

Technology Transfer: The Role of EU ETS and the Kyoto Mechanisms

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**Federal Ministry for the Environment, Nature Protection and Nuclear
Safety, Berlin**

on the occasion of the

**7th CTI Capacity Building Seminar
„Climate Technology and Energy Efficiency –
The Engine for Economic Growth and
Innovation“**

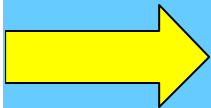
**21 - 25 October 2006
Leipzig, Germany**

Low-Cost Climate Protection

- **Emissions trading: an opportunity for a fundamental change in environmental policy.**
- **A new way of thinking: towards flexible structures – away from command and control.**
- **Climate change allows decentralised decision making: no longer are decisions on 'where', 'when', 'how', 'who' and 'how much' based on the state's limited informational horizon. It is the installation operators who now call the tunes.**
- **Market economy optimisation versus cost-intensive bureaucratic and rigid legislation. Reduces deficits in legislative implementation.**

Some Basics For A Better Understanding

- The objective of emissions trading is to reduce CO₂ emissions in the most cost-efficient way – „cap and trade“ and not „allocate and relax“
- This assumes price signals for business decisions made at decentralised level. The required price signal is arrived at from the reduction target (so called „cap“) and the nature of the individual structural elements.
- allocation of allowances free of charge is largely a matter of distribution.
- Significant competitive effects could result from free of charge allocation.
- Free of charge allocation causes a lot of serious problems and leads to suboptimal results and structures.



The EU Directive is policy-based and does not fully match eco-economic ideals.

The Cap

The Kyoto targets

Party	GHG – target
Austria, Belgium, Bulgaria, Danmark, Estonia, EU, Germany, Finland, France, Greece, Irland, Italy, Latvia, Liechtenstein, Luxembourg, Monaco, Netherlands, Portugal, Romania, Sweden, Swiss, Slovakia, Slovenia, Spain, Czech Republic, United Kingdom	minus 8 %
Croatia	minus 5 %
USA [1990 – 2004: + 19,4 % 2003 – 2004: + 1,4 %]	minus 7 %
Japan, Canada, Poland, Hungary	minus 6 %
Russia, Ukraine, New Zealand	+/- 0 %
Norway	plus 1 %
Australia – [1990 – 2004: + 40 % 2003 – 2004: + 4,3 %]	plus 8 %
Iceland	plus 10 %

The EU Bubble (EU15)

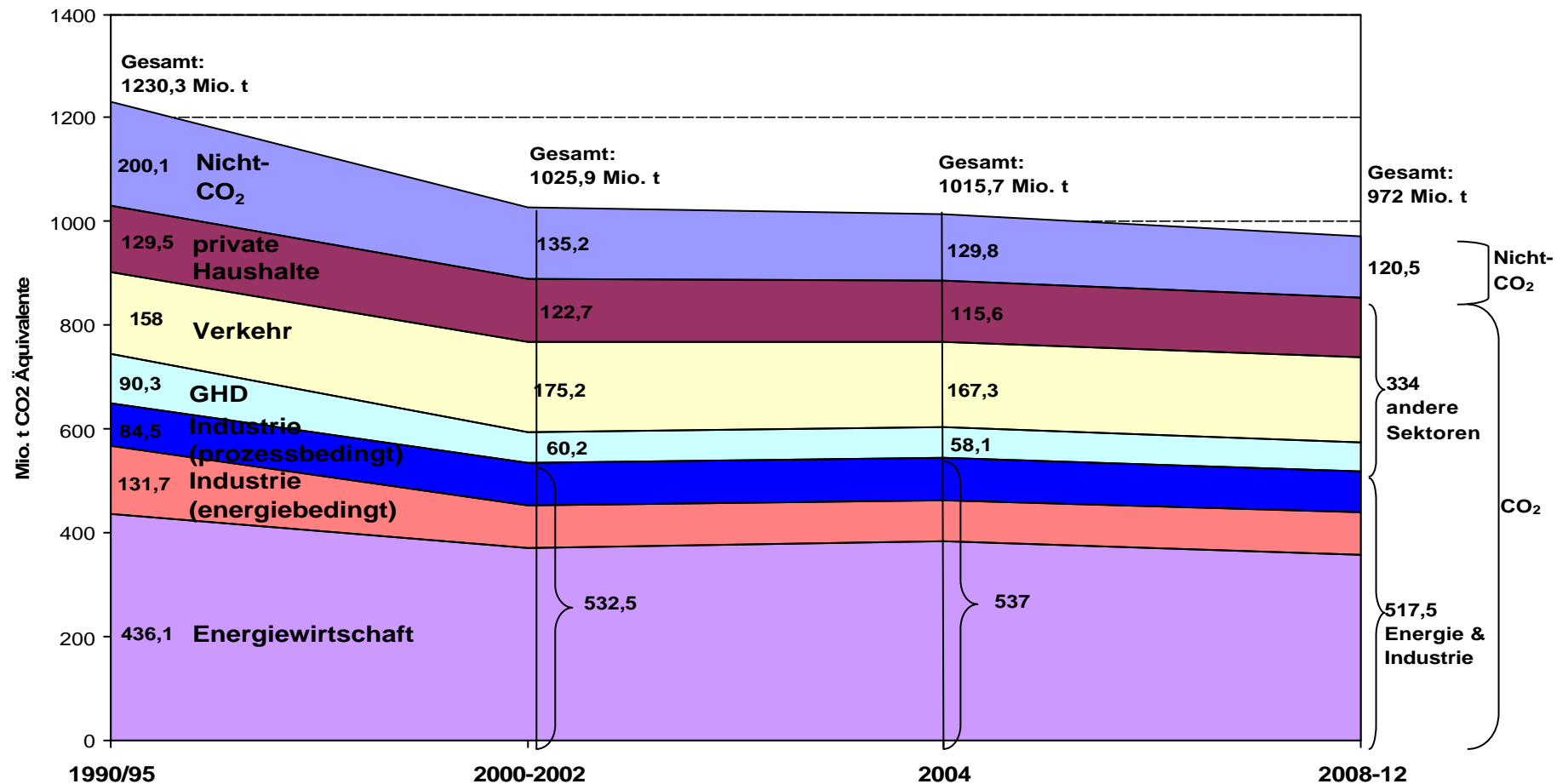
EU Member State	„burden sharing“ target
Luxembourg	- 28 %
Danmark	- 21 %
Germany	- 21 %
Austria	- 13 %
UK	- 12,5 %
Belgium	- 7,5 %
Italy	- 6,5 %
Netherlands	- 6 %
Finland	+/- 0 %
France	+/- 0 %
Sweden	+ 4 %
Ireland	+ 13 %
Spain	+ 15 %
Greece	+ 25 %
Portugal	+ 27 %
EU	- 8 %

Germany's Climate Change Programme: Targets and Timetables

Climate Change related Targets		Status
burden sharing	Reduction of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ by 21 % in the period 2008 – 2012 compared to 1990 and 1995	Ratification of the KP by national law
2020 target	Reduction of greenhouse gas emissions more than 30 % by 2020 on the condition that the EU agrees to a GHG reduction of 30 % by 2020 (base year 1990).	Contract of the black-red Coalition (2005)
Renewables	Doubling the share of renewables by 2010 to primary energy consumption from 2.4 to 5 % and by 2020 to 10 % to electricity generation from 5 % to 12,5 % and by 2020 to 20 %	Renewable Energy Act (2004)
CHP	Maintaining, modernising and expanding CHP with the aim of reducing CO ₂ by an additional 10 mill. t and 23 mill. t by 2010 (base year 1998)	CHP – Act (2001) + CHP commitment by German Industries (2001/2004)
Energy Efficiency	Doubling the energy productivity of the society by 2020 compared to 1990	National Strategy on Sustainable Development

Trends

Roads to comply with Germany's Climate Change target



Current emissions trends

- Trend in energy sector since 1999-2004: upwards: **plus 31 million t (!)**
- Trend in industry: further decrease in CO₂ emissions since 1998 – **minus 7 million t**
- Trend in private households: tendency towards reduction with very substantial temperature-related deviations (2004: **minus 14 million t compared with 1990**)
- Trend in transport sector: downward trend since 1999 with private transport (**minus 15 million t between 1999 and 2004**) but still 8.4 million t higher than in base year 1990
- Conclusion: Germany will not automatically reach its target (minus 21 % in period 2008-2012). Instead, decisions on NAP I and NAP II lead to need for action in remaining sectors “private households” and “transport”. The 2005 Climate Protection Programme (13th July 2005) covers areas where action is still needed

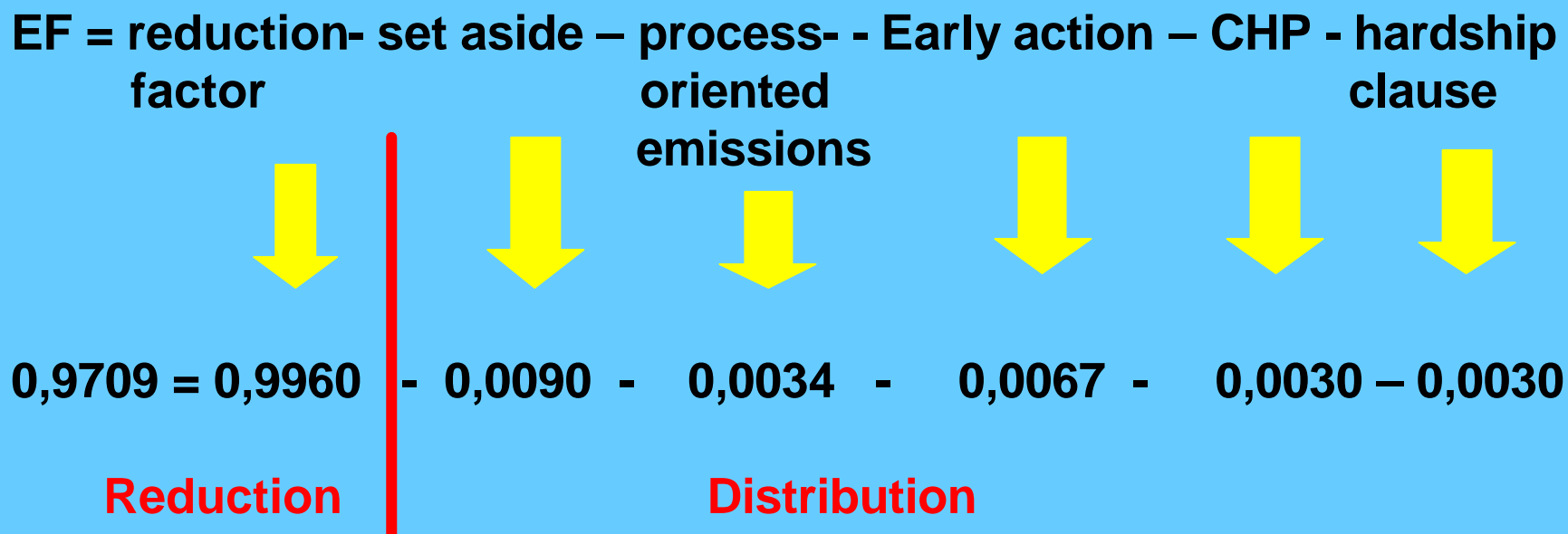
National Allocation – The Strategic Challenge

- **Numerous installations in the energy industry and energy-intensive production sectors – 1849 installations covered**
 - 99 % of CO₂ emissions in public electricity supply**
 - 96 % of CO₂ emissions in the industrial energy sector**
 - 87 % of process-related CO₂ emissions**
 - > 60 % of CO₂ emissions in all other industrial production installations**
- **ET sector represents 500 million t CO₂**
 - of which 250 million t CO₂ are concentrated among the four largest electricity and energy suppliers: E.ON, RWE, Vattenfall and EnBW.**

Reduction by German Industries?

Yes. But most of the compliance factor is due to distributional effects.

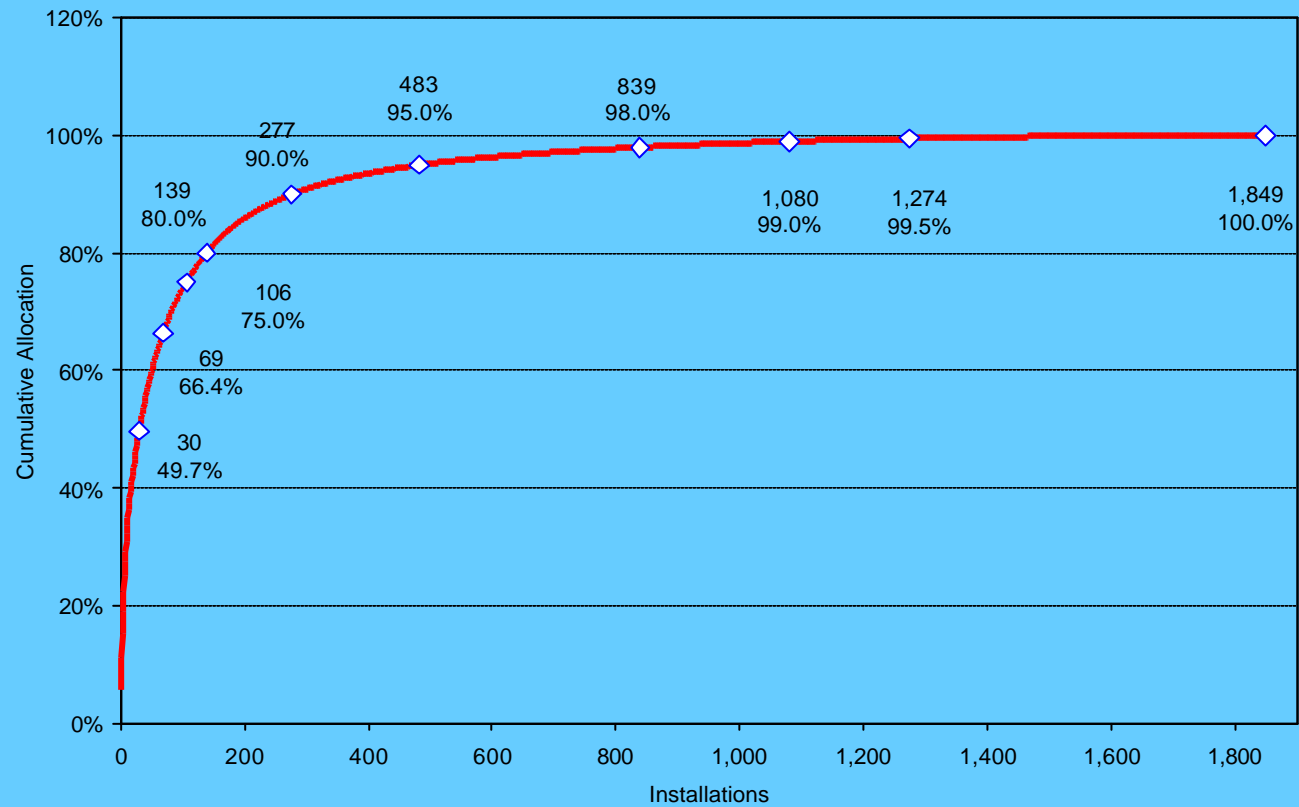
NAP 2005 - 2007



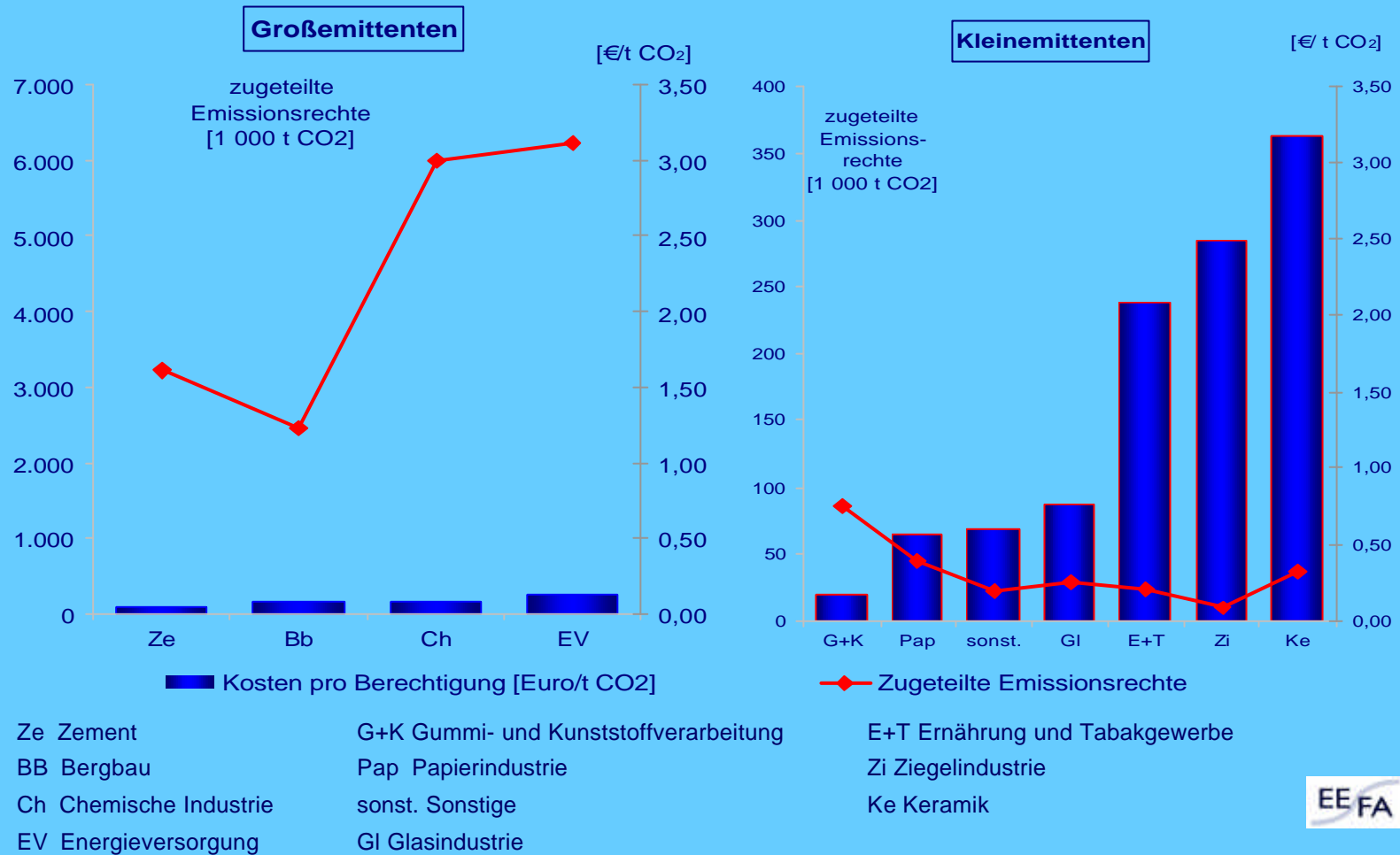
Results of the Allocation

Sektor	Number of Installations		Volume of allowance Trading Period 2005 – 2007	
Energy supply	1.236	66,8 %	1.171	78,9 %
Industry	613	33,2 %	314	21,1 %
total	1.849	100 %	1.485	100 %

Results of the Allocation



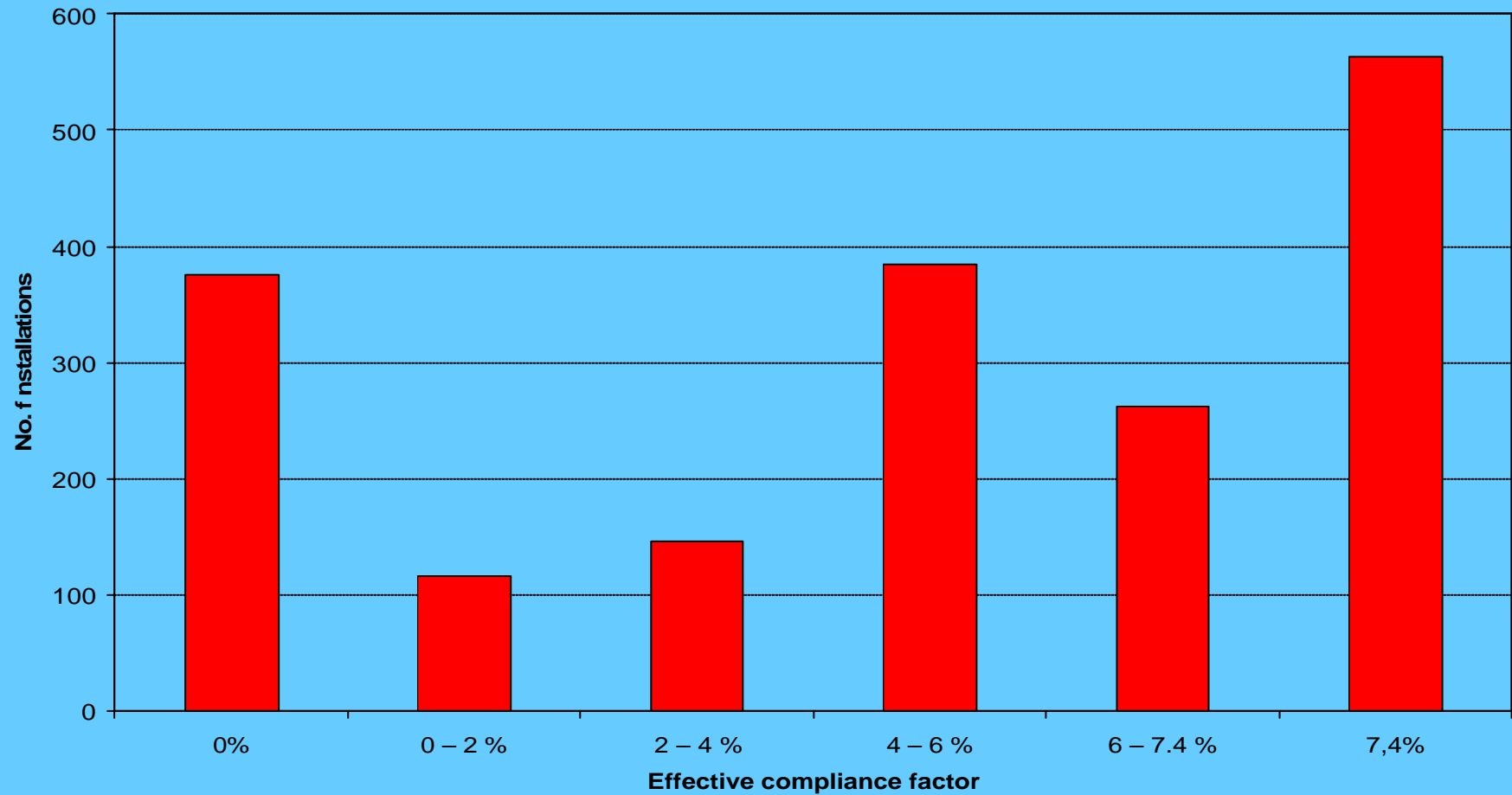
Transaction costs



Installations affected by cutbacks pursuant to Art. 4 (4) and Art. 5 ZuG2007

Cutback of allocation in %	No. of installations
0 %	376
0 – 2 %	116
2 – 4 %	146
4 – 6 %	385
6 – 7.4 %	262
7.4 %	564
Total	1,849

A unique Compliance Factor?



VET - table

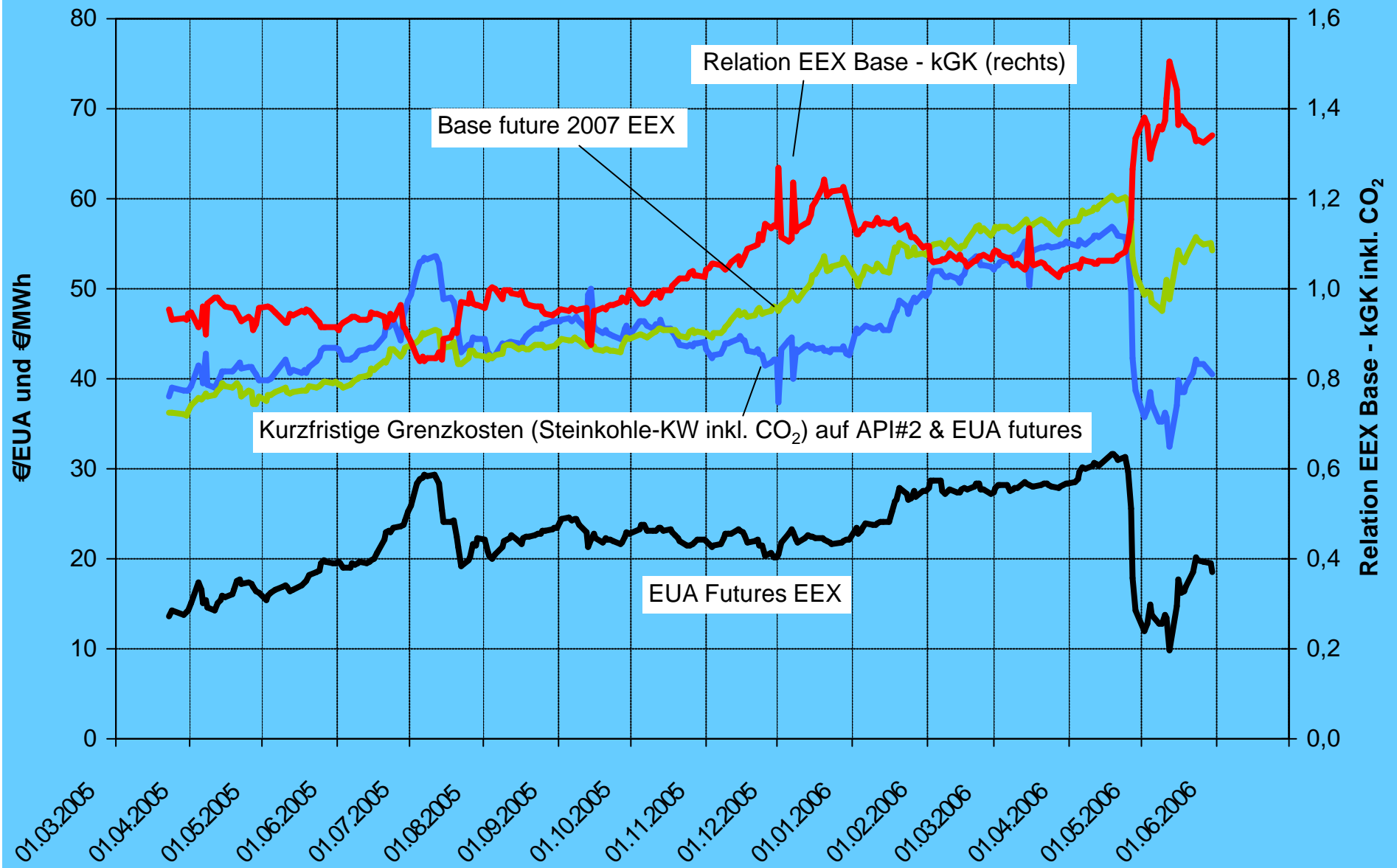
- 21 Mio. t gap between the 2005 allocation and the 2005 emissions
- 9 Mio. t reduction (2000/2002 – 2005)
- 12 Mio. t over allocation (option rule)
- more than 10 Mio. t could be taken back (withdrawal through ex post adjustment)
- RWE, E.ON, EnBW are „short“
- Vattenfall is „long“
- Local energy suppliers are „long“
- Industry ist „long“ (+ 10,6 %)

VET - table

Ranking	Sector/branch	Difference in absolute terms (- = surplus / + = deficit)	in % (- = surplus / + = deficit)
1	Fibre	- 1.179.000	- 81,4 %
2	Ceramics	- 667.500	- 27,7 %
3	Paper and pulp	- 785.500	- 15,7 %
4	Cement	- 3.661.500	- 15,4 %
5	Combustion installations 20 – 50 MW	- 1.532.700	- 15,4 %
6	Glass	- 685,700	- 14,9 %
7	Iron and steel	- 2.039.000	- 14,0 %

VET - table

Ranking	Sector/branch	Difference in absolute terms (- = surplus / + = deficit)	In % (- = surplus / + = deficit)
8	Compressor	- 248.000	- 13,2 %
9	Combustion installations	- 68.200	- 13,0 %
10	Lime	- 790.000	- 8,0 %
11	Iron and Steel	- 500.000	- 3,2 %
12	Combustion installations > 50 MW	- 7.503.000	- 2,0 %
14	Refineries	- 87.000	- 0,4 %



Benefits - Options

Cost-effective possibilities to reduce CO₂ in Germany !? The Ecofys - Study

Range of costs (€/t CO ₂ -reduction)	Reduction potential in mill. t CO ₂ /a
< - 10	23
- 10 bis 0	16
0 - + 10	16
+10 - + 20	15
+ 20 - + 50	19

Opportunities of CO₂- emission reduction in Germany (Lower Saxony – „co2ncept – study“ by the association of enterprises Lower Saxony)

Installations	Total CO₂-emissions	CO₂-emission reduction
59	780.000 t	
41		225.000 t = 28 % technically feasible
29		210.000 t < 10 €/t CO₂ Compared with the actual price of european allowances (EUA) companies mentioned above could benefit by reducing CO₂-emissions ~3 mio €/y

Federal Ministry for Economics and Labor:

„Marginal Costs of CO₂ – reduction are very much lower than 30 €/t“

(letter by Federal Minister Michael Glos, Berlin, 16 May 2006)

So – ET provides the right economic incentives to reduce greenhouse gases

Perspectives on NAP II

**Potential buyers and potential sellers –
action needed on the EU level**

buyers – sellers

Quelle: EUA, 2005

EU-Member State	GHG-emissions base year	GHG-emissions 2005	„burden sharing“	target 2008 - 2012	Distance to target in Mio. t	Distance to target in %
Belgium	146,9	150,2	- 7,5 %	135,9	- 14,3	- 9,5
Danmark	69,0	63,7	- 21 %	54,5	- 9,2	- 14,4
Germany	1230,3	993,6	- 21 %	972,0	- 21,6	- 2,2
Finland	71,2	69,8	+/- 0 %	71,2	+ 1,4	+ 1,9
France	570,8	562,8	+/- 0 %	570,8	+ 8,1	+ 1,4
Greece	108,8	136,5	+ 25 %	136,0	- 0,5	- 0,3
Ireland	55,6	69,9	+ 13 %	62,8	- 7,1	- 10,2
Italy	519,8	583,9	- 6,5 %	486,0	- 97,9	- 16,8
Luxembourg	12,7	14,2	- 28 %	9,2	- 5,0	- 35,4
Netherlands	213,0	219,8	- 6 %	200,2	- 19,6	- 8,9
Austria	79,0	94,1	- 13 %	68,7	- 25,4	- 27,0
Portugal	60,1	83,9	+ 27 %	76,4	- 7,5	- 9,0
Sweden	72,5	69,0	+ 4 %	75,4	+ 6,5	+ 9,4
Spain	287,2	441,6	+ 15 %	330,2	- 111,4	- 25,2
United Kingdom	764,5	657,6	- 12,5 %	668,9	+ 11,4	+ 1,7
total	4.261,4	4.210,4	- 8	3.918,2	- 292,3	- 6,9

Sellers - buyers

Quelle: EUA, 2005

EU Member State	GHG-emissions Basisjahr	GHG-emissions 2005	Kyoto target	Distance to target 2008 - 2012	Distance to target in Mio. t	Distance to target in %
Estonia	42,6	21,2	- 8,0	39,2	+ 18,0	+ 84,7
Latvia	25,9	10,8	- 8,0	23,8	+ 13,0	+ 119,9
Lithuania	50,9	20,8	- 8,0	46,9	+ 26,0	+ 124,8
Malta	2,2	3,2	-	-	-	-
Poland	459,8	387,0	- 6,0	432,2	+ 45,2	+ 11,7
Slovakia	73,4	52,4	- 8,0	67,5	+ 15,1	+ 28,7
Slovenia	20,2	20,1	- 8,0	18,6	- 1,4	- 7,2
Czech Republic	196,3	148,1	- 8,0	180,6	+ 32,5	+ 21,9
Hungary	122,3	84,8	- 6,0	114,9	+ 30,1	+ 35,5
Cyprus	6,0	9,0	-	-	-	-
Taotal Accession countries	999,6	757,7		923,7	+ 178,4	+ 23,9
total EU - 25	5.261,0	4968,0		4.841,9	- 113,9	- 2,3

Main stream on the EU Level

- **One Directive – but 25 National Allocation Plans**
- **Harmonisation strongly needed**
- **First come first served basis for new entrants**
- **Sectoral differentiation**
- **Auctioning used only in some MS (Ireland, Denmark, Hungary)**
- **Benchmarking for incumbents – without fuel differentiation (unique emissions factor – unique load factor)**
- **Not ex post adjustments**

Germany's starting point

The framework for NAP II

- **no modification of the EU Directive**
- **no ex post adjustment (NAP guidance - 22 december 2005)**
- **Coverage of additional installations**
- **Better reliability needed**
- **NAP II has to be more transparent**
- **NAP II has to be less complex**
- **Special provisions have to be reduced**
- **the Problem of the windfall profits caused by the calculation of the Opportunity – costs has to be solved**
- **Facilitation for small emitters**

The Contract of the black-red Coalition **(11th November 2005)**

- **more Transparency**
- **more Simplicity**
- **less comprehensiveness**
- **reducing of the number of special provisions**
- **Solving the opportunity costs problem**
- **Avoiding distortions of the competition**
- **Supporting the inclusion of the aviation**

Starting point - climate change targets

- **German reduction target for 2008-2012 within burden sharing agreement: - 21% compared to 1990/95**
- **achievement as of 2005: 19,2 %**
- **updated GHG-inventory has shown that additional action is necessary to reach the 21% target**
- **all sectors have to contribute to meet compliance gap**

NAP I: Lessons learned

- **Special allocation rules and options have lead to intransparency and missing calculability (especially because of „option rule“)**
- **high distributional effects, partly due to industry lobbying**
- **closure rule has not been effective**
- **transfer rule (replacement of installations) has not been used within first months**
- **more harmonisation on key aspects necessary (allocation rules, scope, etc.)**

The Macro Plan

- **Cap for installations under the Emissions Trading Scheme: 482 mio. t CO₂/a**
- **Cap includes small emitters and additional industrial-scale installation (nap guidance 22 december 2005)**
- **Reduction performance: households, transport, Trade/Commercial/Services: additional reduction of 7 mio. t/a CO₂ for the 2008 – 2012 trading period (base year 2004)**
- **Allocation method: grandfathering = allocation on the basis of average emissions during a reference period**
- **Reference period: 2000 – 2005 - levelling out of extraordinary developments**

Allocation for incumbents – NAP II

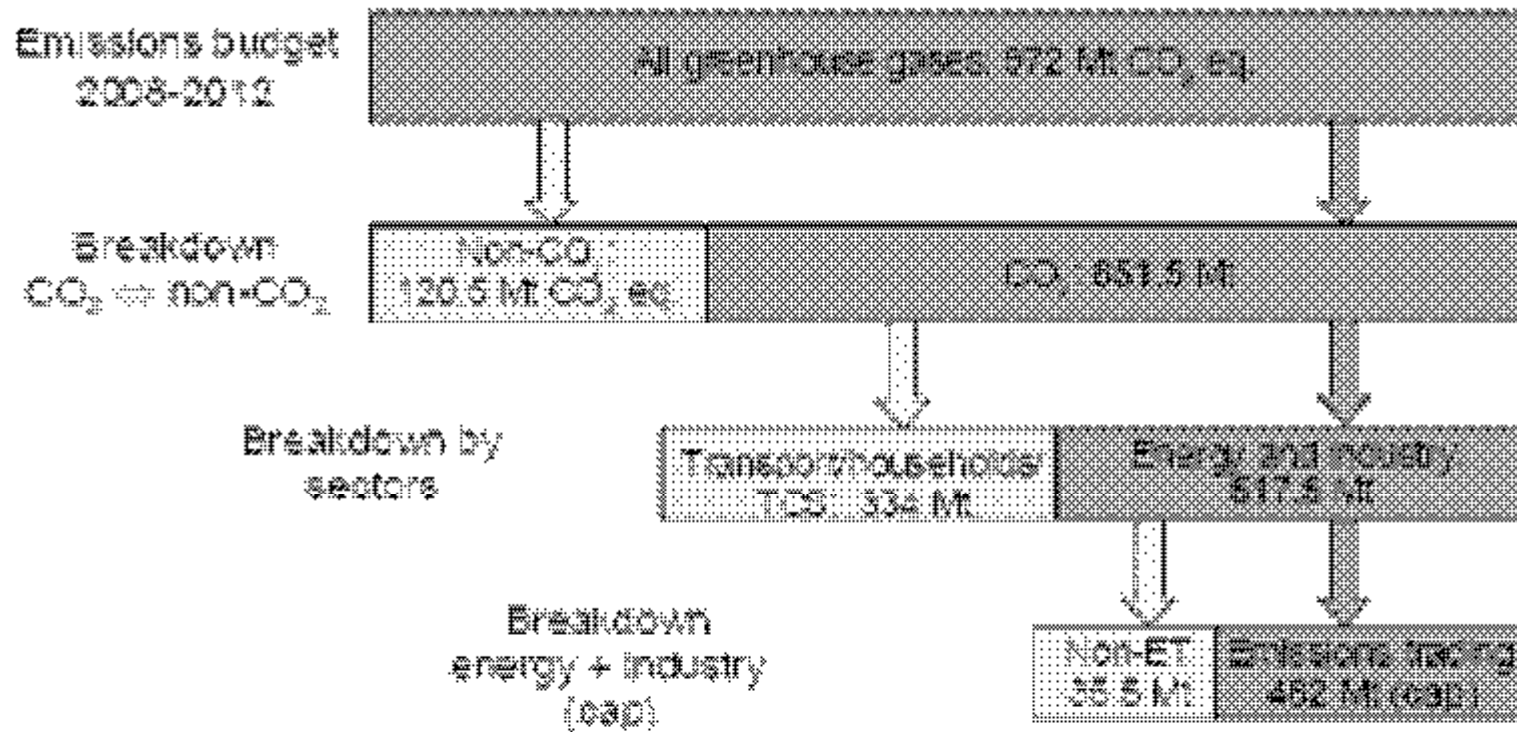
Starting point Cap NAP II	482 Mio. t
Minus additional installations (cracker usw.)	11 Mio. t
intermediate result	471 Mio. t
minus reserve (not available for incumbents)	12 Mio. t
Minus reserve for the compensation mechanism („KfW Mechanism – not available for incumbents)	5 Mio. t
Volume of allowances available for Incumbents	454 Mio. t
vet table 2005	474 Mio. t

20 to 41 mio. t. CO₂ less available compared to the first trading period!

NAP II: Macroplan: Cap

	Cap 2005-2007	Cap 2008-2012
Total cap	495 Mio. t/a	482 Mio. t/a including 11 Mio. t additional installations
Reserve	3 Mio. t/a	17 Mio. t/a
Budget for incumbents in 2005-2007	495 Mio. t/a	482 (total) -17 (reserve) -11(add. installations) = 454 Mio. t/a

NAP II: Macroplan target structure 2008-2012



NAP II: Macroplan –reduction efforts

necessary reduction efforts:

- **Energy and industry:**
 - in comparison to 2000-2002: 15 Mio. t CO₂/a
 - in comparison to 2004: 27,4 Mio. t CO₂/a
- **households and transport:**
 - in comparison to 2000-2002: 21,9 Mio. t CO₂/a
 - in comparison to 2004: 6,9 Mio. t CO₂/a

Compliance factor – sectoral differentiation

- **Industry including the additional installations (NAP guidance on 22 december 2005) and industrial and public CHP: 0,9875 of the average emissions amount in the reference period (reasons: strong international competition, limited possibilities to avoid CO₂-emissions because of process related emissions)**
- **Energy supply: 0,85 (low international competition, high windfall profits)**
- **Compliance Factor 1: small emitters, new entrants under the new comer rules (§ 8 ZuG2007 + § 11 ZuG2007), new entrants under the transfer rule, early action installations**

New entrants & replacement installations

New entrants:

- **100% free allocation for new entrants based on differentiated BAT-Benchmark (e.g. power production: coal: 750 g CO₂/kWh, gas: 365 g CO₂/kWh);**
- **one standard load factor of 7.500 h/a for new power stations**
- **no compliance factor for 14 years**

Replacement installations („transfer rule“):

- **100% free allocation for new installations that replace an existing installation;**
- **additional incentive for replacement of inefficient installations**
- **transfer of allocation from „old“ to replacement installation for 4 years**
- **after transfer period: 10 years no compliance factor;**

Reserve

17 Mio. allowances per year, of which

- **10 Mio. t/a as new entrants reserve**
- **5 Mio. t/a to cover the compensation mechanism as defined in § 6 Abs. 3 ZuG 2007**
- **2 Mio. t/a to cover administrative costs of the system, to be sold;**
- **in case of closures: allowances are transferred to reserve**

Special provisions

- **Process related emissions: sectoral differentiation takes process-related emissions into account – Compliance Factor hardly ambitious – no special process related emissions provision**
- **Small emitters: simplifying application and monitoring. Compliance factor 1 for emitters with average CO₂-emissions during the reference period lower than 25.000 t CO₂/a**
- **Option rule: waived**
- **Hardship clause (§ 7 (10) ZuG2007): waived**
- **Early action: early action rule of NAP I expires**
- **CHP: 98,75 % allocation (promotion of climate friendly technologies)**

Special provisions

- **Malus rule: continues**
- **Closure rule: Avoiding closure bonuses beyond the respective trading period – satisfactory solution to the problem of partial closure**
- **JI/CDM: threshold 12 % of the volume of allowances allocated for the whole trading period (300 Mio. t CO₂)**
- **No ex post adjustments**

Small installations

- **compliance factor = 1**
- **threshold: installations which emit less than 25.000 t CO₂/a in average of baseperiod 2000-2005**
- **simplification of application and monitoring process for small emitters**
- **opt-out for small installations not possible within ETS-Directive and NAP-Guidance:**
 - **important point for discussion for review process;**

Closure rule

- **Closure rule of NAP I not very effective;**
- **to be continued: no issuance of allowances in subsequent years if installation is closed;**
- **new: an installation is seen as closed if its average emissions in 2005-2006 are less than 20% of average in 2000-2004 (due to decrease in production);**

...under investigation in Brussels

- **ETS-cap 482 mio t/y**
- **timeframe for specific provisions (new comer rule, transfer rule 14 years)**
- **Transfer rule**
- **volume of the reserve**
- **KfW-mechanism**
- **Relationship between „E+I“ and „private households+transport+small consumers“**

The Kyoto Mechanisms

Use of CERs and ERUs in EU-ETS - I

- **The Linking Directive provides a bridge between the EU ETS and the Kyoto Mechanisms (CERs and ERUs could be used to meet the requirements under the EU ETS regime).**
- **With regard to the complementarity rule (significant level of domestic action: 50%) a cap on CERs and ERUs has to be taken.**
- **Germany has decided to determine this cap in NAP II next year.**
- **The Federal Government goes for 12% of the total allocation. This means 60 Mt p.a. for the optional use of CERs and ERUs or 300 Mt in the whole trading period 2008/12**
- **An important instrument is the KfW Carbon Fund, which has been created as a PPP-Fund. Public money (The federal Government provided 4 mill. € for renewable energies and for initiating the Fund).**

Project-based mechanisms **(JI/CDM)**

- **for EU ETS installations: use of JI/CDM possible in 2008-2012: 12% of individual allocation can be met through CERs/ERUs**
- **government will not buy credits**
- **but: government will support private companies' involvement in JI/CDM**
- **administration costs will mainly be financed from reserve**

The German Government's Position

- **Priority is given to 'domestic action,**
- **Use of 'Kyoto mechanisms' supplementary**
- **Great interest among German industry in the use of JI and CDM**
- **German Government interest is focussed on 'improved energy efficiency' and 'use of renewable energy, - a „CDM – Initiative“ will be started during the nex months**
- **Wait and see attitude due to the ongoing work in Bruxelles – reports on „sinks“ and „National Compensation Projects“ until 30th June 2006 (???)**
- **Germany not in compliance for JI First Track**

CDM works



Status: 09.06.2006

Registered projects:	356
Requested Registration:	75
Expected CERs:	600,000,000
Issued CERs:	16,767,110
Requested CERs:	18,570.805
Project pipeline:	> 1200
Expected CERs:	1,400,000,000

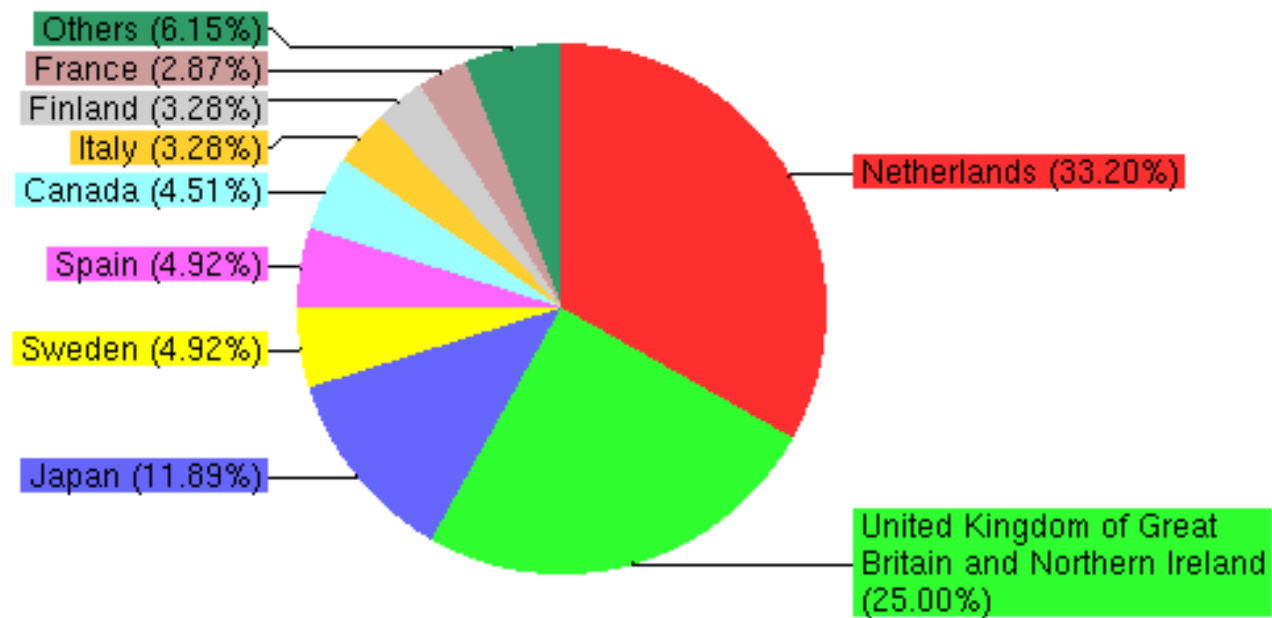
Anzahl der Projekte

J, NL, UK: 171

andere: 68

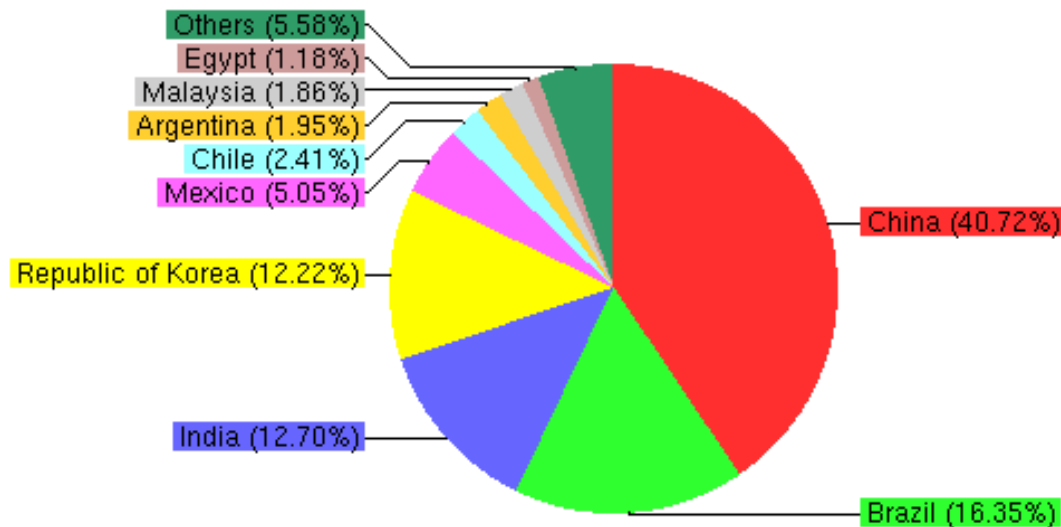
Deutschland 3

Registered projects by AI and NAI investor parties



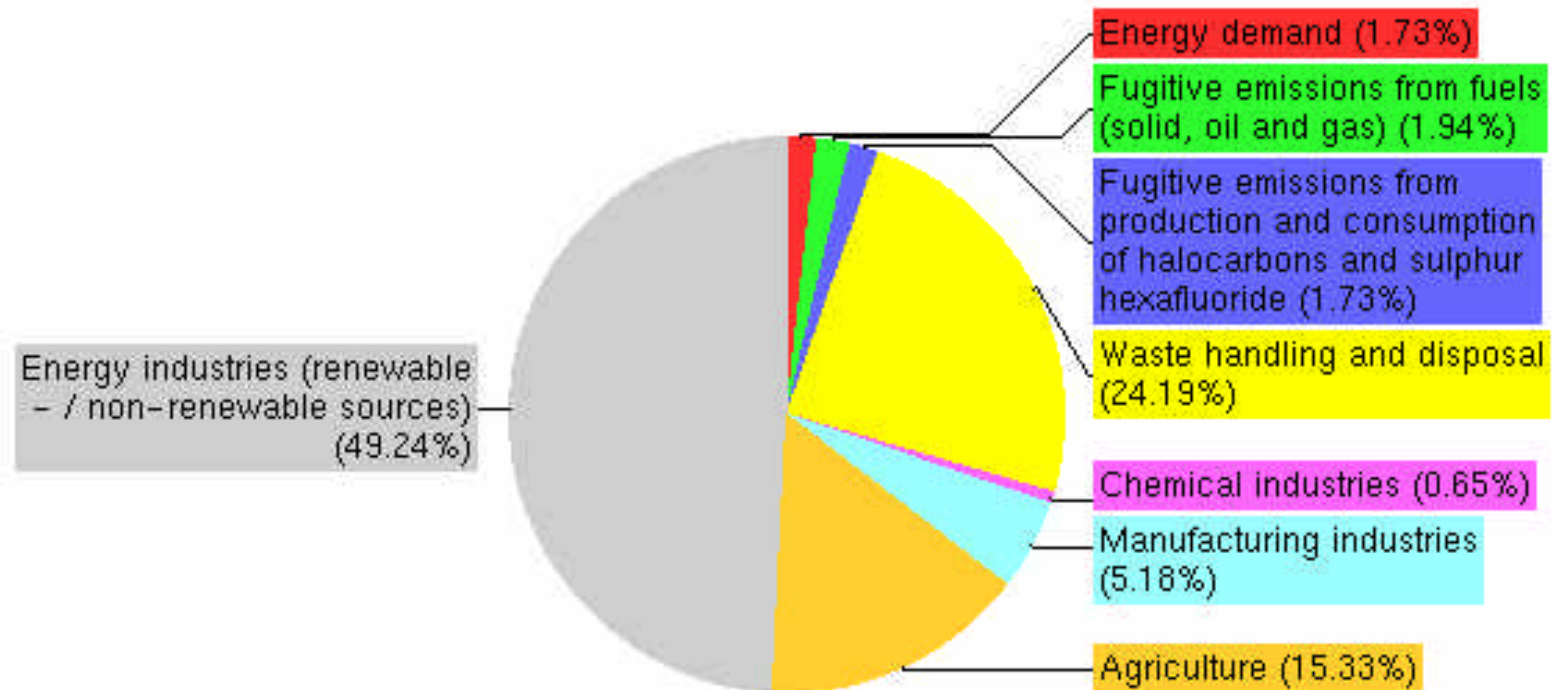
Supply side issues

Expected average annual CERs from registered projects by host party. Total: 90,697,347



- 82% of CERs from Brasil, China, Korea, India
- Excellent Opportunities in Latin American Countries
- Excellent Opportunities in Egypt, Morocco and Tunisia
- Numerous Countries in Africa are not present on the market

Distribution of registered project activities by scope



Price issues

- **Limited price data for CDM due to confidentiality of ERPAs. First quarter of 2006: estimated price average: \$ 11.00 ton CO_{2e}**
- **Factors affecting the price:**
 - Allocation of risk between buyer and seller
 - Creditworthiness of buyer
 - Political and sovereignty risk of seller
 - Ability of seller to deliver the CER's
 - Additional environmental/social benefits required from the project
- **The higher risk taken by the buyer, the lower the price offered – and vice versa for seller.**

Follow-up timetable

- **notification: 30 June 2006**
- **data collection: August-October 2006**
- **data evaluation: until beginning of November 2006**
- **Allocation Act (ZuG) 2012: December 2006**
- **final Allocation decision: September 2007**

PaMs for non-ETS sectors: transport (I)

Implemented in the German climate-protection programme (2000):

- **Ecological tax (Ökosteuer)**
- **Route-dependent road toll for trucks**
- **Emissions-based motor-vehicle tax**
- **Introduction of sulphur-free motor fuel**
- **The automobile industry's voluntary commitment to reduce average fuel consumption by 25 %**
- **CO₂-based labelling requirements**
- **National bicycle-transport programme**

These measures will remain in force in 2008-2012

PaMs for non-ETS sectors: transport (II)

Adopted by German Government in 2003-2005:

- **Revenue-neutral tax breaks for automobiles with low fuel consumption (potential reduction: 1 Mt CO₂)**
- **Introduction of emissions-dependent landing fees at German airports (0.5 Mt CO₂)**
- **Substitution of conventional motor fuels with biofuels (5 Mt CO₂)**
- **Substitution of F-gases in mobile air-conditioning units (0.5 - 1 Mt CO₂)**
- **Intensification of the "New driving" ("Neues Fahren") campaign (3 Mt CO₂).**

These measures will lead to an additional reduction of about 10 Mt CO₂ in comparison to the emissions forecast for the 2008-2012 period.

PaMs for non-ETS sectors: households

Implemented in the German climate-protection programme (2005):

- **Support programme (reduction of 2.8 Mt CO₂), including market incentives programmes for biomasse and solar systems, KfW programmes for the building sector**
- **Public awareness, advising, innovation (reductions of 0.7 Mt CO₂), including DENA competence center, training, contracting, research**
- **Regulatory measures (reduction of 0.4 Mt CO₂), including introduction of „energy certificates“ in the housing sector**
- **Independent effects (reduction of 1.3 – 1.5 Mt CO₂)**

These measures will remain in force in 2008-2012

PaMs for non-ETS sectors: agreed additional measures

Coalition Agreement of 11 November 2005:

- **Further increase in biofuels' share of transport fuels by mixing requirements that will apply as of 2007 (more CO₂-reduction contribution than was forecasted in the 2005 climate-protection programme)**
- **Expansion of the CO₂ building-modernisation programme (annual funding for this programme, over a period of four years, is to amount to 1.4 billion euros)**
- **increase of the use of renewables for heat-production**
- **further promotion of CHP**

Measures adopted with the 2000 and 2005 climate-protection programmes, along with these additional measures will suffice to meet updated target of 334 Mt CO₂ p.a. in 2008-2012 for the sectors of private households, transport and trade/commerce/services.

Thank's for listening

Current Information and Assistance

**Information on current developments, documents for download,
findings of the Working Group Emissions Trading As A Means To
Combating Climate Change:**

[http: www.bmu.de](http://www.bmu.de)

[http: www.umweltbundesamt.de/emissionshandel](http://www.umweltbundesamt.de/emissionshandel)