Centre for Energy and Environmental Markets

UNSW THE UNIVERSITY OF NEW SOUTH WALES SYDNEY • AUSTRALIA



EU National allocation plans

Lessons learnt

Content

- **EU ETS general rules**
  - Regulations
  - Basic rules
  - Regulated installations
  - Monitoring, verification and reporting
- **EU ETS allocation rules**
  - Allocation Criteria
  - EU Commission decisions on NAPs
  - New entrants and closures
  - Early Action
  - Cogeneration
  - Process related emissions
  - General assessment allocation rules
- **Lessons learnt**
- **Outlook**

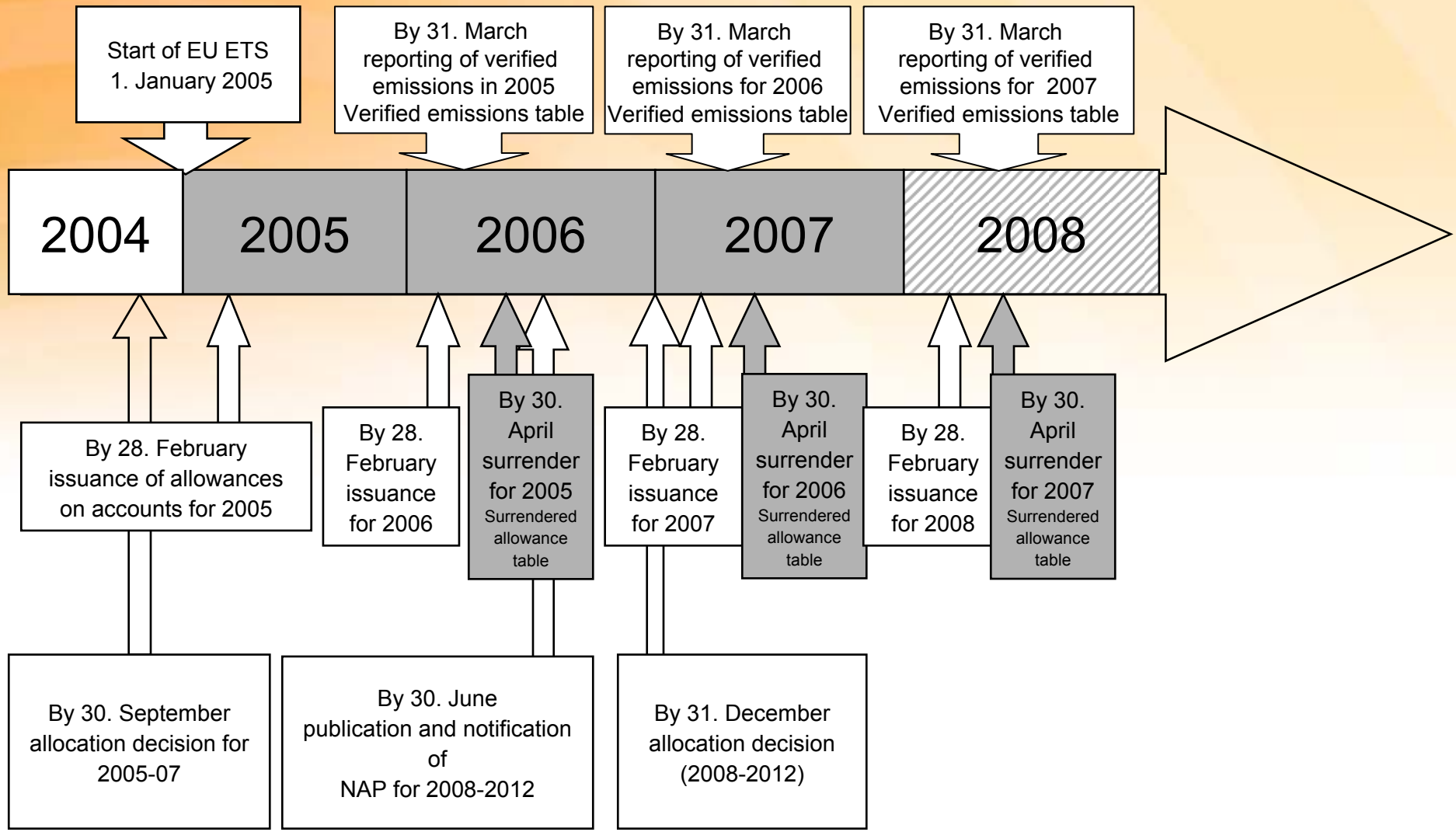
Brief overview on EU ETS

- A cap-and-trade type scheme …
- Operated in phases: 2005-07, 2008-12 etc.
- Covers initially direct CO_2 emissions of major emitting sectors (close to half of CO_2 emissions of EU) -> optionally from 2008 further GHGs
- Operators will need a permit for emitting CO_2
- Harmonised monitoring, reporting and verification of CO_2 emissions based on Monitoring Guidelines
- Harmonised financial sanctions for non-compliance (40 €/t in 2005-2007 / 100 €/t from 2008) + surrender missing allowances + public notification
- Links to project credits established
- Partially harmonised allocation rules: 95 % for free 2005-07 and 90 % in 2008-2012, rest to be auctioned

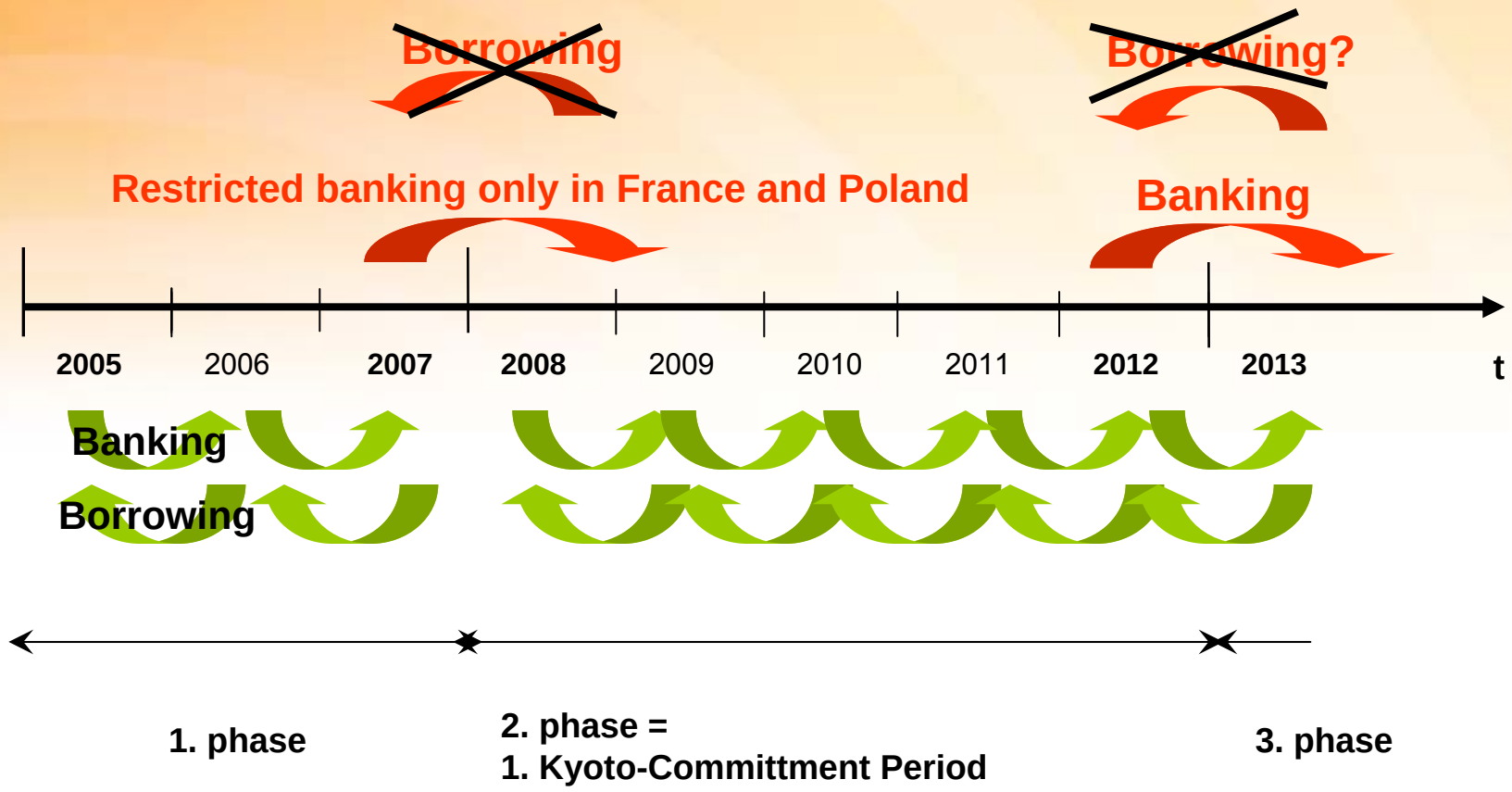
EU Regulations

- **EU ETS Directive** (2003/87/EG) entered into force 13th of Oct. 2003
- **EU Monitoring Guidelines** (2004/156/EC) entered into force on 29th of January 2004
- **EU Linking Directive** (2004/101/EC) with JI and CDM entered into force 27th of Oct. 2004
- **EU Registry Regulation** (2004/2216/EC) entered into force 21st of Dec. 2004 (119 pages!)

See:
http://europa.eu.int/comm/environment/climat/emission/implementation_en.htm


Start of EU ETS
1. January 2005
By 31. March
reporting of verified
emissions in 2005
Verified emissions table
By 31. March
reporting of verified
emissions for 2006
Verified emissions table
By 31. March
reporting of verified
emissions for 2007
Verified emissions table
2004
2005
2006
2007
2008
By 28. February
issuance of allowances
on accounts for 2005
By 28.
February
issuance
for 2006
By 30.
April
surrender
for 2005
Surrendered
allowance
table
By 28.
February
issuance
for 2007
By 30.
April
surrender
for 2006
Surrendered
allowance
table
By 28.
February
issuance
for 2008
By 30.
April
surrender
for 2007
Surrendered
allowance
table
By 30. September
allocation decision for
2005-07
By 30. June
publication and notification
of
NAP for 2008-2012
By 31. December
allocation decision
(2008-2012)

Banking and Borrowing



Regulated Installations I

Annex I of the EU ETS Directive:

The threshold values given below generally refer to production capacities or outputs. Where **one operator** carries out several activities falling under the same subheading in the **same installation or on the same site**, the capacities of such activities are **added together**.

- *Energy activities*
  - **Combustion installations** rated thermal input **exceeding 20 MW** (except hazardous or municipal waste installations)
  - **Mineral oil refineries**
  - **Coke ovens**
- *Production and processing of **ferrous metals***
  - Metal ore (including sulphide ore) roasting or sintering installations
  - Installations for pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2,5 t per hour
- *Other activities*
  - Industrial plants for the production of
    (a) **pulp** from timber or other fibrous materials
    (b) **paper** and board with a production capacity exceeding 20 t per day

Regulated installations II

- *Mineral industry*
  - Installations for the production of **cement clinker** in rotary kilns with a production capacity exceeding 500 t per day or
  - **lime** in rotary kilns, production capacity> 50 t per day or in other furnaces with a production capacity exceeding 50 t per day
  - Installations for the manufacture of **glass** including glass fibre with a melting capacity exceeding 20 t per day
  - Installations for the manufacture of **ceramic products** by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 t per day, and/or with a kiln capacity exceeding 4 m3 and with a setting density per kiln exceeding 300 kg/m3

Flexibility: Opt-in, Opt-out, Pooling

- **Opt-in (Art. 24):** frequently used e.g. Scandinavia (SE, FI) for CHP installations, SI installations 15 -20 MW, LV optional, AT for 1 installation.
- **Opt-out (Art. 27):**
  - NL: < 25kt CO_2 p.a. other installations not covered in other MS
  - GB: for installations covered by UK ETS until 2006
  - PL*: < 5kt CO_2 p.a
  - BE*: natural-gas compression plant, natural-gas transportation, military installations, combustion installation for heating purposes, emergency standby and safety installations for nuclear power plants
  - CZ*: installation with respect to JI projects
- **Pooling (Art. 28)**: mostly allowed, application needed. No overall picture so far on use, but it seems little.

* Not approved by European Commission (August 2005)

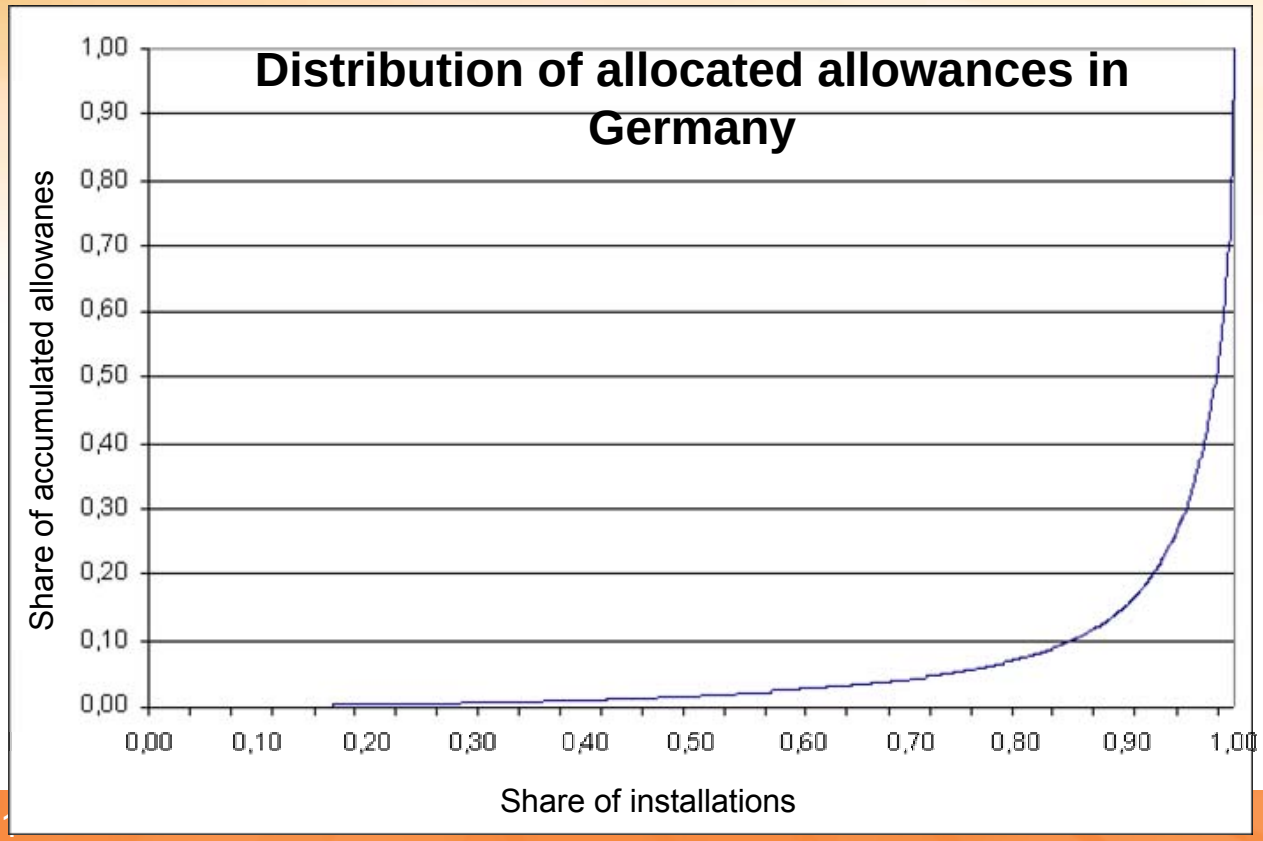
Coverage

Member State	CO_2 allowances in mio. tonnes	Share in EU allowances	Installations covered	Kyoto target
Austria	99.0	1.5 %	205	-13%*
Belgium	188.8	2.9 %	363	-7.5%*
Czech Republic	292.8	4.4 %	435	-8%
Cyprus	16.98	0.3 %	13	-
Denmark	100.5	1.5 %	378	-21%*
Estonia	56.85	0.9 %	43	-8%
Finland	136.5	2.1 %	535	0%*
France	469.5	7.1 %	1,172	0%*
Germany	1,497.0	22.8 %	1,849	-21%*
Greece	223.2	3.4 %	141	+25%
Hungary	93.8	1.4 %	261	-6%
Ireland	67.0	1.0 %	143	+13%*
Italy	697.5	10.6 %	1,240	-6.5%
Latvia	13.7	0.2 %	95	-8%
Lithuania	36.8	0.6 %	93	-8%
Luxembourg	10.07	0.2 %	19	-28%*
Malta	8.83	0.1 %	2	-
Netherlands	285.9	4.3 %	333	-6%*
Poland	717.3	10.9 %	1,166	-6%
Portugal	114.5	1.7 %	239	+27%*
Slovak Republic	91.5	1.4 %	209	-8%
Slovenia	26.3	0.4 %	98	-8%
Spain	523.3	8.0 %	819	+15%
Sweden	68.7	1.1 %	499	+4%*
United Kingdom	736.0	11.2 %	1,078	-12.5%*
Total	**6,572.4**	**100.0 %**	**11,428**	

- Opt-out/ opt-in not included
- Burden-sharing agreement for EU-15
- Malta, Cyprus have no Kyoto targets

Proportion of covered installations

- Germany: (1) 85% of allowances are allocated to top 10% of installations (2) 50% of small installations only receive 1.6% of total allocation
- In other EU countries similar experiences (EU without Germany): (1) 33 % of installations are responsible for 0,7 % emissions (2) 55 % of installations for 2,6 %



- High costs for industry and government!
- Thresholds have to be chosen carefully!

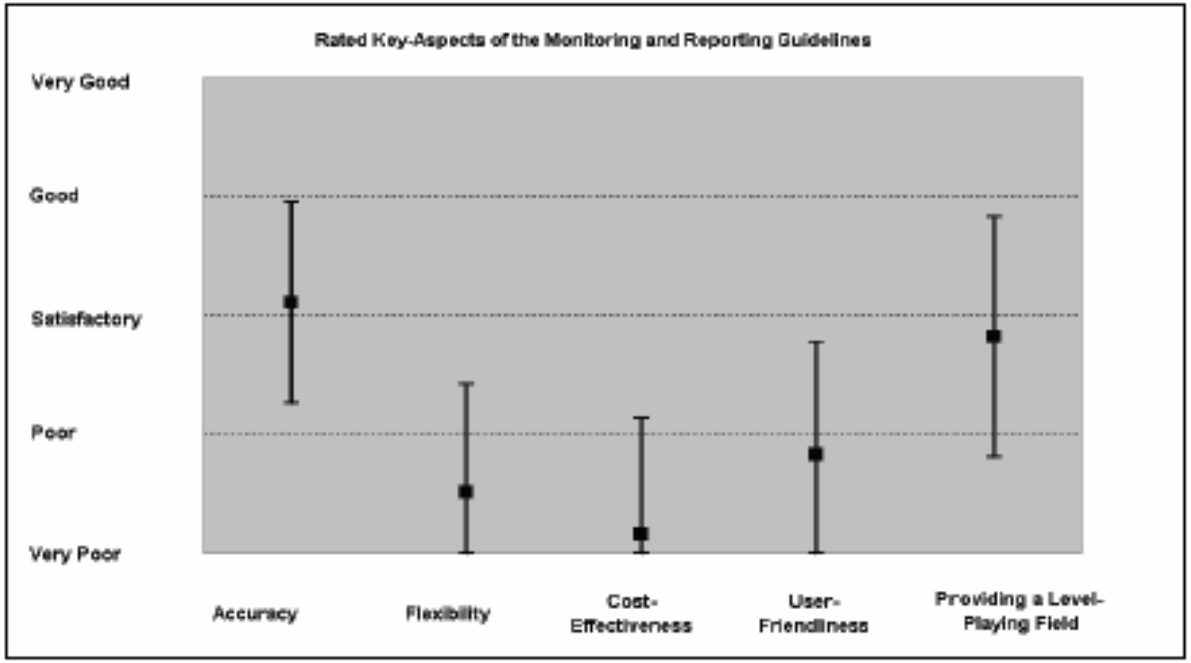
Lessons Learned – Coverage

- ET sector typically covers 30-50 % of national GHG emissions
- EU-25: about 11.000 installation will be covered, not 4,000 – 5,000 as stated in the introduction of the EU ETS directive proposal
- Range from 2 (Malta) to 1,849 (DE); Median: 140, Average: 197
- Definition of Annex I was not precise enough, differences in interpretation of "combustion" installation
  - DE, PL, LU: steam crackers & melting furnaces not included
  - I, E, F: combustion installations from industry not included: now changed!!
- Aggregation provisions of Annex I have been differently applied
  - Mostly based on IPPC permit (one permit / different permits)
- Despite a "non-paper" of the Commission, differences remain. ->Unequal treatment of otherwise equal installations may lead to competition distortion (in addition to differences in stringency of targets)
- Broad interpretation will lead to a huge number of installations covered
- Discussion of thresholds (de minimis rule) for 2nd period

Monitoring and Reporting Guidelines: Tier Approach

- Tier is a specific methodology for determining **activity data**, **emission factors** and **oxidation or conversion factors**. Several tiers form a hierarchy of methodologies.
- Increasing numbering of tiers from 1 upwards reflects increasing levels of accuracy
- Highest numbered tier is preferred tier, but in 2005-2007 tier depends on historic emissions:
  - < 50,000 t CO_2e - lower tiers
  - 50,000 – 500,000 t CO_2e – higher tier
  - > 500,000 t CO_2e – highest tiers
- Only if the highest tier approach is technically not feasible or will lead to unreasonably high costs a next lower tier may be used
- Greenhouse gas emissions permits will contain monitoring requirements (tier), specifying monitoring methodology and frequency.
- **Basic formula: CO_2-emissions = activity data (TJ) * emission factors * oxidation factor**

Evaluation of M & R Guidelines



Accuracy: Do the requirements in the MRG contribute to ensure a high level of accuracy?

Flexibility: Do the guidelines reflect the special circumstances of the installations?

Cost-Effectiveness: Can the requirements of the guidelines be implemented without excessive costs?

User-friendliness: Are the guidelines comprehensible and well structured for implementation?

Providing a level playing field: Are comparable installations treated equally without prejudicing certain types of installations?

Figure 1 Rated Key- Aspects of the Monitoring and Reporting Guidelines

Lessons learnt – Monitoring/Verification

Timing problem- Monitoring:

- Permit and tiers haven't been fixed when calculating historic emissions for allocation -> uncertainty ↑
- Difference in data quality for historic and future emissions data
- Solution: Start early - Monitoring guidelines should be I place before base year

High costs:

- Data collection for historic data twice in Germany -> high costs for industry and government
- The requirement to measure fuel consumption without intermediate storage before combustion in the installation is increasing the costs without sometimes improving accuracy
- Individual determination of flexibility/cost-effectiveness -> ↑uncertainty, transaction costs and distortions between MS
- Solution: assessment of the cost implication before setting requirements, Commission providing further guidance for interpretation of cost-effectiveness (e.g. threshold) better differentiation between small and large emitters, no direct involvement of verifiers in setting up the rules (conflict of interest)

Timing problem - Verification:

- Quick accreditation of verifiers / poor quality / no training
- Solution: Verification requirements are needed – international verification standard was missing -> ISO 14064 will most likely be published in 2006
- Verification process needs starting up-time

Allocation of the CO_2 cap

Allocation

- The basic questions are …
  - … how many allowances …
  - … go to whom …
  - … how?

In theory: allocation does not impact on efficiency

In reality: allocation significantly impacts on efficiency

Allocation Criteria (Annex III of Directive)

Consistency with:

(1) Burden-Sharing Agreement & national climate program
(2) assessments of historic and projected emissions development to achieve required targets
(3) potential to reduce emissions, including technical potential
(4) other EU legislative and policy instruments
(5) non-discrimination between companies or sectors

Information on:

(6) treatment of new entrants
(7) whether & how early action is accounted for
(8) how clean technologies are taken into account
(9) how public was included in process
(10) how competition from outside the EU is accounted for
(11) list of installations with intended allocation

Guidance document published on how to interpret the criteria

http://europa.eu.int/eur-lex/en/com/cnc/2003/com2003_0830en01.pdf

Macro-Level Allocation

Typical two-step approach

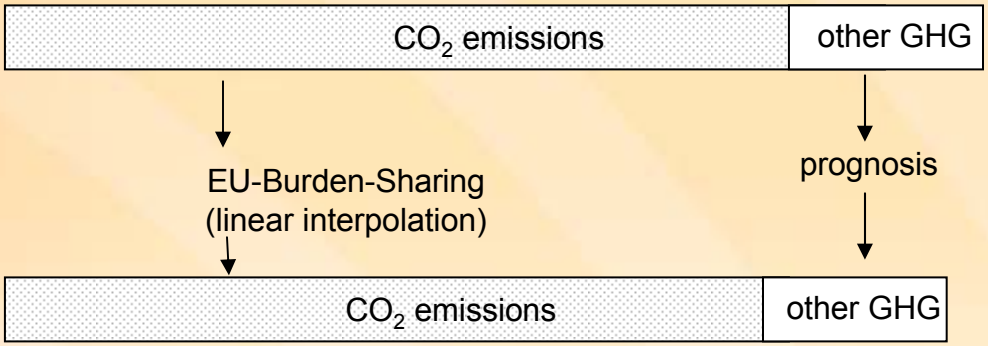
- macro-level allocation defines total target for entire ET-sector or sub-sectors
- micro-level allocation governs allocation of allowances to installations
- apply mathematical "compliance factors" (<1.0) to guarantee consistency or use production share
- in new EU-MS cap is the outcome of installation-level allocation

Macro level allocation

- most MS use “with measures scenarios” to determine targets for 2005-07 for ET- and Non-ET-sector (only few MS like DE and NL include targets for household or transportation sector)
- heavy use of ERUs and CERs for 2008-12 in many EU-15 MS
- voluntary agreements used in GB and NL, BE (GER 15 Mt CO_2 lower)
- Some MS e.g. IR use cost-optimization approach
- most MS specify sub-sector targets (GB, IR, AT)
- reduction targets vary: trade-exposed industry < electricity sector (incl. renewable target)

Macro level

1. GHG emissions 2000-02



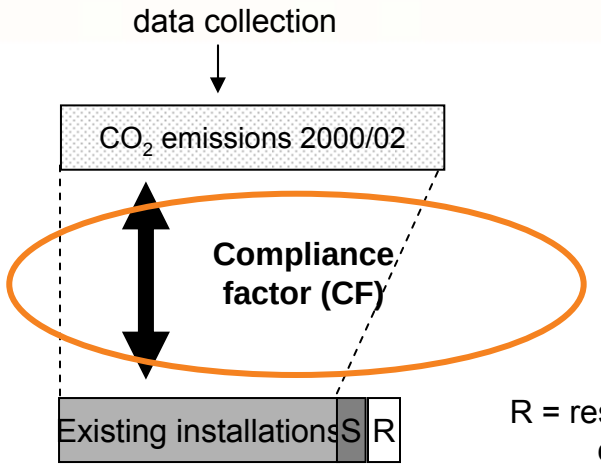
2. GHG emissions budget 2005-07

Targets

3. CO_2 emissions budget for sectors 2005-07

Micro Level

4. Sum of average CO_2 emissions 2000-02

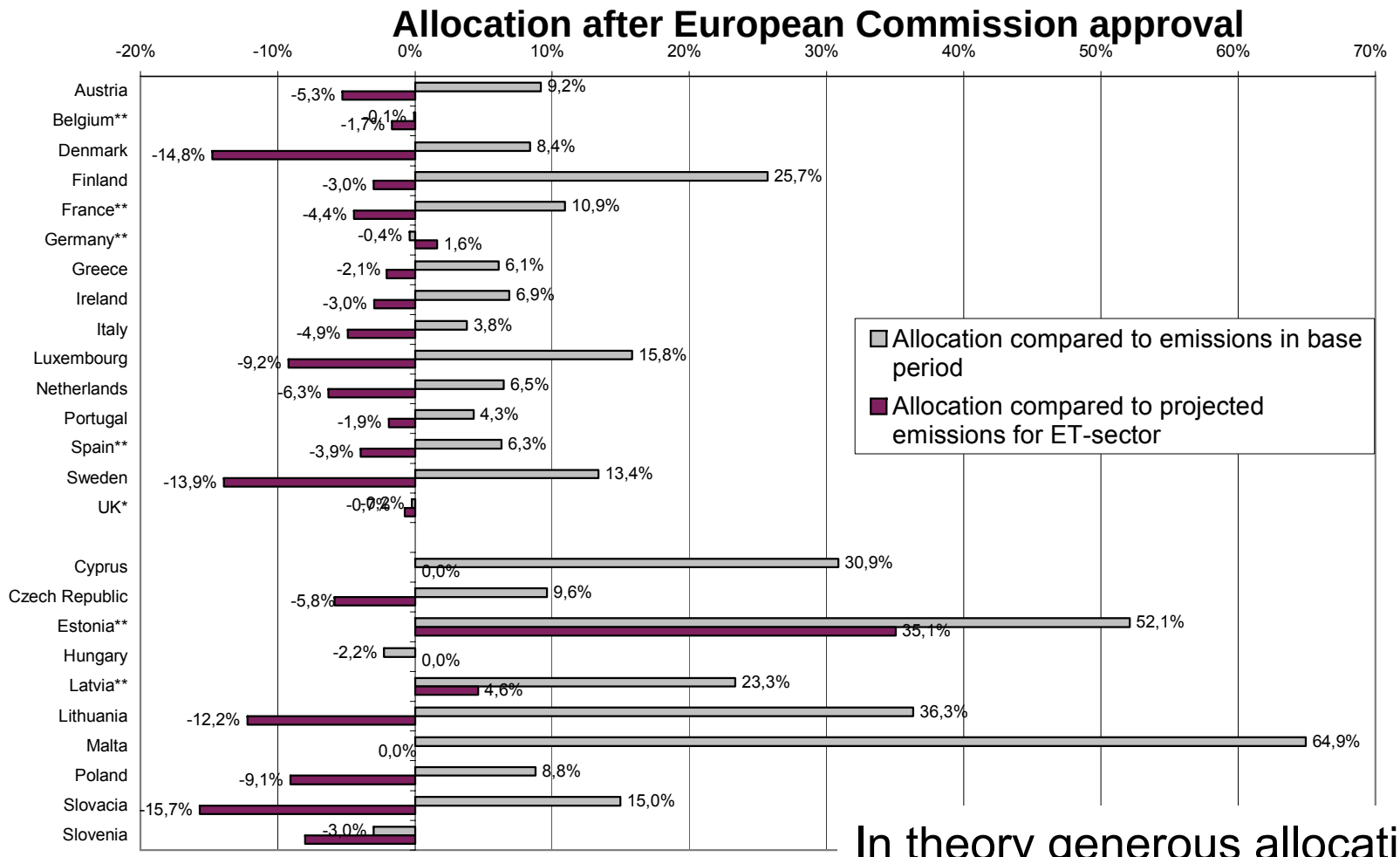


5. CO_2 emissions budget 2005-07 for covered installations

R = reserve for new comers
S = special features

Macro-level: ET-sector-budgets

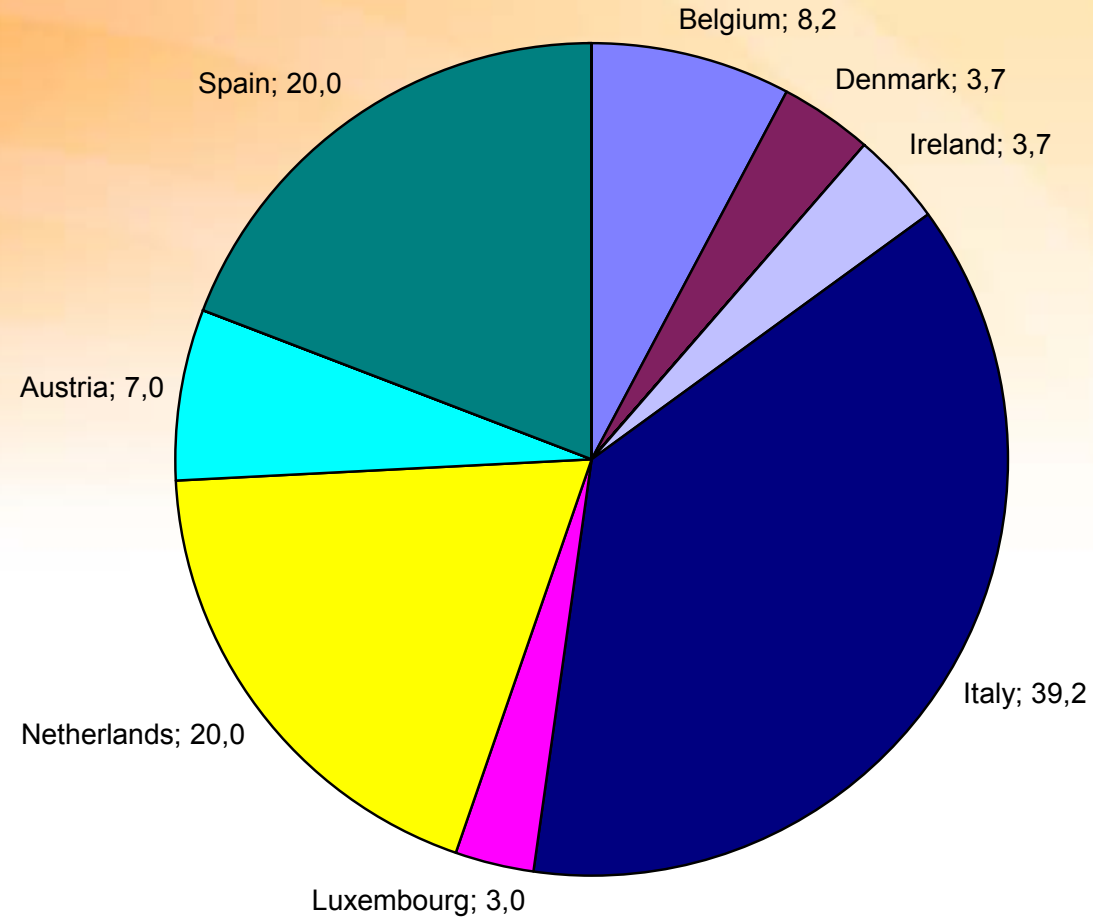
ALLOCATION FOR THE EMISSIONS TRADING SECTOR IN COMPARISON TO EMISSIONS PROJECTIONS (2006) AND HISTORIC EMISSIONS (BASE PERIOD) (%)



In theory generous allocation should lead to low prices!

* Old UK figures from 1st NAP ** own estimates

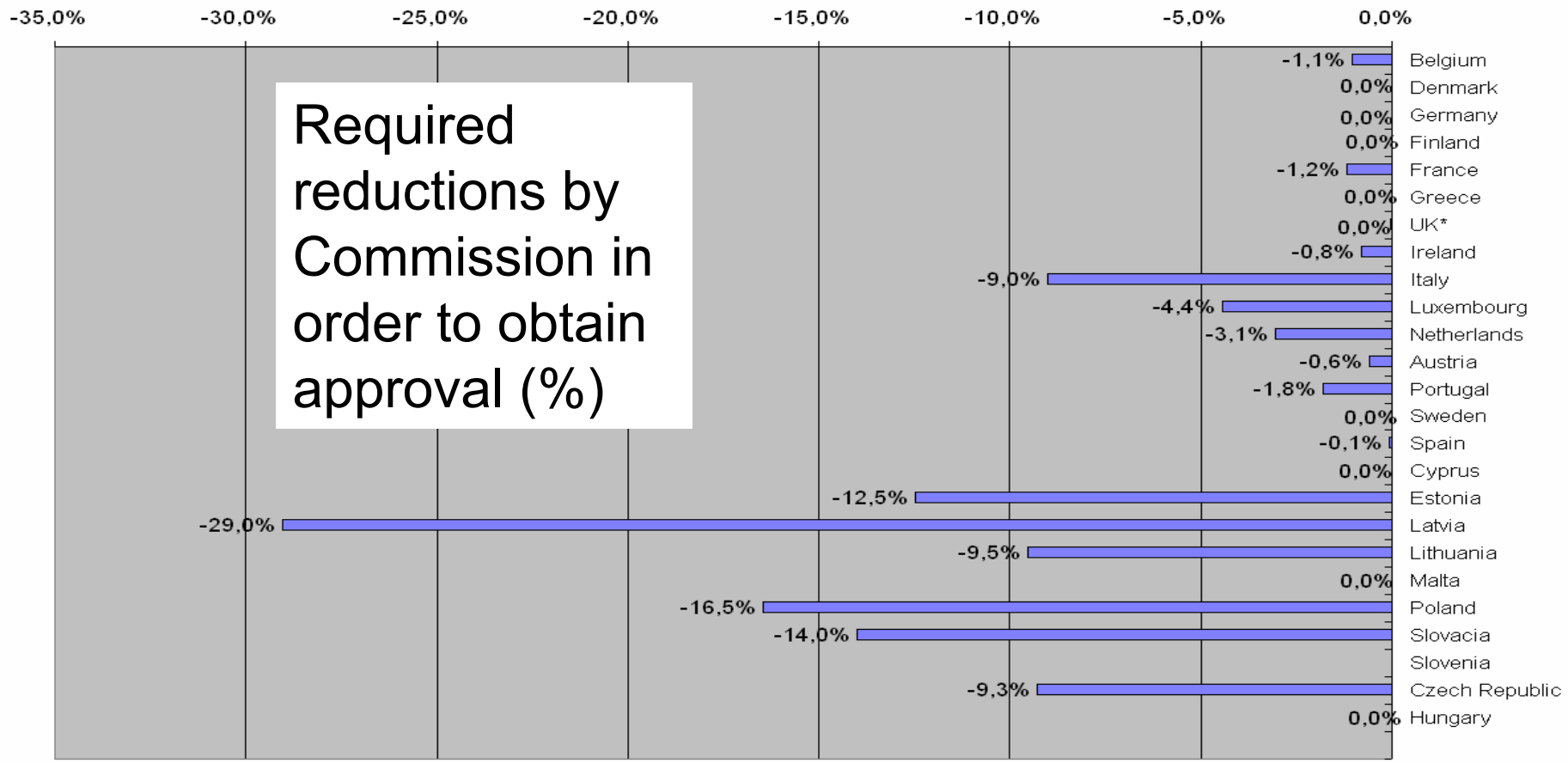
European government expressed interest in Kyoto Mechanisms (KM) 2008-2012 (Total of about 104 Mt CO_2e/a)



Some countries like Finland did not specify an amount in the NAP, but in the presentation in Brussels or some d
the NAP but did not get approval from the Commission like Portugal.

 Source: NAPs, http://europa.eu.int/comm/environment/climat/emission_plans.htm

What was the impact of the EU Commission?



Main Reasons for amendments of NAPs

Excessive Allocation

- gap between measures and Kyoto-/Burden Sharing target for 2008-12 (see previous figure)
- intended purchase of CERs, ERUs and AAUs not backed up by institutional provisions (e.g. IR, IT)
- allocation is based on "too high" growth projections

Ex-post Adjustments (FR, DE, PT, BE, LU)

- incompatible with legal framework
- "create uncertainty for operators"
- "detrimental to the certainty that businesses need in order to make investments that lead to reductions of emissions"

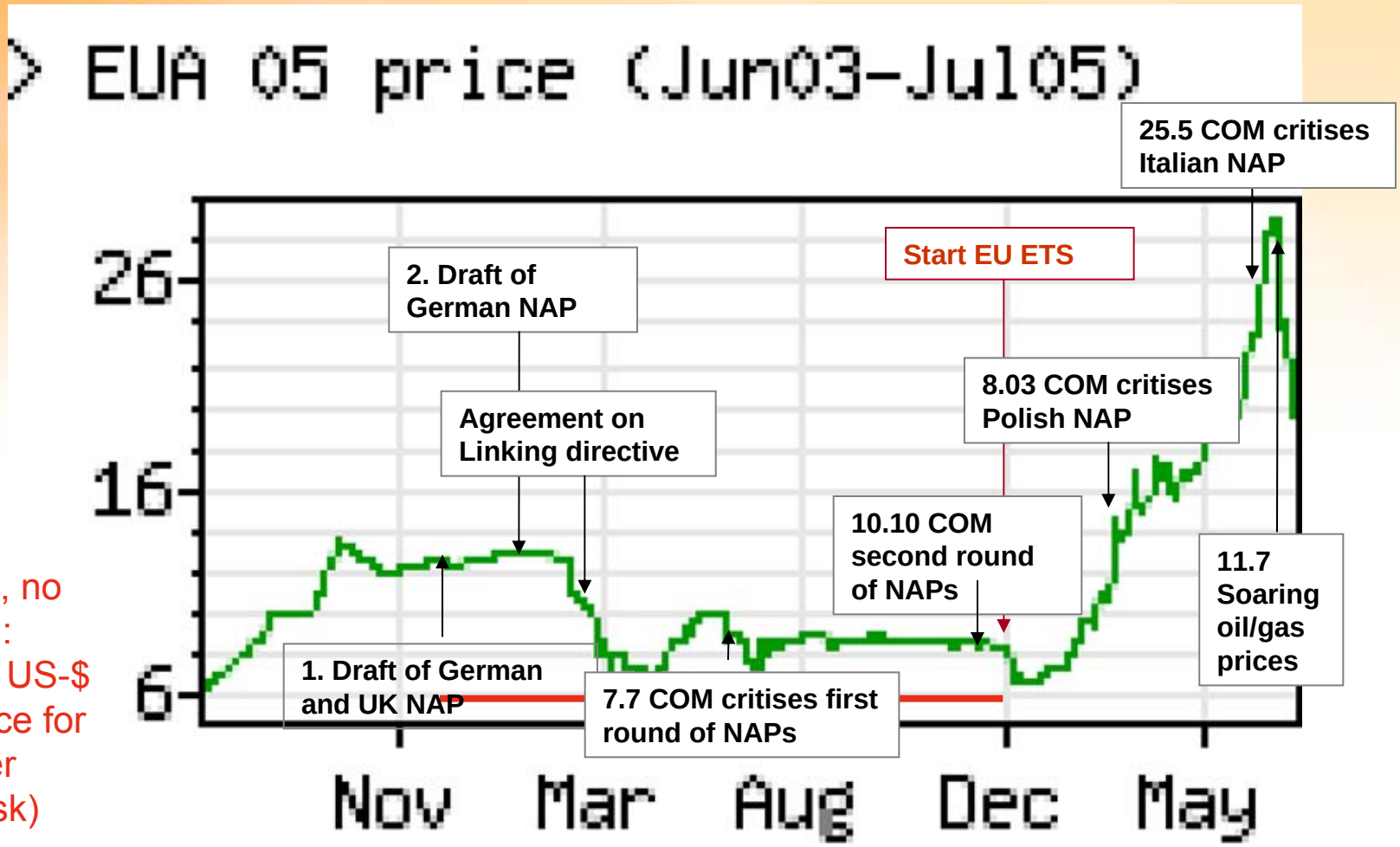
Incomplete list of installations

- missing installations e.g. Åland Islands (FI) or Gibraltar (GB)

Missing information

- New entrant rules (GB)

Price Development of EU Allowances



In contracts, no spot trading:
4.5 € or 5.6 US-$ average price for CERs (seller takes the risk)

Source: Evolution Markets LLC with own amendments

Market is not mature

- CERs and EU allowances fully fungible -> Why this price difference?
  - Independent Transaction Log is not functioning -> risk premium
  - Other project related risks -> the real cause?
  - Little supply -> prices should reflect this scarcity
- Little trading volume (20 Mt CO_2 per month, 10% of allocation)
  - No pressure to trade today -> borrowing up to 2007 possible
  - Not all registries are in place today (14 missing including Italy, Poland)
- Influence on price:
  - Supply:
    - JI/CDM supply (50-100 Mt CO_2 in first period)
    - Registry of transition countries not operational
    - New entrant reserves (around 200 Mt CO2 which will be partly auctioned or cancelled if not used by new entrants)
  - Demand:
    - Economic growth
    - Weather (rainfall, temperature, wind speed)
    - Fuel price spreads (gas/coal)
  - Potential manipulation:
    - to show that trading is not functioning
    - to influence allocation in 2008-2012, which will be decided mid 2006

Micro-Level Allocation

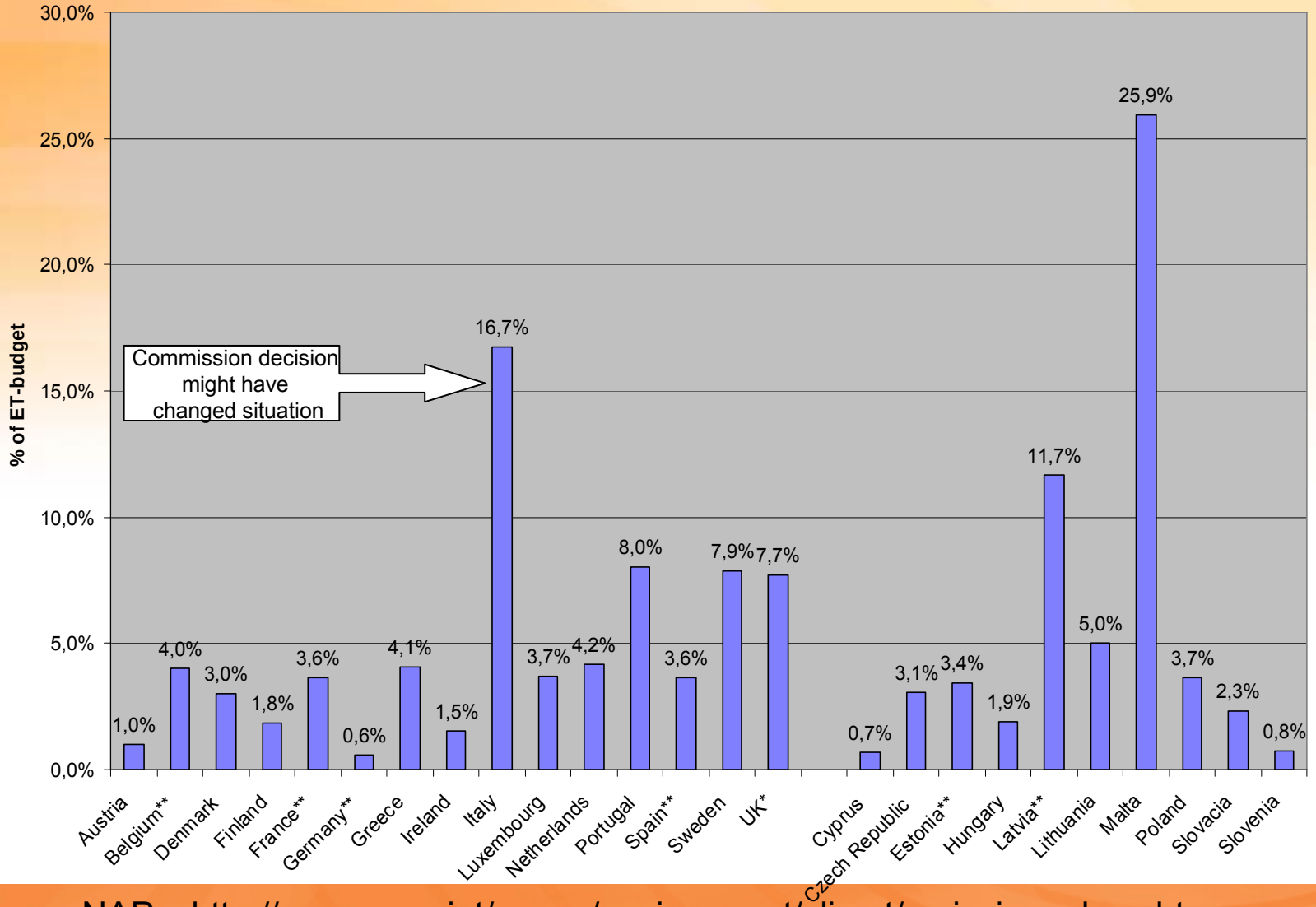
- **Allowances are allocated for free in most MS**
  - auctioning in DK (5%), HU (2,5%), LT (1.5%) and IR (>0.75%, revenues used to cover administrative costs)
- **Allocation based on historic emissions in most MS**
  - base periods between 1997 to 2003 (or averages)
  - exemptions / case of hardship and exclusion of the lowest year's emissions
  - almost all MS use growth factors (DE not)
- **Allocation based on average specific emissions in DK, LT, NL, FR, DE (benchmarking choice! -> more than 60 combinations!)**
- **Other elements like degree days (LT, FI) or fuel CO_2 intensity (AT)**
- **special provisions for CHP and other clean technologies, for process-related emissions, early action**
- **ex-post adjustments if emissions are "lower than expected" DE (< 40 %), LU (< 10 %), PT (<, > 30 % new entrants) not accepted by EU Commission!**

New entrants and reserves

- **New entrants usually get free allowances from reserves**
  - SE: new firms in energy sector must buy allowances
  - benchmarking: BAT (DK, DE, SE), specific emissions for homogeneous products and projected output
  - usually exclusion of compliance factor, not in ES
  - ex-post adjustment based on actual output data (DE)
    → from EU Commissions prohibited – Germany legal cases against decision

- **Reserves**
  - 3-8 % of the ET-budget
  - <1 % in DE, SI and AT, 16.7 % in IT, > 20 % in Malta
  - Reserve too small: most MS allocate on first-come-first-served basis, FI, LU, LT, FR, DE* buy on the market.
  - Reserve too large: sell excess on the market (e.g. AT, IR), or take out of the market (e.g. DE)

New Entrant Reserves



 Source: NAPs, http://europa.eu.int/comm/environment/climat/emission_plans.htm

Benchmark Comparison

- New entrants – benchmarks for electricity production:
  - FR: 900 g CO_2 / kWh
  - DE: 365-750 g CO_2 / kWh
  - LT: 551 g CO_2 / kWh
  - BE (Fl): 500 g CO_2 / kWh
  - IT: 396-1.531 g CO_2 / kWh and 555 g CO_2 / kWh
  - DK: 342 g CO_2 / kWh
  - SE: 265 g CO_2 / kWh
  - GB: Gas benchmark (for 5 different technologies)

-> only two MS use fuel-specific benchmarks

-> a lot of MS did not specify benchmarks in NAP

UK Study on how Benchmarking might be used for 2nd Committment Period: **EU Emissions Trading Scheme Benchmark Research for Phase 2 for DTI.** Prepared by Entec UK Limited and NERA Economic Consulting

Closure of Installations

- typically: stop further issuance of allowances
- allowances of closed installations are transferred to reserve
- **transfer of allowances** to a new installation: e.g. PL, DE, AT, LU, FR
- taking allowances away from closures results in **inefficiencies**, since the opportunity costs are not accounted for (output is subsidized)

First best: New entrants buy on the market

- politically not feasible
- prisoners dilemma between states (locational factor)

Early Action (EA)

- **Allocation based on recent base periods means disadvantage for carbon-efficient installations**

- **EA may be rewarded by earlier base periods (IR, IT, GB, LU, SI, LV, EE)**
  - impossible to consider EA (draft GB, FI)

- **Generous allocation in DE:**
  - new or modernised installations may get a compliance factor of 1.0 (instead of 0.9709) for 12 years after implementation
  - benefits largely Vattenfall (bought former East German power plants in East Germany)

- **Benchmark favors efficient installations (AT, NL, DK, BE, LT)**
- **PL will allocate early action bonus**

Process-related emissions

Definition

- Process-related emissions are defined as "greenhouse gas emissions other than combustion emissions occurring as a result of international and unintentional reactions between substances or their transformation, including the chemical or electrolytic reduction of metal ores, the thermal decomposition of substances, and the formation of substances for use as product or feedstock" (M&R guidelines)

Implementation

- Most member states foresee special treatment: Exemption from compliance factor, inclusion in sectoral budgets, based on projected emissions, included in benchmark
- Problem: find adequate definition so that other industries won't claim exemptions

Cogeneration

- **Existing Cogeneration**
  - Benchmark: DK, NL, SI
  - Bonus: DE, AT, SI
  - Compliance factor = 1: LU, SI
  - Opt-in: FI, SE, SI, LV
  - Others: FR (sectoral budget)

- **New entrant Cogeneration:**
  - Double benchmark: DK, DE
  - Other exemptions: IR, SE, GB, SI

General assessment of allocation

Environmental effectiveness

- targets for EU ETS will not result in large emission reductions, but high use of Kyoto Mechanisms'

Distributional aspects

- generous allocation to ET sector at the cost of other sectors and general taxpayer -> inefficiency and potential windfall profits for electricity generators
- variety of (hidden) special provisions, often benefiting larger companies

Efficiency

- Prices seem not to reflect marginal abatement costs today -> market immature
- transaction costs are expected to be high compared to costs for compliance (esp. for smaller firms)
- lack of long-term targets/signals which are important for investment decisions

Process

- Commission has forced changes to allocations in almost all MS
- Most MS base ETS on existing policies (voluntary agreement)
- a lot of legal cases due to complexity and exemptions

Lessons learnt

- Variety of suggestions on allocation rules set out by the EU directive is positive
- But: the devil is in the details!
- Allocation process in Germany too complex: simple allocation formula but too many exemptions and choices -> difficult to administer
- Other MS: (negotiated) sectoral targets encompass all peculiarities -> less exemptions necessary
- Choice of allocation rules increases transaction costs for companies (due to uncertainty) and for administration
- Interdependences of rules is complex and changes will have unintended implications somewhere else -> suit against Commissions decision in regard to ex-post rules
- Little changes for 2nd period likely, since little time
- Allocation decisions took much more time than expected, because:
  - More than 60 % of the operators have handed in more than one application (choice of rules)
  - Allocation based on projected emissions needs further assessment
  - Case of hardship needs detailed investigations

Outlook for EU ETS

- Cost-efficient allocation between non-trading and trading sector
- Harmonisation of coverage -> no differences in interpretation (e.g. de minimis rules)
- De minimis rule to reduce transaction costs
- Inclusion of other gases and sectors to improve efficiency (e.g. aviation)
- More use of auctioning to reduce windfall profits
- Certainty about allocation rules over several periods (total quantity and basic rules)
- Less exemptions (e.g. CHP, nuclear power, process related, Early Action)
- Harmonised rules for homogenous categories (benchmarks)
- Monitoring und reporting: further harmonisation e.g. more guidance on the interpretation of cost-efficiency

Thank you very much for your attention!

Centre for Energy and Environmental Markets

UNSW
THE UNIVERSITY OF NEW SOUTH WALES
SYDNEY • AUSTRALIA

Article: Betz/Eichhammer/Schleich (2004): Designing National Allocation Plans – A first Analysis of the Outcome, *Energy and Environment*, May, 375-425

Dr. Regina Betz
r.betz@unsw.edu.au

All papers can be downloaded from: www.ceem.edu.au