

Final Review Report

2019 annual review of national greenhouse gas inventory data

pursuant to Article 19(2) of Regulation (EU) No 525/2013

Romania
28 June 2019

European Environment Agency



Reference: 340201/2018/790329/SER/CLIMA.C
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Conclusions from the 2019 annual ESD review

This Final Review Report presents the findings from the 2019 annual review of the greenhouse gas (GHG) emission inventory of Romania, pursuant to Article 19(2) of Regulation (EU) No 525/2013, with a view to monitoring Romania's achievement of its GHG emission reduction or limitation target pursuant to Article 3 of Decision No 406/2009/EC (the 'Effort Sharing Decision', ESD) in 2017.

The reviewers carried out checks to verify the transparency, accuracy, consistency, comparability and completeness of the national GHG inventory for the year 2017 submitted in 2019 by Romania pursuant to Articles 7(1) and 7(3) of Regulation (EU) No 525/2013.

The review consisted of two steps:

1. 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) performed the initial checks under Step 1.
2. A Technical Expert Review Team (TERT) performed Step 2 of the 2019 annual ESD review.

More information on the ESD legislation and the procedures for the 2019 annual ESD review is presented in the annexes to this review report.

Step 1 conclusions

The EU inventory team identified 7 significant issues through the checks performed in Step 1. Therefore, Romania was subject to a second step of the 2019 annual ESD review. Only significant issues were subject to the second step review checks.

Step 2 conclusions

1. The reviewers raised 38 issues with Romania during the first and the second step of the 2019 annual ESD review (see Table 1). The TERT provided recommendations for 6 of these issues. Other issues raised during the annual review were clarified and are considered resolved.
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. Romania provided 2 revised estimates. Table 2 below summarises the revised estimates and further information is provided in the respective chapter of this report. The TERT agreed with the revised estimates.
4. On that basis, the TERT did not deem necessary any technical corrections within the meaning of Article 19(3)(c) of Regulation (EU) No 525/2013 in consultation with Romania.
5. The TERT identified non-binding recommendations in order to improve the national inventory data of Romania (see Table 4).
6. The TERT considers that it received a response from Romania that was sufficient in order to undertake the annual review appropriately.

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

	Issues raised ¹	Recommendations	Revised estimates ²	Technical corrections ³
Total	38	6	2	-
Energy	21	5	2	-
IPPU	4	-	-	-
Agriculture	11	1	-	-
Waste	2	-	-	-
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 and provided by the Member State.

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

National totals

Table 2: National totals

Data / Source category	Reference	Emission estimates (kt CO ₂ equivalent) ¹ 2017
Total greenhouse gas emissions, including indirect CO ₂ , without land use, land-use change and forestry as reported by Romania pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission	ROU_2019_2_05032019	113 753.702
Difference between original estimate and revised estimate provided by Romania and accepted by the TERT²		
1.A.3.b Road transportation, CO ₂	RO-1A3b-2019-0001	-593.589
1.A.1.a Public electricity and heat production, CO ₂	RO-1A1-2019-0002	2968.160
Difference between original estimate and technical correction deemed necessary by the TERT²		
Total greenhouse gas emissions including accepted revised estimate provided by Romania and technical correction deemed necessary by the TERT		116 128.273
CO ₂ emissions from 1.A.3.a Domestic aviation	ROU_2019_2_05032019	147.532
NF ₃ emissions	ROU_2019_2_05032019	-

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 would be taken into account.

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

Greenhouse gas emissions covered by Decision 406/2009/EC

Table 3: Greenhouse gas emissions covered by Decision 406/2009/EC

Data	Reference	Emissions (kt CO ₂ equivalent) ¹ 2017
Total greenhouse gas emissions including accepted revised estimate provided by Romania and technical correction deemed necessary by the TERT	<i>See Table 2 above</i>	116 128.273
Total verified emissions from stationary installations under Directive 2003/87/EC	Extracted by the European Commission from EUTL on 8 March 2019 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015) ²	40 617.496
CO ₂ emissions from 1.A.3.a Domestic aviation	<i>See Table 2 above</i>	147.532
NF ₃ emissions	<i>See Table 2 above</i>	-
Total ESD emissions		75 363.245

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 would be 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.

Statement from Romania on the conclusions presented by the TERT

Romania agrees with the aggregated GHG emission inventory estimates presented in Table 3.

Revised estimates provided by Romania and accepted by the TERT

1	ESD Review Tool ID:	RO-1A3b-2019-0001
	ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2019/RO-1A3b-2019-0001
	Member State:	Romania
	Sector:	1A3b Road transportation
	Gases:	CO ₂
	Fuel	Liquid fuels
	Completed by Sector Expert:	Eva Krtkova
	Reviewed by Counterpart:	Stephan Poupa
	Reviewed by Lead Reviewer:	Ralph Harthan
	Reviewed by Quality Controller:	Justin Goodwin
The underlying problem:	For category 1.A.3.b, diesel oil and gas CO ₂ , the TERT noted that for 2016-2017 the values of the IEF are higher than the upper limit of the range proposed by the 2006 IPCC Guidelines (72.6-74.8 t/TJ). The EF for CO ₂ was based on the COPERT 4.	
Summarise the methodology used:	Romania submitted revised estimate using Tier 1 methodology from IPCC 2006 Gls., in the revised estimate activity data as well as the emission factor were updated. The AD and NCV based on the national energy balance (Annex_4.2 of the March submission) were applied, default EF from the 2006 IPCC Gls. was used.	

Details of the corrected estimate																																																											
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1	ESD Review Tool ID:	RO-1A1-2019-0002
	ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2019/RO-1A1-2019-0002
	Member State:	Romania
	Sector:	1A1a Public electricity and heat production
	Gases:	CO ₂
	Fuel	Solid fuels
	Completed by Sector Expert:	Eva Krtkova
	Reviewed by Counterpart:	Stephan Poupa
	Reviewed by Lead Reviewer:	Ralph Harthan
	Reviewed by Quality Controller:	Justin Goodwin
	The underlying problem:	CRF sectoral approach and the sectoral approach calculated on the basis of Eurostat energy balance data show a notable difference of -5.3% for 1A all fuels (CRF: 1073518 TJ; Eurostat: 1133970 TJ). A large part of this difference comes from the category 1A1 solid fuels where the difference is -26760 TJ or -14.2%. Further, ETS data in the MMR Annex V are reported higher than CO ₂ in the inventory for 1A1a.
	Summarise the methodology used:	In response to this observation Romania provided a revised estimate. Through the revised estimate, Romania solved an error related to the consideration of national data on lignite consumption for energy production, for heat production and associated to the CHP. In the Energy Balance provided by the National Institute of Statistics in the format IEA Eurostat Questionnaire revised by Romania (ENERGY_SOLID_A_RO_2017-updated.xlsm attached), in respect to the lignite consumption, Romania modified the quantity of the fuel consumption from lines, Main activity producer electricity (line 19), Main activity producer CHP (line 20) and Main activity producer heat (line 21), including instead of original elements the aggregate amount of the consumption associated to the EU-ETS operators; at the level of the EU-ETS data sets, there is available only one value for the three activities. Following data provided by the Institute National of Statistics (in the format IEA Eurostat Questionnaire): Main activity producer electricity (19,727.85 Gg), Main activity producer CHP (5,318.96 Gg) and Main activity producer heat (20.629 Gg) in EUROSTAT; was revised based on the EU ETS data with the aggregate of value 24,474.311 Gg (lignite consumption), which is now used in the revised estimate.

2	Details of the corrected estimate									
			Original estimate (kt CO₂e)							
		Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Mixed GHG	Notes
	RO-1A1-2019-0002 -OE	2017	14484.285							
	Was a Revised Estimate received from the MS?		yes							
			Revised Estimate received from MS (kt CO₂e)							
		Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Mixed GHG	Notes
	RO-1A1-2019-0002 -RE	2017	17452.445							
			Difference between RE and OE (Gg CO₂e)							
			2968.160							
	Was a Revised Estimate accepted by the TERT?		yes							
			Technical Correction calculated by TERT (kt CO₂e)							
		Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Mixed GHG	Notes
	RO-1A1-2019-0002 -TC	2017								
			Difference between TC and OE (Gg CO₂e)							
	Was the Technical Correction accepted by the MS?									

Recommendations from the TERT including revised estimates and technical corrections

Table 4: Recommendations from the TERT

EMRT - ID	Key category	Category, gas, year	Conclusion step 2 note	Revised estimate	Technical correction
RO-1A1-2019-0002	Yes	1.A.1 Energy industries, 2017, CH ₄ , CO ₂ , N ₂ O	For 1A1, solid fuels, CO ₂ , 2017 the TERT noted that CRF sectoral approach and the sectoral approach calculated on the basis of Eurostat energy balance data show a notable difference of -5.3% for 1A all fuels (CRF: 1073518 TJ; Eurostat: 1133970 TJ). A large part of this difference comes from the category 1A1 solid fuels where the difference is -26760 TJ or -14.2%. Further, ETS data in the MMR Annex V are reported higher than CO ₂ in the inventory for 1A1a. In response to a question raised during the review, Romania provided a revised estimate for the year 2017. The TERT agreed with the revised estimate provided by Romania. The TERT recommends that Romania include the revised estimate in its next submission.	Yes	No
RO-1A3b-2019-0001	Yes	1.A.3.b Road transportation , 2016-2017, CO ₂	For category 1.A.3.b Road transportation, diesel oil and gas CO ₂ , the TERT noted that for 2017 the value of the IEF is higher than the upper limit of the range proposed by the 2006 IPCC Guidelines. In response to a question raised during the review, Romania provided a revised estimate for the year 2017 and stated that it will be included in the next submission. The TERT agreed with the revised estimate provided by Romania. The TERT recommends that Romania include the revised estimate in its next submission.	Yes	No
RO-1A3b-2019-0002	Yes	1.A.3.b Road transportation , 2017, CO ₂	For category 1.A.3.b Road transportation and gas CO ₂ for the year 2017 the TERT noted that the fossil part of the biofuels is not considered in the emission inventory. In response to a question raised during the review, Romania explained that additional CO ₂ emissions from biofuels, from a possible fossil fraction, do not occur in Romania. The TERT disagreed with the explanation provided by Romania. Under the Article 7a of the Fuel Quality Directive, relevant data are reported. The TERT noted that the issue is below the threshold of significance for a technical correction and recommends that Romania investigate the issue, provide estimates and explain the methodology in the next inventory submission.	No	No

EMRT - ID	Key category	Category, gas, year	Conclusion step 2 note	Revised estimate	Technical correction
RO-1AB-2019-0002	No	1.A.B Reference approach, 2017, CO ₂	For category 1.A.B Reference approach and gas CO ₂ for the year 2017, the TERT noted that the difference between the sectoral approach and the reference approach is 8,57%, which is significant, also in comparison with the difference between both approaches noted in 2016. In response to a question raised during the review, Romania explained the reasons for the difference and provided a detailed explanation of the methodology. Romania developed a note explaining the methodology of comparison between the sectoral approach and the reference approach. The statistical differences are the main reason for the differences between the reference approach and the sectoral approach. Also, the explanation of the comparison between the reference approach and the sectoral approach is provided in the NIR. The TERT agreed with the explanation provided by Romania. The TERT notes that this issue does not relate to an over- or underestimate and recommends that Romania make efforts to reduce the statistical differences by working closely with entity responsible for compiling the energy balance for Romania, since the difference between sectoral approach and reference approach is significantly higher than for the other Member states.	No	No
RO-1B-2019-0001	No	1.B Fugitive emissions from fuels, 2017, CO ₂	For category 1.B Fugitive emissions and CO ₂ , for the year 2017, the TERT noted that the EU ETS emissions reported in the MMR Annex under Reg. 749-2014 Art. 10.1 and Annex V are higher than the emissions reported in the category 1.B for CO ₂ for the year 2017 reported in the GHG emission inventory of Romania. In response to a question raised during the review, Romania explained that part of the emissions reported in EU ETS under 1.B.2.a are related to the catalytic cracking process and the emissions in EU ETS under 1.B.2.d are not fugitive emissions but process emissions related to the production of hydrogen. The TERT notes that this issue does most likely not relate to an over- or underestimation and recommends that Romania increase the transparency of the reporting in the MMR Annex under Reg. 749-2014 Art. 10.1 and Annex V in its next submission in order to better understand the allocation of EU ETS emissions to inventory categories.	No	No

EMRT - ID	Key category	Category, gas, year	Conclusion step 2 note	Revised estimate	Technical correction
RO-3A-2019-0001	Yes	3.A Enteric fermentation, 1990-2017, CH ₄	For category 3.A.2 (Enteric fermentation for non-dairy cattle, CH ₄) and all years the TERT noted that the value of gross energy intake reported in the CRF table is very high with 194 MJ/head/day (mean of outlier years). It represents 1.56 times the median value reported from all countries and 1.1 times the calculated upper limit. However, it is noted that this value is not used in the calculations. The TERT could reproduce the gross energy intake from the reported emissions and the value actually used is around 150 MJ/head/day, which is close to the median value of all other countries. In response to a question raised during the review, Romania indicated that the gross energy intake reported in the CRF tables would be corrected in next submission. The TERT notes that this issue does not relate to an over- or underestimate. However, since this issue was already mentioned by previous ESD reviews without being corrected, the TERT recommends that Romania correct the values reported in CRF tables for gross energy intake (non-dairy cattle).	No	No

Annex I: Legal background and procedures of the 2019 annual ESD 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 Member States 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 regulations (EU) No 749/2014.

The objectives of the 2019 annual ESD review of Member States' GHG emission inventories 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 year 2017 in a credible, consistent, transparent and timely manner, according to Article 19 (2) of the MMR;
- b) to assist Member States in improving the quality of their GHG inventories.

The 2019 annual ESD review of national GHG inventory data was carried out for the compliance year 2017 pursuant to Article 19 of the MMR. The EEA review secretariat (consisting of Melanie Sporer, Claire Qoul and Kirsten May) coordinated the 2019 annual ESD review as foreseen in Article 28 of the Commission Implementing Regulation (EU) No 749/2014.

The scope of the 2019 annual ESD review is presented in Table A.1.1. The checks carried out during the 2019 annual ESD review are presented in Annex II.

The review consisted of 2 steps. Step 1 was combined with the 'EU QA/QC procedures' (i.e. initial checks) and was carried out by the EU inventory team (EEA, ETC/CME, JRC, Eurostat). The EU inventory team consisted of the following experts:

- ETC/CME task manager: Nicole Mandl, Marion Pinterits (ETC/CME)
- Energy: Julien Vincent, Coralie Jeannot, Beata Ondrusova, Eva Krtkova, Marion Pinterits, Matina Kastori (ETC/CME), Michael Goll (Eurostat)
- IPPU: Barbara Gschrey, Steffi Osterheld, Lorenz Moosmann, Graham Anderson (ETC/CME)
- Agriculture: Adrian Leip, Janka Szemesova, Gema Carmona (JRC)
- Waste: Celine Gueguen (ETC/CME)
- LULUCF: Raul Abdas-Vinas (JRC)
- Quality coordinators: Adrian Leip, Giacomo Grassi (JRC), Bernd Guegle, Nicole Mandl, Maria Purzner, Julien Vincent, Giorgos Mellios, Ils Moorkens, Kaat Jespers (ETC/CME)
- Cross-cutting: Nicole Mandl (ETC/CME)

All findings from the initial checks that were relevant for the ESD and that were not resolved within the initial check phase were followed up in the second step of the annual review.

Step 2 of the 2019 annual ESD review was performed by a Technical Expert Review Team (TERT) under service contract 340201/2018/790329/SER/CLIMA.C of the Directorate General for Climate Action of the European Commission. The TERT consisted of the following experts:

- Lead Reviewers: Suvi Monni, Ralph Harthan
- Energy: Graham Anderson, Stephan Poupa, Eva Krtkova
- IPPU: Kristina Kaar, Jolanta Merkeliene
- Agriculture: Etienne Mathias, Steen Gyldenkaerne

- Waste: Hans Oonk, Juraj Farkas
- Quality controller: Justin Goodwin
- Co-ordinator: Bernd Guegele

The TERT did not review emission inventories of Member States 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 Member State whose inventory is concerned, did not take part in the review of that inventory.

Step 2 of the review was performed on the basis of GHG emission data and the national inventory report (NIR) officially reported by Member States by 15 March 2019 under the MMR. Where relevant, the TERT calculated technical corrections for over- or underestimates identified in a mandatory category in the Member States' GHG inventories that exceed the threshold of significance. Technical corrections were calculated for the year 2017.

Table A.1.1: Scope of the 2019 annual ESD review

Element	Scope	Further information
Member States	EU geographical coverage of the Member States	
Years	2017	
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆	NF ₃ is not covered by the ESD
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	
Inventory Submission	Submissions received by 15 March 2019	

Annex II: Checks carried out during the 2019 annual ESD review in line with Art.29 and 32 of the Commission Implementing Regulation (EU) No 749/2014

As part of the EU's effort to assist Member States in improving the quality of the GHG inventories, the checks to verify the transparency, consistency, comparability and completeness of the greenhouse gas inventory included:

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 overestimations or underestimations 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.