spain's main policy framework relating to energy and climate change comprises, at the EU level, the EU 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD; the ESR (2018), which is the successor to the ESD; the 2021 European Climate Law, which forms part of the European Green Deal; and the Fit for 55 package of legislative proposals, which aims to introduce a series of policies intended to help achieve the new 2030 target. At the national level, the main policy frameworks are provided by the NECP, the Long-Term Decarbonization Strategy and Law 7/2021 on Climate Change and Energy Transition. Key legislation supporting Spain's climate change goals includes legislation pertaining to renewable energy and energy efficiency. The Party described the mitigation actions that it has implemented to help it achieve its 2020 and longer-term targets, which include the NECP, the voluntary carbon footprint registry, carbon offsetting, CO<sub>2</sub> absorption projects, the Climate Projects initiative, Royal Decree 1085/2015 on the promotion of biofuels and the national tax on fluorinated gases. These cross-cutting and sectoral PaMs have the most significant mitigation impact and, together, have positioned Spain to overachieve its 2020 ESD target and lay the foundation for reaching its 2030 ESR target.

133. Spain continued to provide climate financing to developing countries in line with Law 7/2021 on Climate Change and Energy Transition. It reduced the level of its financial support (by 1.2 per cent) in 2019–2020 compared with that reported in the BR4 (2017–2018); its public financial support in 2019–2020 totalled USD 1,407.7 million. For 2019–2020, Spain provided more support for mitigation compared with adaptation. The biggest share of support went to projects and programmes on mitigation in the energy, transport and agriculture sectors and to cross-cutting projects that contribute to both mitigation and adaptation.

134. Spain continued to provide support for technology development and transfer and capacity-building. Priority for technological support was given to projects and programmes in the energy, agriculture and water sectors, covering mitigation and adaptation, in recipient countries. The focus was on mitigation; however, Spain has indicated that plans are under way to shift more of its efforts to adaptation activities and initiatives. Priority for capacity-building support was given to projects and programmes in the agriculture, forestry, water and cross-cutting sectors, covering mitigation and adaptation, in recipient countries.

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

impacts, the following are of particular concern: a reduction in water resources, an increased risk of desertification, the deterioration of ecosystems, an increase in the occurrence of wildfires, the loss of coastal resources, the loss of cultural heritage, changes in energy production and consumption, changes in human health and changes in society. Spain has given impetus to addressing adaptation matters through its adoption of the National Climate Change Adaptation Plan for 2021–2030, which provided further direction to government agencies on enhancing preparedness for climate change. Spain is an active contributor to international adaptation activities, including those under RIOCC, the Conference of Ibero-American Water Directors and the Conference of Directors of Ibero-American Meteorological and Hydrological Services.

136. In its NC8 Spain provided information on its activities relating to research and systematic observation. In order to improve national coordination of systematic observation, several initiatives have been developed, including the establishment of national networks such as the Spanish Oceanographic Observation Committee and the AEMET OpenData portal. The NC8 also reflects actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Spain provided funding for scientists from developing countries working on global climate change research. Under the Conference of Directors of Ibero-American Meteorological and Hydrological Services, AEMET has organized training courses on the calibration and maintenance of automatic weather stations; satellite applications; communications; forecasting; global numerical weather prediction; and GHG monitoring. AEMET also implements capacity-building activities funded jointly by EUROCLIMA+ and FIIAPP related to the use of CORDEX data for elaborating climate change scenarios.

137. In its NC8 Spain provided information on its actions relating to education, training and public awareness. Spain's national objectives for education are set out in its Organic Law 3/2020 on Education and its Environmental Education Action Plan for Sustainability 2021–2025. Examples of successful practices and innovative approaches to awareness-raising include the voluntary carbon footprint registry, carbon offsetting and sequestration projects, #Biodirect, climate shelters and the social media community #PorElClima. In the area of public participation, the first Spanish Citizens' Assembly for Climate began its work in 2021, and in 2022 approved its final report, which contains 172 recommendations on moving towards "a fairer Spain in the face of climate change".

138. In the course of the review, the ERT formulated the following recommendations for Spain to improve its adherence to the UNFCCC reporting guidelines on NCs in its next NC, namely to improve the completeness of its reporting by:

- (a) Providing information on any changes in the national inventory arrangements since its last NC or BR or reporting that there have been no changes (see issue 1 in table I.1);
- (b) Providing information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals (see issue 1 in table I.2);
- (c) Providing information on the estimated and expected total effect of implemented and adopted PaMs (see issue 1 in table I.3).

139. In the course of the review of Spain's BR5, the ERT formulated the following recommendations relating to adherence to the UNFCCC reporting guidelines on BRs: issues with the completeness of its reporting relating to providing information on any changes in the national inventory arrangements since its last BR or reporting that there have been no changes (see issue 1 in table II.1).

## Annex I

### Assessment of adherence to the reporting guidelines for the eighth national communication of Spain

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

Table I.1

#### Findings on greenhouse gas inventory information from the review of the eighth national communication of Spain

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 8  Issue type: completeness  Assessment: recommendation	Spain provided in its NC8 summary information on national inventory arrangements; however, it did not report on changes in the national inventory arrangements since the BR4.  During the review, the Party explained the changes – in particular, that Royal Decree 818/2018, which revises and updates in detail the regulation and operation of SEI, was passed into law in July 2018. Among the major new arrangements introduced under the Royal Decree is the procedure for approval of the national GHG inventory by resolution of the Directorate-General for Biodiversity and Environmental Quality under MITECO. The Royal Decree also sets forth the obligation for data providers to provide data and information to SEI for preparation of the national emissions inventory.  The ERT recommends that Spain provide in its next NC information on any changes in the national inventory arrangements since its last NC or BR or report that there have been no changes.

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

Table I.2

#### Findings on policies and measures from the review of the eighth national communication of Spain

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 22  Issue type: completeness  Assessment: recommendation	Spain did not report in its NC8 on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.  During the review, the Party explained that the projections of GHG emissions and removals up until 2040 are based on those in the 2021 edition of the atmospheric emissions projections report published by MITECO, which align with Spain’s Long-Term Decarbonization Strategy.  The ERT reiterates the recommendation from the previous review report for Spain to provide in its next NC explicit information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals.

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

Table I.3

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

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 36	Spain did not report in its NC8 information on the total effect of implemented and adopted PaMs.  During the review, the Party explained that, while this information was not reported in its NC8, a new law – Law 7/2021 on Climate Change and Energy Transition – that will

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
	Issue type: completeness Assessment: recommendation	<p>enable future reporting on the effects of PaMs, was promulgated on 20 May 2021. This law was noted in the corrigendum. The law will be implemented through a Royal Decree establishing the governance mechanism for energy, climate change and atmospheric pollution. The draft Royal Decree covers “Preparation and approval of the national inventory and the projections of emissions and removals of greenhouse gases and other atmospheric pollutants” (article 4) and “Identification, monitoring and notification of policies and measures regarding the reduction of emissions of greenhouse gases and other atmospheric pollutants and promotion of carbon sinks” (article 5), which describe the information flows and set the deadlines to be met by the three bodies in charge of preparing energy scenarios, projections and mitigation PaMs.</p> <p>The ERT reiterates the recommendation from the previous review report for Spain to provide in its next NC information on the estimated and expected total effect of implemented and adopted PaMs.</p>
2	Reporting requirement specified in paragraph 36 Issue type: transparency Assessment: encouragement	<p>Spain did not report in its NC8 correct and consistent information on the total effect of planned PaMs. For example, the impact of the PaMs in the energy sector is reported as an increase rather than a decrease in emissions, and the total effect does not match the difference between the WEM and WAM scenarios.</p> <p>During the review, the Party, after explaining that the increase in emissions from energy sector PaMs was a reporting error that arose during transcription, provided the ERT with a file containing the correct values. Spain also explained that the total effect reported did not match the difference between the WEM and WAM scenarios because emission reductions from ‘Other non-specific measures’ or from the LULUCF sector were not included in the total effect of PaMs.</p> <p>The ERT encourages Spain to report in its next NC correct and consistent values for the estimated and expected total effect of planned PaMs.</p>
3	Reporting requirement specified in paragraph 38 Issue type: transparency Assessment: encouragement	<p>Spain did not provide in its NC8 clear information regarding the year from which policies were assumed to have been implemented when calculating the projected emission estimates.</p> <p>During the review, the Party explained that the cut-off date for PaMs to be included in the WEM scenario was 18 February 2021.</p> <p>The ERT encourages Spain to improve transparency by including in its next NC a more detailed definition of the WEM scenario, including clear information regarding the year from which policies were assumed to have been implemented or not implemented when calculating the projected emission estimates.</p>
4	Reporting requirement specified in paragraph 40 Issue type: completeness Assessment: encouragement	<p>Spain did not report in its NC8 detailed information on the models and approaches, the types and main features of models and tools, or any associated references used for GHG emission projections in some non-energy sectors, such as agriculture, waste and IPPU. The Party also did not explain in its NC8 how its models and approaches account for overlaps and synergies between different PaMs used in its sectoral projections.</p> <p>During the review, the Party explained that sectors not included in the energy system modelling for the NECP (performed with the TIMES-Sinergia model) were projected, on a sector-by-sector basis, according to national forecasts for the main activity variables representative of each sector and by applying calculation methodologies consistent with those used for the national emissions inventory (from the <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>). Furthermore, Spain provided detailed information on the models and approaches, and the types and main features of models and tools, used for GHG emission projections in the agriculture, waste and IPPU sectors.</p> <p>The ERT reiterates the encouragements from the previous review report for Spain to (1) enhance the completeness of its reporting by providing in its next NC information on the models and approaches used to project emissions for different sectors (including the non-energy sectors, such as agriculture, waste and IPPU), information on the type and main features of these models and tools, and any associated references to methodologies and models; and (2) explain in its next NC how it accounts for overlaps and synergies between different PaMs in the models it uses for performing GHG emission projections.</p>

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

Table I.4

**Findings on education, training and public awareness from the review of the eighth national communication of Spain**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 68 Issue type: completeness Assessment: encouragement	Spain did not report in the NC8 the extent of public participation in the preparation or domestic review of the NC.  During the review, the Party explained that preparation of the NC8 is a very collaborative process even though there is no public consultation stage. Spain has a number of mechanisms in place that allow for public participation in the design and implementation of PaMs related to climate change.  The ERT encourages Spain to improve the completeness of its reporting by providing in its next NC information on the extent of public participation in the preparation or domestic review of the NC, for example by including the information provided during the review.

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

## Annex II

### Assessment of adherence to the reporting guidelines for the fifth biennial report of Spain

The BR5 of Spain is the final BR under the measurement, reporting and verification system established under the Convention.<sup>1</sup> Nevertheless, ERTs continue to provide recommendations and encouragements to Parties on completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. Parties may find these recommendations and encouragements relevant, as appropriate, when preparing their initial biennial transparency report under the enhanced transparency framework of the Paris Agreement. Tables II.1–II.2 summarize the ERT assessment of adherence to the UNFCCC reporting guidelines on BRs for Spain’s BR5.

Table II.1

#### Findings on greenhouse gas emissions and trends from the review of the fifth biennial report of Spain

No.	Reporting requirement and issue type	Description of the finding
1	Reporting requirement specified in paragraph 3  Issue type: completeness Assessment: recommendation	Spain provided in its BR5 summary information on national inventory arrangements; however, it did not report on changes in the national inventory arrangements since the BR4.  During the review, the Party explained the changes – in particular, that Royal Decree 818/2018, which revises and updates in detail the regulation and operation of SEI, was passed into law in July 2018. Among the major new arrangements introduced under the Royal Decree is the procedure for approval of the national GHG inventory by resolution of the Directorate-General for Biodiversity and Environmental Quality under MITECO. The Royal Decree also sets forth the obligation for data providers to provide data and information to SEI for preparation of the national emissions inventory.  The ERT recommends that Spain provide information on any changes in the national inventory arrangements since its last BR or report that there have been no changes.

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

Table II.2

#### Findings on projections reported in the fifth biennial report of Spain

No.	Reporting requirement and issue type	Description of the finding
1	Reporting requirement specified in paragraph 40  Issue type: completeness Assessment: encouragement	Spain did not report in its BR5 detailed information on the models and approaches, the types and main features of models and tools, or any associated references used for GHG emission projections in the non-energy sectors, such as agriculture, waste and IPPU. The Party also did not explain in its BR5 how its models and approaches account for overlaps and synergies between different PaMs used in its sectoral projections.  During the review, the Party explained that sectors not included in the energy system modelling for the NECP (performed with the TIMES-Sinergia model) were projected, on a sector-by-sector basis, according to national forecasts for the main activity variables representative of each sector and by applying calculation methodologies consistent with those used for the national emissions inventory (from the <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i> ). Furthermore, Spain provided detailed information on the models and approaches, and the types and main features of models and tools, used for GHG emission projections in the agriculture, waste and IPPU sectors.

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



<i>No.</i>	<i>Reporting requirement and issue type</i>	<i>Description of the finding</i>
		<p>The ERT reiterates the encouragements from the previous review report for Spain to (1) enhance the completeness of its reporting by providing information on the models and approaches used to project emissions for different sectors (including the non-energy sectors, such as agriculture, waste and IPPU), information on the type and main features of these models and tools, and any associated references to methodologies and models; and (2) explain how it accounts for overlaps and synergies between different PaMs in the models it uses for performing GHG emission projections.</p>

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

## Annex III

### Documents and information used during the review

#### A. Reference documents

2021 GHG inventory submission of Spain. Available at <https://unfccc.int/ghg-inventories-annex-i-parties/2021>.

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## B. Additional information provided by the Party

Responses to questions during the review were received from Susana Castro-Acuña Baixauli, Maria Navarro González-Valerio, Maria Ascension Ramírez Sobrino, Sara Rodríguez Rego and Teresa Solana Méndez de Vigo (MITECO), including additional material. The following references were provided by Spain and may not conform to UNFCCC editorial style as some have been reproduced as received:

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