Analysis of fuel economy standard options for new passenger vehicles in Mexico

Fuel economy/greenhouse gas emissions standards for passenger vehicles

Technical Meeting

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SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES

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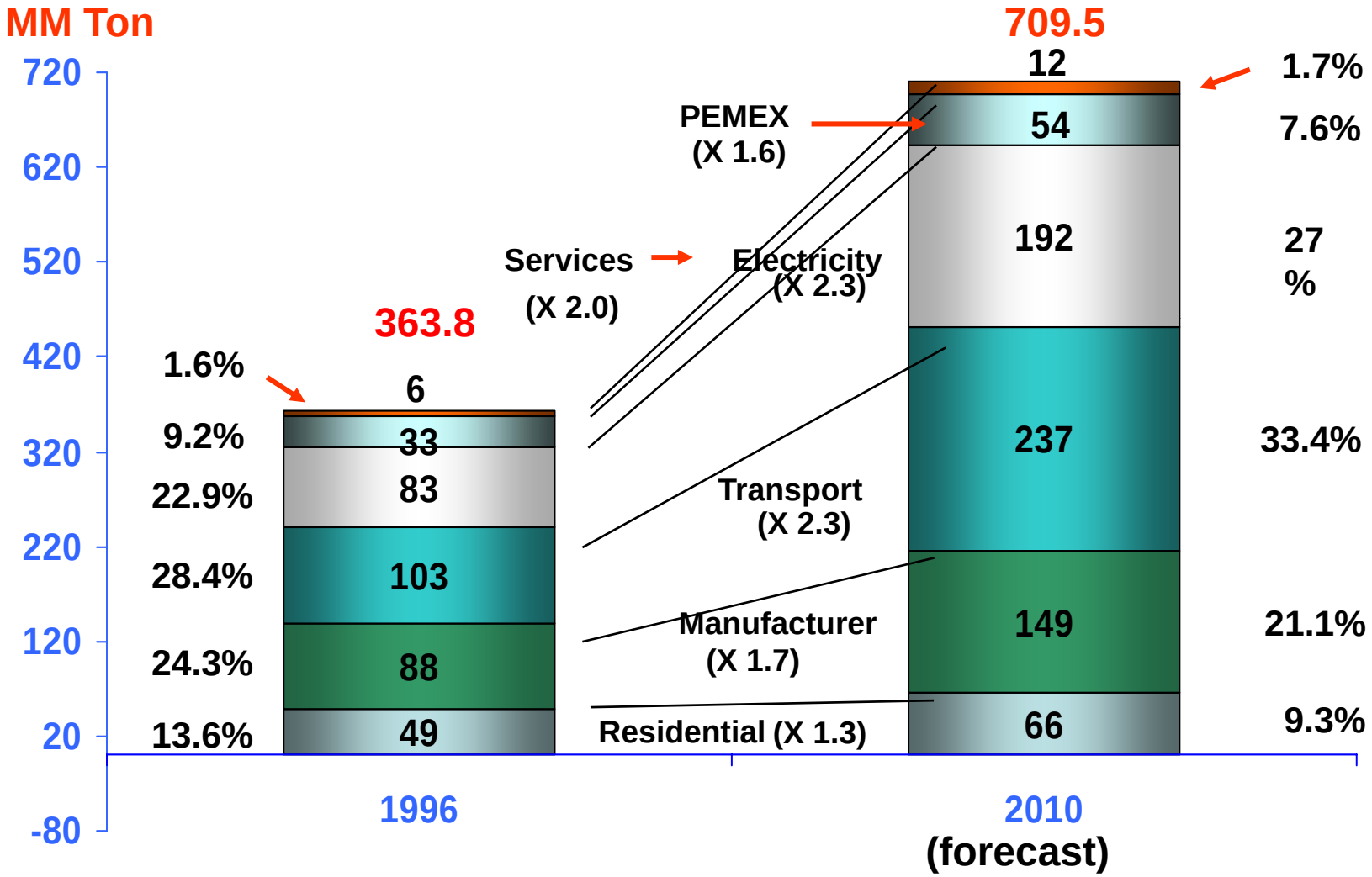
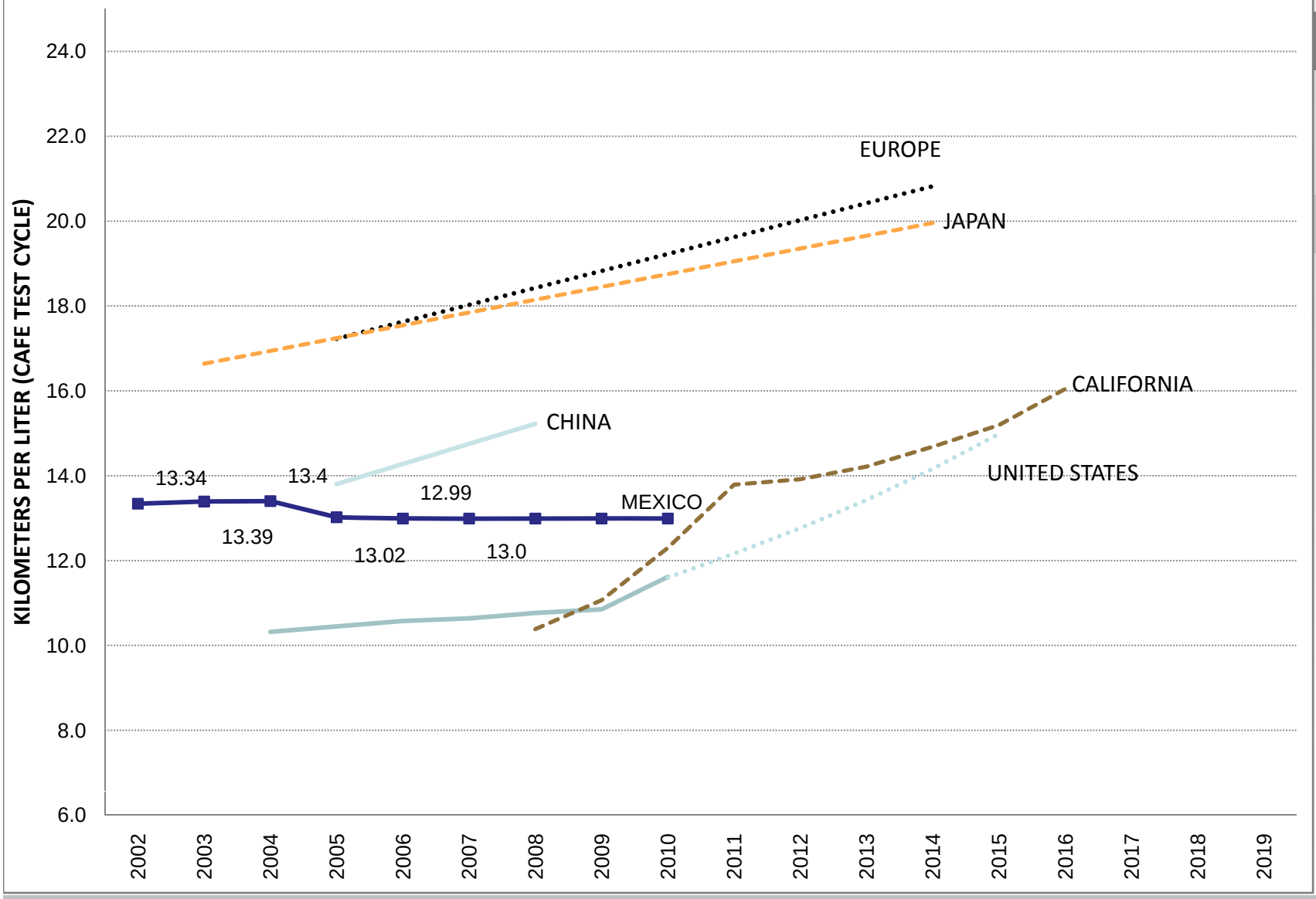
GHG emissions by sector



Source: Mexico's Third National Communication to the United Nations Framework. Convention on Climate Change, Mexico ,2007.

New passenger vehicles fuel economy evolution in Mexico 2002-2008



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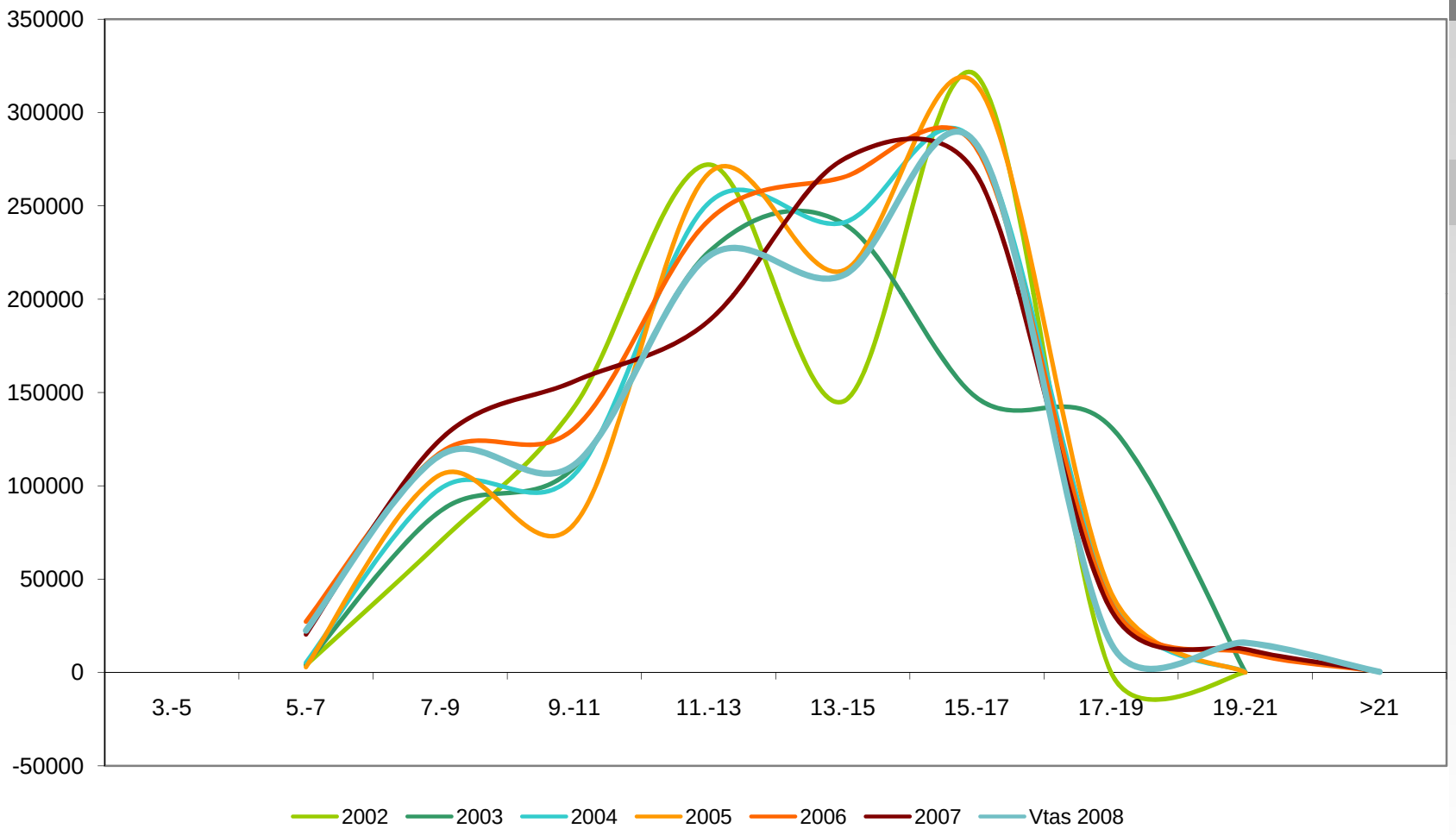
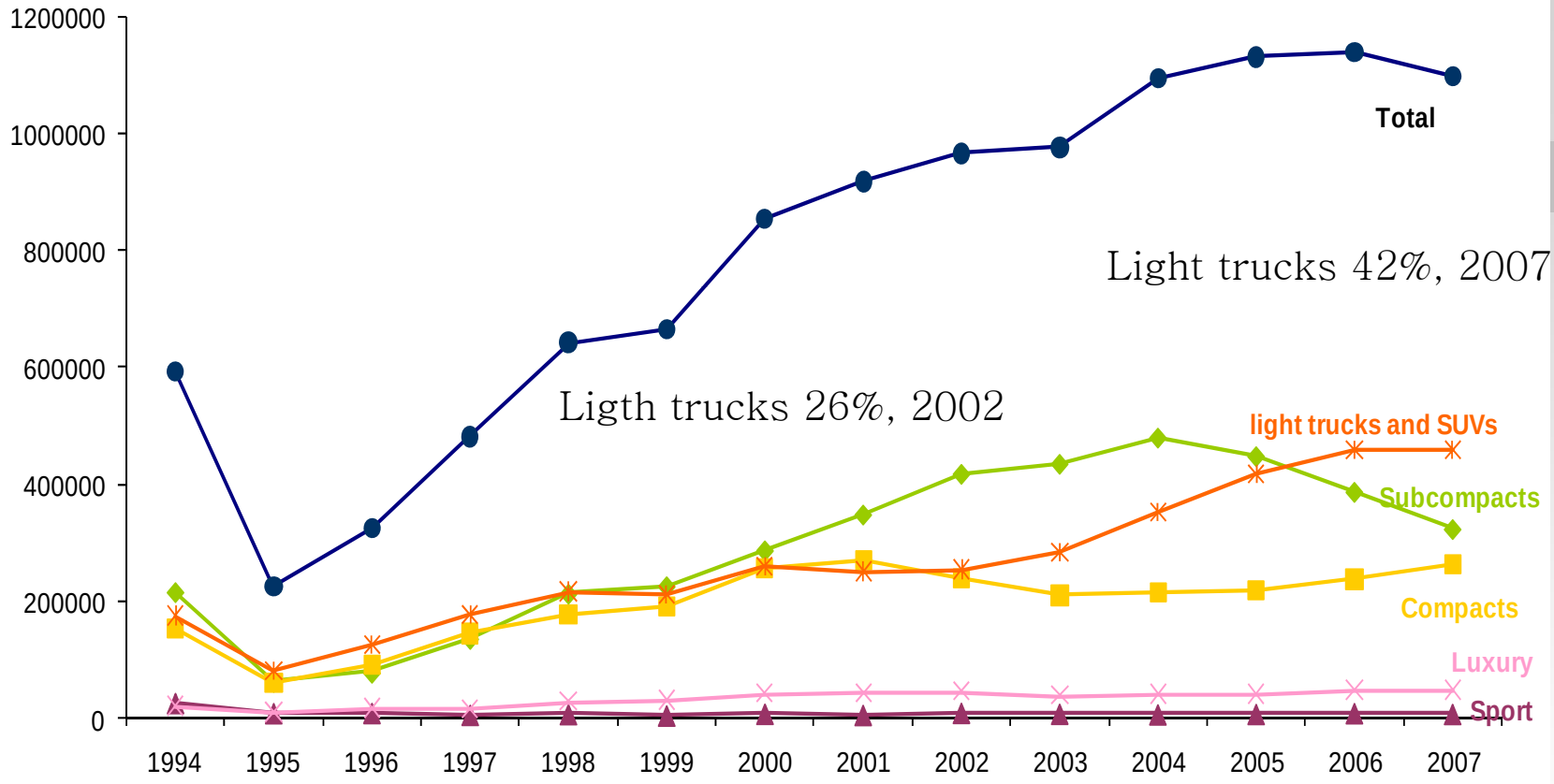
Sales distribution by fuel economy



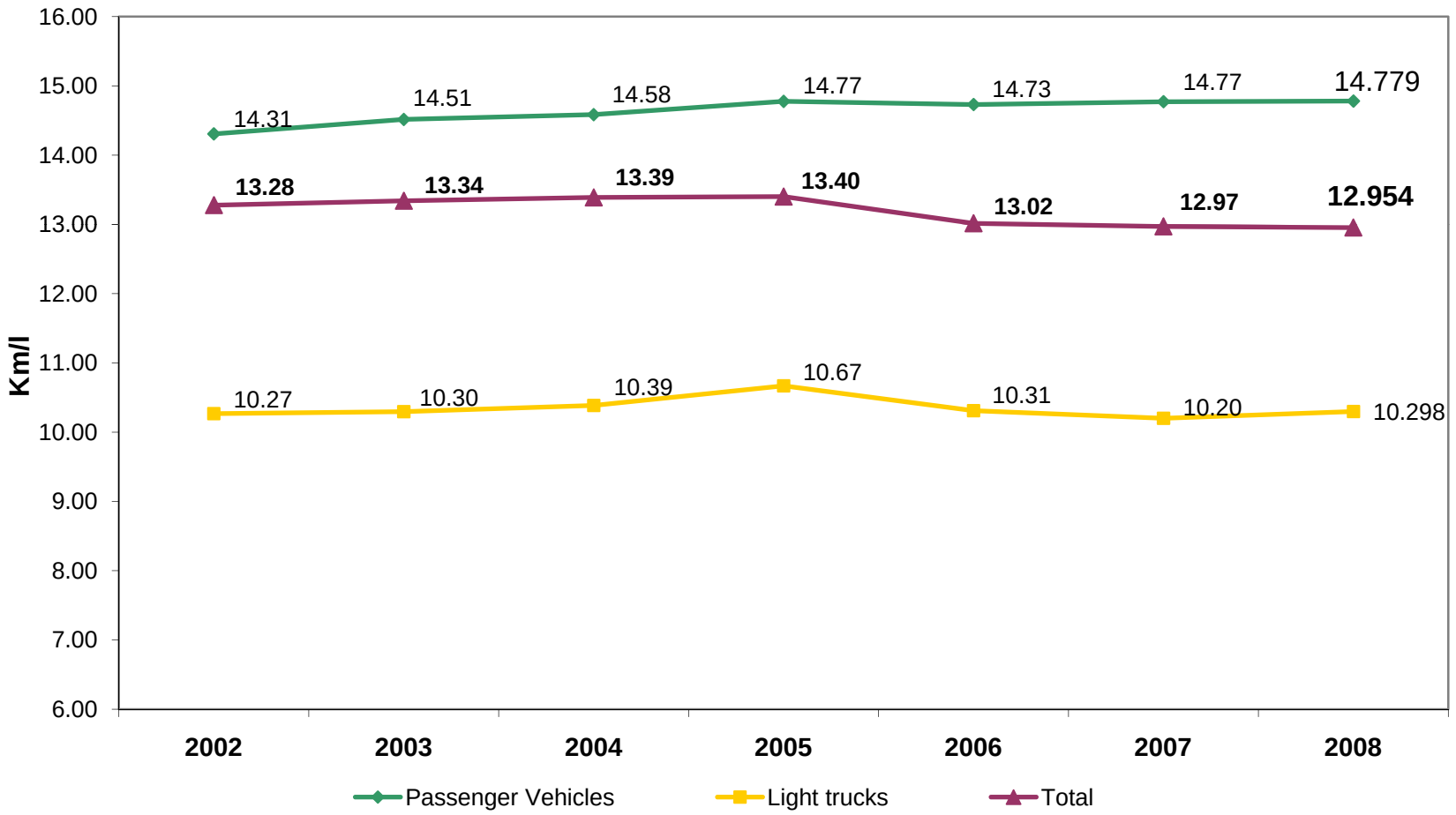
Source: AMIA and CONAE, 2008

Sales by category



Source: AMIA , 2007

Fuel economy evolution by category



Source: AMIA and CONAE, 2008

Analysis

- Different options (both test cycles and by fuel economy and CO2 emissions)

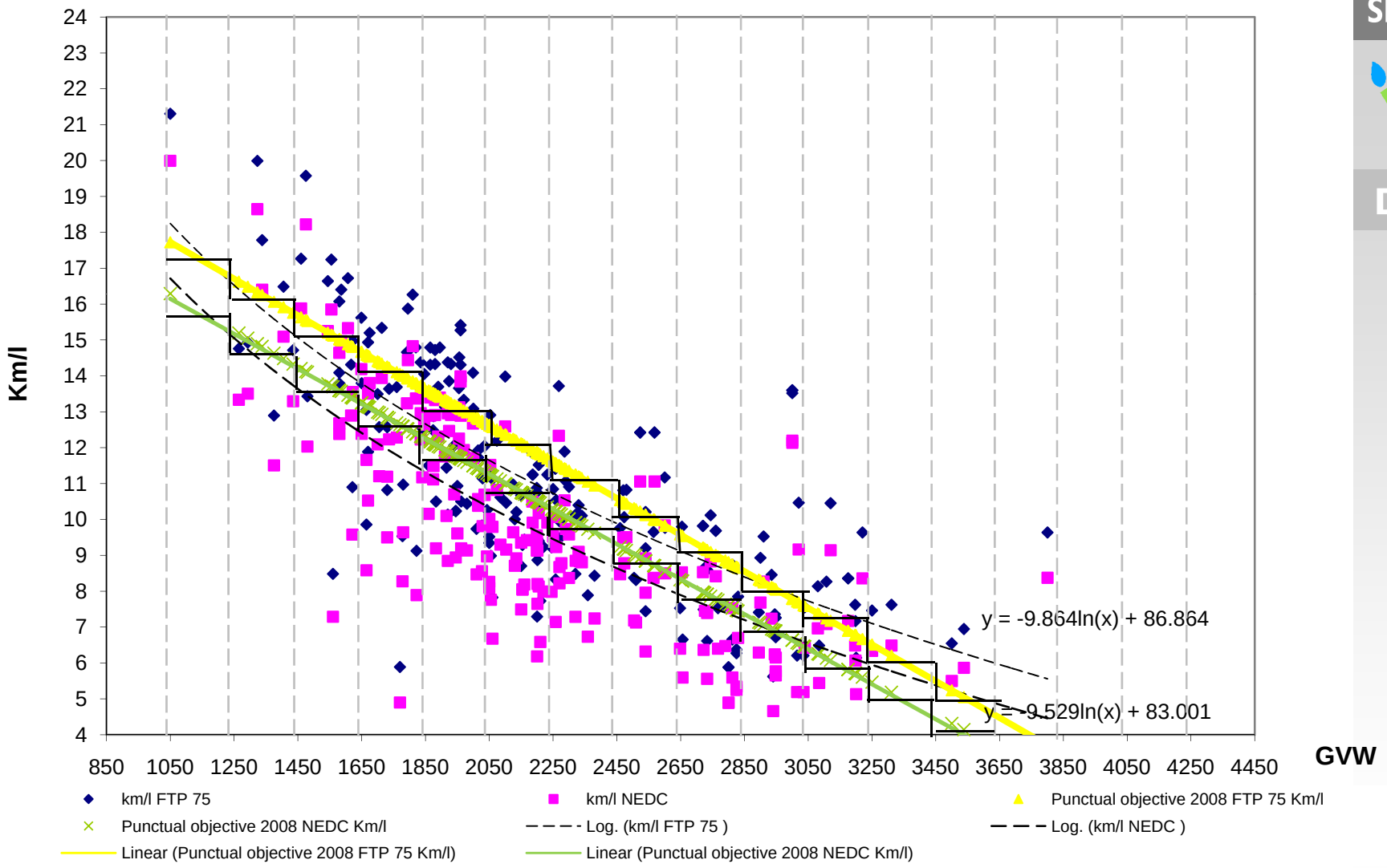
Attribute based:

- By weight bins
- By “One car one target” based on weight
- Footprint

Non Attribute:

- Flat

Fuel Economy for different schemes and cicles



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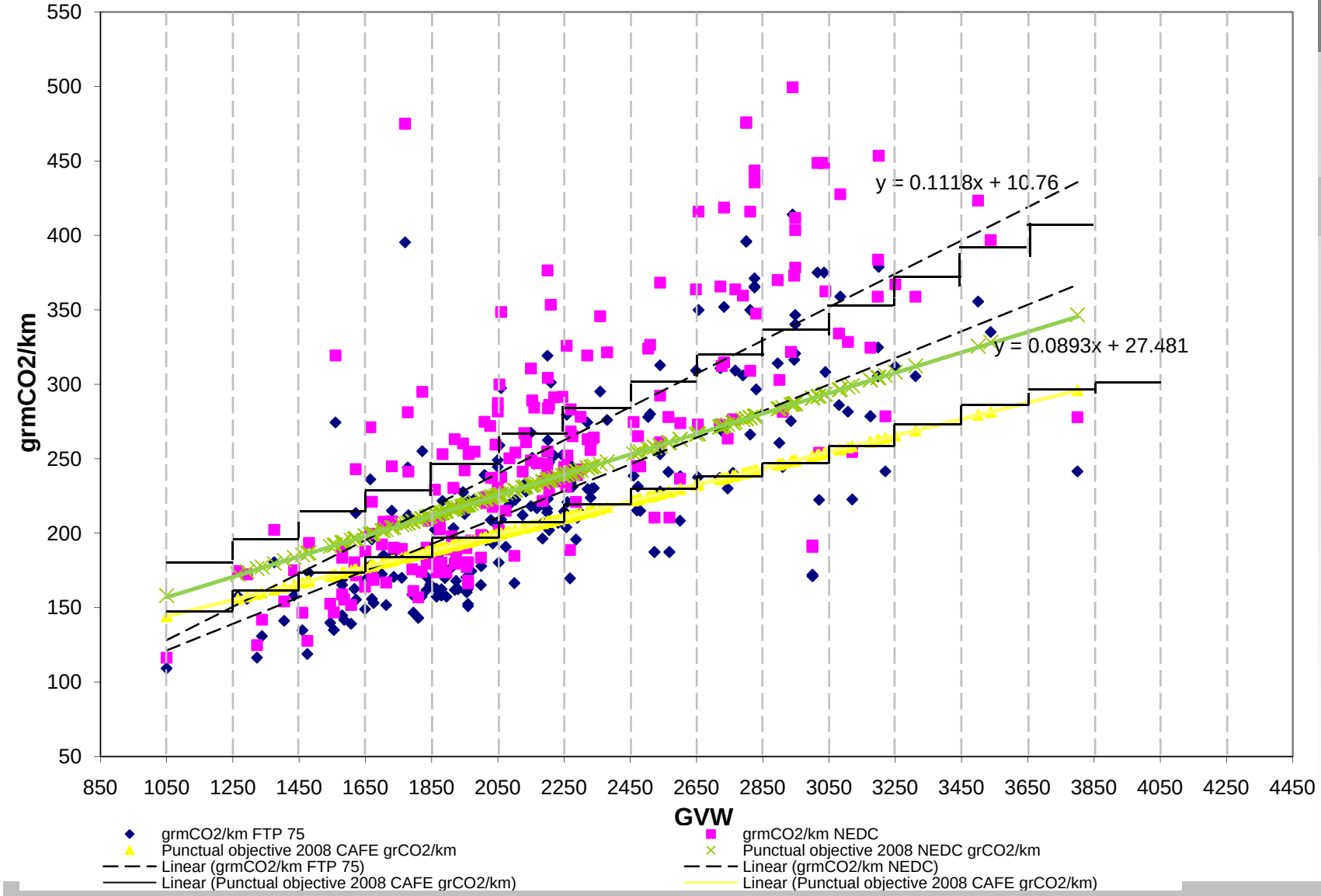
CO2 emissions for different schemes and cicles



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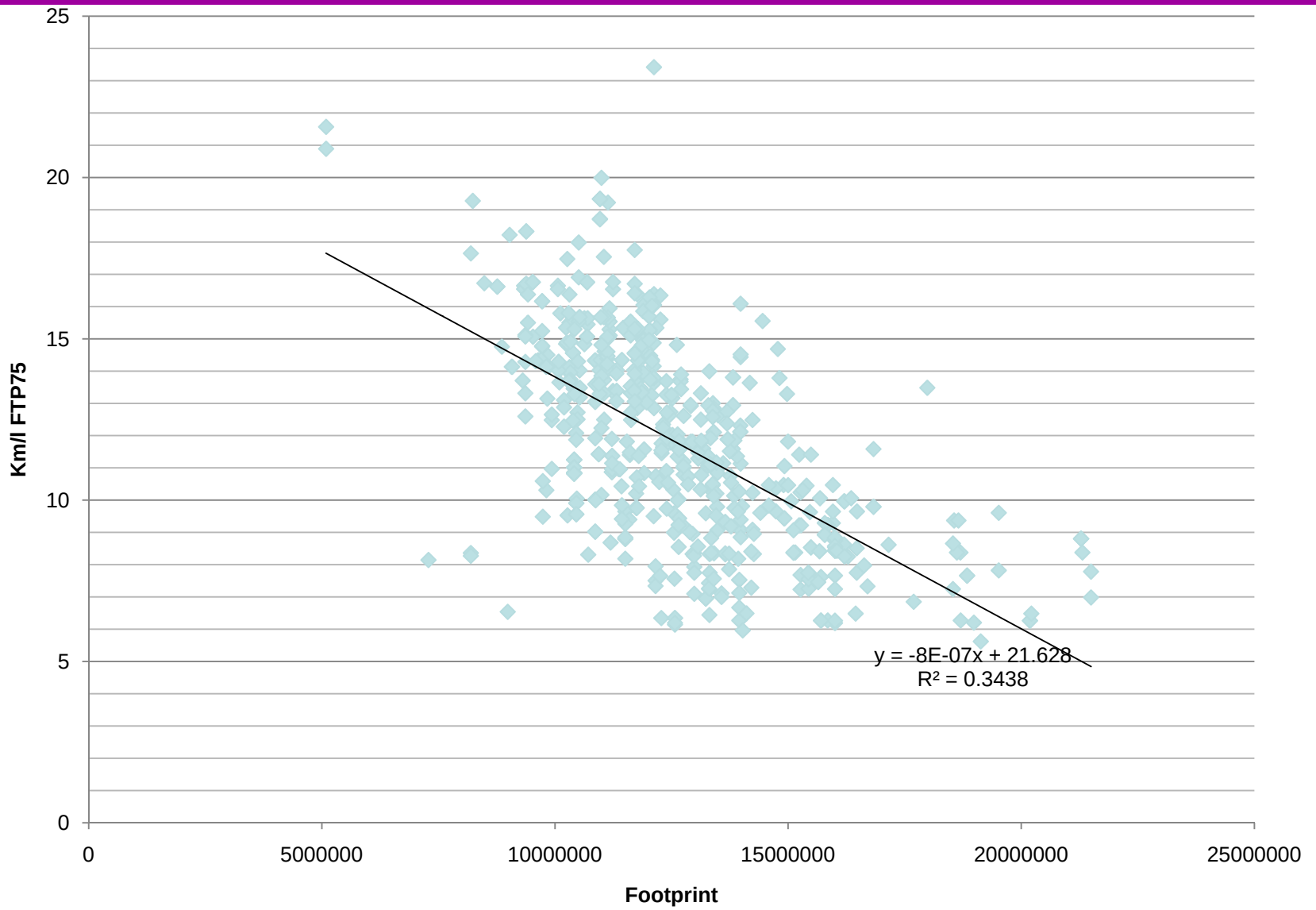
Footprint



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Some results

	Simples Average		Weighted average		Corporate average	
	km/l	grmCO2/km	km/l	grmCO2/km	km/l	grmCO2/km
DAIMLERCHRYSLER	-0.74	22.13	0.84	1.38	-1.52	27.78
FORD	-1.11	27.06	-0.14	19.21	-2.30	37.70
GM	0.70	-6.64	0.86	-8.30	0.58	-8.23
NISSAN	0.39	-0.63	0.96	-0.94	1.63	-23.96
VOLKSWAGEN	-0.51	12.15	0.07	7.65	1.63	-23.96
BMW	-1.19	12.68	-0.75	7.61	-1.42	6.03
FIAT	1.28	-27.15	2.63	-43.72	1.62	-27.87
HONDA	1.04	-12.27	0.74	-15.73	0.42	-11.44
PEUGEOT	0.37	-20.46	0.48	-21.99	1.10	-24.35
RENAULT	1.25	-30.74	1.57	-33.46	2.73	-39.83
SUBARU	-1.09	5.12	-0.78	4.86	-2.26	24.96
SUZUKI	-0.09	-5.44	1.47	-27.85	0.93	-17.60
TOYOTA	-0.54	24.24	-0.24	6.72	-1.24	21.55

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Some conclusions

- The slopes are different for each test cycle
- For CO2 emissions NEDC seems to be less stringent for heavier vehicles
- Using averages instead of targets by model only help some manufacturers to comply
- If we are using attributes, compensation between models and traders might have a larger impact lowering compliance costs (Cap&Trade)

INE's Standard Proposal

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- Target: to achieve 18 km/l corporate average fuel economy for the new light duty vehicle fleet in 2015 (equivalent 130grCO2/km*)

Policy to:

- Mitigate Green House Emissions
- Curve fossils fuels comsumption
  - To cut fossil fuels subsidies (1.87% of the GDP, 2008)
  - To diminish fossil fuels imports (44% of the total consumption in 2008)

*Emision Factor= 2325 grCO2/lt, ICCT, 2007

Standard Characteristics

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- A non attribute flat standard using combined fuel economy (average weighted by sales) of the total new light duty vehicle fleet
  - Gasoline only (ULS diesel is not yet available in Mexico)
  - Avoiding incentives to increase weight
  - As similar as possible with the rest of Northamerica
  - Scheme by traders (not manufacturers)
  - As flexible as possible allowing changes in fleet composition, technological change and allowing a market to compensate between traders

Schedule

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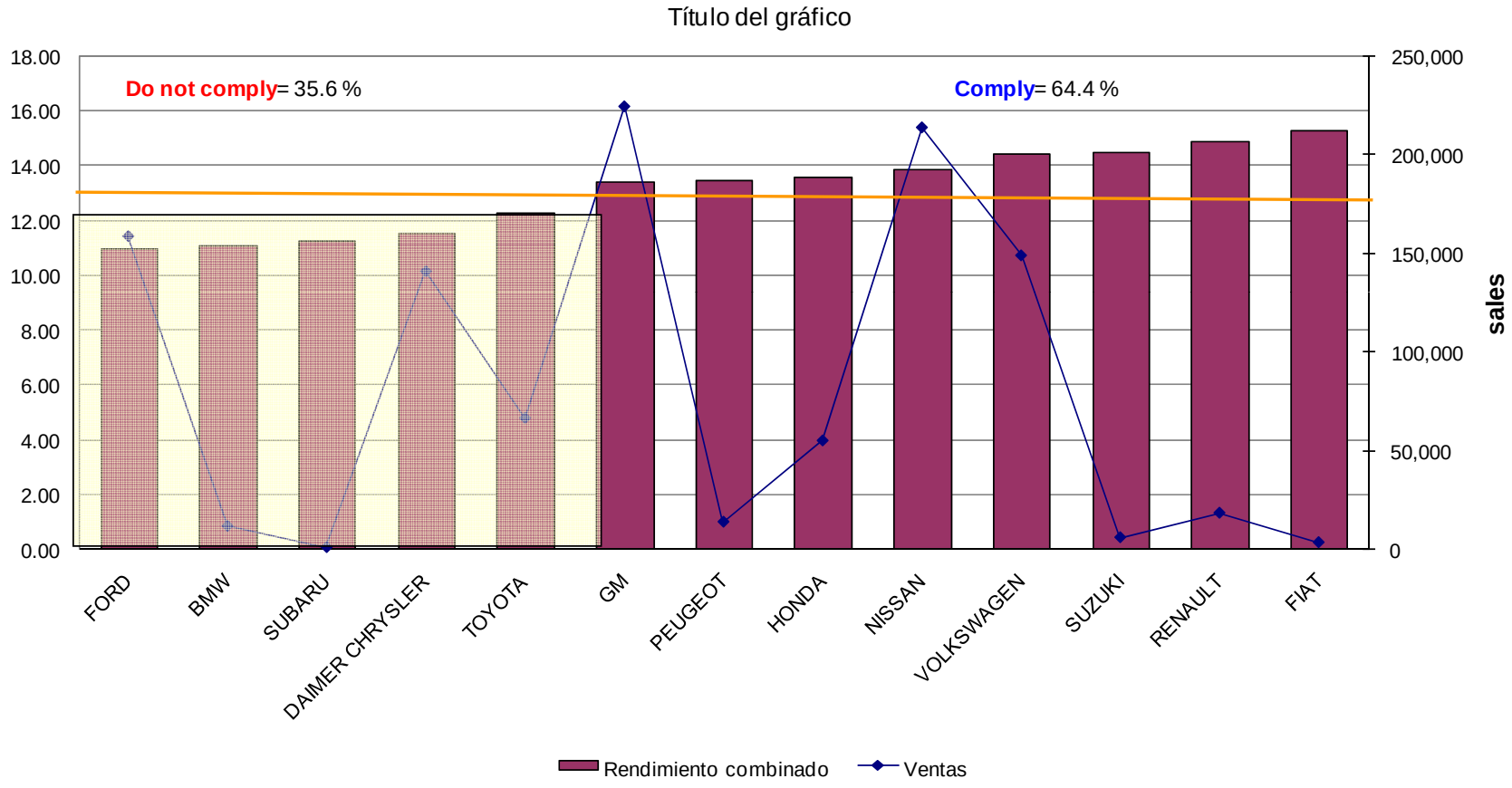
Year	Fuel economy standard	Fuel economy increases (km/l)	CO2 emissions (grCO2/km)	Rate
2010	12.97		179.26	
2011	13.97	1 Km/l	166.43	7.71 %
2012	14.97	1 Km/l	155.31	7.16 %
2013	15.97	1 Km/l	145.59	6.68 %
2014	16.97	1 Km/l	137.01	6.26 %
2015	18.00	1.03 Km/l	129.17	6.07 %

Current fuel economy situation by traders in 2007



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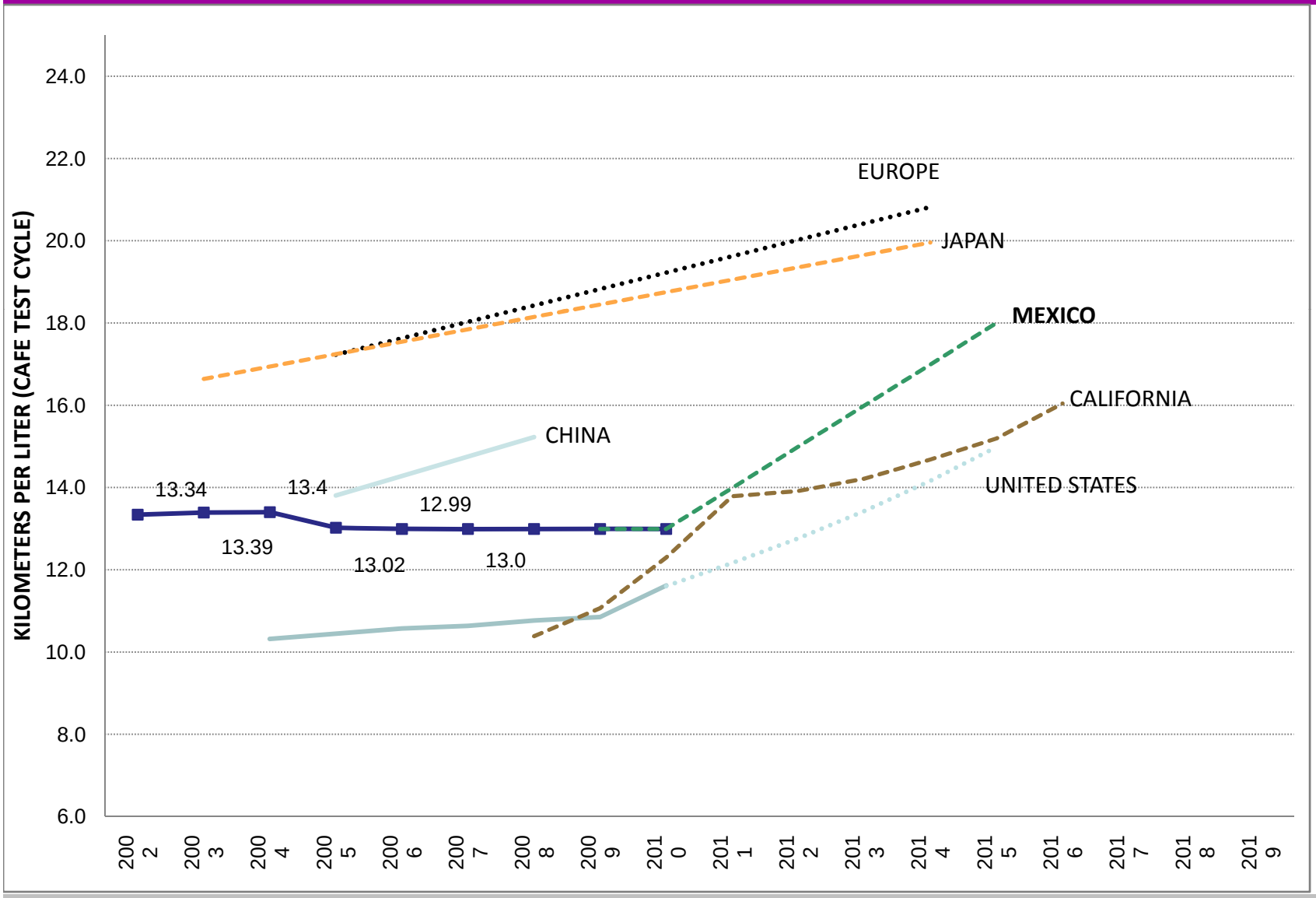
Actual and projected fuel economy for new passenger vehicles by country/region 2002-2016



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Methodology

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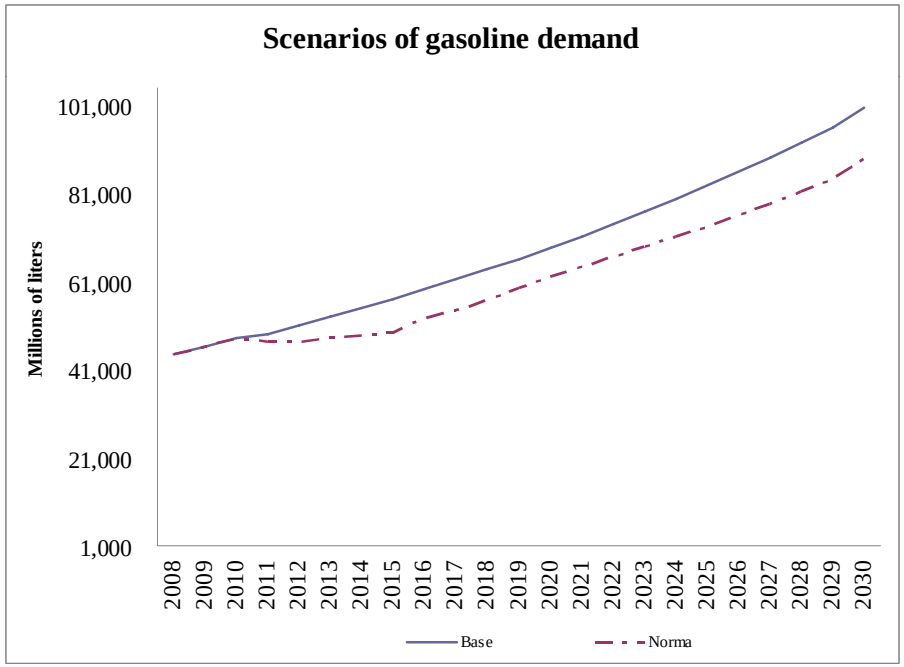
Econometric model of Autoregressive Vectors*
(Johansen, 1988) for gasoline demand estimation

$$gas_t = 1.13\,Y_t - 0.14\,PRG_t - 0.15\,PRA_t - 0.16\,EF_t$$

where:

gas	=	Gasoline demand
Y	=	Income (GDP)
PRA	=	Relative price of gasoline
PRG	=	Relative price of vehicles
EF	=	Fuel efficiency

Gasoline demand



Year	Gasoline demanda (millions of liters)		Difference (millions of liters)
	Baseline	Standard	
2008	44431	44431	0
2009	46242	46242	0
2010	48224	48207	17
2011	49097	47432	1665
2012	51023	47186	3837
2013	52864	48103	4762
2014	54894	48665	6229
2015	57036	49363	7673
2016	59157	52661	6496
2017	61427	54518	6910
2018	63795	56757	7038
2019	66207	59647	6560
2020	68703	62072	6631
2021	71289	64362	6926
2022	73991	66562	7429
2023	76780	68787	7993
2024	79689	71074	8615
2025	82715	73491	9224
2026	85824	76033	9791
2027	89040	78677	10363
2028	92450	81466	10984
2029	95960	84377	11582
2030	100447	88735	11712

FE/CO2 Standard Benefits

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	Millions of CO2 savings
Annual average emission savings 2011-2015	4.24
Emission savings in 2015	6.66
Acumulated emission savings 2011-2015	21.19