Centre for Energy and Environmental Markets

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Allocation rules and investment incentives:
Experiences with the European Emissions Trading Scheme

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Background

To combat climate change we need different (investment) decisions regarding energy production and fuel consumption

Aim of the presentation

Assessment of how the EU ETS will lead to the right investment incentives to decrease greenhouse gas emissions

What are the key features of the EU ETS?

- **Regulated entities:** ca. 11.000 CO_2-intensive installations
- **Timing**: successive phases: 2005-07, 2008-12 etc.
- **Approach**: cap-and-trade system
- **Covered greenhouse gases**: only CO_2 + opt-in from 2008
- **Allocation method**: partially harmonized
  2005-07: 95 % free of charge; 2008-2012: 90 % free
- **Flexibility**: banking and borrowing between/within phases
- **Accountable units**: EU allowances, CERs (CDM) from 2005 and ERUs (JI) from 2008, quantitative limits from 2008 -> no forestry CDM units
- **Sanctions**: harmonized financial sanctions for non-compliance (40 €/t in 2005-2007; 100 €/t from 2008-) & surrender missing allowances + public notification

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 to which extend used. France

Macro-Level Allocation

Typical two-step approach

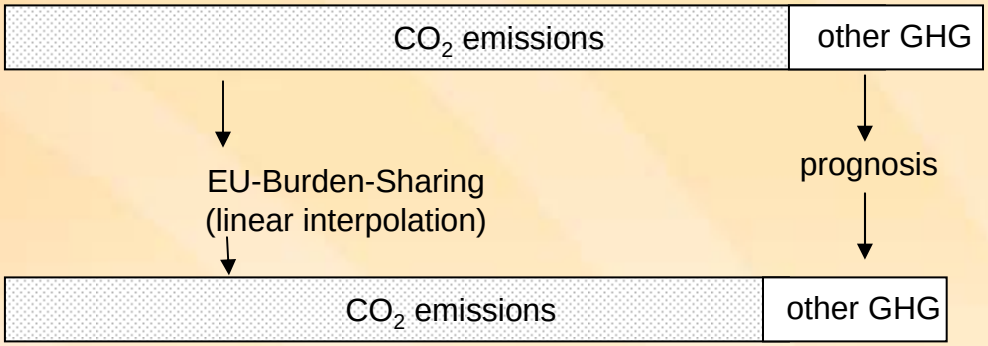
- macro-level allocation defines total target for entire ET-sector or sub-sectors
- micro-level allocation governs allocation of allowances to installations
- apply mathematical "compliance factors" (<1.0) to guarantee consistency or use production share
- in new EU-MS cap is the outcome of installation-level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



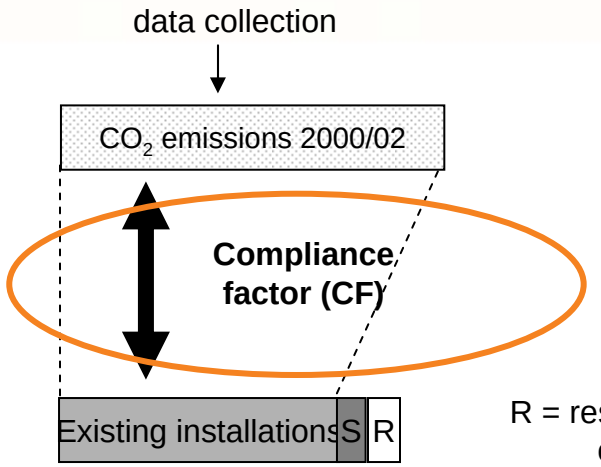
2. GHG emissions budget 2005-07

Targets

3. CO_2 emissions budget for sectors 2005-07

Micro Level

4. Sum of average CO_2 emissions 2000-02



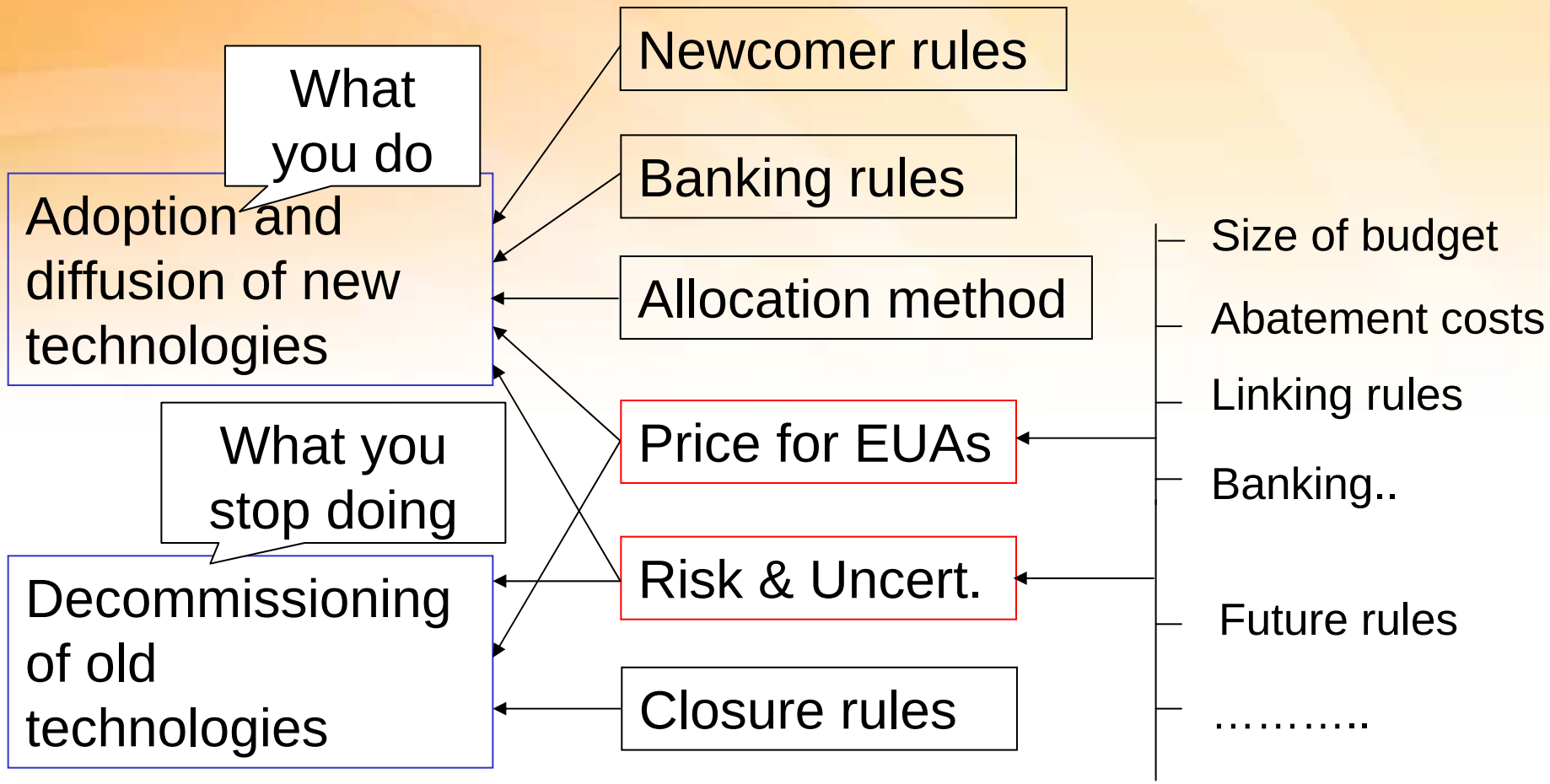
R = reserve for new comers
S = special features

5. CO_2 emissions budget 2005-07 for covered installations

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!**

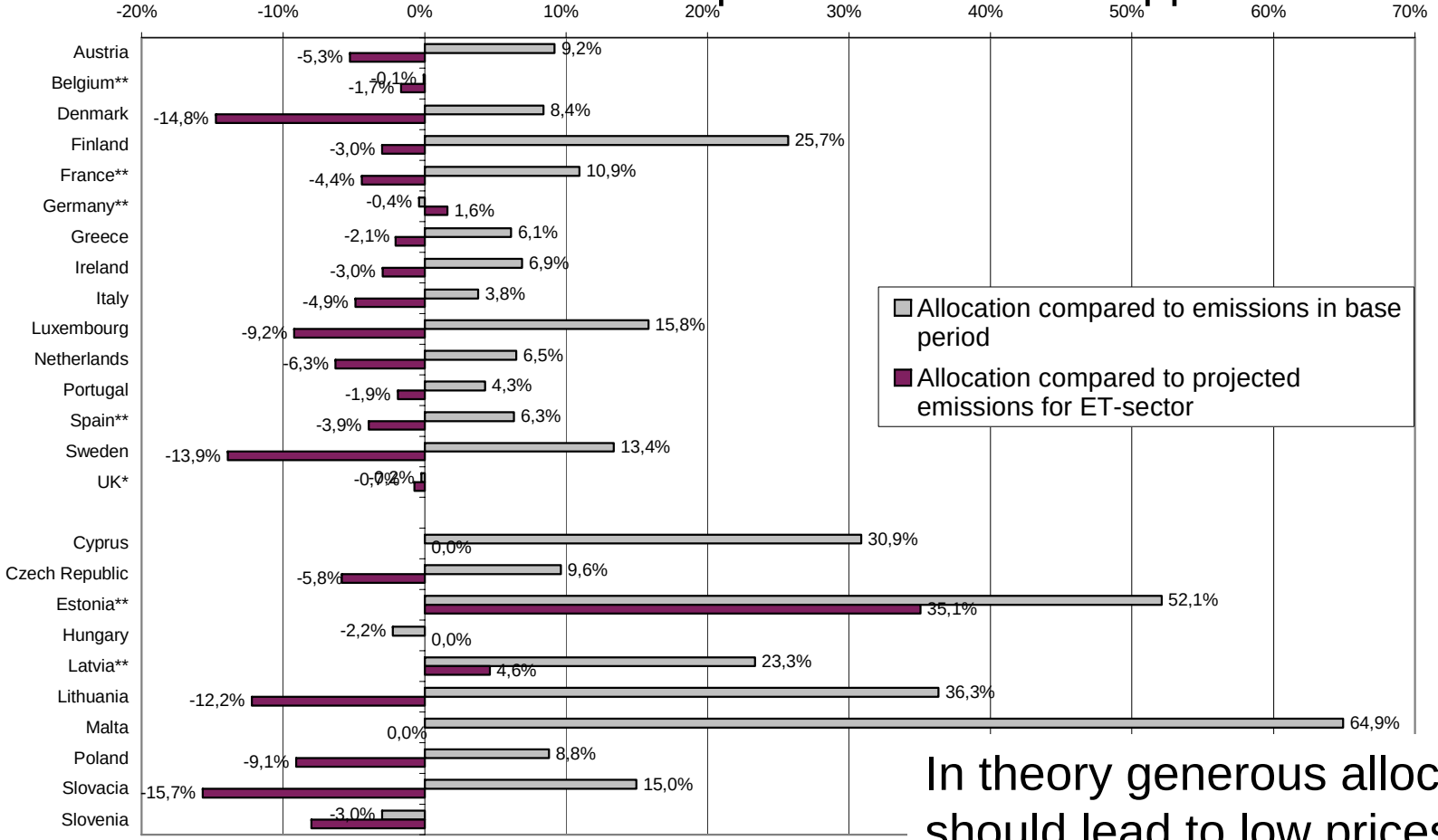
What is the relation between allocation rules and innovation incentives?



Will allocation result in high prices?

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

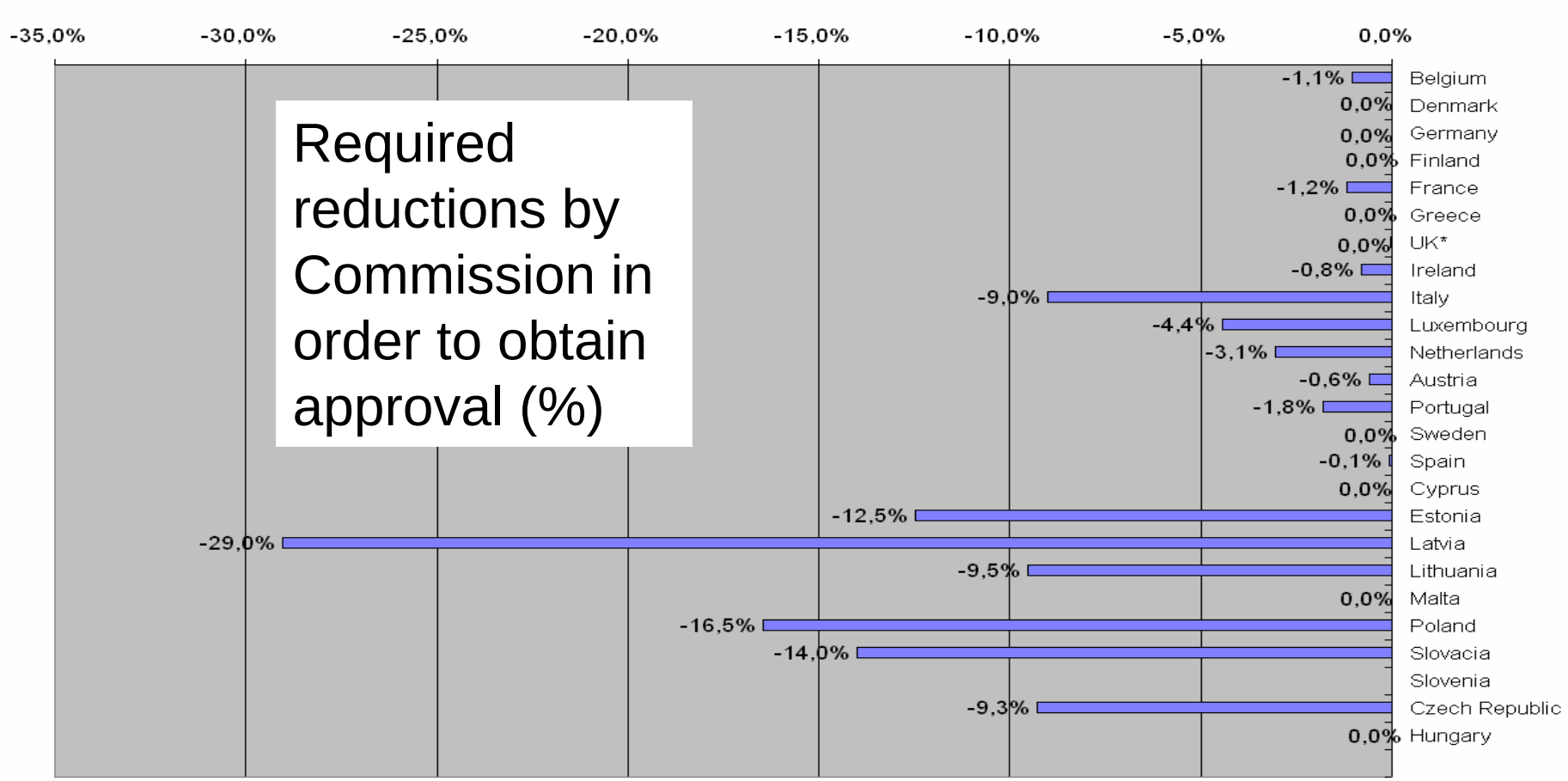
Allocation after European Commission approval



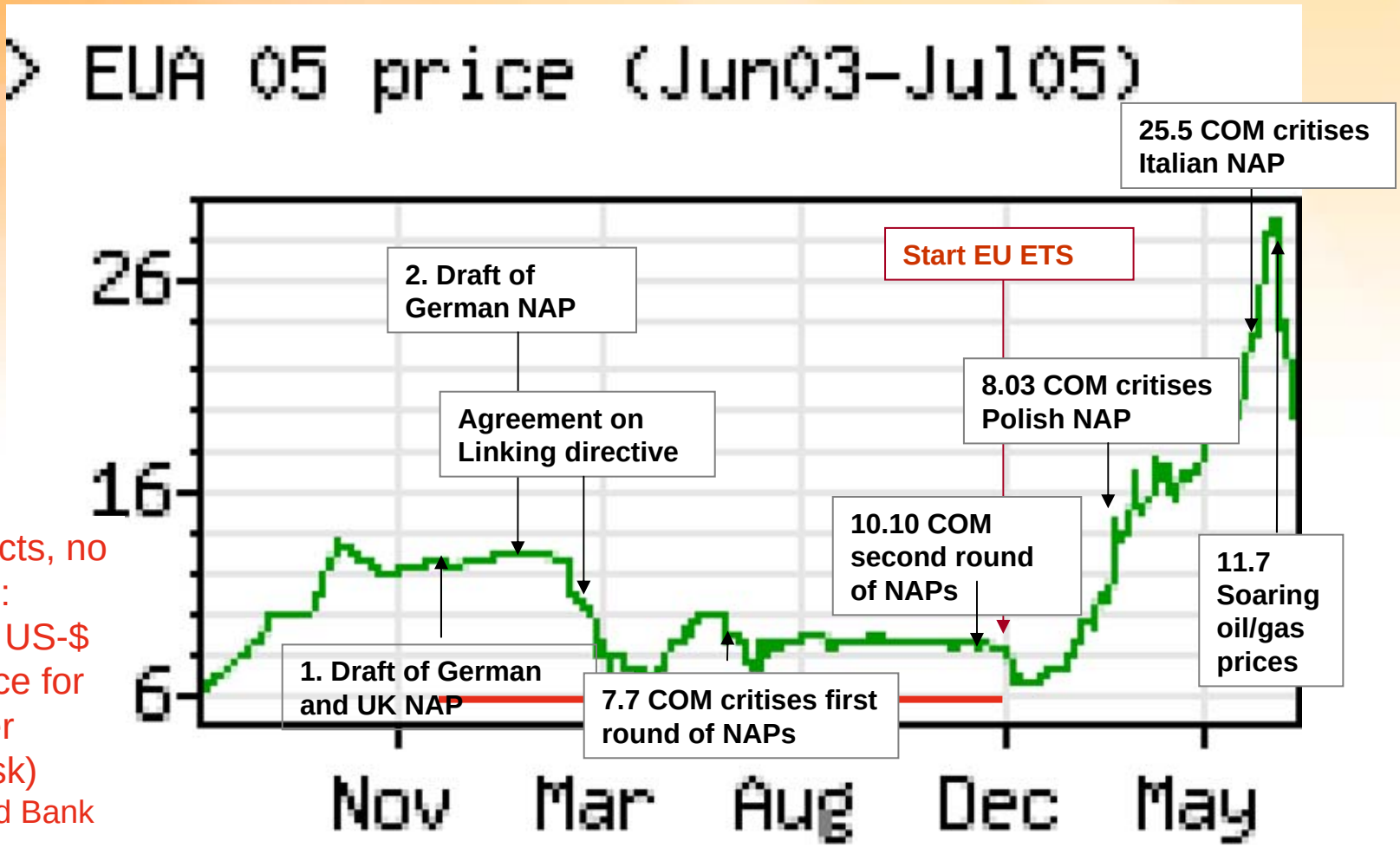
In theory generous allocation should lead to low prices!

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

What was the impact of the EU Commission?



Price Development of EU Allowances



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

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 at the beginning (today higher: 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

Allocation mechanism: Auctioning – Free

Innovation incentive for existing installations:

- Under certain assumptions there is no differences between auctioning and free allocation
  - freed-up allowances can be sold
  - less allowances have to be purchased in case of auctioning
- However:
  - Diffusion: auctioned allowances increase the benefits from lower prices compared to free allocation
  - Price signal: auctions may produce good early price signals and companies have an incentive to assess their marginal abatement costs early

New entrants (NE) – closure rules

Implementation:

- All Member States allocate new entrants' allowances for free (exemption: electricity installations in Sweden beside CHP) based on a reserve (first-come-first-served rule)
- All Member States terminate allocation after closure (required by directive)

Innovation incentive:

- Auctioning and grandfathering have different effects dependent on new entrant and closure rules
- Incentive to invest:
  - NE buy on the market:
    - Allocation for free for existing installations will have negative impact on investment
    - With auctioning for existing installations high incentive
  - NE get allowances based on stringent benchmark
    - With allocation for free for existing installations will delay investment (no anticipated investment)
  - After closure allocation terminates:
    - Little incentive since no opportunity costs -> transfer rule helps
  - After closure allocation continues
    - High incentive since opportunity costs -> not in line with EU directive
- Incentive to invest in lowest CO_2-emissions technology:
  - NE buy on the market: high
  - NE get allowances for free the incentive depends on benchmark:
    - High for uniform benchmarks
    - Low for sub-benchmarks e.g. fuel or technology specific

Banking

Implementation:

Almost all MS will ban banking of allowances from 2007 to 2008
(Poland & France allow for restricted banking)

Considerations:

- excess allowances from MS with banking provisions flow into MS without banking provisions
- difficult to estimate total quantity of banked allowances by the time the allocation plan for the second phase has to be submitted (6/2006)

Innovation incentive:

\+ allows for buffering allowances -> improves profitability of new investments but may

\- reduce future investments (prices impact)

Future allocation rules

Implementation:

- Only few member states mention future allocation rules (e.g. Germany)
- If mentioned in the 1. NAP but the Commission has not approved 2. NAP rules, impacts on investment certainty

Innovation incentive:

- Future allocation rules are important for investment certainty -> risk of updating will have negative impacts on innovation!
- For long term investment (e.g. a coal fired plant will need 5 year planning and 20 years for amortization) the time span of the 1. national allocation plan and the 2nd are too short
- Recommendation: Information about future targets and rules are necessary to drive long term investment

Overview of selected allocation rules and MS

Rules	Number MS with	Number MS without
Auctioning	4 (Denmark, Hungary, Ireland, Lithuania)	21
Newcomers	BAT: 16 Benchmark: 7	Estimations or based on projected emissions: 2 No information: 1 (Cyprus)
Closure	Further allocation: 0 No further allocation: 15	No information/ not decided: 10
Transfer option	Explicitly mentioned: 9	No information / not decided yet: 3 No transfer: 5
Banking	2 (Poland and France restricted banking)	22 (Malta not decided yet)

Conclusions

- **EU ETS ambitious effort and EU policy innovation:**
  - More than 11,000 installations in 25 countries
- **Sound framework – fundamental design choice:**
  - Deterrent sanctions
  - Robust monitoring
  - Implementation in different phases with review options gives flexibility for improvement
- **Poor innovation incentives likely in first trading period:**
  - Size of ET-budget -> low prices:
    - Low effects on ET-sector -> generous allocation
    - High effects on non-ET-sector (households, transport)
  - Auctioning – low effects since 99.8 % for free
  - New entrant rules
    - Benchmark for homogeneous group -> higher effect
    - Best available technology -> little effect
  - Closure rules – low effects -> transfer rules positive effect
  - Future allocation rules – low effects
  - Renewables are not directly covered and promoted (only indirect through elec. price)
- **Design choices of allocation heavily influenced by industry lobbying**
- **Ways forward – proposed changes:**
  - More auctioning
  - Stricter targets
  - New entrants buy on the market and allocation is continued after closure

Thank you!

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