

THE EUROPEAN AMBIENT AIR POLICY – DEVELOPMENTS AND THE ROLE OF MODELLING

Andrej Kobe

Directorate-General Environment, European Commission, Brussels, EU

Abstract: European air policy has seen some important developments in the last few years. While the Thematic Strategy on Air pollution in 2005 outlined EU objectives by 2020, the recently adopted Directive 2008/50/EC merged and streamlined the existing directives and introduced new objectives and standards for fine particulate matter PM_{2.5}. With the review scheduled in 2013 the focus is now on implementation. Serious abatement efforts are still needed as for example 40% of all zones in EU still exceed the PM₁₀ limit value. Modelling is becoming a standard and an increasingly important tool in assessment and management of air quality. EU wide initiatives such as INSPIRE, FAIRMODE, GMES and SEIS outlined in the text are further strengthening its role and facilitate its effective use in the implementation of air policy.

Key words: air quality, EU Directives, modelling, CAFE

1. INTRODUCTION

Following the specific request made by the Council and European Parliament in the 6th Environmental Action Plan, the commission launched the Clean Air for Europe (CAFE) programme. In the years 2001-2005 CAFE compiled the latest knowledge on the impacts of air pollution, developed and assessed possible policy responses to complement implementation of existing legislation and other activities related to air pollution abatement. It resulted in the Thematic Strategy on Air Pollution (the Strategy) adopted by the Commission in October 2005. The Strategy has been endorsed by the Council and European Parliament in 2006. It has been later accompanied by the Thematic Strategy on Urban Environment, which is explicitly addressing environmental problems of urban areas where air pollution problems are most acute. In parallel, a specific list of actions have been identified in the Environment and Health Action plan that aims to coherently address the impacts of a number of physical and chemical stressors, including air pollution, on human health.

The Strategy sets interim objectives for improvement of human health and environment through improvement of air quality up to year 2020. It points to fine particles PM_{2.5} as the most important culprits for health impacts, as they currently contribute to more than 350.000 premature deaths annually in Europe. In the Strategy the most important sources and their abatement potential have been identified and need for specific measures outlined, including community measures such as energy efficiency action plan, vehicle emission standards EURO 5/6 & EURO VI, the revision of IPPC, NEC directive, and addressing shipping and aviation at the international level. Top priority has been given to air pollution research in FP7, and a number of guidelines and activities (such as development of GMES – Global Monitoring for Environment and Security services) are being set up to facilitate air pollution abatement.

The Commission has jointly with the Strategy proposed a new Directive on ambient air quality and cleaner air for Europe, which has been adopted this year by the Council and the European Parliament as Directive 2008/50/EC. It includes elements such as new PM_{2.5} environmental standards including an innovative PM_{2.5} exposure reduction target and the exposure concentration obligation.

While there has been significant improvement in the air quality in the last 2 decades of the 20th century, concentrations for some of the most important pollutants have levelled off or are even in the increase in the past 8 years. The limit values for particulate matter PM₁₀, to be attained by 2005, are still exceeded in 40% of all zones in the EU. The similar exceedance situation is expected for nitrogen dioxide NO₂ by the attainment date in 2010. Reasons are complex and span across different spatial scales, from the inability to resolve local street-canyon hot spot situations to increasing hemispheric contributions. The new Directive provides for certain flexibility to address compliance with these limit values, based on tight conditions which include introduction of further abatement measures and the assessment of the air quality plan by the Commission.

The revision of the new Directive is scheduled in 2013, with intent to revisit the objectives and in particular try to strengthen those related to fine particles PM_{2.5}. Until then the main focus is on the implementation and enforcement.

2. MODELLING AND CURRENT INITIATIVES

The ambient air quality assessment and management are becoming increasingly dependent on modelling. In assessment, modelling supports optimization of measurement network, provides more comprehensive spatial information and delivers additional information in understanding of the contributing sources of pollution. While the required assessment regime has not been fundamentally altered by the new Directive, several introduced provisions such as one on the modelling uncertainty estimation facilitate a more widespread use of modelling. The new reporting scheme currently in preparation is expected to further facilitate reporting of modelled assessment.

As the low lying fruit in terms of pollution abatement measures have mainly been picked, modelling is becoming the essential air quality management tool to find further cost-efficient abatement solutions. At the EU level the integrated assessment models such as RAINS/GAINS covering pollutants as well as principal greenhouse gases, coupled with the EMEP air quality model, have been successfully applied in recent major policy proposals such as the development of the Thematic Strategy on Air Pollution and the development of the Climate and energy package. These models enable to quantify public health benefits, identify maximum synergies between policies and potential trade-offs that need to be addressed. Local modelling has also been used to assess the attainability of the proposed limit values.

On the implementation side, Member States are exploiting models at the regional and local scales to develop compliance schemes with the limit values. One-off research type air quality model attempts in selected European cities of just several years ago are now becoming continuous routine applications in all major cities and support not just the development of the air quality plans but also guide related policies in spatial development, urban mobility etc.

While the field has benefited from a variety of models and approaches in development of more robust model applications, international and EU initiatives such as HARMO, COST actions and projects such as City-Delta have proven very beneficial introducing coherence and thus a more rapid development and acceptance of models in the air quality community. The Commission and the European Environment Agency (EEA) have now launched a further initiative with a specific focus on the implementation of the AQ directives FAIRMODE. This comprehensive initiative that will be presented in more detail in other presentations covers an establishment of standing modelling forum, development of guidance documents, organisation of intercomparison exercises, research and development of recommendations to the Commission for the potential modification of related EU legislation and implementing provisions to ensure adequate level of harmonization and comparability of model outputs.

Another important EU initiative is the development of GMES Atmosphere service. The prototypes of some core services which is expected to be operational by 2013 are already available by the precursor projects such as FP6 GEMS and PROMOTE, and by the EEA data services. They include AQ modelling and forecasting on the regional scale and are expected to support model nesting but also more complex downstream services such as inverse emission modelling to support more efficient management of air pollution and its enforcement. An FP7 Project MACC which will develop the principal core service elements by 2011 is expected to kick-off in 2009. In the review of the air quality Directive in 2013, on the basis of the output by FAIRMODE and the available operational services at the time, a new assessment regime taking into account the availability of such services at EU scale, will be considered.

The implementation in particular in terms of reporting, exchange of model inputs, modelling and measurement results and forecasts, public information and dissemination will be importantly affected by the implementation of the INSPIRE Directive 2007/3/EC establishing an environmental spatial data infrastructure. Access to spatial environmental data within the Member States will be enabled through interoperable services with standardised metadata and search engines. As an example, infrastructure is expected to serve as backbone in exchange of near real time assessment information facilitating local air quality modelling and more effective information to the public. The expert group on Data exchange led by DG Environment is responsible for the development of Implementing provisions on reporting under the air quality Directives, but is also a SDIC - Spatial Data interest Community under INSPIRE, expected to develop the metadata specifications for the field of air quality.

Access to relevant environmental information to either feed the models or to inform the public is also expected to improve through the development and implementation of the European Shared Environmental Information System (SEIS). Recent Commission Communication on the subject is currently being complemented by the development of a concrete action plan.

3. CONCLUSION

Dedicated research, technological developments and concerted action had brought air quality modelling in the mainstream of air quality assessment and management. Air quality modelling is increasingly used not just in the implementation of air policy and as a standard tool in the environmental assessments in spatial development, but also in related fields such as climate change and transport policy to evaluate environmental benefits and trade-offs of specific policy options.

Initiatives are in place at EU level to facilitate appropriate use of models and their results and ensure their contribution to implementation of effective abatement measures and public information resulting in reduced public exposure to air pollutants. It is important to embrace and exploit these initiatives to ensure effective implementation of EU policy, eliminating any unnecessary overlaps at EU level and using common approaches in the further development, use, evaluation and dissemination of model results.

Information on the Directives, policy documents and initiatives mentioned in the text can be found at http://ec.europa.eu/environment/air/index_en.htm.