Republic of Serbia
MINISTRY OF AGRICULTURE AND
ENVIRONMENTAL PROTECTION

Experience in Air Quality Modeling in Republic of Serbia

Air and Ozone layer Protection Unit
Ministry of Agriculture and Environmental Protection

IPA 2007 Strengthening Administrative Capacities for Implementation of Air Quality Management System SR 07 IB EN 01 ***(2009-2012)***

Beneficiaries: Ministry, SEPA, autonomous province of Vojvodina, LSGs, PHIs

Component 4.

- Activity 4.1. To perform preliminary air quality assessment, including modelling, improving the air emission database and analysis of assessment methods.

- Activity 4.4. To prepare action plans and programmes for air quality management and reduction of emissions.

Activity 4.1. To perform preliminary air quality assessment, including modelling, improving the air emission database and analysis of assessment methods.

- **Training courses and workshop on modeling were conducted**

- ✓ The AERMOD model application

- **The pilot study „Air quality modelling of SO_2 in Belgrade territory"**

The aim was to:

- ✓ To estimate the influence of the large point sources of SO_2 on air quality in Belgrade
- ✓ To demonstrate the capabilities and advantages of air quality modeling as an important tool applicable and useful for the air quality assessment and management

The air quality modelling of SO_2 in Belgrade territory consisted of the following steps:

1. The emission data (emission rate, gas temperature, gas exit velocity, stack height, stack mouth diameter, stack geographical co-ordinates and elevation) and meteorological data for 2010 were checked and corrected.
2. Test model run has been executed.
3. The AERMOD model application training continued; advanced model tools such as maps and graphical outputs customization were practiced.
4. Base map creation and geo referencing using Google Earth has been demonstrated and exercised.
5. With the 2010 data, the final model run for Belgrade territory has been started and finished successfully.
6. Concentration maps were constructed from the model output data.

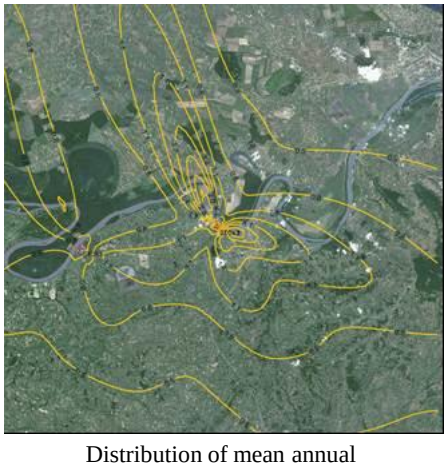
The following particular data for the year of 2010 were used:

- ✓ the emission data for Belgrade heating plants, power plants Nikola Tesla A, B, Kolubara and sources in Pančevo;
- ✓ 1-hour meteorological data measured at station 13274 Beograd-Vračar prepared by RHMZ: wind speed, wind direction and other parameters needed for the parameterization of the dispersion conditions.

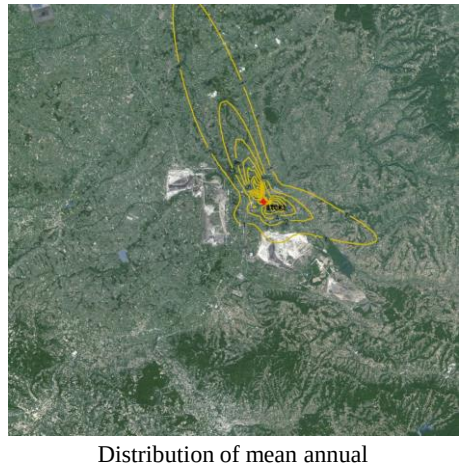
- For the comparison of modeled and measured concentration SO_2, 10 stations operated within the Belgrade territory by various bodies were selected.

Annual mean value, the 4th maximum daily value, the 24th maximum hourly value and the maximum three-hour average for the year 2010 were chosen for the comparison.

All concentration characteristics evaluated by the model are significantly underestimated in comparison with the measures data.



Distribution of mean annual concentration of sulfur dioxide (µg / m3) to the impact of TENT A and B



Distribution of mean annual concentration of sulfur dioxide (µg / m3) to the impact of Kolubara A

- **Conclusions from the pilot study „Air quality modelling of SO_2 in Belgrade territory"**

✓ Proceeding in this way is advisable;

✓ Upgrade of the hardware and modelling software tools appears as a necessary support for this in the Republic of Serbia;

✓ Formation of broader team consisting of modeller/meteorologist, emission, IT and GIS professionals might be of high usefulness.

Activity 4.4. To prepare action plans and programmes for air quality management and reduction of emissions.

Study: "Analysis of the traffic impact on the emissions of NO_2 and PM_{10} in Novi Sad and staff training in the city administration"

The Study aim was:

- to calculate the emissions from roads with high frequency of traffic in the city
- training the staff in the city administration for the use of PROKAS software in this field.

Study was implemented in cooperation with:

- Transport and Traffic Engineering Faculty from the University of Belgrade
- Faculty of Technical Sciences the University of Novi Sad

The importance of Study "Analysis of the traffic impact on the emissions of NO_2 and PM_{10} in Novi Sad and staff training in the city administration" was in the possibility to use and apply the results:

- for air quality analysis in urban areas;
- for the elaboration of AQ Plan for agglomeration of Novi Sad;
- for the study of transport policy impact.

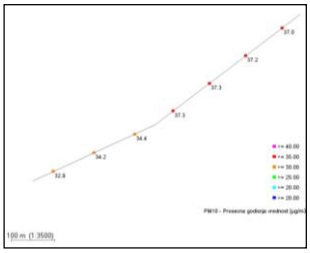
PROKAS was also used during the preparation of Air Quality Plan for agglomeration "Belgrade".

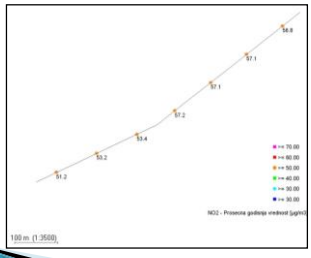
Traffic influence analysis on the emissions of NO2 and PM10 in Novi Sad

- Simulation of the influence of traffic on NO_2 and PM_{10} emissions at the most heavily congested city streets, based on the surrounding housing and meteorological conditions in Novi Sad.
- The use of PROKAS software was validated based on the data from automatic measurement stations in Novi Sad.

Simulation results

Example: Kornelija Stankovića Street





Conclusions

- AQ modelling is an important tool for AQ assessment and AQ management
- It is necessary to strengthen human capacities in the field of AQ modeling (at the moment there is only one employee in SEPA that performs these tasks)
- Additional EU assistance for use of AQ modeling will be needed (TAIEX, other available EU funded projects)

Thank you for your attention!

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