



# **Emissions in the Road Freight Sector and Truck Fleet Evolution in Germany – the Impact of Regulation**

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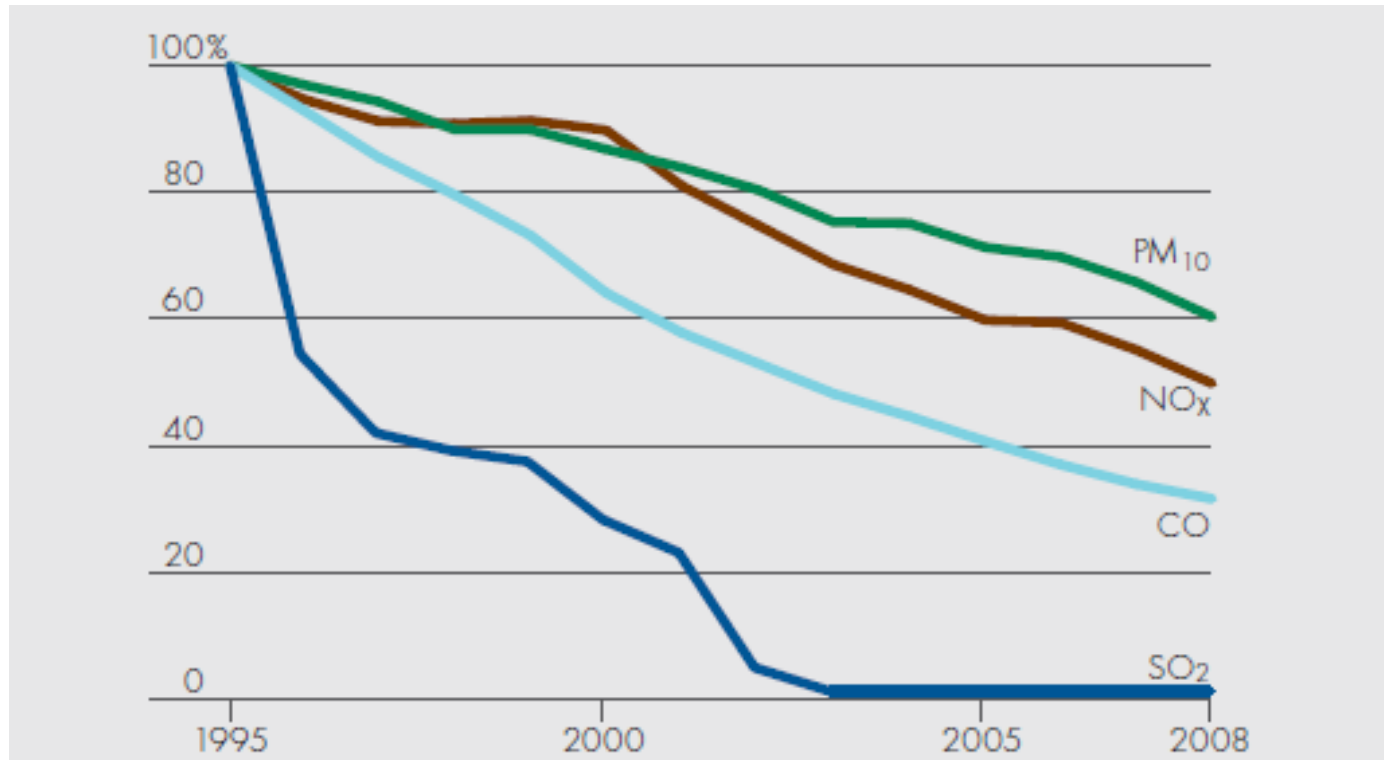
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# Outline

- Emissions' reduction and exhaust gas limits in Germany (Europe)
- Euro-norms – the European regulation on emission control and the diffusion of new technologies
- The German motorway charge 'Maut' as an instrument for incentivizing the use of new vehicle technologies
- Conclusions



# Emissions' reduction in Germany since 1995: Less emissions despite an increase in road transport



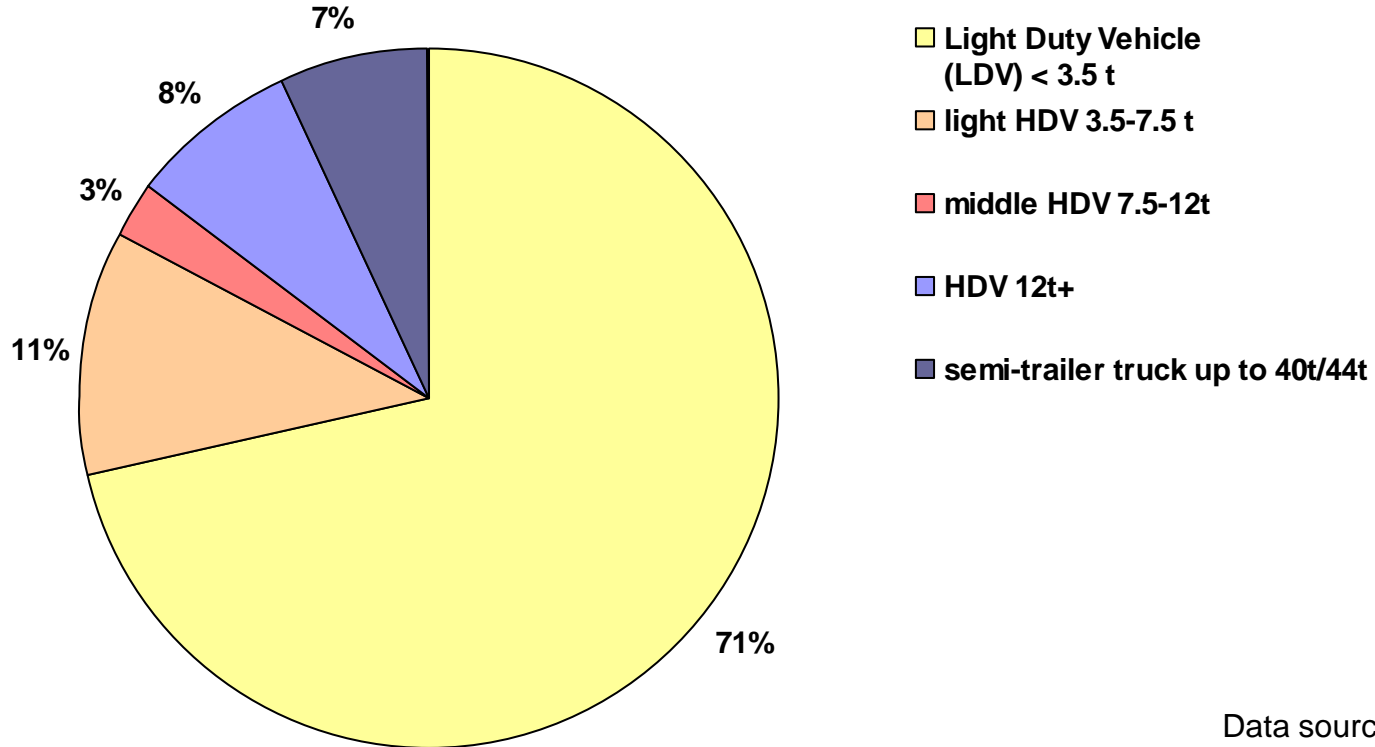
Source: SHELL Lkw-Studie 2010, based on data of National Agency for the Environment (Umweltbundesamt)

# Regulations to limit exhaust gas

- First limits of exhaust gas in the 1990ies
- EU Action Plan for the Environment 2002-2012:
  - \* specification of common standards of air quality
  - \* definition of immission limits e.g. for  $PM_{10}$  and  $NO_x$  and their accentuation since 1<sup>st</sup> January 2010, also HC and CO
- Regulation about emission sources, i.e. also vehicles
- Local regulation by “environmental zones”, i.e. regulation of access to cities by emission class of vehicle (private cars and trucks)

# What is a „truck“ in Germany?

- Registrations on 01. January 2010 and share in total truck fleet
- Overall about 2.5 Mio. vehicles



Data source: KBA

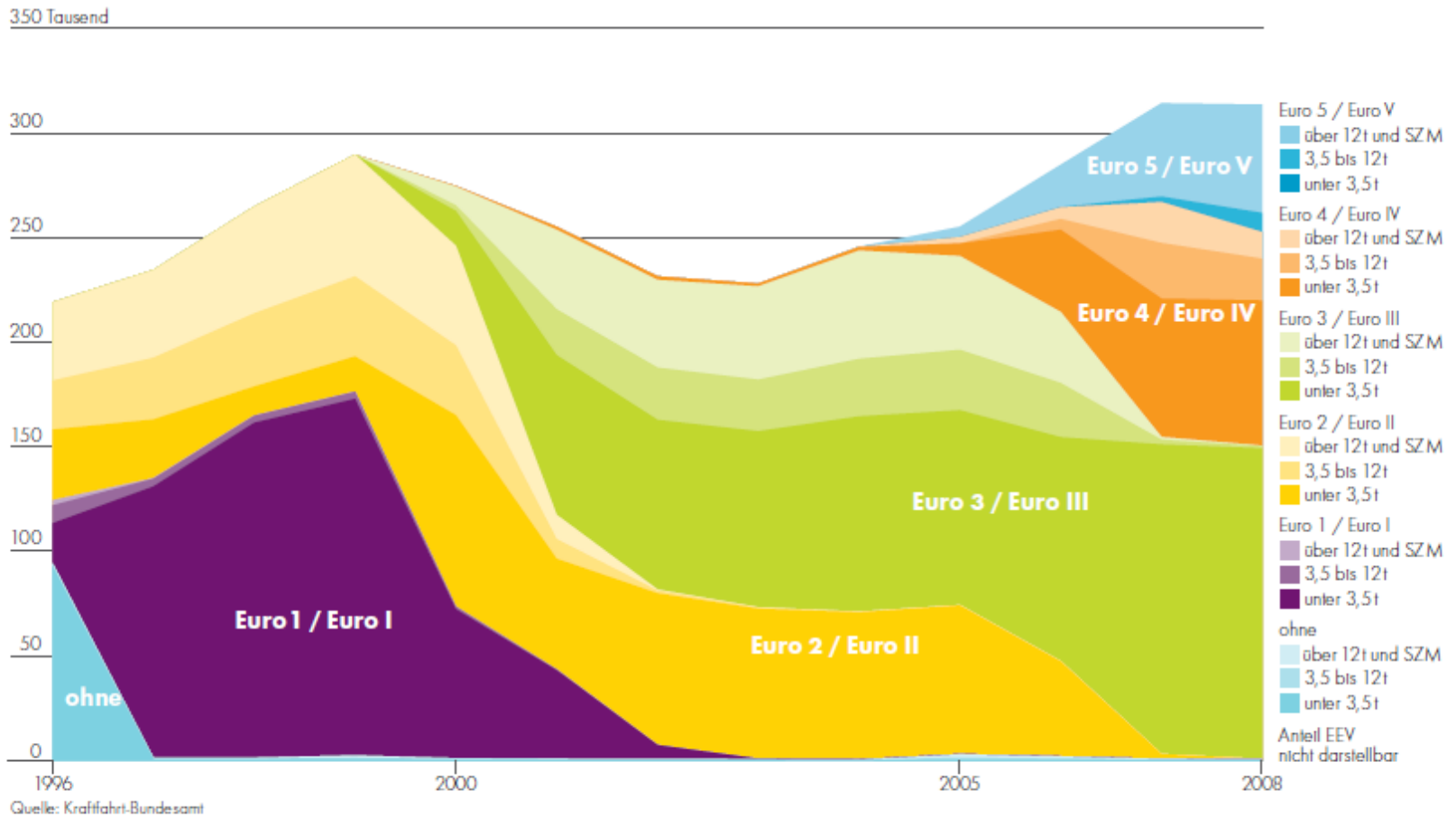
# Euronorms for trucks (new vehicles) 3,5 t +: From Euro I in 1993 to Euro VI in 2012

	Euro 1 since 1993	→	Euro 6 since 2012	reduction Euro 1 to Euro 6
CO	4,50 g/km		1,50 g/km	67 %
HC	1,10 g/km		0,13 g/km	88 %
PM <sub>10</sub>	0,36 g/km		0,01 g/km	97 %
NO <sub>x</sub>	8,00 g/km		0,40 g/km	95 %

Source: SHELL Lkw-Studie 2010

**!!!** goal conflict in internal combustion between reduction of PM,  
reduction of NO<sub>x</sub> and efficiency relevant for CO<sub>2</sub> **!!!**

# New registrations of trucks in Germany by Euro Norm

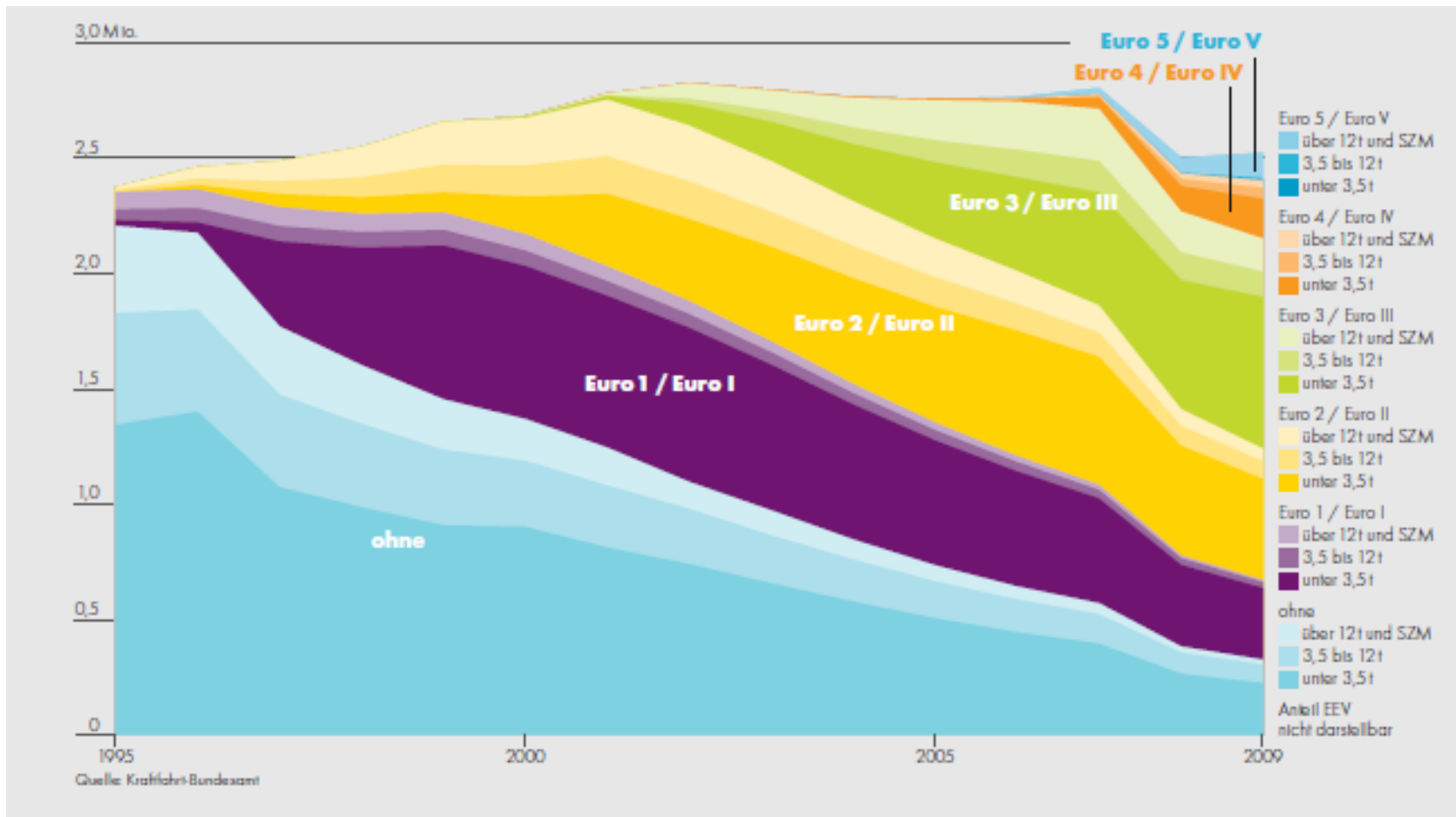


source: SHELL Lkw-Studie 2010





# Overall truck fleet in Germany by Euro Norm



source: SHELL Lkw-Studie 2010





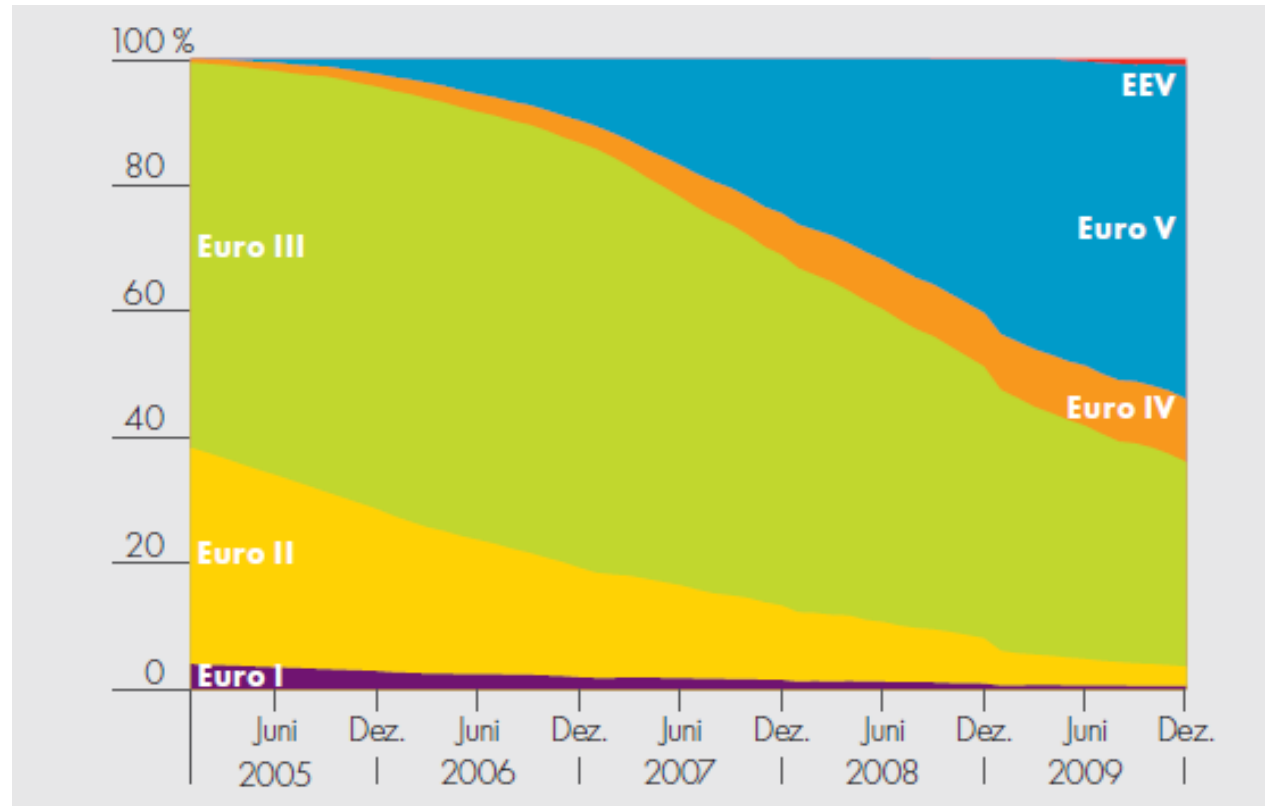
# Link of Euro Norm to Maut taxation on German motorways

Emission category	Maut category	Maut since 1 <sup>st</sup> January 2011 per km
Euro V	A	14.0-15.4 €ct
Euro IV	B	16.8-18.2 €ct
Euro III	C	21.0-22.4 €ct
Euro II	D	27.3-27.7 €ct
Euro I / Euro 0	E	27.3-28.7 €ct

source: [www.bmvbs.de](http://www.bmvbs.de); simplified version

# Benefits from introduction of Euro Norm: Increase of less polluting trucks on German motorways

December 2010:  
60.4 % of total kms  
driven by trucks on  
German motorways  
are driven by Euro 5  
tractor units and  
trucks



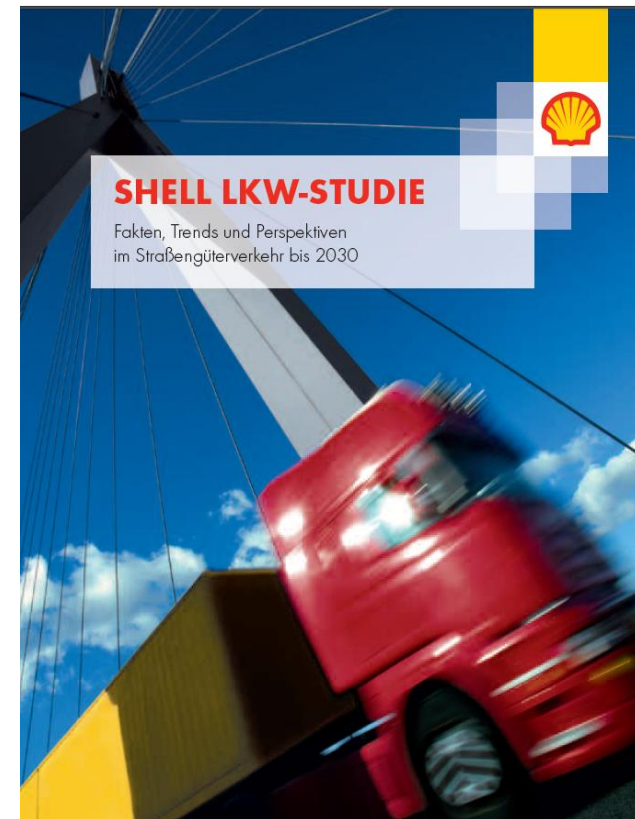
source: SHELL Lkw-Studie 2010,  
based on data from BAG

# Conclusions

- Large effects on exhaust gas reduction were possible
- Important contribution from European policies (regulation)
- The German 'Maut' system has proved its capability to promote the use of new vehicle technologies
- CO<sub>2</sub> remains a problem for the freight sector: increasing efficiency by technological progress / alternative drivetrains are limited & increase in transport volumes
- Dependency from oil in this and the next decade

# Thank you!

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