

Final Review Report

2022 annual review of national greenhouse gas inventory data

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

Ireland
30 June 2022

European Environment Agency



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Umweltbundesamt GmbH
Spittelauer Lände 5
1090 Vienna Austria

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Conclusions from the 2022 annual ESD review

This Review Report presents the findings from the 2022 annual review of the greenhouse gas (GHG) emission inventory of Ireland, pursuant to Article 19(2) of Regulation (EU) No 525/2013, with a view to monitoring Ireland's achievement of its GHG emission reduction or limitation target pursuant to Article 3 of Decision No 406/2009/EC (the 'Effort Sharing Decision', ESD) in 2020.

The reviewers carried out checks to verify the transparency, accuracy, consistency, comparability and completeness of the national GHG inventory for the year 2020 submitted in 2022 by Ireland pursuant to Articles 7(1) and 7(3) of Regulation (EU) No 525/2013.

The review consisted of two steps:

1. The EU inventory team (European Environment Agency (EEA), European Topic Centre on Climate Change Mitigation (ETC/CM), 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 2022 annual ESD review.

More information on the ESD legislation and the procedures for the 2022 annual ESD review is presented in the annexes to this review report.

Step 1 conclusions

The checks performed identified 2 significant issues, therefore Ireland was subject to a second step of the 2022 annual ESD review. Only significant issues were subject to the second step review checks.

Step 2 conclusions

1. The reviewers raised 25 issues with Ireland during the first and the second step of the 2022 annual ESD review (see Table 1). The TERT provided a recommendation for 2 of these issues. Other issues raised during the annual review were clarified and are considered resolved.
2. The TERT identified cases where inventory data were prepared in a manner which is inconsistent with UNFCCC guidance documentation or Union rules. In particular, the TERT identified an under- or over-estimate exceeding the threshold of significance pursuant to Article 31 of Commission Implementing Regulation (EU) No 749/2014.
3. Ireland provided 1 revised estimate. The TERT agreed to 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 Ireland.
5. The TERT identified non-binding recommendations in order to improve the national inventory data of Ireland (see Table 4).
6. The TERT considers that it received a response from Ireland that was sufficient in order to undertake the review appropriately.

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

	Issues raised ¹	Recommendations ²	Revised estimates ³	Technical corrections ⁴
Total	25	2	1	-
Energy	10	1	-	-
IPPU	3	-	-	-
Agriculture	7	1	1	-
Waste	5	-	-	-
Cross-cutting	-	-	-	-

¹ Excluding findings related to Land use, land use change and forestry (LULUCF) and Kyoto Protocol (KP) LULUCF.

² The total number of recommendations includes revised estimates and technical corrections.

³ Revised estimates: changes in inventory estimates triggered by the review and provided by the Member State.

⁴ 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

Data / Source category	Reference	Emission estimates (kt CO ₂ equivalent) ¹ 2020
Total greenhouse gas emissions, including indirect CO ₂ , without land use, land-use change and forestry as reported by Ireland pursuant to Article 7(4) of Regulation (EU) No 525/2013, taking into account any resubmission to the Commission	IRL_2022_1_07032022	57 716.091
Difference between original estimate and revised estimate provided by Ireland and accepted by the TERT²		
3A Enteric fermentation, CH ₄	IE-3A-2022-0002	316.249
Total greenhouse gas emissions including revised estimate		58 032.340
CO ₂ emissions from 1A3a Domestic aviation ³	IRL_2022_1_07032022	13.274
NF ₃ emissions ³	IRL_2022_1_07032022	1.462

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.

³ CO₂ emissions from 1A3a Domestic aviation and NF₃ emissions have been deducted from the national total as they are not included within the scope of total ESD 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 2020
Total greenhouse gas emissions including accepted revised estimate provided by Ireland	<i>See Table 2 above</i>	58 032.340
Total verified emissions from stationary installations under Directive 2003/87/EC	Extracted by the European Commission from EUTL on 8 March 2022 (as agreed at the Working Group I of the Climate Change Committee on 18 May 2015) ²	13 296.424
CO ₂ emissions from 1A3a Domestic aviation ³	<i>See Table 2 above</i>	13.274
NF ₃ emissions ³	<i>See Table 2 above</i>	1.462
Total ESD emissions		44 721.180

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. Emissions of ETS stationary installations have been deducted from the national total as they are not included within the scope of total ESD emissions.

³ CO₂ emissions from 1A3a Domestic aviation and NF₃ emissions have been deducted from the national total as they are not included within the scope of total ESD emissions.

Statement from Ireland on the conclusions presented by the TERT

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

Recommendations from the TERT including revised estimates

Table 4: Recommendations from the TERT (RE = Revised estimate¹; TC = Technical correction²)

EMRT - ID	Key category	Category, gas, year	Recommendation	RE or TC in 2022
IE-3A-2022-0002	Yes	3A Enteric Fermentation, 1990-2020, CH ₄	The TERT identified a potential underestimate exceeding the threshold of significance for 3A2 Enteric Fermentation Sheep and CH ₄ from enteric fermentation in 2020. In response to a question raised during the review, Ireland provided a revised estimate for year 2020. The TERT agreed with the revised estimate provided by Ireland and attached to the annex of the review report. The TERT recommends that Ireland include the revised estimate in its next submission.	RE
IE-1A1a-2022-0001	Yes	1A1a Public Electricity and Heat Production, 2011-2020, CO ₂	For category 1A1a Public Electricity and Heat Production / Other fuels / CO ₂ / 2011-2020, the TERT noted that there is a lack of transparency regarding the CO ₂ IEFs for MSW incineration. The TERT notes with reference to CRF Table1.A(a)s1 / NIR section 3.2.4.1 that the CO ₂ IEF for Waste to Energy (WtE) is higher than the upper limit of the 2006 IPCC default EF interval. The TERT notes that this issue does not relate to an over- or under-estimate of emissions. In response to a question raised during the review, Ireland explained that AD waste tonnage, NCV for the entire waste tonnage, the renewable portion and CO ₂ emissions (fossil+biogenic) are provided by the plants. Ireland explains that the CO ₂ emissions are estimated using quarterly measurements of the %CO ₂ concentration in the flue gas stack, converted to mass based on density, and then multiplied by run hours and flow rate for a total CO ₂ mass emission. Ireland indicated that it is reasonably confident that the total CO ₂ emissions are accurate as are the MSW tonnages, but that the energy content of the MSW and the biogenic/fossil fractions are more uncertain. The TERT recommends that Ireland investigate further the reasons behind the unexpectedly high IEF for WtE, and include an explanation in the NIR, which also describes how the CO ₂ emissions are estimated by the plants.	No

¹ Revised estimates: changes in inventory estimates triggered by the review and provided by the Member State.

² Technical corrections: changes in inventory estimates triggered by the review and provided by the TERT.

Revised estimates provided by Ireland and accepted by the TERT

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ESD Review Tool ID:	IE-3A-2022-0002
ESD Review Tool URL:	https://emrt-esd.eionet.europa.eu/2022/IE-3A-2022-0002
Country:	Ireland
Sector:	3A Enteric Fermentation
Gases:	CH ₄
Fuel	N/A
Completed by Sector Expert:	Steen Gyldenkaerne
Reviewed by Counterpart:	Etienne Mathias
Reviewed by Lead Reviewer:	Ralph Harthan
Reviewed by Quality Controller:	Bernd Gugele

The underlying problem:	Sheep is a key category in Ireland and Tier 2 should be used. Ireland is currently using a Tier 1 emission factor (EF) of 8 kg CH ₄ /head/year for adult sheep and a national developed lower EF for lambs of 2.7 kg CH ₄ /head/year which is 34 % of the Tier 1 EF. The Tier 1 EF per head in the 2006 IPCC Guidelines is developed under the conditions with an average feed intake for the whole herd of sheep taking into account the average age distribution of the sheep and not for adult sheep only. The Irish national correction of the Tier 1 EF to a lower value for lambs is therefore not justified.
Summarise the methodology used:	All sheep and lambs reported in the Irish inventory submission has been applied with the 2006 IPCC Guidelines Tier 1 default EF of 8 kg CH ₄ /head/year.

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	Original estimate (Gg CO ₂ e)							Notes
Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Mixed GHG	
2020		741.071						

	Revised Estimate received from country (Gg CO ₂ e)							Notes
Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Mixed GHG	
2020		1 057.320						

	Difference between RE and original estimate (Gg CO ₂ e)						
Year	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Mixed GHG
2020		316.249					

Annex I: Legal background and procedures of the 2022 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.

Therefore, this is the last ESD review that will be performed. 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 Regulation (EU) No 749/2014.

The objectives of the 2022 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 2020 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 2022 annual ESD review of national GHG inventory data was carried out for the compliance year 2020 pursuant to Article 19 of the MMR. The EEA review secretariat (consisting of Melanie Sporer, Claire Qoul and Justine Raoult) coordinated the 2022 annual ESD review as foreseen in Article 28 of the Commission Implementing Regulation (EU) No 749/2014.

The scope of the 2022 annual ESD review is presented in Table A.1.1. The checks carried out during the 2022 annual ESD review are presented in Annex II.

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

- ETC/CME task manager: Nicole Mandl, Marion Pinterits (ETC/CM)
- Energy: Julien Vincent, Coralie Jeannot, Marion Pinterits, Zuzana Roskova, Bernd Gugele, Markéta Klusackova, Maria Georgakaki (ETC/CM), Michael Goll (Eurostat)
- IPPU: Barbara Gschrey, Kristina Kaar, Lorenz Moosmann, Lukas Emele, Julien Vincent, Coralie Jeannot (ETC/CM)
- Agriculture: Frank Dentener, Simona Bosco, Efisio Solazzo (JRC)
- Waste: Céline Gueguen (ETC/CM)
- LULUCF: Peter Iversen (EEA), Raúl Abad-Viñas (JRC)
- Quality experts: Frank Dentener, Giacomo Grassi (JRC), Nicole Mandl, Marion Pinterits, Markéta Klusackova, Risto Saarikivi, Maria Purzner, Julien Vincent, Giorgos Mellios, Ils Moorkens, Zuzana Roskova (ETC/CM)
- Cross-cutting: Nicole Mandl (ETC/CM)

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 2022 annual ESD review was performed by a Technical Expert Review Team (TERT) under service contract 340201/2018/790329/SER/CLIMA.C of the Directorate General for Climate Action of the European Commission. The TERT consisted of the following experts:

- Lead Reviewers: Suvi Monni, Ralph Harthan
- Energy: Marlene Plejdrup, Ioannis Sempos
- IPPU: Kristina Kaar, Maria Purzner
- Agriculture: Etienne Mathias, Steen Gyldenkaerne
- Waste: Richard Claxton, Hans Oonk
- Quality controller: Emma Salisbury, Justin Goodwin
- Co-ordinator: Bernd Guegle

The TERT did not review emission inventories of Member States where these individuals have themselves contributed to the compilation of that inventory, or presently are or have been any part of the decision-making process related to the compilation of that inventory. Reviewers who are nationals of the Member State whose inventory is concerned, did not take part in the review of that inventory.

Step 2 of the review was performed on the basis of GHG emission data and the national inventory report (NIR) officially reported by Member States by 15 March 2022 under the MMR. Where relevant, the TERT calculated technical corrections for under- or over-estimates identified in a mandatory category in the Member States' GHG inventories that exceed the threshold of significance. Technical corrections were calculated for the year 2020.

Table A.1.1: Scope of the 2022 annual ESD review

Element	Scope	Further information
Countries	EU geographical coverage of the 27 Member States and the United Kingdom	
Years	2020	
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆	NF ₃ is not covered by the ESD
Sectors	All emission source sectors excluding LULUCF	National totals exclude emissions from LULUCF and emissions reported under memo items
Indirect CO ₂ emissions	Included in national total	
Inventory Submission	Submissions received by 15 March 2022	

Annex II: Checks carried out during the 2022 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.