

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

The Netherlands

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 the Netherlands, pursuant to:

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

The Netherlands provided a resubmission to the Commission on 07/05/2020. The TERT considered this resubmission as the basis for the comprehensive review.

Step 1 and 2 conclusions

1. The reviewers raised 45 issues with the Netherlands during the first and the second step of the 2020 comprehensive ESD review (see Table 1). The TERT provided recommendations for 3 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. The Netherlands provided 3 revised estimates that were accepted by the TERT. Table 2 and Table 3 below summarise the revised estimates and further information is provided in the respective chapter of this report.
4. The TERT did not deem necessary any technical corrections in the meaning of Article 19(3)(c) of Regulation (EU) No 525/2013.
5. The TERT identified non-binding recommendations in order to improve the national inventory data of the Netherlands (see Table 6).
6. The TERT considers that it received a response from the Netherlands that was sufficient in order to undertake the comprehensive review appropriately.

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

| | Issues raised step 1 ¹ | Issues raised step 2 | Recommendations | Revised estimates ² | Technical corrections ³ |
|---------------|--------------------------------------|-------------------------|-----------------|-----------------------------------|---------------------------------------|
| Total | 28 | 17 | 3 | 3 | - |
| Energy | 6 | 3 | - | - | - |
| IPPU | 15 | 4 | 3 | 3 | - |
| Agriculture | 5 | 7 | - | - | - |
| Waste | 2 | 3 | - | - | - |
| Cross-cutting | - | - | - | - | - |

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

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

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

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

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

| Emission source category | Reference | Emission estimates (kt CO ₂ equivalent) ¹ 2018 |
|---|---------------------|--|
| Total greenhouse gas emissions, including indirect CO ₂ , without Land Use, Land Use Change and Forestry, without international aviation, as reported by the Netherlands pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission | NLD_2020_2_10042020 | 188 196.789 |
| Difference between original estimates and revised estimates provided by the Netherlands and accepted by the TERT² | | |
| 2B1 Ammonia Production, CO ₂ | NL-2B1-2020-0001 | -1 019.286 |
| Total greenhouse gas emissions including revised estimates | | 187 177.503 |
| CO ₂ emissions from 1A3a Domestic Aviation ³ | NLD_2020_2_10042020 | 32.159 |
| NF ₃ emissions ³ | NLD_2020_2_10042020 | - |

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

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

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

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

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

| Emission source category | Reference | Emission estimates (kt CO ₂ equivalent) ¹ | | | |
|---|---------------------|---|--------------------|--------------------|--------------------|
| | | 2005 | 2016 | 2017 | 2018 |
| Total greenhouse gas emissions, including indirect CO ₂ , without Land Use, Land Use Change and Forestry, without international aviation, as reported by the Netherlands pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission | NLD_2020_2_10042020 | 214 664.825 | 195 442.334 | 193 329.515 | 188 196.789 |
| Difference between original estimates and revised estimates provided by the Netherlands and accepted by the TERT² | | | | | |
| 2B1 Ammonia production, CO ₂ | NL-2B1-2020-0001 | -712.611 | -1 126.765 | -1 169.734 | -1 019.286 |
| 2B10 Other (chemical industry), CO ₂ | NL-2B10-2020-0001 | 314.585 | - | - | - |
| 2F1 Refrigeration and Air Conditioning, HFCs | NL-2F1-2020-0008 | -389.616 | - | - | - |
| Total greenhouse gas emissions including revised estimates | | 213 877.184 | 194 315.568 | 192 159.781 | 187 177.503 |
| CO ₂ emissions from 1A3a Domestic Aviation ³ | NLD_2020_2_10042020 | 43.985 | 30.017 | 32.201 | 32.159 |

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

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

³ Included in the totals

Statement from the Netherlands on the conclusions presented by the TERT

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

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

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

| Emission source category | Reference | Emission estimates (kt CO ₂ equivalent) ¹ 2018 |
|--|---|--|
| Total greenhouse gas emissions including any accepted revised estimates provided by the Netherlands and any technical corrections deemed necessary by the TERT | See Table 2 above | 187 177.503 |
| Total verified emissions from stationary installations under Directive 2003/87/EC | Extracted by the European Commission from EUTL on 9 March 2020 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015) ² | 87 413.360 |
| CO ₂ emissions from 1A3a Domestic Aviation | See Table 2 above | 32.159 |
| NF ₃ emissions | See Table 2 above | - |
| Total ESD emissions | | 99 731.984 |

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

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

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

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

| Emission source category | Reference | Emission estimates (kt CO ₂ equivalent) ¹ | | | |
|--|---|---|--------------------|--------------------|-------------------|
| | | 2005 ³ | 2016 | 2017 | 2018 |
| Total greenhouse gas emissions including any accepted revised estimates provided by the Netherlands and any technical corrections deemed necessary by the TERT | See Table 3 above | 213 877.184 | 194 315.568 | 192 159.781 | 187 177.503 |
| Total verified emissions from stationary installations under Directive 2003/87/EC | Extracted by the European Commission from EUTL on 9 March 2020 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015) ² | 80 351.292 | 93 868.545 | 91 418.179 | 87 413.360 |
| CO ₂ emissions from 1A3a Domestic Aviation | See Table 3 above | 43.985 | 30.017 | 32.201 | 32.159 |
| Total ESR emissions | | - | 100 417.007 | 100 709.401 | 99 731.984 |

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

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

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

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

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

| EMRT-ID | Key category | Category, gas, year | Recommendation | Revised estimate or technical correction in 2020 |
|-------------------|--------------|---|---|--|
| NL-2B1-2020-0001 | Yes | 2B1 Ammonia Production, CO ₂ , 1990-2018 | For 2B1 Ammonia production and CO ₂ in 2005, 2016, 2017 and 2018 the TERT noted that the Netherlands did not subtract CO ₂ recovered in integrated urea production. The TERT noted also that 3H urea application is reported as IE and 2D3 CO ₂ emissions (urea catalyst) reporting are double counted for those years. As the Netherlands is a net exporter of urea, the TERT concluded that the accounting approach used by the Netherlands results in an overestimation of CO ₂ emissions across all ammonia/urea sectors for all considered years. In response to a question raised during the review the Netherlands provided a revised estimate for the 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 the Netherlands. The TERT recommends that Netherlands include the revised estimate in its next submission and ensure full consistency in the applied stoichiometric conversion factors and provide a transparent textual description in the next NIR. The TERT further recommends the Netherlands to develop a urea balance taking into account urea imports and exports and considering urea-based CO ₂ emissions reported in CRF 3.H and 2.D.3 and to provide the information in a future NIR. | RE |
| NL-2B10-2020-0001 | Yes | 2B10 Other (Chemical Industry), CO ₂ , 2005-2018 | For 2B10 Production of industrial gas and CO ₂ in 2005, 2016 and 2017 the TERT noted that the Netherlands had applied a storage factor which was not in line with the 2006 IPCC Guidelines. The Netherlands explained that for 2016 and 2017 this was only an allocation issue between 2B10 and 1A2, not affecting overall emission totals. For 2B10 CO ₂ emissions in 2005, however, the Netherlands provided a revised estimate and stated that it will be included in the next submission. The TERT agreed with the revised estimate provided by the Netherlands. The TERT recommends that Netherlands abandon the storage factor approach for the 2B10 production of industrial gas CO ₂ emissions and carry out a recalculation of the complete time series for 1A2 and 2B10 emissions related to the production of industrial gas and provide a transparent textual description in the next NIR. | RE |

| EMRT-ID | Key category | Category, gas, year | Recommendation | Revised estimate or technical correction in 2020 |
|------------------|--------------|---|--|--|
| NL-2F1-2020-0008 | Yes | 2F1 Refrigeration and Air Conditioning, HFCs, 1994-2018 | For category 2F1 Refrigeration and Air Conditioning, HFC emissions for the years 1994-2013, the TERT noted that the Netherlands applied an old version of their calculation model which led to a significant decrease of emissions from 2013 onwards, and higher emissions for the years before. In response to a question raised during the review, the Netherlands explained that they were still studying the different techniques to ensure a consistent time series and had not applied one yet. The Netherlands provided a revised estimate for the years 1994-2013, applying the overlap splicing technique from the 2006 IPCC Guidelines, and stated that it will continue their efforts to find the best way of applying new information on the rest of the time series and that this information will be included in their next submission. The TERT agreed with the revised estimate provided by the Netherlands. The TERT recommends that the Netherlands include the revised estimate in its next submission. | RE |

Revised estimates provided by the Netherlands and accepted by the TERT

| | | | | | | | | | |
|---|---|---|-----------------|------------------|------|------|-----------------|-----------------|-------|
| 1 | ESD Review Tool ID: | NL-2B1-2020-0001 | | | | | | | |
| | ESD Review Tool URL: | https://emrt-esd.eionet.europa.eu/2020/NL-2B1-2020-0001 | | | | | | | |
| | Country: | Netherlands | | | | | | | |
| | Sector: | 2B1 Ammonia Production | | | | | | | |
| | Gases: | CO ₂ | | | | | | | |
| | Fuel | N/A | | | | | | | |
| | Completed by Sector Expert: | Wolfram Jörß | | | | | | | |
| | Reviewed by Counterpart: | Kristina Kaar | | | | | | | |
| | Reviewed by Lead Reviewer: | Ralph Harthan | | | | | | | |
| | Reviewed by Quality Controller: | Bernd Gugele | | | | | | | |
| 1 | The underlying problem: | In 2B1 Ammonia production, the Netherlands did not subtract CO ₂ recovered in integrated urea production. 3H urea application is reported as IE. 2D3 CO ₂ emissions (urea catalyst) reporting are double counted. As the Netherlands is net exporter of urea, the reported approach is an overestimation of CO ₂ emissions across all ammonia/urea sectors. This issue was also raised in an earlier UNFCCC review. In response to a question raised by the TERT, the Netherlands provided a revised estimate for the years 2005, 2016-2018. The TERT agreed with the revised estimate provided by the Netherlands. | | | | | | | |
| | Summarise the methodology used: | For the revised estimate, the Netherlands collected data on urea production (making use of CO ₂ recovered from ammonia production), urea use for melamine production and urea use in agriculture. Furthermore, urea use as catalyst (as previously reported in 2D3) is considered. Urea production amounts exceeding the use in agriculture, melamine production and as catalyst are considered net exported. CO ₂ recovered for urea production is subtracted in 2B1. CO ₂ emissions from urea uses are accounted in 3H (agriculture), 2D3 (urea catalyst) and 2B8 (melamine production: 50% of carbon in urea is emitted, 50% is stored in the product). | | | | | | | |
| | | | | | | | | | |
| 2 | Original estimate (Gg CO ₂ e) | | | | | | | | Notes |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | |
| | 2005 | 3 741.413 | | | | | | | |
| | 2016 | 3 814.781 | | | | | | | |
| | 2017 | 3 941.740 | | | | | | | |
| | 2018 | 3 756.737 | | | | | | | |
| | Revised Estimate received from the country (Gg CO ₂ e) | | | | | | | | Notes |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | |
| | 2005 | 3 028.803 | | | | | | | |
| | 2016 | 2 688.016 | | | | | | | |
| | 2017 | 2 772.007 | | | | | | | |
| | 2018 | 2 737.450 | | | | | | | |
| | Difference between RE and OE (Gg CO ₂ e) | | | | | | | | |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | |
| | 2005 | -712.611 | | | | | | | |
| | 2016 | -1 126.765 | | | | | | | |
| | 2017 | -1 169.734 | | | | | | | |
| | 2018 | -1 019.286 | | | | | | | |

| | | | | | | | | | | |
|---------------------------------|---|---|-----------------|------------------|------|------|-----------------|-----------------|-----------|-------|
| 1 | ESD Review Tool ID: | NL-2B10-2020-0001 | | | | | | | | |
| | ESD Review Tool URL: | https://emrt-esd.eionet.europa.eu/2020/NL-2B10-2020-0001 | | | | | | | | |
| | Country: | Netherlands | | | | | | | | |
| | Sector: | 2B10 Other (Chemical Industry) | | | | | | | | |
| | Gases: | CO ₂ | | | | | | | | |
| | Fuel | N/A | | | | | | | | |
| | Completed by Sector Expert: | Wolfram Jörß | | | | | | | | |
| | Reviewed by Counterpart: | Kristina Kaar | | | | | | | | |
| 1 | Reviewed by Lead Reviewer: | Ralph Harthan | | | | | | | | |
| | Reviewed by Quality Controller: | Bernd Gugele | | | | | | | | |
| The underlying problem: | | A storage factor applied by the Netherlands during the calculation of 2B10 process emissions for CO ₂ from industrial gases production for 2005, 2016 and 2017 (not applied for 2018) was not in line with the 2006 IPCC Guidelines. For 2016 and 2017, this results only in an allocation issue between 1A2 and 2B10, not affecting CO ₂ emission totals. For 2005, the Netherlands provided a revised estimate, which was accepted by the TERT. | | | | | | | | |
| Summarise the methodology used: | | For the revised estimate for 2005, the natural gas-based carbon, which had been assumed as stored in the original estimate, was added to the CO ₂ emissions. | | | | | | | | |
| 2 | Original estimate (Gg CO ₂ e) | | | | | | | | | Notes |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | Mixed GHG | |
| | 2005 | 372.624 | | | | | | | | |
| | 2016 | | | | | | | | | |
| | 2017 | | | | | | | | | |
| | 2018 | | | | | | | | | |
| | Revised Estimate received from the country (Gg CO ₂ e) | | | | | | | | | Notes |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | Mixed GHG | |
| | 2005 | 687.209 | | | | | | | | |
| | 2016 | | | | | | | | | |
| | 2017 | | | | | | | | | |
| | 2018 | | | | | | | | | |
| | Difference between RE and OE (Gg CO ₂ e) | | | | | | | | | |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | Mixed GHG | |
| | 2005 | 314.585 | | | | | | | | |
| | 2016 | | | | | | | | | |
| | 2017 | | | | | | | | | |
| | 2018 | | | | | | | | | |

| | | | | | | | | | | |
|---------------------------------|---|---|-----------------|------------------|-----------|------|-----------------|-----------------|-----------|--|
| 1 | ESD Review Tool ID: | NL-2F1-2020-0008 | | | | | | | | |
| | ESD Review Tool URL: | https://emrt-esd.eionet.europa.eu/2020/NL-2F1-2020-0008 | | | | | | | | |
| | Country: | Netherlands | | | | | | | | |
| | Sector: | 2F1 Refrigeration and Air Conditioning | | | | | | | | |
| | Gases: | HFCs | | | | | | | | |
| | Fuel | N/A | | | | | | | | |
| | Completed by Sector Expert: | Stéphanie Barrault | | | | | | | | |
| | Reviewed by Counterpart: | Maria Purzner | | | | | | | | |
| | Reviewed by Lead Reviewer: | Ralph Harthan | | | | | | | | |
| Reviewed by Quality Controller: | Bernd Guele | | | | | | | | | |
| The underlying problem: | | For category 2F1 the TERT noted a significant decrease in emissions since 2013, particularly in 2F1c. It is explained in the NIR that the two methods applied in 2F1 Stationary (old stock-model method until 2012 and new method since 2013) are completely different. The new method is considered more accurate and the estimate before 2012 over-estimated. The NIR also provides information on plans to use the overlap splicing technique from the 2006 IPCC Guidelines to create a consistent times series in the next submission. As this constitutes a time series inconsistency, the TERT demanded a revised estimate for 2005, which was provided by the Netherlands based on the overlap splicing technique as a first estimate, before they would look into this issue in detail. | | | | | | | | |
| Summarise the methodology used: | | The overlap splicing technique was applied, and emissions were reduced by a combined percentage of the difference between the old and the new method. | | | | | | | | |
| 2 | Original estimate (Gg CO ₂ e) | | | | | | | | | Notes |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | Mixed GHG | |
| | 2005 | | | | 1 289.085 | | | | | 2F1 Refrigeration and air conditioning |
| | 2016 | | | | | | | | | |
| | 2017 | | | | | | | | | |
| | 2018 | | | | | | | | | |
| | Revised Estimate received from country (Gg CO ₂ e) | | | | | | | | | Notes |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | Mixed GHG | |
| | 2005 | | | | 899.469 | | | | | 2F1 Refrigeration and air conditioning |
| | 2016 | | | | | | | | | |
| | 2017 | | | | | | | | | |
| | 2018 | | | | | | | | | |
| | Difference between RE and OE (Gg CO ₂ e) | | | | | | | | | |
| | Year | CO ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ | Mixed GHG | |
| | 2005 | | | | -389.616 | | | | | |
| | 2016 | | | | | | | | | |
| | 2017 | | | | | | | | | |
| | 2018 | | | | | | | | | |

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

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

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

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

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

Objectives

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

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

Procedures

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

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

The EU inventory team consisted of the following experts:

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

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

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

The TERT consisted of the following experts:

- CRF categories 1A1, 1A2, 1A4, 1A5 (Stationary Combustion) + Reference Approach: Katrina Young, Julien Vincent and Stephan Poupa;
- CRF categories 1A3 Transport + 1D International Bunkers: Melanie Hobson, Jean-Marc André and Matina Kastori;
- CRF categories 1B Fugitive + 1C CO₂ Transport and Storage: Ioannis Sempos, Marlene Plejdrup and Marion Pinterits;
- CRF categories IPPU Fluorinated Gases: Barbara Gschrey, Jacek Skoskiewicz and Stephanie Barrault;
- CRF categories IPPU Other Gases than Fluorinated Gases: Emma Salisbury, Kristina Kaar and Wolfram Jörß;
- CRF categories 3A Enteric Fermentation and 3B Manure Management: Chris Dore, Steen 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 ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ | |
| Sectors | All emission source sectors excluding LULUCF | National totals exclude emissions from LULUCF and emissions reported under memo items |
| Indirect CO ₂ emissions | Included in national total | |

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

First step review checks:

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

Second step review checks:

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