WMO/GAW Coordinated study on impacts of covid-19 lockdown measures on air quality: an observational and modelling analysis

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Ranjeet Sokhi, George Tsegas, Vikas Singh, Tim Butler, Sandro Finardi, Roberto San Josè, Alejandro Casallas, Alexander Baklanov, Lu Ren (**modelling analysis coordination group**) and many global contributors

Italian participation to the initiative

Observational analysis

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- Anna Di Leo e Guido Lanzani (ARPA Lombardia)
- Giada Marchegiani e Alessandro Di Giosa (ARPA Lazio)
- Fabio Murena (Università degli studi di Napoli "Federico II")

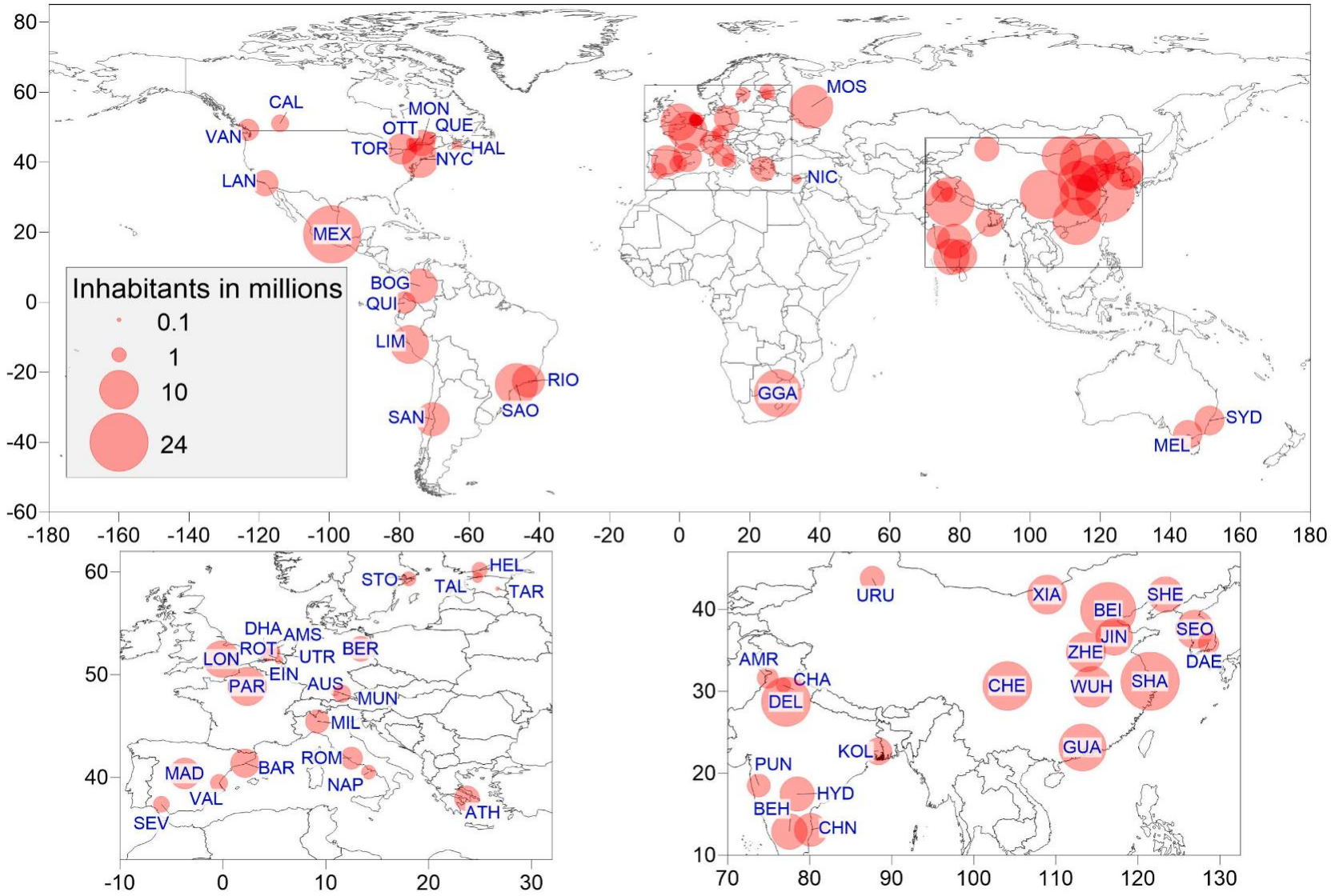
Modelling analysis

- Antonio Piersanti, Massimo D'Isidoro, Gino Briganti,… (ENEA)
- Sandro Finardi, Giuseppe Calori, Nicola Pepe, Alessio D'Allura,… (ARIANET)
- Andrea Bolignano, Giada Marchegiani e Alessandro Di Giosa (ARPA Lazio)

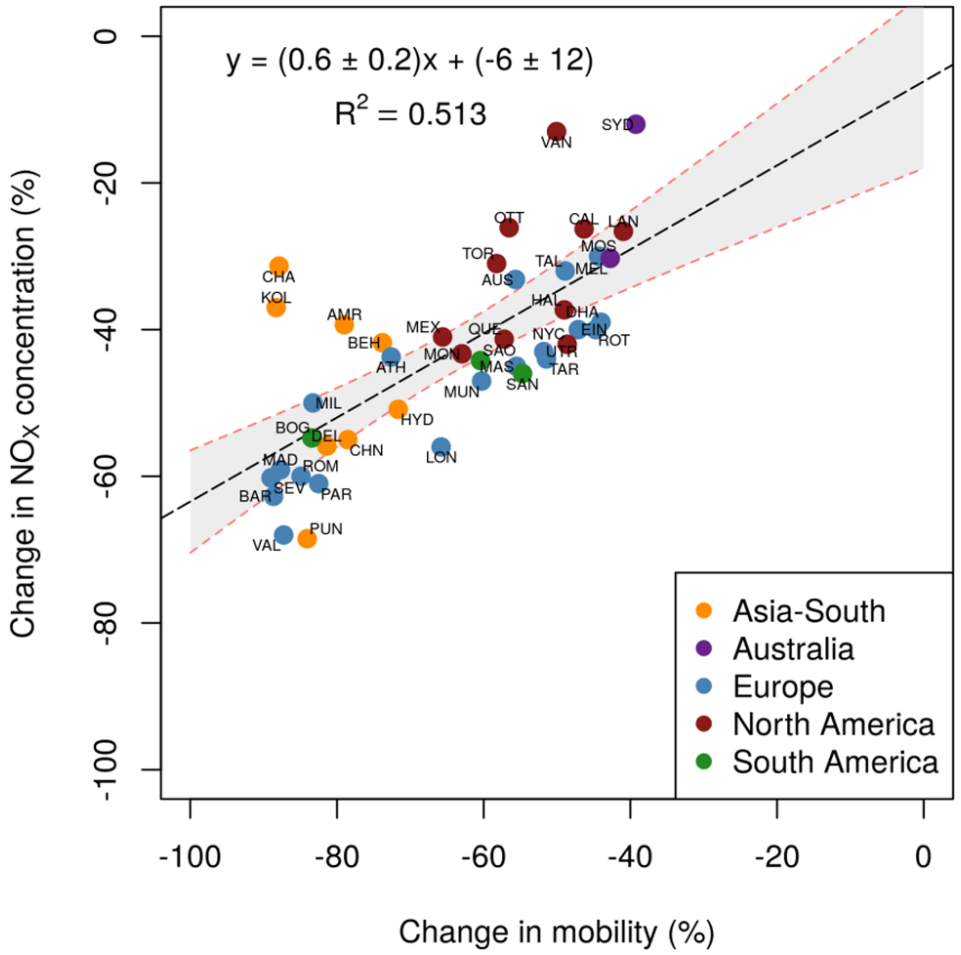
Observational analysis

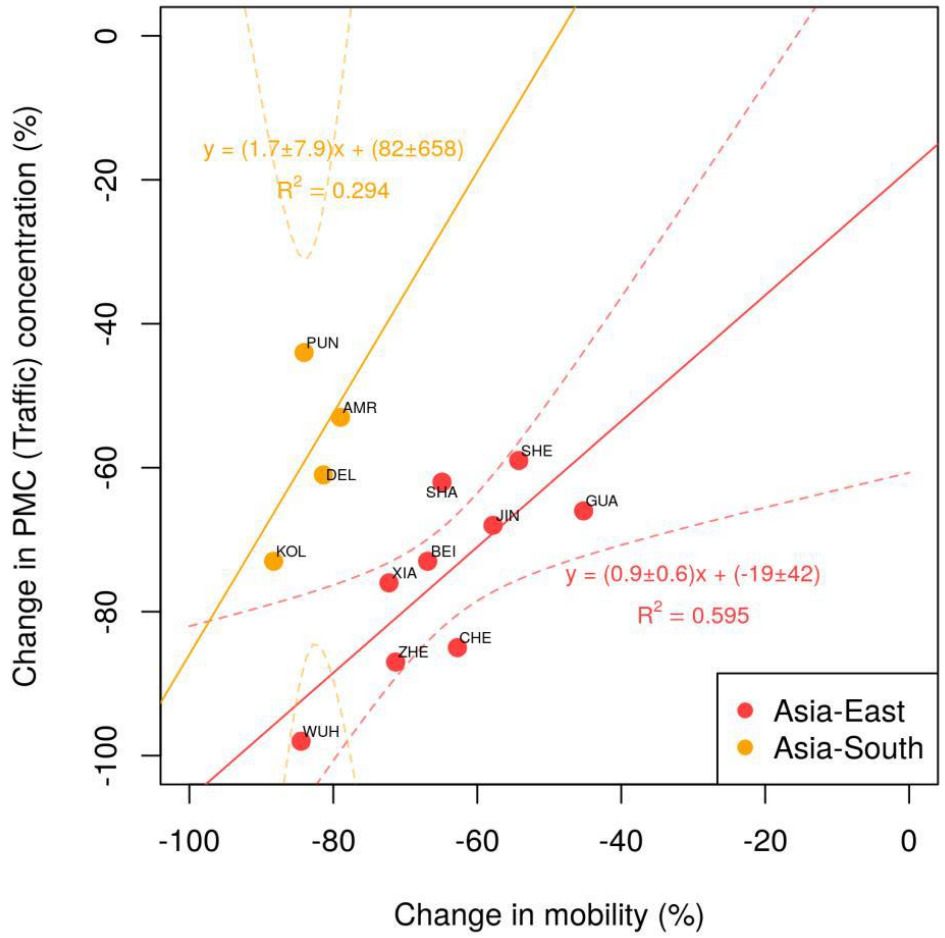
Sokhi et al., 2021: A global observational analysis to understand changes in air quality during exceptionally low anthropogenic emission conditions. Environ Int.;157:106818. https://doi.org/10.1016/j.envint.2021.106818

63 Cities



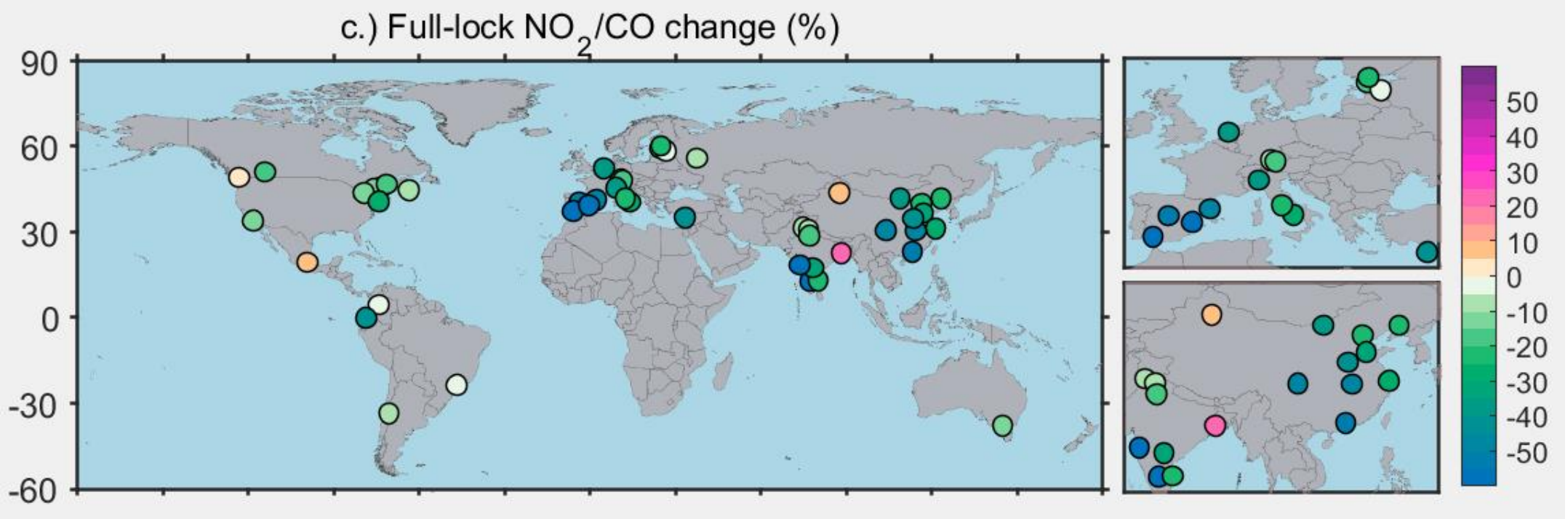
Observational analysis (NOx and PM)





Observational analysis (NOx/CO)

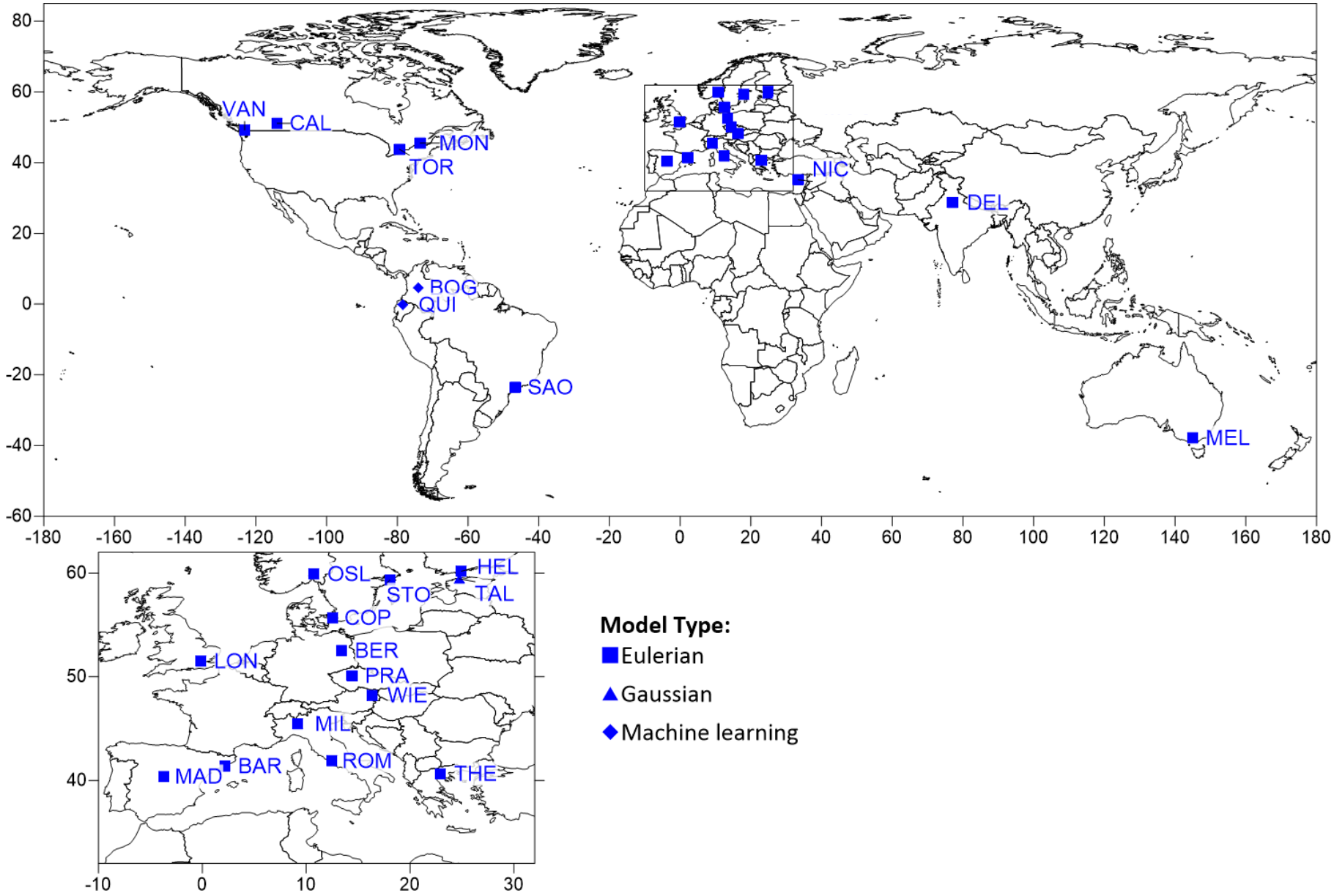
A large ratio indicates traffic dominated conditions in the cities and a small ratio indicates contributions from other sources, such as domestic/agricultural/wildfire burning.



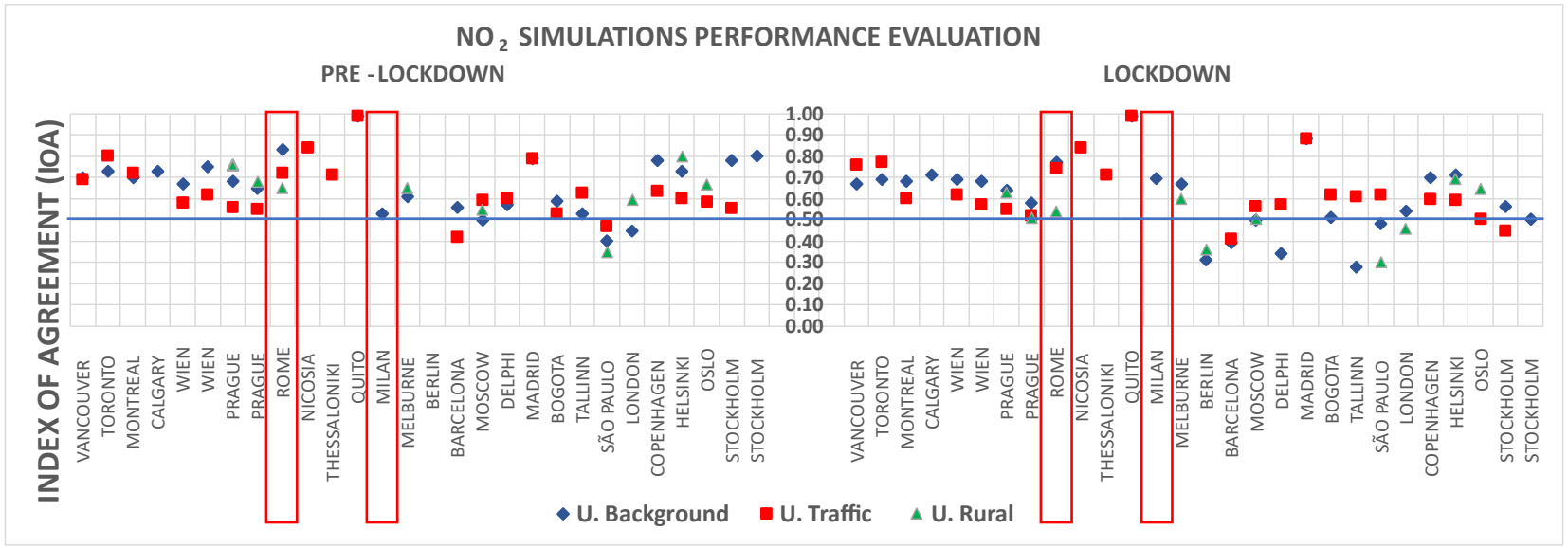
The highest reductions were reached in Southern Europe (- 49 ± 20%), and especially in the Spanish cities (- 61 ± 20%). The highest reduction in Spain is attributed to the dense cities with a high proportion of diesel passenger cars and the worldwide strictest mobility reduction, while the lowest reductions were associated with lax mobility restrictions and lower diesel cars proportions in the fleet.

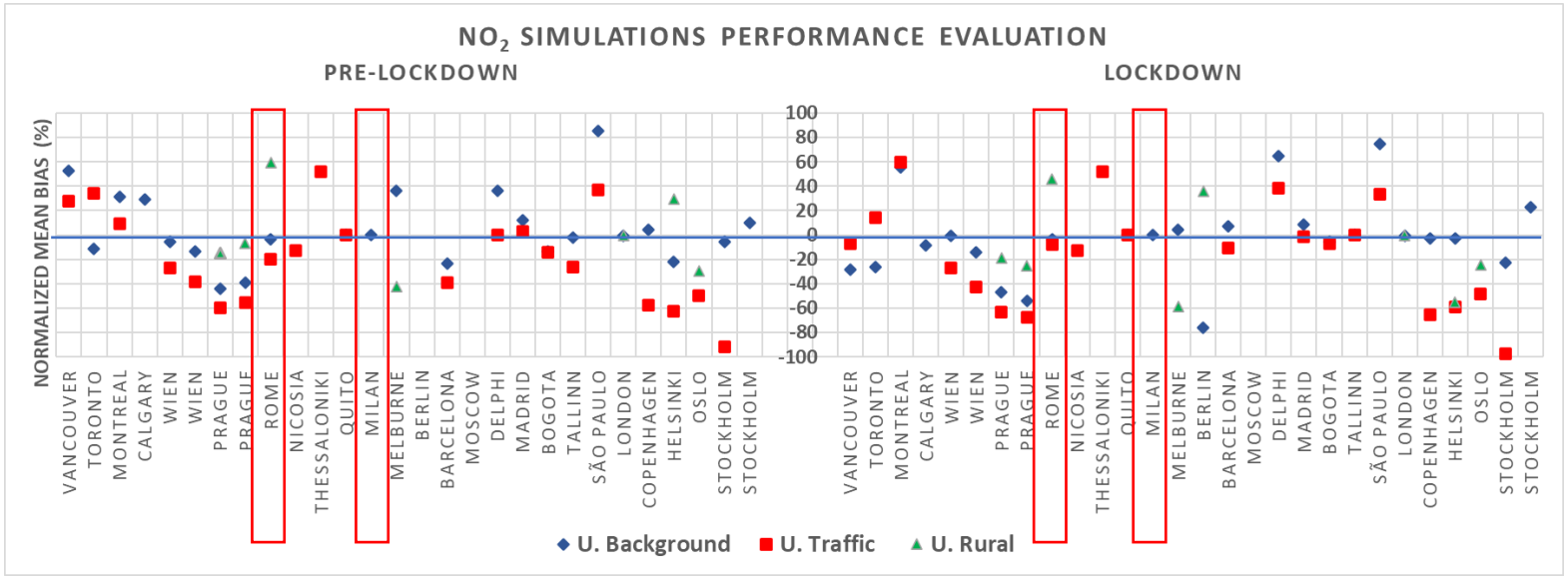
Modelling analysis (ongoing)

24 Cities



Modelling analysis (model evaluation: NO2)





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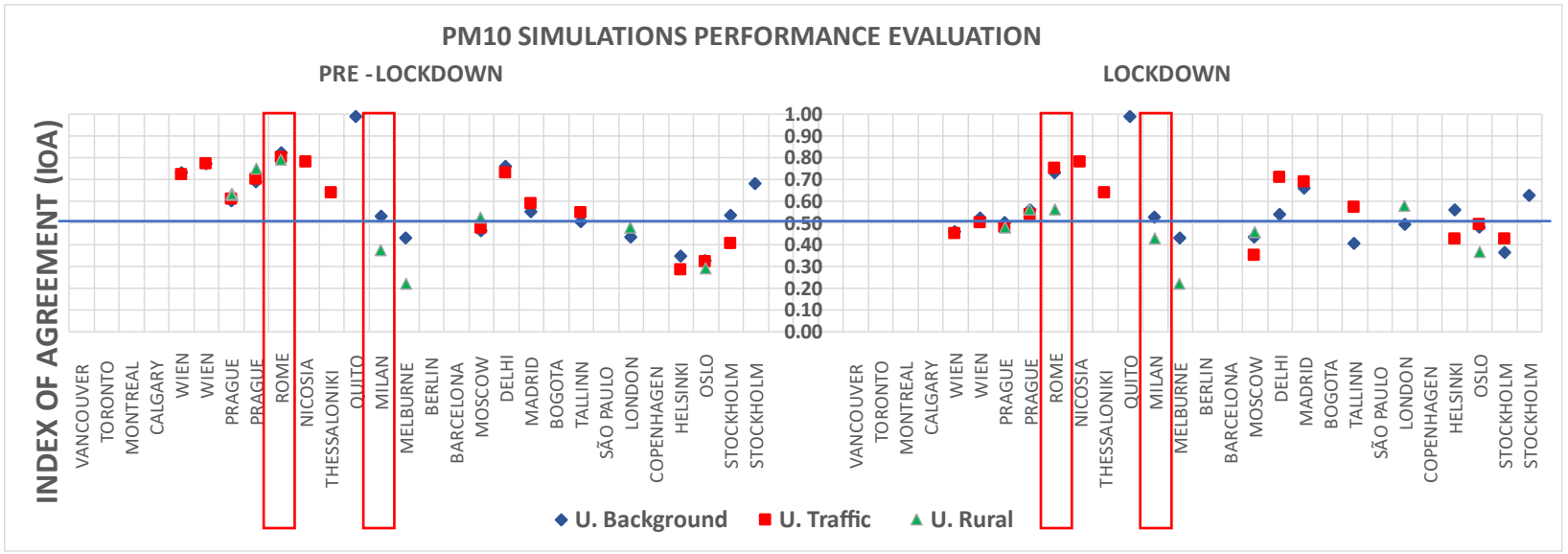
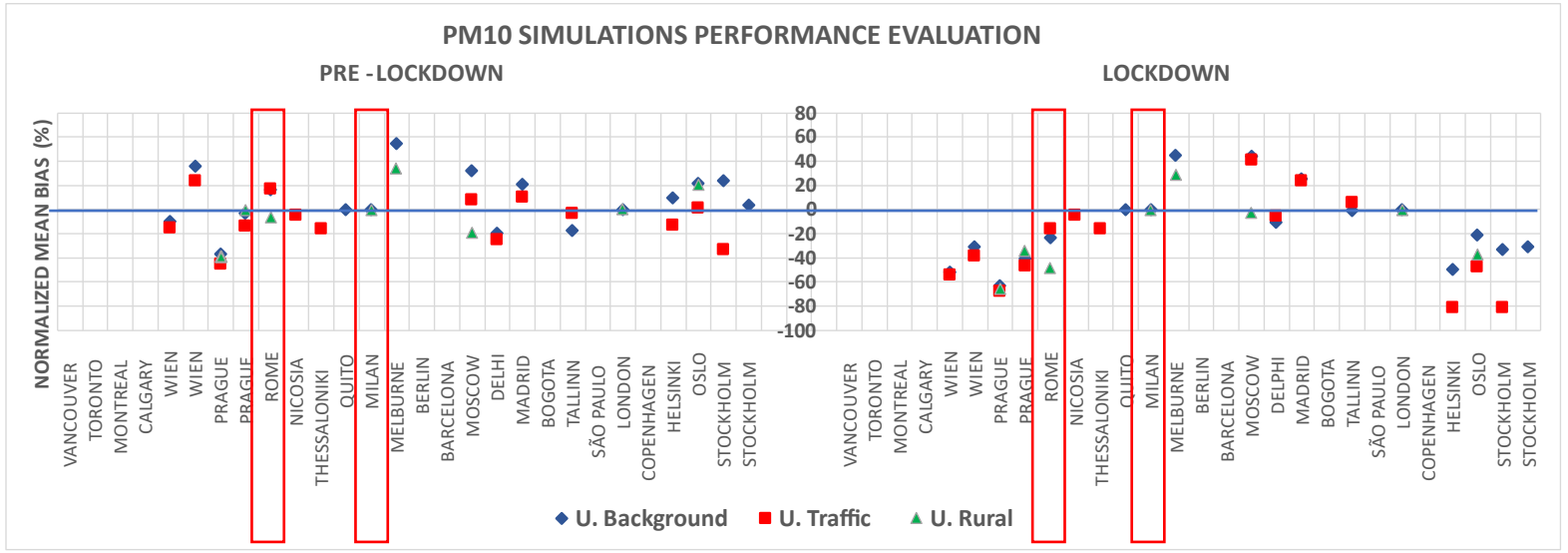
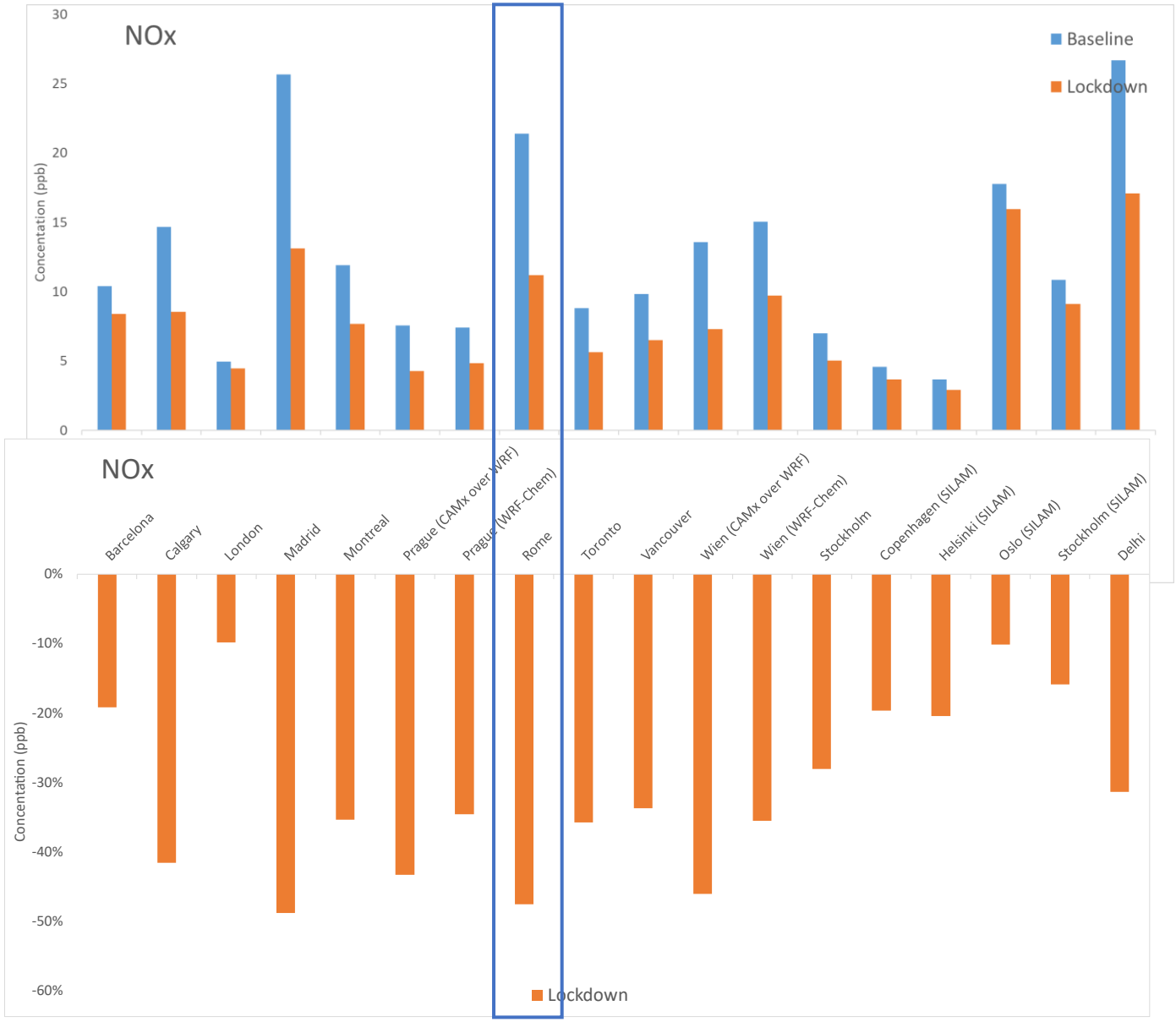
Modelling analysis (model evaluation: PM10)

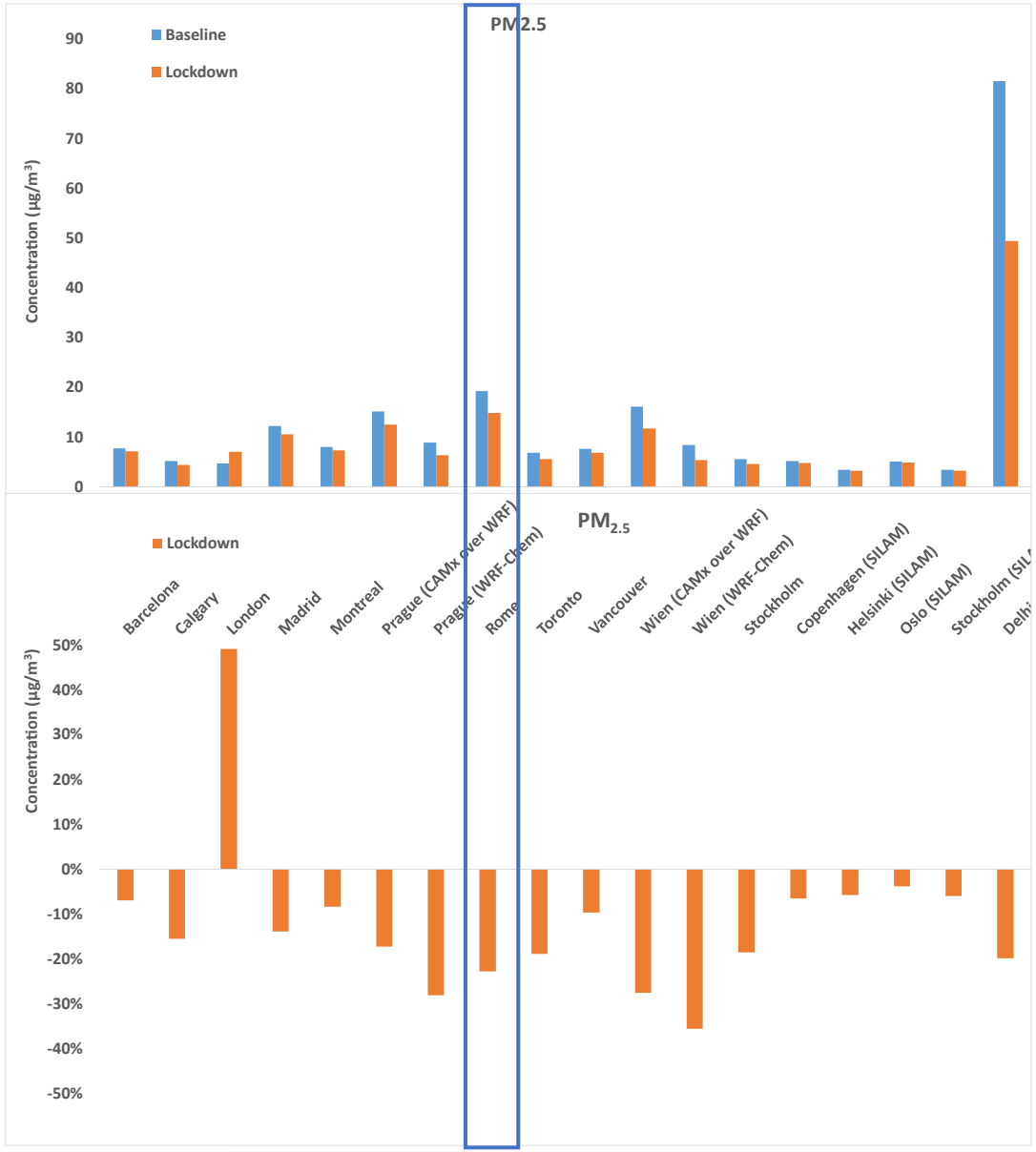




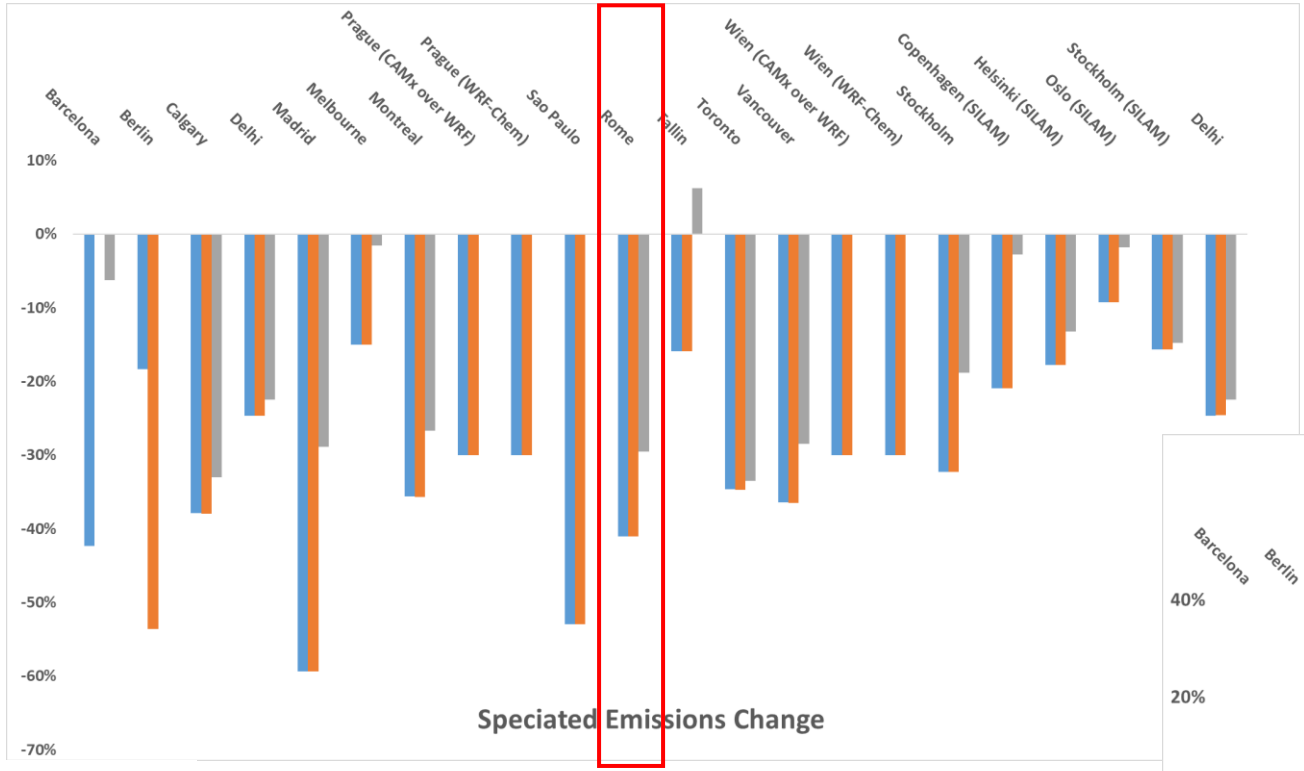
Modelling analysis (Concentration change: NOx)

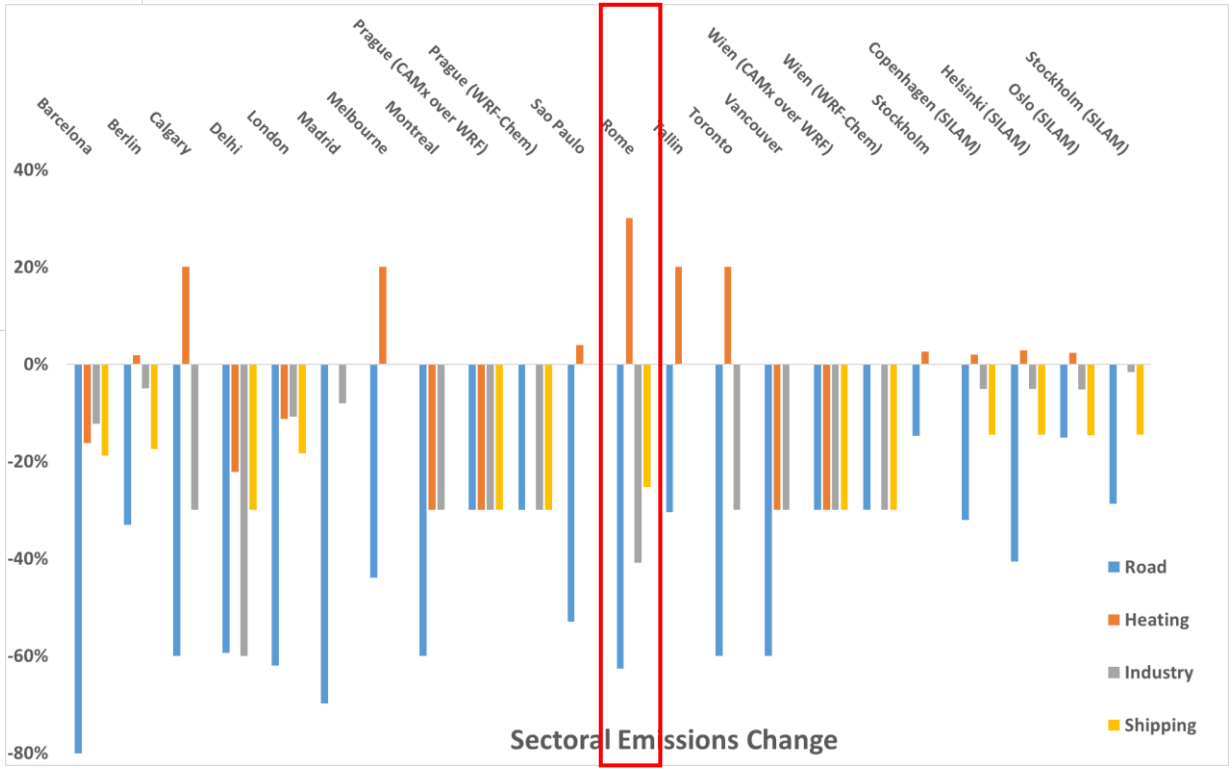


Modelling analysis (Concentration change: PM2.5)



Modelling analysis (Emissions change)





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Grazie per la vostra attenzione