Blue sky over the Ruhr – a review of the effectiveness of more than 50 years of air quality measures in Germany

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In January and February 2013, the poor air quality in many major cities in parts of Asia, such as Peking and Delhi, made headlines worldwide. The high concentrations of air pollutants and the accompanying pictures and effects look very familiar to those, who lived in the area Rhine Ruhr during the fifties and sixties. Notable was, e. g., the smog episode in December 1962, leading to an increase of mortality by 30 %. This drastically increased number of deaths owing to poor air quality made very apparent that something had to be done.

Already the year 1961 marked a turning point in German air quality planning, because of a notable speech of the subsequent chancellor, Willy Brandt, who demanded a change in politics concerning air quality with the catch phrase of blue sky over the Ruhr area. This was the first time that someone so prominently focussed on the combination of air quality, health effects and social justice, turning smoking stacks into something more than just a sign for economic success.

While this single talk did not mean an immediate change in politics and public awareness, it was a popular vision from which future activities could build. These activities included monitoring air quality as well as measures for emission reduction. The awareness of air quality as a challenging problem has grown in the public since then. Now, the blue sky is again visible over the Ruhr area, at least on sunny days. The European Commission has declared the year 2013 as the year of air quality. When comparing today's air quality in Europe to the situation in the past and to the present situation in Asia, this might seem a bit exaggerated at the first glance. But is this true? Are all problems already solved? Therefore, we review the past, present and possible future activities in Germany and Europe and their results for air quality. It can be seen, that the work on clean air includes some success stories. As an example, figure 1 shows the SO_2 concentration in the area Rhine Ruhr from 1964 till 2011. The TSP and PM10 trend from 1968 to 2011 can be seen in figure 2. These figures well illustrate the success stories of air quality measures – as well as some less favourable measures. It can be seen that the general trend shows a clear decrease in SO_2, PM10, and TSP concentrations. Measures like dust separation in industrial facilities, substituting solid fuels in space heating as well as the structural change in the Ruhr area all led to a reduction of SO_2, PM10, and TSP, while the policy of high stacks only led to a change in distribution, causing acidification and eutrophication in ecosystems. Particularly the desulphurisation of power plants since 1977 enhanced the decrease and it can be stated that today the concentrations of SO_2 in Germany are no longer problematic with respect to human health.

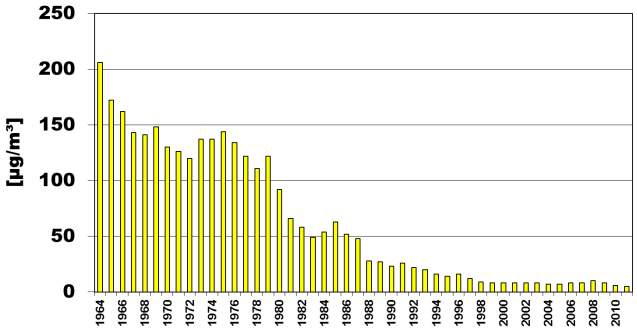

Fig. 1: Trend of annual average SO_2 concentrations in µg/m³ in the area Rhine Ruhr from 1964 to 2011. The highest concentrations correspond to values above 200 µg/m³, the lowest are below 10 µg/m³

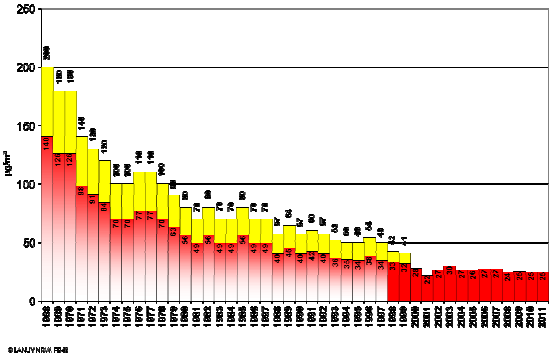

Fig. 2: Trend of annual average total suspended particle (TSP, yellow bars) and PM10 (red bars) concentrations in µg/m³ in the area Rhine Ruhr from 1968 to 2011. The highest concentrations correspond to values above 200 µg/m³, the lowest are below 50 µg/m³

But despite all advances, there are still problems to face. E. g., the high amount of road traffic is a main source for high NO_2 concentrations in cities. The number of PM10 exceedance days is still occasionally too high. Another challenge is the preservation of nature protection areas that can be adversely affected by high depositions of nitrogen, acid, or heavy metals.

Our presentation will give an overview of the last 50 years' challenges, success stories and memorable events as well as a reflection on current and future challenges in the area of air quality planning.