

# **Europe's highest stack in complex terrain – evaluation of dispersion modelling for the Trbovlje power plant, Slovenia**

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A power plant with a 360 m high stack is situated near Trbovlje in the narrow Save Valley between Celje and Lubljana, Slovenia. Continuous meteorological and air quality measurements are available at four stations at different altitudes within the next 4 km. Besides of a few small farms and a street with low traffic frequency, the power plant is the dominant source of emissions in the area and its impact is clearly seen in the air pollution measurements.

Therefore, the Trbovlje case renders an excellent data base for the evaluation of dispersion modelling in complex terrain. Two years data have been made available from the Environmental Agency of the Republic of Slovenia (EARS) and from the management of the Trbovlje power plant.

Simple Gaussian dispersion models as well as the Lagrangian dispersion model LASAT are applied with different meteorological input: wind data from a single station and diagnostic wind fields based on all wind information available in the area.

Main emphasis is put on the modelling of the flow field within the Save Valley and the representation of flow in the model approaches. The study reveals that the plume of this very high stack in complex terrain can be reproduced by the simple model approaches with the appropriate meteorological input. The application of a complex dispersion model also requires a careful definition of the meteorological input and a thorough testing of the modelled flow field.