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# **Kyoto Protocol and Emissions Trading – Perspectives for Railways**

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# Content

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- 1. Climate Change Policies**
- 2. Performance of Railways**
- 3. Rules and Effects of CO<sub>2</sub> Emissions Trading**
- 4. Preparing for the Second Emissions Trading Period**
- 5. Resume**

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# The EU Emissions Trading scheme is based on International, European and National Laws

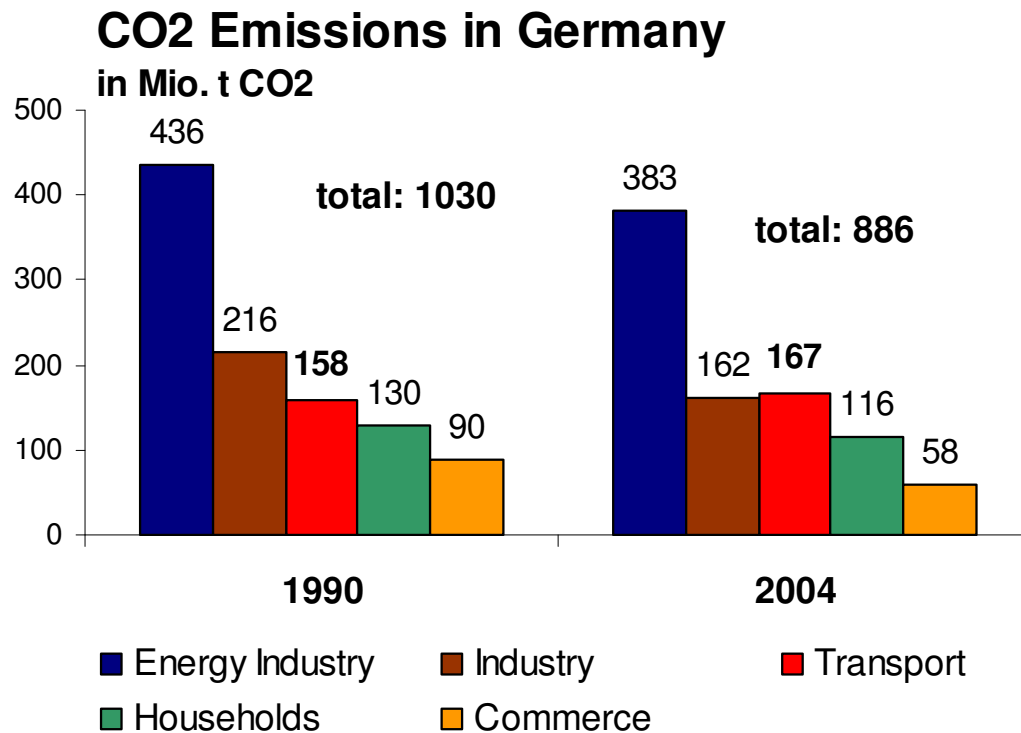
<p>Kyoto-Protocol</p>	<p><b>Kyoto-Protocol</b> of the UN from 1997 entered into force on 16. Feb 2005; this implies agreement on goals and instruments to reduce climate emissions</p>
<p>EU Directives</p>	<p><b>EU Directive on Emissions Trading</b> of 13. Oct. 2003</p>
	<p><b>EU Directive on Project Mechanisms</b> of 27. Oct 2004</p>
<p>German National Law</p>	<p><b>Treibhausemissionshandelsgesetz TEHG</b> of 8. July 2004</p>
	<p><b>Zuteilungsgesetz 2007 (ZuG 2007)</b> of 26. Aug. 2004</p>

# Most Member States of the EU 15 are not on track in achieving their Climate Change Targets

- **EU target** to reduce greenhouse gas emissions by 8% until 2008-12
- **Burden Sharing** to achieve the target - EU15 member states have taken specific responsibilities
- **France, Germany, Sweden and UK** are on track, but 10 member states are off track, also the EU is far distant from its target
- **Therefore pressure from climate change policies will intensify**

<b>Greenhouse Gas Emissions of EU 15</b>					
EEA European Community Greenhouse Gas Inventory 2006					
	1990	2004	Change 1990-2004	Burden Sharing Target	
	Mio. t CO2 equiv.		%	%	off track on track
Austria	79	91	15,7	-13	off track
Belgium	147	148	0,7	-7,5	off track
Denmark	69	68	-1,8	-21	off track
Finland	71	81	14,5	0	off track
France	567	563	-0,8	0	on track
Germany	1230	1015	-17,5	-21	on track
Greece	111	138	23,9	25	on track
Ireland	56	69	22,7	13	off track
Italy	519	583	12,3	-6,5	off track
Luxemburg	13	13	0,3	-28	off track
NL	214	218	1,6	-6	off track
Portugal	60	85	41,0	27	off track
Sweden	73	70	-3,6	4	on track
Spain	289	428	47,9	15	off track
UK	768	659	-14,1	-12,5	on track
<b>EU 15</b>	<b>4266</b>	<b>4227</b>	<b>-0,9</b>	<b>-8</b>	off track

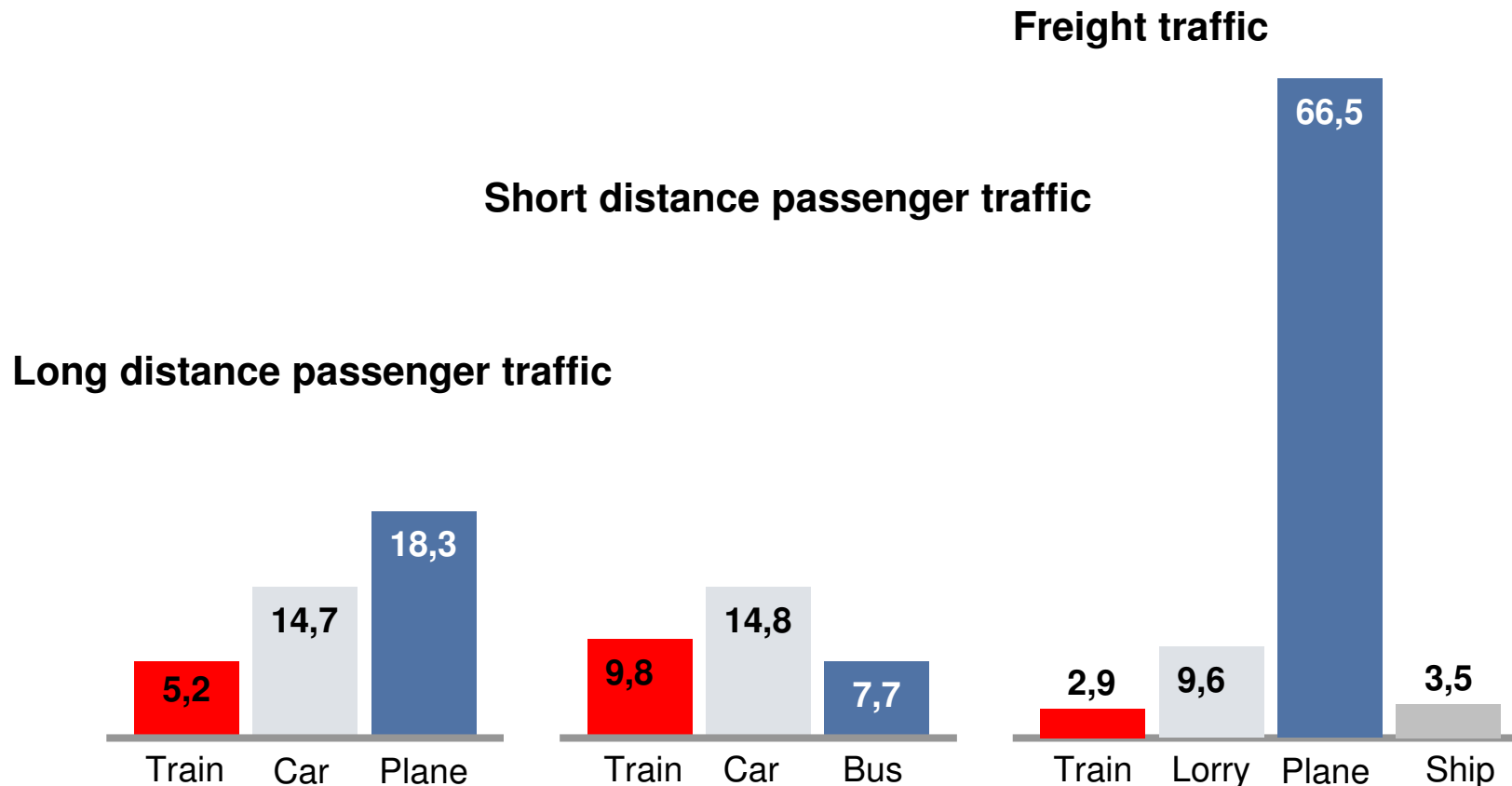
# CO<sub>2</sub> Emissions in all Sectors of the Economy are declining – except for the Transport Sector



Figures from NAP II of Bundesumweltministeriums, 28.06.2006

- **CO<sub>2</sub> emissions** in most sectors of the EU economy are decreasing
- **Transport** accounts for 21% of EU CO<sub>2</sub> emissions
- **CO<sub>2</sub> emissions from transport** have risen by 24% in EU-15 from 1990-2003 as transport volumes grow faster than energy efficiency is improving
- **Rising CO<sub>2</sub> emissions** from the transport sector put the EU Kyoto targets at risk
- **Therefore all energy- and climate change policies should promote sustainable transport systems**

# CO<sub>2</sub> Emissions of Railways are one third of Emissions in Road Traffic



Specific emissions of the German transport sector in kg CO<sub>2</sub> per 100 kilometre per person and in 100 kilometre per tonne for freight traffic.

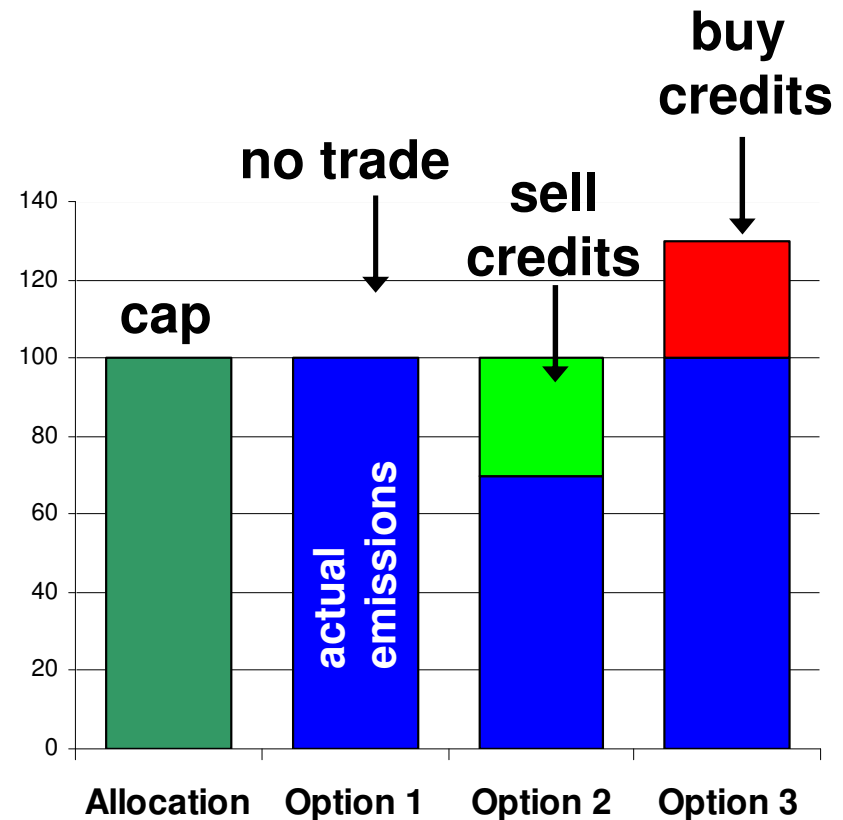
# Cap and Trade: how is the European CO<sub>2</sub> Emissions Trading Scheme (ETS) working ?

## Cap and ...

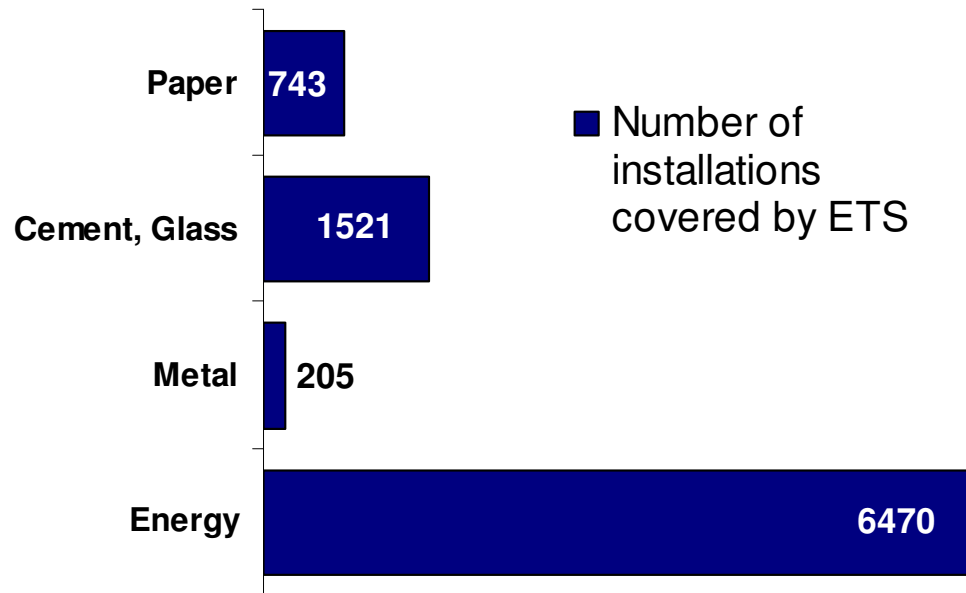
- National Governments **allocate emission certificates** over absolute amounts of emissions to installations
- Certificates are allocated **free of charge**
- At the end of the trading period each installation has to return certificates to **cover for actual emissions**

## ... trade of emission rights

- Companies may buy and sell certificates - 3 options:
  - ➔ they emit according to their cap – no trade
  - ➔ they emit less than their cap – sell certificates
  - ➔ they emit more than their cap – buy certificates
- **Goal according to Art. 1 of Emissions Trading Directive: economically efficient reduction of climate emissions**



# Who is directly covered by European CO<sub>2</sub> Emissions Trading?

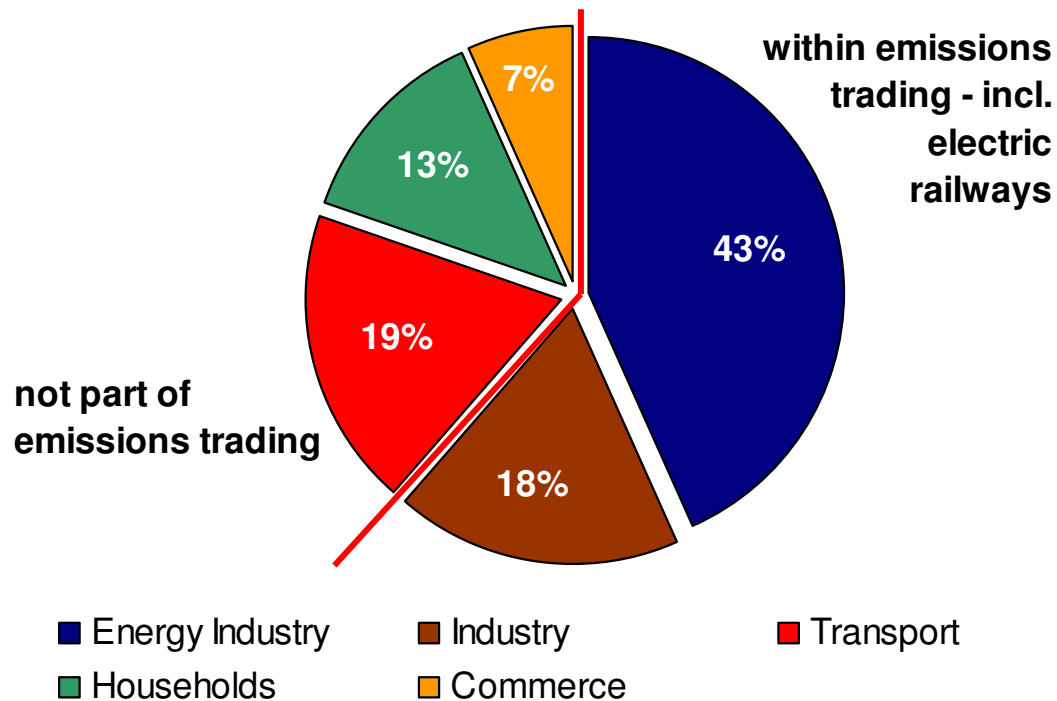


European Environment Agency 

- Activities covered by ETS:
  - ➔ **Energy:** power, heat >20 MW, refinery
  - ➔ **Metal** industry
  - ➔ **Cement**, glass, ceramic industry
  - ➔ **Paper** and pulp industry
- ➔ In EU-21 over 8.900 installations are covered by ETS and 45% of CO<sub>2</sub> emissions - 55% are outside ETS
- **Dominance of energy industries:** over 70% of all installations and even more of total emissions
- In Germany 80% of certificates belong to the energy industry

# In the Transport Market Emissions Trading is only effecting electric Railways

CO2 Emissions 2004 in %



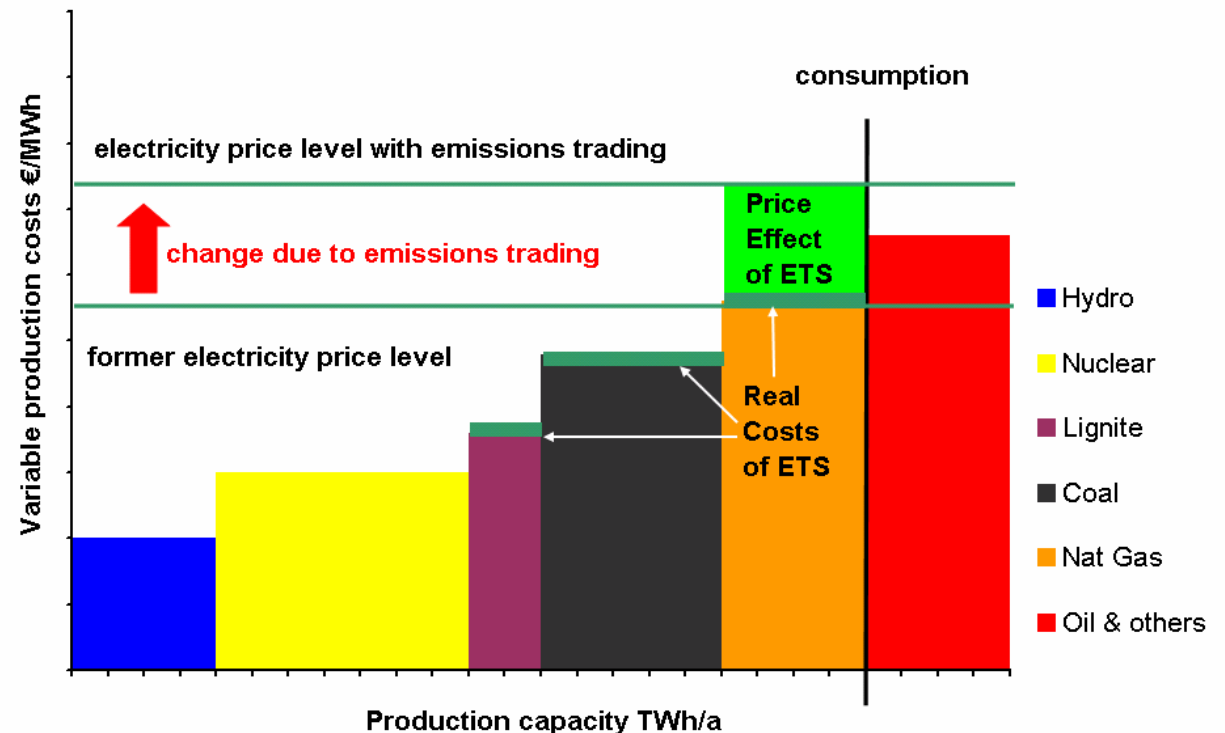
- As **railways** rely on electric power, also the railways are effected by ETS
- But **competitors of the railways** in the transport market like cars, lorries, planes, ships are not effected
- Commissions **review of ETS** will include suggestions for possible extension to include aviation (due in mid 2006)
- But extension to include **road traffic** is far beyond reality
- The **2. trading phase** starting 2008 will see no other modes of transport included

Figures from NAP II of Bundesumweltministeriums, 28.06.2006

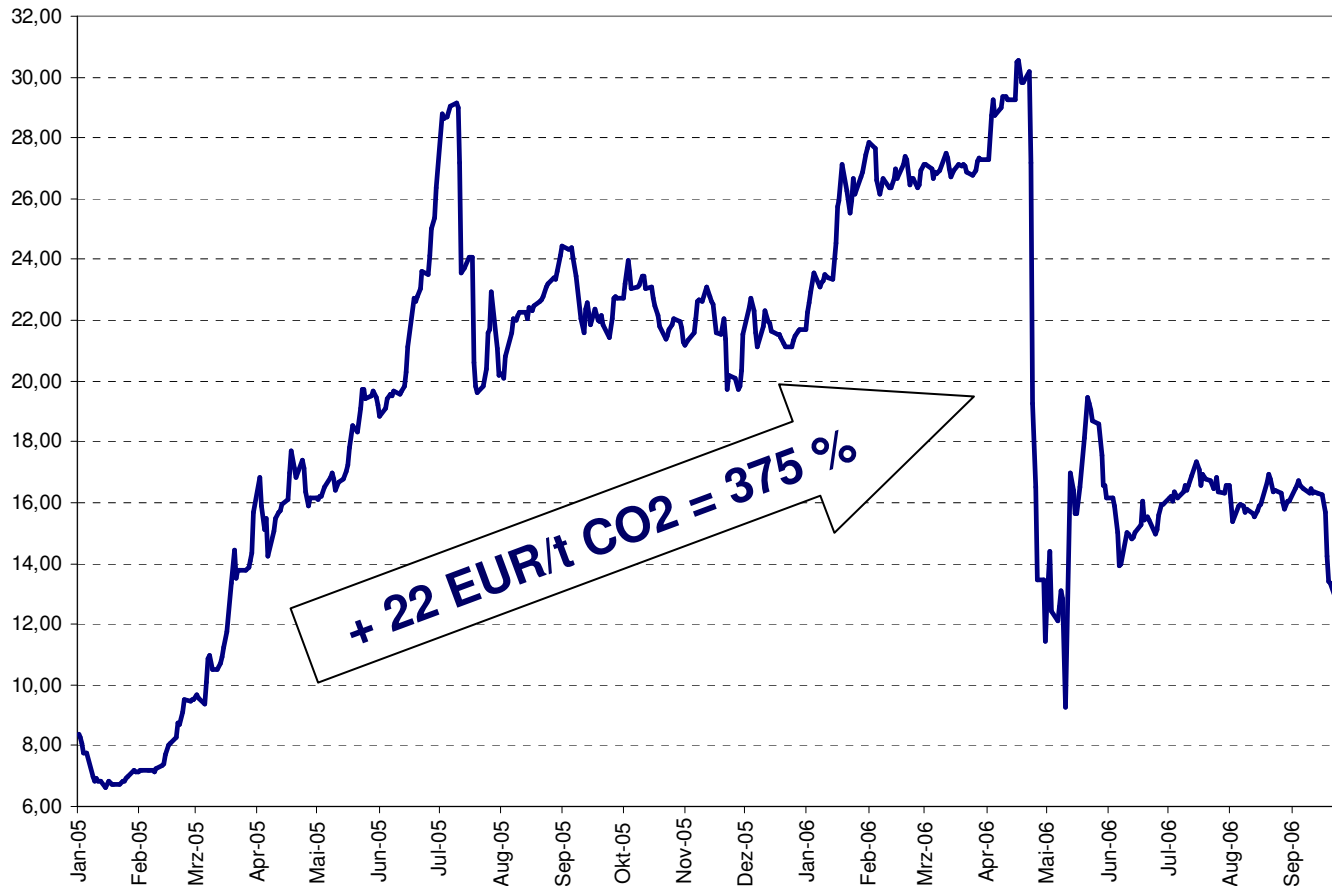
# CO2 Emissions Trading has drastic effects on rising electricity prices

- **Electricity suppliers** pass on costs from ETS to customers
- Costs are such for **purchase of missing certificates** (real costs)
- Costs also include the **market value of all certificates** needed for power production (opportunity costs)
- Despite free allocation certificates are included in power prices, leading to large **windfall profits**
- Total electricity costs by railways in EU have increased due to ETS by over **400 Mio. EUR** per year

## Electricity prices with and without ETS

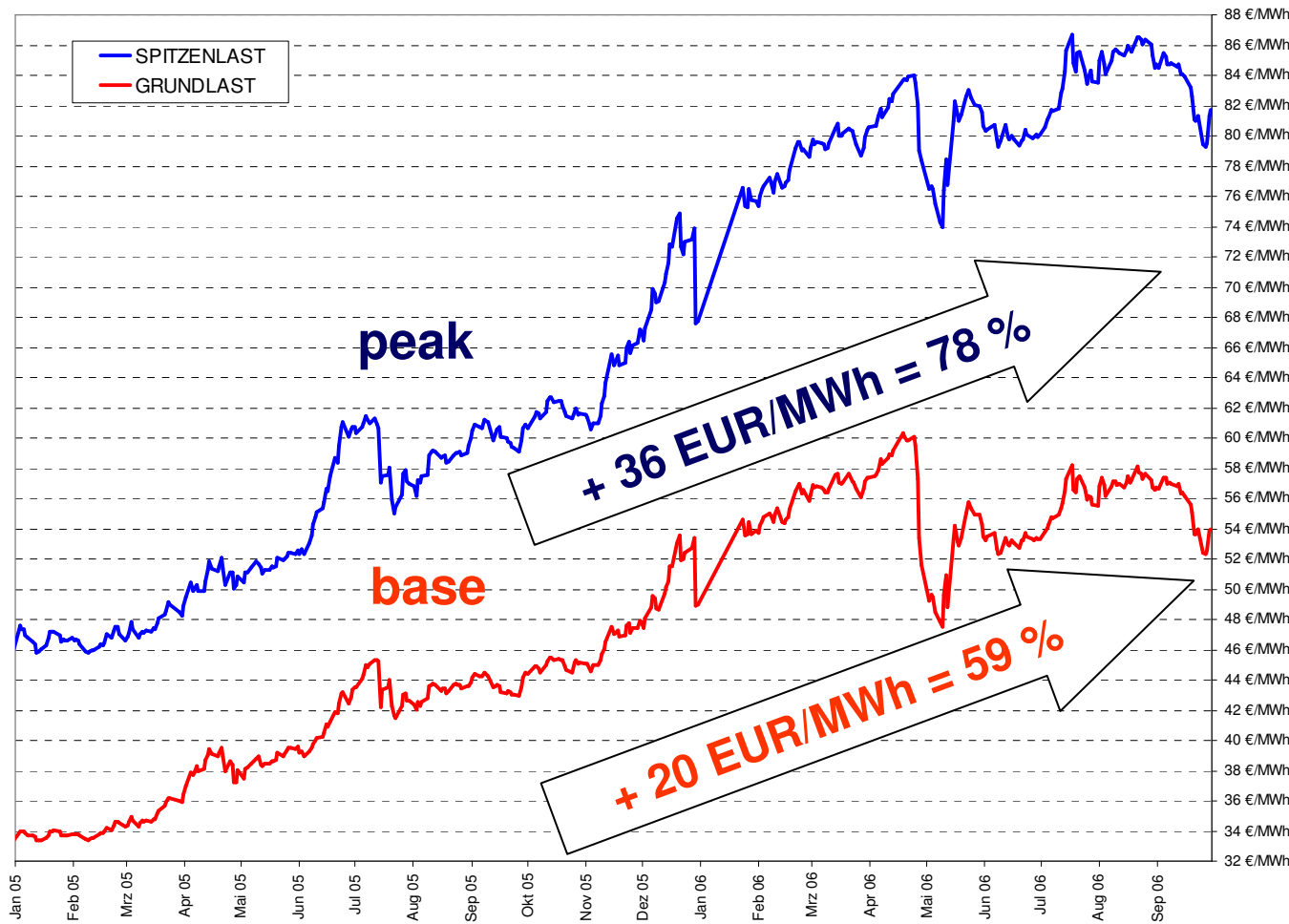


## CO2 Prices have been rising until April 2006 – further movements will be erratic



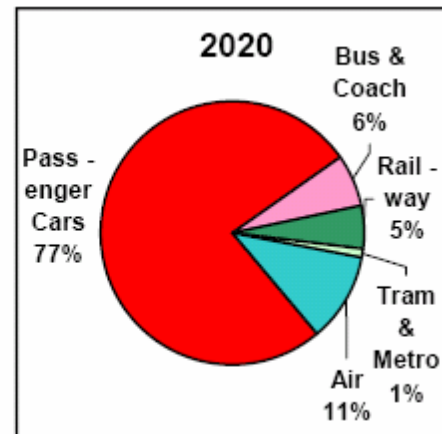
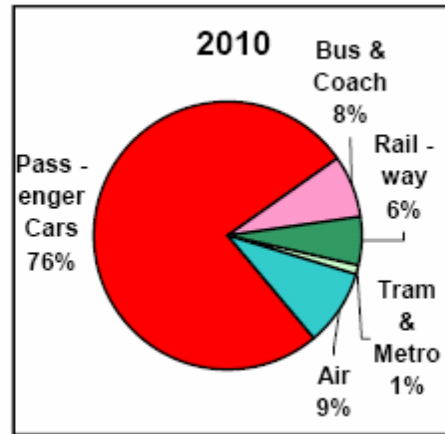
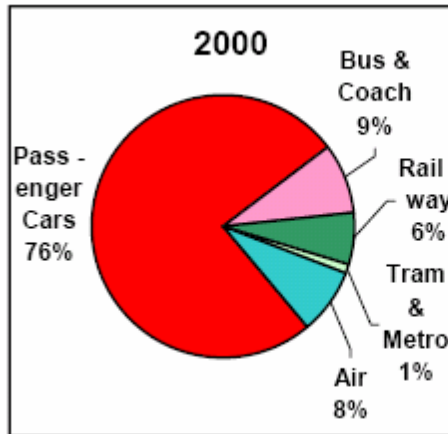
- **CO2 prices** have been rising strongly until 4/2006
- **Information leak:** EU is CO2 long in 4/2006
- **Prices for electricity** and CO2 are strongly correlating - according to electricity suppliers 1 €/tCO2 leads to 0,49 €/MWh electricity price
- Therefore ETS adds currently about 6-8 €/MWh to electricity prices

# Electricity Prices at EEX are drastically rising since the Introduction of Emissions Trading in 2005



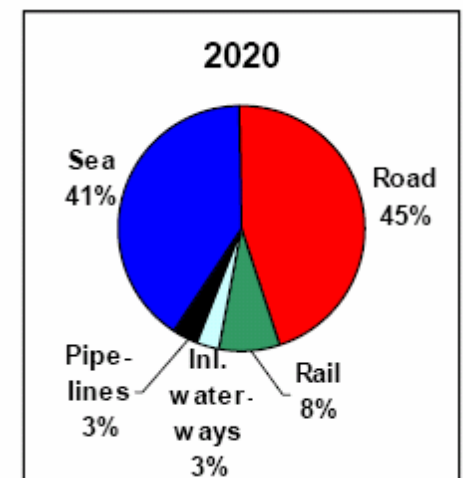
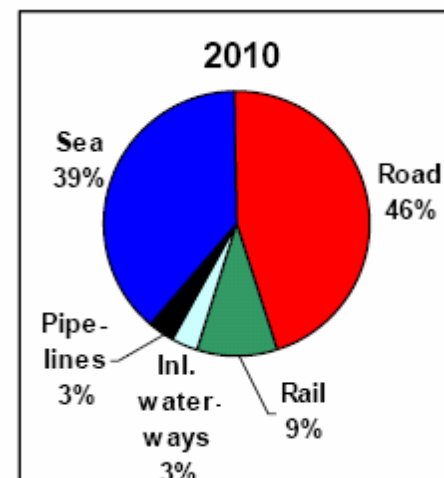
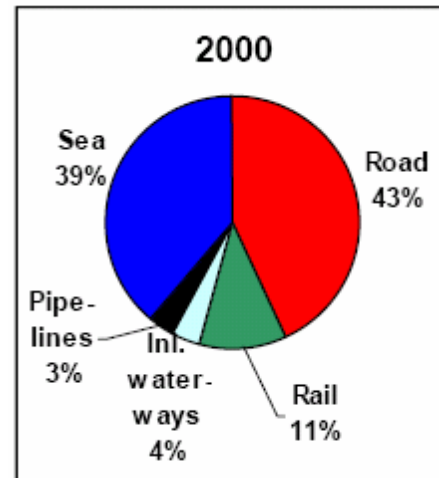
- **Electricity baseload price** for delivery next year in 10/2006 is at 54 EUR/MWh
- Price increase since 1/2005 by 20 EUR/MWh or 59%
- **Electricity peak load price** is at 82 EUR/MWh
- Price increase since 1/2005 by 36 EUR/MWh or 78%
- Are further increases inevitable?

# European Railways are under strong Market Pressure



- In **passenger markets** the share of **railways** will decline
- Market share of **cars** will grow
- Market share of **airplanes** will also grow

- In **freight markets** the share of **railways** is also expected to decline
- Market share of **road transport** will grow
- Market share of **sea transport** will also grow

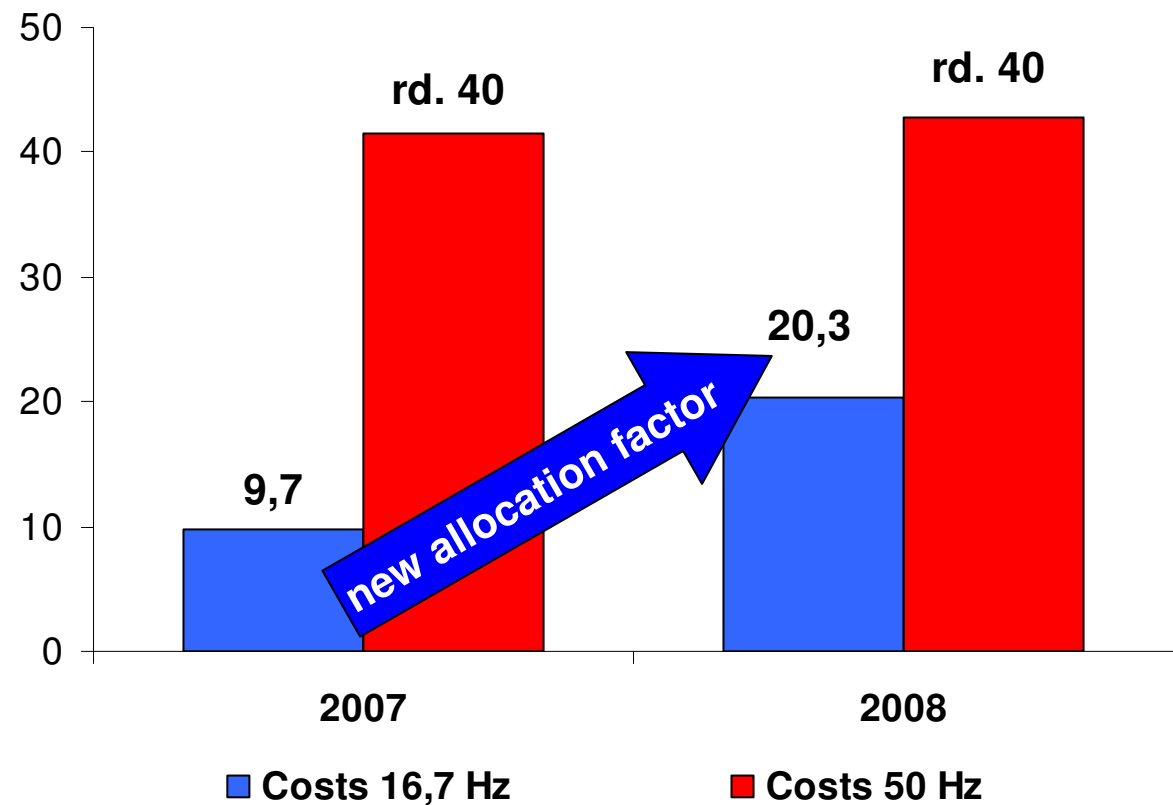


Source: Graph 2-3, 2-4 from EU Commission: Mid-term review of the Transport White Paper, 6/2006

# Due to NAP II the Costs of ETS for Railways could rise even further during 2008 - 2012

- **ETS leads to extra costs** for DB AG of 50 Mio. EUR/a during 2005-07
- According to the new allocation factor of the German **NAP II** the energy sector receives only 85% of needed certificates from 2008-12
- **Industry** receives 98,75% of needed certificates
- In case **power plants for railways** are treated like the energy sector, cost from ETS will rise by further 10 Mio. EUR per year
- Therefore railway power plants need to be treated like industry

**DB AG Costs from NAP II (Mio. EUR/a)**



# Cost to Railways from the European Emissions Trading Scheme need to be controlled

## Emissions trading



Electricity price shock

- Railways are heavily burdened by energy taxes and other energy levies
- Emissions trading leads to price shocks in the electricity markets
- Other transport modes are not effected by costs of emissions trading
- The 1. phase was a “learning phase”- the 2. phase of ETS needs to avoid discrimination of railways, by ...
  - Allocation of emission rights according to total demand to railway energy installations
  - Reimbursement of costs by decreasing other energy taxes for railways
  - Other means of financial compensation