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**Progress in emission inventories and other emissions-related issues:
Adjustments under the Protocol to Abate Acidification, Eutrophication
and Ground-level Ozone (Gothenburg Protocol)****Review of adjustment applications****Report by the Centre on Emission Inventories and Projections***Summary*

The present report was prepared by the Centre on Emission Inventories and Projections in line with its mandate under the 2018–2019 workplan for the implementation of the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/140/Add.1).

The report provides a summary of the 2019 review of applications for adjustments to emission inventories submitted by the Netherlands in accordance with Executive Body decisions 2012/3, 2012/4 and 2012/12, as amended by decision 2014/1 (ECE/EB.AIR/111/Add.1, ECE/EB.AIR/113/Add.1, ECE/EB.AIR/127/Add.1 and ECE/EB.AIR/130).

It also provides information on applications on the adjustments approved for Belgium, Denmark, Finland, France, Germany, Hungary, Luxembourg, Spain and the United Kingdom of Great Britain and Northern Ireland prior to 2019. The review is based on documents submitted by Parties and findings of the Expert Review Team.



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I. Introduction

1. At its thirtieth session (Geneva, 30 April–4 May 2012), aware of the uncertainties inherent in estimating and projecting emission levels and of the need for continuous scientific and methodological improvements and determined that the emergence of new methodologies should not place a Party at a disadvantage in terms of its emission reduction commitments, the Executive Body for the Convention on Long-range Transboundary Air Pollution adopted decisions 2012/3 and 2012/4 in order to allow Parties to make adjustments to emission reduction commitments, or to inventories for the purposes of comparing total national emissions with them, pursuant to the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to the 1979 Convention on Long-range Transboundary Air Pollution (Gothenburg Protocol).
2. At its thirty-first session (Geneva, 11–13 December 2012), the Executive Body adopted decision 2012/12 on guidance for such adjustments. The guidance, contained in annex to that decision (ECE/EB.AIR/113/Add.1), sets out the general principles that Parties should follow in submitting applications for adjustments.
3. However, following the first review of adjustment applications by countries in 2014, it became evident that more detailed technical guidance was needed. At its thirty-third session (Geneva, 8–12 December 2014), the Executive Body therefore adopted decision 2014/1 on improving the guidance for adjustments (ECE/EB.AIR/127/Add.1). The technical guidance for Parties making adjustment applications and for the expert review of adjustment applications (Technical Guidance) (ECE/EB.AIR/130) was prepared by the Task Force on Emission Inventories and Projections and published on 28 April 2015.
4. Pursuant to the Executive Body's decisions, as clarified by the Technical Guidance, Parties may apply to adjust their inventory data or emission reduction commitments under extraordinary circumstances, which fall into three broad categories:
 - (a) Emission sources are identified that were not accounted for at the time when the emission reduction commitments were set (for a more detailed definition, see ECE/EB.AIR/127/Add.1, decision 2014/1, annex, para. 3 (a) (i)–(iii));
 - (b) Emission factors used to determine emissions levels for particular source categories for the year in which emissions reduction commitments are to be attained are significantly different than the emission factors applied to these categories when emission reduction commitments were set;
 - (c) The methodologies used for determining emissions from specific source categories have undergone significant changes between the time when emission reduction commitments were set and the year they are to be attained.
5. A Party applying for an adjustment to its inventory is required to notify the Convention secretariat through the Executive Secretary of the United Nations Economic Commission for Europe (ECE) by 15 February at the latest if the application is to be reviewed during the same year. All supporting information requested in Executive Body decision 2012/12, as amended by decision 2014/1 and clarified in the Technical Guidance, must be provided as part of the Party's informative inventory report, or in a separate report, by 15 March of the same year, for review by the Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP).
6. The present report summarizes the review of the inventory adjustment applications submitted by the Netherlands in 2019 in accordance with Executive Body decisions 2012/3, 2012/4, 2012/12 and 2014/1 and in light of the Technical Guidance. It also provides information on adjustments approved prior to 2019.
7. The report is based on the documents submitted by Parties and those prepared by the Expert Review Team during the review process in 2019. It was prepared by the EMEP Centre on Emission Inventories and Projections in line with its mandate under the 2018–2019 workplan for implementation of the Convention (ECE/EB.AIR/140/Add.1).

II. Organization of the review

8. As mandated by Executive Body decision 2012/12, applications for adjustments submitted by Parties are subject to expert review. Technical coordination of and support for the 2019 review was provided by the Centre on Emission Inventories and Projections, led by Ms. Katarina Mareckova (Slovakia). The members of the review team were selected from the experts appointed to the Centre on Emission Inventories and Projections roster of experts by the Parties.

9. The adjustment review was performed in parallel with the stage 3 review. The Expert Review Team was composed of a lead reviewer, Ms. Kristina Saarinen (Finland) and eight sectoral experts: Ms. Magdalena Zimakowska-Laskowska, transport (Poland); Mr. Giorgos Melios, transport (European Union); Mr. Jean Marc André, transport (France), Mr. Benjamin Cuniasse, stationary combustion (France); Mr. Kees Peek, stationary combustion (Netherlands); Ms. Simone Haider, agriculture (Austria); Ms. Rikke Albrektsen, agriculture (Denmark); and Ms. Lotte Lagerwerf, agriculture (Netherlands). The team assessed:

- (a) New adjustment applications submitted in 2019;
- (b) Adjustments approved prior to 2019.

10. Each sector was reviewed by two independent sectoral experts during May and June 2019 (desk review). The findings were discussed at a meeting held at the European Environment Agency in Copenhagen from 24 to 28 June 2019. The conclusions and recommendations from the review for submission to the EMEP Steering Body were discussed during the review week. They are summarized in chapters III and IV below.

11. The Centre on Emission Inventories and Projections has updated a dedicated web page¹ for the review process, which provides an introduction, links to documentation and other information on the adjustments submitted by Parties in 2019 and those approved prior to 2019, as well as the tool used by the reviewers in assessing adjustment applications approved prior to 2019.

III. Assessment of new adjustment applications of the Netherlands

12. The Netherlands submitted new adjustment applications to the secretariat in early 2019. The Party applied for adjustments to its national emission inventory. For the details of the applications, see table 1 below.

¹ See www.ceip.at/adjustments_gp (last updated in June 2019).

Table 1
New applications for adjustments to emission inventories in 2019

Country	Sector	NFR	Pollutant	Years	Extraordinary circumstances (decision 2012/3, para. 6(a))
Netherlands	Agriculture	3.B	NMVOC	2010–2017	New emission source category
Netherlands	Agriculture	3.D.	NMVOC	2010–2017	New emission source category
Netherlands	Agriculture	3.B.3	NH ₃	2017	Significant changes in methodology
Netherlands	Agriculture	3.D.a.4	NH ₃	2014–2017	New emission source category
Netherlands	Agriculture	3.D.e.3	NH ₃	2017	New emission source category

Abbreviations: NFR –Nomenclature for Reporting, NMVOC, non-methane volatile organic compound; NH₃, ammonia.

^a For a description of source categories, see European Environment Agency, *EMEP/EEA air pollutant emission inventory guidebook: 2016. Technical guidance to prepare national emission inventories*, Report No. 21/2016 (Luxembourg, Publications Office of the European Union, 2016). Available at www.eea.europa.eu/publications/emep-eea-guidebook-2016; and annex 1 to Reporting Guidelines.

13. The Expert Review Team conducted a full and thorough assessment of the application of the Netherlands for an adjustment to its NMVOC emissions inventory for 2010–2017 and NH₃ emissions inventory for 2014–2017, for:

(a) NMVOC manure management (3B1a-b, 3B2, 3B3 and 3B4d-h) and crop production and agricultural soils (3Da2a, 3Da3, 3Dc and 3De);

(b) NH₃ manure management (3.B.3), crop residues applied to soils (3.D.a.4) and cultivated crops (3.D.e).

14. During the review, revised data and an updated chapter for the informative inventory report were received from the Netherlands and included in the assessment. In the 2019 submission, the Netherlands included NMVOC emissions from manure management (3.B), animal manure applied to soil (3.D.a.2.a), urine and dung deposited by grazing animals (3.D.a.3), farm-level agricultural operations, including storage, handling and transport of agricultural products (3.D.c) and cultivated crops (3.D.e) in its inventory in accordance with the methodology presented in the 2016 *EMEP/EEA air pollutant emission inventory guidebook* (2016 Guidebook) and has identified these as new sources that were not accounted for when its emission reduction commitments were set. The second edition of the Guidebook (*EMEP/CORINAIR Atmospheric Emission Inventory Guidebook 1999* (1999 Guidebook))² did not provide methodologies for estimating NMVOCs from these sources.

15. The Netherlands included NH₃ from treatment of manure in manure management for swine (3.B.3), crop residues applied to soils (3.D.a.4) and cultivated crops (3.D.e) in its inventory based on a national methodology, given that no methodologies are given in the 2016 Guidebook. Emission from manure management for swine (3.B.3) is identified as a significantly different methodology and emissions from crop residues (3.D.a.4) and cultivated crops (3.D.e) are identified as new sources, which were not accounted for when the emission reduction commitments of the Netherlands were set. The second edition of the

² European Environment Agency, *EMEP/CORINAIR Atmospheric Emission Inventory Guidebook 1999*, Technical report No. 30 (Copenhagen, 1999). Available at: www.eea.europa.eu/publications/EMEPCORINAIR.

EMEP/CORINAIR Atmospheric Emission Inventory Guidebook 1999 (1999 Guidebook)² did not provide methodologies for estimating NH₃ from these sources.

16. The Netherlands indicate that, if the proposed adjustments are accepted, its national total of NMVOC and NH₃ emissions will be below the emission ceiling in accordance with the Gothenburg Protocol as from 2010, for NMVOCs, and as from 2014, for NH₃. The Expert Review Team concluded that the adjustment applications met all of the requirements set out in decision 2012/12 and in the Technical Guidance and therefore recommended that the EMEP Steering Body accept these adjustment applications.

Table 2

Impact of adjustments on the NMVOC and NH₃ emission inventories of the Netherlands for 2010-2017

(Thousands of tonnes)

Reference number	Pollutant	NFR	2010	2011	2012	2013	2014	2015	2016	2017
Netherlands 1	NMVOC	3.B	-59.330	-58.667	-59.166	-51.359	-45.003	-54.898	-58.274	-57.515
Netherlands 2	NMVOC	3.D	-23.184	-22.627	-22.067	-24.004	-22.654	-24.225	-14.417	-14.349
Netherlands 3	NH ₃	3.B.3	..	..	..	..	..	..	..	-0.487
Netherlands 4	NH ₃	3.D.a.4	..	..	..	..	-2.153	-1.851	-2.007	-2.345
Netherlands 5	NH ₃	3.D.e	..	..	..	..	..	..	..	-1.821
Total	NMVOC		-82.514	-81.294	-81.233	-75.363	-67.657	-79.123	-72.691	-71.864
Total	NH₃		N/A	N/A	N/A	N/A	-2.153	-1.851	-2.007	-4.654

Abbreviations: N/A, not applicable; NFR, Nomenclature for Reporting; NMVOC, non-methane volatile organic compound; NH₃, ammonia.

IV. Assessment of adjustments approved prior to 2019

17. The reviewers assessed the adjustments reported by Belgium, Denmark, Finland, France, Germany, Hungary, Luxembourg, Spain and the United Kingdom of Great Britain and Northern Ireland that had been approved prior to 2019, as reported in annex VII to the reporting guidelines.³ Details on these adjustments may be downloaded from the Centre on Emission Inventories and Projections website. A summary is presented in table 5 below.

A. Belgium – road transport (1.A.3.b.i–iv)

18. The reviewers conducted an assessment of the adjustment of NO_x emissions from road transport (1.A.3.b.i–iv) for Belgium based on significant changes in emission factors. The adjustment had been recalculated and adjustment values decreased by 0.003 per cent for 2010 and increased by 0.23 per cent for 2015 compared to the last approved version (2018). Belgium explained that those differences had resulted from changes in mobility data and updates in biofuels blends. The emissions were estimated using the methodology previously presented to and approved by the Expert Review Team. The reviewers therefore concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that the application met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted.

³ See www.ceip.at/reportinginstructions/annexes-to-the-reporting-guidelines/.

B. Belgium – manure management (3.B), agricultural soils (3.D.a.1 and 3.D.a.2.a) and cultivated crops (3.D.e)

19. The reviewers conducted an assessment of the adjustment for Belgium, based on a new source, for:

(a) NO_x emissions from manure management (3.B), inorganic N-fertilizers (includes also urea application) (3.D.a.1) and animal manure applied to soils (3.D.a.2.a);

(b) NMVOC from manure management (3.B) and cultivated crops (3.D.e).

20. Belgium provided a declaration stating that the criteria and methodologies used in the calculation of adjustments for the period 2010–2016 for all sectors and pollutants were unchanged from the year in which the adjustments had been approved. The reviewers noted that recalculations with an impact on quantification of the adjustment (revisions to livestock numbers in Flanders for 2014 and 2015, correction of the amount of excreted nitrogen (N) from poultry in Flanders for 2013 and a downward revision of the amount of organic fertilizer used in Wallonia) had been made. They were satisfied with the explanations provided and concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted.

C. Denmark – inorganic N-Fertilizers (3.D.a.1), cultivated crops (3.D.e) and manure management (3.B)

21. The reviewers conducted an assessment of the adjustment for Denmark for:

(a) NH₃ emissions from inorganic N-fertilizers (3.D.a.1) and cultivated crops (3.D.e) based on significantly different emission factors and new sources, respectively;

(b) NMVOC emissions from cultivated crops (3.D.e) based on a new source.

22. For NH₃ from inorganic N-fertilizers, no recalculations have been carried out compared to the previous year. NH₃ emissions from cultivated crops also remained unchanged. In summary, the adjustments regarding NH₃ were not changed from the values approved in 2018.

23. For NMVOC, slightly revised livestock data had resulted in a very small decrease of about 0.13 per cent changes for the year 2016 in the adjustment compared to the earlier version (2018). The reviewers concluded that there had been no change in the methodologies that would alter the original approval of the adjustment applications and that they met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustments continue to be accepted.

D. Finland – stationary combustion (1.A.4.a.i, 1.A.4.b.i and 1.A.4.c.i)

24. The reviewers conducted an assessment of the NH₃ emissions adjustments for Finland based on significant revisions to emission factors originally approved in 2015 for source categories:

(a) commercial/industrial stationary combustion (1.A.4.a.i);

(b) residential stationary combustion (1.A.4.b.i);

(c) agriculture/forestry/fishing stationary combustion (1.A.4.c.i).

25. The adjustments have been recalculated comparing them to previous submission owing to updated activity data, and to corrected emission factors due to new carbon monoxide emission factors measurement data from which NH₃ emission factors are deduced. In total values, the adjustments have increased by 80.2–107.4 per cent (in the period 2010–2016, see table 3 below). Finland provided an explanation of these recalculations; all relevant information concerning these changes was provided in the Declaration on consistent

reporting of approved adjustments and the reviewers concluded that there has been no change in the methodology that changes the original approval of the adjustment application. The reviewers concluded that the adjustments met all the requirements laid out in Executive Body decision 2012/12 and in the Technical Guidance. It is recommended that the adjustments continue to be accepted.

Table 3

Finland stationary combustion (1.A.4.a.i, 1.A.4.b.i and 1.A.4.c.i) - difference to submission 2018

	<i>Years</i>							
	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
Adjustments reported 2019 (Thousands of tons)	-0.862	-0.740	-0.789	-0.706	-0.722	-0.699	-0.772	-0.746
Latest approved version (2018) (Thousands of tons)	-0.479	-0.372	-0.391	-0.340	-0.353	-0.339	-0.381	..
Difference (Percentage)	80.2	98.7	101.6	107.4	104.7	106.2	102.4	..

E. Finland – road transport (1.A.3.b.i–iv)

26. The reviewers conducted an assessment of the NH₃ emissions adjustments for Finland for passenger cars (1.A.3.b.i), light duty vehicles (1.A.3.b.ii), heavy duty vehicles and buses (1.A.3.b.iii) and mopeds and motorcycles (1.A.3.b.iv) based on significant changes in emission factors. The adjustment had been recalculated and values had increased by 0.7– 1.3 per cent for the period 2010–2016. Finland explained that those differences had resulted from updates in emissions factors and activity data (revised mileage in the national road transport emissions model). The emissions were estimated using the methodology previously approved by the Expert Review Team.

27. The reviewers concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. The reviewers recommended that the adjustment continue to be accepted.

F. France – road transport (1.A.3.b.i–iv)

28. The reviewers conducted an assessment of the adjustment for France with respect to NO_x emissions from road transport based on significant changes in emission factors. The informative inventory report indicates that the methodology is unchanged from last year’s submission, which is already approved by the Expert Review Team. Recalculations occurred for the whole time series (2010–2016) and are in the range of 2–5 per cent. These recalculations are explained in the informative inventory report and are due to addition of new vehicles and the update of the network usage of light commercial vehicles.

29. Therefore, the Expert Review Team concluded that there has been no change in the methodology that would alter the original approval of the adjustment and that the application met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. Consequently, the Expert Review Team recommends that the adjustment continue to be accepted.

G. Germany – road transport (1.A.3.b.i–iv)

30. The reviewers conducted an assessment of the adjustment for Germany for NO_x emissions from road transport based on significant changes in emission factors. The adjustment was slightly recalculated and adjustment values increased or decreased in range from -0.001 to -0.042 per cent compared with the last approved version (2018). Germany explained that those differences had resulted from changes in emissions factors and the Transport Emission Model equations as initial methodology. The emissions were estimated using the previously presented methodology and approved by the Expert Review Team. During the review, more detailed information was requested from Germany, and Germany provided that information. The reviewers therefore concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. The reviewers recommended that the adjustment continue to be accepted.

H. Germany – manure management (3.B), crop production and agricultural soils (3.D) and storage of energy crops (3.I)

31. The reviewers conducted an assessment of the adjustment for Germany for:

(a) NO_x from manure management, (3.B), agricultural soils (3.D), and storage of energy crops (3.I) based on new sources;

(b) NH₃ from crop production and agricultural soils (3.D) and storage of energy crops (3.I) based on significant revisions to emission factors and a new source, respectively;

(c) NMVOCs from manure management (3.B) and crop production and agricultural soils (3.D) based on new sources.

32. The Declaration on consistent reporting of approved adjustments that Germany submitted states that the methods and emission factors used for the calculation of emissions for the period 2010–2017 are the same for all sectors and pollutants as in the year the adjustments were approved. For NMVOCs no changes were observed.

33. However, for NO_x and NH₃ some recalculations of the activity data and emission factors were made, which resulted in changes over the time period. For all cattle categories multiple characteristics were updated, namely; energy requirements, animal numbers, amount of bedding materials, milk yield and feed characteristics. For swine, a slight shift of animal numbers between animal categories took place and performance data was updated. Also, there was the meat production of broilers, updated in 2016 only. For anaerobic digestion the activity data was updated for all years and, lastly, the activity data of application of sewage sludge to soils was updated in 2016.

34. The reviewers concluded that there had been no change in the methodologies that would alter the original approval of the adjustment applications and that all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance were met. It is recommended that the adjustments continue to be accepted.

I Hungary - manure management (3.B) and cultivated crops (3.D.e)

35. The Expert Review Team conducted an assessment of the application of Hungary for an adjustment to its NMVOC emissions inventory for 2010–2017, based on new sources, for manure management (3.B) and for cultivated crops (3.D.e). In the 2019 submission, there were no recalculations to originally approved adjustments. The reviewers therefore concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted.

J. Luxembourg – road transport (1.A.3.b.i–iv)

36. The reviewers conducted an assessment of the adjustment for Luxembourg with respect to NO_x emissions from road transport based on a significant change in emission factors. The reviewers noted no recalculations for the period 2010–2016. The reviewers concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted.

K. Luxembourg – manure management (3.B), crop production and agricultural soils (3.D) and cultivated crops (3.D.e.)

37. The reviewers conducted an assessment of the adjustment for Luxembourg with regard to:

(a) NO_x from manure management (3B) and crop production and agricultural soils (3.D.a.1, 3.D.a.2.a, 3.D.a.2.b and 3.D.a.2.c);

(b) Non-methane volatile organic compound emissions from manure management (3.B) and cultivated crops (3.D.e).

38. Nitrogen oxides emissions from manure management (3.B) had been calculated using the 2016 Guidebook Tier 2 methodology. Recalculations have been made for the entire time series and the adjusted values increased by 29–34 per cent. The informative inventory report for 2019 of Luxembourg states and documents that there have been some changes in activity data and emission factors/parameters due to improvements. Furthermore, a complete quality assurance/quality check analysis had been carried out as some errors were corrected in the calculation model for estimating amount of total ammoniacal nitrogen (steps 5 and 7 of EMEP/EEA Guidebook on manure management). The reviewers concluded that there had been no change in the methodology on estimation of NO_x that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted with the corrected figures.

39. Nitrogen oxides emissions from crop production and agricultural soils (3.D.a.1, 3.D.a.2.a, 3.D.a.2.b, 3.D.a.2.c, 3.D.a.3, and 3.D.a.4) using the Tier 1 methodology. Recalculations have been made for the entire time series and the adjusted values increased by 5–8 per cent. The reviewers concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted with the corrected figures.

40. Non-methane volatile organic compound emissions from manure management (3B) had been recalculated for the entire time series due to updated activity data. The adjustment values decreased by 20 per cent compared with the last approved version (2018). The reviewers concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. they recommended that the adjustment continue to be accepted with the corrected figures.

41. The informative inventory report provides full details of the emission factor used to calculate NMVOC emissions from cultivated crops (3.D.e) and no recalculations have been made. The reviewers therefore concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted.

L. Spain – road transport (1.A.3.b.i and 1.A.3.b.iii)

42. The reviewers conducted an assessment of the adjustment for Spain with respect to NO_x emissions from passenger cars (1.A.3.b.i) and heavy-duty vehicles (1.A.3.b.iii) based on significant changes in emission factors. The informative inventory report indicates that the methodology is unchanged from last year's submission, which is already approved by the Expert Review Team. Recalculations occurred for the whole time series (2010–2015) and are in the range of 7–19 per cent for 1.A.3.b.i and of 0.1–1 per cent for 1.A.3.b.iii. Spain has stated that these recalculations are due to the update of the Computer Programme to calculate Emissions from Road Transport 4 equations and parameters introduced by the May 2017 version of the 2016 Guidebook and to the inclusion of Euro 6/VI vehicle technologies. The reviewers concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance; they recommended that the adjustment continue to be accepted.

M. Spain – manure management (3.B)

43. The reviewers conducted an assessment of the adjustment for Spain with respect to NO_x emissions from manure management (3.B) based on a new source. The reviewers conducted an assessment of the adjustment for Spain with respect to NO_x emissions from manure management (3.B) based on a new source. The adjustment has been recalculated and the adjustment values increased by 7–12 per cent compared with the last approved version (2018). Spain explained that the recalculation of NO_x is related to changes in estimation of nitrogen emission in manure management systems but not to changes in the methodology in estimating NO_x. The reviewers therefore concluded that there had been no change in the methodology that would alter the original approval of the adjustment application and that it met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. They recommended that the adjustment continue to be accepted.

N United Kingdom of Great Britain and Northern Ireland – road transport (1.A.3.b.i–iv)

44. The Expert Review Team conducted an assessment of the application by the United Kingdom of Great Britain and Northern Ireland for an adjustment to its NO_x emissions inventory for 2010 for road transport (1.A.3.b.i–iv) based on significant changes in emission factors.

45. The adjustment was recalculated comparing to 2018 submission (due to revision of underlying data) and the adjustments have values increased (by 0.185 per cent for 2010) compared to the last approved version (2018). Additionally, in the 2019 submission, the United Kingdom of Great Britain and Northern Ireland inventory also exceeds the 2010 NO_x ceiling for the year 2012, therefore an adjustment was provided for the year 2012 in addition to the year 2010. The United Kingdom of Great Britain and Northern Ireland explained that those differences had resulted from changes in activity data. The emissions were estimated using the methodology already approved by the Expert Review Team during previous review. The reviewers therefore concluded that there had been no change in the principle that would alter the original approval of the adjustment application and that the application met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. They recommended that the adjustment continue to be accepted.

V. Conclusions and recommendations

A. 2019 adjustment cases

46. Adjustment applications made by the Netherlands in 2019 were thoroughly assessed. The Expert Review Team determined that additional information was needed and the Party

provided the requested information during the review. Table 4 below provides a summary of the new adjustment applications received in 2019 and the resulting Expert Review Team recommendations to the EMEP Steering Body.

Table 4

Expert Review Team recommendations on adjustment applications received in 2019

<i>Country</i>	<i>Sector</i>	<i>NFR</i>	<i>Pollutant</i>	<i>Years</i>	<i>Expert Review Team recommendation</i>
Netherlands	Agriculture	3.B	NMVOG	2010–2017	Accept
Netherlands	Agriculture	3.D	NMVOG	2010–2017	Accept
Netherlands	Agriculture	3.B.3	NH ₃	2017	Accept
Netherlands	Agriculture	3.D.a.4	NH ₃	2014–2017	Accept
Netherlands	Agriculture	3.D.e	NH ₃	2017	Accept

Abbreviations: NH₃, ammonia; NMVOG, non-methane volatile organic compound.

47. The detailed conclusions and recommendations regarding the 2019 adjustment applications may be found in chapter III of the present report. The Expert Review Team has prepared country-specific reports explaining the findings, which will be made available to the Netherlands and published on the Centre on Emission Inventories and Projections website. They will also be available as informal documents for the fifth joint session of the EMEP Steering Body and the Working Group on Effects (Geneva, 9–13 September 2019).

B. Adjustment cases approved prior to 2019

48. This section provides a summary of the emissions adjustments reported by Belgium, Denmark, Finland, France, Germany, Hungary, Luxembourg, Spain and the United Kingdom of Great Britain and Northern Ireland accepted by the Expert Review Team during the review performed in May and June 2019. The reported adjustments refer to NO_x, NMVOG and NH₃ emissions for various Nomenclature for Reporting sectors. More detailed information on each reported adjustment may be found in chapter IV of the present report.

49. The Expert Review Team assessed the reported data and concluded that the adjustments met all of the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. It therefore recommended that the EMEP Steering Body accept all of the adjustments reported by Belgium, Denmark, Finland, France, Germany, Hungary, Luxembourg, Spain and the United Kingdom of Great Britain and Northern Ireland (see table 5 below).

Table 5
Emission adjustments approved in previous years, as reported by countries in 2019
(Thousands of tons)

<i>Reference number</i>	<i>Pollutant</i>	<i>NFR</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
Belgium-1	NO _x	1.A.3.b.i-iv	-48.229	-48.158	-47.87	-49.123	-47.788	-45.163	N/A	N/A
Belgium-2	NO _x	3.B	-0.716	-0.701	-0.698	-0.703	-0.71	-0.711	N/A	N/A
Belgium-3	NO _x	3.D.a.1	-5.969	-5.75	-5.723	-5.992	-6.079	-6.113	N/A	N/A
Belgium-4	NO _x	3.D.a.2.a	-6.942	-6.66	-6.45	-6.391	-6.364	-6.273	N/A	N/A
Belgium-B	NMVOG	3.B	..	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Belgium-C	NMVOG	3.D.e	..	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	NO_x		-61.855	-61.268	-60.741	-62.209	-60.941	-58.259	N/A	N/A
Total	NMVOG		0.000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Denmark_01	NH ₃	3.D.a.1	-2.14	-1.691	-1.593	-2.118	-2.459	-2.23	-2.841	-2.317
Denmark_02	NH ₃	3.D.e	-5.407	-5.419	-5.401	-5.375	-5.452	-5.4	-5.407	-5.409
Denmark_03	NMVOG	3.B	-35.436	-35.306	-35.663	-35.842	-35.714	-35.79	-35.829	-36.326
Total	NH₃		-7.547	-7.110	-6.994	-7.492	-7.911	-7.63	-8.248	-7.726
Total	NMVOG		-35.436	-35.306	-35.663	-35.842	-35.714	-35.790	-35.829	-36.326
Finland 12-14	NH ₃	1.A.4	-0.863	-0.739	-0.789	-0.706	-0.722	-0.699	-0.771	-0.746
Finland 15-18	NH ₃	1.A.3.b.i-iv	-1.515	-1.403	-1.274	-1.176	-1.098	-1.004	-0.915	-0.833
Total	NH₃		-2.378	-2.142	-2.063	-1.882	-1.820	-1.703	-1.686	-1.579
France	NO _x	1.A.3.b.i-iv	-140.903	-144.895	-147.488	-160.004	-159.76	-155.742	-144.978	N/A
Total	NO_x		-140.903	-144.895	-147.488	-160.004	-159.760	-155.742	-144.978	N/A
Germany-A	NO _x	1.A.3.b	-172.332	-174.452	-177.417	-180.346	-171.396	-148.783	-123.270	-93.679

<i>Reference number</i>	<i>Pollutant</i>	<i>NFR</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
Germany-B	NO _x	3.B	-1.623	-1.595	-1.574	-1.572	-1.580	-1.564	-1.555	-1.542
Germany-C	NO _x	3.D	-113.788	-124.118	-119.843	-122.589	-124.757	-130.896	-126.194	-124.072
Germany-D	NO _x	3.I	-0.161	-0.183	-0.154	-0.176	-0.174	-0.178	-0.176	-0.178
Germany-B	NMVOC	3.B	-191.736	-191.699	-194.108	-198.356	-198.946	-197.118	-194.505	-192.731
Germany-C	NMVOC	3.D	-9.491	-8.992	-10.021	-10.323	-11.340	-9.846	-9.632	-9.677
Germany-D	NH ₃	3.D	-36.939	-46.340	-48.454	-56.416	-57.107	-57.721	-57.413	-58.295
Germany-D	NH ₃	3.I	-2.999	-3.401	-2.877	-3.277	-3.248	-3.313	-3.270	-3.315
Total	NO_x		-287.904	-300.348	-298.988	-304.682	-297.907	-281.421	-251.195	-219.471
Total	NMVOC		-201.227	-200.691	-204.130	-208.679	-210.286	-206.964	-204.137	-202.407
Total	NH₃		-39.9385	-49.741	-51.331	-59.692	-60.355	-61.034	-60.683	-61.609
Hungary-01	NMVOC	3.B	-21.573	-21.359	-21.408	-21.441	-21.992	-22.674	-22.908	-22.6
Hungary-02	NMVOC	3.D.e	-3.633	-3.57	-3.618	-3.613	-3.635	-3.579	-3.547	-3.589
Total	NMVOC		-25.206	-24.929	-25.026	-25.054	-25.627	-26.253	-26.455	-26.189
Luxembourg	NO _x	1.A.3.b.i-iv	-2.849	-3.076	-3.243	-3.344	-3.456	-3.327	-3.102	-2.860
Luxembourg	NO _x	3.B	-0.073	-0.071	-0.069	-0.070	-0.072	-0.073	-0.073	-0.074
Luxembourg	NO _x	3.D.a.1, 3.D.a.2.a, 3.D.a.2.b, 3.D.a.2.c	-0.976	-1.018	-0.989	-0.978	-0.970	-0.961	-1.009	-1.001
Luxembourg	NMVOC	3.B	-3.074	-2.963	-2.888	-2.977	-3.085	-3.160	-3.216	-3.265
Luxembourg	NMVOC	3.D.e	-0.113	-0.113	-0.113	-0.113	-0.113	-0.113	-0.112	-0.113
Total	NO_x		-3.898	-4.164	-4.301	-4.392	-4.498	-4.361	-4.184	-3.935
Total	NMVOC		-3.187	-3.076	-3.001	-3.090	-3.198	-3.273	-3.329	-3.378

<i>Reference number</i>	<i>Pollutant</i>	<i>NFR</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
Spain 1-2	NO _x	1.A.3.b.i, 1.A.3.b.iii	-142.610	-132.070	-119.560	-110.030	-104.630	-94.950	-81.990	-68.980
Spain 3-11	NO _x	3.B	-4.377	-4.290	-4.254	-4.188	-4.277	-4.417	-4.586	-4.610
Total	NO_x		-146.987	-136.360	-123.814	-114.218	-108.907	-99.367	-86.576	-73.590
United Kingdom	NO _x	1.A.3.b.i–iv	-102.402	N/A	-99.877	N/A	N/A	N/A	N/A	N/A
Total	NO_x		-102.402	N/A	-99.877	N/A	N/A	N/A	N/A	N/A

Abbreviations: N/A, not applicable; NH₃, ammonia; NMVOC, non-methane volatile organic compound; NO_x, nitrogen oxides.
^a figures as revised by the Expert Review Team.

C. Recommendations from the reviewers

50. The declarations on consistent reporting of approved adjustments that had been provided by countries on a voluntary basis were evaluated by the reviewers and made the assessment process more efficient. It is recommended that the Steering Body continue to encourage countries to submit these declarations annually, together with the completed annex VII to the reporting guidelines.

51. In the road transport sector, Parties should provide transparent information on assumed emission factors, particularly when making original emission estimates for years in which the emission factors available in the original models are not applicable. For this calculation, the reviewers consider it best practice to continue to use Euro 4 emission factors, which reflect the information available at the time, rather than those established after the 2010 emission ceilings were agreed.

52. The reviewers recognized that more detailed information should accompany annex VII to the reporting guidelines where countries recalculate emissions owing to a shift to a higher tier method, improved activity data or a move to country-specific methods. Parties should submit such information annually by the deadline of 15 March so that it can be reviewed in May and June of the same year.

53. It is important that Parties continue to use the same reporting format – i.e. the same units and level of disaggregation across the emission source sectors – for information on previously approved adjustments. The data-handling systems cannot process the information provided in different submissions unless it is reported in a consistent manner.

54. There is still a high demand for Expert Review Team adjustment reviews and unless countries provide complete, sufficient and detailed (NFR categories) information in a timely manner and sufficient resources for reviewers, it may not be possible for adjustment applications to be reviewed and recommendations provided to the EMEP Steering Body in the year of submission.
