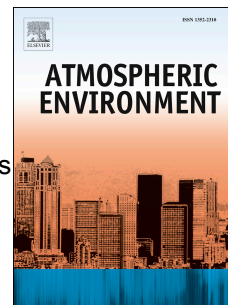


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A comprehensive approach for the evaluation and comparison of emission inventories in Madrid

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# 1 A Comprehensive Approach for the Evaluation and Comparison of Emission Inventories in Madrid

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9

## 10 Abstract

11 Emission inventories provide a description of the polluting activities that occur across a specific geographic  
12 domain, and are widely used as input for air quality modelling for the assessment of compliance with  
13 environmental legislation. The spatial scale to which these inventories are referred has an influence in the  
14 representativeness of the emission estimates, as these are underpinned by a number of considerations and  
15 data with different levels of granularity. This study proposes a comprehensive framework for the evaluation  
16 of emission inventories that allows identifying methodological issues by examining differences in  
17 performance to a chemical transport model (CTM) when such inventories are used as input. To demonstrate  
18 the approach, a comparison between the national and regional emissions inventories for the Autonomous  
19 Community of Madrid (ACM) was carried out (NEI and REI respectively). The analysis revealed  
20 discrepancies in compilation methodologies for the domestic sector (SNAP 02), industrial combustion  
21 (SNAP 03), road traffic (SNAP 07) and other mobile sources (SNAP 08); most of the differences were  
22 originally caused by taking into account different activity variables, fuel mixes, and spatial disaggregation  
23 and allocation proxies. The granularity of the base data (statistics, fuel consumption, facilities, etc.) proved to  
24 be an essential limiting factor, which means that whenever bottom-up approaches were followed, the  
25 description of emission sectors tended to be more accurate.

26

27 *Keywords: Air quality modelling; Urban emission inventory; Scale interaction; Harmonisation;*  
28 *Uncertainties; Madrid.*

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