

THE CONTRIBUTION OF LONG-RANGE TRANSPORT OF DUST TO PM₁₀ LEVELS IN EUROPE

K.L. Smallbone, T. Broomhead

School of the Environment, University of Brighton, Brighton, UK

Within Europe, air quality standards have been established for a range of pollutants including PM₁₀. This legislated process involves the assessment and, if necessary, the management of pollutants. As approximately 80 per cent of PM₁₀ are derived from primary and secondary natural sources, managing PM₁₀ within the Air Quality Framework of Europe can be problematic. This paper examines the contribution of Saharan wind blown dust to PM₁₀ and examines its influence on air quality management of particulates within the EU. PM₁₀ and PM_{2.5} monitoring was undertaken using a number of high volumetric samplers (TEOMS) in Spain and the UK. A network of low-tech (Frisbee) samplers was employed to increase the spatial distribution of data. Analysis of the data indicated that a significant PM₁₀ episode occurred during July 2002. It was concluded that this event was the result of dust fallout from a high-level air mass caused by a cyclonic event. Similar meteorological conditions were identified using TOMS and back trajectory analysis and a PM₁₀ Saharan-influenced episode in August 2003 identified in both Spain and the UK. Chemical composition analysis indicated that this event contained a higher than average contribution of crustal dust. To date most studies have not considered the impact of high level air masses mixing within cyclonic events. Using the above model, similar events of Saharan origin have been identified for the previous year. The use of such a technique could allow prediction of future Saharan dust events and have an impact on the European management of PM₁₀.