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Subject:	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 - Note from the Commission

With a view to the Working Party on the Environment (WPE) on 29 September 2015, delegations will find in the Annex a note prepared by the Commission services on ecosystem monitoring in relation to Article 8 and Annex V of the abovementioned proposal.

Clarifications on the relation between ecosystem monitoring under the proposed new NEC Directive, and ecosystem monitoring under the Convention on Long Range Transboundary Air Pollution (CLRTAP) and existing EU legislation

The Commission proposal for a new NEC Directive includes the provision for Member States (MSs) to monitor ecosystem effects of air pollution as set out in Article 8 and specified in its Annex V. This note clarifies the relation of these proposals to the ecosystem monitoring carried out under CLRTAP and existing EU legislation.

In summary, the NECD proposal as drafted would require air pollution impacts to be reported on around 1000 sites. Under the CLRTAP, Member States report information from 250 sites, but the sites currently designated under the Water Framework Directive would be sufficient on average to cover the surface water ecosystem needs, while for the monitoring of forest ecosystems there is potentially a large overlap with activities under the Habitats Directive and national surveys. The main additional effort may be for ozone damage to vegetation, although there is likely to be some overlap with national surveys which it has not been possible to quantify due to lack of information.

The detailed assessment is as follows.

Requirements to monitor ecosystem effects under CLRTAP

The CLRTAP created a framework for controlling and reducing the damage to human health and the environment caused by transboundary air pollution. Keys to its success are the institutional framework bringing together research and policy and the use of an effects-based approach¹. The underpinning science for the effects-based approach is provided by effect-related programs, organised via International Cooperative Programmes (ICPs). These ICPs identify the most endangered areas, ecosystems and other receptors by considering damage to human health, terrestrial and aquatic ecosystems and materials. An important part of the work of the ICP's is long-term monitoring.

¹ The effects-based approach is also adopted by the EU as exemplified through the objectives laid down in the 6th and 7th Environment Action Program of the EU and in EU legislation e.g. the NEC Directive 2001/81/EC and the Directive on Ambient Air Quality (2008/50/EC).

To align the activities of the ICP's the Coordinating Centre for Effects (CCE) develops and publishes guidance (Manuals) on the monitoring of effects. These manuals include details for the field activities, laboratory procedures, analysis and reporting and general QA/QC ². The ICPs provide on a regular basis the CLRTAP Parties with assessment reports on ecosystems sensitivities to air pollution (critical loads and levels) as well as follow-up of the effectiveness of policy action (e.g. recovery of the ecosystems). In particular the 2016 Assessment report and the Trend report of the CLRTAP will include work also on effects.

The 2012 amendment to the Gothenburg Protocol strengthens the role of effects-oriented activities since the new Article 3 paragraph 11 quarter requires that "Each Party should actively participate in programmes under the Convention on the effects of air pollution on human health and the environment". The Commission views that this commitment should be part of the *acquis* to safeguard monitoring activities and data for the follow-up of the measures taken (*ex-post* evaluations) as well as a basis for future policies (*ex-ante* assessment) of the EU and the Convention.

Current MSs reporting under the CLRTAP of their effects-related activities varies greatly. An overview made by the CCE for the last five years' reporting shows that several MSs either do not participate in such programs or do not report. Also, there is a reduction of the effects-related activities and reporting by Convention Parties over the last five years, from about 700 sites to some 250 sites reporting. Added to that the sites are very unevenly distributed between MSs and also between the types of ecosystem covered (forests soils monitoring with the highest coverage and ozone forest damage the lowest), see Table 2.

The proposal for a new NEC Directive would require MSs to ensure representative monitoring for their fresh water, natural and semi-natural as well as forest eco-systems. The requirements for parameters and frequency outlined in the Annex V are based on the latest CLRTAP manuals (adopted in 2010 and partly updated later), and correspond mainly to level I monitoring (except for the exceedance of ozone flux-based critical levels, which is part of level II monitoring).

² Such as the ICP Forest Manual (<http://icp-forests.net/page/icp-forests-manual>), ICP Waters Manual (<http://www.icp-waters.no/Manual/tabid/61/Default.aspx>), ICP vegetation (http://icpvegetation.ceh.ac.uk/manuals/mapping_manual.html), ICP Modelling and Mapping (http://icpmapping.org/Mapping_Manual).

Coverage of the EU acquis and the Proposed NEC Directive

As such the proposal for the new NEC Directive does not specify the number of monitoring sites per MS, but leaves the responsibility of selecting representative sites/ecosystems to the MSs. The Commission has assumed in its Impact Assessment ³ that a representative number of monitoring sites per MS would be comparable to the number of relevant ecosystem types defined under the NATURA 2000 network for that country. Under that assumption the overall number of sites would be in the range of 1,000 sites throughout the EU. Such a network would likely cover the basic needs of the EU and the CLRTAP on air pollution impact data for the evaluation of the measures taken and as a basis for future policies. It should be emphasized that the Commission proposal does not prescribe which specific ecosystems/sites make part of a representative network nor the number of monitoring stations per MS, the choice of monitoring network and sites remains with the MSs.

EU MSs already have an important monitoring network in place under EU legislation, notably under the Water Framework Directive ⁴, the Nitrates Directive ⁵, the Habitats Directive ⁶ and the Birds Directive ^{7 8} as well as under national legislation.

Habitats and Birds Directives

Monitoring under the Habitats Directive is aimed at determining conservation status and trends of all protected habitat types and species. The directive also requires MSs to provide information on status (e.g. concentration of pollution and occurrence of key and indicator species) and threats (e.g. deposition of air pollution) to habitat types and species within the entire territory and not restricted to Natura 2000 sites. Similar monitoring on population status and trends takes place under the Birds Directive. Site specific monitoring under these directives is also relevant for the monitoring proposed in the new NEC Directive, but as there is a lack of common information/databases an assessment of current coverage/overlap has not been possible.

³ Commission Staff Working Document SWD(2013) 531.

⁴ Directive 2000/60/EC.

⁵ Directive 91/676/EEC.

⁶ Directive 92/43/EEC.

⁷ Directive 2009/147/EC.

⁸ The Habitats and Birds Directives are currently undergoing a fitness check to be concluded in 2016, see mandate for that evaluation on the COM webpage http://ec.europa.eu/environment/nature/legislation/fitness_check/docs/Mandate%20for%20Nature%20Legislation.pdf.

The Commission has recently analysed information provided by EU MSs on the status of and trends for ecosystems and species under these directives ⁹, underpinned by technical assessment reports of the EEA ¹⁰. MSs reporting identify air pollution as a relevant threat to all types of ecosystems (e.g. for heathland ecosystems air pollution is identified as a threat in 8.9% of the cases and for wetland ecosystems in 5.4% of the cases). By contrast, the comprehensive integrated assessment modelling with GAINS ¹¹ shows that 67% of EU ecosystem and 77% of the Natura 2000 ecosystems are exposed to excessive atmospheric deposition load of nitrogen.

Waters

The EU Water Framework Directive (WFD) requires MSs to designate protected areas and monitor the ecological status of waters, including surface freshwater ecosystems (lakes, rivers, etc). These surface water ecosystems are explicitly mentioned as part of the ecosystems to be monitored according to article 8 of the proposed NEC Directive.

The most recent Commission evaluation of the implementation of the WFD in 2012 ¹², includes estimates of the ongoing activities in the EU, including also the monitoring coverage. MSs specifically have to assess the physico-chemical and biological status of waters through surveillance, operational and investigative monitoring. For lakes, rivers (i.e. fresh water ecosystems), transitional and coastal waters this includes the monitoring of chemical aspects such as the degree of acidification, levels of nitrates, organic matter and nutrient conditions as well as of biological parameters (e.g. composition and abundance of phytoplankton, macrophytes, phytobenthos, fish and benthic invertebrates).

⁹ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52015DC0219&from=EN>.

¹⁰ <http://www.eea.europa.eu/highlights/state-of-nature-in-the>.

¹¹ IIASA TSAP report #11.

¹² COM 2012 670 final <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0670>, including the Staff Working Documents.

The 2012 evaluation of the implementation of the WFD shows that the number of defined protected areas under the WFD is 14,855¹³ for areas defined also under the Habitats Directive and 4114¹⁴ for areas also defined under the Bird Directive (aka Natura 2000 network sites¹⁵). In total there are about 82,000 monitoring sites for surface waters in the EU as whole, of which about 67,000 are located in rivers and about 7500 in lakes. The monitoring (site) density varies across MSs, being high in MS with large demand on water resources and relatively low in MS with good availability and less pressure on water resources. Given the aforementioned assumption that a representative number of monitoring sites under the proposed new NEC Directive would broadly be similar to the ecosystem types defined by MSs under the Natura 2000 network, corresponding to 241 freshwater ecosystems sites in the EU, it is likely that the current monitoring under the WFD would be appropriate to cover the needs of the proposed ecosystem monitoring.

Forests and vegetation

At EU level, the monitoring of forests (soil and vegetation) was largely covered by the Forest Focus Regulations 2152/2003 and 1737/2006¹⁶ and by the LIFE plus project 'FUTMON'. These monitoring activities were based on the existing network and plots established under older Council regulations¹⁷. The monitoring programme was linked to the CLRTAP ICP on Assessment and Monitoring of Air Pollution Effects on Forest (ICP Forests). Continuous and intensive monitoring of the Level II plots cover close to 500 plots in the EU. All the data collected under the EU programmes are hosted by the JRC (Forest Focus Data Centre). Assessment of ozone vegetation damage based on on-site measurement of exceedances of flux-based critical levels was only performed at a limited number of sites¹⁸.

¹³ These estimates do not include Croatia.

¹⁴ These estimates do not include Croatia.

¹⁵ There are 27 384 Natura 2000 sites in the EU.

¹⁶ The EU also co-financed forest monitoring through other instruments in the period from 1986 to 2003.

¹⁷ Regulations (EEC) No 3528/86 and regulations (EEC) No 1696/87 and EC No 1091/94.

¹⁸ The Forest Focus regulation provided financial contributions to optionally monitor ozone exposure by experimental methods mainly through assessing the AOT40, max and mean ozone metrics (default methodology and for a few places ozone flux measurements (experimental demonstration projects)).

There has been no continuation of financing these activities under EU instruments, but many MS have forest monitoring as part of their continued and general monitoring of forest health conditions and in relation to Natura 2000 sites (e.g. growth and tree damage, soil conditions, soil chemistry, etc). It has not been possible to make an assessment of the overlap between the current MS monitoring and the proposed requirements under the NEC Directive, mainly due to lack of common EU wide databases of such monitoring.

Natural and semi-natural ecosystems

As for the current monitoring of forest, MSs have ongoing monitoring of natural and semi-natural grasslands in place, particularly in relation to Natura 2000 sites. Again, it has not been possible to make an assessment of the overlap between the current MS monitoring and the requirements under the proposed new NEC Directive.

Cost estimates

The Impact assessment accompanying the proposed new NEC Directive included a first order estimate of initial and running cost estimates based on the average cost per monitoring site.

With the new information at hand and a slightly updated method it can be assumed that the current activities (with some modifications) under the WFD would be sufficient on average to cover the needs under the proposed new NEC Directive regarding the monitoring of waters. For the monitoring of forest ecosystems there is potentially a large overlap with activities under the Habitats Directive and national surveys, whereas for ozone damage to vegetation there may be some overlap with national surveys. As mentioned before, it has not been possible to quantify the overlaps, but MS should be able to decide whether the existing monitoring sites are representative.

The extensive coverage of surface water ecosystem monitoring under the WFD would allow MSs to coordinate those activities with those under the proposed new NEC Directive. Potentially such coordination benefits would reduce annual running costs by up to about 27 percent. Also for other ongoing monitoring there is a potential for coordination and cost saving. That potential has not been quantified due to lack of coherent information and data from MSs.

Table1. Updated number of habitats types defined under the NATURA 2000 networks

				IA	WPE Sept 2015
Member State	No of habits in category 3 (Fresh water habitats)	No of habits in category 6 (Natural and semi natural grassland formations)	No of habits in category 9 (Forests)	3+6+9 OLD estimate	3+6+9 New estimate
Austria	9	14	18	44	41
Belgium	8	9	10	26	27
Bulgaria	6	18	27	49	51
Croatia	8	18	16	36	42
Cyprus	4	4	11	19	19
Czech Republic	9	13	16	38	38
Denmark	7	5	9	21	21
Estonia	7	8	10	25	25
Finland	9	11	12	32	32
France	15	16	28	59	59
Germany	12	13	17	42	42
Greece	10	18	26	44	54
Hungary	5	12	13	30	30
Ireland	8	6	4	18	18
Italy	15	14	38	65	67
Latvia	7	10	19	26	36
Lithuania	7	9	13	27	29
Luxembourg	4	7	8	19	19
Malta	2	1	6	9	9
Netherlands	7	8	7	22	22
Poland	10	13	17	39	40
Portugal	13	11	18	42	42
Romania	10	17	24	51	51
Slovakia	9	15	19	42	43
Slovenia	10	11	11	32	32
Spain	14	13	29	53	56
Sweden	8	14	17	39	39
U. K.	8	9	11	28	28
EU total	241	317	454	977	1012

Table 2 Overview of key parameter reporting to the ICPs by EU MSs in the period 2008 to 2013.

CLRTAP	Freshwater ecosystem					Terrestrial ecosystem, soils, level II (2001)				Soils						ozone	forests (IM)
	ANC	pH	SO ₄	NO ₃	DOC	OC	Total organic nitrogen	Exch Al	Exch BAC	pH (median frequency)	S-SO ₄ (median frequency)	N-NO ₃ (median frequency)	K (median frequency)	Ca (median frequency)	Mg (median frequency)		Foliar damage
AT	1	1	1	1		2	2	0	2	6	6	6	6	6	6	6	1
BE						20	20	0	20	7	7	7	7	7	7	4	1
BG						11	11	0	11	3	3	3	3	3	3		
CR						10	10	2	8							1	1
CY						3	3	2	0								
CZ	8	8	8	8	8					11	11	11	11	11	11	8	
DK		0	0	0		12	12	3	9	21	21	21	21	21	21		
EE	1	1	1	1		1	1	0	0								
FI	8	8	8	8	8	112	112	12	100	20	20	20	20	20	20		1
FR						100	100	0	99	15	15	15	15	15	15	2	1
DE	35	35	35	35	14	11	11	0	11	98	98	98	98	98	98	29	2-6
GR						15	15	0	14	3	3	3	3	3	3	3	1-3
HU						20	20	0	19	2	2	2	2	2	2	11	1-2
IE	10	10	10	10	10	20	20	0	18	5	5	5	5	5	5		1
IT	6	6	6	6		56	56	8	42	12	12	12	12	12	12	26	1-3
LT						126	126	12	126	3	3	3	3	3	3	10	

CLRTAP	Freshwater ecosystem					Terrestrial ecosystem, soils, level II (2001)				Soils						ozone	forests (IM)
	ANC	pH	SO ₄	NO ₃	DOC	OC	Total organic nitrogen	Exch Al	Exch BAC	pH (median frequency)	S-SO ₄ (median frequency)	N-NO ₃ (median frequency)	K (median frequency)	Ca (median frequency)	Mg (median frequency)		Foliar damage
LU						4	4	0	1								
LV	5	5	5	5		10	10	10	0	1	1	1	1	1	1	1	1-4
MT	1	1	1	1													
NL						3	3	0	3	14	14	14	14	14	14		1
PL	4	4	4	4		13	13	2	3	12	12	12	12	12	12		1
PT						19	19	3	16								1
RO						33	33	2	26	5	5	5	5	5	5	4	
SK						12	12	12	0	6	6	6	6	6	6	8	
SI						7	7	0	0	3	3	3	3	3	3	4	1-3
ES	7	7	7	7	7	4	4	0	4	5	5	5	5	5	5	15	1-3
SE	10	10	10	10	10	53	53	0	53	54	54	54	54	54	54		1
UK	6	6	6	6	6	38	38	33	38	11	11	11	11	11	11	7	1-2