Research Article

The impact on air quality of PM10 emissions from the bus fleet of Buenos Aires City

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Received: 3 August 2022 / Accepted: 21 November 2022
Published online: 08 December 2022

Abstract

Automobile transport in megacities poses serious problems in the area of sustainability and environmental security. In the City of Buenos Aires (CABA) it represents 37% of GHG emissions and is an important source of pollutants dangerous to human health. As such, it is an energy consumption sector targeted for the implementation of methods that allow for sustainable urban transport. At the same time, very few previous studies about transport vehicle emissions have utilized the PM10 as an indicator of environmental contamination, considering that the negative impact of this environmental contaminant on human health is widely studied. An emission model linked to an atmospheric dispersion model, statistically validated, were used to study different scenarios of emissions generated by diesel buses. It was observed that in a scenario of zero bus emissions (E0), PM10 immission (air concentrations) concentration in CABA is reduced by half. When studying the energy transition from diesel buses to electric energy, while the rest of the vehicle fleet was maintained at the expense of fossil fuels, the local immission concentration of PM10 in CABA was of the same magnitude of that which was obtained when simulating the (E0) scenario of only private vehicle fleet. This study is relevant in the evaluation of public policy on vehicle emission mitigation that seeks to reduce health risks from poor air quality and to develop a more progressively sustainable city.

Article Highlights

- Transition energy exclusively for buses could reduce PM10 immission values of CABA by 50%.
- Thermal energy needed to the energy transition does not significant impact the PM10 immission values on the local air quality.
- Electric buses could reduce the maximum PM10 immission value by half.

Keywords Mobile sources · PM10 · Pollution plume · Public health · Sustainable public transport · City of Buenos Aires(CABA)

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s42452-022-05231-5.

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SN Applied Sciences (2023) 5:6 | https://doi.org/10.1007/s42452-022-05231-5

SN Applied Sciences
A SPRINGER NATURE journal