Development and performance of a semi-operational chemical weather forecasting system EcoForecast.EU

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A semi-operational chemical weather forecasting system EcoForecast was developed in the framework of the COST ES0602 Action in July 2009. The forecasting system is based on the GEM-AQ model (Kaminski et al. 2008). The model is run on global variable resolution grid with horizontal spacing of 25km over Europe. A high resolution forecast at 5km for Southern Poland was added in November 2010. The forecast is published once a day at www.EcoForecast.EU. A new high resolution domain for the Great Lakes Region in North America will be added in the spring of 2011.

GEM-AQ is a comprehensive chemical weather model where air quality processes (chemistry and aerosols), troposphere and stratospheric chemistry are implemented on-line in the operational weather prediction model, the Global Environmental Multiscale (GEM) model, developed at Environment Canada.

We will present the design strategy, development and implementation of the forecasting system including the current configuration of the regional and high resolution forecasts and the GIS-based methodology developed for refining emission data. Modelling results will be evaluated and compared with observation of primary pollutants from rural background air quality monitoring stations and meteorological synoptic stations. Model performance for 2010 will be compared with the skill scores from 2009 forecasts.
Ozone exposure indices, as defined in the CAFE Directive, will be shown for the regional configuration. For the high resolution configuration we will focus on the PM10 concentrations variability in winter months.

Also, we will present plans, methodology and results from the extended GEM-AQ model. The extended model includes a comprehensive and interactive stratospheric chemistry with the model top at 0.1 hPa.