

ENERGY EFFICIENCY AND CO₂ EMISSION ESTIMATION OF HYBRID VEHICLE USING BIG DATA

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Research Centre
for Gas Innovation

cleaner energy for a sustainable future

V Internal Workshop

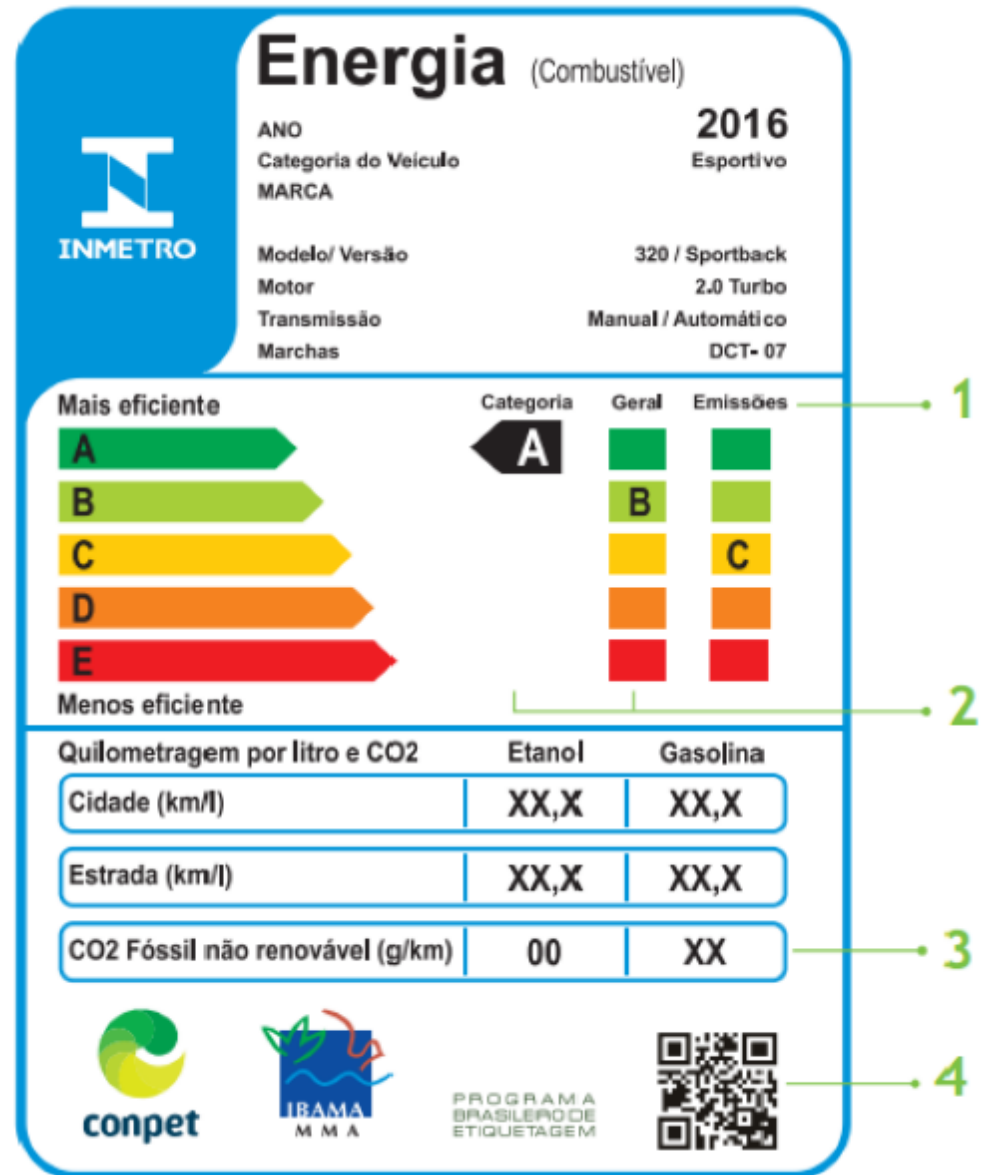
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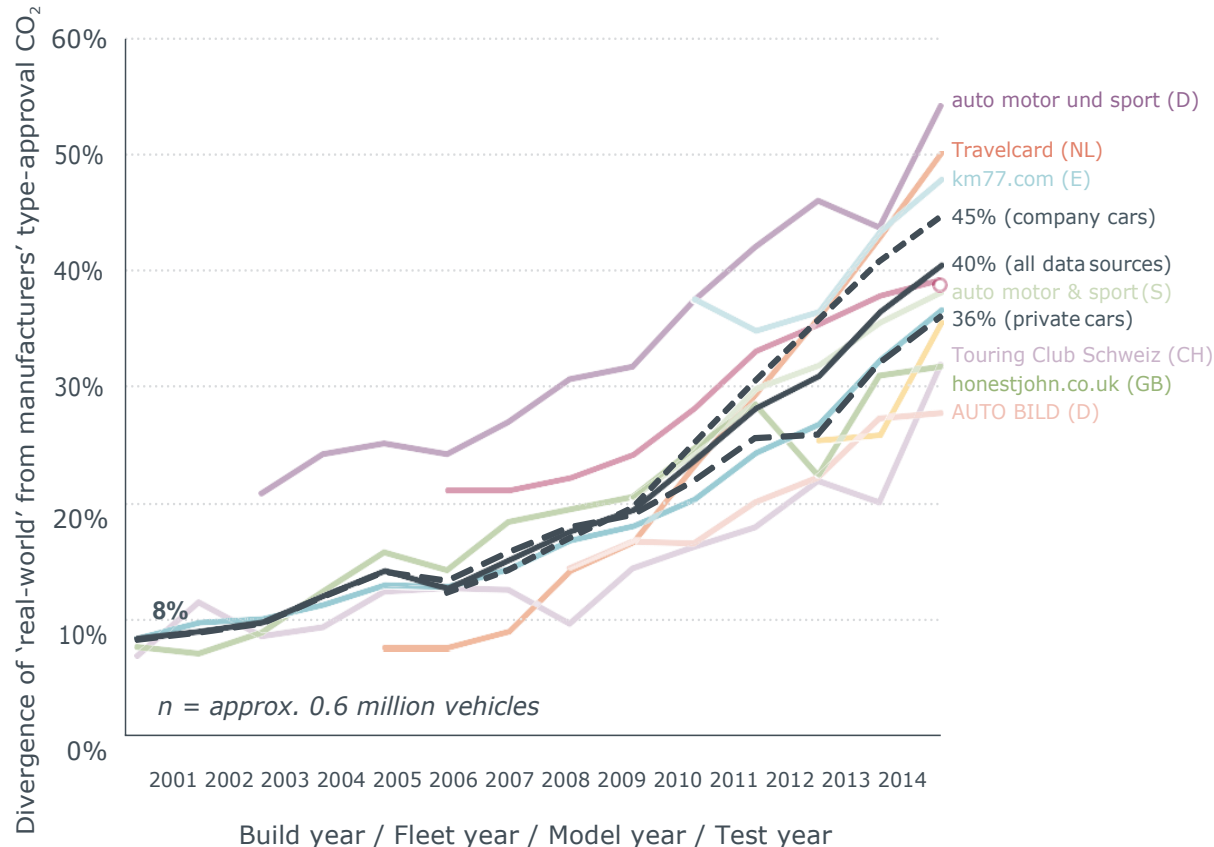
21 – 22 AUG 2018

VEHICLE ENERGY EFFICIENCY:

The Brazilian Program for Vehicle Labeling - PBEV



LABORATORY MEASUREMENT AND REGULAR USE COMPARATION



Divergence between normal use and laboratory values in Europe (source: ICCT, 2015)

USE OF CORRECTION FACTORS OR USE OF THE 5 CYCLES METHOD

CORRECTION FACTORS

City

Highway

$$Cr_{(km/l)} = \frac{1}{0,0076712 + \frac{1,18053}{Ct_{(km/l)}}}$$

$$Cr_{(km/l)} = \frac{1}{0,0032389 + \frac{1,3466}{Ct_{(km/l)}}}$$

5 CYCLES METHOD

FTP-75

HFET

SFTP-US06

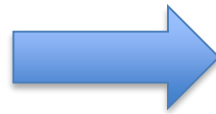
SFTP-US03

FTP75 Cold

CONVENTIONAL VEHICLE X HYBRID VEHICLE



ICE ONLY VEHICLE



HYBRID VEHICLE
**30% - 50% MORE
EFFICIENT**

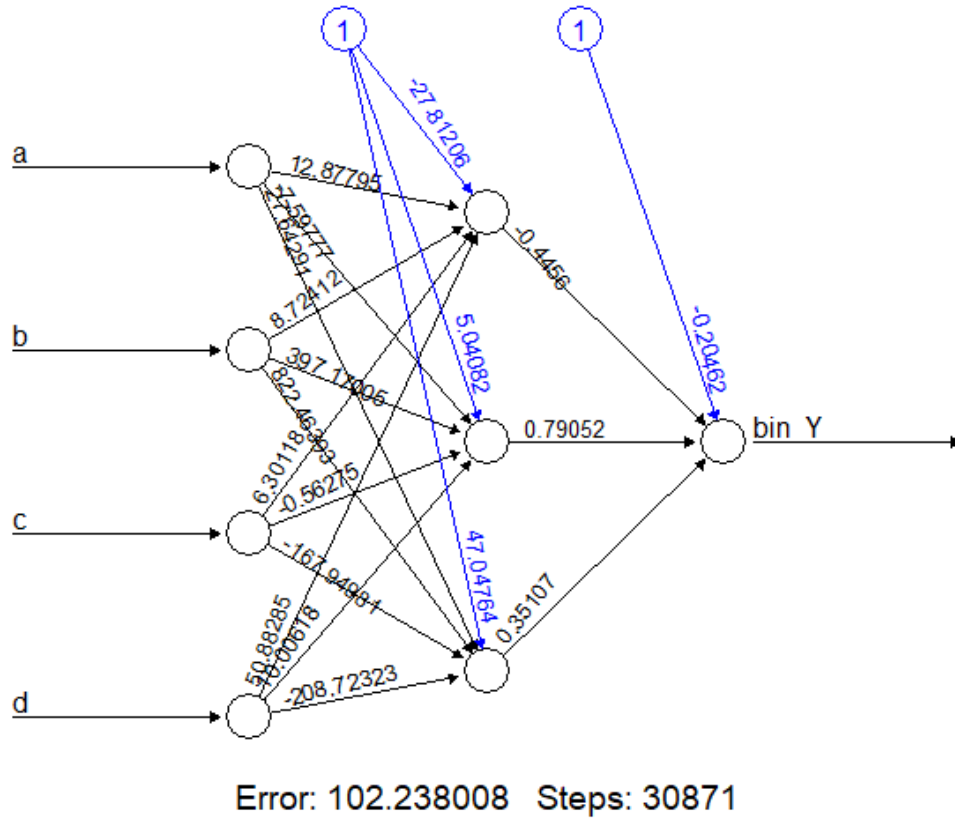
Brazil, hybrid vehicles and CO₂

CORRECTION FACTORS	
City	Highway
$Cr_{(km/l)} = \frac{1}{0,0076712 + \frac{1,18053}{Cr_{(km/l)}}}$	$Cr_{(km/l)} = \frac{1}{0,0032389 + \frac{1,3466}{Cr_{(km/l)}}}$

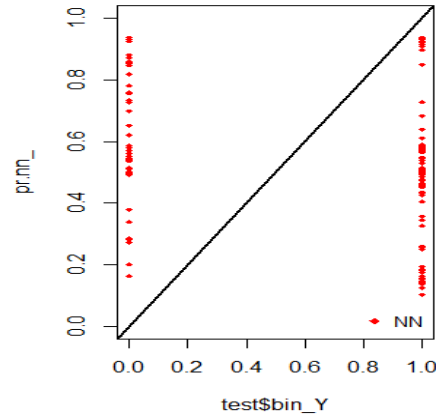
In Brazil by applying the correction factors:

Slightly better fuel economy

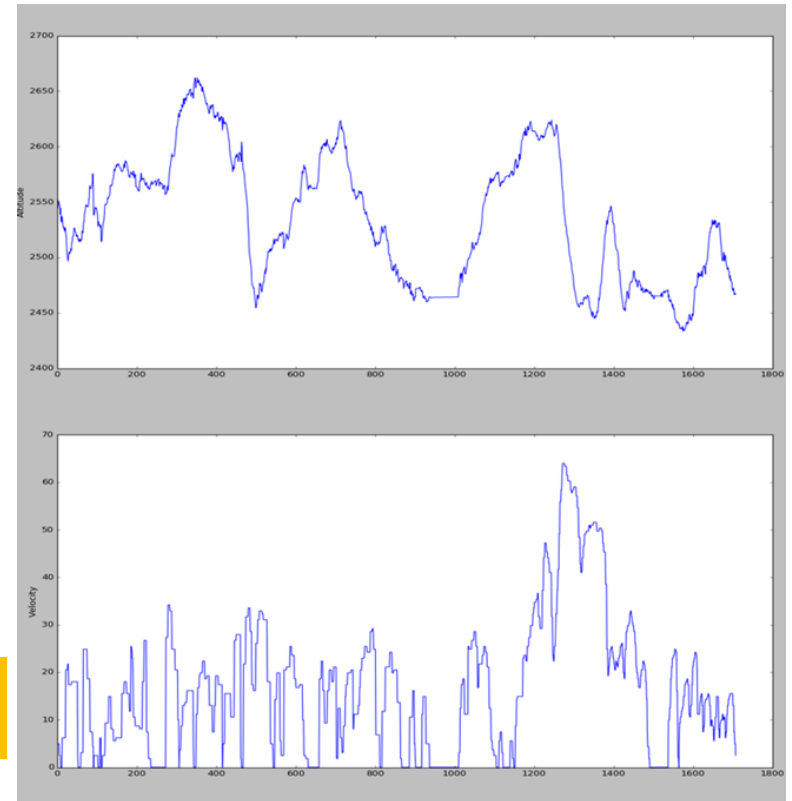
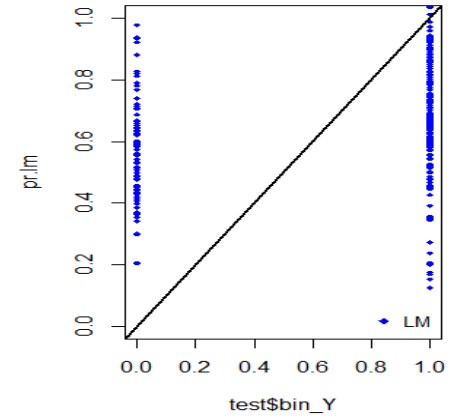
Conceptual design



Real vs predicted nn



Real vs predicted lm



High synergy with Project 8 (Profa. Celma Ribeiro)



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THANK YOU



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