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The SHERPA Methodology and Implementation to Explore Potential Air Quality Improvements at the Regional/Local Scales

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Abstract: This work presents the SHERPA tool (Screening for High Emission Reduction Potentials on Air quality), a simplified air quality model that has been recently developed at the European Commission Joint Research Centre, to simulate the effect of local emission reduction policies on air pollution.

The SHERPA methodology is based on the concept of source-receptor models, that is to say on the use of simplified models able to mimic the link between emissions and concentrations as simulated by a complex deterministic Chemical Transport Model. As “family” of source-receptor models in SHERPA we used “linear regressions”, designed to simulate yearly PM₂₅, PM₁₀ and NO₂ ground-level concentrations. More in details, source-receptor models have been trained and validated using data from the CHIMERE Chemical Transport Model, run at roughly 7x7 km² resolution over Europe, using emissions as derived by the recent “2013 Clear Air Policy Package” to keep consistency with “higher level” EU policies.

Starting from these source-receptor models, SHERPA produces a set of indicators to support policymakers in their decisions. In particular it helps answering the following questions, for a given regional/local domain:

- (1) What is the potential for local action (is pollution locally created or originating from outside?);
- (2) What are the key activity/sectors and pollutants to tackle first and
- (3) Which spatial scale (region, province, city...) should be considered to take efficient actions?

In this contribution an overview of the SHERPA tool will be provided, with particular emphasis on the methodology, and showing an example of application.