Final Review Report

2018 annual review of national greenhouse gas inventory data

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

Cyprus

30 June 2018

European Environment Agency

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Conclusions from the 2018 annual ESD review

This Final Review Report presents the findings from the 2018 annual review of the GHG emission inventory of Cyprus, pursuant to Article 19(2) of Regulation (EU) No 525/2013, with a view to monitoring Cyprus's achievement of its greenhouse gas emission reduction or limitation target pursuant to Article 3 of Decision No 406/2009/EC (the 'Effort Sharing Decision', ESD) in 2016.

The reviewers carried out checks to verify the transparency, accuracy, consistency, comparability and completeness of the national greenhouse gas inventory for the year 2016 submitted in 2018 by Cyprus 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 Air Pollution and Climate Change Mitigation (ETC/ACM), 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 2018 annual ESD review.

More information on the Effort Sharing Decision and the procedures for the 2018 annual ESD review is presented in the annexes to this review report.

Step 1 conclusions

The EU inventory team identified 2 significant issues through the checks performed in Step 1. Therefore, Cyprus was subject to a second step of the 2018 annual ESD review. Only significant issues were subject to the second step review checks.

Step 2 conclusions

1. The TERT considered 2 issues during the second step of the review 2018. The TERT provided recommendations for these 2 issues (see Table 1).
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 an underestimate or overestimate exceeding the threshold of significance pursuant to Article 31 of Commission Implementing Regulation (EU) No 749/2014.
3. Cyprus provided 1 revised estimate. The TERT agreed with the revised estimate. Table 2 below summarises the revised estimate and further information is provided at the end of this report.
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 Cyprus.
5. The TERT identified non-binding recommendations in order to improve the national inventory data of Cyprus (see Table 4).
6. The TERT considers that it received a response from Cyprus that was sufficient in order to undertake the annual review appropriately.

Table 1: Issues raised with Cyprus during the first and the second step

	Issues raised[1]	Recommendations	Revised estimates[2]	Technical corrections[3]
Total	**19**	**2**	**1**	**-**
Energy	7	-	-	-
IPPU	3	1	-	-
Agriculture	9	1	1	-
Waste	-	-	-	-
Cross-cutting	-	-	-	-

[1] Excluding findings related to Land use, land use change and forestry (LULUCF) and LULUCF KP.
[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] 2016
Total greenhouse gas emissions, including indirect CO_2, without land use, land-use change and forestry as reported by Cyprus pursuant to Articles 7(1) and 7(3) of Regulation (EU) No 525/2013	CYP_2018_2_16032018	9 015.189
Difference between original estimate and revised estimate provided by Cyprus and accepted by the TERT[2]		
3.D.1 Direct N_2O emissions from managed soils, N_2O	CY-3D1-2018-0002	-253.962
Total greenhouse gas emissions including accepted revised estimate provided by Cyprus		8 761.227
CO_2 emissions from 1.A.3.a Domestic aviation	CYP_2018_2_16032018	0.563
NF_3 emissions	CYP_2018_2_16032018	-

[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] 2016
Total greenhouse gas emissions including accepted revised estimate(s) provided by Cyprus	*See Table 2 above*	8 761.227
Total verified emissions from stationary installations under Directive 2003/87/EC	Extracted by the European Commission from EUTL on 8 March 2018 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015)[2]	4 649.223
CO_2 emissions from 1.A.3.a Domestic aviation	*See Table 2 above*	0.563
NF_3 emissions	*See Table 2 above*	-
Total ESD emissions		4 111.441

[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 Cyprus on the conclusions presented by the TERT

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

Revised estimates provided by Cyprus and accepted by the TERT

ESD Review Tool ID:	**CY-3D1-2018-0002**
ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2018/CY-3D1-2018-0002
Member State:	Cyprus
Sector:	3.D.1 Direct N_2O emissions from managed soils
Gases:	N_2O
Fuel	n/a

Completed by Sector Expert:	Katalin Lovas
Reviewed by Counterpart:	Etienne Mathias
Reviewed by Lead Reviewer:	Klaus Radunsky
Reviewed by Quality Controller:	Bernd Gugele

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The underlying problem:	In response to reiterate recommendations ref. number CY-3D1-2016-0006 and CY-3D1-2017-0004 from 2016 and 2017 ESD Review Cyprus has estimated the N_2O emissions from 3.D.1.2.c Other organic fertilizer applied to soils for the first time in the 2018 March submission. The emissions were calculated not in line with the 2006 IPCC methodologies, because (1) units were incorrectly carried through the calculation and there was a transcription error between the calculation sheet and the CRF Table (2) activity data was used inconsistently (the 43.49 kt compost is interpreted as dry matter in CRF Table 5.B vs. in Table 5.25 of the NIR it is taken into account as wet weight). Emissions from 3.D.1.2.c Other organic fertilizer applied to soils have impacts on the 3.D.2 Indirect N_2O emissions from managed soils. Concerning this emission there was another unresolved issue (Ref. Number CY-3D2-2018-0002 of the STEP 1 ESD Review 2018) not handed over to the STEP 2, which must be clarified to get reliable revised estimate for all the related emissions.
The rationale for the corrected estimate:	Over estimation of 3.D Direct and Indirect N_2O emissions from Agricultural soils
Summarise the methodology used:	The activity data was corrected according to default value for moisture content of composted waste provided in Table 4.1 of the 2006 IPCC Guidelines. The calculation error to estimate the N content of composted waste was corrected. The fractions to estimate the volatilisation losses from synthetic fertiliser (FracGASF) and organic manure (FracGASM) were used in accordance with the default figures given in Table 11.3 of the 2006 IPCC Guidelines.
References to other workbooks:	n/a

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Details of the corrected estimate

		Original estimate (kt CO_2eq)						Notes
	Year	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	
CY-3D1-2018-0002- OE	2016			367.531				

Was a Revised Estimate received from the MS?	**yes**

		Revised Estimate received from MS (kt CO_2eq)						Notes
	Year	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	
CY-3D1-2018-0002-RE	2016			113.570				

Was the Revised Estimate accepted by the TERT?	**yes**

		Technical Correction calculated by TERT (kt CO_2e)						Notes
	Year	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	
CY-3D1-2018-0002-TC	2016							

Was the Technical Correction accepted by the MS?	**no**

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
CY-3D1-2018-0002	Yes	3.D.1 Direct N_2O emissions from managed soils, N_2O, 1990-2016	For direct N_2O emissions from 3.D.1.2.c Other organic fertilizer applied to soils for the year 2016 the TERT noted that (1) units were incorrectly carried through the calculation and there was a transcription error between the calculation sheet and the CRF Table (2) activity data was used inconsistently (the 43.49 kt compost was interpreted as dry matter in CRF Table 5.B vs. in Table 5.25 of the NIR it was taken into account as wet weight). Emissions from 3.D.1.2.c Other organic fertilizer applied to soils have impacts on the 3.D.2 Indirect N_2O emissions from managed soils. Concerning this emission there was another unresolved issue (Ref. Number CY-3D2-2018-0002 of the STEP 1 ESD Review 2018) not handed over to the STEP 2, which must be clarified to get reliable revised estimate for all the related emissions. In response to a question raised during the review, Cyprus explained that there are calculation errors in the estimate of N_2O direct emissions from 3.D.1.2.c Other organic fertilizer applied to soils as well as the 3.D.2 Indirect emissions from agricultural soils and Cyprus provided revised estimates for years 1990-2016 for both of the emissions and stated that it will be included in the next submission. The TERT agreed with the revised estimate provided by Cyprus and attached to the annex of the review report. The TERT recommends that Cyprus include the revised estimate in its next submission and ensure the consistency of activity data used for the CRF sectors 3.D.1.2.c and 5.B.1.	Yes	No
CY-2F1-2018-0001	Yes	2.F.1 Refrigeration and air conditioning, HFCs, 2016	For category 2.F Consumption of Halocarbons and Sulphur Hexafluoride (including 2.F.1, 2.F.2, 2.F.3 and 2.F.4) and HFC-gases the TERT noted that Cyprus has applied a methodology which uses the reported emissions from Malta, Greece, Italy and Spain to estimate the Cyprus emissions, weighted based on population. It was already found during the 2016 ESD review that this methodology is not in line with the 2006 IPCC Guidelines and the TERT confirmed this view again. In addition, during the step 1 checks performed in 2018, it was noted that there is downward trend in emissions of Cyprus since 2014 and that mainly relates to a decrease in emissions of Spain through the implementation of a tax of F-gases and that no comparable policy measures are in place in Cyprus. In response, Cyprus provided revised estimates for 2.F.1, excluding data of Spain in category 2.F.1 for years 2014-2016, in the March submission. The TERT noted some issues regarding the methodology used (population data not updated for 2015 in category 2.F.4 and this affects per capita emissions in 2016, HFC-125 stock emissions are included in category 2.F.3 but reported under HFC-227ea, including only HFC-134a in category 2.F.2 not necessarily justified), but notes that the impact is below the threshold of significance. The TERT further noted that excluding the data of Spain in category 2.F.1 in 2014-2016 and including in 1990-2013 is not consistent use of methodology throughout the time series. During the review, Cyprus explained that the inventory of F-gas users continues and it is anticipated that it will	No	No

EMRT - ID	Key category	Category, gas, year	Conclusion step 2 note	Revised estimate	Technical correction
			be possible to apply the IPCC methodology in the 2020 submission. The TERT noted that the impact of applying a methodology that is not in line with the 2006 IPCC Guidelines is most likely above the threshold of significance for technical correction, but the TERT concluded that the approach it would use for a technical correction would be the same as the approach used by Cyprus for its estimates submitted in 2018. The TERT strongly recommends that Cyprus makes use of the new data to estimate emissions from 2.F based on national information and include the revised estimates in its next submission. The TERT recommends Cyprus to make efforts to improve the activity data if necessary, and use methods presented in the 2006 IPCC Guidelines volume 1, chapter 5 to create a consistent time series.		

Annex I: Legal background and procedures of the 2018 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 2018 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 2016 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 2018 annual ESD review of national greenhouse gas (GHG) inventory data was carried out for the compliance year 2016 pursuant to Article 19 of the MMR. The EEA review secretariat (consisting of Melanie Sporer, Claire Qoul and Emma Salisbury) coordinated the 2018 annual ESD review as foreseen in Article 28 of the Commission Implementing Regulation (EU) No 749/2014.

The scope of the 2018 annual ESD review is presented in Table A.1.1. The checks carried out during the 2018 annual ESD review are presented in Annex I.

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/ACM, JRC, Eurostat). 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 2018 annual ESD review was performed by a Technical Expert Review Team (TERT) under service contract 340201/2017/765292/SER/CLIMA.C2 of the Directorate General for Climate Action of the European Commission. The TERT consisted of the following experts:

- Lead Reviewers: Suvi Monni, Klaus Radunsky
- Energy: Laetitia Nicco, Graham Anderson, Ioannis Sempos
- IPPU: Kristina Kaar, Eva Krtkova
- Agriculture: Etienne Mathias, Katalin Lovas
- Waste: Hans Oonk, Juraj Farkas
- Quality controller: Justin Goodwin
- Co-ordinator: Bernd Gugele

The lead reviewers and sector review experts 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 2018 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 2016.

Table A.1.1: Scope of the 2018 annual ESD review

Element	Scope	Further information
Member States	EU geographical coverage of the Member States	
Years	2016	
Gases	CO_2, CH_4, N_2O, 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 2018	

Annex II: Checks carried out during the 2018 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.