

# 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

### Cyprus

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 Cyprus, pursuant to:

- Article 4(3) of Regulation (EU) No 2018/842 (the 'Effort Sharing Regulation', ESR), for the purpose of setting out Cyprus's annual emission allocations (AEAs) for the years from 2021 to 2030 in terms of tonnes of CO<sub>2</sub> equivalent, and
- Article 3 of Decision No 406/2009/EC (the 'Effort Sharing Decision', ESD), for the purpose of verifying Cyprus'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 Cyprus 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.

Cyprus did not provide a resubmission to the Commission.

### Step 1 and 2 conclusions

1. The reviewers raised 26 issues with Cyprus during the first and the second step of the 2020 comprehensive ESD review (see Table 1). The TERT provided recommendations for 10 of these issues. Other issues raised during the comprehensive review were clarified and are considered 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. Cyprus provided 7 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 also deemed necessary a technical correction in the meaning of Article 19(3)(c) of Regulation (EU) No 525/2013 and calculated the technical correction taking into account the consultation with Cyprus on this issue. The technical correction is presented in Table 2 and Table 3 of the present review report and is accompanied by evidence-based justification. In its response to the draft technical correction, Cyprus stated that it agrees with the technical correction.
5. The TERT identified non-binding recommendations in order to improve the national inventory data of Cyprus (see Table 6).

6. The TERT considers that it received a response from Cyprus that was sufficient in order to undertake the comprehensive review appropriately.

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

	Issues raised step 1 <sup>1</sup>	Issues raised step 2	Recommendations	Revised estimates <sup>2</sup>	Technical corrections <sup>3</sup>
<b>Total</b>	<b>7</b>	<b>19</b>	<b>10</b>	<b>7</b>	<b>1</b>
Energy	3	4	1	1	-
IPPU	2	11	7	6	-
Agriculture	2	1	1	-	-
Waste	-	3	1	-	1
Cross-cutting	-	-	-	-	-

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

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

<sup>3</sup> 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 <sub>2</sub> equivalent) <sup>1</sup> 2018
Total greenhouse gas emissions, including indirect CO <sub>2</sub> , without Land Use, Land Use Change and Forestry, without international aviation, as reported by Cyprus pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission	CYP_2020_3_14042020	8 810.370
<b>Difference between original estimates and revised estimates provided by Cyprus and accepted by the TERT<sup>2</sup></b>		
1B2c Fugitive Emissions from Venting/Flaring, CO <sub>2</sub> , CH <sub>4</sub>	CY-1B2c-2020-0001	-0.212
2A1 Cement Production, CO <sub>2</sub>	CY-2A1-2020-0002	4.814
2D3 Other Non-Energy Products from Fuels and Solvent Use, CO <sub>2</sub>	CY-2D-2020-0002	-13.516
2F1 Refrigeration and Air Conditioning, HFCs	CY-2F1-2020-0003	11.058
2G3b Propellant for Pressure and Aerosol Products, N <sub>2</sub> O	CY-2G-2020-0002	-50.451
2G Other Product Manufacture and Use, SF <sub>6</sub>	CY-2G-2020-0003	2.578
<b>Difference between original estimates and technical corrections deemed necessary by the TERT<sup>2</sup></b>		
5A Solid Waste Disposal, CH <sub>4</sub>	CY-5A-2020-0001	-15.423
<b>Total greenhouse gas emissions including revised estimates and technical corrections</b>		<b>8 749.218</b>
CO <sub>2</sub> emissions from 1A3a Domestic Aviation <sup>3</sup>	CYP_2020_3_14042020	0.889
NF <sub>3</sub> emissions <sup>3</sup>	CYP_2020_3_14042020	-

<sup>1</sup> 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.

<sup>2</sup> A positive difference indicates an increase compared to reported emissions. A negative difference indicates a decrease compared to reported emissions.

<sup>3</sup> Included in the totals. NF<sub>3</sub> 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 <sub>2</sub> equivalent) <sup>1</sup>			
		2005	2016	2017	2018
Total greenhouse gas emissions, including indirect CO <sub>2</sub> , without Land Use, Land Use Change and Forestry, without international aviation, as reported by Cyprus pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission	CYP_2020_3_14042020	9 387.132	8 791.748	8 974.072	8 810.370
<b>Difference between original estimates and revised estimates provided by Cyprus and accepted by the TERT<sup>2</sup></b>					
1B2c Fugitive Emissions from Venting/Flaring, CO <sub>2</sub> , CH <sub>4</sub>	CY-1B2c-2020-0001	-0.219	-0.204	-0.212	-0.212
2A1 Cement Production, CO <sub>2</sub>	CY-2A1-2020-0001	-33.630	-	-	-
2A1 Cement Production, CO <sub>2</sub>	CY-2A1-2020-0002	-	-	4.045	4.814
2D3 Other Non-Energy Products from Fuels and Solvent Use, CO <sub>2</sub>	CY-2D-2020-0002	-18.447	-10.767	-10.217	-13.516
2F1 Refrigeration and Air Conditioning, HFCs	CY-2F1-2020-0003	8.367	10.149	10.574	11.058
2G3b Propellant for Pressure and Aerosol Products, N <sub>2</sub> O	CY-2G-2020-0002	-42.716	-49.087	-49.641	-50.451
2G Other Product Manufacture and Use, SF <sub>6</sub>	CY-2G-2020-0003	1.716	2.389	2.548	2.578
<b>Difference between original estimates and technical corrections deemed necessary by the TERT<sup>2</sup></b>					
5A Solid Waste Disposal, CH <sub>4</sub>	CY-5A-2020-0001	4.376	-8.993	-12.380	-15.423
Total greenhouse gas emissions including revised estimates and technical corrections		9 306.579	8 735.235	8 918.789	8 749.218
CO <sub>2</sub> emissions from 1A3a Domestic Aviation <sup>3</sup>	CYP_2020_3_14042020	12.481	0.563	0.821	0.889

<sup>1</sup> 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.

<sup>2</sup> A positive difference indicates an increase compared to reported emissions. A negative difference indicates a decrease compared to reported emissions.

<sup>3</sup> Included in the totals.

## Statement from Cyprus on the conclusions presented by the TERT

Cyprus 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 <sub>2</sub> equivalent) <sup>1</sup> 2018
Total greenhouse gas emissions including any accepted revised estimates provided by Cyprus and any technical corrections deemed necessary by the TERT	See Table 2 above	8 749.218
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) <sup>2</sup>	4 585.570
CO <sub>2</sub> emissions from 1A3a Domestic Aviation	See Table 2 above	0.889
NF <sub>3</sub> emissions	See Table 2 above	-
<b>Total ESD emissions</b>		<b>4 162.760</b>

<sup>1</sup> 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.

<sup>2</sup> 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 <sub>2</sub> equivalent) <sup>1</sup>			
		2005 <sup>3</sup>	2016	2017	2018
Total greenhouse gas emissions including any accepted revised estimates provided by Cyprus and any technical corrections deemed necessary by the TERT	See Table 3 above	9 306.579	8 735.235	8 918.789	8 749.218
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) <sup>2</sup>	5 078.877	4 649.223	4 672.871	4 585.570
CO <sub>2</sub> emissions from 1A3a Domestic Aviation	See Table 3 above	12.481	0.563	0.821	0.889
<b>Total ESR emissions</b>		-	<b>4 085.449</b>	<b>4 245.097</b>	<b>4 162.760</b>

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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 'CO<sub>2</sub> 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
CY-1B2c-2020-0001	No	1B2 Fugitive Emissions from Fuels – Oil and Natural Gas, CO <sub>2</sub> , CH <sub>4</sub> , 2005-2018	For 1B2c1i Oil Venting, CO <sub>2</sub> and CH <sub>4</sub> , years 2005, 2016-2018 the TERT noted that there is an over-estimate of emissions. Cyprus reported CO <sub>2</sub> and CH <sub>4</sub> emissions under 1B2c1i Oil Venting although there is no primary production of liquid fuels in the country. Cyprus estimated venting emissions using the Tier 1 emission factors from 2006 IPCC Guidelines (Vol. 2, table 4.2.4) that correspond to "oil transport - tanker trucks and rail cars" and used as AD the total volume of secondary liquid fuels from the national energy balance. The TERT noted that "oil transport" refers to emissions associated to "the transport of marketable crude oil (including conventional, heavy and synthetic crude oil and bitumen) to upgraders and refineries" as it is explained in Table 4.2.1 of the 2006 IPCC Guidelines, Vol. 2. CH <sub>4</sub> and CO <sub>2</sub> are contained only at upstream petroleum industry (i.e. crude oil) and they are not contained in secondary fuels. For that reason, the CH <sub>4</sub> and CO <sub>2</sub> emission factors for "refined product distribution" in Table 4.2.4 of the 2006 IPCC Guidelines are included as 'NA'. Cyprus provided revised estimates for years 2005, 2016, 2017 and 2018 and stated that they will be included in the next submission. The TERT agreed with the revised estimates provided by Cyprus. The TERT recommends that Cyprus include the revised estimates in its next submission.	RE
CY-2A1-2020-0001	Yes	2A1 Cement Production, CO <sub>2</sub> , 2005	For category 2A1 Cement Production, CO <sub>2</sub> , 2005 the TERT noted that there was a step change in the IEF (2004 = 0.5352 t/t, 2005 = 0.5581 t/t, 2006 = 0.5324 t/t). In response to a question raised during the review, Cyprus explained that they consulted the cement factory and obtained updated activity data and emissions data for 2005, which has been validated under the EU ETS. Cyprus provided a revised estimate for the year 2005. The TERT agreed with the revised estimate provided by Cyprus. The TERT recommends that Cyprus include the revised estimate in its next submission.	RE

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2020
CY-2A1-2020-0002	Yes	2A1 Cement Production, CO <sub>2</sub> , 2017, 2018	For category 2A1 Cement Production, CO <sub>2</sub> , 2017 and 2018 the TERT noted that the sum of the verified emissions under Directive 2003/87/EC according to the different CRF categories (1A1, 2A) (4200.3 kt CO <sub>2</sub> eq) reported in MMR Annex V was below the total verified emissions reported at the top of the same Annex (4585.6 kt CO <sub>2</sub> ). In response to a question raised during the review, Cyprus explained that there was a mistake in the Annex V table (see correspondence under CY-1-2020-0001) and also explained that emissions from bypass dust were accidentally excluded for a cement factory in the years 2017 and 2018. Cyprus provided revised estimates for the years 2017 and 2018. The TERT agreed with the revised estimate provided by Cyprus. The TERT recommends that Cyprus include the revised estimate in its next submission.	RE
CY-2D-2020-0002	No	2D Non-Energy Products from Fuels and Solvent Use, CO <sub>2</sub> , 2005-2018	For 2D3 Other Non-Energy Products from Fuels and Solvent Use, CO <sub>2</sub> , 2000-2018, the TERT noted that indirect CO <sub>2</sub> emissions from glue consumption were two times higher than emissions from all other Solvent Use sub-categories. In response to a question raised during the review, Cyprus explained that there was an error in the activity data for glue consumption. Cyprus provided revised estimates for years 2005, 2016, 2017 and 2018. The TERT agreed with the revised estimate provided by Cyprus. The TERT recommends that Cyprus include the revised estimate in its next submission.	RE
CY-2F1-2020-0003	Yes	2F1 Refrigeration and Air Conditioning, HFCs, 1990-2018	For HFC emissions from 2F1 Refrigeration and Air Conditioning, the TERT noted that manufacturing emissions were not reported separately for 2F1a and 2F1c and that for 2F1e only emissions from mobile air conditioning systems in passenger cars were reported, excluding the emissions from other vehicle types. Cyprus provided a revised estimate for years 2005, 2016, 2017 and 2018 and stated that it will be included in the next submission. The TERT agreed with the revised estimate provided by Cyprus. The TERT recommends that Cyprus include the revised estimate in its next submission.	RE

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2020
CY-2G-2020-0002	No	2G Other Product Manufacture and Use, N <sub>2</sub> O, 2005, 2016, 2017, 2018	For 2G3b Other N <sub>2</sub> O from Product Uses, N <sub>2</sub> O, 1990-2018, the TERT noted that the methodology is based on a per capita factor using Greece's 2013 submission. The TERT noted that Cyprus has the highest per capita emissions for 2G3b of all Member States and that the emissions are approximately 10 times higher than Greece's per capita emissions. In response to a question raised during the review, Cyprus explained that it is not possible to obtain the AD required to estimate emissions using a Tier 1 approach. Cyprus provided revised estimates based on a per capita factor using Greece's 2020 submission for years 2005, 2016, 2017 and 2018. The TERT agreed with the revised estimate provided by Cyprus. The TERT recommends that Cyprus moves to a Tier 1 approach, or if this is not possible, evaluates the most appropriate per capita factor to apply in its next submission and includes a clear justification for the chosen approach in the NIR.	RE
CY-2G-2020-0003	No	2G Other Product Manufacture and Use, SF <sub>6</sub> , 1990-2018	For SF <sub>6</sub> emissions from 2G1 Electrical Equipment, the TERT noted that a methodology that is not consistent with the 2006 IPCC Guidelines is used. The method is based on data from other countries and population data. In response to a question raised during the review, Cyprus explained that a new methodology on the basis of actual data will be introduced for the next submission. The TERT decided not to make a technical correction, because due to lack of better data, the method that would have been used for the technical correction would have been similar to that currently used by Cyprus. Cyprus also clarified that a mistake in the calculations was found and provided revised estimate for 2005, 2016, 2017 and 2018 and stated that it will be included in the next submission. The TERT agreed with the revised estimate provided by Cyprus. However, the TERT recommends that Cyprus implement a new method in line with the 2006 IPCC Guidelines and on the basis of actual data in the next submission.	RE
CY-5A-2020-0001	Yes	5A Solid Waste Disposal, CH <sub>4</sub> , 2005-2018	For category 5A Solid Waste Disposal, CH <sub>4</sub> for years 2005-2018 the TERT noted that the Cypriot inventory lacks transparency on the composition of municipal solid waste. The TERT considered that due to lack of more accurate information, it would be appropriate to assume a constant waste composition for the years 2005-2018. In response Cyprus provided a revised estimate, which was the average value of their original estimate and the estimate obtained using a constant waste composition for 2005-2018. The TERT did not agree with this revised estimate and decided to calculate a technical correction for the years 2005, 2016, 2017 and 2018 which was accepted by Cyprus. The estimates demonstrate that the issue is above the threshold of significance. The TERT recommends that Cyprus include a revised estimate in its next submission.	TC

EMRT-ID	Key category	Category, gas, year	Recommendation	Revised estimate or technical correction in 2020
CY-2F-2020-0001	No	2F Product Uses as Substitutes for Ozone Depleting Substances, HFCs, 1990-2018	Under 2F Product Uses as Substitutes for Ozone Depleting Substances for HFCs, for 2F2, 2F3 and 2F4, the TERT noted that Cyprus has applied a methodology which uses the reported emissions from neighbouring countries to estimate the Cyprus emissions, weighted based on population. It was already found during the 2016 and 2018 ESD reviews that this methodology is not in line with the 2006 IPCC Guidelines and the TERT confirmed this view again. In response to a question raised during the review Cyprus explained that methodological changes for these subcategories are being implemented and that the issue will be addressed for the 2021 submission. Cyprus did not provide a revised estimate. 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 2020. Therefore, the TERT concluded that a technical correction would not improve accuracy of the estimates. The TERT recommends that Cyprus make use of new data to estimate emissions from 2F2, 2F3 and 2F4 based on national information and include the revised estimates in its next submission. The TERT recommends that Cyprus use methods presented in the 2006 IPCC Guidelines volume 1, chapter 5 to develop a consistent time series.	No
CY-3B-2020-0001	Yes	3 Agriculture, N <sub>2</sub> O, CH <sub>4</sub> , 1990-2018	For category 3B Manure Management - Dairy Cows, N <sub>2</sub> O emissions and for all years the TERT notes that the nitrogen excretion value per head remains static at a value of 96.36 kg per head/year (CRF table3.B(b)) and that the milk yield per cow increases from a value of 12.2 kg per head per day in 1990 to 19.6 kg per head per day in 2018 (NIR table 5.7) and that information for the derivation of nitrogen excretion values using equations 10.31, 10.32 and 10.33 Chapter 10, Volume 4 of the 2006 IPCC Guidelines may be available from the Tier 2 model used to estimate CH <sub>4</sub> emissions from enteric fermentation. In response to a question raised during the review, Cyprus stated that it does not have data in relation to the quantities of each type of feed fed to dairy cows which would enable a diet crude protein value to be derived for inclusion in equation 10.32 in the Chapter 10, Volume 4 of the 2006 IPCC Guidelines. Cyprus also referred to the estimates made for enteric fermentation in response to the issue CY-3A-2016-0002. The TERT recommends that Cyprus undertake an analysis of the feeding practices for dairy cows and include this assessment in the derivation of emissions of CH <sub>4</sub> from enteric fermentation in category 3A as well as in the determination of the crude protein content of the diet and revise estimates under 3A and 3B accordingly. The TERT further recommends that until the improvement is implemented, the country report on progress in the NIR.	No

## Revised estimates provided by Cyprus and accepted by the TERT

1

ESD Review Tool ID:	CY-1B2c-2020-0001
ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2020/CY-1B2c-2020-0001
Country:	Cyprus
Sector:	1B2 Fugitive Emissions from Fuels – Oil and Natural Gas
Gases:	CO <sub>2</sub> , CH <sub>4</sub>
Fuel	Liquid fuels
Completed by Sector Expert:	Ioannis Sempas
Reviewed by Counterpart:	Marlene Plejdrup
Reviewed by Lead Reviewer:	Suvi Monni
Reviewed by Quality Controller:	Justin Goodwin

The underlying problem:

For 1B2c1i Oil Venting, CO<sub>2</sub> and CH<sub>4</sub>, years 2005, 2016-2018 the TERT noted that there is an over-estimate of emissions. Cyprus reported CO<sub>2</sub> and CH<sub>4</sub> emissions under 1B2c1i Oil Venting, although there is no primary production of liquid fuels in the country. Cyprus estimated venting emissions using the Tier 1 emission factors from the 2006 IPCC Guidelines (Vol. 2, table 4.2.4) that correspond to "oil transport - tanker trucks and rail cars" and used as activity data the total volume of secondary liquid fuels from the national energy balance. The TERT noted that "oil transport" refers to emissions associated to "the transport of marketable crude oil (including conventional, heavy and synthetic crude oil and bitumen) to upgraders and refineries" as it is explained in Table 4.2.1 of the 2006 IPCC Guidelines, Vol. 2. CH<sub>4</sub> and CO<sub>2</sub> are contained only at upstream petroleum industry (i.e. crude oil) and they are not contained in secondary fuels. For that reason, the CH<sub>4</sub> and CO<sub>2</sub> emission factors for "refined product distribution" in Table 4.2.4 of the 2006 IPCC Guidelines are included as 'NA'.

Summarise the methodology used:

In the revised estimate, CO<sub>2</sub> and CH<sub>4</sub> emissions associated to 1B2c1i Oil Venting were reported as 'NA', by considering that no transport of crude oil occurs in Cyprus and that the transport of secondary liquid fuels does not result in CO<sub>2</sub> and CH<sub>4</sub> emissions.

2

	Original estimate (Gg CO <sub>2</sub> e)								Notes
Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
2005	0.063	0.156							
2016	0.058	0.146							
2017	0.061	0.151							
2018	0.060	0.151							

	Revised Estimate received from country (Gg CO <sub>2</sub> e)								Notes
Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
2005	NA	NA							
2016	NA	NA							
2017	NA	NA							
2018	NA	NA							

	Difference between RE and OE (Gg CO <sub>2</sub> e)							
Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG
2005	-0.063	-0.157						
2016	-0.058	-0.146						
2017	-0.061	-0.151						
2018	-0.060	-0.151						

1	ESD Review Tool ID:	CY-2A1-2020-0001								
	ESD Review Tool URL:	<a href="https://emrt-esd.eionet.europa.eu/2020/CY-2A1-2020-0001">https://emrt-esd.eionet.europa.eu/2020/CY-2A1-2020-0001</a>								
	Country:	Cyprus								
	Sector:	2A1 Cement Production								
	Gases:	CO <sub>2</sub>								
	Fuel	N/A								
	Completed by Sector Expert:	Emma Salisbury								
	Reviewed by Counterpart:	Kristina Kaar								
	Reviewed by Lead Reviewer:	Suvi Monni								
Reviewed by Quality Controller:	Justin Goodwin									
The underlying problem:		There was an unexplained step change in the IEF for 2005.								
Summarise the methodology used:		Cyprus obtained corrected values from the cement factory that were validated by the ETS and used them in the revised estimate.								
2	Original estimate (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005	821.808								
	2016									
	2017									
	2018									
	Revised Estimate received from country (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005	788.178								
	2016									
	2017									
	2018									
	Difference between RE and OE (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005	-33.630								
	2016									
	2017									
	2018									

1	ESD Review Tool ID:	CY-2A1-2020-0002								
	ESD Review Tool URL:	<a href="https://emrt-esd.eionet.europa.eu/2020/CY-2A1-2020-0002">https://emrt-esd.eionet.europa.eu/2020/CY-2A1-2020-0002</a>								
	Country:	Cyprus								
	Sector:	2A1 Cement Production								
	Gases:	CO <sub>2</sub>								
	Fuel	N/A								
	Completed by Sector Expert:	Emma Salisbury								
	Reviewed by Counterpart:	Kristina Kaar								
Reviewed by Lead Reviewer:	Suvi Monni									
Reviewed by Quality Controller:	Justin Goodwin									
The underlying problem:		Emissions from bypass dust from cement production facilities were excluded from emission estimates in 2017 and 2018. This problem was originally discussed under observation CY-1-2020-0001.								
Summarise the methodology used:		Emissions from bypass dust were taken from the validated EU ETS reports: 4044.8 t CO <sub>2</sub> eq and 4814.2 t CO <sub>2</sub> eq for 2017 and 2018 respectively (provided by Cyprus under observation CY-1-2020-0001). These were added to the emission estimates for 2A1 Cement Production.								
2	Original estimate (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005									
	2016									
	2017	918.948								
	2018	843.349								
	Revised Estimate received from country (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005									
	2016									
	2017	922.993								
	2018	848.163								
	Difference between RE and OE (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005									
	2016									
	2017	4.045								
	2018	4.814								



1	ESD Review Tool ID:	CY-2D-2020-0002								
	ESD Review Tool URL:	<a href="https://emrt-esd.eionet.europa.eu/2020/CY-2D-2020-0002">https://emrt-esd.eionet.europa.eu/2020/CY-2D-2020-0002</a>								
	Country:	Cyprus								
	Sector:	2D3 Other Non-Energy Products from Fuels and Solvent Use								
	Gases:	CO <sub>2</sub>								
	Fuel	N/A								
	Completed by Sector Expert:	Emma Salisbury								
	Reviewed by Counterpart:	Kristina Kaar								
Reviewed by Lead Reviewer:	Suvi Monni									
Reviewed by Quality Controller:	Justin Goodwin									
The underlying problem:		CO <sub>2</sub> emissions from the consumption of glues were higher than expected. Cyprus confirmed that the activity data (AD) for consumption of glues were too high.								
Summarise the methodology used:		Cyprus obtained updated AD for the consumption of glues for the whole time series. Cyprus validated these AD with the data provider: Statistical Service of Cyprus and used the same method and emission factors as those used in the inventory to estimate the emissions.								
2	Original estimate (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005	37.796								
	2016	20.548								
	2017	24.879								
	2018	25.537								
	Revised Estimate received from country (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005	19.350								
	2016	9.781								
	2017	14.662								
	2018	12.021								
	Difference between RE and OE (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005	-18.447								
	2016	-10.767								
	2017	-10.217								
	2018	-13.516								

1	ESD Review Tool ID:	CY-2F1-2020-0003								
	ESD Review Tool URL:	<a href="https://emrt-esd.eionet.europa.eu/2020/CY-2F1-2020-0003">https://emrt-esd.eionet.europa.eu/2020/CY-2F1-2020-0003</a>								
	Country:	Cyprus								
	Sector:	2F1 Refrigeration and Air Conditioning								
	Gases:	HFCs								
	Fuel	N/A								
	Completed by Sector Expert:	Barbara Gschrey								
	Reviewed by Counterpart:	Jacek Soszkiewics								
Reviewed by Lead Reviewer:	Suvi Monni									
Reviewed by Quality Controller:	Justin Goodwin									
The underlying problem:		A new methodology for emission estimates from 2F1 was implemented for the entire time series. Certain aspects were not addressed properly: Manufacturing emissions for commercial and industrial refrigeration equipment were not reported as such. Emission estimates for mobile air conditioning referred to cars only, not to other vehicle types.								
Summarise the methodology used:		Manufacturing emissions were estimated separately from operation emissions in 2F1a and 2F1c. Emissions from mobile air conditioning systems in other vehicle types were included in 2F1e.								
2	Original estimate (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005				68.912					2F1a, 2F1c, and 2F1e
	2016				106.626					
	2017				111.029					
	2018				115.272					
	Revised Estimate received from country (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005				77.279					
	2016				116.775					
	2017				121.603					
	2018				126.331					
	Difference between RE and OE (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005				8.367					
	2016				10.149					
	2017				10.574					
	2018				11.058					

1	ESD Review Tool ID:	CY-2G-2020-0002								
	ESD Review Tool URL:	<a href="https://emrt-esd.eionet.europa.eu/2020/CY-2G-2020-0002">https://emrt-esd.eionet.europa.eu/2020/CY-2G-2020-0002</a>								
	Country:	Cyprus								
	Sector:	2G3b Propellant for Pressure and Aerosol Products								
	Gases:	N <sub>2</sub> O								
	Fuel	N/A								
	Completed by Sector Expert:	Emma Salisbury								
	Reviewed by Counterpart:	Kristina Kaar								
Reviewed by Lead Reviewer:	Suvi Monni									
Reviewed by Quality Controller:	Justin Goodwin									
The underlying problem:		The methodology is based on a per capita factor using Greece's 2013 submission. Cyprus has the highest per capita emissions for 2G3b of all Member States, which is approximately 10 times higher than Greece's per capita emissions.								
Summarise the methodology used:		Per capita emissions based on Greece's 2020 submission.								
2	Original estimate (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005			47.442						
	2016			54.504						
	2017			55.100						
	2018			55.858						
	Revised Estimate received from country (Gg CO <sub>2</sub> e)									Notes
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005			4.726						
	2016			5.417						
	2017			5.459						
	2018			5.407						
	Difference between RE and OE (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005			-42.716						
	2016			-49.087						
	2017			-49.641						
	2018			-50.451						

1	ESD Review Tool ID:	CY-2G-2020-0003								
	ESD Review Tool URL:	<a href="https://emrt-esd.eionet.europa.eu/2020/CY-2G-2020-0003">https://emrt-esd.eionet.europa.eu/2020/CY-2G-2020-0003</a>								
	Country:	Cyprus								
	Sector:	2G Other Product Manufacture and Use								
	Gases:	SF <sub>6</sub>								
	Fuel	N/A								
	Completed by Sector Expert:	Barbara Gschrey								
	Reviewed by Counterpart:	Jacek Soszkiewics								
Reviewed by Lead Reviewer:	Suvi Monni									
Reviewed by Quality Controller:	Justin Goodwin									
The underlying problem:		Originally the issue related to the methodology for SF <sub>6</sub> emission estimates which relies on data from neighbouring countries, weighted by population. A new approach based on newly collected data will be introduced for the next submission. During the review, Cyprus noted that the GWP value used for estimates of SF <sub>6</sub> emissions were incorrect.								
Summarise the methodology used:		The GWP value used for the calculation of SF <sub>6</sub> emissions was corrected.								
2	Original estimate (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	Notes
	2005						0.115			
	2016						0.165			
	2017						0.165			
	2018						0.165			
	Revised Estimate received from country (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	Notes
	2005						1.831			
	2016						2.554			
	2017						2.713			
	2018						2.743			
	Difference between RE and OE (Gg CO <sub>2</sub> e)									
	Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
	2005						1.716			
	2016						2.389			
	2017						2.548			
2018						2.578				

## Technical corrections deemed necessary by the TERT

ESD Review Tool ID:	CY-5A-2020-0001								
ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2020/CY-5A-2020-0001								
Country:	Cyprus								
Sector:	5A Solid Waste Disposal								
Gases:	CH <sub>4</sub>								
Fuel	N/A								
Completed by Sector Expert:	Hans Oonk								
Reviewed by Counterpart:	Céline Gueguen								
Reviewed by Lead Reviewer:	Suvi Monni								
Reviewed by Quality Controller:	Justin Goodwin								
The underlying problem:	<p>The TERT noted with reference to 5A, CH<sub>4</sub> and years 2005-2018 and the NIR, table 7.11 (page 227) an unexpected trend in waste composition: the shares of plastics and other inert waste reduce while the shares of textiles, food and garden wastes increase. This trend is not expected, based on waste policy in Cyprus (see Page 218 in the NIR), which comprises of separate collection of paper and green wastes at households (according to table 7.6 in the NIR, composting of organic wastes started in 2010). During the review, Cyprus explained that actual trend in Cypriot waste composition is not monitored and the trend in composition is an estimate. The TERT considered that due to lack of more detailed information, it would be more appropriate to assume a constant waste composition for 2005-2018. Cyprus provided a revised estimate, which was calculated as an average value of the original estimate and emissions calculated assuming a constant waste composition for 2005-2018. The TERT noted that the estimate is still partially based on Table 7.11 in the NIR, and that the chosen approach was not justified. Therefore, the TERT did not agree with the revised estimate.</p>								
Summarise the methodology used:	<p>As part of the revised estimate, Cyprus provided its calculation files (IPCC waste models) for (i) managed landfills, (ii) unmanaged, deep landfills and (iii) unmanaged, shallow landfills, using a constant waste composition for 2005-2018. The technical correction is calculated as a sum of results in these files. The spreadsheets are attached as an appendix to this conclusion in the EMRT.</p>								
		Original estimate (Gg CO <sub>2</sub> e)							Notes
Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
2005		370.581							
2016		485.031							
2017		494.031							
2018		502.601							
		Technical Correction calculated by TERT (Gg CO <sub>2</sub> e)							Notes
Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
2005		374.957							
2016		476.038							
2017		481.652							
2018		487.178							
		Difference between TC and OE (Gg CO <sub>2</sub> e)							
Year	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>	Mixed GHG	
2005		4.376							
2016		-8.993							
2017		-12.380							
2018		-15.423							

## 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> Transport and Storage: Ioannis Sempas, 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 Gyldenkerne 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 <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs, SF <sub>6</sub> , NF <sub>3</sub>	
Sectors	All emission source sectors excluding LULUCF	National totals exclude emissions from LULUCF and emissions reported under memo items
Indirect CO <sub>2</sub> 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.