Integrated approach to assess ozone control strategies costs and effects

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Regional Authorities require tools to evaluate effectiveness and cost associated to different emission reduction strategies. To answer this kind of problems, classical approaches used in literature consist in cost-benefit analysis and cost-effectiveness analysis, even if these methodologies hide possible trade-offs between objectives and between stakeholders. It is necessary to take into account these possible conflicts, and for this reason it is preferable to use a multi-objective approach as a tool to support Regional Authorities decisions.

In this work the formulation of a multi-objective problem to control ground-level ozone is proposed, formalizing: (a) an ozone exposure indicator; (b) cost functions and constraints for different emission abatement strategies; (c) local source-receptor models, describing the cause-effect relation between the air quality indicator and the emission abatement strategies. The implemented procedure considers, as local source-receptor models, Elman neural networks identified processing three dimensional seasonal simulations (Gabusi and Volta, 2005) of GAMES multiphase modelling system (Volta and Finzi, 2006).

The procedure has been applied over a Northern Italy domain, often affected by high ozone levels. Results of the optimization point out the emission macrosectors that Regional Authorities should first take into consideration to reduce precursor emissions with minimum economic costs.

REFERENCES

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