



# **ECOLOGICAL CHARACTERISTICS OF MOTOR VEHICLES AND FUELS IN RUSSIAN FEDERATION**

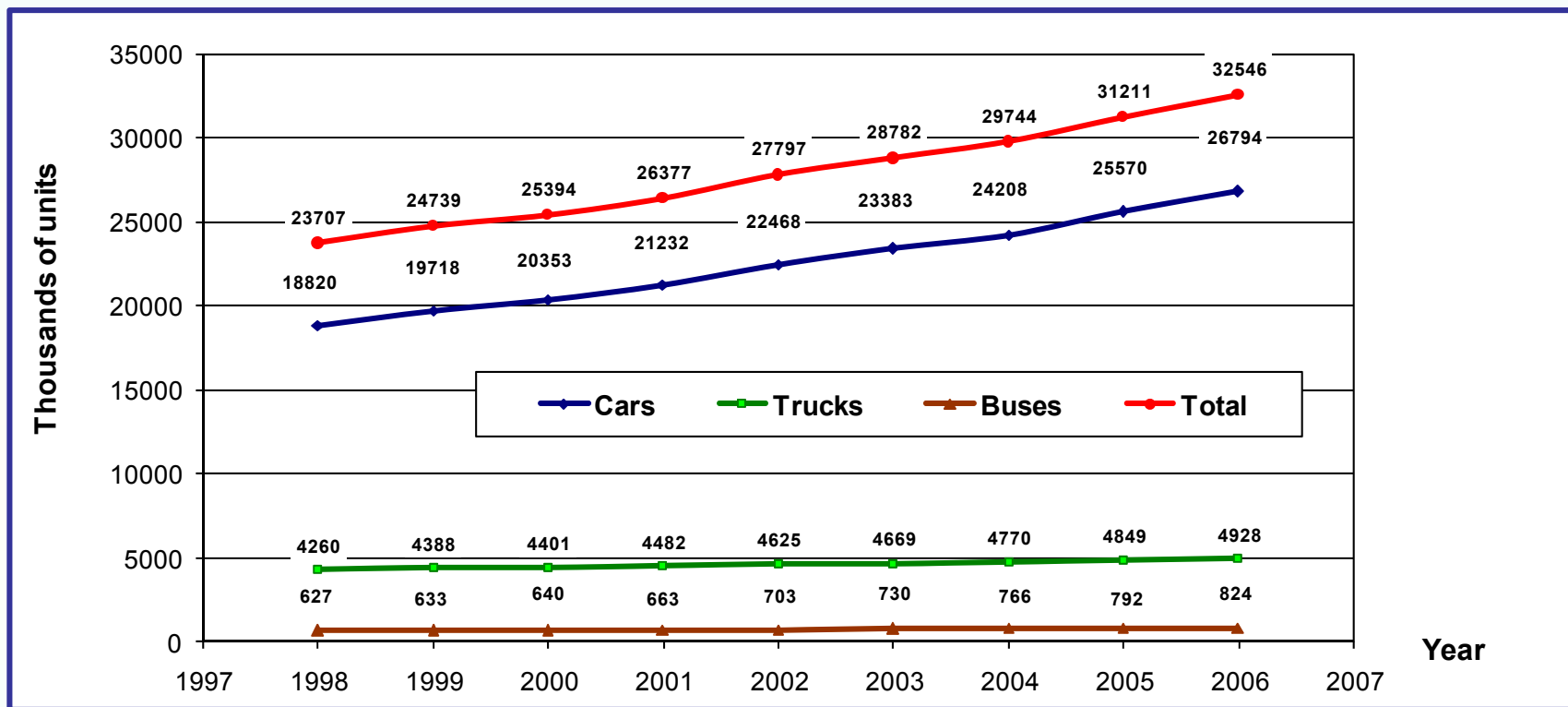
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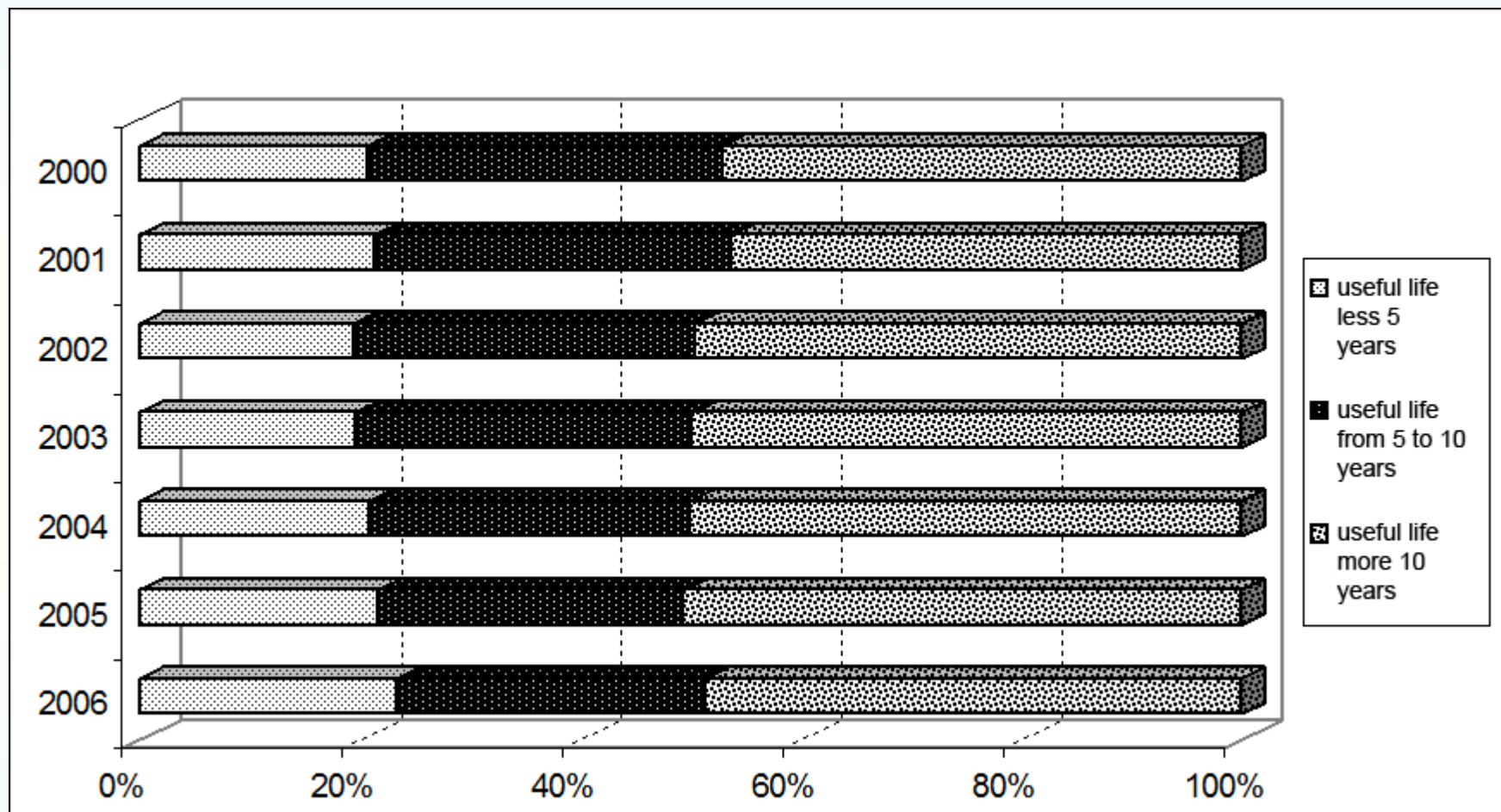
## Performance dynamics of main indicators on motor vehicles

Indicator	2001	2002	2003	2004	2005	2006
Volume of freight traffic, Mill. t	6125	6348	6469	6550	6 675	7436
Freight turnover, Bill. t/km	159,9	167,2	173,2	180,0	187,6	204,0
Volume of passenger traffic, mill. people	23650	23120	23130	23200	23432	23713
Passengers' turnover, Bill. pass/km	219,2	225,5	233,4	235,0	238,1	241,0

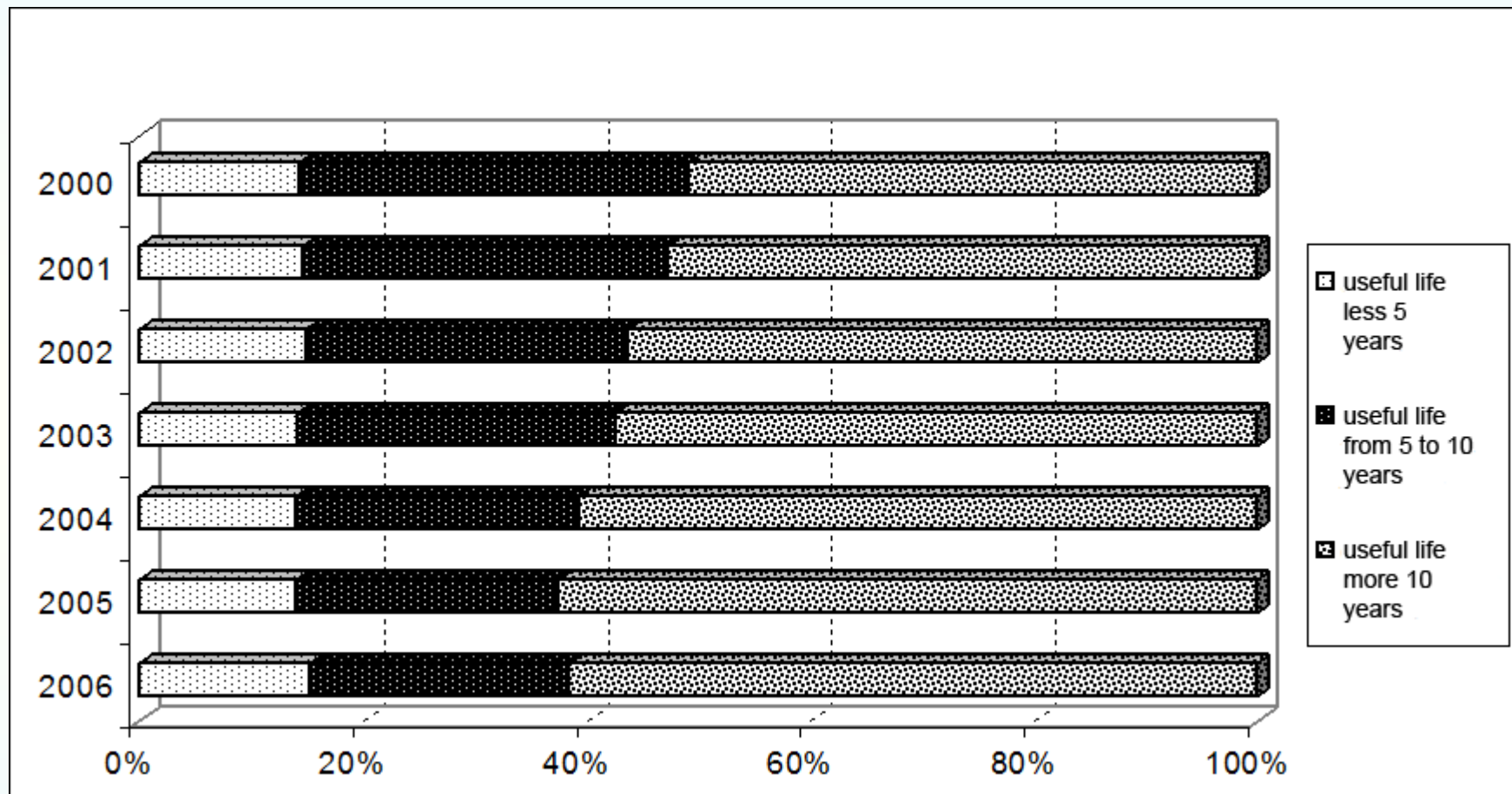
# Russian vehicle fleet size dynamics



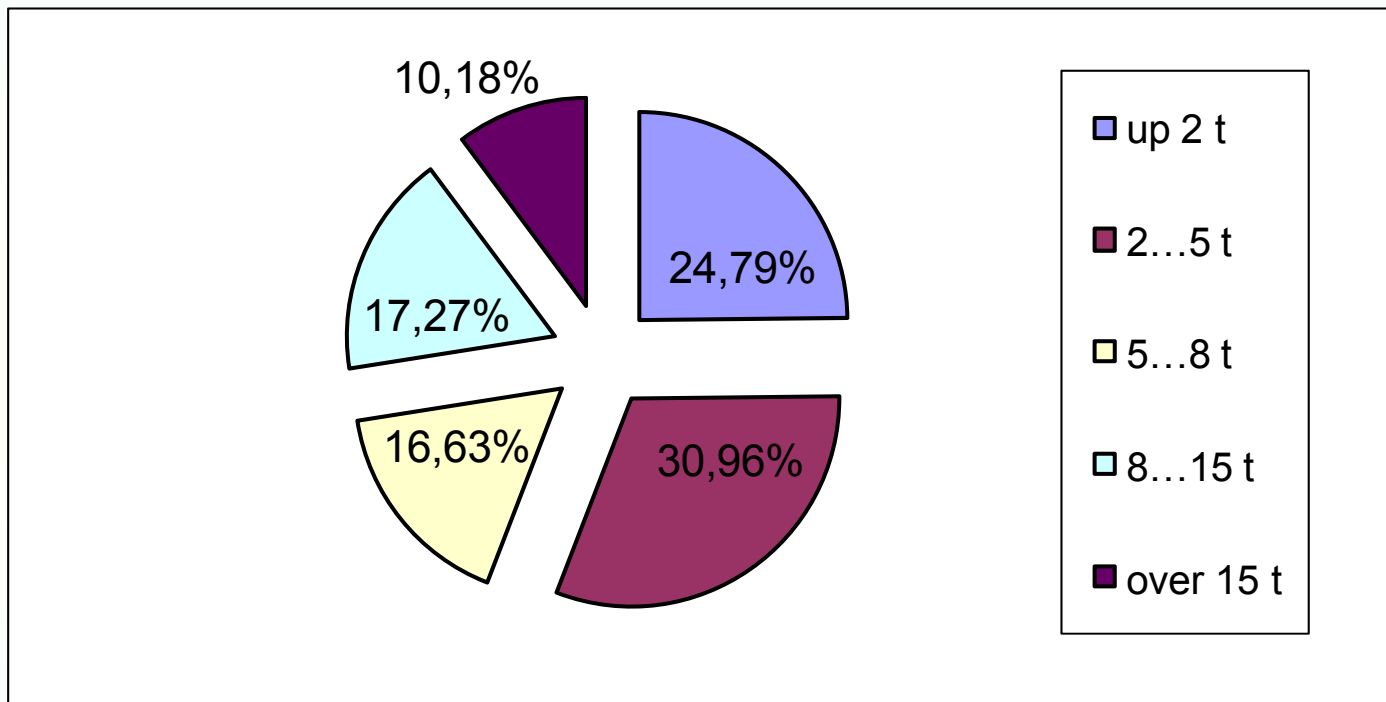
## Age structure dynamics of Russian passenger cars



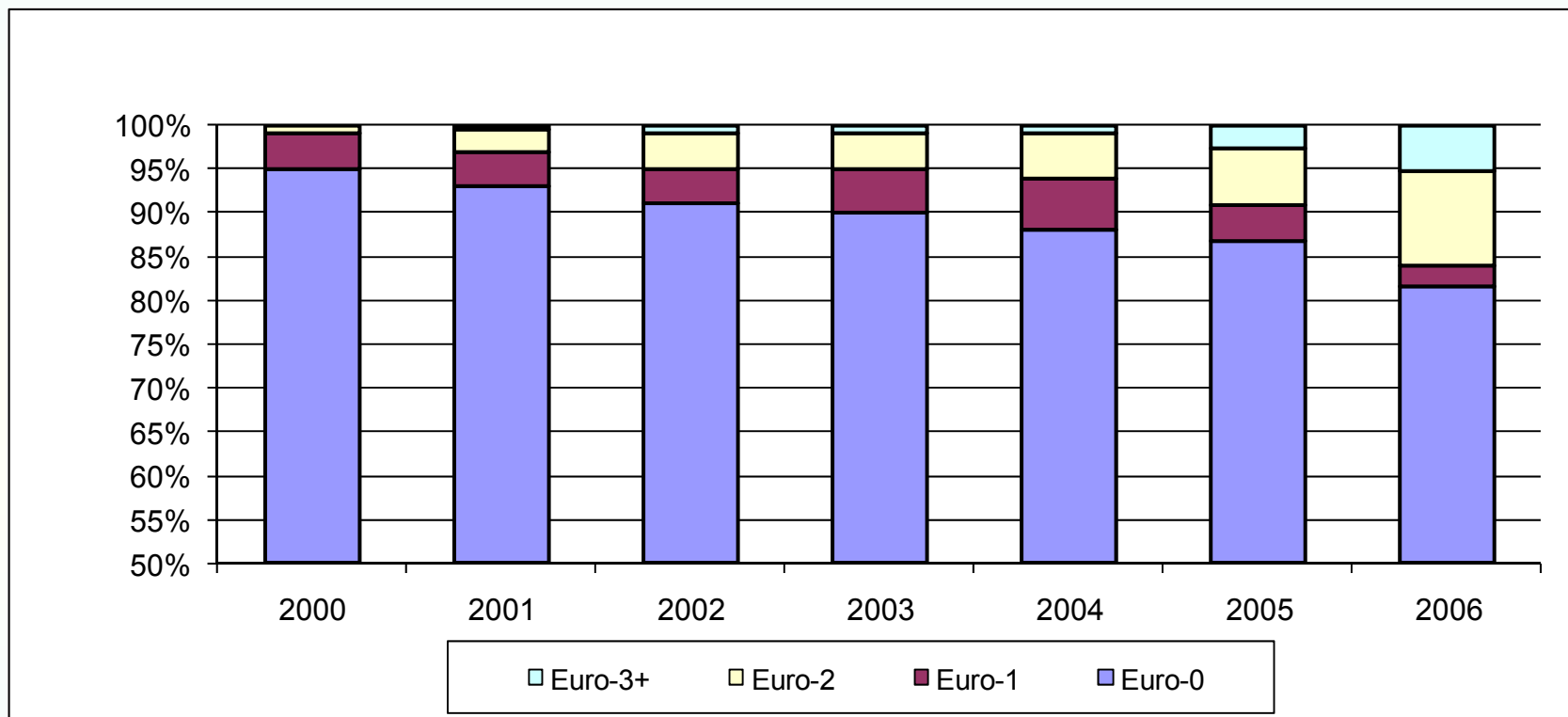
## Age structure dynamics of Russian trucks



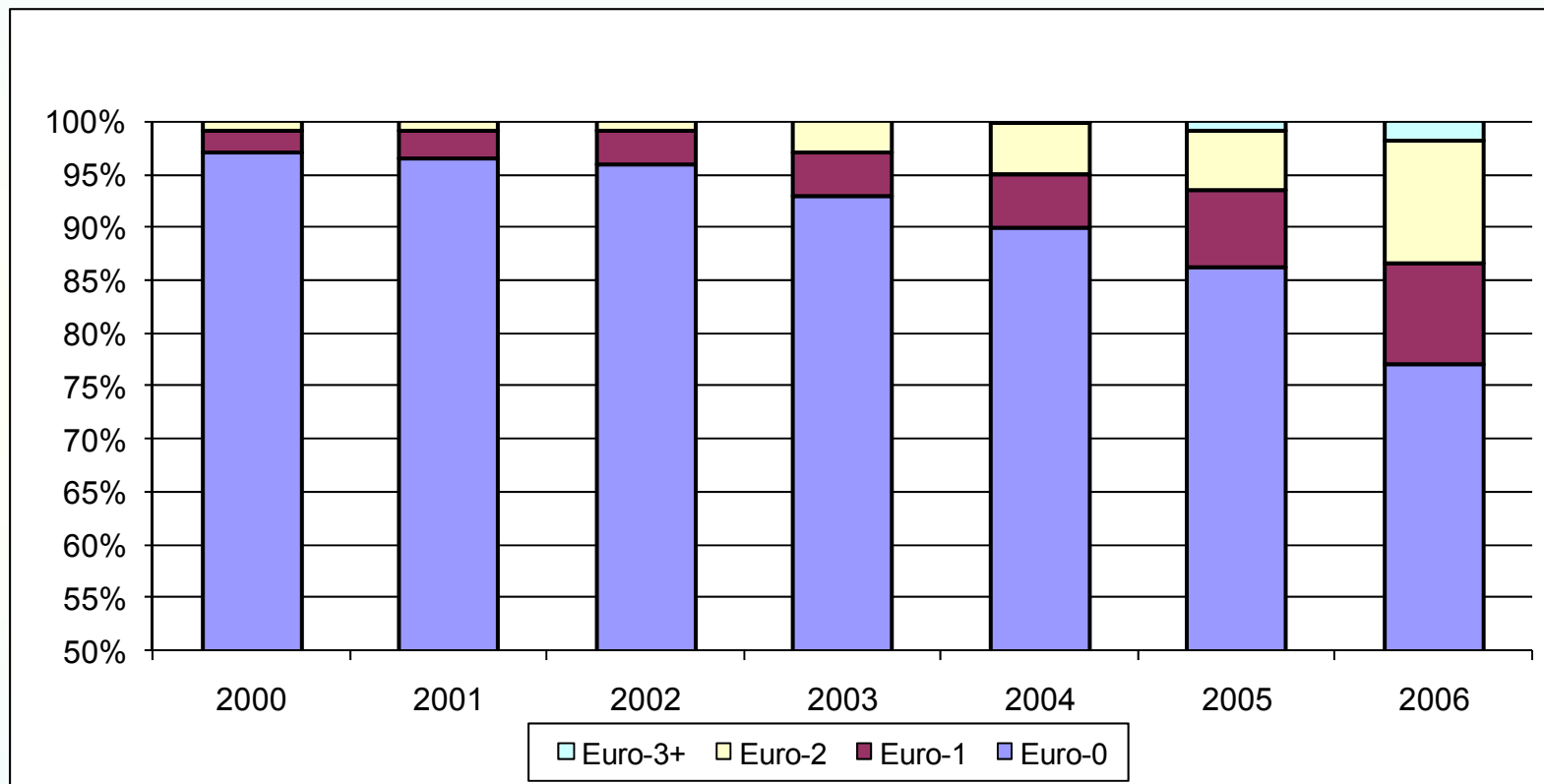
## Russian truck fleet structure by tonnage



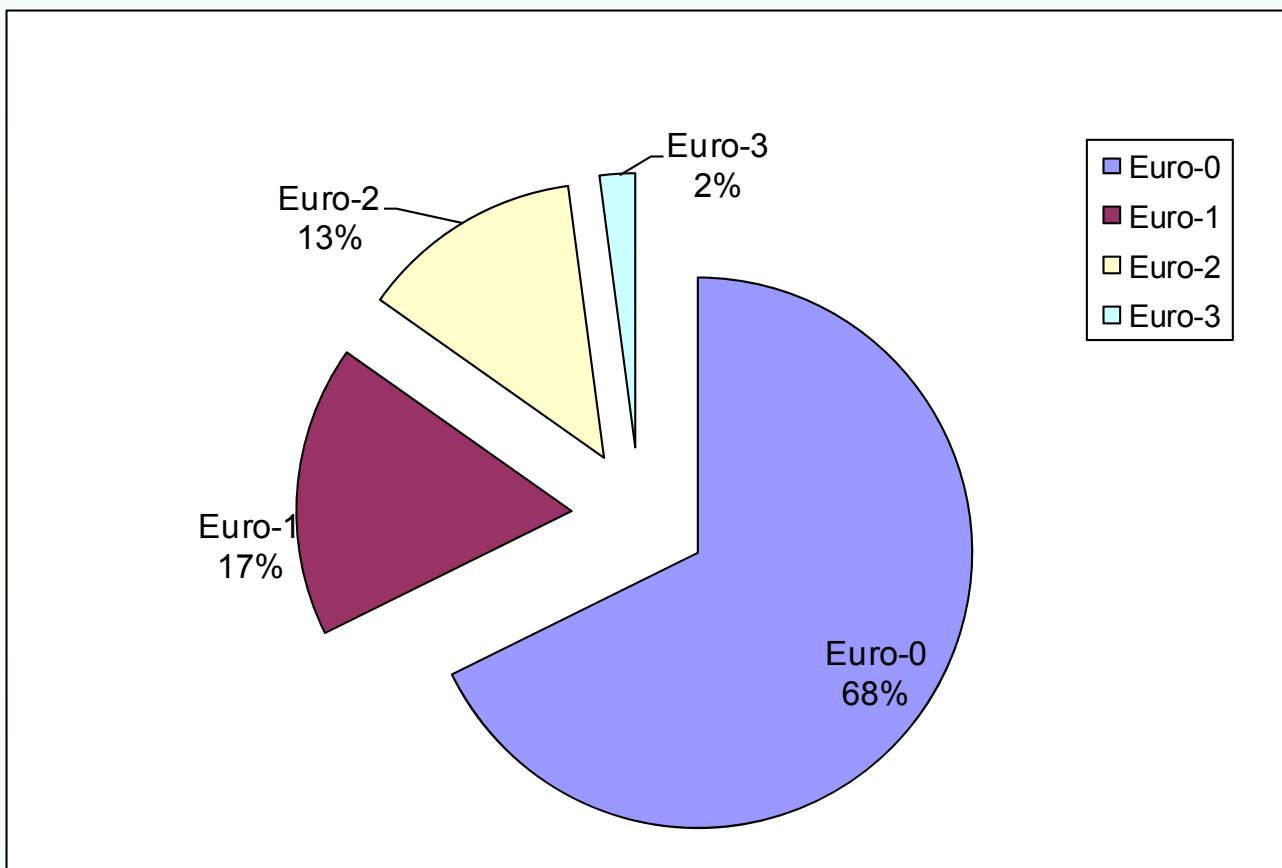
## Russian passenger car fleet structure by ecological standards



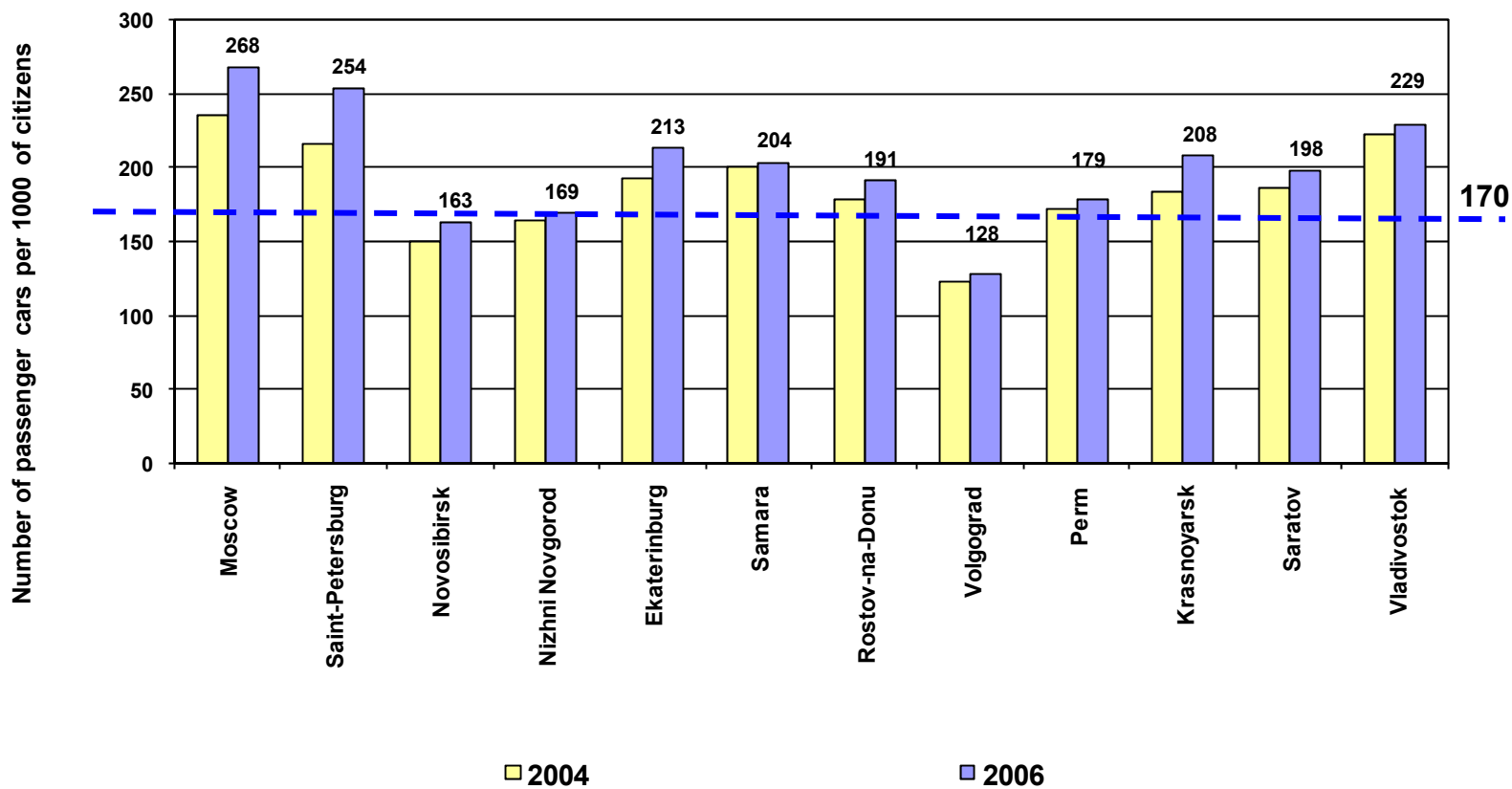
## Russian truck fleet structure by ecological standards



# Russian bus fleet structure by ecological standards in 2006



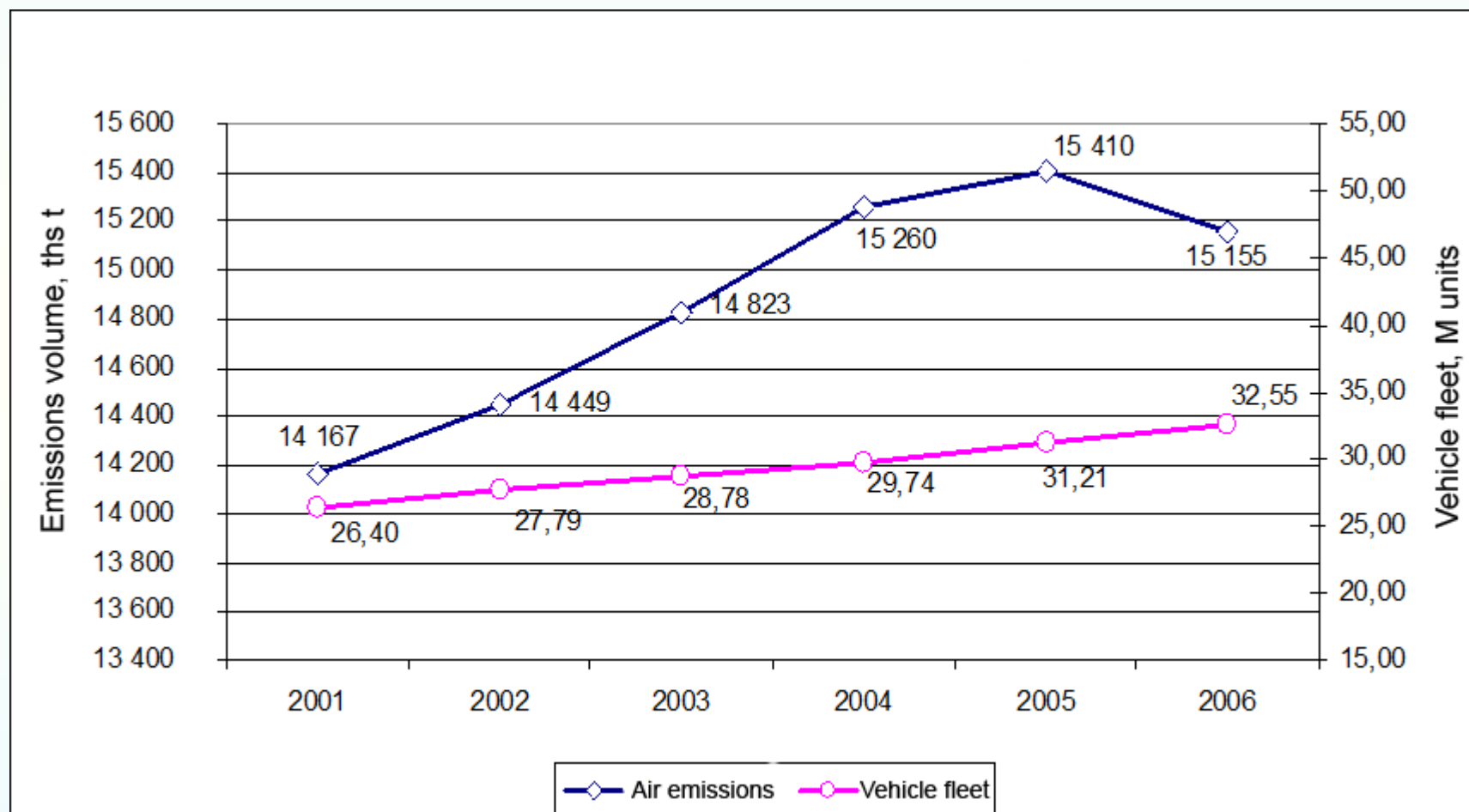
# Car ownership levels in large and largest Russian cities



## Pollutant emissions from vehicles in 2006, ths t

Emissions	CO	C <sub>n</sub> H <sub>m</sub>	NO <sub>x</sub>	PM	SO <sub>2</sub>	Total
Emission volume, ths t	11202	1723,8	2055	53,91	119,8	15154,8
% to 2005	96,1	100,3	110,5	110,3	98,3	98,3

## Dynamics of pollutant emissions from vehicles in Russia



## Timelines for introduction of ecological standards for emissions and fuels

Stand ard	Year of introduction					
	Emissions		Gasoline <sup>*)</sup>		Diesel <sup>*)</sup>	
	Western Europe	Russia	Western Europe	Russia	Western Europe	Russia
<b>Euro-2</b>	1996	2006	1994-1995 (EN 228:1993)	1997 (GOST R 51105)	c 01.1996 EN-590:1996	-
<b>Euro-3</b>	2000	2008	2000 (EN 228:1999)	2002 (GOST R 51866)	2000 EN-590:1999	2005 GOST R 52368
<b>Euro-4</b>	2005	2010	2005 (EN 228:2004)	2005 ( TS 38.401-58-350-2005)	2005 EN-590:2004	2005 GOST R 52368

\*) – For Russia, timeline for new requirements introduction means appearance of the corresponding fuels on the fuel market, along with continuation of low quality fuels production.

Such an order will tend to continue until the moment of technical regulation specifying requirements for quality of Russian motor fuel approval.

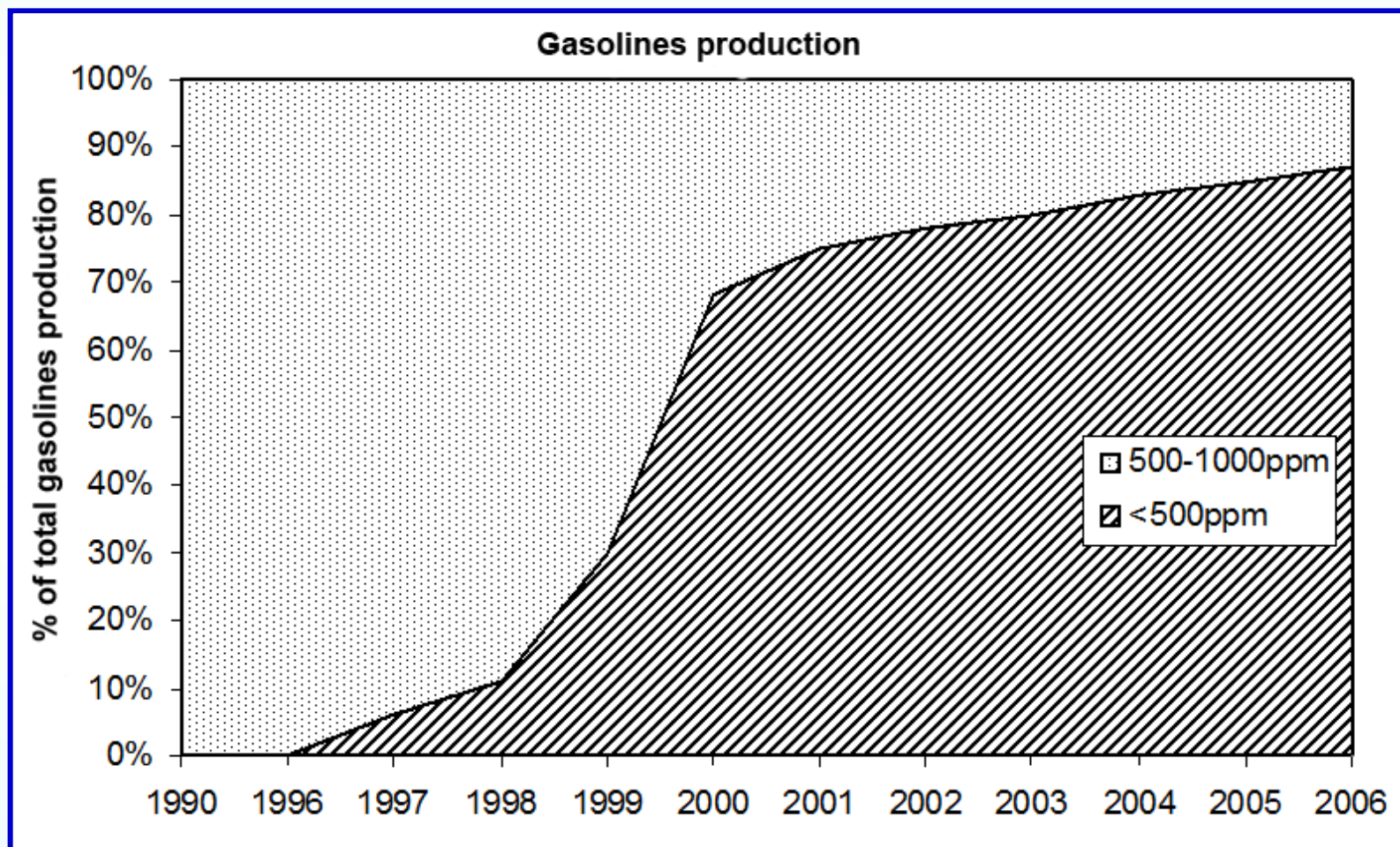
## Major fuel characteristics defining its ecological standard

Component	Unit of measure	Ecological standard, (duration of requirements in Russia according to the technical regulation draft)			
		Euro 2 (till 31.12.2008)	Euro 3 (till 1.12.2009)	Euro 4 (till 31.12.2012)	Euro 5 (under discussion)
<b>GASOLINE</b>					
Sulfur mass fraction, no more	mg/kg	500	150	50	10
Aromatic hydrocarbons volume fraction, no more	%	-	42	35	35
Olefin hydrocarbons volume fraction, no more	%	-	18	18	18
Benzene volume fraction, no more	%	5	1,0	1,0	1,0
Lead concentration, no more	mg/dm <sup>3</sup>	< 5	< 5	< 5	< 5
<b>DIESEL FUEL</b>					
Sulfur mass fraction, no more	mg/kg	500	350	50	10
Cetane rating, no more		45	51	51	51
PAH mass fraction, no more	%	-	11	11	11

## Production structure of Russian motor fuel, %

<b>Gasoline Grade</b> year	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2005</b>	<b>2006</b>
<b>Total volume of fuel production, B t</b>	40,6	27,4	27,2	29,5	34,4
<b>A-72</b>	5,7	0,2	-	-	-
<b>A-76(AI-80)- Euro-1,2</b>	78,3	76,3	55,3	39,6	31,3
<b>AI-93(AI-91,92)- Euro-2</b>	15,4	22,2	38,3	47,5	55
<b>AI-95 (AI-96)- Euro-2,3</b>	0,4	1,1	6,2	12,6	13,3
<b>AI-98 - Euro-2,3</b>	0,2	0,2	0,2	0,3	0,4
<b>Including: share of leaded</b>	61,3	53,1	2,3	-	-
<b>share of unleaded</b>	38,7	46,9	97,7	100	100

## Production volumes dynamics of Russian gasoline with different sulfur content



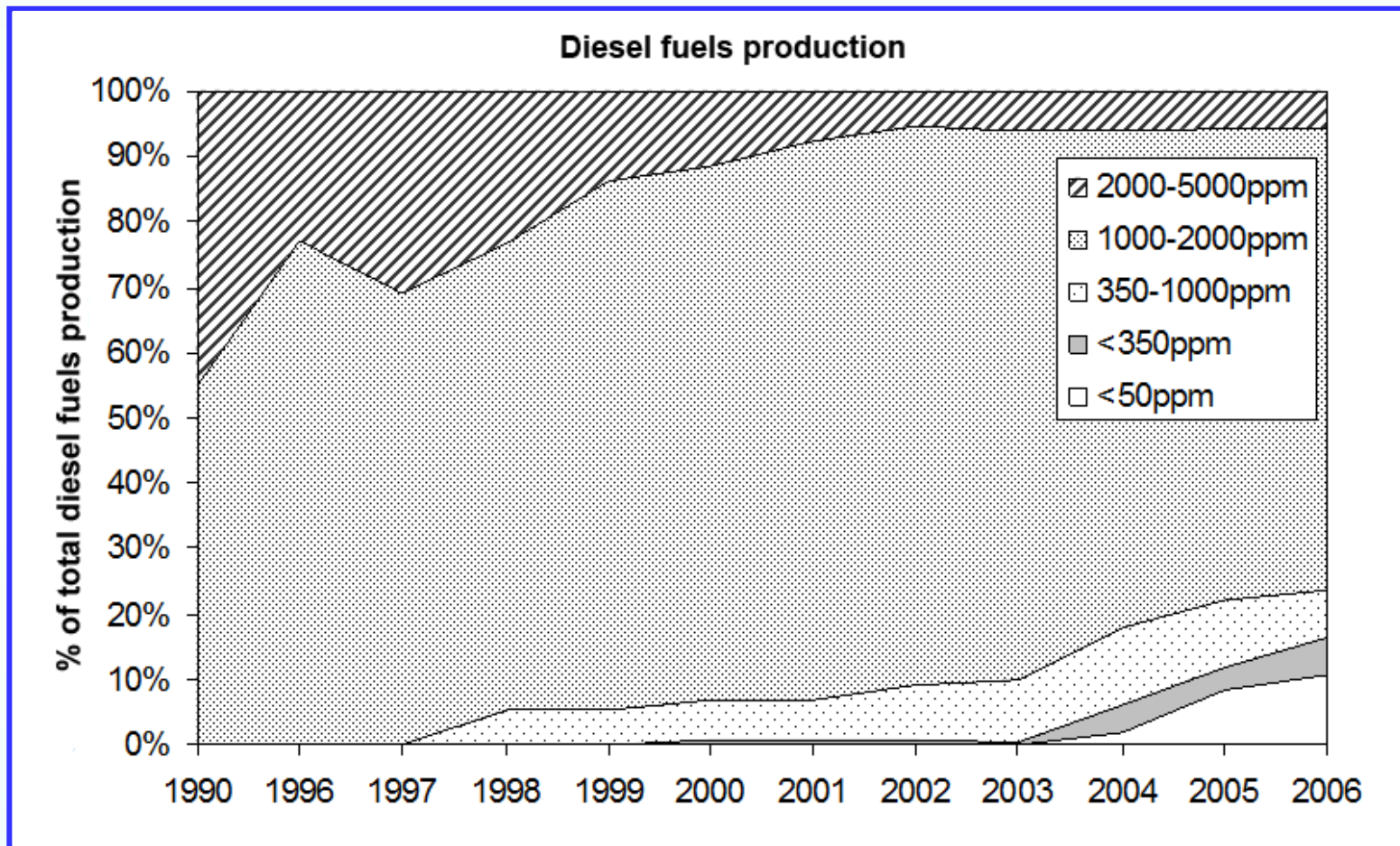
## Production patterns of diesel fuel in Russian refineries by sulfur content, %\*)

Sulfur content, % mass no more	2000	2001	2002	2003	2004	2005	2006
0,001(Euro-5) <sup>**)</sup>	-	-	-	-	-	0,8	1,7
0,005(Euro-4) <sup>**)</sup>	-	-	-	-	-	7,5	9,1
0,035(Euro-3) <sup>**)</sup>	-	-	-	3,5	5,3	3,5	5,7
0,05	9,8	11,7	12,2	11,3	1,6	7,8	4,4
0,1	6,3	3,9	3,1	-	1,4	2,4	2,6
0,2	72,3	77,1	78,1	79,2	75,5	72,3	70,9
0,5	11,6	7,3	6,6	6,0	6,2	5,7	5,6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

\*) - not including enterprises of JSC "Gazprom" and MINI-NPZ

\*\*\*) - EN-590

# Production volumes dynamics of Russian diesel fuels with different sulfur content



## Major ecological characteristics of motor gasolines (Euro -3/Euro-4) produced in Russian enterprises

Component	Standard	Motor gasolines					
	Euro-3/ Euro-4	Surgut ZSK		JSC «YANOS»	JSC «NU NPZ»	JSC «NK NPZ»	
		Regular- 92	Premium- 95	Premium- 95	Regular-92	Regular- 92	Premium- 95
Lead concentration, mg/dm <sup>3</sup>	No more 5	< 5	< 5	< 5	< 5	< 5	< 5
Hydrocarbon content, % of total :	No more						
Olefins	18	0	0,2	2,2	1,8	1,1	0,4
Aromatics	42/35	35	41	32	36	32,5	37,8
Benzene	1,0	0,7	0,8	0,4	0,7	0,7	0,8
Sulfur content, mg/kg	No more 150/50	50	50	140	140	50	40
Content O <sub>2</sub> , %	No more 2,7	1,5	2,4	2,0	0,5	1,8	2,5

**Thank you for your attention!**