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ROAD TRAFFIC EMISSION INVENTORY AND EVALUATION OF EMISSION REDUCTION STRATEGIES IN KUALA LUMPUR, MALAYSIA

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Abstract

Urban transportation is a major source of air pollution, highlighting the need for sustainable strategies to reduce emissions. This study aims to develop a city-wide traffic emission inventory for Kuala Lumpur using the EMISSIONS SENSitivity (EMISENS) model. The model was applied across the full urban road network, covering both major and minor road segments within the city's administrative boundaries. The study projected CO, NO_x, PM₁₀, SO₂ and NMVOC emissions for the year 2018 for Business-As-Usual (BAU) scenario and two emission reduction strategy scenarios in accordance with transport-related policies aimed at reducing vehicle emissions. The total CO, NO_x, PM₁₀, SO₂ and NMVOC emissions based on BAU scenario calculated over Kuala Lumpur were 640.79, 61.50, 20.24, 5.96, and 668.74 kt/yr, respectively. Motorcycles are the largest source of CO, whereas cars are the primary source of NMVOC and SO₂. The adoption of electric mobility adoption and mode shift from private vehicles to public transport demonstrate strong potential to reduce key pollutants, particularly SO₂, NMVOC and PM₁₀. EMISENS model was used to provide data-driven emission reduction planning and offer actionable insights to support the development of sustainable urban transport strategies in Kuala Lumpur.

Key words: emission inventory, emission reduction strategies, traffic emissions, transport policy

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