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## Economic Commission for Europe

Executive Body for the Convention on Long-range  
Transboundary Air Pollution

**Steering Body to the Cooperative Programme for  
Monitoring and Evaluation of the Long-range  
Transmission of Air Pollutants in Europe**

**Working Group on Effects**

**Eighth joint session**

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Item 10 (a) (i) of the provisional agenda

**Progress in activities of the Cooperative Programme for Monitoring  
and Evaluation of the Long-range Transmission of Air Pollutants  
in Europe in 2022 and future work: improvement and reporting  
of emission data and adjustments under the Protocol to Abate Acidification,  
Eutrophication and Ground-level Ozone: adjustments under the Protocol to  
Abate Acidification, Eutrophication and Ground-level Ozone**

### **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 2022–2023 workplan for the implementation of the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/148/Add.1).

The report provides a summary of the 2022 review of applications for adjustments to emission inventories submitted by Denmark, the Netherlands, France and the United Kingdom in accordance with Executive Body decisions 2012/3, 2012/4 and 2012/12, as amended by Executive Body decision 2014/1.<sup>a</sup>

The review is based on documents submitted by Parties and findings of the Expert Review Team.

<sup>a</sup> Available at [www.unece.org/env/lrtap/executivebody/eb\\_decision.html](http://www.unece.org/env/lrtap/executivebody/eb_decision.html).

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\* The present document is being issued without formal editing.



## 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<sup>1</sup> 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 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) to the Convention on Long-range Transboundary Air Pollution.
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, 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, 8–11 December 2014), the Executive Body therefore adopted decision 2014/1 on improving the guidance for adjustments. 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. The amended Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) entered into force on 7 October 2019. Tables 2–6 of annex II to the amended Protocol set out the emission reduction commitments for SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub>, NMVOCs and PM<sub>2.5</sub> for 2020 and beyond, expressed as percentage reductions from the 2005 emission level. The Task Force on Emission Inventories and Projections prepared updated technical guidance for inventory adjustments in the context of emission reduction commitments. An advanced version of this technical guidance was made available<sup>2</sup> in 2022 for Parties to use prior to the planned adoption of the guidance at the Executive Body meeting in December 2022.
5. 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;<sup>3</sup>
  - (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 from 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.<sup>4</sup>
6. 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

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<sup>1</sup> All Executive Body decisions referred to in the present document are available at [www.unece.org/env/lrtap/executivebody/eb\\_decision.html](http://www.unece.org/env/lrtap/executivebody/eb_decision.html).

<sup>2</sup> <https://www.ceip.at/technical-guidance-adjustments-erc>.

<sup>3</sup> For a more detailed definition, see Executive Body decision 2014/1, annex, para. 3.

<sup>4</sup> ECE/EB.AIR/130, para. 5.

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).

7. The present report summarizes the review of the inventory adjustment applications submitted by Denmark, the Netherlands, France and the United Kingdom in 2022 in accordance with Executive Body decisions 2012/3, 2012/4, 2012/12 and 2014/1 and in the light of the Technical Guidance.

8. The report is based on the documents submitted by Parties and those prepared by the Expert Review Team (ERT) during the review process in 2022. It was prepared by the EMEP Centre on Emission Inventories and Projections in line with its revised mandate (Executive Body decision 2019/14).

## **II. Organization of the review**

9. 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 2022 review was provided by the Centre on Emission Inventories and Projections, represented by Ms. Sabine Schindlbacher. 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.

10. The adjustment expert review team was composed of a lead reviewer Ms. Kristina Saarinen (Finland) and three sector experts for agriculture: Ms. Simone Mayer (Austria), Ms. Anđelka Radosavljević (Serbia) and Mr. Tim van der Zee (Netherlands). The conclusions and recommendations from the review for submission to the EMEP Steering Body are summarized in sections III and IV below.

11. The Centre on Emission Inventories and Projections has updated a dedicated web page<sup>5</sup> for the review process, which provides an introduction, links to documentation and other information on the adjustments submitted by Parties in 2022 and those approved prior to 2022, as well as the tool used by the reviewers in assessing adjustment applications approved prior to 2022.

## **III. Assessment of new adjustment applications**

### **A. Denmark – manure management - dairy cattle (3.B.1.a)**

12. Denmark notified the secretariat through the ECE Executive Secretary of its intention to apply for a new adjustment within the legal deadline on 15 February 2022. Denmark submitted a new adjustment application in annex IIa to the secretariat on 15 February 2022. All supporting information requested by decision 2012/12 was provided as part of the Informative Inventory Report before the legal deadline of 15 March of the same year that it is being submitted for review by the EMEP Steering Body (decision 2012/12, annex, para. 1). The Party applied for adjustments to its national emission inventory. For details of the applications, see table 1 below.

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<sup>5</sup> See [www.ceip.at/gothenburg-protocol/review-of-adjustments](http://www.ceip.at/gothenburg-protocol/review-of-adjustments) (last updated in May 2022).

Table 1  
**New applications for adjustments to emission inventories in 2022**

| Country | Sector      | Nomenclature<br>for reporting | Pollutant | Years      | Extraordinary circumstances (decision<br>2012/3, para. 6 (a)) |
|---------|-------------|-------------------------------|-----------|------------|---|
| Denmark | Agriculture | 3.B.1.a                       | NMVOG     | 2005, 2020 | New emission source category                                  |

*Abbreviations:* NMVOG, Non-methane volatile organic compounds.

*Notes:* For a description of source categories, see European Environment Agency (EEA), *EMEP/EEA air pollutant emission inventory guidebook: 2019. Technical guidance to prepare national emission inventories*, Report No. 13/2019 (Luxembourg, Publications Office of the European Union, 2019). Available at <https://www.eea.europa.eu/publications/emep-eea-guidebook-2019>; and annex I to the Guidelines for Reporting Emissions and Projections Data under the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/125). Available at <https://www.ceip.at/reporting-instructions/annexes-to-the-2014-reporting-guidelines>.

13. The ERT undertook a full and thorough assessment of the application by Denmark for an adjustment to its NMVOG emissions inventory for the years 2005 and 2020 for sector 3.B.1.a Manure management – dairy cattle.

14. The new NMVOG adjustment for Manure management – dairy cattle (3.B.1.a) has been justified with the explanation that this is a new source compared to when the emission reduction commitments were set. As specified in the "Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments"<sup>6</sup> the reference version of the EMEP/EEA Guidebook for adjustment applications under the amended Gothenburg Protocol is the EMEP/EEA 2009 version (EMEP/EEA 2009). No default emission factors were available for NMVOG emissions from animal husbandry and manure management in the EMEP/EEA 2009 Guidebook and Denmark did not report emissions at the time the emission reduction commitments were set.

15. The ERT reviewed the quantification of the emissions adjustments provided by the Denmark. The ERT concluded that the information provided was accurate and error free, and was consistent with the current EMEP/EEA Emissions Inventory Guidebook and scientific literature. The ERT recommends the EMEP SB to accept new adjustment applications submitted by Denmark. An overview of the impact of the adjustment on the NMVOG emission inventory for the years 2005 and 2020 is given in table 2 below.

Table 2  
**Impact of adjustments on the NMVOG emission inventory of Denmark for the year 2005 and 2020**

|   | Unit             | 2005 | 2020        |
|---|------------------|------|-------------|
| <b>ERC</b>                                | <b>% of 2005</b> |      | <b>-35%</b> |
| ERC unadjusted                            | (kt)             |      | 100         |
| NT for Compliance unadjusted              | (kt)             | 155  | 107         |
| <b>Gap to ERC unadjusted</b>              | <b>(%)</b>       |      | <b>-6%</b>  |
| ERC adjusted                              | (kt)             |      | 87          |
| Adjusted NT for Compliance                | (kt)             | 135  | 83          |
| <b>Gap to ERC adjusted</b>                | <b>(%)</b>       |      | <b>6%</b>   |
| Impact of adjustment on NT for Compliance | (kt)             | -20  | -24         |

*Notes:* ERC: emission reduction commitment, NT: National total

<sup>6</sup> Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments, available at: <https://www.ceip.at/gothenburg-protocol/adjustments>

## B. France – Manure management (3.B) and Crop production and agricultural soils (3.D)

16. France notified the secretariat through the ECE Executive Secretary of its intention to apply for a new adjustment within the legal deadline on 10 February 2022. France submitted a new adjustment application in annex IIa to the secretariat on 10 February 2022. All supporting information requested by decision 2012/12 was provided as part of the Informative Inventory Report before the legal deadline of 15 March of the same year that it is being submitted for review by the EMEP Steering Body (decision 2012/12, annex, para. 1). The Party applied for adjustments to its national emission inventory. For details of the applications, see table 3 below.

Table 3

### New applications for adjustments to emission inventories in 2022

| Country | Sector      | Nomenclature for reporting | Pollutant | Years      | Extraordinary circumstances (decision 2012/3, para. 6 (a)) |
|---------|-------------|----------------------------|-----------|------------|--|
| France  | Agriculture | 3.B<br>3.D                 | NMVOC     | 2005, 2020 | New emission source category                               |

*Abbreviations:* NMVOC, Non-methane volatile organic compounds.

17. The ERT undertook a full and thorough assessment of the application by France for an adjustment to its NMVOC emissions inventory for the years 2005 and 2020 for the sector 3.B Manure management and 3.D Crop production and agricultural soils.

18. The new NMVOC adjustment for Manure management (3.B) and Crop production and agricultural soils (3.D) has been justified with the explanation that this is a new source compared to when the emission reduction commitments were set. As specified in the "Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments"<sup>7</sup> the reference version of the EMEP/EEA Guidebook for adjustment applications under the amended Gothenburg Protocol is the EMEP/EEA 2009 version (EMEP/EEA 2009). No methodology was available for NMVOC emissions from Manure management (3.B) and Crop production and agricultural soils (3.D) in the EMEP/EEA 2009 Guidebook and France did not report emissions at the time the emission reduction commitments were set.

19. In response to a question from the review team France provided details and further background documents on the model used to calculate emissions for 3.D.e - cultivated crops. The ERT reviewed the quantification of the emissions adjustments provided by France. The ERT concluded that the information provided was accurate and error free, and was consistent with the current EMEP/EEA Emissions Inventory Guidebook and scientific literature. The ERT recommends the EMEP SB to accept the new adjustment applications submitted by France. An overview of the impact of the adjustment on the NMVOC emission inventory for the years 2005 and 2020 is given in table 4 below.

<sup>7</sup> Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments, available at: <https://www.ceip.at/gothenburg-protocol/adjustments>

Table 4  
**Impact of adjustments on the NMVOC emission inventory of France for the year 2005 and 2020**

|   | <i>Unit</i>      | <i>2005</i> | <i>2020</i> |
|---|------------------|-------------|-------------|
| <b>ERC</b>                                | <b>% of 2005</b> |             | <b>-43%</b> |
| ERC unadjusted                            | (kt)             |             | 905         |
| NT for Compliance unadjusted              | (kt)             | 1587        | 939         |
| <b>Gap to ERC unadjusted</b>              | <b>(%)</b>       |             | <b>-4%</b>  |
| ERC adjusted                              | (kt)             |             | 678         |
| Adjusted NT for Compliance                | (kt)             | 1190        | 550         |
| <b>Gap to ERC adjusted</b>                | <b>(%)</b>       |             | <b>19%</b>  |
| Impact of adjustment on NT for Compliance | (kt)             | -398        | -389        |

*Notes:* ERC: emission reduction commitment, NT: National total

### C. The Netherlands – manure management - dairy cattle (3.B.1.a)

20. The Netherlands notified the secretariat through the ECE Executive Secretary of its intention to apply for a new adjustment just after the legal deadline on 15 February 2022. The Netherlands submitted a new adjustment application in annex IIa to the secretariat on 15 March 2022. All supporting information requested by decision 2012/12 was provided as part of the Informative Inventory Report before the legal deadline of 15 March of the same year that it is being submitted for review by the EMEP Steering Body (decision 2012/12, annex, para. 1). The Party applied for adjustments to its national emission inventory. For details of the applications, see table 5 below.

Table 5  
**New applications for adjustments to emission inventories in 2022**

| <i>Country</i>  | <i>Sector</i> | <i>Nomenclature for reporting</i> | <i>Pollutant</i> | <i>Years</i> | <i>Extraordinary circumstances (decision 2012/3, para. 6 (a))</i> |
|-----------------|---------------|-----------------------------------|------------------|--------------|---|
| The Netherlands | Agriculture   | 3.B.1.a                           | NMVOC            | 2005, 2020   | New emission source category                                      |

*Abbreviations:* NMVOC, Non-methane volatile organic compounds.

21. The ERT undertook a full and thorough assessment of the application by the Netherlands for an adjustment to its NMVOC emissions inventory for the years 2005 and 2020 for sector 3.B.1.a Manure management – dairy cattle.

22. The new NMVOC adjustment for Manure management – dairy cattle (3.B.1.a) has been justified with the explanation that this is a new source compared to when the emission reduction commitments were set. As specified in the "Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments"<sup>8</sup> the reference version of the EMEP/EEA Guidebook for adjustment applications under the amended Gothenburg Protocol is the EMEP/EEA 2009 version (EMEP/EEA 2009). No default emission factors were available for NMVOC emissions from animal husbandry and manure management in the EMEP/EEA 2009 Guidebook and the Netherlands did not report emissions at the time the emission reduction commitments were set.

23. The ERT reviewed the quantification of the emissions adjustments provided by the Netherlands. In response to a question from the review team the Netherlands provided

<sup>8</sup> Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments, available at: <https://www.ceip.at/gothenburg-protocol/adjustments>

reasons for the increase in silage feeding and confirmed that the EMEP/EEA Guidebook 2019 was used. The ERT concluded that the information provided was accurate and error free, and was consistent with the current EMEP/EEA Emissions Inventory Guidebook and scientific literature. The ERT recommends the EMEP SB to accept new adjustment applications submitted by the Netherlands. An overview of the impact of the adjustment on the NMVOC emission inventory for the years 2005 and 2020 is given in table 6 below.

Table 6

**Impact of adjustments on the NMVOC emission inventory of the Netherlands for the year 2005 and 2020**

|   | Unit             | 2005 | 2020       |
|---|------------------|------|------------|
| <b>ERC</b>                                | <b>% of 2005</b> |      | <b>-8%</b> |
| ERC unadjusted                            | (kt)             |      | 251        |
| NT for Compliance unadjusted              | (kt)             | 273  | 272        |
| <b>Gap to ERC unadjusted</b>              | <b>(%)</b>       |      | <b>8%</b>  |
| ERC adjusted                              | (kt)             |      | 229        |
| Adjusted NT for Compliance                | (kt)             | 249  | 228        |
| <b>Gap to ERC adjusted</b>                | <b>(%)</b>       |      | <b>0%</b>  |
| Impact of adjustment on NT for Compliance | (kt)             | -24  | -44        |

Notes: ERC: emission reduction commitment, NT: National total

**D. The United Kingdom – Other organic fertilisers applied to soils (3.D.a.2.c)**

24. The United Kingdom notified the secretariat through the ECE Executive Secretary of its intention to apply for a new adjustment within the legal deadline on 14 February 2022. The United Kingdom submitted a new adjustment application in annex IIa to the secretariat on 15 March 2022. All supporting information, except the information on when the United Kingdom would meet its emission ceiling for NH<sub>3</sub>, requested by decision 2012/12, was provided as part of the Informative Inventory Report before the legal deadline of 15 March of the same year that it is being submitted for review by the EMEP Steering Body (decision 2012/12, annex, para. 1). The Party applied for adjustments to its national emission inventory. For details of the applications, see table 7 below.

Table 7

**New applications for adjustments to emission inventories in 2022**

| Country            | Sector      | Nomenclature for reporting | Pollutant       | Years      | Extraordinary circumstances (decision 2012/3, para. 6 (a)) |
|--------------------|-------------|----------------------------|-----------------|------------|--|
| The United Kingdom | Agriculture | 3.D.a.2.c                  | NH <sub>3</sub> | 2005, 2020 | New emission source category                               |

Abbreviations: NH<sub>3</sub>, Ammonia.

25. The ERT undertook a full and thorough assessment of the application by the United Kingdom for an adjustment to its NH<sub>3</sub> emissions inventory for the years 2005 and 2020 for sector 3.D.a.2.c Other organic fertilisers applied to soils.

26. The new NH<sub>3</sub> adjustment for Other organic fertilisers applied to soils (3.D.a.2.c) has been justified with the explanation that this is a new source compared to when the emission reduction commitments were set. As specified in the "Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction

Commitments<sup>99</sup> the reference version of the EMEP/EEA Guidebook for adjustment applications under the amended Gothenburg Protocol is the EMEP/EEA 2009 version (EMEP/EEA 2009). No methodology for estimating NH<sub>3</sub> emissions from the spreading of non-manure digestate was presented in the EMEP/EEA 2009 Guidebook and the United Kingdom did not report emissions at the time the emission reduction commitments were set.

27. The ERT reviewed the quantification of the emissions adjustments provided by the United Kingdom. In response to a question from the review team the United Kingdom clarified the scope of the adjustment application. The ERT concluded that the information provided was accurate and error free and was consistent with the current EMEP/EEA Emissions Inventory Guidebook and scientific literature. The ERT recommends the EMEP SB to accept new adjustment applications submitted by the United Kingdom. An overview of the impact of the adjustment on the NMVOC emission inventory for the years 2005 and 2020 is given in table 8 below.

Table 8

**Impact of adjustments on the NH<sub>3</sub> emission inventory of the United Kingdom for the year 2005 and 2020**

|   | Unit             | 2005 | 2020       |
|---|------------------|------|------------|
| <b>ERC</b>                                | <b>% of 2005</b> |      | <b>-8%</b> |
| ERC unadjusted                            | (kt)             |      | 258        |
| NT for Compliance unadjusted              | (kt)             | 280  | 259        |
| <b>Gap to ERC unadjusted</b>              | <b>(%)</b>       |      | <b>-1%</b> |
| ERC adjusted                              | (kt)             |      | 258        |
| Adjusted NT for Compliance                | (kt)             | 280  | 257        |
| <b>Gap to ERC adjusted</b>                | <b>(%)</b>       |      | <b>0%</b>  |
| Impact of adjustment on NT for Compliance | (kt)             | 0    | -3         |

Notes: ERC: emission reduction commitment, NT: National total

## IV. Conclusions and recommendations

### A. 2022 adjustment cases

28. Adjustment applications made by Denmark, France, the Netherlands and the United Kingdom in 2022 were thoroughly assessed. The ERT found that additional information was needed for France, the Netherlands and the United Kingdom. Parties provided the requested information during the review. ERT recommends that the EMEP Steering Body accept the NMVOC adjustments submitted by Denmark, France and the Netherlands and the NH<sub>3</sub> adjustment submitted by the United Kingdom. Table 9 below provides a summary of the new adjustment applications received in 2022 and the resulting ERT recommendations to the EMEP Steering Body.

Table 9

**Expert Review Team recommendations on adjustment applications received in 2022**

| Country | Sector      | Nomenclature for reporting | Pollutant | Years      | Expert Review Team recommendation |
|---------|-------------|----------------------------|-----------|------------|-----------------------------------|
| Denmark | Agriculture | 3.B.1.a                    | NMVOC     | 2005; 2020 | Accept                            |
| France  | Agriculture | 3.B, 3.D                   | NMVOC     | 2005; 2020 | Accept                            |

<sup>99</sup> Technical Guidance for Emissions Inventory Adjustments under Inventory adjustments in the context of Emission Reduction Commitments, available at: <https://www.ceip.at/gothenburg-protocol/adjustments>

| <i>Country</i>     | <i>Sector</i> | <i>Nomenclature for reporting</i> | <i>Pollutant</i> | <i>Years</i> | <i>Expert Review Team recommendation</i> |
|--------------------|---------------|-----------------------------------|------------------|--------------|--|
| The Netherlands    | Agriculture   | 3.B.1.a                           | NM VOC           | 2005; 2020   | Accept                                   |
| The United Kingdom | Agriculture   | 3.D.a.2.c                         | NH <sub>3</sub>  | 2005; 2020   | Accept                                   |

29. A more detailed discussion regarding the 2022 adjustment applications may be found in section III of the present report. ERT has prepared country-specific reports explaining the findings, which will be made available to Denmark, France, the Netherlands and the United Kingdom and published on the Centre on Emission Inventories and Projections website. The report will also be available as an informal document for the eighth joint session of the EMEP Steering Body and the Working Group on Effects.

## **B. Recommendations from the reviewers**

30. The declarations on consistent reporting of approved adjustments that had been provided by countries on a voluntary basis will be needed in 2023 again. 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.

31. 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.

32. There is still a high demand for ERT adjustment reviews and unless countries provide 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.