



## **Emission scenarios for Central Europe with emphasis on the Benelux region and North-Rhine-Westphalia**

Michael Memmesheimer (1), Hermann J. Jakobs (1), Sabine Wurzler (2), Heike Hebbinghaus (2), Elmar Friese (1), Georg Piekorz (1), and Adolf Ebel (1)

(1) University of Cologne, EURAD, Cologne, Germany (mm@eurad.uni-koeln.de), (2) North Rhine Westphalia State Agency for Nature, Environment and Consumer Protection

The Benelux/Rhine-Ruhr area is a strongly industrialized region with high population density in Central Europe. Three major European metropolitan areas are located within Benelux/Rhine-Ruhr. The largest one is the urban agglomeration of Rhine-Ruhr itself with 12 million inhabitants living in an area of about 7.000 km<sup>2</sup>, which has a megacity character with respect to population density, traffic, industry and environmental issues. The main centre of European steel production and the biggest inland port of the world is located in Duisburg, one of the major cities in the Rhine-Ruhr area (major cities are: Cologne, Düsseldorf, Duisburg, Essen, Dortmund, Bochum). The Randstad is a conurbation in the Netherlands consisting of the four largest Dutch cities (Amsterdam, Rotterdam, The Hague and Utrecht) with 6.7 million inhabitants in total, about 40% of the Netherlands, with Rotterdam as one of the most important sea harbours of the world. Within Belgium the Brussels-Antwerp region with 4 million inhabitants (about 40% of Belgium) again forms a conurbation with metropolitan character and an important sea harbour (Antwerp). To investigate the future development of air pollution and the impact of transboundary transport a set of model calculations has been carried out with the EURAD model for the year 2009. The results for european-scale emission-scenario for 2015 have been compared with the reference case for 2009 with particular emphasis on PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>. The impact of anthropogenic emissions from Belgium and the Netherlands is investigated by emission scenarios assuming no anthropogenic emissions in Belgium and the Netherlands. The results are discussed with respect to annual values and specific episodes with high air pollution, in particular an episode in the beginning of April 2009 with high concentrations of PM<sub>10</sub>.