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ANNEXES 1 to 6

ANNEXES

to the Proposal

for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

**on the reduction of national emissions of certain atmospheric pollutants and amending
Directive 2003/35/EC**

ANNEX I

Monitoring and reporting of atmospheric emissions

A. Annual emission reporting requirements as referred to in article 7(1), first subparagraph

Element	Pollutants	Time series	Reporting dates
Total national emissions by NFR ⁽¹⁾ source category, including memo-items	- SO ₂ , NO _x , NMVOC, NH ₃ , CO - heavy metals (Cd, Hg, Pb)* - POPs** (total PAHs and benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, dioxins/furans, PCBs, HCB)	Annual, from 1990 to reporting year minus 2 (X-2)	15/02****
Total national emissions by NFR source category	- PM _{2,5} , PM ₁₀ *** and BC.	Annual, from 2000 to reporting year minus 2 (X-2)	15/02****
Total national emissions by source category	- CH ₄	Annual, from 2005 to reporting year minus 2 (X-2)	15/02****
Preliminary national emissions by aggregated NFR ⁽²⁾	- SO ₂ , NO _x , NH ₃ , NMVOC, PM _{2,5}	Annual, for reporting year minus 1 (X-1)	30/09

(1) Nomenclature for reporting as provided by the LRTAP Convention

(2) As aggregated in sectors as defined in Annex IV of the guidelines for reporting of the LRTAP Convention

* Cd (cadmium), Hg (mercury), Pb (lead)

** POPs (persistent organic pollutants)

*** PM₁₀ means particulate matter which passes through a size-selective inlet as defined in the reference method for the sampling and measurement of PM₁₀, EN 12341, with a 50 % efficiency cut-off at 10 µm aerodynamic diameter.

**** Re-submissions due to errors shall be provided within four weeks at the latest and include a clear explanation of the changes made.

B. Annual emission reporting requirements as referred to in article 7(1), second subparagraph

Element	Pollutants	Time series	Reporting date

Total national emissions by NFR source category	- heavy metals (As, Cr, Cu, Ni, Se and Zn and their compounds)* - TSP**	Annual, from 1990 (2000 for TSP) to reporting year minus 2 (X-2)	15/2
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* As (arsenic), Cr (chromium), Cu (copper), Ni (nickel), Se (selenium), Zn (zinc)

** TSP (total suspended particles)

C. Biennial as from 2017 reporting requirements on emissions and projections as referred to in article 7(2)

Element	Pollutants	Time series / target years	Reporting dates
National gridded data of emissions by source category (GNFR)	- SO ₂ , NO _x , NMVOC, CO, NH ₃ , PM ₁₀ , PM _{2.5} - heavy metals (Cd, Hg, Pb), - POPs (total PAHs, HCB, PCBs, dioxins/furans) - BC (if available)	Biennial for reporting year minus 2 (X-2)	01/05 *
Large Point Sources (LPS) by source category (GNFR)	- SO ₂ , NO _x , NMVOC, CO, NH ₃ , PM ₁₀ , PM _{2.5} , - heavy metals (Cd, Hg, Pb), - POPs (total PAHs, HCB, PCBs, dioxins/furans) - BC (if available)	Biennial for reporting year minus 2 (X-2)	01/05 *
Projected emissions by aggregated NFR	- SO ₂ , NO _x , NH ₃ , NMVOC, PM _{2.5} and BC	Biennial reporting, covering every year from year X up to 2030 and, where available, 2040 and 2050	15/03
Projected emissions by aggregated source category	- CH ₄		15/03

* Re-submissions due to errors shall be provided within four weeks and include a clear explanation of the changes made

D. Annual reporting of informative inventory report referred to in article 7(3)

Element	Pollutants	Time series / target years	Reporting dates
Informative Inventory Report (IIR)	- SO ₂ , NO _x , NMVOC, NH ₃ , CO, TSP, PM _{2.5} , PM ₁₀ and BC - heavy metals (Cd, Hg, Pb, As, Cr, Cu, Ni, Se, Zn) - POPs (total PAHs and benzo(a)pyrene,	All years (as indicated in tables A-B-C)	15/03

	benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, dioxins/furans, PCBs, HCB)		
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ANNEX II

National emission reduction commitments

Table (a): Emission reduction commitments for sulphur dioxide (SO₂), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOC). Fuels sold, base year 2005.

Member State	SO ₂ reduction compared with 2005			NO _x reduction compared with 2005			NMVOC reduction compared with 2005		
	For any year from 2020 to 2029		For any year from 2030	For any year from 2020 to 2029		For any year from 2030	For any year from 2020 to 2029		For any year from 2030
Belgium	43%		68%	41%		63%	21%		44%
Bulgaria	78%		94%	41%		65%	21%		62%
Czech Republic	45%		72%	35%		66%	18%		57%
Denmark	35%		58%	56%		69%	35%		59%
Germany	21%		53%	39%		69%	13%		43%
Estonia	32%		71%	18%		61%	10%		37%
Greece	74%		92%	31%		72%	54%		67%
Spain	67%		89%	41%		75%	22%		48%
France	55%		78%	50%		70%	43%		50%
Croatia	55%		87%	31%		66%	34%		48%
Ireland	65%		83%	49%		75%	25%		32%
Italy	35%		75%	40%		69%	35%		54%
Cyprus	83%		95%	44%		70%	45%		54%
Latvia	8%		46%	32%		44%	27%		49%
Lithuania	55%		72%	48%		55%	32%		57%
Luxemburg	34%		44%	43%		79%	29%		58%
Hungary	46%		88%	34%		69%	30%		59%
Malta	77%		98%	42%		89%	23%		31%
Netherlands	28%		59%	45%		68%	8%		34%
Austria	26%		50%	37%		72%	21%		48%
Poland	59%		78%	30%		55%	25%		56%
Portugal	63%		77%	36%		71%	18%		46%
Romania	77%		93%	45%		67%	25%		64%
Slovenia	63%		89%	39%		71%	23%		63%
Slovakia	57%		79%	36%		59%	18%		40%
Finland	30%		30%	35%		51%	35%		46%
Sweden	22%		22%	36%		65%	25%		38%
United Kingdom	59%		84%	55%		73%	32%		49%
EU 28	59%		81%	42%		69%	28%		50%

Table (b): Emission reduction commitments for ammonia (NH₃), fine particulate matter (PM_{2,5}) and methane (CH₄). Fuels sold, base year 2005.

Member State	NH ₃ reduction compared with 2005			PM _{2,5} reduction compared with 2005			CH ₄ reduction compared with 2005	
	For any year from 2020 to 2029		For any year from 2030	For any year from 2020 to 2029		For any year from 2030		For any year from 2030
Belgium	2%		16%	20%		47%		26%
Bulgaria	3%		10%	20%		64%		53%
Czech Republic	7%		35%	17%		51%		31%
Denmark	24%		37%	33%		64%		24%
Germany	5%		39%	26%		43%		39%
Estonia	1%		8%	15%		52%		23%
Greece	7%		26%	35%		72%		40%
Spain	3%		29%	15%		61%		34%
France	4%		29%	27%		48%		25%
Croatia	1%		24%	18%		66%		31%
Ireland	1%		7%	18%		35%		7%
Italy	5%		26%	10%		45%		40%
Cyprus	10%		18%	46%		72%		18%
Latvia	1%		1%	16%		45%		37%
Lithuania	10%		10%	20%		54%		42%
Luxemburg	1%		24%	15%		48%		27%
Hungary	10%		34%	13%		63%		55%
Malta	4%		24%	25%		80%		32%
Netherlands	13%		25%	37%		38%		33%
Austria	1%		19%	20%		55%		20%
Poland	1%		26%	16%		40%		34%
Portugal	7%		16%	15%		70%		29%
Romania	13%		24%	28%		65%		26%
Slovenia	1%		24%	25%		70%		28%
Slovakia	15%		37%	36%		64%		41%
Finland	20%		20%	30%		39%		15%
Sweden	15%		17%	19%		30%		18%
United Kingdom	8%		21%	30%		47%		41%
EU 28	6%		27%	22%		51%		33%

ANNEX III

Content of National Air Pollution Control Programmes

PART 1

MEASURES WHICH MAY BE INCLUDED IN THE NATIONAL AIR POLLUTION CONTROL PROGRAMME

Where relevant, Member States shall make use of the UNECE Guidance Document for Preventing and Abating Ammonia Emissions (Ammonia Guidance Document),¹ and best available techniques set out in Directive 2010/75/EU of the European Parliament and of the Council² when implementing the measures set out in Part 1.

A. Measures to control ammonia emissions

1. Member States shall establish a national advisory code of good agricultural practice for reducing ammonia emissions, based on the 2001 UNECE Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions,³ covering at least the following items:
 - (a) nitrogen management, taking into account the full nitrogen cycle;
 - (b) livestock feeding strategies;
 - (c) low-emission manure spreading approaches;
 - (d) low-emission manure storage systems;
 - (e) low-emission manure processing and composting systems;
 - (f) low-emission animal housing systems;
 - (g) low-emission approaches for mineral fertilizer application.
2. Member States shall establish a national nitrogen budget to monitor the changes in overall losses of reactive nitrogen from agriculture, including ammonia, nitrous oxide, ammonium, nitrates and nitrites, based on the principles set out in the UNECE Guidance Document on Nitrogen Budgets⁴.
3. Member States shall reduce ammonia emissions from inorganic fertilizers by using the following approaches:
 - (a) use of ammonium carbonate fertilizers shall be prohibited;
 - (b) urea-based fertilizers shall as far as possible be replaced by ammonium nitrate-based fertilizers;
 - (c) where urea-based fertilizers continue to be applied, methods shall be used that have been shown to reduce ammonia emissions by at least 30% compared with the use of the reference method, as specified in the Ammonia Guidance Document;

¹ Decision 2012/11, ECE/EB/AIR/113/Add. 1

² Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (OJ L 334, 17.12.2010, p. 17).

³ Decision ECE/EB.AIR/75, paragraph 28a

⁴ Decision 2012/10, ECE/EB.AIR/113/Add.1

- (d) inorganic fertilisers shall be spread in line with the foreseeable requirements of the receiving crop or grassland with respect to nitrogen and phosphorus, also taking into account the existing nutrient content in the soil and the nutrients from other fertilizers.
4. Member States shall by 1 January 2022 reduce ammonia emissions from livestock manure by using the following approaches:
- (a) reduce emissions from slurry and solid manure application to arable land and grassland, by using methods that reduce emissions by at least 30 % compared with the reference method described in the Ammonia Guidance Document and on the following conditions:
 - (i) manures and slurries shall only be spread in line with the foreseeable nutrient requirement of the receiving crop or grassland with respect to nitrogen and phosphorous, also taking into account the existing nutrient content in the soil and the nutrients from other fertilizers;
 - (ii) manures and slurries shall not be spread when the receiving land is water saturated, flooded, frozen or snow covered;
 - (iii) slurries spread to grassland shall be applied using a trailing hose, trailing shoe or through shallow or deep injection;
 - (iv) Manures and slurries spread to arable land shall be incorporated within the soil within four hours of spreading.
 - (b) reduce emissions from manure storage outside of animal houses, by using the following approaches:
 - (i) for slurry stores constructed after 1st January 2022, low emission storage systems or techniques shall be used which have been shown to reduce ammonia emissions by at least 60% compared with the reference method described in the Ammonia Guidance Document, and for existing slurry stores at least 40%;
 - (ii) for stores for solid manure, the stores shall be covered;
 - (iii) farms shall have sufficient manure storage capacity to spread manure only during periods that are suitable for crop growth.
 - (c) reduce emissions from animal housing, by using systems which have been shown to reduce ammonia emissions by at least 20% compared with the reference method described in the Ammonia Guidance Document.
 - (d) Reduce emissions from manure, by using low protein feeding strategies which have been shown to reduce ammonia emissions by at least 10% compared with the reference method described in the Ammonia Guidance Document.

B. Emission reduction measures to control emissions of particulate matter and black carbon

1. Member States shall shall ban open field burning of agricultural harvest residue and waste and forest residue, and shall monitor and enforce its implementation. Any exemptions to such a ban shall be limited to preventive programs to avoid uncontrolled wildfires, to control pest or to protect biodiversity.

2. Member States shall establish a national advisory code of good agricultural practices for the proper management of harvest residue, on the basis of the following approaches:
 - (a) improvement of soil structure through incorporation of harvest residue;
 - (b) improved techniques for incorporation of harvest residue;
 - (c) alternative use of harvest residue;
 - (d) improvement of the nutrient status and soil structure through incorporation of manure as required for optimal plant growth, thereby avoiding burning of manure (farmyard manure, deep-straw bedding).
- C. Preventing impacts on small farms**
1. In taking the measures outlined in sections A and B above, Member States should ensure that impacts on small and micro farms are fully taken into account. Member States may, for instance, exempt them from those measures where possible and appropriate in view of the applicable reduction commitments.

PART 2

MINIMUM CONTENT OF THE NATIONAL AIR POLLUTION CONTROL PROGRAMME

1. The initial national air pollution control programme referred to in Articles 6 and 9 shall at least cover the following content:
 - (a) the national air quality and pollution policy framework in which context the programme has been developed, including:
 - (i) the policy priorities and their relationship to priorities set in other relevant policy areas, including climate change;
 - (ii) the responsibilities attributed to national, regional and local authorities;
 - (iii) the progress made by current policies and measures in reducing emissions and improving air quality, and the degree of compliance with national and EU obligations;
 - (iv) the projected further evolution assuming no change to already adopted policies and measures
 - (b) the policy options considered to meet the emission reduction commitments for 2020 and 2030 onwards and the intermediate emission levels determined for 2025 and to contribute to further improve the air quality, and their analysis, including the method of analysis; the individual or combined impacts of the policies and measures on emission reductions, air quality and the environment; and the associated uncertainties;
 - (c) the measures and policies selected for adoption, including a timetable for their implementation and review and the competent authorities responsible;

- (d) where relevant, an explanation of the reasons why the intermediate emission levels for 2025 cannot be met without measures entailing disproportionate costs;
 - (e) an assessment of how selected policies and measures ensure coherence with plans and programmes set up in other relevant policy areas.
2. The national air pollution control programme updates referred to in Articles 6 and 9 shall at least include:
- (a) an assessment of the progress made with implementation of the programme, the reduction of emissions and the reduction of concentrations;
 - (b) any significant changes in the policy context, assessments, the programme or the implementation time table.

ANNEX IV

Methodologies for the preparation and the updating of national emission inventories, emission projections, informative inventory reports and adjusted emission inventories

For the pollutants referred to in Annex I, other than CH₄, Member States shall establish emission inventories, adjusted emission inventories, projections and informative inventory reports using the methodologies adopted by Parties to the LRTAP Convention (EMEP Reporting Guidelines) and are requested to use the EMEP/EEA Guidebook referred to therein. In addition, supplementary information, in particular the activity data, needed for the assessment of the inventories and projections shall be prepared in accordance with the same guidelines.

Reliance upon the EMEP Reporting Guidelines is without prejudice to the additional modalities specified in this Annex and to the requirements on reporting nomenclature, time series and reporting dates specified in Annex I.

PART 1

NATIONAL ANNUAL EMISSION INVENTORIES

1. National emission inventories shall be transparent, consistent, comparable, complete and accurate.
2. Emissions from identified key categories shall be calculated in accordance with the methodologies defined in the EMEP/EEA Guidebook and with the aim of using a Tier 2 or higher (detailed) methodology.

Member States may use other scientifically based and compatible methodologies for establishing national emission inventories if producing more accurate estimates than the default methodologies set out in the EMEP/EEA Guidebook.

3. For emissions from transport, Member States shall calculate and report emissions consistent with national energy balances reported to Eurostat.
4. Emissions from road vehicle transport shall be calculated and reported on the basis of the fuel sold in the Member State concerned. In addition, Member States may also report emissions from road vehicles based on fuel used or kilometres driven in the Member State.
5. Member States shall report their annual national emissions expressed in the applicable unit specified in the NFR reporting template of the LRTAP Convention.

PART 2

EMISSION PROJECTIONS

1. Emission projections shall be transparent, consistent, comparable, complete and accurate and reported information shall include at least the following:
 - (a) clear identification of the adopted and planned policies and measures included in the projections;
 - (b) the results of sensitivity analysis performed for the projections;

- (c) a description of methodologies, models, underlying assumptions and key input and output parameters.
- 2. Projections of emissions shall be estimated and aggregated to relevant source sectors. Member States shall provide a ‘with measures’ (adopted measures) and, where relevant, a ‘with additional measures’ (planned measures) projection for each pollutant in accordance with the guidance established in the EMEP/EEA Guidebook.
- 3. Projections shall be consistent with the latest national annual emission inventory and with projections reported under Regulation No 525/2013.

PART 3

INFORMATIVE INVENTORY REPORT

The informative inventory reports shall be prepared in accordance with the EMEP Reporting Guidelines and reported using the template for inventory reports as specified therein. The inventory report shall include, as a minimum, the following information:

- (a) descriptions, references and sources of information of the specific methodologies, assumptions, emission factors and activity data, as well as the rationale for their selection;
- (b) a description of the national key categories of emission sources;
- (c) information on uncertainties, quality assurance and verification;
- (d) a description of the institutional arrangements for inventory preparation;
- (e) recalculations and planned improvements;
- (f) if relevant, information on the use of the flexibilities provided for under Article 5(1) and (3);
- (g) an executive summary.

PART 4

ADJUSTMENT OF NATIONAL INVENTORIES

- 1. A Member State that proposes an adjustment to its national emission inventory in accordance with the provision of article 5(3) shall include in its proposal to the Commission, at least, the following supporting documentation:
 - (a) evidence that the concerned national emission reduction commitment(s) is/are exceeded;
 - (b) evidence of the extent to which the adjustment to the emission inventory reduces the exceedance and contributes to compliance with the concerned national emission reduction commitment(s);
 - (c) an estimation of whether and when the concerned national emission reduction commitment(s) is/are expected to be attained based on emission projections without the adjustment;

(d) evidence that the adjustment is consistent with one or several of the following three circumstances. Reference can be made, as appropriate, to relevant previous adjustments:

(i) for new emission source categories:

- evidence that the new emission source category is acknowledged in scientific literature and/or the EMEP/EEA Guidebook;
- evidence that this source category was not included in the relevant historic national emission inventory at the time when the emission reduction commitment was set;
- evidence that emissions from a new source category contribute to a Member State being unable to meet its emission reduction commitments, supported by a detailed description of the methodology, data and emission factors used to arrive at this conclusion;

(ii) for significantly different emission factors used for determining emissions from specific source categories:

- a description of the original emission factors, including a detailed description of the scientific basis upon which the emission factor was derived;
- evidence that the original emission factors were used for determining the emission reductions at the time when they were set;
- a description of the updated emission factors, including detailed information on the scientific basis upon which the emission factor was derived;
- a comparison of emission estimates made using the original and the updated emission factors, demonstrating that the change in emission factors contributes to a Member State being unable to meet its reduction commitments;
- the rationale for deciding whether the changes in emission factors are significant.

As from 2025, emission factors significantly different than expected from the implementation of a given norm or standard shall not be considered for the adjustment.

(iii) for significantly different methodologies used for determining emissions from specific source categories:

- a description of the original methodology used, including detailed information on the scientific basis upon which the emission factor was derived;
- evidence that the original methodology was used for determining the emission reductions at the time when they were set;
- a description of the updated methodology used, including a detailed description of the scientific basis or reference upon which it has been derived;

- a comparison of emission estimates made using the original and updated methodologies demonstrating that the change in methodology contributes to a Member State being unable to meet its reduction commitment;
 - the rationale for deciding whether the change in methodology is significant;
- 2. Member States may submit the same supporting information for adjustment procedures based on similar preconditions, provided that each Member State submits the required individual country-specific information as described in paragraph 1.
- 3. Member States shall recalculate adjusted emissions to ensure consistency of the time series for every year that the adjustment(s) are applied.

ANNEX V

Monitoring of effects of pollutants in the environment

1. Member States shall ensure that their network of monitoring sites is representative of their fresh water, natural and semi-natural as well as forest ecosystems types.
2. Member States shall ensure that the monitoring is based upon the following mandatory indicators at all sites of the network defined in paragraph 1:
 - (a) for freshwater ecosystems: establishing the extent of biological damage, including sensitive receptors (micro- and macrophytes and diatoms), and loss of fish stock or invertebrates:

the key indicator acid neutralising capacity (ANC) and the supporting indicators acidity (pH), dissolved sulphate (SO₄), nitrate (NO₃) and dissolved organic carbon with a minimum frequency of sampling from yearly (in lake autumn turnover) to monthly (streams).
 - (b) for terrestrial ecosystems: assessing the soil acidity, soil nutrients loss, nitrogen status and balance as well as biodiversity loss:
 - (i) the key indicator soil acidity: exchangeable fractions of base cations (base saturation) and exchangeable aluminium in soils every ten years and the supporting indicators, pH, sulphate, nitrate, base cations, aluminium concentrations in soil solution every year (where relevant);
 - (ii) the key indicator soil nitrate leaching (NO_{3,leach}) every year;
 - (iii) the key indicator carbon-nitrogen ratio (C/N) and the supporting indicator of total nitrogen in soil (N_{tot}), every ten years;
 - (iv) the key indicator nutrient balance in foliage (N/P,N/K, N/Mg) every four years.
 - (c) for terrestrial ecosystems: assessing ozone damage to vegetation growth and biodiversity:
 - (i) the key indicator vegetation growth and foliar damage and the supporting indicator carbon flux (C_{flux}) every year;
 - (ii) the key indicator exceedence of flux-based critical levels every year during the growing season;
3. Member States shall use the methodologies on the Convention on Long-Range Transboundary Air Pollution and its Manuals for the International Cooperative Programmes when collecting and reporting⁵ the information covered by paragraph 2.

⁵ Decision 2008/1, ECE/EB.AIR/wg.1/2008/16

ANNEX VI

Correlation Table

Present Directive	Directive 2001/81/EC
Article 1	Article 1
Article 2	Article 2 (1 st sub-paragraph)
Article 3(1)	Article 3 (e)
Article 3 (2), (3), (6), (7), (9-12)	-
Article 3(4)	Article 3(j)
Article 3(5)	Article 3(k)
Article 3(8)	Article 3(g)
Article 4(1), (2)	Article 4(1)
Article 4(3)	Article 2(2 nd sub-paragraph)
Article 5	-
Article 6 (1)	Article 6(1), (2)
Article 6 (2), (5-9)	-
Article 6 (3), (4)	Article 6(3)
Article 7 (1) (1 st sub-paragraph)	Article 7(1)
Article 7 (1) (2 nd sub-paragraph), (3-6)	-
Article 7 (2)	-
Article 7 (7)	Article 7(2)
Article 7 (8)	Article 7(3)
Article 7 (9)	Article 7(4)
Article 8	-
Article 9 (1)	Article 8(2)
Article 9 (2) (1 st sub-paragraph)	Article 8(1)
Article 9 (2) (2 nd sub-paragraph), (3-5)	-

Article 10	Articles 9 and 10
Article 11(1)	Article 6(4)
Article 11(2)	Article 7(3)
Article 12	Article 11
Article 13	Article 13(3)
Article 14	Article 13(1), (2)
Article 15	Article 14
Article 16	-
Article 17	Article 15
Article 18	-
Article 19	Article 16
Article 20	Article 17
Annex I	Article 8(1) and Annex III
Annex II	Annex I
Annexes III, V and VI	-
Annex IV	Annex III