

Thermal power plant Trbovlje air pollution impact modelling in complex terrain

M. Z. Božnar (1), P. Mlakar (1), B. Grašič (1), G. Tinarelli (2)

(1) AMES d.o.o., Ljubljana, Slovenia, (Marija.Boznar@ames.si / Phone: +386 1-3657087), (2) ARIANET Srl, Milano, Italy, (G.Tinarelli@aria-net.it)

Trbovlje region is a highly industrial area located in a river canyon in central part of Slovenia. There are several air pollution sources there: Thermal Power Plant (TPP) Trbovlje, Cement factory Trbovlje and Glass factory Hrastnik are the main ones. SO₂ and dust pollution exceed the regulation limits. High pollution of the area is caused by high emissions, but it is also extremely emphasized by local microclimatological conditions (calm situations and low wind speeds, strong thermal inversions in the winter time) as the area is a highly complex terrain (canyon with the steep slopes of cca 45 deg.).

TPP has just installed the desulphurisation plants and Cement factory will do this in the near future. That will decrease the present level of pollution significantly and will allow installation of new objects, among those firstly a new gas powered power plant is planned.

AMES company is making a study in order to reconstruct the current air pollution situation in the area, to quantify the reduction by desulphurisation plants and to model the future scenarios.

A study was performed using several months of on-line meteorological, air pollution and emission data. A Lagrangean particle model SPRAY with the 3D reconstruction of wind field and other meteorological parameters was used.

In the area there exist a dense monitoring of meteorological parameters (including one SODAR profile) environmental concentrations (6 stations) and one on-line emission station on the TPP stack (other sources will be estimated).

Future scenarios modelling (possible new TPP and operating of desulphurisation plants) will be used by the decision makers to allow or reject building of new TPP (or other objects) in the area. As the area is considered to be highly polluted, this results may also help to prepare other programs for better air quality in the area.