

Transport Sector in Brazil

Carlos Feu Alvim – Economy & Energy – e&e

**New Energy Indicators for Transport:
The Way Forward**
Paris - January 28 and 29, 2008

Transport Sector and GHG Emissions in Brazil

- Transport Sector and GHG Emissions
 - New Cars Sales by Mode
 - Energy Prices and Vehicles Market
 - New Car Sales by Fuel
 - Vehicle Fleet by Mode and Fuel
 - Use of Natural Gas and Biodiesel
 - GHG Emissions in Transport
 - Motorcycles Sales and Fleet
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Transport Sector in Brazil :

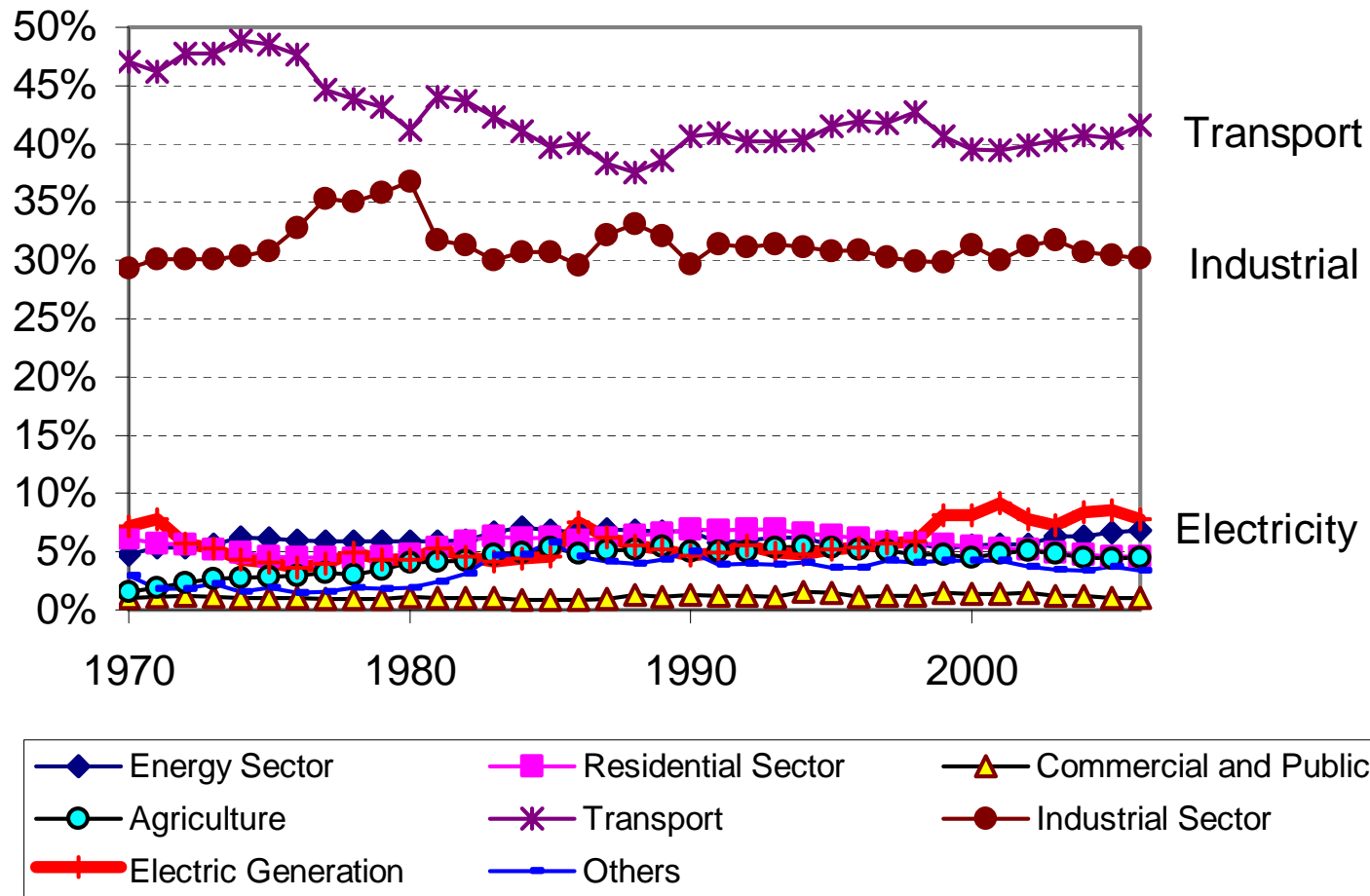
Transport in Brazil and GHG Emissions

- Transport is responsible for 24% of global GHG emissions from fossil fuels
- Transport accounts for 42% of carbon emissions from energy use
- In 1994 only 23% of CO₂ emissions were due to energy activities according to the first Brazilian GHG Inventory
- Emissions due to fossil energy use is not yet predominant in Brazil but its share is increasing



Transport Sector in Brazil

GHG Emissions from Energy Uses



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Transport Sector in Brazil :

New Vehicles Market by Mode – 2007

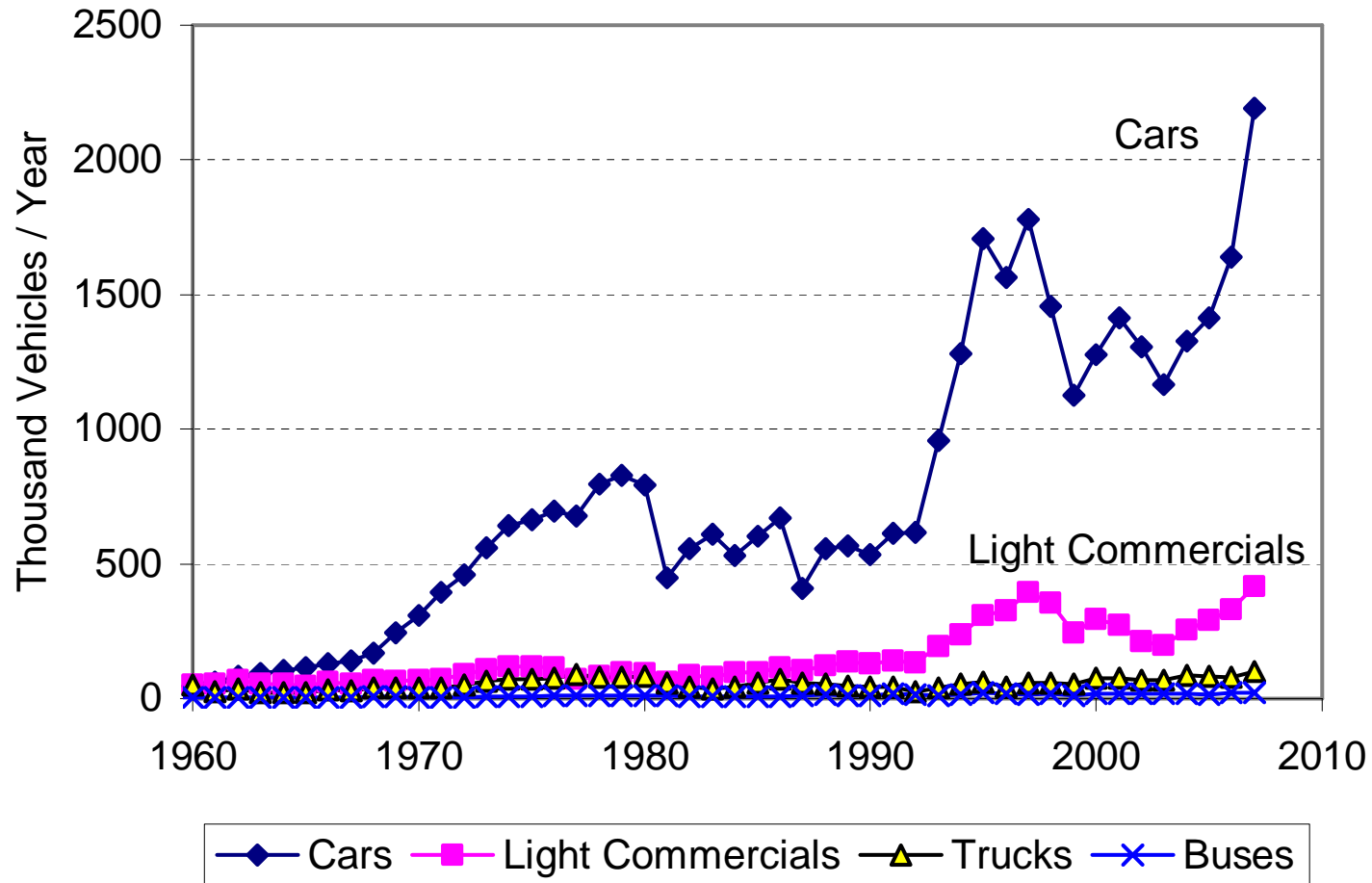
Thousand Vehicles/Year

	Produced	Exported	Imported Registered	National Registered	Stock Changes
Passenger cars	2389	586	176	1799	180
Light commercials	408	144	88	277	75
Trucks	137	41	3.3	95	4
Buses	39	15	0.046	23	1
Total	2973	787	268	2195	259



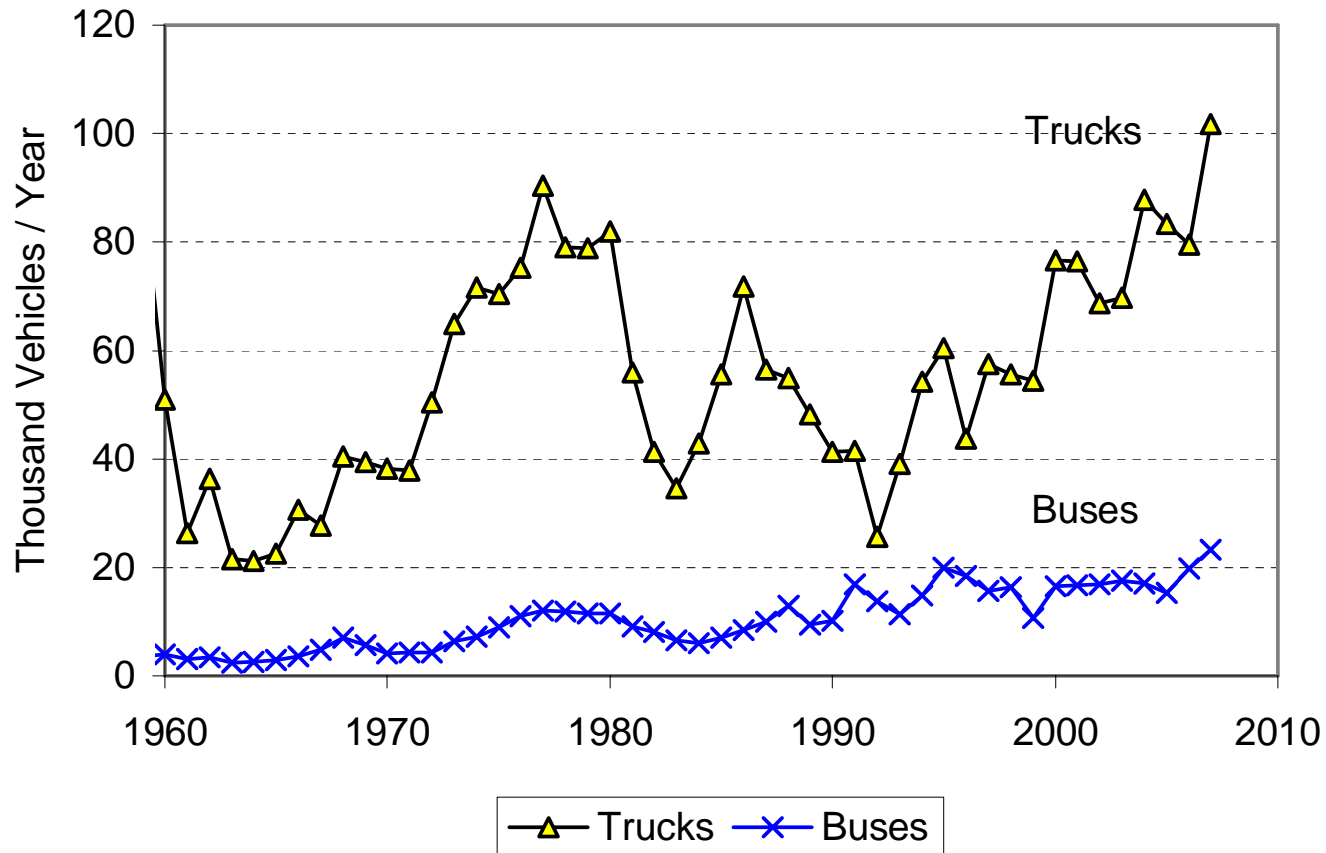
Transport Sector in Brazil

Sales (New Car Registration) by Mode



Transport Sector in Brazil

New Car Registration – Heavy Vehicles



Transport Sector in Brazil :

Share 1000 cc Engines in Registration of New Cars – Year 2007

Thousand Vehicles/Year

TOTAL		2973
Light vehicles		2797
Passenger cars		2389
Light commercials	GVW < 3.5 ton	408
Trucks		137
Semi-light	GVW > 3.5 t < 6 t	6
Light	GVW > 6 t < 10 t	27
Medium	GVW > 10 t < 15 t	14
Semi-heavy	GVW > 15 t	43
Heavy	GVW > 15 t	47
	GCW > 45 t	0
Buses(Chassis)		39
Coach		7
City bus		31

GVW (gross vehicle weight)

GCW (Gross Combined Weight)

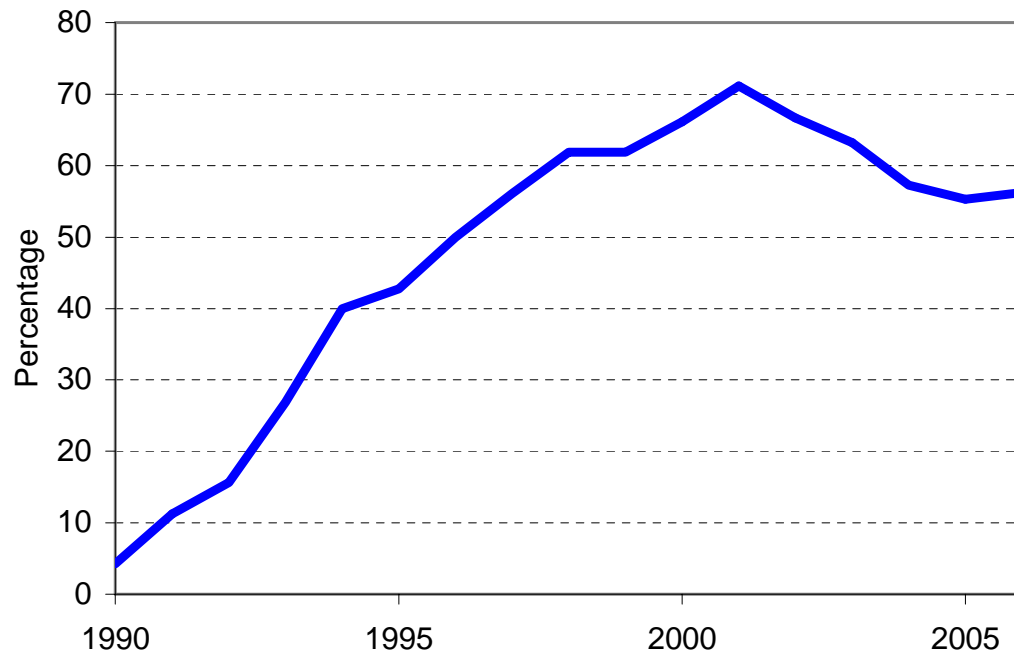


Transport Sector in Brazil :

Share 1000 cc Engines in Registration of New Cars – Year 2007

and 1000 cc Share in Sales

Share 1000 cc Engines in Registration of New Cars



Thousand Vehicles/Year

Car Sales in 2007		
1000 cc	1067	54%
<1000 cc >= 2000 cc	882	45%
>2000 cc	27	1%

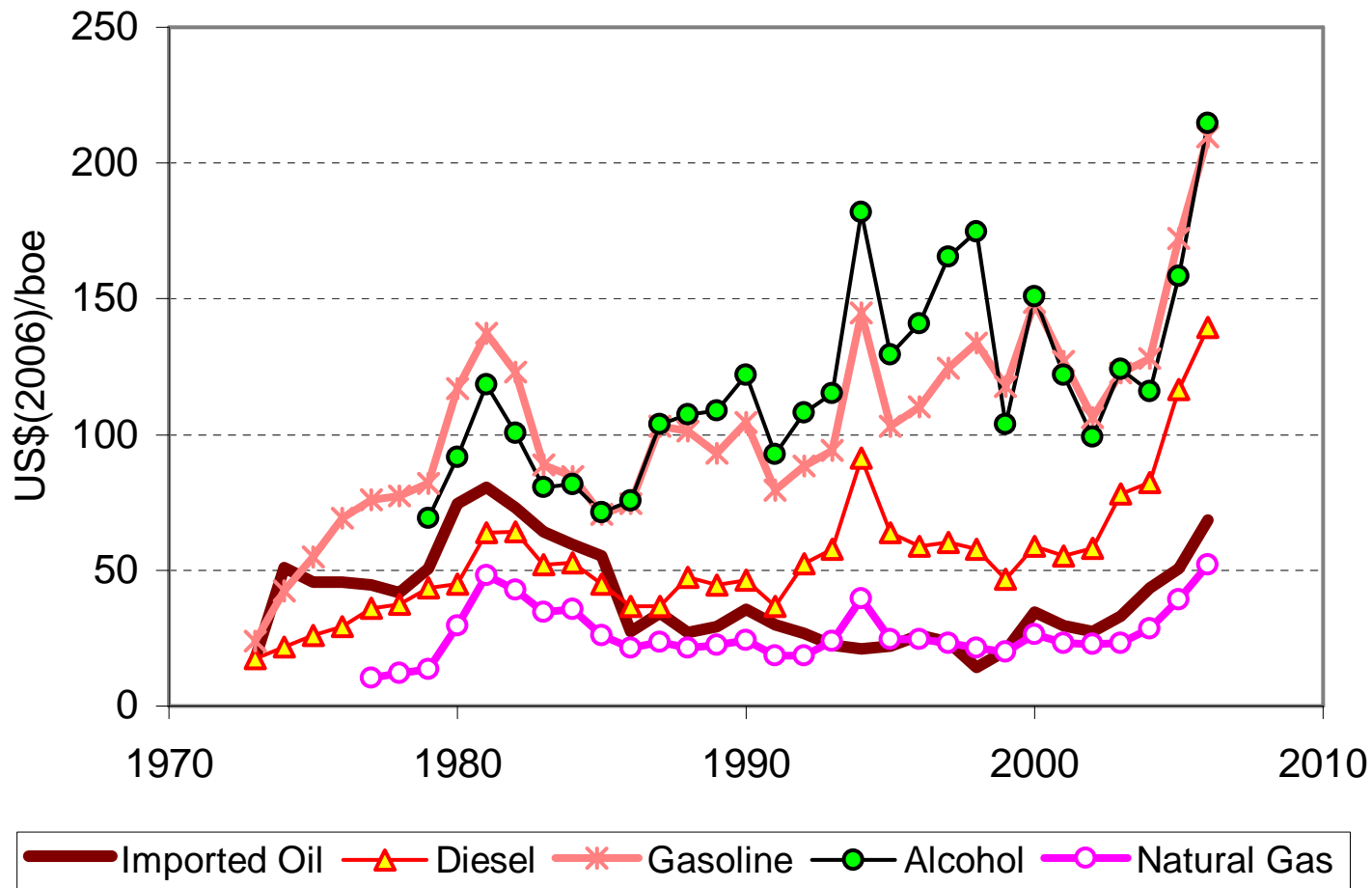


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Transport Sector in Brazil : Domestic Fuel Prices



Transport Sector in Brazil :

Changes Affecting Fuel Consumption and Vehicles Carbon Emissions

- After First Oil Price Shock (1973)
 - Change in domestic relative price gasoline/diesel
 - Anhydrous alcohol in gasoline mixture
- After Second Oil Price Shock (1979)
 - Pure Alcohol Vehicles
 - Sale of Pure Alcohol Vehicles almost zero
- After Third Oil Price Shock and GHG Increased Concerns
 - Flex Fuel (gasoline/alcohol)
 - Compressed Natural Gas
 - Biodiesel



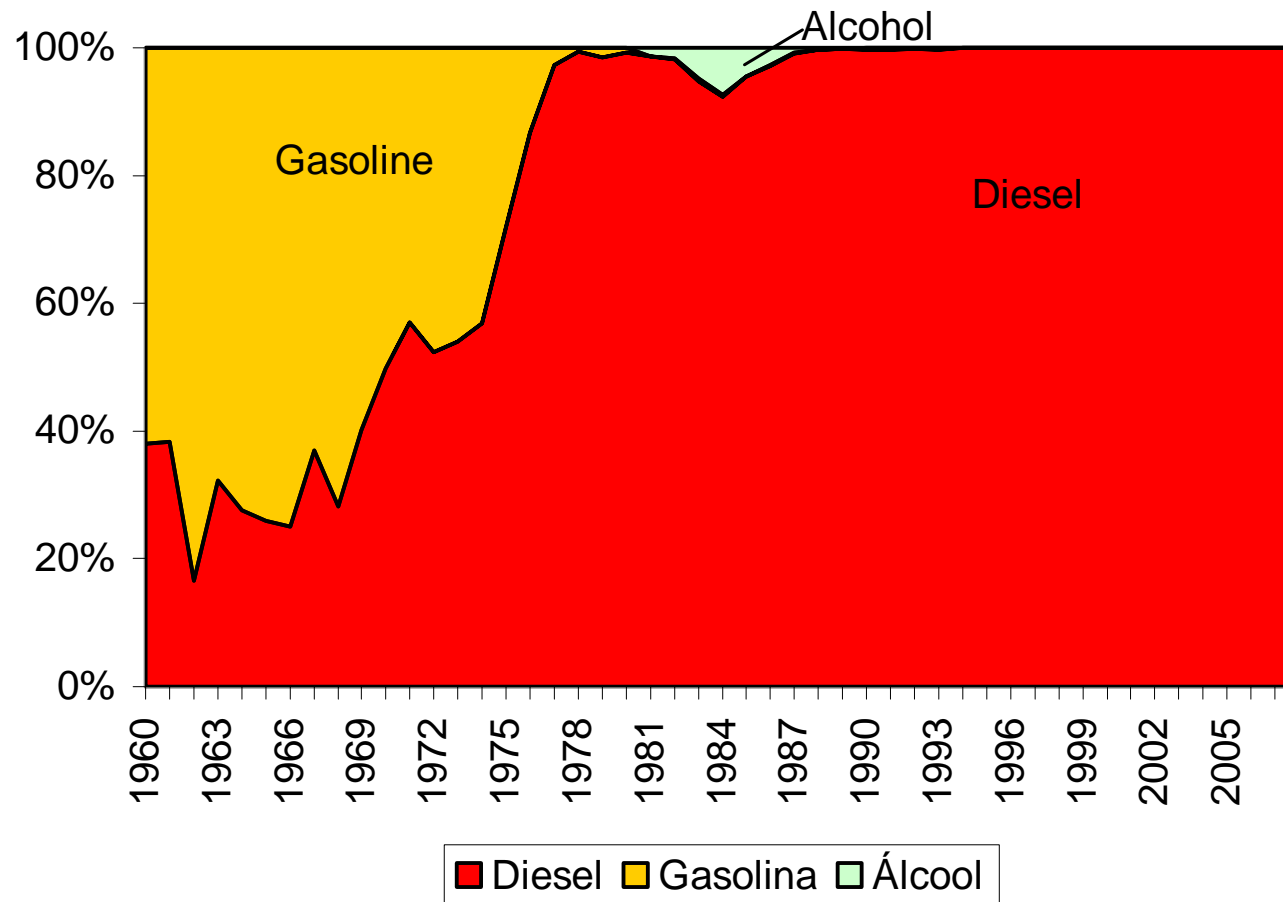
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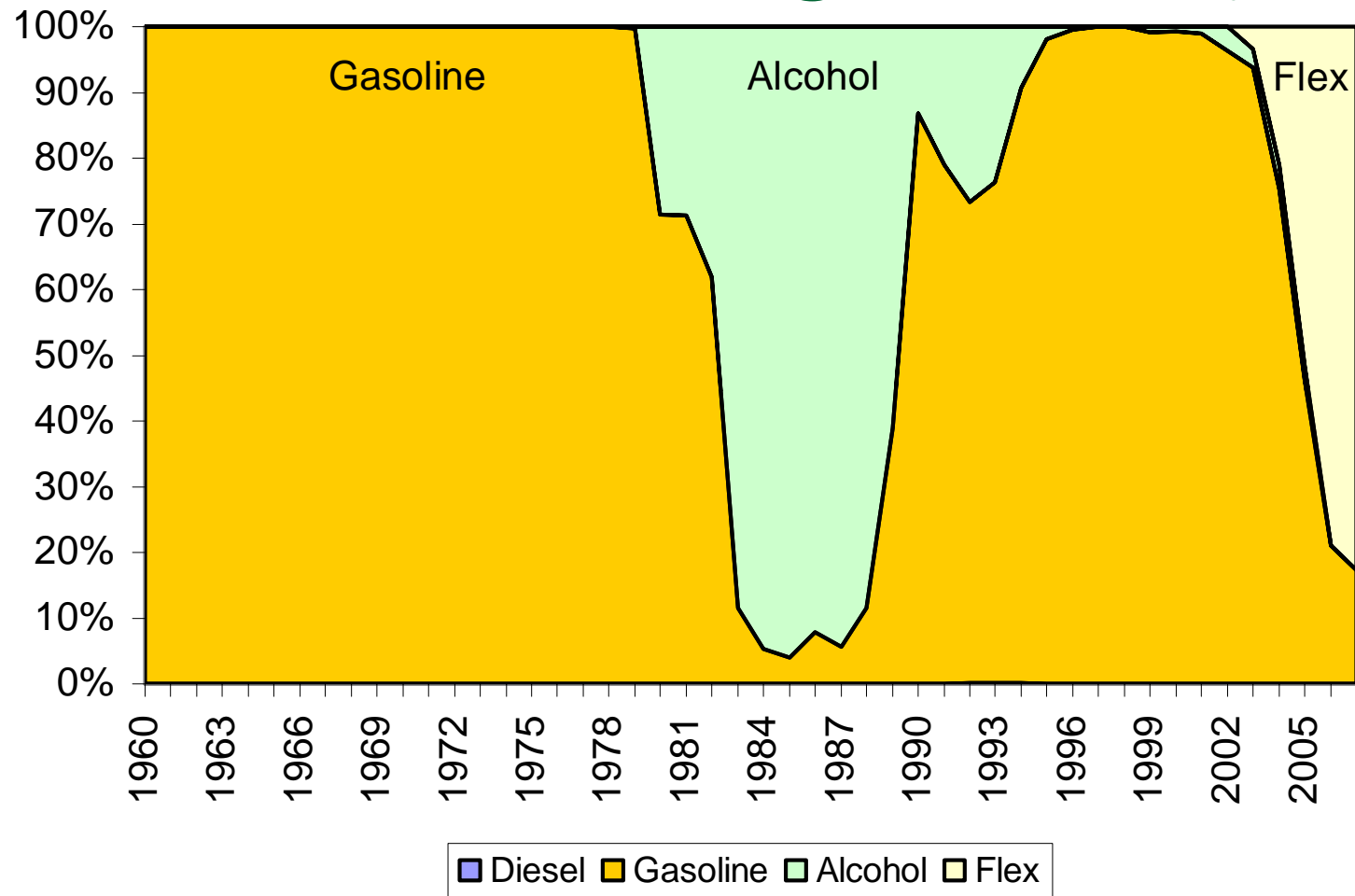
Transport Sector in Brazil :

Share of New Trucks Registration by Fuel



Transport Sector in Brazil :

Share of New Cars Registration by Fuel



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Transport Sector in Brazil :

Road Transport Fleet – Different Sources

Year 2006	Denatran	e&e		Anfavea	
	Thousand Vehicles	Thousand Vehicles	% Denatran	Thousand Vehicles	% Denatran
Passenger cars	27000	22974	85%	19212	71%
Light commercials	4485	3594	80%	3061	68%
Trucks	2004	1254	63%	1411	70%
Buses	344	281	82%	386	112%
Total	33833	28103	83%	24070	71%



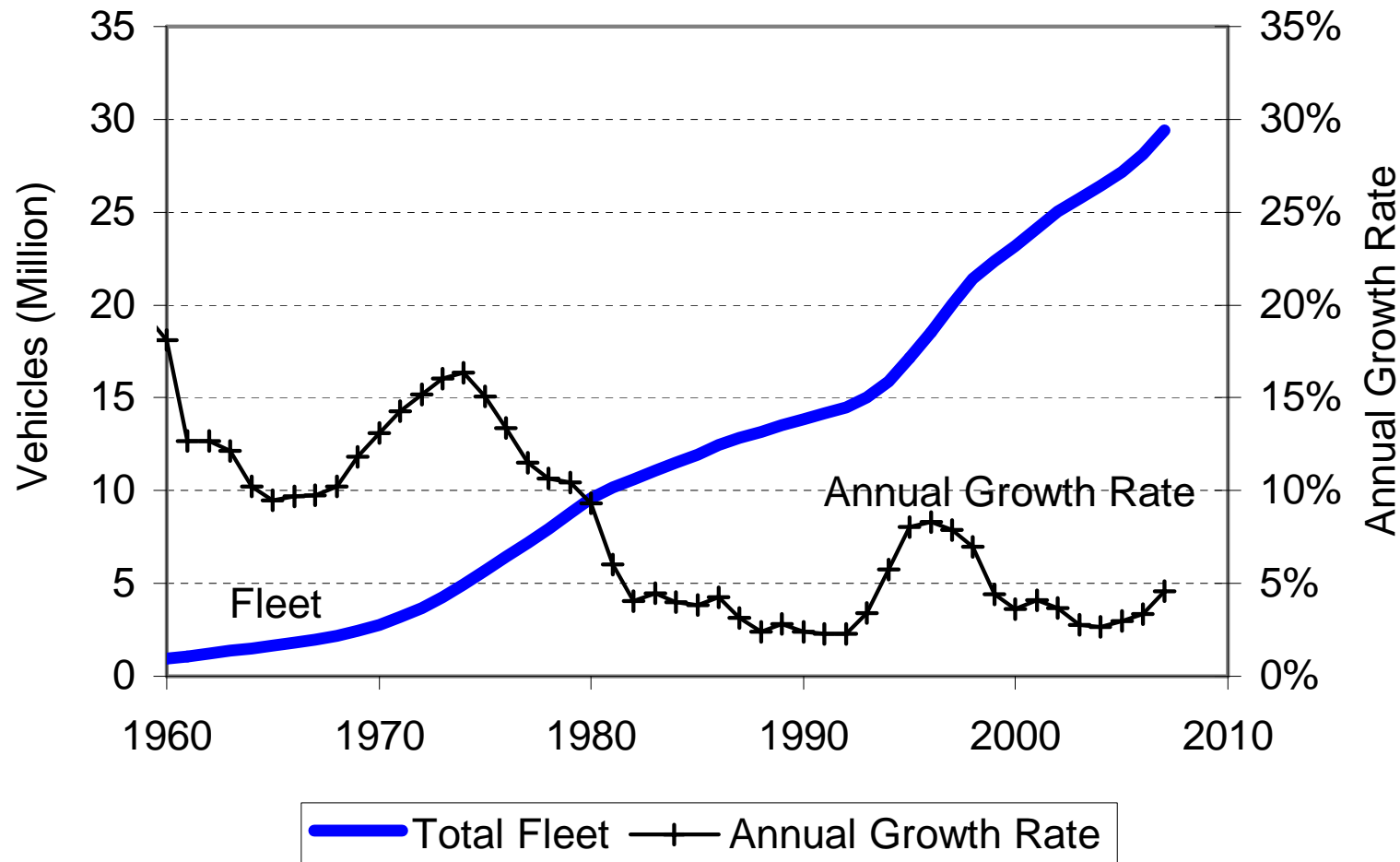
Transport Sector in Brazil :

Comments about Different Fleet Sources

- Denatran – National Road Traffic Department (Official Data) – Inter-states vehicles changes are not well computed
 - Anfavea – National Association of Automotive Industry - Fleet based on annual vehicle registration and calculated annual scrapping,
 - e&e – Same methodology but different scrapping rates
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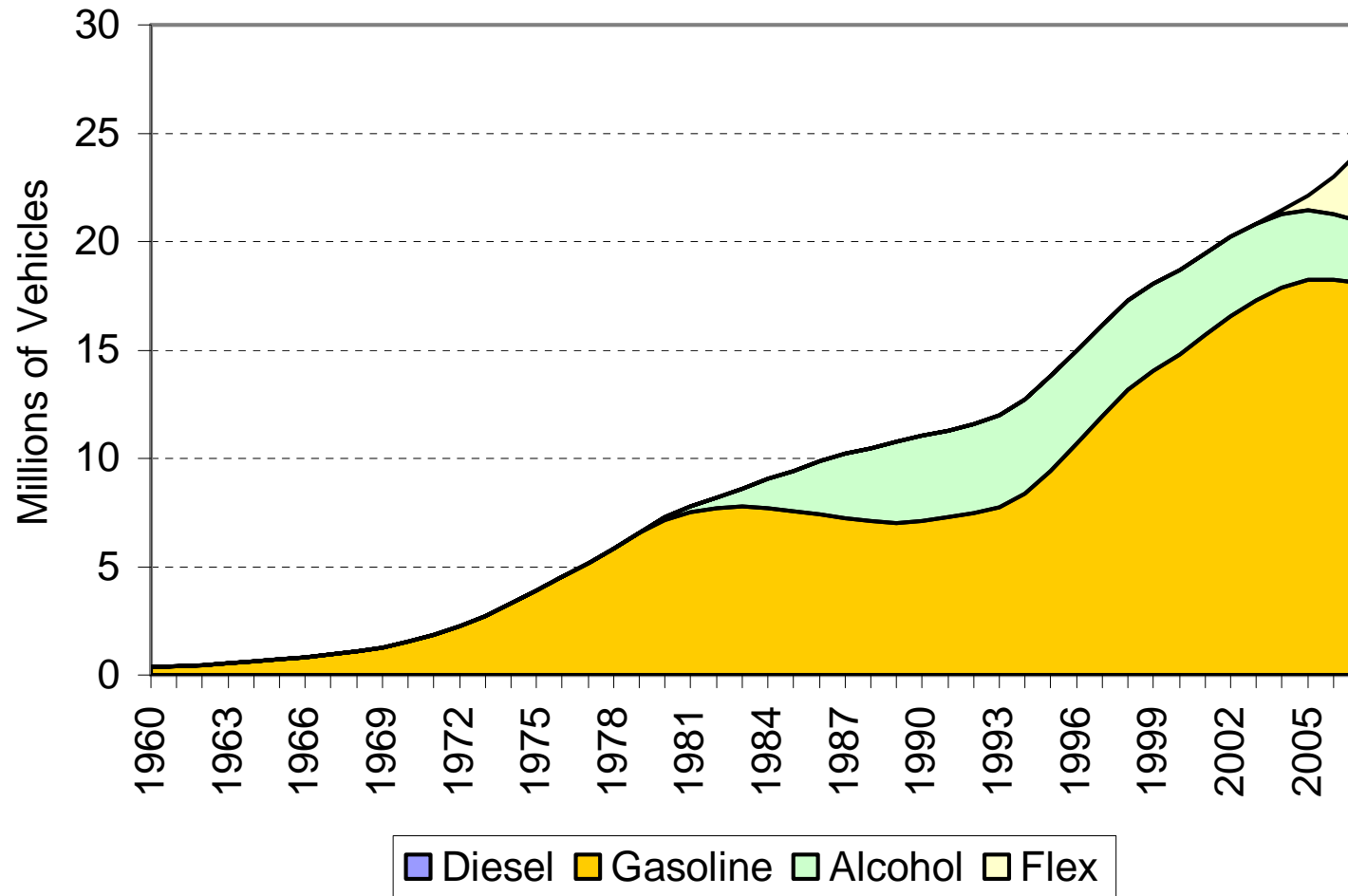


Transport Sector in Brazil : Road Transport Fleet

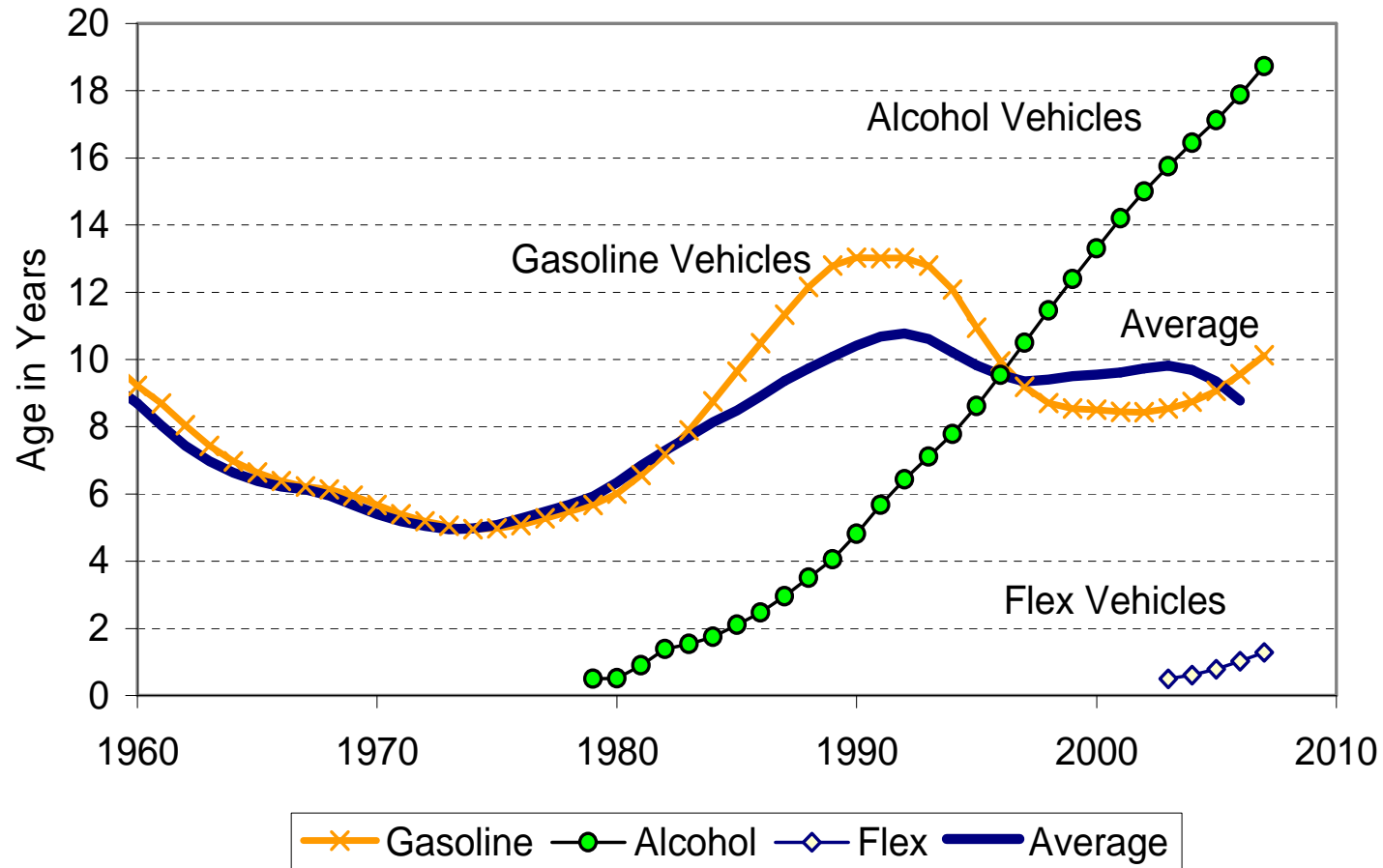


Transport Sector in Brazil

Car Fleet Evolution by Fuel



Transport Sector in Brazil : Average Age of Cars Fleet



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Transport Sector in Brazil :

Use of Compressed Natural Gas in Vehicles

- All the present fleet is of converted cars (dual fuel) using gasoline/NG or Alcohol/NG
- Estimated fleet 1.4 million car (light vehicles)
- Average consumption
 - 220 million m³/month
 - 5,1 Nm³/day
- Brazilian NGV fleet of Brazilian almost equal to Argentinean in 2007
- Prices: Gasoline 0.66 US\$/l, Alcohol 0.99 US\$/l
NGV 0,66/m³
40% Gasoline, 39% Alcohol (Energy Relative Price)
- Data Source: NGV Group September 2007



Transport Sector in Brazil : Biodiesel

- National Target: 5% renewable fuel mixed with diesel for next years (present target 2%)
 - Sterification of vegetable oil
 - H-bio produced in hydro-treating units in existing oil refineries
- Brazilian Biodiesel Production
(in million of boe / year)
 - 2005 0.005
 - 2006 0.4
 - 2007 2.5 (1.3% of diesel consumption)



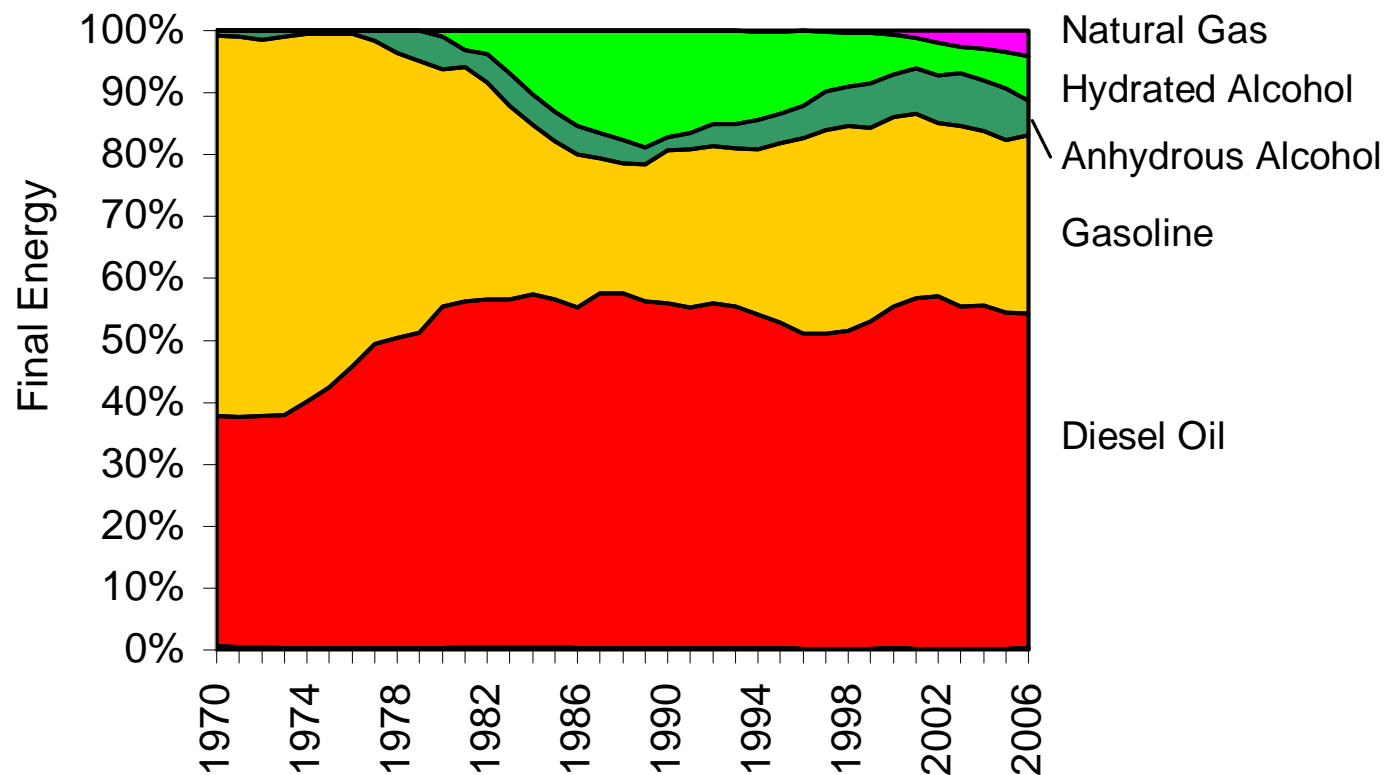
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Transport Sector in Brazil :

Road Transportation Fuel Consumption



■ Diesel Oil

■ Gasoline

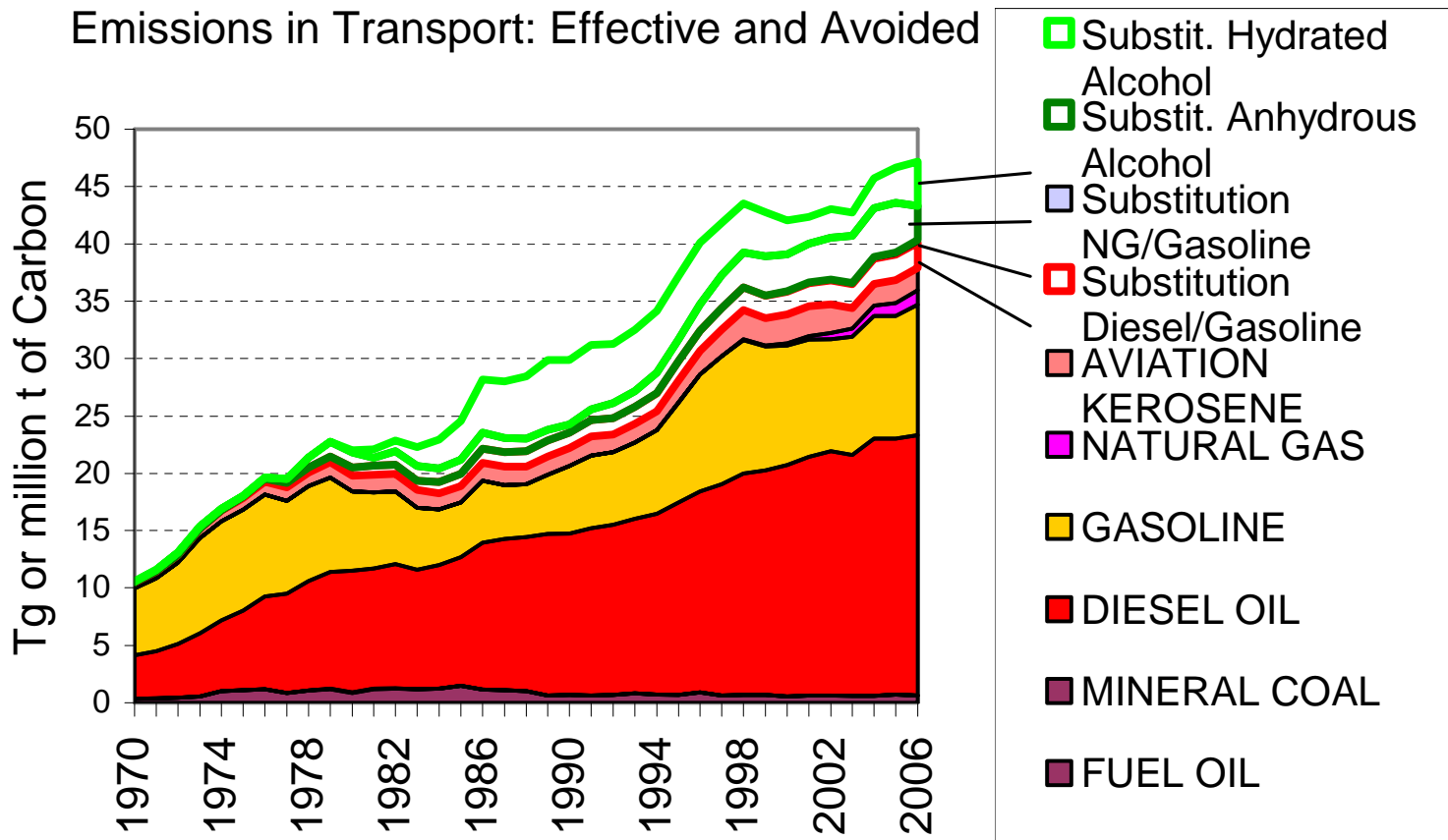
■ Anhydrous Alcohol

■ Hydrated Alcohol

■ Natural Gas



Transport Sector in Brazil : Carbon Emissions Avoided

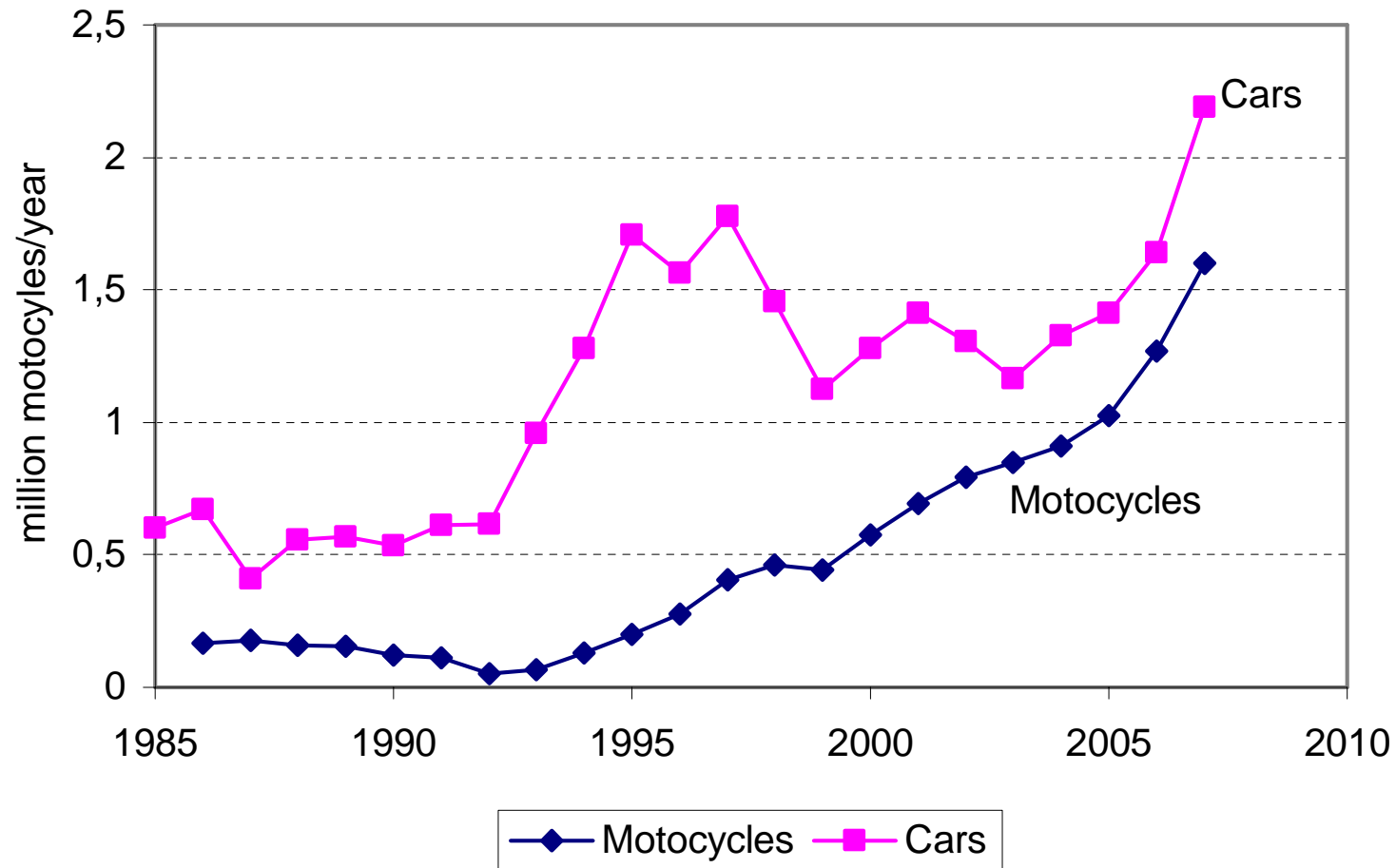


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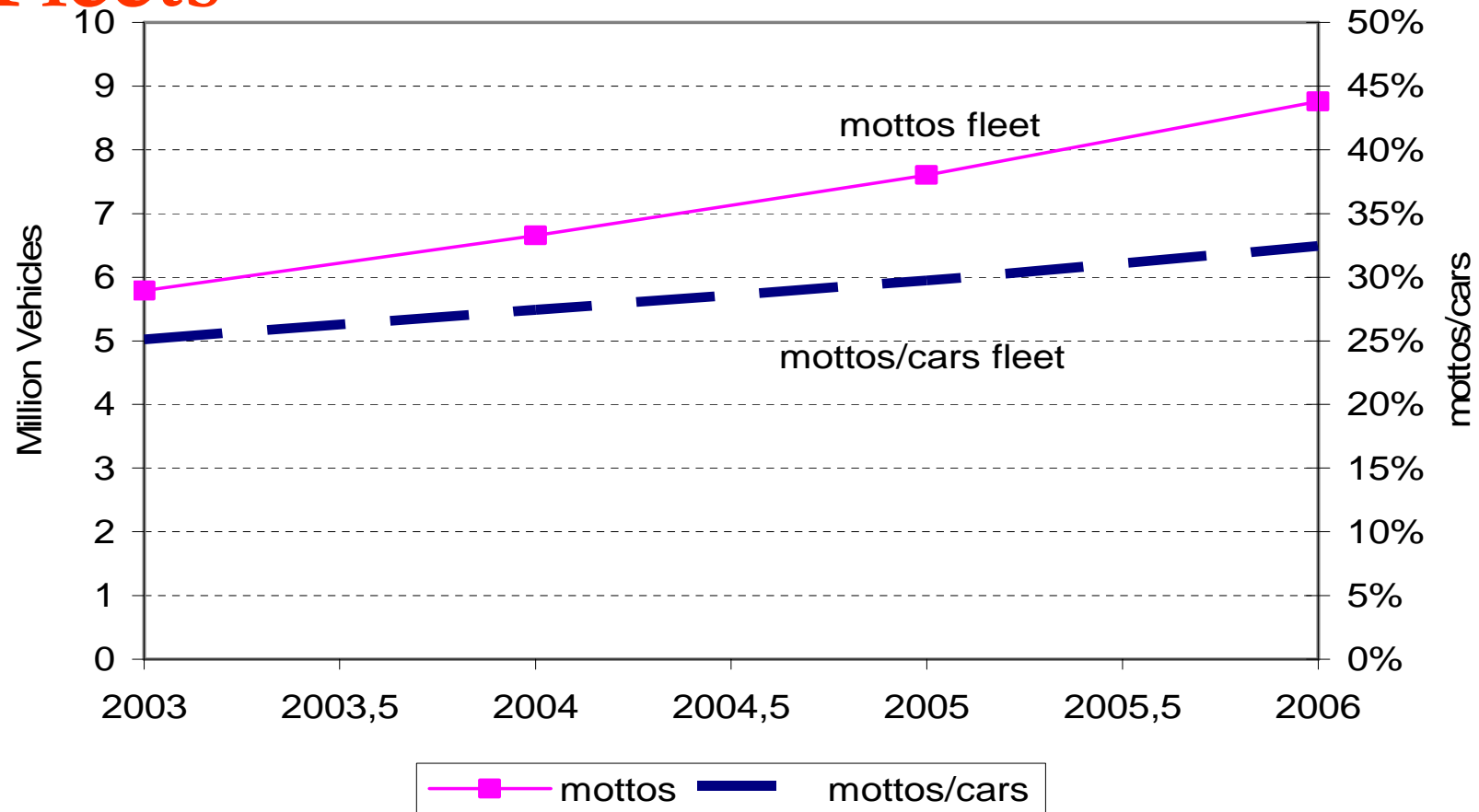
Transport Sector in Brazil : Motorcycles and Cars Sales



Transport Sector in Brazil :

Motorcycles and Motorcycles/Cars

Fleets



Transport Sector in Brasil

Motorcycles and Traffic

- In Brazil motorcycles are still considered as a marginal vehicle
- The motorcycles fleet is now 1/3 of cars fleet
- About 380 thousand registered accidents with victims (36 thousand deaths) in 2005
- Recently the Sao Paulo's administration established some special corridor for motorcycles



Transport Sector and GHG Emissions in Brazil

- END
- <http://ecen.com>

Transport Sector in Brazil :

Transport Fuel Consumption

