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

Expert Review Team Report for the EMEP Steering Body

<b>Report title</b>	Review of the 2015 Adjustment Application by Finland
<b>Country</b>	Finland
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Secondary expert reviewer	Road transport (1A3bi-iv)	Michael Kotzulla (DE)
Primary expert reviewer	Manure management (3B)	Jim Webb (UK)
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## Executive Summary

- 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 Finland. The review was undertaken on behalf of the EMEP<sup>1</sup> 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).
- 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 SB have been documented in this country report.

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

Reasons for adjustment application (decision 2012/3, para 6 as amended by decision 2014/1, annex, para 3)	Stationary combustion (1A2gviii, 1A4ai, 1A4bi, 1A4ci): new source Road transport (1A3bi-iv): significantly different EFs Manure management (3B): significantly different EFs
Pollutant for which adjustment is applied for	NH <sub>3</sub>
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

- The expert review team (ERT) reviewed and evaluated the documents submitted by Finland.
- NH<sub>3</sub> emissions from stationary combustion (1A2gviii, 1A4ai, 1A4bi, 1A4ci):** Finland provided information that transparently presented “extraordinary” revisions of NH<sub>3</sub> emission factors and, moreover, clearly quantified the impact of the EF revisions. The expert review tea 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.
- NH<sub>3</sub> emissions from road transport (1A3bi-iv):** Finland provided information that transparently presented “extraordinary” revisions to NH<sub>3</sub> emission factors and, moreover, clearly quantified the impact of the EF revisions separately. The expert review tea 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.

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

6. **NH<sub>3</sub> emissions from manure management (3B):** Finland provided information that transparently presented revisions of the N excretion rates for livestock and the resulting impact on NH<sub>3</sub> emissions. The ERT reviewed the information provided and concluded that the application regarding NH<sub>3</sub> from manure management<sup>2</sup> (3B) does not meet the requirements set out in decision 2012/12 of the Executive Body of the CLRTAP. The ERT noted that revisions of N excretion estimates are regarded as revisions of activity data and that the application was therefore not based on one of the three circumstances listed in para 6 of decision 2012/3 as amended by decision 2014/1. The ERT therefore recommends that the EMEP Steering Body **REJECT** the adjustment application submitted for NH<sub>3</sub> from manure management 3B.

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

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

Pollutant		2010	2011	2012	2013
NH <sub>3</sub>	kt	-2.05	-1.85	-1.85	-1.72

**Table ES3: Impact of Recommended Inventory Adjustments on National Emissions, Finland 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 (%)
NH <sub>3</sub>	31	38.25	36.20	5%	37.28	35.56	5%

8. Finland's total national emissions will remain above the Gothenburg Protocol ceilings if the EMEP Steering Body follows the recommendations of the ERT.

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

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# 1 Introduction and Context

9. 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 not 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 emission factors applied to these categories when the emission reduction commitments were set; or
- c) the methodologies used for determining emissions from specific source categories change significantly between the time the emission reduction commitments are set and the year they must be attained.

10. 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/AB.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.

11. 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.

12. 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.

13. 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 description of the ERT findings at each of the decision gates in the process.

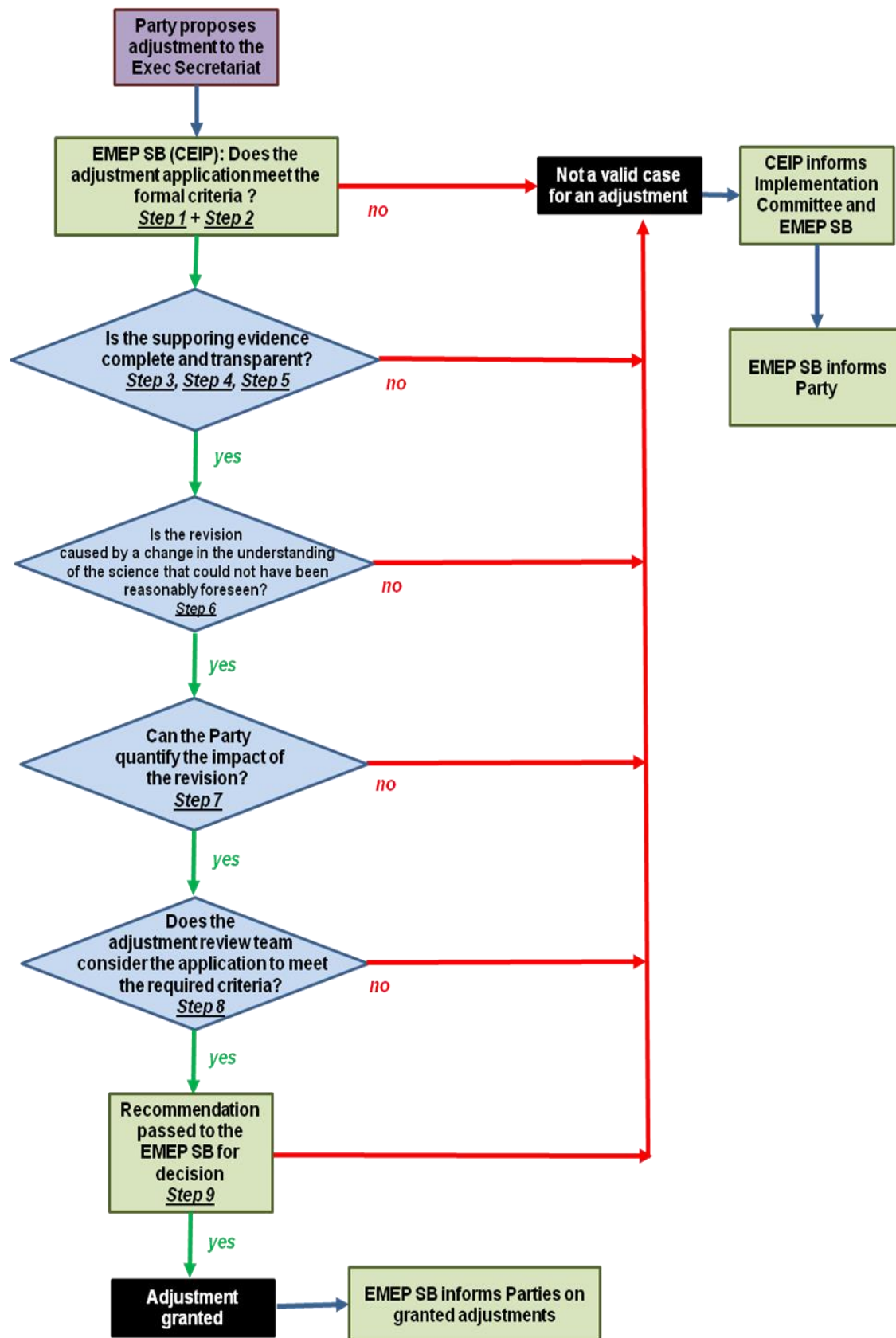
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<sup>3</sup> The term "emission reduction commitments" is used throughout this report. However, the term "emission ceilings" is equally applicable.

<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 document 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 2015

### 2.1 Assessment of Formal Criteria

14. Finland notified the Convention Secretariat through the Executive Secretary of its intention to apply for an 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 CEIP and ERT. Section 4 lists the documentation provided by the Party.

15. Finland submitted an application for NH<sub>3</sub> emission adjustments for 2010-2013 in the sectors indicated below:

- a) Stationary combustion (1A2gviii, 1A4ai, 1A4bi, 1A4ci);
- b) Road transport (1A3bi-iv);
- c) Manure management (3B1a, 3B1b, 3B2, 3B3, 3B4d, 3B4e, 3B4gi-iv and 3B4h; hereinafter referred to as 3B).

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

17. Finland 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.

18. In the supporting documentation, Finland included information on when it expects to meet its NH<sub>3</sub> emission ceiling.

### 2.2 Stationary Combustion (1A2gviii, 1A4ai, 1A4bi, 1A4ci), NH<sub>3</sub>

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

19. Finland initially submitted an adjustment application for new sources. However, after consultation with the ERT, Finland decided to convert this application into an application based on significant emission factor revisions.

20. The adjustment application requires the provision of specific supporting information to demonstrate compliance with specific criteria (decision 2012/3, para 6a-c as amended by decision 2014/1, annex, para 3). The ERT reviewed the supporting documentation on the basis of these criteria (see Section 4) and concluded that the NH<sub>3</sub> emission factors used to determine emission levels for source categories 1A2gviii, 1A4ai, 1A4bi and 1A4ci for the year in which emission reduction commitments were to be attained are significantly different than the emission factors applied to these categories when the emission reduction commitments were set.

21. The biomass NH<sub>3</sub> EFs used for calculation of the 2015 submission are significantly higher than those available in the 1999 Guidebook. However, the NH<sub>3</sub> EFs used for coal are lower than those in the 1999 Guidebook.



22. The ERT therefore concluded that the supporting evidence provided complies 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 Finland at the time the emission ceilings were established for 2010.

### 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 is submitted. Table 1 provides an overview of Finland's NH<sub>3</sub> adjustment applications in the stationary combustion sector. The adjustments for categories 1A2gviii, 1A4ci and 1A4ai are positive because the selected EFs for coal are lower than those in the 1999 Guidebook.

**Table 1: Finland's NH<sub>3</sub> Adjustment Applications for Stationary Combustion, 2010-2013**

Reference number	Pollutant	NFR14	Unit	2010	2011	2012	2013
11a-11b	NH <sub>3</sub>	1A2gviii	kt	0.015	0.014	0.017	0.015
12a-12b	NH <sub>3</sub>	1A4ai	kt	0.023	0.022	0.026	0.024
13a-13af	NH <sub>3</sub>	1A4bi	kt	-0.610	-0.485	-0.594	-0.542
14a-14c	NH <sub>3</sub>	1A4ci	kt	0.042	0.036	0.044	0.041
	NH <sub>3</sub>	<b>Total</b>	<b>kt</b>	<b>-0.531</b>	<b>-0.413</b>	<b>-0.507</b>	<b>-0.462</b>

24. The ERT concludes that the quantification of the impact of this adjustment, as calculated by Finland, on national total emissions uses an appropriate methodology and does not include any calculation errors. Furthermore, the ERT concludes that the information presented by Finland is in line with the most up-to-date available guidance from the EMEP/EEA Guidebook and the scientific literature.

## 2.3 Road Transport (1A3bi-iv), NH<sub>3</sub>

### 2.3.1 Assessment of Compliance with Requirements of EB Decision 2012/3 as amended by EB Decision 2014/1

25. Finland initially submitted an adjustment application based on new sources. However, after consultation with the ERT, Finland decided to convert this application into an application based on significant revisions of the NH<sub>3</sub> road transport emission factors (EFs).

26. The adjustment application requires the provision of specific supporting information to demonstrate compliance with specific criteria (decision 2012/3, para 6a-c, as amended by decision 2014/1, annex, para 3). The ERT reviewed the supporting documentation relating to these criteria (see section 4) and concluded that the emission factors used to determine emission levels for road transport source category 1A3bi-iv for the year in which emission reduction commitments were to be attained are significantly different than the emission factors applied to these categories when the emission reduction commitments were set.

27. Finland provided information to support its application for an adjustment, which was based on NH<sub>3</sub> emission factors for the transport sector being significantly different. It did so on the basis that the NH<sub>3</sub> emission factors in the 1999 Guidebook vary significantly from those specified in the EMEP/EEA Guidebook.

28. Finland did not include NH<sub>3</sub> emissions from the transport sector in their inventory until their 2005 submission. However, for the sake of determining whether the emission factor has significantly changed, the 1999 Guidebook compared with EMEP/EEA Guidebook.

29. The EF changes highlighted in the adjustment application could not have been foreseen at the time the 2010 emission ceilings were set and result from NH<sub>3</sub> emissions from the fact that vehicles fitted with catalytic converters were higher than originally accounted for.

30. The ERT therefore concluded that the supporting evidence provided complies with the criteria set forth 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.

31. The supporting information provided by the Party on the emission factor revisions was deemed complete. A spreadsheet outlining the NH<sub>3</sub> emission factors contained in the 1999 and 2013 versions of the emission inventory guidebook and the emission factors used in the Finland emission inventory was provided.

### 2.3.2 Assessment of the Quantification of the Revision Impact

32. The adjustment application requires that the Party submit a quantification of the impact of the adjustment for which an application is submitted. Table 2 provides an overview of Finland's NH<sub>3</sub> adjustment applications in the road transport sector.

**Table 2: Finland's NH<sub>3</sub> Adjustment Applications for Road Transport, 2010-2013**

Reference number	Pollutant	NFR14	Unit	2010	2011	2012	2013
FI/2014/1a	NH <sub>3</sub>	1A3bi-iv	kt	-1.52	-1.44	-1.34	-1.26

33. The ERT concludes that the quantification of the impact of this adjustment, as calculated by Finland, on national total emissions uses an appropriate methodology and does not include any calculation errors. Furthermore, the ERT concludes that the information presented by Finland is in line with the most up-to-date available guidance from the EMEP/EEA Guidebook and the scientific literature.

## 2.4 Manure Management (3B), NH<sub>3</sub>

### 2.4.1 Assessment of Compliance with Requirements of EB Decision 2012/3 as amended by EB Decision 2014/1

34. The Party submitted an application based on revised manure management EFs (3B1a, 3B1b, 3B2, 3B3, 3B4d, 3B4e, 3B4gi-iv and 3B4h; referred to as "3B").

35. An adjustment application requires the provision of specific supporting information to demonstrate compliance with specific criteria (decision 2012/3, para 6a-c as amended by decision 2014/1, annex, para 3). The ERT reviewed the supporting documentation relating to these criteria (see section 4).

36. The ERT noted that the application was submitted on the basis that N excretion from livestock had increased since the ceilings had been set in 1999. However, the ERT considers N excretion to be activity data and not an EF component. In addition, the ERT found that the application of year-specific N excretion values (rather than a fixed value) did not represent a change in methodology. The ERT recognized that it was good practice to revise input data when productivity and farming practices changed, but considered this particular revision to constitute routine emission inventory development.

37. Consequently, the ERT concluded that the application for NH<sub>3</sub> adjustment for manure management 3B did not comply with the criteria set forth in decision 2012/3. In particular, the ERT noted that the application was not based on one of the three circumstances listed in para 6 of decision 2012/3 as amended by decision 2014/1.

#### 2.4.2 Assessment of the Quantification of the Revision Impact

38. The adjustment application process requires that the Party submit a quantification of the impact of the adjustment for which an application is submitted. Table 3 provides an overview of Finland's NH<sub>3</sub> adjustment applications for manure management.

**Table 3: Finland's NH<sub>3</sub> Adjustment Applications for Manure Management, 2010 - 2013**

Reference number	Pollutant	NFR14	Unit	2010	2011	2012	2013
FI/2015/1	NH <sub>3</sub>	3B1a	kt	-1.149	-1.194	-1.260	-1.271
FI/2015/2a-2d	NH <sub>3</sub>	3B1b	kt	-3.389	-3.274	-3.093	-3.116
FI/2015/3	NH <sub>3</sub>	3B2	kt	0.259	0.261	0.257	0.268
FI/2015/ 4a-4d	NH <sub>3</sub>	3B3	kt	-0.111	-0.068	-0.108	-0.169
FI/2015/5	NH <sub>3</sub>	3B4d	kt	0.010	0.009	0.009	0.009
FI/2015/6a-6b	NH <sub>3</sub>	3B4e	kt	0.261	0.253	0.236	0.237
FI/2015/7a-7b	NH <sub>3</sub>	3B4gi	kt	-0.281	-0.259	-0.254	-0.273
FI/2015/8a-8b	NH <sub>3</sub>	3B4gii	kt	-0.710	-0.819	-0.894	-1.012
FI/2015/9	NH <sub>3</sub>	3B4giii	kt	-0.161	-0.171	-0.163	-0.152
FI/2015/10a-10b	NH <sub>3</sub>	3B4giv	kt	-0.307	-0.284	-0.294	-0.326
FI/2015/11a-11c	NH <sub>3</sub>	3B4h	kt	1.119	1.157	0.987	1.075
	<b>NH<sub>3</sub></b>	<b>3B TOTAL</b>	<b>kt</b>	<b>-4.459</b>	<b>-4.387</b>	<b>-4.578</b>	<b>-4.730</b>

39. Finland did not inform the ERT when the emission ceilings would be reached. However, Finland noted that it would continue to implement measures to abate ammonia emissions and further develop the inventory to reflect impacts of the measures on the emission levels in a timely manner.

### 3 Conclusions and Recommendations

40. The ERT has undertaken a full and thorough assessment of the application for adjustments of the NH<sub>3</sub> emission inventory submitted by Finland for the following source sectors:

- a) Stationary combustion (1A2gviii, 1A4ai, 1A4bi, 1A4ci);
- b) Road transport (1A3bi-iv);
- c) Manure management (3B).

41. 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.

42. Table 4 below provides a summary of the adjustment applications received from Finland as well as the subsequent recommendations the ERT made to the EMEP Steering Body.

**Table 4: ERT Recommendations to the EMEP Steering Body, Finland 2015**

Country	Sector	NFRs	Pollutant	Years	ERT recommendation
Finland	Stationary combustion	1A2gviii, 1A4ai, 1A4bi, 1A4ci	NH <sub>3</sub>	2010- 2013	Accept
	Road transport	1A3bi-iv	NH <sub>3</sub>	2010 – 2013	Accept
	Manure management	3B	NH <sub>3</sub>	2010 - 2013	Reject

43. **Stationary combustion (1A2gviii, 1A4ai, 1A4bi, 1A4ci, 1A2gviii), NH<sub>3</sub>:** Finland provided information to support their application for an adjustment. During the review, the ERT requested more detailed information from Finland, which the latter was able to provide, and this is detailed in Table 6. The ERT therefore recommends that the EMEP Steering Body **ACCEPT** the adjustments submitted for these sectors.

44. **Road transport (1A3bi-iv) NH<sub>3</sub>:** Finland provided information to support their application for an adjustment. During the review, the ERT requested more detailed information from Finland, which the latter was able to provide, and this is detailed in Table 6. The ERT therefore recommends that the EMEP Steering Body **ACCEPT** the adjustments submitted for these sectors.

45. **Manure management (3B) NH<sub>3</sub>:** Finland provided information that transparently present the quantification of an NH<sub>3</sub> adjustment for manure management 3B. However, the ERT concluded that the application does not meet the requirements set out in decision 2012/12 of the Executive Body of the CLRTAP and, in particular, that the application is not based on one of the three circumstances listed in para 6 of decision 2012/3 as amended by decision 2014/1. The ERT therefore recommends that the EMEP Steering Body **REJECT** the NH<sub>3</sub> adjustment submitted for manure management 3B.

46. Finland did not provide information on when it expects to meet its emission ceiling for NH<sub>3</sub> in the supporting documentation. However, Finland noted that it would continue to implement measures to abate ammonia emissions and further develop the inventory to reflect the impacts of the measures on the emission levels in a timely manner.

## 4 Information Provided by the Party

47. 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 Finland**

Filename	Short description of content
Appendix 3 to FI IIR 2015 DOCUMENTATION ADJUSTMENT APPLICATION 13March2015.docx	Special Appendix to IIR 2015, including documentation of adjustments
FI_IIR2015_22_May2015_revised_Part_1.pdf	IIR 2015, revised version of 22 May
FI_IIR2015_13March2015_Part2.pdf	IIR 2015 Annexes, version of 13 March
FI_NotificationTemplate__CLRTA P_EMEP_emission_inventory_status_report_2015_20022014.docx	CLRTAP submission 2015 notification template
FI_YM12_44_2014.pdf	Official letter from the Ministry of Environment to UNECE about adjustment application, 12 February 2015

48. The ERT 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 Finland**

Filename	Short description of content
Documentation Transport 24 June 2015.xls	Road transport NH <sub>3</sub> emission factors provided in the 1999 Guidebook and those used in the 2014 Finland emission inventory and accompanying calculations to assess the difference in emission estimates
Documentation Small Combustion 23June2015.xlsx	Detailed calculations of NH <sub>3</sub> emissions for biomass and coal with EFs from the 1999 Guidebook and EFs used for the 2015 submission

<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/)

## 5 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>

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)