

Expert Meeting

at the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

on September 15th, 2005 in Bonn

NO₂ concentrations have decrease less as expected – in some places concentrations have increased

First analyses of the causes of the air quality development and impacts of different technologies on NO₂ emissions of motor vehicles

As from January 1st, 2010, two ambient air quality limit values for nitrogen dioxide (NO₂), which have been adopted in 1999, have to be met in the EU. These two limit values are a one hour average concentration of 200 µg/m³ and an annual average concentration of 40 µg/m³. Whereas the one hour value is complied with nearly everywhere today, the annual average concentration is exceeded today at many monitoring stations, particularly at roadside stations. Further reductions of NO₂ concentrations are thus essential to comply with the annual limit value by 2010.

The measured concentrations of NO₂ seem to be in contradiction with the successes in the reduction of NO_x emissions (total of nitrogen monoxide and nitrogen dioxide) in Germany. These emissions have decreased by about 50% between 1990 and today. This decrease is also reflected in NO_x concentrations measured in ambient air, in particular at roadside monitoring stations, but not to the same degree in NO₂ concentrations.

In order to design efficient NO₂ reduction measures, it is therefore necessary to understand the reasons for the NO₂ levels as quickly as possible. This was the aim of the expert meeting organised by the Federal Ministry for the Environment. The harmful effects of NO₂ on human health and the environment as well as the setting of the level of the limit values were not part of the workshop.

Speakers from research institutions, industry and administration gave presentations on the development of emissions and immissions of nitrogen oxides, on analyses of current immission situations and their further development and on the formation and reduction of nitrogen oxides in engines and exhaust gas treatment systems.

Experts from federal and Länder ministries, federal and Länder authorities as well as representatives from industry took part in the discussion.

The results of the expert meeting are presented in the following summary.

**Summary of the Federal Ministry for the Environment
on the results of the expert meeting and future outlook**

1. In Germany, NO₂ concentrations near many heavily polluted roads have hardly decreased over the past years – they have even increased at some sites.
2. If the trend of the past years continues, it is highly likely that at least NO₂ annual limit values will be exceeded at many roadside monitoring stations in Germany in the year 2010.
3. The increase in the average urban ozone concentration in the past years has contributed to the rise in roadside NO₂ levels. It remains to be clarified in how far the increase in ozone concentrations results from decreasing NO emissions.
4. The explanation that direct NO₂ emissions in vehicle exhaust make a relevant contribution to roadside NO₂ concentrations is supported by many experts.
5. Today, diesel engines are the main contributors to NO₂ emissions from road traffic. The role of petrol engines is judged to be less significant.
6. A reduction in direct NO₂ exhaust emissions through technical measures in vehicles would thus lead to a reduction in NO₂ concentrations. It cannot be fully assessed at the moment, if such measures are sufficient to achieve a compliance with the NO₂ air quality limits.
7. Measuring methods to determine NO₂ exhaust emissions of vehicles should be standardised in order to obtain reliable and comparable data.
8. For clarification, additional measurement data on the NO₂ content in exhaust gas should be obtained. Also, information concerning the effects of after-treatment technologies and engine engineering on NO₂ emissions from vehicles is required.
9. Further meetings should be organised to clarify open questions and to determine future action.
10. In the context of reviewing vehicle emission limit values, solutions for the reduction of NO₂ concentrations have to be found as well.