HRAQRed: High Resolution Air Quality downscaling for cost-effective and cost-benefit Reduction of air pollution

Ambient air pollution is a major health risk worldwide. A recent study for Europe suggests that the annual excess mortality rate from air pollution is 790 000. Air pollution reduces the mean life expectancy in Europe by 2.2 years. In more polluted central European countries such as Poland, reduction is higher and reach 2.8 years. Particulate matter (PM) with an aerodynamic diameter below 2.5 um (PM2.5) or below 10 um (PM10), along with the tropospheric ozone (O3), are Europe's most problematic pollutants against health. Concentrations of cancerogenic benzo(alfa)pyrene (BaP) observed in Poland reach the highest levels compared to other EU countries, exceeding the recommended threshold values.

The main aims of this proposal include application of very high-resolution atmospheric transport models to answer the following questions:

1. What are the health costs of atmospheric pollutants concentrations exceeding recommended WHO guidelines?
2. Which emission sectors are responsible for high concentrations of atmospheric pollutants?
3. What are the economic costs and health benefits in reaching the WHO recommended air quality standards in Poland?