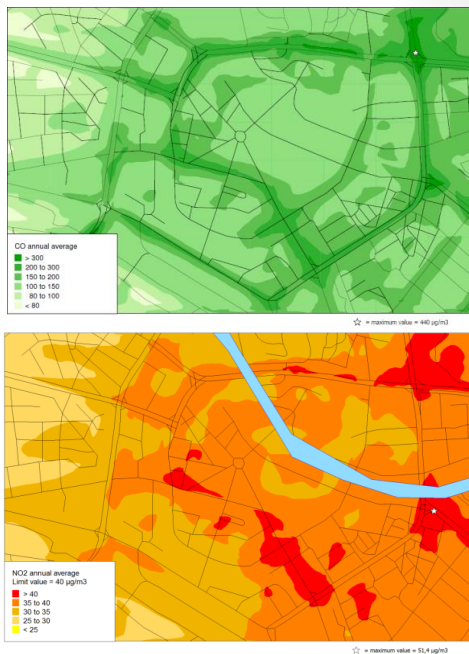
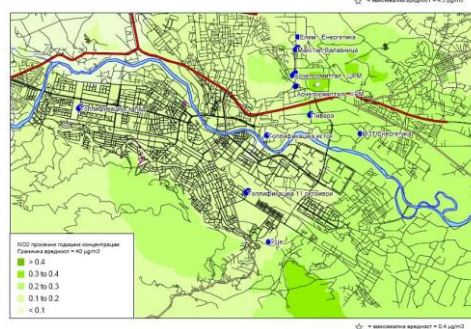
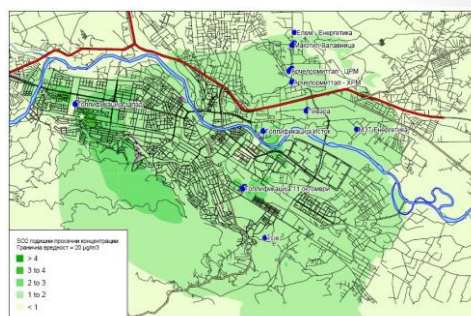
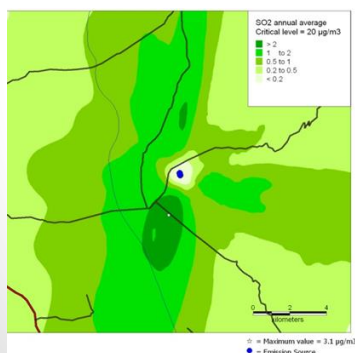


- Dispersion modeling of traffic emissions in the Central city area of Skopje
- NO₂ and CO concentrations calculated with CAR-FMI



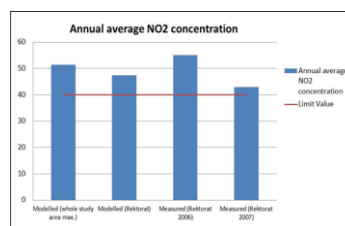
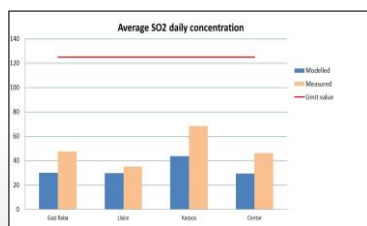
Local scale modeling case study

- Dispersion modeling of emissions from large point sources in Skopje
- NO₂ and SO₂ concentrations calculated with UDM-FMI



Results and uncertainties

- CAR-FMI and UDM-FMI developed in FMI were used to calculate the dispersion of traffic and large point source emissions in Skopje
- For traffic, the modeled and monitored concentrations of CO and NO₂ compared quite well (especially for annual averages)
- For point sources, the modelled SO₂ concentrations were lower than measured. This was expected as likely not all the emissions sources affecting the concentrations were included in the calculations.



Uncertainties and needed improvements

- Uncertainties in calculations and needed improvements:
 - Poor quality and quantity of meteorological observations in Skopje valley \Rightarrow need to improve the meteorological observations
 - Uncertain and limited traffic count data (improved since with automatic traffic counters)
 - No data of vehicle division to different classes \Rightarrow data needed of division of car fleet to euro classes
 - Emission data for point sources somewhat uncertain/old, updated emission inventories needed
- In order to carry out comprehensive city scale dispersion modeling study for City of Skopje, information of other emission sources is needed including fugitive sources, smaller point sources not included in inventories and household heating (major contributor to poor air quality in Skopje).

Regional scale modelling with SILAM

Assessment:

Study cases - Runs were set with 4 different sets of emissions (TNO emissions with different resolutions and national emission database)

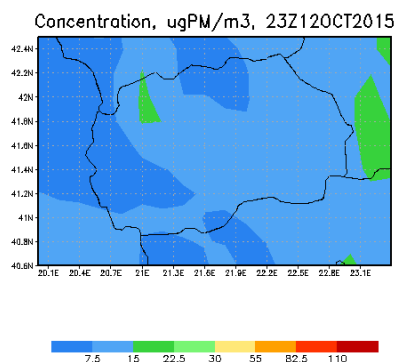
Assessment of different emissions scenarios - Scenario analysis and simulations to estimate the impact of the emission reduction measures (from NERP)

Forecasting:

Established three day air quality forecast

- <http://silam.moepp.gov.mk/>

- ECMWF weather model data
- TNO database emissions
- PM10, PM2,5, SO2, NO2, CO



Current situation and future plans

- Further training in dispersion modelling provided as a part of ongoing EU funded Twinning project 'Further strengthening the capacities for effective implementation of the acquis in the field of air quality'.
- Improvement of emission data for Skopje to include updated data and more point sources and traffic emission calculation to cover larger area with updated traffic count data.
- Utilization of modelling results to support the development of air quality improvement plans and programmes ⇒ in future to assess the impact of air quality improvement measures.
- Utilization of SILAM to support the assessment of the magnitude and duration of air quality episodes.
- Further strengthening the cooperation with institutions providing input data.