

# **Transboundary Air Pollution in Croatia – National Assessment Report**

Croatian contribution to the EMEP assessment report

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## **Abstract**

National assessment report is based on the analysis of measurement data on precipitation quality collected over 20 years (1981-2001) in the whole territory of Croatia. Number of stations varied from 20-30 over that period, but generally, number and geographical distribution of measurement sites allowed for the spatial analysis of concentrations and deposition. Statistical Mann-Kendall test was used for trend analysis at all stations with series of data longer than 10 years. Detailed statistical analysis and frequency distributions for all stations are calculated. In order to analyse performance of Lagrangian model at Croatian territory, comprehensive analysis of measured and modelled data is performed for EMEP sites Zavižan and Puntijarka (HR04 and HR02). Data analysis, trend analysis and frequency distributions are calculated for different trajectory sectors. Measured and modelled values are compared. Transboundary fluxes, estimated on the basis of measurements and model calculations are compared and discussed.

Simultaneous analysis of measured and modelled data showed that environmental conditions in Croatia have improved over last 20 years. Significant improvement has occurred in last 5 years (measurements only). Since Lagrangian model has not been used after 1996, this conclusion cannot be confirmed by model calculations yet. The comparison of modelled and measured values for 12-year period (1985-1996) indicates that for Croatian territory model results underestimate measured values around 30% for sulphur compounds, while it is around 60% for nitrogen compounds. The possible identifiable source of such underestimation, besides known model deficiencies and less known measurements uncertainties, might be the emission strength underestimation in transport sectors most efficient for Croatia (NW, W, SW and S). The complex topography of Northern Mediterranean basin is additional factor that most probably influenced the performance of Lagrangian model, especially in relation to calculated precipitation amount and deposition of pollutants. From the policy oriented point of view the underestimation between 30 and 60 per cent is rather important since it influences critical loads calculated for Croatia. If calculated critical loads, taken as a basis for Gothenburg protocol were too low, then policy measures suggested by might not be sufficient or adequate for Croatian environment protection.