

Final Review Report

2020 Comprehensive Review of National Greenhouse Gas Inventory Data

pursuant to Article 4(3) of Regulation (EU) No 2018/842 and to
Article 3 of Decision No 406/2009/EC

Poland

30 August 2020



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Conclusions from the 2020 comprehensive review

This Final Review Report presents the findings from the 2020 review of the greenhouse gas (GHG) emission inventory of Poland, pursuant to:

- Article 4(3) of Regulation (EU) No 2018/842 (the 'Effort Sharing Regulation', ESR), for the purpose of setting out Poland's annual emission allocations (AEAs) for the years from 2021 to 2030 in terms of tonnes of CO₂ equivalent, and
- Article 3 of Decision No 406/2009/EC (the 'Effort Sharing Decision', ESD), for the purpose of verifying Poland's GHG emissions and achievement of its GHG emission limitation target in the year 2018

The review was carried out as a comprehensive review in line with Article 19(1) of Regulation (EU) No 525/2013 (the 'Monitoring Mechanism Regulation', MMR). The global warming potentials applied are those from the IPCC Assessment Report 4.

The reviewers carried out checks to verify the transparency, accuracy, consistency, comparability and completeness of the national GHG inventory for the years 2005, 2016, 2017 and 2018 submitted in 2020 by Poland pursuant to Article 7 of the MMR.

The review consisted of two steps. The initial checks in step 1 were performed by the EU inventory team (European Environment Agency (EEA), European Topic Centre on Climate Change Mitigation and Energy (ETC/CME), Joint Research Centre (JRC) and Eurostat). Step 2 was performed by a Technical Expert Review Team (TERT).

More information on the Effort Sharing legislation and the procedures for the 2020 comprehensive review is presented in the annexes of this review report.

Poland did not provide a resubmission to the Commission.

Step 1 and 2 conclusions

1. The reviewers raised 44 issues with Poland during the first and the second step of the 2020 comprehensive ESD review (see Table 1). The TERT provided recommendations for 5 of these issues. Other issues raised during the comprehensive review were clarified and are non-issues for the ESD review 2020.
2. The TERT identified cases where inventory data were prepared in a manner which is inconsistent with UNFCCC guidance documentation or Union rules. In particular, the TERT identified a number of under- or over-estimates exceeding the threshold of significance pursuant to Article 31 of Commission Implementing Regulation (EU) No 749/2014.
3. Poland provided 2 revised estimates that were accepted by the TERT. Table 2 and Table 3 below summarise the revised estimates and further information is provided in the respective chapter of this report.
4. The TERT did not deem necessary any technical corrections in the meaning of Article 19(3)(c) of Regulation (EU) No 525/2013.
5. The TERT identified non-binding recommendations in order to improve the national inventory data of Poland (see Table 6).
6. The TERT considers that it received a response from Poland that was sufficient in order to undertake the comprehensive review appropriately.

Table 1: Overview of issues raised with Poland during the first and the second step

	Issues raised step 1 ¹	Issues raised step 2	Recommendations	Revised estimates ²	Technical corrections ³
Total	24	20	5	2	-
Energy	5	8	2	-	-
IPPU	13	2	-	-	-
Agriculture	3	5	2	1	-
Waste	3	5	1	1	-
Cross-cutting	-	-	-	-	-

¹ Excluding findings related to Land Use, Land Use Change and Forestry (LULUCF) and Kyoto Protocol (KP) LULUCF.

² Revised estimates: changes in inventory estimates triggered by the review, which were provided by the country and accepted by the TERT.

³ Technical corrections: changes in inventory estimates triggered by the review and provided by the TERT.

National totals for the purpose of Article 3 of Decision No 406/2009/EC (ESD)

Table 2: National totals for the purpose of Article 3 of Decision No 406/2009/EC

Emission source category	Reference	Emission estimates (kt CO ₂ equivalent) ¹ 2018
Total greenhouse gas emissions, including indirect CO ₂ , without Land Use, Land Use Change and Forestry, without international aviation, as reported by Poland pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission	POL_2020_1_14042020	412 856.373
Difference between original estimates and revised estimates provided by Poland and accepted by the TERT²		
3 Agriculture, N ₂ O	PL-3B-2020-0003	612.306
5A Solid waste disposal, CH ₄	PL-5A-2020-0002	-326.781
Total greenhouse gas emissions including revised estimates		413 141.899
CO ₂ emissions from 1A3a Domestic Aviation ³	POL_2020_1_14042020	133.988
NF ₃ emissions ³		-

¹ The tables presented in this report show numbers rounded to three decimal places, although most numbers are available with greater precision. For all calculations (in particular of total GHG emissions and total ESD emissions), all available decimal places were used. Therefore, the totals shown may slightly differ from calculation results where only three decimals are taken into account.

² A positive difference indicates an increase compared to reported emissions. A negative difference indicates a decrease compared to reported emissions.

³ Included in the totals. NF₃ was included in the comprehensive review (see Table A-1) for the purpose of the ESR, but has to be deducted for the purpose of ESD.

National totals for the purpose of Article 4(3) of Regulation (EU) No 2018/842 (ESR)

Table 3: National totals for the purpose of Article 4(3) of Regulation (EU) No 2018/842

Emission source category	Reference	Emission estimates (kt CO ₂ equivalent) ¹			
		2005	2016	2017	2018
Total greenhouse gas emissions, including indirect CO ₂ , without Land Use, Land Use Change and Forestry, without international aviation, as reported by Poland pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission	POL_2020_1_14042 020	404 459.533	400 268.492	414 679.371	412 856.373
Difference between original estimates and revised estimates provided by Poland and accepted by the TERT²					
3 Agriculture, N ₂ O	PL-3B-2020-0003	787.517	551.728	588.692	612.306
5A Solid Waste Disposal, CH ₄	PL-5A-2020-0002	-130.400	-484.554	-403.915	-326.781
Total greenhouse gas emissions including revised estimates		405 116.650	400 335.666	414 864.148	413 141.899
CO ₂ emissions from 1A3a Domestic Aviation ³	POL_2020_1_14042 020	78.861	116.863	133.625	133.988

¹ The tables presented in this report show numbers rounded to three decimal places, although most numbers are available with greater precision. For all calculations (in particular of total GHG emissions and total ESR emissions), all available decimal places were used. Therefore, the totals shown may slightly differ from calculation results where only three decimals are taken into account.

² A positive difference indicates an increase compared to reported emissions. A negative difference indicates a decrease compared to reported emissions.

³ Included in the totals

Statement from Poland on the conclusions presented by the TERT

Poland agrees with the aggregated GHG emission inventory estimates presented in Table 2 and Table 3.

Greenhouse gas emissions covered by Decision 406/2009/EC (ESD)

Table 4: Greenhouse gas emissions for the purpose of Article 3 of Decision No 406/2009/EC

Emission source category	Reference	Emission estimates (kt CO ₂ equivalent) ¹ 2018
Total greenhouse gas emissions including any accepted revised estimates provided by Poland and any technical corrections deemed necessary by the TERT	See Table 2 above	413 141.899
Total verified emissions from stationary installations under Directive 2003/87/EC	Extracted by the European Commission from EUTL on 9 March 2020 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015) ²	199 974.539
CO ₂ emissions from 1A3a Domestic Aviation	See Table 2 above	133.988
NF ₃ emissions	See Table 2 above	-
Total ESD emissions		213 033.372

¹ The tables presented in this report show numbers rounded to three decimal places, although most numbers are available with greater precision. For all calculations (in particular of total GHG emissions and total ESD emissions), all available decimal places were used. Therefore, the totals shown may slightly differ from calculation results where only three decimals are taken into account.

² The emissions of ETS stationary installations were independently verified and recorded in the EU Transaction Log (EUTL). These emissions do not derive from the national greenhouse gas emission inventory data and therefore the TERT was not tasked to review them.

Greenhouse gas emissions covered by Regulation (EU) No 2018/842 (ESR)

Table 5: Greenhouse gas emissions for the purpose of Article 4(3) of Regulation (EU) No 2018/842 (ESR)

Emission source category	Reference	Emission estimates (kt CO ₂ equivalent) ¹			
		2005 ³	2016	2017	2018
Total greenhouse gas emissions including any accepted revised estimates provided by Poland and any technical corrections deemed necessary by the TERT	See Table 3 above	405 116.650	400 335.666	414 864.148	413 141.899
Total verified emissions from stationary installations under Directive 2003/87/EC	Extracted by the European Commission from EUTL on 9 March 2020 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015) ²	203 149.576	198 051.726	202 166.696	199 974.539
CO ₂ emissions from 1A3a Domestic Aviation	See Table 3 above	78.861	116.863	133.625	133.988
Total ESR emissions		-	202 167.077	212 563.826	213 033.372

¹ The tables presented in this report show numbers rounded to three decimal places, although most numbers are available with greater precision. For all calculations (in particular of total GHG emissions and total ESR emissions), all available decimal places were used. Therefore, the totals shown may slightly differ from calculation results where only three decimals are taken into account.

² The emissions of ETS stationary installations were independently verified and recorded in the EU Transaction Log (EUTL). These emissions do not derive from the national greenhouse gas emission inventory data and therefore the TERT was not tasked to review them.

³ Due to changes in ETS scope and country coverage between 2005 and 2013, 'Total ESR emissions' cannot be calculated for 2005 by deducting 'Total verified emissions from stationary installations under Directive 2003/87/EC' and 'CO₂ emissions from 1A3a Domestic Aviation' from 'Total GHG emissions including any revised estimates and any technical corrections'.

Recommendations from the TERT, considering revised estimates and technical corrections deemed necessary by the TERT

Table 6: Recommendations from TERT (RE = Revised estimate; TC = Technical correction)

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2020
PL-3B-2020-0003	Yes	3 Agriculture, N ₂ O, 1990-2018	For category 3B Manure Management, and gases N ₂ O for year 2005, 2016, 2017 and 2018, the TERT noted that the nitrogen excretion rate for dairy cattle in Poland was very low to what would be expected. In response to a question raised during the review, Poland explained that Nitrogen excretion values were under review and provided revised estimate for all years and stated that it will be included in the next submission. As this issue has impact on emissions from manure management and agricultural soils both categories were revised. The TERT agreed with the revised estimate provided by Poland. The TERT recommends that Poland include the revised estimate in its next submission.	RE
PL-5A-2020-0002	Yes	5A Solid Waste Disposal, CH ₄ , 1990-2018	For 5A Solid Waste Disposal, CH ₄ and years 2000-2018, the TERT noted that the amount of CH ₄ recovered based on the amount of landfill gas recovered (as presented in NIR Table 7.11) has been calculated also taking into account the fraction of CH ₄ in landfill gas, which is not necessary. In response to a question raised during the review, Poland agreed and provided a revised estimate for all years, including 2005, 2016, 2017 and 2018. The TERT agreed with the revised estimate provided by Poland. The TERT recommends that Poland includes the revised estimate in its next submission.	RE
PL-1A3a-2020-0001	No	1A3a Domestic Aviation, CH ₄ , CO ₂ , N ₂ O, 2018	For 1A3a Military Aviation, for all gases and fuels the TERT noted that based on information included in the CRF and NIR it was not clear where military aviation emissions were reported. The TERT notes that this issue does not relate to an over- or under- estimate of emissions. In response to a question raised during the review, Poland explained all military activities are incorporated in country energy balance. The TERT recommends that Poland includes in the next NIR submission clear description on handling of military fuel use.	No

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2020
PL-1B-2020-0002	Yes	1B Fugitive Emissions from Fuels, CO ₂ , 1990-2018	For CO ₂ emissions from subcategory 1B2d Fugitive Emissions from Fuels: Other the TERT noted that Poland does not provide information on this key category in its NIR. The TERT notes that this issue does not relate to an over- or under- estimate of emissions. In response to a question raised during the review, Poland explained that in sub-category 1B2d, CO ₂ emissions related to process emissions of refineries and flaring (hydrogen production, regeneration of catalysts, discharges of hydrocarbons, refining of mineral oils, tail gas flaring, airdrop gas flaring, etc.). These emissions are based on ETS reporting and are based on a country specific methodology (Tier 2). The TERT recommends that Poland provides a description including methodology, activity data and emission factors from source category 1B2d in its future NIR.	No
PL-3B-2020-0004	Yes	3B Manure Management, N ₂ O, 1990-2018	For category 3B Manure Management and 3D Agricultural Soils and N ₂ O for all years, the TERT noted that the national amount of volatilized nitrogen (mainly NH ₃) reported in the submission to UNFCCC and to CLRTAP differs substantially. In response to a question raised during the review, Poland explained that they are following the 2016 EMEP/EEA Guidebook for the submission of NH ₃ emissions under the Convention on Long-Range Transboundary Air Pollution and the National Emission Ceilings Directive and the IPCC guidelines under the MMR and UNFCCC and "Indeed the indirect emissions of nitrogen compounds (NH ₃ and NO _x) are not the same as reported under CLRTAP in relative sector what is triggered by lack of consistency in methodologies presented in 2006 IPCC Guidelines and the 2016 EMEP/EEA Guidebook. Since both methodologies are going to be consistent in 2019 EMEP/EEA Guidebook and the 2019 Refinement of the 2006 IPCC Guidelines – reporting under those two conventions using the newest guidelines should ensure full consistency (subject raised at the last TFEIP at Agricultural session). At the time being, mandatory 2006 IPCC Guidelines methodology is applied under UNFCCC". The TERT acknowledges this difference but considers that the amount of volatilized nitrogen should be the same for reporting under the NECD and the MMR and that Poland should choose the most appropriate methodology. Furthermore, the TERT does not agree with the statement that the 2006 IPCC Guidelines are mandatory, as it gives full possibilities for a country to choose the best estimation methodology as long as it is consistent with the principles in the IPCC Guidelines. The TERT recommends that Poland harmonises the methodology used for estimation of volatilized nitrogen in the submission under the MMR and the NECD.	No

Revised estimates provided by Poland and accepted by the TERT

1

ESD Review Tool ID:	PL-3B-2020-0003							
ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2020/PL-3B-2020-0003#tab-qa							
Country:	Poland							
Sector:	3 Agriculture							
Gases:	N ₂ O							
Fuel	N/A							
Completed by Sector Expert:	Steen Gyldenkaerne							
Reviewed by Counterpart:	Bernard Hyde							
Reviewed by Lead Reviewer:	Ole-Kenneth Nielsen							
Reviewed by Quality Controller:	Bernd Guegle							
The underlying problem:	The TERT noted low nitrogen excretion rates for several animal categories compared to default values and other countries.							
Summarise the methodology used:	In response to questions raised by the TERT Poland submitted revised estimates based on Tier 2 methodology. As this issue has impact on emissions from manure management and agricultural soils both categories were revised.							

2

	Original estimate (Gg CO ₂ e)								Notes
Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Mixed GHG	
2005			15 685.673						3B Manure management and 3D Agricultural soils
2016			16 578.357						3B Manure management and 3D Agricultural soils
2017			17 557.551						3B Manure management and 3D Agricultural soils
2018			17 577.021						3B Manure management and 3D Agricultural soils
	Revised Estimate received from country (Gg CO ₂ e)								Notes
Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Mixed GHG	
2005			16 473.190						
2016			17 130.085						
2017			18 146.242						
2018			18 189.327						
	Difference between RE and OE (Gg CO ₂ e)								
Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Mixed GHG	
2005			787.517						
2016			551.728						
2017			588.692						
2018			612.306						

1	ESD Review Tool ID:	PL-5A-2020-0002								
	ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2020/PL-5A-2020-0002#tab-qa								
	Country:	Poland								
	Sector:	5A Solid Waste Disposal								
	Gases:	CH ₄								
	Fuel	N/A								
	Completed by Sector Expert:	Elisabeth Kampel								
	Reviewed by Counterpart:	Hans Oonk								
Reviewed by Lead Reviewer:	Ole-Kenneth Nielsen									
Reviewed by Quality Controller:	Bernd Guegle									
The underlying problem:		It was noted that the CH ₄ recovered was calculated by also taking into account the fraction of CH ₄ in the landfill gas, which is not necessary. The calculation requires only to divide by the NCV for methane.								
Summarise the methodology used:		The amount of landfilled gas (TJ) as provided in the NIR (Table 7.11), was divided by the NCV for methane (50.4 MJ/kg), which results in the amount of methane recovered. To estimate the resulting CH ₄ emissions, the oxidation factor of 0.1 has been considered.								
2	Original estimate (Gg CO ₂ e)									Notes
	Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Mixed GHG	
	2005		4 012.110							5A1a Managed waste disposal sites (aerobic)
	2016		5 168.378							5A1a Managed waste disposal sites (aerobic)
	2017		5 118.121							5A1a Managed waste disposal sites (aerobic)
	2018		5 152.966							5A1a Managed waste disposal sites (aerobic)
	Revised Estimate received from country (Gg CO ₂ e)									Notes
	Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Mixed GHG	
	2005		3 881.710							
	2016		4 683.825							
	2017		4 714.207							
	2018		4 826.186							
	Difference between RE and OE (Gg CO ₂ e)									
	Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Mixed GHG	
	2005		-130.400							
	2016		-484.554							
	2017		-403.915							
	2018		-326.781							

Annex I: Legal background and procedures of the 2020 comprehensive review

The Effort Sharing Decision No 406/2009/EC (ESD) sets national emission limits for greenhouse gas (GHG) emissions in the sectors outside the EU's Emission Trading System (ETS) for the period 2013-2020. The ESD and the Monitoring Mechanism Regulation (EU) 525/2013 (MMR) lay down annual reporting obligations, compliance checks and a Union review process to ensure that the compliance with annual GHG emission limits is assessed in a credible, consistent, transparent and timely manner.

The requirements for the Union review of the national inventory data submitted by countries are set out in Article 19 of the MMR. The details concerning the review process, such as the timing and steps of conducting the annual and comprehensive reviews are set out in Chapter III and Annex XVI of the Commission Implementing Regulation (EU) No 749/2014.

The Effort Sharing Regulation (EU) 2018/842 (ESR) sets national emission limits for greenhouse gas emissions in the sectors outside the EU's ETS for the period 2021-2030. In Article 4(3) of the ESR, the Commission is required to adopt implementing acts setting out annual emission allocations (AEAs) for the period 2021-2030 in terms of CO₂ equivalents, for which it shall carry out a comprehensive review.

The 2020 Union review was thus held as a comprehensive review in line with MMR Article 19 (1) in concert with the Union review required by the ESR.

Objectives

The objectives of the comprehensive review of countries' GHG emission inventories in 2020 are:

- a) to support the European Commission by ensuring it has accurate, reliable and verified information on annual GHG emissions for
 - determining compliance with ESD targets for the years 2018 in a credible, consistent, transparent and timely manner, and for
 - setting out countries' annual emission allocations (AEAs) for the years from 2021 to 2030 in terms of tonnes of CO₂ equivalent, according to Article 4(3) of the ESR.
- b) to assist countries in improving the quality of their GHG inventories.

Procedures

The scope of the 2020 comprehensive review is presented in Table A-1. The checks carried out during the 2020 comprehensive review are presented in Annex II. The review consisted of two steps.

The Step 1 was combined with the 'EU QA/QC procedures' (i.e. initial checks) and was carried out by the EU inventory team (ETC/CME, JRC, Eurostat). All findings from the initial checks that were partly resolved or not resolved within the initial check phase were followed up in the second step of the review.

The EU inventory team consisted of the following experts:

- ETC/CME task manager: Nicole Mandl, Marion Pinterits (ETC/CME)
- Energy: Julien Vincent, Coralie Jeannot, Eva Krtková, Marion Pinterits, Matina Kastori, Giorgos Mellios, Markéta Müllerová, Bernd Gugele (ETC/CME), Michael Goll (Eurostat)
- IPPU: Barbara Gschrey, Lorenz Moosmann, Kristina Kaar, Lukas Emele, Maria Purzner, Ils Moorkens (ETC/CME)
- Agriculture: Adrian Leip, Janka Szemesová, Alexander De-Meij (JRC)
- Waste: Céline Gueguen (ETC/CME)
- LULUCF: Raúl Abad-Viñas (JRC)

- Quality coordinators: Adrian Leip, Giacomo Grassi (JRC), Bernd Gugele, Nicole Mandl, Marion Pinterits, Maria Purzner, Julien Vincent, Giorgos Mellios, Ils Moorkens, Kaat Jespers (ETC/CME)
- Cross-cutting: Nicole Mandl (ETC/CME)

Step 2 of the comprehensive review 2020 was performed by a Technical Expert Review Team (TERT) under service contract **340201/2019/814628/SER/CLIMA.C.2** of the Directorate General for Climate Action of the European Commission. The lead reviewers and sector review experts did not review emission inventories of countries where these individuals have themselves contributed to the compilation of that inventory, or presently are or have been any part of the decision-making process related to the compilation of that inventory. Reviewers who are nationals of the country whose inventory is concerned, did not take part in the review of that inventory.

The TERT consisted of the following experts:

- CRF categories 1A1, 1A2, 1A4, 1A5 (Stationary Combustion) + Reference Approach: Katrina Young, Julien Vincent and Stephan Poupa;
- CRF categories 1A3 Transport + 1D International Bunkers: Melanie Hobson, Jean-Marc André and Matina Kastori;
- CRF categories 1B Fugitive + 1C CO₂ Transport and Storage: Ioannis Sempos, Marlene Plejdrup and Marion Pinterits;
- CRF categories IPPU Fluorinated Gases: Barbara Gschrey, Jacek Skoskiewicz and Stephanie Barrault;
- CRF categories IPPU Other Gases than Fluorinated Gases: Emma Salisbury, Kristina Kaar and Wolfram Jörß;
- CRF categories 3A Enteric Fermentation and 3B Manure Management: Chris Dore, Steen Gyldenkærne and Bernard Hyde;
- CRF categories 3C-3J: Katalin Lovas, Etienne Mathias and Michael Anderl;
- CRF sector 5 Waste: Céline Gueguen, Elisabeth Kampel and Hans Oonk;
- Lead reviewers: Karin Kindbom, Suvi Monni, Ole-Kenneth Nielsen and Ralph Harthan;
- The following experts supported the team on request of the TERT: Tomas Gustafson (IPPU), Maria Purzner (F-gases), Beatriz Sanchez (Agriculture), Katja Pazdernik (Waste).

The second step of the review was coordinated by Bernd Gugele and Justin Goodwin.

The EEA review secretariat consisting of Melanie Sporer, Claire Qoul, Kirsten May, Justine Raoult and Henry Irvine prepared and coordinated the Union comprehensive review as foreseen in Article 28 of Commission Implementing regulations (EU) No 749/2014 and Article 42 of the Governance Regulation (EU) 2018/1999.

The step 2 of the review was performed on the basis of the 15 April submissions of GHG emission data and the national inventory report (NIR) under the Monitoring Mechanism. Resubmissions reported by countries were taken into account until 8 May 2020.

Where relevant, the TERT calculated technical corrections for over- or under-estimates identified in a mandatory category in the countries' GHG inventories that exceed the threshold of significance. Technical corrections have been calculated only for the years 2005 and 2016-2018. If the technical correction exceeds the threshold of significance for at least one year of the inventory under review (2005, and 2016-2018) but not for all the years the technical correction was calculated for all years under review in order to ensure time series consistency.

Table A-1: Scope of the comprehensive review 2020

Element	Scope	Further information
Countries	EU geographical coverage of the Member States, the United Kingdom, Norway and Iceland	
Years	2005, 2016, 2017, 2018	According to MMR Article 27(2); According to MMR Article 19(1); According to ESR Article 4(3)
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃	
Sectors	All emission source sectors excluding LULUCF	National totals exclude emissions from LULUCF and emissions reported under memo items
Indirect CO ₂ emissions	Included in national total	

Annex II: Checks carried out during the 2020 comprehensive review in line with Art. 29, 32 and 33 of the Commission Implementing Regulation (EU) No 749/2014

First step review checks:

1. Assessment whether all emission source categories and gases required under Regulation (EU) No 525/2013 are reported;
2. Assessment whether emissions data time series are consistent;
3. Assessment whether implied emission factors across Member States are comparable taking the IPCC default emission factors for different national circumstances into account;
4. Assessment of the use of 'Not Estimated' notation keys where IPCC Tier 1 methodologies exist and where the use of the notation key is not justified in accordance with paragraph 37 of the UNFCCC reporting guidelines on annual greenhouse gas inventories as included in Annex I to Decision 24/CP.19;
5. Analysis of recalculations performed for the inventory submission, in particular if the recalculations are based on methodological changes;
6. Comparison of the verified emissions reported under the Union's Emissions Trading System with the greenhouse gas emissions reported pursuant to Article 7 of Regulation (EU) No 525/2013 with a view of identifying areas where the emission data and trends as submitted by the Member State under review deviate considerably from those of other Member States;
7. Comparison of the results of Eurostat's reference approach with the Member States' reference approach;
8. Comparison of the results of Eurostat's sectoral approach with the Member States' sectoral approach;
9. Assessment whether recommendations from earlier Union or UNFCCC reviews, not implemented by the Member State could lead to a technical correction;
10. Assessment whether there are potential over-estimations or under-estimations relating to a key category in a Member State's inventory.

Second step review checks:

1. Detailed examination of the inventory estimates including methodologies used by the Member State in the preparation of inventories;
2. Detailed analysis of the Member State's implementation of recommendations related to improving inventory estimates as listed in its most recent UNFCCC annual review report made available to that Member State before the submission under review or in the final review report pursuant to Article 35(2) of this Regulation; where recommendations have not been implemented a detailed analysis of the justification provided by the Member State for not implementing them;
3. Detailed assessment of the time series consistency of the greenhouse gas emissions estimates;
4. Detailed assessment whether the recalculations made by a Member State in the given inventory submission as compared to the previous one are transparently reported and made in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories;
5. Follow-up on the results of the checks referred to in Article 29 of the Commission Implementing Regulation (EU) No 749/2014 and on any additional information submitted by the Member State under review in response to questions from the technical experts review team and other relevant checks.