

Overview of critical noise values in the European Region



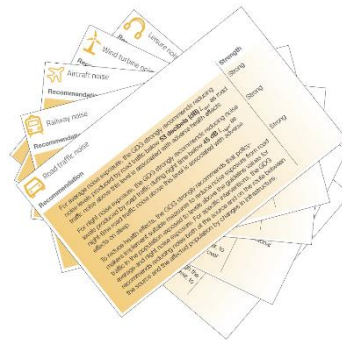
Executive summary

In October 2018, the World Health Organization published its "Environmental noise guidelines for the European Region". The report contains recommended maximum immission levels for environmental noise. The WHO guidelines do not provide guidance as to how these limit values should be implemented in national legislation. The goal of this study is to provide such guidance by describing the current state of noise limits in European countries, including a description of related regulations and consequences of exceedance.

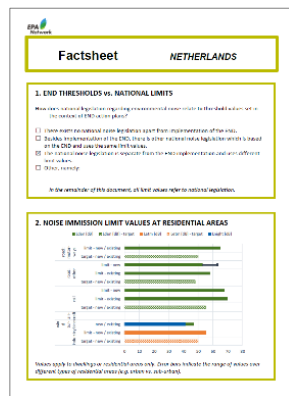
Study objectives

The study addresses two main research questions:

- How do current noise limits in Europe relate to the WHO recommendations?
- How are limit values implemented: what is their scope and what are the consequences of exceedance? Beside the limits, these aspects are crucial for protecting citizens to the adverse effects of environmental noise.



Research method



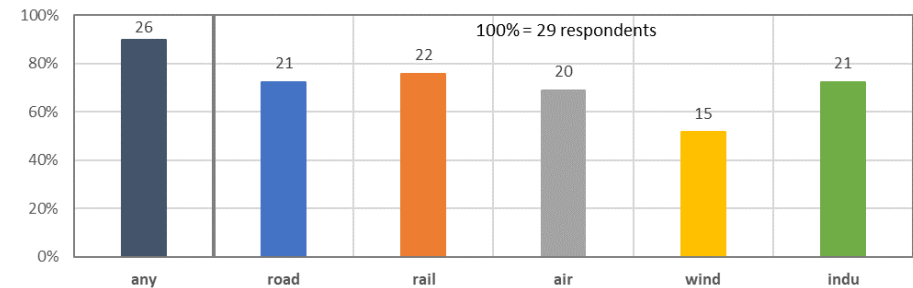
To create an overview of limit values in the European region, a questionnaire in the format of a fact sheet was sent out across the European region. A total of 29 responses from 27 different countries were received.

The primary interest of this study are national limit values regarding noise immission at the facade of dwellings, outdoors. Threshold values for action planning set in the context of the Environmental Noise Directive are not taken into account, because there are no mandatory consequences attached to exceeding

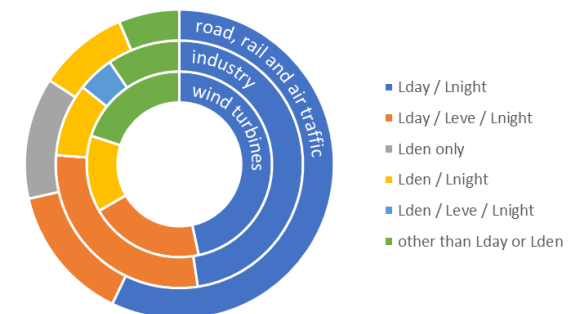
these thresholds. The study differentiates between different sources of sound: roads, railways, aircraft, wind turbines and industry.

Noise limits in Europe

From the received information, it has been found that there is a high level of noise legislation in Europe. 90% of the responding countries have limit values for environmental noise. Roughly 75% of countries with limits, have limits for road, rail, aircraft and industry. For wind turbines, this is slightly more than 50%.



Limit values are most often assessed using L_{day} and L_{night} , sometimes in combination with an $L_{evening}$. Less common is the use of the L_{den} , usually combined with a separate L_{night} limit. What all countries have in common is that they use equivalent (average) noise limits; some have additional limits for short-term peak values, for instance a maximum number of night flights above a certain L_{max} .

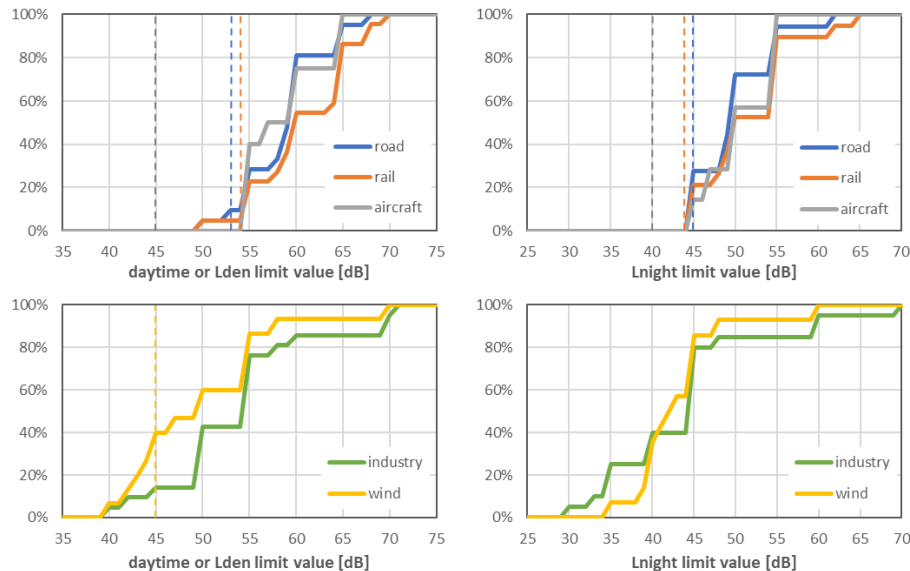


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Absolute values

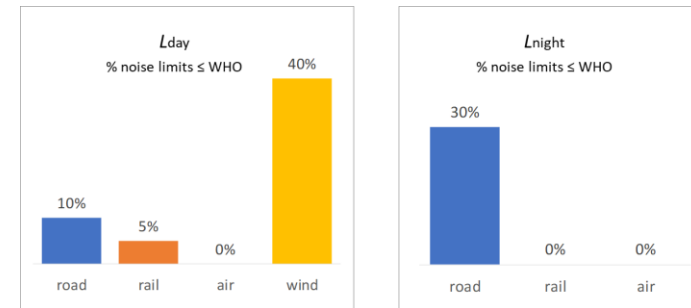
Regarding the absolute value of noise limits, there is a wide variety of values used. Limits vary over a range of 20 dB for roads, railways and wind turbines, with a slightly smaller range for aircraft and a wide range of more than 30 dB for industrial installations and wind turbines.



Generally speaking, limit values used in European countries are higher than the intervention levels recommended by the WHO. Percentages of countries with limit values at or below the recommended intervention levels for the day-time are 10% for road, 5% for rail, 40% for wind turbines and 0% for aircraft. For the night-time, 30% of countries have limits at or below the recommended value for road traffic; for rail and aircraft, this holds for not a single country.

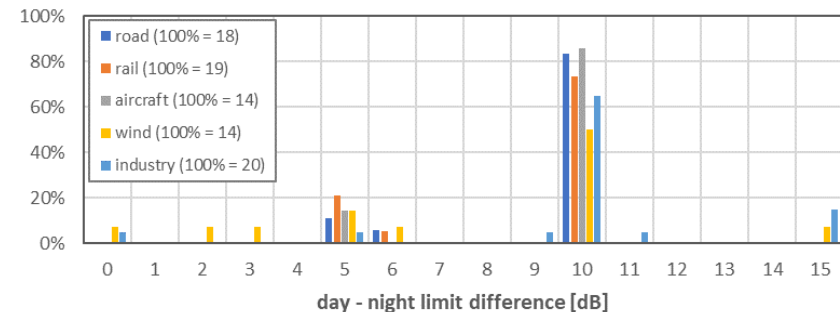
It should be noted that the WHO values are recommendations based purely on a health perspective. As the WHO states in their report, additional considerations – such as feasibility, costs and preferences – can influence the ultimate value chosen

as a noise limit. In addition, it should be kept in mind that limit values represent the allowed situation and not the actual noise exposure.



Day versus night limits

Most countries have separate limits for the day- and nighttime. For road, rail, aircraft and industry, 70% - 90% of countries use 10 dB lower limits for the nighttime than for the day. For wind turbines, smaller differences are also reasonably common (45%).



Comparison between sources

A comparison of noise limits for different sources within a country, shows that 75% of the countries with noise limits for aircraft noise allow equal or higher levels for aircraft noise than for road noise. This is not supported by the new 2018 WHO

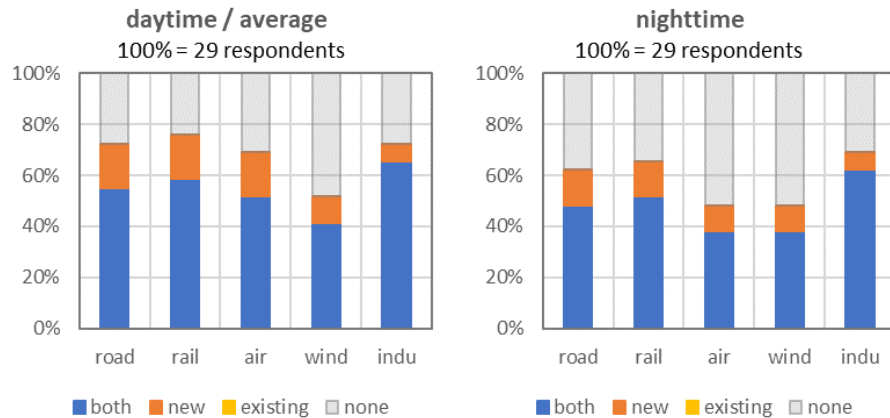
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exposure-response functions, which indicate that the negative health impact of aircraft noise is significantly higher than of road noise, at the same noise level. Furthermore, 25% of countries apply a 'rail bonus', i.e. a higher noise limit for rail than for road noise. Again, this difference is not justified by the exposure-response functions, which indicate similar or slightly higher annoyance rates and health impacts for rail than for road noise, at least at levels above 55 dB L_{den} / 50 dB L_{night} .

Scope of limits

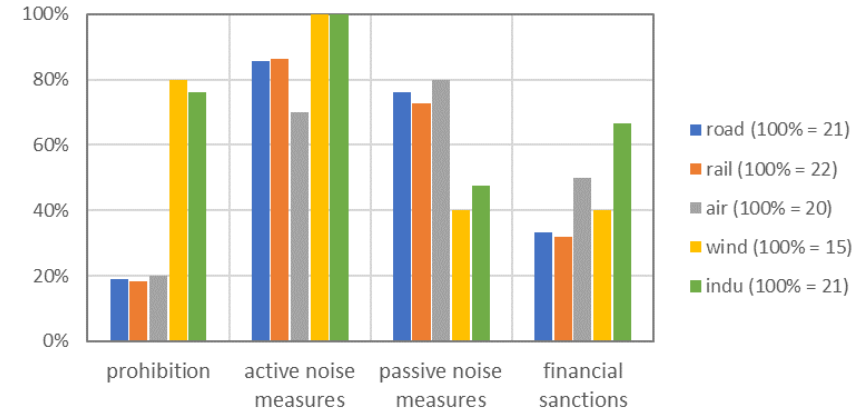
Respondents were asked to indicate whether limits exist only for new situations, such as when constructing new houses or new infrastructure, or for existing situations, or both. The results show that a majority of countries has limits for both new and existing situations. Of those countries, depending on the noise source, up to 30% report allowing higher noise levels in existing situations, in which cases a 5 dB difference is common.



Consequences of exceedance

With one or two exceptions, all countries have consequences linked to exceedance of limit values. Most common for all sources is a legal obligation to consider active noise measures (at the source or in the sound path). In the case of road, railways and aircraft, this consideration is often followed by the obligation to take passive

measures (e.g. facade insulation) if active measures are not possible or not cost-effective. Full prohibition of activities or construction is common for industry and wind turbines (70 to 80%), but uncommon for traffic noise sources (20%). Lastly, financial sanctions, such as fines for the operator or financial compensation of exposed residents, are a regularly used instrument (30 to 70%).



Recommendations

National and local authorities in European countries may currently consider whether to update their current noise legislation based on the new WHO guidelines. From the results in this report, the following recommendations are given for the implementation of these guidelines:

- Be clear about the objective of the limit value: is it a target value *above* which actions should be considered, or a maximum value that is not to be exceeded?
- Consider the legislative system as a whole: the actual significance of a limit value is determined largely by the consequences attached to exceeding it. Authorities should therefore regard the entire system, including enforcement methods and triggers, as well as the legal consequences of exceedance.
- For transparency and accountability, the rationale behind the value of the noise limit should be clear and publicly documented. Preferably, limits are based on the relevant exposure-response functions, along with cost-benefit and other possible considerations.