Methodology to quantify the effect of policies and measures on emission reductions from road transport

CIMO 2008

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1.- INTRODUCTION

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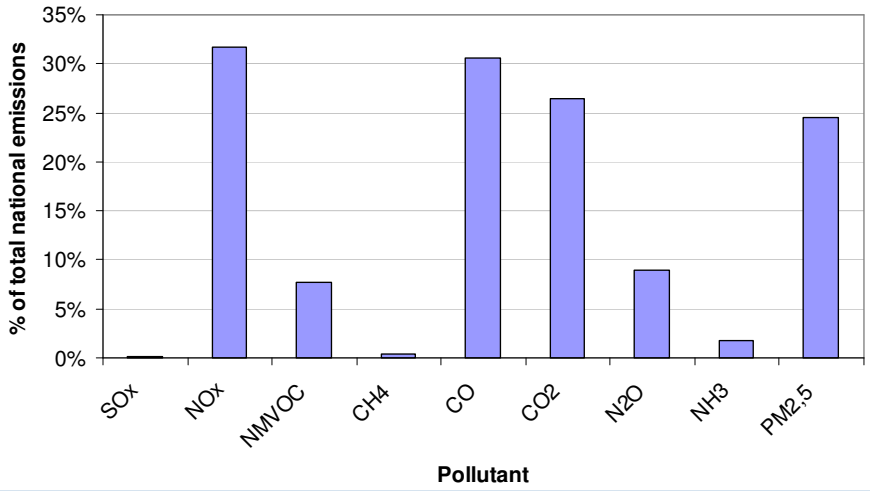
1.- Introduction

Road transport is one of the main air pollution sources. Example, Spain



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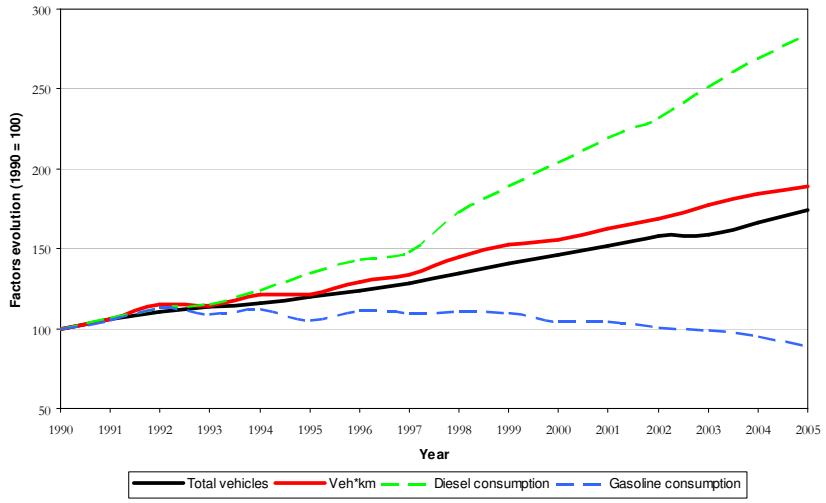
1.- Introduction

With a great change in type of vehicles



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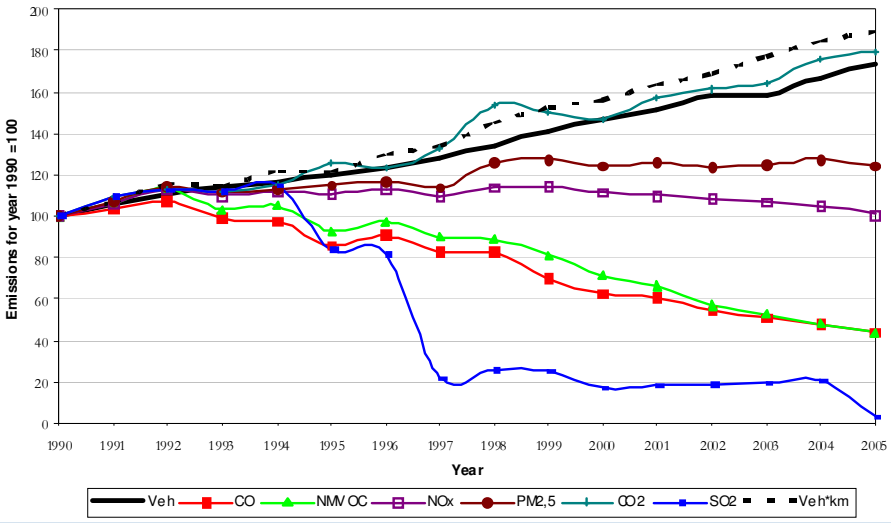
1.- Introduction

With increasing emissions in the last years for some pollutants



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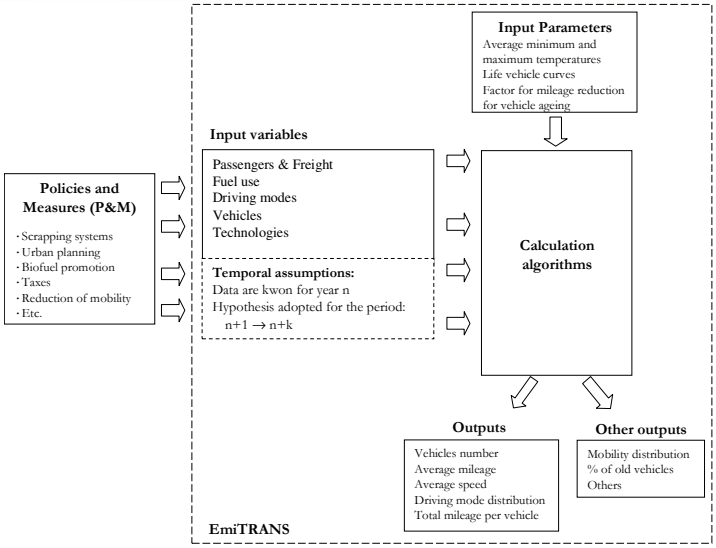
2.- EMITRANS DEVELOPMENT

2.- EmiTRANS development



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3.- APPLICATION TO SPAIN

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3.- Application to Spain

1st step Input process → **2nd step** QA/QC and calculations → **3rd step** Results generation ← **Under 5 scenarios for 2006-2020**

Scenario	Mobility	Technology in 2020	Vehicles Power	Biofuels
Business as usual	+4% PC +6% HDV	Same as baseline	Same as baseline	Same as baseline
Baseline	+3.6-0.5% PC +5.1-0.2% HDV	1.4% Electric/H_2 3.2% Hybrid 16% NG urban buses	Petrol: 41%<1,4 litre (l); 52%∈ 1,4-2 l; 7%>2 l Diesel: 86%<2l; 14% >2l	2010: 5.83% 2012: 8% 2016-2020: 10%
Technological	Same as baseline	10% Electric/H_2 20% Hybrid 50% NG urban buses	Same as baseline	Same as baseline
Lower mobility	No mobility increase	Same as baseline	Same as baseline	Same as baseline
Biofuel promotion	Same as baseline	Same as baseline	Same as baseline	2010: 6.88% 2012: 9.5% 2020: 20%

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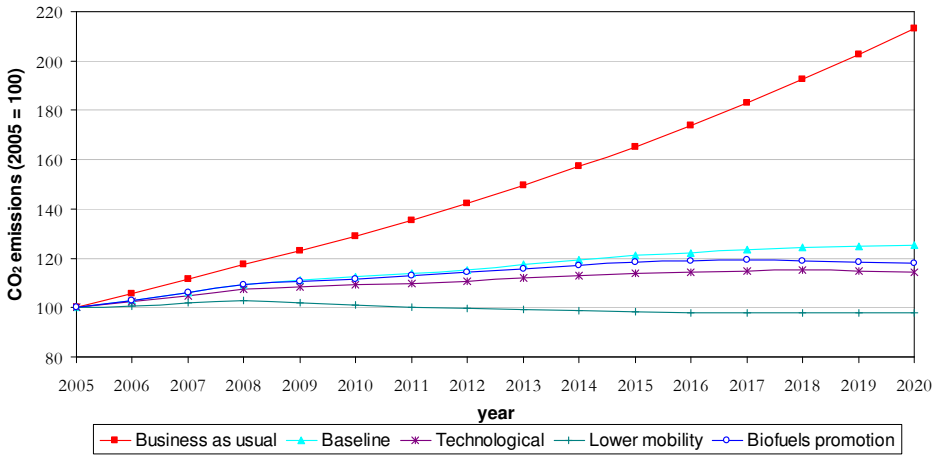
3.- Application to Spain

CO_2 emissions from road transport in Spain up to 2020



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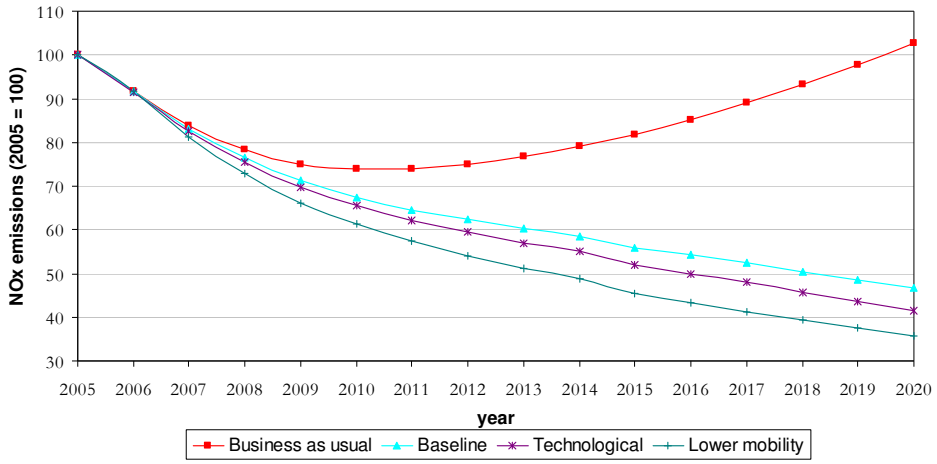
3.- Application to Spain

NO_X emissions from road transport in Spain up to 2020



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4.- SENSITIVITY ANALYSIS

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4.- Sensitivity analysis

Factor	Sensitivity analyses
Fuel distribution for vehicles	Reference: 46.6% petrol, 53,4% diesel
	30% petrol, 70% diesel
	40% petrol, 60% diesel
	60% petrol, 40% diesel
	70% petrol, 30% diesel
Urban average speed	Reference: 25 km/h
	20 km/h
	22.5 km/h
	27.5 km/h
	30 km/h
Highway average speed	Reference: 105 km/h
	84 km/h
	94.5 km/h
	115.5 km/h
	126 km/h

Factor	Sensitivity analyses
% of large vehicles	Reference: vehicles with engine cylinder>2 l are 6.2% for petrol and 14.2% for diesel
	Number of large vehicles are tripled
	Number of large vehicles are doubled
	Number of large vehicles are divided by 2
	There is no large vehicle
Number of old passenger cars	Reference: 5,375 M vehicles (26.5 %)
	20% substitution by Euro 5 vehicles
	40% substitution by Euro 5 vehicles
	60% substitution by Euro 5 vehicles
	80% substitution by Euro 5 vehicles

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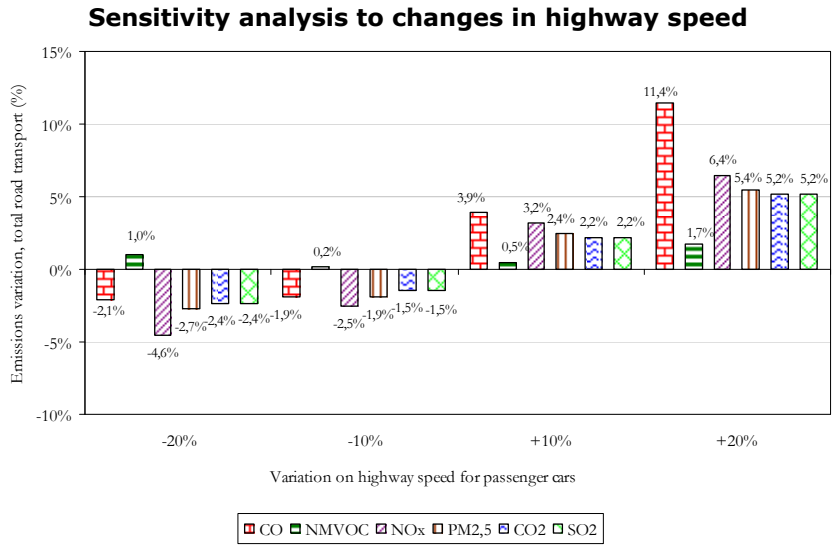
4.- Sensitivity analysis for changes in highway speed



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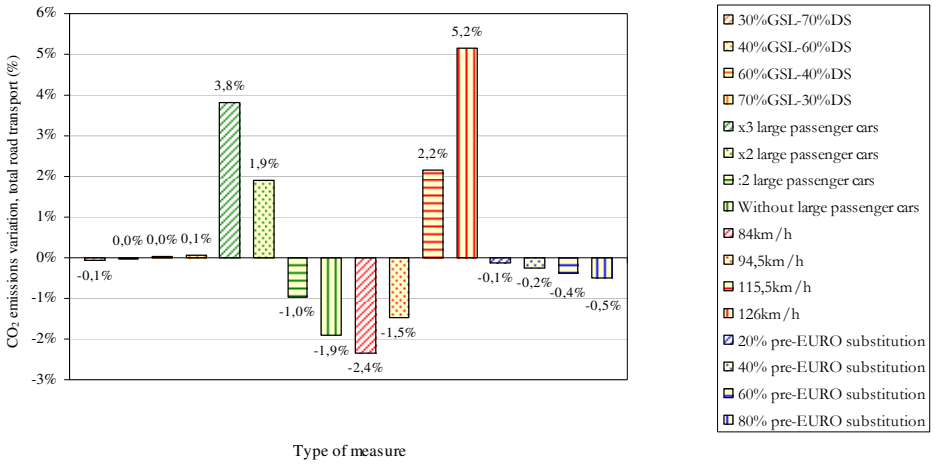
4.- Sensitivity analysis on CO_2 emissions

Sensitivity analysis on CO_2 emissions



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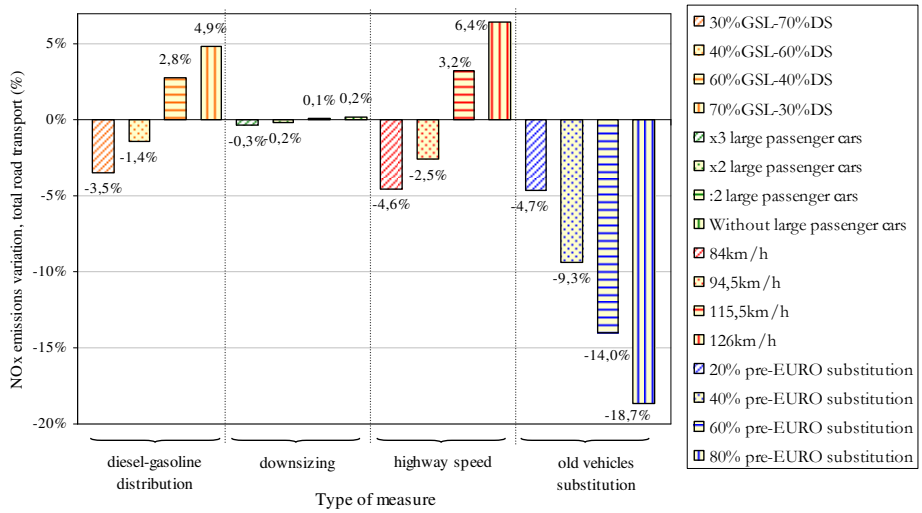
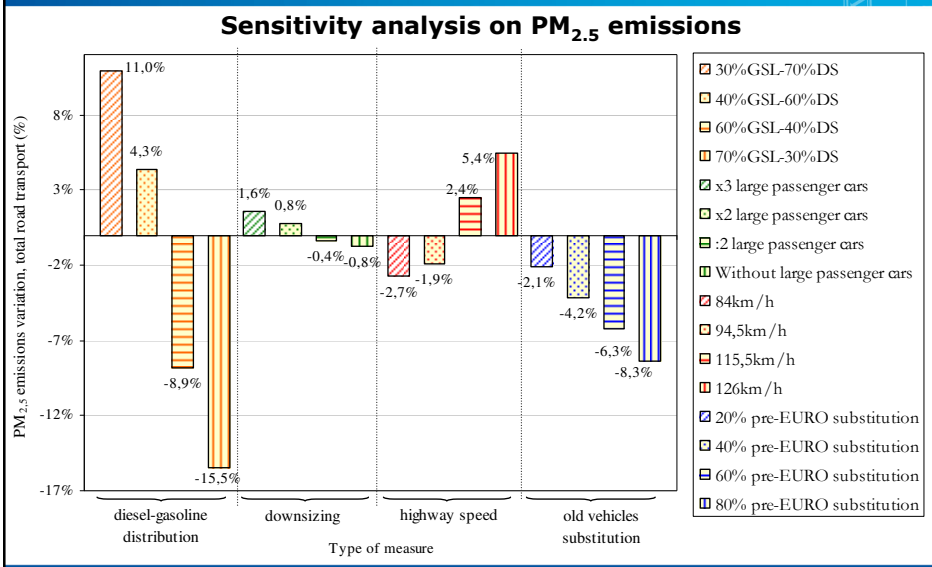
4.- Sensitivity analysis on NO_X emissions

Sensitivity analysis on NO_X emissions



4.- Sensitivity analysis on $PM_{2.5}$ emissions



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5.- CONCLUSIONS

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5.- Conclusions

We have developed a methodology to quantify the effect of policies and measures on emission reductions from road transport

It includes the development of a model called EmiTRANS

EmiTRANS is able to estimate the influence of several factors over emissions in a flexible and coherent way

EmiTRANS also allows the development of different emission scenarios for future years

This methodology has successfully been applied to the case of Spain

For Spain, the most influent variables for CO, NMVOC, NOx and $PM_{2.5}$ emissions are passenger car mileage and scrapping systems for vehicle substitution

To obtain CO_2 reductions, non-technical measures such as increasing average speed in cities and decreasing it in highways, are more effective than scrapping systems

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Thank you for your attention!

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