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A Critical Evaluation of Local Air Quality Management and its Contribution to Meeting the EU Annual Mean Nitrogen Dioxide Limit Value

PhD Abstract

Local Air Quality Management (LAQM) was initially intended to play a supplementary role in assisting the UK government in achieving its European air quality obligations (Directive 2008/50/EC) through the implementation of action plans to reduce public exposure to local air pollution hotspots. Since the inception of LAQM in 1997, however, exceedences of health-based nitrogen dioxide objectives, primarily related to road traffic sources, have proved to be more widespread and intractable than previously anticipated. The failure of the UK government to achieve the EU annual mean limit value by the prescribed deadline of 1st January 2010 for 93% of the UK's Zones and Agglomerations has increased the emphasis on the role of LAQM. At the same time, the lack of revocations of local Air Quality Management Areas has called into question the efficacy of local authorities Air Quality Action Plans (AQAPs).

This research draws on the extensive body of evidence provided by the LAQM process since 1997 to establish if it possible to determine whether local AQAPs have been effective in achieving their aims and in improving air quality at a local level. By evaluating the degree of success achieved through individual AQAPs and then building an aggregate picture of progress to achievement of their goals, it has been possible to assess the effectiveness and efficiency of the LAQM regime as a national strategy to meet national air quality objectives and to contribute to EU air quality legislative requirements.

The key finding from this research is a confirmation of the thesis statement, i.e. that historically LAQM has not been a successful strategy in achieving selected EU limit values. An absence of adequate AQAP progress reporting and representatively sited robust monitoring data indicate that, collectively, the means to assess the effectiveness of LAQM in terms of reducing local concentrations of nitrogen dioxide does not currently exist.

The thesis offers nine recommendations for Defra and the Devolved Administrations to improve the effectiveness of LAQM in assisting with the achievement of the NO₂ annual mean EU limit value. They are proposed as solutions to the limitations and obstacles observed in undertaking this research, and in essence advocate a combined and coordinated national and local approach to reducing traffic-related nitrogen dioxide concentrations in order to achieve the EU limit value. The current revision of LAQM and the recent changes to the EU AAQD reporting requirements make this an opportune moment to instigate these proposed changes.