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Environmental noise directive: do's and don'ts for the second round

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ABSTRACT

July 2008, the first round of noise mapping, requested under the European Environmental Noise Directive, should have come to an end. Although many member states have not quite finished yet, first conclusions can be drawn from the available results. The process of strategic noise mapping and action planning has raised discussions about the principles of the Directive. The quality of the results is affected by the variety in assessment methods applied. Often, basic approaches requested by the Directive, such as a dialogue with the affected citizens, have not been successful or even not implemented at all. Action plans in general show little ambition and will most likely have little effect. The European Commission, responsible for the control of noise at the source, is committed to interpret the results as an incentive for their future policy. Therefore, it is essential that a better quality be achieved in the second round. Suggestions for improvement are presented.

1. INTRODUCTION

In article 1, the European Directive on the Assessment and Management of Environmental Noise (END) states, that its objective is to define a common approach intended to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to the exposure to environmental noise. More specific, the directive states the following objectives:

- Noise in the environment is one of the main environmental problems in Europe. People should be protected against it.
- Reliable, comparable data regarding the “situation of the various sources” should be acquired.
- A common noise indicator should be applied.
- A common methodology for noise calculation and measurement should be applied.
- A basis should be provided for developing and completing the existing set of Community measures concerning noise emitted by the major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery, and for developing additional measures, in the short, medium and long term.

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- Quiet areas in agglomerations should be preserved, and appropriate limits should be developed by the member states.
- Action plans should be drawn up that address priorities.
- Information on environmental noise should be spread widely to the public,
- Assessment methods should be supplemented and adapted to technical and scientific progress.

As a further specification of these objectives, the Directive states, that the major sources to be included are

- road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and outdoor machinery.

Further, the Directive envisages a need for reduction and prevention of environmental noise

- particularly where exposure levels can induce harmful effects on human health, and to preserving environmental noise quality where it is good.

During the first round of noise mapping and action planning, many of the above issues have been questioned by representatives from national governments and from cities, by national experts and even by citizens. A particular point of discussion has been the necessity to define common noise reception limits at a Community level. The current paper discusses the main issues, following the above list, but in a different order, and recommends modifications to the approach where considered necessary.

2. COMMON INDICATORS

For the implementation of the Directive, the day-evening-night level L_{den} and the night time level L_{night} have been defined as common indicators. In some member states, the change from their usual indicators into these new ones has raised discussion. More importantly, it was found in many occasions that these common indicators created a misunderstanding and sometimes even suspicion among the general public, including e.g. city councilors. The selection of an energy equivalent indicator is based on the presumption that health effects due to exposure to noise are the main issue of the Directive. Supposed and demonstrated health effects, such as cardiovascular diseases, originate from general annoyance and sleep disturbance, and such effects develop over a long period of time. When discussing annoyance with the general public, the usual comment is, that annoyance relates to incidents rather than to long term, more or less stable situations. People feel annoyed, and may even tend to submit complaints, if they are provoked by incidental noise events. Such events raise their attention because they occur only seldom. This type of annoyance is caused for instance by extremely loud motorcycles passing, by open air music events, by loud neighbors, by construction work; all these events are not addressed specifically in the directive and their contribution would hardly show when using an equal energy indicator like L_{den} or L_{night}. This lack of compatibility between what people experience and what the directive intends to address affects the credibility of the whole mapping and action planning operation. Obvious improvements could be:

- it should be made clear that the main issue addressed is health. It is absolutely necessary that the World Health Organisation finally produces its position paper on the relationship between noise exposure and health. A paper was issued on the health effects of sleep disturbance, but clearly this is only part of the story.
- Although the Directive suggests that member states can apply other indicators to describe specific effects such as the noise events mentioned above, very few member

states have actually engaged into doing so. More guidance should be provided to competent authorities on how to deal with and what indicators to apply for obvious sources of community annoyance, such as neighbor noise, leisure noise and others. Moreover, it would help to make action plans more credible and to gain public and political awareness if these elements were to be addressed in the action plans.

3. COMMON ASSESSMENT METHODS

3A. Noise mapping data

The production of strategic noise maps has been generally slow. Action planning has been even slower. The requested schedules for both steps were largely exceeded by most member states. A thorough evaluation of the reasons should be carried out – and possibly has been under the article 11 review project. Likely reasons for this delay are:

- lack of awareness and commitment from the political level,
- lack of (financial) means to carry out the work,
- lack of capacity in the competent authorities, or lack of prioritising the available capacity to the relevant tasks,
- lack of expertise and capability to carry out the work, that was generally considered complex,
- lack of data required for the mapping.

Many different efforts have been made to overcome these difficulties. For instance, in the UK, the national government has committed itself to the task of noise mapping, instead of putting up the cities with the work. In The Netherlands, national funding was supplied to competent authorities. In order to relax the complexity, the Good Practice Guide was issued under the responsibility of the Commission. It therefore appears that the lack of data has been one of the major concerns. This applies to traffic data and terrain data with sufficient detail and sufficiently representative. Often it appeared to be an enormous effort to gather this crucial data and make it available in suitable formats. The European Directive 2007/2/EC "establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)" may offer a platform for future users. It could support them to collect and maintain relevant data in a harmonized and controlled way. Eventually, it might even lead to a situation where the maps are no longer produced by the Member State but instead by the European Environment Agency itself, in an extremely harmonized way, on the basis of the input data provided, in a harmonized format, by the Member State. In addition, it seems to be recommendable to make the Good Practice Guide available in other languages than just English.

3B. Accuracy, precision and credibility

The complexity of the prediction methods and the level of detail of the required data depend on the required precision and accuracy of the method. However, these requirements are related to the credibility one intends to achieve. Clearly, the mapping exercise serves two main objectives of a rather general nature:

- For the city, i.e. both city authorities and citizens: to have an insight into the exposure to noise and the quality of life of its citizens and to know how to prioritize if one wants to improve that in terms of local mitigation actions,
- For the Commission: to have an insight in the overall exposure of the European citizens at large and to know how to prioritize source related actions.

It should be emphasized that strategic noise maps are not intended to assess the noise exposure of individual citizens with any level of accuracy. After all, the required precision for individual citizens can be low, as long as the statistical precision is sufficient to serve to two objectives mentioned above. Credibility may however require higher precision levels. Citizens expect and demand that strategic noise maps are consistent with exposure information from other sources, e.g. environmental impact assessments. This expectation raises a range of issues generally responsible for inconsistencies, such as:

- The receiver height, which is 4 m consistently in the strategic noise mapping but may be different for any assessment of the individual exposure,
- The reference year, which is typically one year before the publication of the map for noise mapping, but could be a future moment in time for impact assessment,

Such differences need to be explained or avoided. Citizens and politicians will never engage actively into a dialogue about environmental noise as long as they do not trust or do not understand the information presented.

3C. The need for harmonisation

So far, one round of noise mapping has been –almost- concluded. As it was put forward in the previous section, there are two main objectives in the strategic maps. Both require a clear insight not merely in the status quo, but particularly in the observed trend. Sound decisions on required source policy at EU level can only be made on the basis of a trend analysis. Trends should not be affected by the mere change of a computation method. In addition, decisions both at EU and local level will be influenced by benchmarking. If one member state demonstrates far lower percentages of exposed citizens than another, it is useful to know the reasons and to find out how this member state maintains this situation. Therefore it is essential that one single harmonized assessment method be defined, at the shortest notice possible, and that this method be applied consistently for several consecutive rounds of mapping. In order to prevent that the results of the first round, with non harmonized methods, are useless, at least for the second round two parallel methods should be applied: the exact same methods as for the 2007 mapping, and the new, harmonized method.

4. ACTION PLAN PRIORITIES

Road traffic noise in cities is by far the dominant source of environmental noise exposure. This is a clear and straightforward conclusion from the first round of mapping, inconsistent and incomparable as the results may be. For main roads outside agglomerations, extensive mitigation measures have been applied over the last decades. These measures mainly resulted into the erection of noise barriers. In some countries, quiet road surfaces like thin layer asphalt have amended the noise barriers. For urban traffic, it turns out that the options for noise reduction are rather limited. Agglomerations need to focus more on integrated sustainable mobility plans, reducing the traffic flow, particularly of heavy and loud traffic, taking the obvious alternatives, such as walking, cycling, public transport and low emission zones more seriously.

The Directive suggests a focus on the so-called hotspots, hotspots being the locations where high exposure levels are combined with high population density. This approach leads to a peak shaving effect of mitigation measures, reducing mainly the highly exposed dwellings. As a consequence, this will result into a shift toward a lower exposure class; the overall effect of hotspot generated measures is usually disappointing. For higher effect, the focus should be

more on generic measures, which could be emphasized more in the Directive and in the Good Practice Guide. On the other hand, the call for more generic measures is a call to the Commission to take their noise source policy more seriously.

4. COMMUNICATION AND AWARENESS

The principles and structure of the Directive are based on the understanding, that noise is mainly a local issue, and that only a consideration of local interests can decide what is acceptable and what is not. This however presumes involvement of both the local political level and from the citizens. To put it in the extremes: these parties decide between a car free, quiet city and a city with great car infrastructure and a lot of noise.

Strategic noise maps have generally been published on the web, sometimes with attractive interfaces allowing visitors to zoom in to their own homes. But the main item suitable for dialogue is the action plan, which was hardly communicated or discussed at all. Unfortunately, there is little political gain in a published noise action plan, for once because it does not address the relevant topics or the relevant sources (see chapter 2). In some member states, the participation of the general public is low anyway, due to a cynicism caused by previous experience. There is a need to make the public and the politicians better aware of the health risks of a noisy environment. But another, and more modern argument could be, that noise exposure in general affects the quality of a living area, which makes people move away. This could become highly relevant once the predicted demographic developments, namely an overall reduction of the European population, become true.

5. COMMON LIMITS?

Some cities, struggling with their action plans, have called upon the European Commission to come up with a harmonized limit value for noise exposure. This would enable the cities to define a common target value for their action plans. Although the request is understandable, it is completely out of line with the Directive's approach of noise being a local issue that needs to be considered locally, in a dialogue between politicians and citizens. Irrespective of this, it is the responsibility of the Commission to provide for common effect assessments, indicating as precisely as possible the health risks due to exposure to certain noise levels. More pressure should be set on the field research work assessing health versus exposure relationships, both for annoyance, sleep disturbance and possibly for "instant annoyance" due to incidental noise events. By defining a noise level of 55 dB L_{den} as the lower limit for noise mapping, a lower limit for any target value is set implicitly. However, there is clear evidence that health effects occur at levels as low as 42 dB. Although it is far too ambitious to set that as a target level, it should not be forgotten that an enormous percentage of annoyed and highly annoyed citizens are exposed to levels between 42 and 55 dB L_{den}. Any action plan target above 42 dB is therefore a compromise between economics and health.

6. ACTIONS AND RESPONSIBILITIES

The above suggestions and recommendations translate into actions and responsibilities. Some of those directly refer to the content of the Directive and could be achieved by rather straightforward amendments or modifications thereof. This applies to for instance (this is not an exhaustive list):

- The fact that those actors who are involved in noise mapping for the second time should produce the 2011 noise map using both the possible new, harmonized method and the method that they used before when they produced the 2007 noise map.
- The fact that the harmonized prediction method is obligatory for the mapping exercise only; that a comparison of two consecutive maps will provide an efficiency assessment of the action plans; for the prediction of the efficiency of future actions plans there is a free choice of prediction method as there is no need for harmonization.
- The fact that a periodic assessment of the aggregated number of exposed European citizens should be carried out, that the results thereof should be published and that the European Commission should report publicly how these results will influence their source policy (in the current Directive there is only one single planned review, namely the one on 2009).
- The recommendations of the Good Practice Guide should be referred to in the Directive itself and one could even consider to make the GPG an integral part of the prescribed methods.
- The hot spot approach, prioritizing action plans to the locations with high noise exposure, leads to a disappointing effect in terms of overall annoyance reduction. Much more integrated approaches, such as traffic management and modal shift, in combination with a much more pro-active source policy by the Commission, could turn out to be more efficient. In proposing such an integrated approach, the Directive should be interlinked with other regulations, e.g. the Air Quality Directive and regulations for Sustainable Urban Traffic Plans.

Apart from these procedural modifications, there is a range of activities that could be undertaken to facilitate and support the process of noise mapping and action planning. Here, the Commission could help to start off these activities, for instance in financial support programs like Life, Interreg or the Framework Program. This applies to:

- Awareness raising, which is a key element to achieve better participation from local politicians and citizens. The health effects, the effects to the quality of life and to real estate value should be emphasized more and consistently at a European level, including the European Parliament.
- Various methods of responsibility sharing have been used in different member states, from complete funding of cities producing noise maps by their national government (in The Netherlands), to a higher authority level taking over the responsibility for the noise maps (the national government in the UK, the local “Land” government in Germany). It should be assessed which of these methods has worked best from the perspective of efficiency of implementation and commitment of different authority levels.
- The establishment of a national support unit, providing for knowledge building and exchange through a dedicated website, networking and meetings, as well as progress control under an assignment of the national government has been quite effective in The Netherlands. The same approach could work well at an aggregated European level.
- Cities have a rather limited number of options to mitigate road traffic noise. Facing empty tool boxes, cities choose for quiet road surfaces. Beyond that solution, efficient measures are scarce. The concept of Low Noise Emission Zones is worth further investigating.
- The Good Practice Guide should be translated in at least a handful of the main European languages in order to avoid that it would stay out of sight of the targeted end users.

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