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# **Review of the 2015 Adjustment Application by Denmark**

Expert Review Team Report for the EMEP Steering Body

<b>Report title</b>	Review of the 2015 Adjustment Application by Denmark
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## Expert Review Team

<b>Role</b>	<b>NFR14 sectors</b>	<b>Name (country)</b>
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Secondary expert reviewer	Agriculture (3B)	Jim Webb (UK)
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Basic checks (Steps 1 and 2)	N/A	Katarina Mareckova (CEIP)

## Executive Summary

1. As mandated by decision 2012/3 (ECE/EB.AIR/111/Add.1) of the Executive Body of the Convention on Long-range Transboundary Air Pollution (CLRTAP), the nominated expert review team (ERT) undertook a detailed review of the adjustment application submitted by Denmark. The review was undertaken on behalf of the EMEP1 Steering Body (SB) and following the guidance published in the Annex to decisions 2012/12 (ECE/EB.AIR/113/Add.1) and 2014/1 (ECE/EB.Air/130).

2. Each section of the application was reviewed by two independent sectoral experts in May and June 2015. The findings were discussed at the meeting held from 22 to 26 June 2015 at the EEA in Copenhagen. The conclusions and recommendations for the EMEP Steering Body have been documented in this country report.

**Table ES1: Summary Information on the Submitted Application, Denmark 2015**

Reasons for adjustment application (decision 2012/3, para 6 as amended by decision 2014/1, annex, para 3)	Manure management (3B) <sup>2</sup> : new sources
Pollutant for which adjustment is applied for	NMVOG
Year(s) for which inventory adjustment is (are) applied for	2010, 2011, 2012, 2013
Date of notification of adjustment to the Convention Secretariat	13 February 2015
Date of submission of supporting documentation	13 March 2015

3. The expert review team (ERT) reviewed and evaluated the documents submitted by Denmark.

4. **Manure management (3B), NMVOG:** Denmark provided information that transparently presented the addition of new NMVOG sources from manure management and, moreover, clearly quantified the impact of the additional new source. The expert review team has concluded that the application meets all of the requirements set out in decision 2012/12 of the Executive Body of the CLRTAP and therefore recommends that the EMEP Steering Body **ACCEPT** this adjustment application.

5. A summary of the quantity and impact of the adjustments recommended for acceptance is provided in tables ES2 and ES3 below.

<sup>1</sup> Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe

<sup>2</sup> NFR 3B1a, 3B1b, 3B2, 3B3, 3B4d, 3B4e, 3B4gi-iv and 3B4h hereinafter referred to as 3B

**Table ES2: Sum Total of Recommended Inventory Adjustments (ktonnes), Denmark 2010-2013**

Pollutant		2010	2011	2012	2013
NMVOC	kt	-35.52	-35.45	-35.85	-36.13

**Table ES3: Impact of Recommended Inventory Adjustments on National Emissions, Denmark 2010 and 2013**

Poll.	GP emission reduction commitment (kt)	2010 emissions reported in 2015 (kt)	2010 emissions (adjusted) (kt)	Difference (%)	2013 emissions reported in 2015 (kt)	2013 emissions (adjusted) (kt)	Difference (%)
NMVOC	85	125.38	89.86	28%	114.43	78.30	32%

6. Denmark's total national emissions will be below the Gothenburg Protocol ceilings from 2011 onwards if the proposed adjustments are accepted.

7. **Adjustments approved in 2014:** The ERT has undertaken a full and thorough assessment of the Denmark's ammonia (NH<sub>3</sub>) adjustments for agricultural soils (3Da1 and 3De) previously accepted in 2014 and recommends that the EMEP Steering Body continue to accept these adjustments.

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## 1 Introduction and Context

8. Parties may apply for an adjustment to their inventory data or emission reduction commitments whenever they are (or expect to be) in non-compliance with their emission reduction targets<sup>3</sup>. However, in making an adjustment application, they must demonstrate that extraordinary circumstances have given rise to the need to revise their emission estimates. These extraordinary circumstances fall into three broad categories:

- a) emission source categories are identified that were accounted for at the time the emission reduction commitments are set (for a more detailed definition see decision 2014/1, annex, para. 3 (a) (i)–(iii)); or
- b) emission factors used to determine emissions levels for the year in which emission reduction commitments are to be attained are significantly different than the emission factors applied to these categories when the emission reduction commitments were set; or
- c) the methodologies used to determine emissions from specific source categories change significantly between the time the emission reduction commitments are set and the year they must be attained.

9. Any Party submitting an application for an adjustment to its inventory is required to notify the Convention Secretariat through the Executive Secretary by 15 February at the latest. The supporting information detailed in decision 2012/12 and the Technical Guidance document (ECE/EB.Air/130) must be provided (either as part of the Informative Inventory Report or in a separate report) by 15 March of the same year.

10. Decision 2012/12, as amended by the decision 2014/1, of the Executive Body of the CLRTAP, mandates that applications for adjustments submitted by Parties shall be subject to an expert review<sup>4</sup>. Technical coordination and support in the review is provided by EMEP's Centre on Emission Inventories and Projections (CEIP). The members of the review team are selected from the available review experts<sup>5</sup> nominated by Parties to the CEIP roster of experts.

11. The expert review team (ERT) undertakes a detailed technical review of the adjustment application in cooperation with the technical bodies under EMEP and makes a recommendation to the EMEP Steering Body on the acceptance or rejection of the application. The EMEP Steering Body then takes its decision on each adjustment application based on the outcome of the technical assessment completed by the ERT.

12. The flow diagram below outlines the different stages of the technical review. The following sections of this report are structured in the same way and provide a detailed prescription of the ERT findings at each of the decision gates in the process.

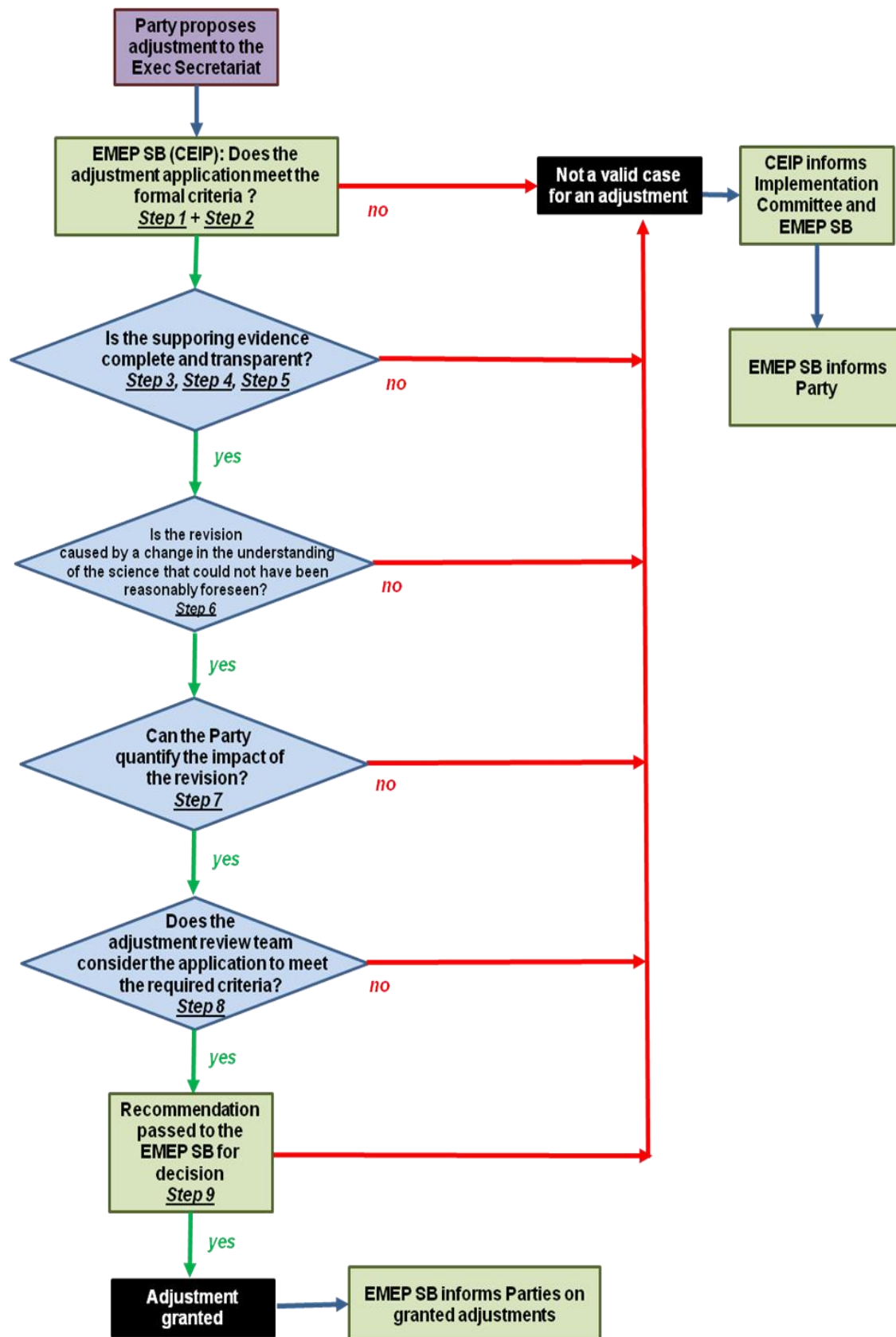
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<sup>3</sup> The term "emission reduction commitments" is used throughout this report. However, the term "emission ceilings" is equally applicable.

<sup>4</sup> The EMEP Steering Body, in conjunction with other appropriate technical bodies under EMEP, shall review the supporting documentation and assess whether the adjustment is consistent with the circumstances described in para 6 of EB decision 2012/3 and the further guidance in EB decision 2012/12 as amended by EB decision 2014/1 and as described in the Technical Guidance ECE/EB.Air/130.

<sup>5</sup> [http://www.ceip.at/fileadmin/inhalte/emep/pdf/2015/0\\_Roster\\_2015.pdf](http://www.ceip.at/fileadmin/inhalte/emep/pdf/2015/0_Roster_2015.pdf)

Figure 1: Flow Diagram/Decision Tree for the Review of Adjustment Applications



## 2 Review of Adjustments Submitted in 2015

### 2.1 Assessment of Formal Criteria

13. Denmark notified the Convention Secretariat through the Executive Secretary of its intention to apply for a new adjustment on 13 February 2015, i.e. before the legal deadline of 15 February. All supporting information requested by decision 2012/12 as amended by decision 2014/1 was provided as part of the Informative Inventory Report before the legal deadline of 15 March of the same year it was submitted for review by the EMEP Steering Body (decision 2012/12, annex, para 1). Additional documentation was provided during the review in response to requests from the ERT. Section 4 lists the documentation provided by the Party.

14. Denmark submitted an application for NMVOC emission adjustments for 2010-2013 in the sectors indicated below:

- a) Manure management (3B1a, 3B1b, 3B2, 3B3, 3B4d, 3B4e, 3B4gi-iv and 3B4h; hereinafter referred to as 3B)

15. Denmark does not comply with its emission reduction commitments listed in Annex II of the Gothenburg Protocol (para 1 of decision 2012/3).

16. Denmark provided information relating to the adjustment impact on its emission inventory and the extent to which it would reduce the current exceedance and presumably bring the Party in compliance with the emission reduction commitments.

17. Denmark did not explicitly include information on when it expects to meet its NMVOC emission ceilings in the supporting documentation, but the ERT was able to determine this using the information provided.

### 2.2 Manure Management (3 B), NMVOC

#### 2.2.1 Assessment of Consistency with Requirements of EB Decision 2012/3 as amended by EB Decision 2014/1

18. The Party submitted an application for a new source.

19. The adjustment application requires the provision of specific supporting information to demonstrate compliance with specific criteria (decision 2012/3, para 6a-c). Denmark included supporting documentation in its IIR Chapter 11 "Adjustments" and the ERT has reviewed this information (see section 4) on the basis of these criteria. The ERT deemed the supporting information provided by Denmark complete enough to allow the required review.

20. The ERT noted that no methodology for this source was included in the 1999 Guidebook and concluded that the supporting evidence provided fails to comply with the criteria presented in decision 2012/3 and that the circumstances on which the adjustment is based could not have been reasonably foreseen by the Party at the time the emission ceilings were established for 2010.

21. The ERT reviewed the documentation that was provided to support the application (listed in Section 4).



22. The supporting information on the new source provided by the Party was fully transparent. The ERT was satisfied that this information fully explained the impact on NMVOC emissions (resulting in the exceedance of the 2010 ceiling).

### 2.2.2 Assessment of the Quantification of the Revision Impact

23. The adjustment application requires that the Party submit a quantification of the impact of the adjustment for which an application has been submitted. Table 1 provides an overview of the NMVOC adjustment applications for manure management.

**Table 1: Denmark's NMVOC Adjustment Applications for Manure Management, 2010-2013**

Reference number	Pollutant	NFR14	Unit	2010	2011	2012	2013
DK/2015/1	NMVOC	3B	kt	-35.52	-35.45	-35.85	-36.13

24. The ERT concluded that the quantification of the effect of recalculations, as calculated by Denmark, on total national emissions does not include any calculation errors. Furthermore, the ERT concluded that the information presented by Denmark is in line with the most up-to-date EMEP/EEA Guidebook available and with the scientific literature.

25. In the 2015 submission, Denmark reported NMVOC emissions from the manure management sector (NFR category 3B) for the first time. The improvement to the inventory is based on the new EMEP/EEA Guidebook, which for the first time includes default EFs for the estimation of NMVOC emissions.

26. Following the new EMEP/EEA Guidebook, only little data is available concerning NMVOC emissions from manure storage and manure application. The methodologies provided are still extremely uncertain.

27. Official Danish projections (Nielsen et al., 2013) did not include NMVOC emissions from animal husbandry. As NMVOC emissions from manure management are strongly correlated with animal numbers, it is reasonable to conclude that Danish NMVOC emissions will not reach the ceiling even in 2035.

28. In its adjustment proposal, Denmark transparently demonstrated that increased emissions result from a new emission source reported by Denmark. The elevation is not the result of new specific agriculture activities causing additional emissions in Denmark. The ERT is therefore of the opinion that this adjustment is valid.

### 3 Assessment of Adjustments Accepted in 2014

29. In addition to adjustment applications submitted in 2015, the ERT reviewed the 2015 report on adjustments granted in 2014. Denmark had an adjustment accepted in 2014 for NH<sub>3</sub> emissions in agricultural soils (3Da1 and 3De). See report Review of the 2014 adjustment application by Denmark for detailed information (CEIP/Adjustment RR/2014/Denmark 1 September 2014 ).

30. Without these adjustments, Denmark would not be in compliance with its emission reduction commitments listed in Annex II of the Gothenburg Protocol (para 1 of decision 2012/3).

31. Denmark provided information on the impact of the adjustments on its emission inventory.

32. The ERT undertook a full and thorough assessment of Denmark's reported data and concluded that the adjustments met all the requirements set out in Executive Body decision 2012/12 and in the Technical Guidance. More specifically, the ERT found that the adjusted emissions currently reported by Denmark for 2010–2012 are identical to the values approved in 2014, and the ERT therefore concluded that no changes had been made to the methodology of quantifying the adjustment.

33. The ERT therefore recommends that the EMEP Steering Body continue to accept the reported adjustments for Denmark.

**Table 2: Emission Adjustments Approved in 2014, as Reported by Denmark in 2015 (in thousands of tonnes)**

Reference number:	Pollutant	NFR14	Unit	2010	2011	2012	2013
Denmark_01	NH <sub>3</sub>	3Da1	kt	-3.67	-3.42	-3.30	-3.75
Denmark_02	NH <sub>3</sub>	3De	kt	-5.41	-5.42	-5.40	-5.37
<b>Denmark total</b>	<b>NH<sub>3</sub></b>		kt	<b>-9.08</b>	<b>-8.84</b>	<b>-8.70</b>	<b>-9.13</b>

## 4 Conclusions and Recommendations

34. The ERT has undertaken a full and thorough assessment of the application for an adjustment of the NMVOC emission inventory submitted by Denmark for the following source sectors:

- a) Manure management (3B), NMVOC

35. The review of the submitted application was performed in accordance with the guidance provided in the Annex to decision 2012/12 of the Executive Body of the CLRTAP and in the Technical Guidance ECE/EB.AIR/130. The ERT findings are described in detail in Section 2 of this report.

36. Table 3 below provides a summary of the adjustment applications received from Denmark as well as the subsequent recommendations the ERT made to the EMEP Steering Body.

**Table 3: ERT Recommendations to the EMEP Steering Body, Denmark 2015**

Country	Sector	NFR14	Pollutant	Years	ERT recommendation
Denmark	Manure management	3B	NMVOC	2010 - 2013	Accept

37. **Manure management 3B, NMVOC:** Denmark provided information that transparently presented the addition of new NMVOC sources from manure management and, moreover, clearly quantified the impact of the additional new source. The ERT has concluded that the application meets all the requirements set out in decision 2012/12 of the Executive Body of the CLRTAP and therefore recommends that the EMEP Steering Body **ACCEPT** this adjustment application.

38. Denmark provided information in the supporting documentation to allow the ERT to determine when it will meet its emission ceiling for NMVOC.

39. **Adjustments approved in 2014:** The ERT has undertaken a full and thorough assessment of Denmark's NH<sub>3</sub> adjustments for agricultural soils (3Da1 and 3De) previously accepted in 2014 and recommends that the EMEP Steering Body **continue to accept** these adjustments.

**Table 4: NH<sub>3</sub> Adjustment Approved in 2014, as Reported by Denmark in 2015 (in thousands of tonnes)**

	Pollutant	2010	2011	2012	2013
Denmark TOTAL	NH <sub>3</sub>	-9.08	-8.84	-8.7	-9.13

## 5 Information Provided by the Party

40. Table 5 below lists the information provided by the Party in its adjustment application. The information provided by the Party can be downloaded from the CEIP website<sup>6</sup>.

**Table 5: Information Provided by Denmark**

Filename	Short description of content
DK_notificationTemplate_2015_Denmark	Notification of the intention to submit an adjustment application
Danish_informative_inventory_report_2015	Detail of the additional sources that are now included in the national inventory, and the justification of the application, quantification of the adjustment, and reference to the existing EMEP/EEA Guidebook methodology
Annex VII _Adjustment summary_16_4_2015.xlsx	Information on adjustments approved in 2014

41. CEIP found it necessary to ask the Party for further information. The information provided is described in Table 6 below.

**Table 6: Additional Information Provided by Denmark**

Filename	Short description of content
Appendix_B1_Adjustment_application _Tables_v1_Nov2014.xls	Adjustment quantification, version of 16 April 2015

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<sup>6</sup> [http://www.ceip.at/ms/ceip\\_home1/ceip\\_home/adjustments\\_gp/](http://www.ceip.at/ms/ceip_home1/ceip_home/adjustments_gp/)

## 6 References

Decision 2012/3 (ECE/EB.AIR/111/Add.1): Adjustments under the Gothenburg Protocol to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

Decision 2012/12 (ECE/EB.AIR/113/Add.1): Guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

Decision 2014/1 (ECE/EB.Air/127/Add.1): Improving the guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

Data submitted by Parties applying for an adjustment:

[http://www.ceip.at/ms/ceip\\_home1/ceip\\_home/adjustments\\_gp/](http://www.ceip.at/ms/ceip_home1/ceip_home/adjustments_gp/)

EMEP/EEA air pollutant emission inventory guidebook 2013 (EMEP/EEA Guidebook)

<http://www.eea.europa.eu/publications/emep-eea-guidebook-2013>

EMEP/CORINAIR atmospheric emission inventory guidebook - Second edition 1999 (1999 Guidebook)

<http://www.eea.europa.eu/publications/EMEPCORINAIR>

Guidelines for reporting emissions and projections data under the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/125)

[http://www.ceip.at/ms/ceip\\_home1/ceip\\_home/reporting\\_instructions/](http://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/)

ECE/EB.AIR/130: Technical Guidance for Parties Making Adjustment Applications and for the Expert Review of Adjustment Applications, 14 April 2015

<http://www.unece.org/environmental-policy/conventions/envlrtapwelcome/guidance-documents-and-other-methodological-materials/emissions-reporting.html>

Review of the 2014 Adjustment Application by Denmark, (CEIP/Adjustment RR/2014/DENMARK 1 September 2014)

[http://webdab.umweltbundesamt.at/download/adjustments2014/Adjustment\\_Review\\_Report\\_DENMARK\\_2014.pdf?cgiproxy\\_skip=1](http://webdab.umweltbundesamt.at/download/adjustments2014/Adjustment_Review_Report_DENMARK_2014.pdf?cgiproxy_skip=1)

The 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) [http://www.unece.org/env/lrtap/multi\\_h1.html](http://www.unece.org/env/lrtap/multi_h1.html)