

# Simulations to reduce emissions from road transport

March 24 2014

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Researchers at the UPM are developing a methodology to estimate atmospheric emissions from road transport that will help to make environmental decisions.

The research result conducted by the School of Engineering of the Universidad Politécnica de Madrid (UPM) is a model system that allows the simulation of future cases of greenhouse gas and air pollutants [emissions](#) from vehicles. This proved how difficult is to implement measures that could help simultaneously reduce both types of emissions.

The emission problems of [greenhouse gas](#) and air pollutants are the big challenges of [road transport](#) today. Its contribution to climate change and the low urban air quality are the main reasons why road transport increase is currently being limited.

Researchers of the Environmental Technology and Industry Resources group have developed a methodology that can calculate the emissions of an area transport fleet, taking into account vehicle types and environmental laws of that area.

Therefore, this simulation model can assess the impact of policies and measures such as support systems for vehicle renewal, speed reduction, market penetration of less powerful engines, vehicles fuel change, the city circulation restriction policy and the biofuel usage awareness.

This model system was successfully conducted in Spain by calculating

emission projections until 2020 in diverse situations. The conducted tests show that reducing the greenhouse emissions requires mostly non-technological measures (mobility restriction). However, the renewal of the vehicles fleet with systems of advanced emission reduction is the most efficient option to reduce emissions of air pollutants (mainly nitrogen oxides and particulate matter).

Researchers also conducted a sensitivity analysis to identify the most influential variables in future emissions. The obtained values show that the link among petrol and diesel cars and the vehicles age are decisive variants for [nitrogen oxide emissions](#). On the other hand, speed on highways and the vehicle engine type are the most influential factors that contribute to CO<sub>2</sub> emissions.

This research shows the difficulty to implement measures to reduce simultaneously both [greenhouse emissions](#) and [air pollutants](#) on road transport. This research suggests studying the side effects of these measures before putting them into practice.

**More information:** LUMBRERAS, J; BORGE, R; GUIJARRO, A; LÓPEZ, JM; RODRÍGUEZ, ME. "A methodology to compute emission projections from road transport (EmiTRANS)". *Technological Forecasting and Social Change* 81: 165-176. [DOI: 10.1016/j.techfore.2013.02.011](#). Enero 2014.

Provided by Universidad Politécnica de Madrid

Citation: Simulations to reduce emissions from road transport (2014, March 24) retrieved 18 September 2024 from <https://phys.org/news/2014-03-simulations-emissions-road.html>

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