



REPUBLIC OF ESTONIA  
ENVIRONMENT AGENCY



# Estonian Informative Inventory Report 1990-2024

## ANNEXES I-II

Submitted under the Convention on Long-Range Transboundary Air  
Pollution

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## Data sheet

Title: Estonian Informative Inventory  
Report 1990-2024

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Cover photo: Hüppassaare study trail.

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## ANNEX I – Inclusion/Exclusion of the Condensable Component from PM<sub>10</sub> and PM<sub>2.5</sub> Emission Factors

NFR	Source/sector name	PM emissions: the condensable component is		EF reference and comments
		included	excluded	
1A1a	Public electricity and heat production		X	National emission factors of TSP not included condensable component
1A1c	Manufacture of solid fuels and other energy industries		X	See comment for NFR 1A1a
1A2a	Stationary combustion in manufacturing industries and construction: Iron and steel		X	See comment for NFR 1A1a
1A2b	Stationary combustion in manufacturing industries and construction: Non-ferrous metals		X	See comment for NFR 1A1a
1A2c	Stationary combustion in manufacturing industries and construction: Chemicals		X	See comment for NFR 1A1a
1A2d	Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print		X	See comment for NFR 1A1a
1A2e	Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco		X	See comment for NFR 1A1a
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals		X	See comment for NFR 1A1a
1A2gvii	Mobile Combustion in manufacturing industries and construction: (specified in the IIR)	X		EMEP/EEA Guidebook 2023: PM factors represent total PM emissions (filterable and condensable fractions)
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (specified in the IIR)		X	See comment for NFR 1A1a
1A3ai(i)	International aviation LTO (civil)	–	–	EMEP/EEA Guidebook 2019
1A3aii(i)	Domestic aviation LTO (civil)	–	–	EMEP/EEA Guidebook 2019
1A3bi	Road transport: Passenger cars	X		EMEP/EEA Guidebook 2023: Road transport PM mass emission factors in this chapter are considered to include both filterable and condensable material
1A3bii	Road transport: Light duty vehicles	X		EMEP/EEA Guidebook 2023: Road transport PM mass emission factors in this chapter are considered to include both filterable and condensable material
1A3biii	Road transport: Heavy duty vehicles and buses	X		EMEP/EEA Guidebook 2023: Road transport PM mass emission factors in this chapter are considered to include both filterable and condensable material
1A3biv	Road transport: Mopeds & motorcycles	X		EMEP/EEA Guidebook 2023: Road transport PM mass emission factors in this chapter are considered to include both filterable and condensable material
1A3bvi	Road transport: Automobile tyre and brake wear	–	–	EMEP/EEA Guidebook 2023
1A3bvii	Road transport: Automobile road abrasion	–	–	EMEP/EEA Guidebook 2023
1A3c	Railways	–	–	EMEP/EEA Guidebook 2023
1A3dii	National navigation (shipping)	–	–	EMEP/EEA Guidebook 2023
1A4ai	Commercial/institutional: Stationary			See comment for NFR 1A1a
1A4aii	Commercial/institutional: Mobile	X		EMEP/EEA Guidebook 2023: PM factors represent total PM emissions (filterable and condensable fractions)
1A4bi	Residential: Stationary	X	X	EMEP/EEA Guidebook 2023 for the solid, liquid and gaseous fuels. Emissions from wood burning are calculated using national factors (included condensable ) derived from measurements: <a href="https://klab.ee/wp-content/uploads/2024/03/Arendus2023_aruanne_final.pdf">https://klab.ee/wp-content/uploads/2024/03/Arendus2023_aruanne_final.pdf</a>
1A4bii	Residential: Household and gardening (mobile)	X		EMEP/EEA Guidebook 2023: PM factors represent total PM emissions (filterable and condensable fractions)
1A4ci	Agriculture/Forestry/Fishing: Stationary			See comment for NFR 1A1a

NFR	Source/sector name	PM emissions: the condensable component is		EF reference and comments
		included	excluded	
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	X		EMEP/EEA Guidebook 2023: PM factors represent total PM emissions (filterable and condensable fractions)
1A4ciii	Agriculture/Forestry/Fishing: National fishing	–	–	EMEP/EEA Guidebook 2023
1B1b	Fugitive emission from solid fuels: Solid fuel transformation			Facility specific EF. It is not known if the condensable part is included or not.
1B1c	Other fugitive emissions from solid fuels			Facility specific EF. It is not known if the condensable part is included or not.
1B2aiv	Fugitive emissions oil: Refining / storage			Facility specific EF. It is not known if the condensable part is included or not.
1B2c	Venting and flaring (oil, gas, combined oil and gas)			Facility specific EF. It is not known if the condensable part is included or not.
2A1	Cement production			Facility specific EF. It is not known if the condensable part is included or not.
2A2	Lime production			Facility specific EF. It is not known if the condensable part is included or not.
2A5a	Quarrying and mining of minerals other than coal			Facility specific EF. It is not known if the condensable part is included or not.
2A5b	Construction and demolition		X	EMEP/EEA Guidebook 2023
2A6	Other mineral products (specified in the IIR)			Facility specific EF. It is not known if the condensable part is included or not.
2B10a	Chemical industry: Other (specified in the IIR)			Facility specific EF. It is not known if the condensable part is included or not.
2B10b	Storage, handling and transport of chemical products (specified in the IIR)			Facility specific EF. It is not known if the condensable part is included or not.
2C1	Iron and steel production			Facility specific EF. It is not known if the condensable part is included or not.
2C3	Aluminium production			Facility specific EF. It is not known if the condensable part is included or not.
2C5	Lead production			Facility specific EF. It is not known if the condensable part is included or not.
2C6	Zinc production			Facility specific EF. It is not known if the condensable part is included or not.
2C7a	Copper production			Facility specific EF. It is not known if the condensable part is included or not.
2C7c	Other metal production (specified in the IIR)			Facility specific EF. It is not known if the condensable part is included or not.
2D3b	Road paving with asphalt	–	–	EMEP/EEA Guidebook 2023
2D3d	Coating applications	–	–	Facility specific EF. It is not known if the condensable part is included or not.
2D3e	Degreasing	–	–	Facility specific EF. It is not known if the condensable part is included or not.
2D3g	Chemical products	–	–	Facility specific EF. It is not known if the condensable part is included or not.
2D3h	Printing	–	–	Facility specific EF. It is not known if the condensable part is included or not.
2D3i	Other solvent use (specified in the IIR)	–	–	Facility specific EF. It is not known if the condensable part is included or not.
2G	Other product use (specified in the IIR)	–	–	EMEP/EEA Guidebook 2023
2H1	Pulp and paper industry			Facility specific EF. It is not known if the condensable part is included or not.
2H2	Food and beverages industry			Facility specific EF. It is not known if the condensable part is included or not.
2I	Wood processing			Facility specific EF. It is not known if the condensable part is included or not.
2L	Other production, consumption, storage, transportation or handling of bulk products (specified in the IIR)			Facility specific EF. It is not known if the condensable part is included or not.
3B1a	Manure management - Dairy cattle			EMEP/EEA Guidebook 2023
3B1b	Manure management - Non-dairy cattle			EMEP/EEA Guidebook 2023
3B2	Manure management – Sheep			EMEP/EEA Guidebook 2023
3B3	Manure management – Swine			EMEP/EEA Guidebook 2023
3B4d	Manure management - Goats			EMEP/EEA Guidebook 2023
3B4e	Manure management - Horses			EMEP/EEA Guidebook 2023
3B4gi	Manure management - Laying hens			EMEP/EEA Guidebook 2023
3B4gii	Manure management - Broilers			EMEP/EEA Guidebook 2023
3B4giv	Manure management - Other poultry			EMEP/EEA Guidebook 2023
3B4h	Manure management - Other animals (specified in the IIR)			EMEP/EEA Guidebook 2023
3Dc	Farm-level agricultural operations including storage, handling and transport of agricultural products			EMEP/EEA Guidebook 2023

NFR	Source/sector name	PM emissions: the condensable component is		EF reference and comments
		included	excluded	
5A	Biological treatment of waste - Solid waste disposal on land	–	–	The combination of facility specific and the EMEP/EEA Guidebook 2023 EFs. It is not known if the condensable part is included or not.
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities	–	–	Facility specific EF. It is not known if the condensable part is included or not.
5C1bi	Industrial waste incineration	–	–	Facility specific EF. It is not known if the condensable part is included or not.
5C1bv	Cremation	–	–	EMEP/EEA Guidebook 2023
5C2	Open burning of waste	–	–	EMEP/EEA Guidebook 2023
5E	Other waste (please specify in IIR)	–	–	EMEP/EEA Guidebook 2023
6A	Other (included in national total for entire territory) (specified in the IIR)			



## ANNEX II – Recommendations from the NECD Review, Considering Revised Estimates (RE), Technical Corrections (TC) and their Status of Implementation in Estonia

*All findings for NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>, including those made during the 2025 NECD inventory review and those not implemented from the 2024 NECD inventory review*

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-3Da4-2025-0001	No	3Da4 Crop Residues Applied to Soils, NH <sub>3</sub> , 1990-2023	N/A	TC
<b>Recommendation</b> For NH <sub>3</sub> emissions from 3Da4 Crop Residues Applied to Soils in all years, the TERT noted that emissions were reported using the notation key 'NA' (Not applicable) when a Tier 1 method is available in the 2023 EMEP/EEA Guidebook, meaning that there was an under-estimate of emissions. In response to a question raised during the review, Estonia explained that the analysis of the availability of activity data has been started, and it had been intended to estimate emissions from this category in the next (2026) submission. The TERT decided to calculate a technical correction for the 2005 and 2020-2023 which was accepted by Estonia. The estimates demonstrate that the issue is above the threshold of significance. <b>The TERT recommends that Estonia include a revised estimate in the next submission.</b>					
Improvement made			IIR Chapter, page		
The revised estimate has been calculated and included in the current submission.			Chapter 5.3.2		
Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-1A3c-2025-0001	Yes	1A3c Railways, NO <sub>x</sub> , 1990-2023	N/A	RE
<b>Recommendation</b> For category 1A3c Railways, the TERT notes that in the IIR, page 148 and Table 3.56, there is a lack of transparency regarding what information or method was used to apportion the fuel consumption by different generic locomotive technology types, and whether the apportionment is constant over time. In response to a question raised during the review, Estonia explained the apportionment assumptions for passenger transport and freight transport over the time series. Moreover, they have identified a calculation error regarding NO <sub>x</sub> emissions for passenger rail transport, in which an incorrect emission factor had been applied to railcar fuel consumption data for the period 1990–2022. This resulted in an overestimation of NO <sub>x</sub> emissions for those years. However, Estonia has confirmed that the correct emission factor for railcars was applied for year 2023. The TERT agreed with the revised estimate provided by Estonia. <b>The TERT recommends that Estonia to include the explanation regarding the source of information, method and assumptions used to apportion the fuel consumption by different generic locomotive technology types in the IIR and to include the revised estimate in the next submission.</b>					
Improvement made			IIR Chapter, page		
The amendments were made to the methodology chapter to explain the apportionment of fuel. The correct NO <sub>x</sub> emission factor for railcars was used and history was corrected.			Chapter 3.3.4.2		

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-3Da1-2025-0003	Yes	3Da1 Inorganic N-fertilizers (includes also urea application) NH <sub>3</sub> , 1990-2023	N/A	RE
<b>Recommendation</b> For NH <sub>3</sub> emissions from 3Da1 Inorganic N-fertilisers, across the whole time series, the TERT identified an over-estimate exceeding the threshold of significance. Estonia can distinguish only urea from other fertilisers in fertiliser application data currently available, and in the 2025 submission an EF of 0.07 kgNH <sub>3</sub> /kg N was used for non-urea N fertilisers, stating that 0.07 is an arithmetic mean of the emission factors for non-urea fertilisers pH soils. However, the correct mean EF for other fertilisers on normal pH soils is 0.054. In response to a question raised during the review, Estonia confirmed this error. Regarding the measure to incorporate fertilisers by ploughing, Estonia commented that the penetration of the measure is currently under analysis; preliminary estimates suggest that farmers are implementing this measure more extensively in Estonia than initially anticipated, and until the new assessment is clear the earlier expert assessment by Allan Kaasik will be taken into account by Estonia. The TERT notes that the 35% abatement efficiency of the measure based on expert judgement is more conservative than the >50% value provided in table S6 of the UNECE ammonia abatement guidance document ( <a href="https://www.unece.org/fileadmin/DAM/env/documents/2012/EB/ECE_EB.AIR_120_ENG.pdf">https://www.unece.org/fileadmin/DAM/env/documents/2012/EB/ECE_EB.AIR_120_ENG.pdf</a> ). Estonia provided revised estimates for years 1990-2023 correcting the error identified in the EF. The TERT agreed with the revised estimate provided by Estonia. <b>The TERT recommends that Estonia include the revised estimate in the next submission, and that Estonia review the estimated penetration rates and abatement efficiency of the fertiliser incorporation measure in light of the results of the ongoing analysis.</b>					
Improvement made				IIR Chapter, page	
The revised estimate has been calculated and included in the current submission.				Chapter 5.3.2	
Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-0A-2025-0001	No	0A National Total - National total for the entire territory - Based on fuel sold/fuel used, SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, Cd, Hg, PCDD/F, 1990-2023	N/A	No
<b>Recommendation</b> For 44 instances in the NFR tables, the TERT notes that Estonia reports numerical zeros as emissions instead of notation keys. This does not relate to an over- or under-estimate of emissions. In response to a question raised during the review, Estonia explained that these numbers will be replaced by notation keys in the future. <b>The TERT recommends that Estonia report only positive numbers larger than zero or notation keys in its next submission.</b>					
Improvement made				IIR Chapter, page	
Corrections will be included in the next submission.					



Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-1B1b-2025-0002	No	1B1b Fugitive Emission from Solid Fuels: Solid Fuel Transformation, SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , NMVOC, PM <sub>2.5</sub> , PAHs, PCBs, HCB, Cd, Hg, Pb, PCDD/F, 2017-2023	N/A	No
<b>Recommendation</b> For category 1B1b Fugitive Emission from Solid Fuels: Solid Fuel Transformation, pollutants SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, PM <sub>2.5</sub> , PM <sub>10</sub> , years 2010-2016 the TERT notes that there is a lack of transparency regarding the origin of the emissions reported. This does not relate to an over-estimate or under-estimate of emissions. In response to a question raised during the review, Estonia explained that the emissions were misallocated. <b>The TERT recommends that Estonia re-allocate the emissions to be reported under the correct NFR code 2C7c.</b>					
Improvement made			IIR Chapter, page		
The Estonian inventory team acknowledges the recommendation of the TERT regarding the allocation of emissions reported under NFR category 1B1b for the years 2010–2016.  As explained in the previous response, the reported emissions originated from one facility that mistakenly reported emissions using a SNAP code corresponding to NFR 1B1b. These sources were subsequently reported under the correct NFR category 2C7c. The facility ceased operations in 2019.  The Estonian inventory team confirms that the necessary corrections have not yet been implemented in the current submission. The emissions reported under NFR 1B1b for the years 2010–2016 will be reallocated to the correct category (2C7c) in the next submission. At the same time, the time series will be harmonised by applying the notation key NA for all emissions and activity data in category 1B1b, consistent with the reporting for the years 2017–2024. These corrections will be reflected in the 2027 submission.					
Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-3B3-2025-0001	No	3B3 Manure Management - Swine, NMVOC, 1990-2018	N/A	No
<b>Recommendation</b> For category 3B3 Manure Management - Swine, pollutant NMVOC, years 1990-2018, the TERT notes that there is a lack of transparency regarding the significant recalculations over the period. This does not relate to an over-estimate or under-estimate of emissions. In response to a question raised during the review, Estonia explained that the main reason is the correction of the old model originally used to populate the NFR tables, affecting the relative share of swine subcategories. <b>The TERT recommends that Estonia provide detailed explanation for all recalculations in the IIR in future submissions.</b>					
Improvement made			IIR Chapter, page		
The recommendation is noted.					

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-3Da1-2025-0004	Yes	3Da1 Inorganic N-fertilizers (includes also urea application) NH <sub>3</sub> , 2015-2023	N/A	No
<b>Recommendation</b> For category 3Da1 Inorganic N-fertilizers (includes also urea application), pollutant NH <sub>3</sub> , years 2015-2023, the TERT notes that there is a lack of transparency regarding the adjustment made to emissions from 2015 onwards to account for the abatement impact of fertiliser ploughed into the soil. This does not relate to an over-estimate or under-estimate of emissions. In response to a question raised during the review, Estonia explained that an abatement factor was derived based on the UNECE ammonia guidance and on expert judgment. <b>The TERT recommends that Estonia provide a clear explanation of the rationale and the hypothesis made for this abatement factor due to incorporation of inorganic N-fertilisers in the IIR, through a qualitative text and a summary table.</b>					
Improvement made			IIR Chapter, page		
The methodological description has been updated in the current submission.			Chapter 5.3.2		
Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-3Da3-2025-0001	No	3Da3 Urine and Dung Deposited by Grazing Animals, NH <sub>3</sub> , 2005	N/A	No
<b>Recommendation</b> For category 3Da3 Urine and Dung Deposited by Grazing Animals, pollutant NH <sub>3</sub> , year 2005, the TERT notes that there is a lack of transparency regarding the evolution of Nex values for non-dairy cattle, due to a potential outlier in the reported emissions in 2005. This does not relate to an over- or under-estimate of emissions. In response to a question raised during the review, Estonia provided a calculation sheet (N-flow tool) and explained that the apparent outlier was due to several reasons. Time spent on pasture was recalculated for mature female cattle. Moreover, changes in the Nex due to changes in feed digestibility (lower digestibility = higher dry matter intake), as well as higher crude protein content of feed for other cattle. <b>The TERT recommends that Estonia provide an explanation of driving factors affecting Nex values and Nex trends in the IIR, either as a qualitative text or by providing summary tables, in the next submission.</b>					
Improvement made			IIR Chapter, page		
The recommendation is noted.					

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2024	RE, TC, or UPTC in 2025
2025 (1)	EE-5C-2025-0001	No	5C Waste Incineration, SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, PM <sub>2.5</sub> , PAHs, PCBs, HCB, Cd, Hg, Pb, PCDD/F, PM <sub>10</sub> , 2005-2023	N/A	No
<b>Recommendation</b> For category 5C Waste Incineration, SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, PM <sub>2.5</sub> , PAHs, PCBs, HCB, Cd, Hg, Pb, PCDD/F, PM <sub>10</sub> , years 2005-2023, the TERT notes that there is a lack of transparency regarding the reporting of waste incineration without energy recovery in the waste sector and the reporting of waste incineration with energy recovery in the energy sector. This concerns emissions from category 5C1a, 5C1bi, 5C1bii and 5C1biii, for which it is not clear to which extent waste from these categories is incinerated with energy recovery and reported in another category, and what methodologies are used to estimate these emissions. In response to a question raised during the review, Estonia explained that all municipal waste is incinerated for with energy recovery, and provided information on data used. <b>The TERT recommends that Estonia include information on the methodology and allocation of emissions resulting from waste incineration with energy recovery in its next submission and uses the notation key 'NO' in the waste sector where energy recovery takes place.</b>					
Improvement made			IIR Chapter, page		
The recommendation has been implemented. Mixed municipal solid waste is incinerated only with energy recovery and is therefore reported under the energy sector (NFR 1A1a), as described in Chapter 3.2.2.2 of the IIR. Therefore, NFR 5C1a is reported as "NO" in the waste sector. There has been no incineration of sewage sludge for disposal purposes, and NFR 5C1biv is reported as "NO". Emissions under NFR 5C1bi, 5C1bii and 5C1biii originate from incineration without energy recovery and are described in the waste sector.			Chapter 6.4.1, Chapter 6.4.2, Chapter 3.2.2.2		

All findings for heavy metals and POPs, including those made during the 2025 NECD inventory review and those not implemented from the 2021 NECD inventory review<sup>2</sup>

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2019 (7)	EE-3Df-2019-0001	No	3Df Use of Pesticides, HCB, 1990, 2005, 2016-2017	No	TC
<b>Assessment of the implementation of the initial recommendation</b> For 3Df Use of Pesticides, HCB for all years, the TERT notes that the notation key 'NE' (Not estimated), or 'NA' (Not applicable; in 2023 only) was reported in the 2025 NFR submission. In response to a question raised during the review Estonia explained that data on quantity of pesticides sold is available for 2011 onwards, but retrieval of data for the 1990-2010 period has proved challenging to date. Estonia did not provide a revised estimate, and did not accept the corrected estimate calculated by the TERT for 2020-2023 only during the centralised review. The TERT therefore decided to calculate a technical correction for the years 2005 and 2020-2023, taking into account the suggestion made in Estonia's response for extrapolating the 2005 value as an average of emissions for the 2011-2023 period. The estimates demonstrate that the issue is above the threshold of significance. <b>However, the TERT notes that the extrapolation of the 2005 emission value is an interim solution only and recommends that Estonia include a revised estimate in the next submission based on national data for pesticide use in 1990-2010, or on a more robust extrapolation method.</b>					
Improvement made				IIR Chapter, page	
The revised estimate has been calculated and included in the current submission.				Chapter 5.3.2	

<sup>2</sup> Heavy metals and POPs were last reviewed in the 2020 and the 2021 NECD inventory reviews in the form of a follow-up review to the in-depth review, which had been performed as part of the 2018 and 2019 NECD inventory reviews.

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2025 (1)	EE-1A1c-2025-0001	No	1A1c Manufacture of Solid Fuels and Other Energy Industries, PAHs, PCBs, HCB, 2000-2023	N/A	No
<b>Recommendation</b> For category 1A1c Manufacture of Solid Fuels and Other Energy Industries, pollutants PAHs, PCBs, HCB, years 2000-2023, the TERT notes that there is a lack of transparency regarding where the emissions for the conversion of oil shale into shale oil are reported. This does not relate to an over-estimate or under-estimate of emissions. This was raised during the 2023 NECD inventory review. In response to a question raised during the review, Estonia explained that emissions were reported under 1A1c and the TERT noted that perhaps they should be reported under category 1B1b Fugitive Emission from Solid Fuels: Solid Fuel Transformation. <b>The TERT recommends that Estonia, as indicated, conduct a review of the allocation of emissions related to the conversion of oil shale into shale oil for the next inventory submission.</b>					
Improvement made				IIR Chapter, page	
<p>The Estonian inventory team acknowledges the recommendation of the TERT regarding the allocation of emissions related to the conversion of oil shale into shale oil.</p> <p>The inventory estimates are based on data reported by operators, which are derived either from measurements or calculated according to the national methodology. At present, no specific data on PAH emissions from oil shale processing are available. Furthermore, the 2023 EMEP/EEA Guidebook does not provide emission factors specifically for oil shale processing, and the available methodologies mainly refer to coal processing. Therefore, the direct application of coal-based emission factors is considered not fully appropriate in this case.</p> <p>Currently, emissions related to shale oil production are reported under NFR category 1A1c (Manufacture of Solid Fuels and Other Energy Industries), as the process represents an industrial fuel transformation activity carried out in controlled installations rather than fugitive emissions from solid fuel transformation.</p> <p>Following the recommendation of the TERT, the Estonian inventory team will further review the allocation of emissions related to shale oil production and assess whether any methodological adjustments or reallocation of emissions are appropriate. The results of this review will be reflected in the 2027 submission.</p>					

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2025 (1)	EE-1A2a-2025-0002	No	1A2a Stationary Combustion in Manufacturing Industries and Construction: Iron and Steel, PCDD/F, Pb, 2004-2007, 2009-2010, 2014-2020	N/A	No
<b>Recommendation</b> For category 1A2a Stationary Combustion in Manufacturing Industries and Construction: Iron and Steel, pollutants Pb, PCDD/F, Cd, years 2004, 2005, 2006, 2007, 2009, 2010, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2009-2010, 1990-2023, respectively, the TERT notes that whilst Estonia acknowledges emissions from fuel combustion do occur, albeit in very small amounts, they are reported using the notation key 'NA'. The TERT notes that the notation key 'NA' should be used only for non-existent emissions. The TERT notes that the issue is below the threshold of significance for a technical correction. <b>The TERT recommends that Estonia provide emission estimates for the pollutants Pb, PCDD/F, and Cd for category 1A2a, Stationary Combustion in Manufacturing Industries and Construction: Iron and Steel, for all years, using the 2023 EMEP/EEA Guidebook Tier 1 method in the next submission.</b>					
Improvement made				IIR Chapter, page	
<p>The Estonian inventory team acknowledges the recommendation of the TERT regarding the reporting of heavy metals and POP emissions in category 1A2a Stationary Combustion in Manufacturing Industries and Construction: Iron and Steel.</p> <p>There is no primary iron and steel production in Estonia; only secondary production (iron and steel casting) takes place. Metals are mainly processed in thermal furnaces, most of which operate on electricity. Therefore, in line with previous recommendations, all process-related emissions have been reported under NFR 2C1, based on statistical data on metal processing and emission factors from the 2023 EMEP/EEA Guidebook (Chapter 2C1, Tables 3-8 and 3-15).</p> <p>Emissions from fuel combustion (mainly natural gas), which occurs primarily in small boilers and other stationary combustion units, are reported under category 1A2a. These estimates are based on activity data from the national energy balance and emission factors for small combustion plants.</p> <p>Given that the amount of fuel consumed is very small and the corresponding emission factors for some pollutants (e.g. Pb, Cd and PCDD/F) are extremely low, emissions were previously reported using the notation key NA for several years.</p> <p>Following the recommendation of the TERT, the Estonian inventory team will review the time series and assess the possibility of providing emission estimates for Pb, Cd and PCDD/F for all years using the Tier 1 methodology from the 2023 EMEP/EEA Guidebook. Where appropriate, the necessary updates will be implemented in the 2027 submission.</p>					



Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2025 (1)	EE-1A2b-2025-0003	No	1A2b Stationary Combustion in Manufacturing Industries and Construction: Non-Ferrous Metals, Cd, Hg, Pb, 2005-2023	N/A	No
<b>Recommendation</b> For category 1A2b Stationary Combustion in Manufacturing Industries and Construction: Non-Ferrous Metals, pollutants Hg, Cd, Pb, years 2005-2023, the TERT noted inconsistent reporting of emission in the NFR files. During the review, Estonia has provided information showing that emissions of the pollutants Cd, Hg and Pb do exist, albeit it in very small amounts and that their occurrence varies with the fuels year by year. The TERT notes that the issue is below the threshold of significance for a technical correction. <b>The TERT recommends that Estonia provide emission estimates for the pollutant Cd for the category 1A2b, Stationary Combustion in Manufacturing Industries and Construction: Non-Ferrous Metals, for all years, using the 2023 EMEP/EEA Guidebook Tier 1 method and verify the time series consistency for all pollutants reported.</b>					
Improvement made				IIR Chapter, page	
<p>The Estonian inventory team acknowledges the recommendation of the TERT regarding the reporting of heavy metal emissions in category 1A2b Stationary Combustion in Manufacturing Industries and Construction: Non-Ferrous Metals.</p> <p>Emissions in this category originate mainly from secondary non-ferrous metal production processes (secondary lead, zinc and aluminium) and from stationary combustion units associated with these activities. Emissions are estimated using activity data from the national energy balance and emission factors described in Chapter 3.2.2.2 of the IIR.</p> <p>According to the energy balance data, the most frequently used fuels in this sector are natural gas and coal (reported as solid fuel in the NFR tables). Biomass was used only in 2007, and liquid fuel in 2006. As the consumption of natural gas in this sector is very low and the emission factors for certain heavy metals (e.g. Pb and Cd) are extremely small, emissions for some years were previously reported using the notation key NA.</p> <p>For example, in 2015 the calculated lead emissions were approximately 0.06 g (0.00000006 t), representing a negligible amount.</p> <p>Following the recommendation of the TERT, the Estonian inventory team will review the time series consistency for heavy metal emissions in this category and assess the possibility of providing emission estimates for Cd for all years using the Tier 1 methodology from the 2023 EMEP/EEA Guidebook. Any necessary adjustments to the time series will be implemented in the 2027 submission.</p>					

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2025 (1)	EE-2C1-2025-0002	No	2C1 Iron and Steel Production, PCDD/F, 2020	N/A	No
<b>Recommendation</b> For category 2C1 Iron and Steel Production, pollutant PCDD/F, year 2020 the TERT notes a factor 10 mistake in the emission numbers. In response to a question raised during the review, Estonia confirmed that the reported 2020 emission of the pollutant PCDD/F in category 2C1 Iron and Steel Production contains a clear typographical mistake. The correct emission value is 0.000193 g. The TERT notes that the issue is below the threshold of significance for a technical correction. <b>The TERT recommends that emissions are updated in the next submission.</b>					
Improvement made				IIR Chapter, page	
The Estonian inventory team confirm that the submitted data on PCDD/PCDF emissions of the pollutant category 2C1 for 2020 contains an obvious typographical error. The correct emission value is 0.000193 g. The incorrectly entered value has been corrected.					
Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2025 (1)	EE-2C6-2025-0001	No	2C6 Zinc Production, Hg, Cd, 1998, 2006-2023	N/A	No
<b>Recommendation</b> For category 2C6 Zinc Production, pollutants Hg, Cd, years 1998 and 2006-2023, the TERT notes that the notation key 'NA' (not applicable) is used whilst a Tier 1 method is available in the 2023 EMEP/EEA Guidebook. In response to a question raised during the review, Estonia clarified that there is no primary zinc production, however some facilities engaged in metal recycling and galvanizing (i.e., secondary zinc production). All these activities have a Tier 2 method for heavy metals according to the 2023 EMEP/EEA Guidebook. The TERT notes that the issue is below the threshold of significance for a technical correction. <b>For completeness, the TERT recommends that Estonia map the activity from this sector and calculates the emissions based on relevant emission factors or applies a Tier 3 method.</b>					
Improvement made				IIR Chapter, page	
The Estonian inventory team acknowledges the recommendation of the TERT regarding the reporting of emissions for category 2C6 Zinc Production. According to the currently available information, there are no facilities in Estonia engaged in primary zinc production from raw materials. Consequently, no production processes corresponding to this category and associated emissions of Hg, Cd and Pb occur in Estonia. Therefore, the use of the notation key "NA" (not applicable) for these pollutants in category 2C6 is considered appropriate. A small number of facilities in Estonia are engaged in metal recycling and galvanizing activities (secondary zinc production). These activities correspond to SNAP code 040308 and their emissions have been reported in category 2C7c for the entire time series.					
Following the recommendation of the TERT, the Estonian inventory team will further review the mapping of these activities to ensure the correct allocation of emissions and confirm the appropriateness of the current reporting approach in the 2027 submission.					

Review year of initial recommendation (number of years since it has first been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC, or UPTC in 2021	RE, TC, or UPTC in 2025
2018 (8)	EE-5C1biv-2018-0001	No	5C1biv Sewage Sludge Incineration, HCB, PCDD/F, 1990, 2005, 2016	No	No
<b>Assessment of the implementation of the initial recommendation</b> For category 5C1biv Sewage Sludge Incineration, pollutants HCB, PCDD/F, years 1990, 2005, 2016, the TERT notes that emissions are still reported as 'NA' in the NFR tables. This was raised during the 2018, 2019 and 2020 NECD reviews. In response to a question raised during the review Estonia responded that incineration of sewage sludge without energy recovery is not occurring. This conclusion is based on an analysis of annual environmental reports submitted by operators. The TERT notes that the issue is below the threshold of significance for a technical correction. <b>The TERT recommends reporting PCDD/F and HCB emissions from 5C1biv Sewage Sludge in the next submission as 'NO' (not occurring).</b>					
Improvement made				IIR Chapter, page	
The recommendation has been implemented. Sewage sludge incineration without energy recovery does not occur in Estonia. Therefore, pollutant emissions under NFR 5C1biv are reported as "NO" in the 2026 submission.				Chapter 6.4.1	