

Nitrogen Deposition and the Nature Directives

Impacts and Responses: Our shared experiences



Department
for Environment
Food & Rural Affairs



Theme 2: Working Group 5: Measures to reduce nitrogen deposition from sources other than localised agriculture (e.g. transport, power generation, industry and long range emissions)

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The workshop is being organised by JNCC on behalf of the UK Government, Devolved Administrations and country nature conservation bodies, in collaboration with the Dutch Ministry of Economic Affairs and in co-operation with the Task Force on Reactive Nitrogen.

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1. Summary

Nitrogen deposition from a range of emission sources is currently impacting on many habitats across Europe and is forecast to continue into the foreseeable future despite the provisions of existing pollution legislation.

The sources have long-range and localised impacts. The focus of this working group will be on measures to reduce nitrogen deposition from sources other than local agriculture, for example transport, power generation and industry.

The working group will assess what measures exist at a regional or local scale to reduce nitrogen impacts on protected sites drawing on existing practice and proposals for future strategies or plans.

2. Introduction

Air pollution is a shared issue across Europe, with long range impacts creating significant problems in many areas. The 'Co-operative programme for monitoring and evaluating air pollutants in Europe' (EMEP, 1977) and the 'United Nations Economic Commission for Europe (UNECE) Convention on Transboundary Air Pollution' (CLRTAP, 1979) are pivotal in developing strategic approaches to this problem.

Much has been achieved in the last three decades. Directives such as the National Emissions Ceilings Directive (NECD, 2001/81/EC) have led to systematic reductions in a range of air pollutants often delivered via Member States' own air pollution initiatives.

While for many countries, projected emissions of the major air pollutants will continue to decline up until at least 2020, updated targets for individual Member States are currently being negotiated in a revision of the NECD. This may lead to further reductions of emissions of pollutants, including nitrogen oxides (NO_x) and ammonia (NH₃), both major constituents of nitrogen deposition.

In 2001, the NECD set specific targets for the reduction of acidification (Article 5¹) with an expectation to also reduced critical load exceedance for nitrogen by "about" 30% from the situation in 1990, by 2010 (Annex 1 of the Directive, footnote¹). In its latest status report the Co-ordinating Centre for Effects reported that the EU has failed to meet this objective, in that by 2010 critical load exceedance for nutrient nitrogen has only been reduced by about 23% (Posch *et al*, 2012). As a result critical loads of nutrient nitrogen are currently exceeded on 62% of the ecosystem area in the EU-27 countries (Posch *et al*, 2012).

Across Europe, in future NH₃ will dominate atmospheric nitrogen deposition especially in agricultural areas in north-west Europe as NO_x emissions decline. Working Group 4 will focus on measures aimed at reducing local impacts from agricultural sources. However, long range transport of NH₃ and its compounds will be considered in this group. NO_x from sources such as transport, electricity production and other industry still forms a significant component of nitrogen deposition and will be considered in this group. Whilst many European countries have met the majority of their emission ceilings for pollutants covered in the NECD, some

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Member States failed to meet their targets for NO_x by 2010. The revised ceiling for NO_x in 2020 is not yet established, but even to reach the current targets additional controls will be required. Most of the policy drivers for NO_x reductions are driven by locally based, human health considerations, but emission reductions will also improve concentrations of ground level ozone and help reduce deposition impacts of nitrogen deposition on ecosystems.

This working group will consider measures for non-agricultural sources to address local impacts from NO_x and measures or strategies for long range pollution (including oxidised and reduced forms of nitrogen). One major source of long range air pollution is shipping. This is not covered under the provisions of the NECD. Shipping emissions are controlled by the International Maritime Organisation (IMO), a UN agency. Within the IMO, the International Convention for the Prevention of Pollution from Ships (MARPOL, Annex VI¹) regulates emissions from shipping. These requirements, having been adopted by the European Union (2012/33/EU), are now being transposed into national law by Member States. From 2016, new provisions will control NO_x from new ships, but expected increases in shipping volumes may offset these gains. By 2020, emissions of NO_x from maritime sources are estimated to be close to those originating from land based sources (Sutton *et al*, 2011). With the focus of this group on “practical experience” and “effectiveness of” measures to reduce nitrogen emissions/deposition it is proposed that the issues of shipping and aircraft lie out-with the remit of this group. However, if delegates have practical examples of measures to consider or control emissions from these two sources within their national considerations these should be highlighted.

3. Objectives of the working group

The aim of this working group is to share knowledge and experience of measures for non-agricultural sources (i.e. transport, electricity production, industry) to address local impacts from NO_x and measures or strategies for long range pollution (including oxidised and reduced forms of nitrogen). In advance of the meeting it would be useful to gauge the relative national contribution of these sources of nitrogen deposition to give an overview of their relative magnitude. At specific sites the relative contributions of emissions may be very different. For example:

- Nitrogen deposition at sites in lowland agricultural areas (particularly livestock agriculture) tend to be dominated by ammonia inputs (reduced nitrogen). This scenario is the focus of Working Group 4;
- Natura 2000 sites located in areas close to major roads, or industry may be dominated by oxidised nitrogen inputs;
- Sites in remote areas (and particularly upland areas), are subject to inputs of reduced and oxidised forms of nitrogen from long-range transport of pollution from distant sources.

In the work of the group it is suggested that in discussing experience and suggestions for measures we focus our discussions to looking at the long range remote sites issue and those of sites that are dominated by local sources. This background paper is not intended to

¹ MARPOL 73/78. 1997 Protocol – Annex V1 “Regulations for the Prevention of Air Pollution from Ships”.

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provide a prescriptive methodology of how the group will operate. This is up to the members of the group. We welcome participants to bring suggestions of how we may want to operate on the day based on the broad principles provided in this paper.

The objectives include:

- to identify measures or programmes that have been implemented to reduce nitrogen deposition from non agricultural sources at local or national level. To provide these as case studies for discussion by the group. But also to discuss if consideration is given to long range NH₃ emissions;
- to outline current thinking on proposals under consideration to reduce future emissions/deposition. These can be in the form of regional/national plans or specific measures to target and reduce nitrogen emissions;
- to describe the drivers behind nitrogen reduction measures and proposals. Are the objectives specifically to improve air quality for human health, water quality and ecosystem protection? If we have time we can discuss the merits of exploring the potential synergies between integrating these drivers.

4. Discussion points

Members of this working group are asked to bring along information and examples of the following and be willing to discuss:

- i) Does your country have a National Air Quality Plan or Strategy to control nitrogen emissions? Is this simply to implement the requirements of the NECD or does it make provisions beyond this. What consideration is given to ecosystem protection?
- ii) Does your country have regional or local plans to control nitrogen emissions and if so what consideration is given to ecosystem protection?
- iii) In terms of practical measures are there provisions to assess new nitrogen impacts on sites in a structured manner e.g. limit on amounts of new development/growth in transport in an area?
- iv) Is control of industrial emissions simply based on established Best Available Techniques (BAT) or are provisions made to go beyond BAT to protect Natura habitats?
- v) Are there examples of joined up approaches between various permitting and planning bodies to consider air pollution impacts on Natura sites from a range of pollution sources?
- vi) Although our focus is on approaches to tackle air pollution impacts are there parallel examples of such measures that you are aware of that have been applied to emissions of say phosphates and nitrates in to the aquatic environment. For example under consideration of implementing the Water Framework Directive. Such examples

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could give an insight into similar approaches/ measures that could be adopted for the control of atmospheric nitrogen releases.

5. How the group will operate

Members of the group are invited to provide a short presentation related to the objectives and the discussion points above. We request that Member States agree a representative for the working group who will provide such a presentation. A focus should be on existing practical measures their effectiveness and limitations. Information on emerging proposals to tackle air pollution will also be welcome.

A digital projector and power point will be provided. Presenters are encouraged to bring printed handouts of their presentation, so these can be circulated amongst the group. However, delegates may wish to make a more informal presentation for example, a short report, without the use of slides.

Following the presentations the group can discuss common issues similarities and differences in approach and the benefits and drawbacks of such approaches.

We will provide a summary of approaches in our workshop to present in plenary and highlight by example details of practical and effective measures to reduce nitrogen deposition impacts.

6. References

POSCH M., SLOOTWEG J., HETTELINGH, J.P. 2012, Modelling and mapping of atmospherically-induced ecosystem impacts in Europe. CCE Status report 2012. Coordination Centre for Effects, RIVM, Bilthoven, The Netherlands. www.rivm.nl/cce

SUTTON, M.A., HOWARD, C., ERISMAN, J.W., BILLEN, G., BLEEKER, A., GRENNFELT, P., VAN GRINSVEN, H., & GRIZZETTI, B. 2011. *The European Nitrogen Assessment*. Cambridge University Press.