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Options to address EU ETS induced increases in power prices and windfall profits

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Introduction and contents

- **Background:**
  - 1st January 2005: start EU ETS (cap & trade; free allocation)
  - Impact EU ETS on power prices (and generators' profits)

- **Contents of presentation**:
  - Summary of past research
  - Present work for European Commission (DG Environment)
  - Policy options and implications
  - Some conclusions and points for discussion

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Summary of past research

Impact of EU ETS on power prices

Summary of first report (September 2005)

- **Empirical & statistical analyses (January-July 2005):**
  - Estimates of *marginal* pass through rates (i.e. change in power price related to carbon costs of marginal, price-setting technology)
  - 2 countries (GE, NL), 2 markets (year ahead: peak & off peak), 3 methods:
  - 12 estimates: 40-70% pass through (3-10 €/MWh)
  - Good econometric tests

- **Model research (COMPETES):**
  - 4 countries (BE, FR, GE, NL)
  - Pass through: 60-80% (1-19 €/MWh)

Summary of second, update report
(March 2006; Climate policy, June 2006)

- **Empirical & statistical analyses (January-December 2005):**
  - Same countries/markets; several methods
  - Pass through: 60 - 120%
  - Less good econometric tests

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Summary of past research

Impact EU ETS on generators' profits

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Changes in generators' profits

- Distinction in profit changes due to:
  A. ETS induced changes in production costs, power prices and sales volumes (assumption: buy all allowances)
     - Depends on marginal (price-setting) unit versus inframarginal unit
  B. Free allocation
     – Depends on % of allowances received for free

- Distinction is important because of:
  1. Different causes
  2. Different effects/incentives for new investments
  3. Different policy implications

Estimates of windfall profits

- Model scenario estimates (in % of baseline profits):
  - Windfall A: -1.6% / 42%
  - Windfall B: 9.6% / 46%
  - Total: 8.0% / 88%
  - Depending on scenario assumptions (market structure, demand elasticity and carbon price)

- Empirical estimates:
  - NL (ECN): €300-400 mln/a (35 MtCO2 free allowances)
  - UK (IPA): €1200-1300 mln/a (134 MtCO2 free allowances)
  - Qualifications: rough estimates, major differences between countries and installations; time lags; static analyses

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Present work for European Commission

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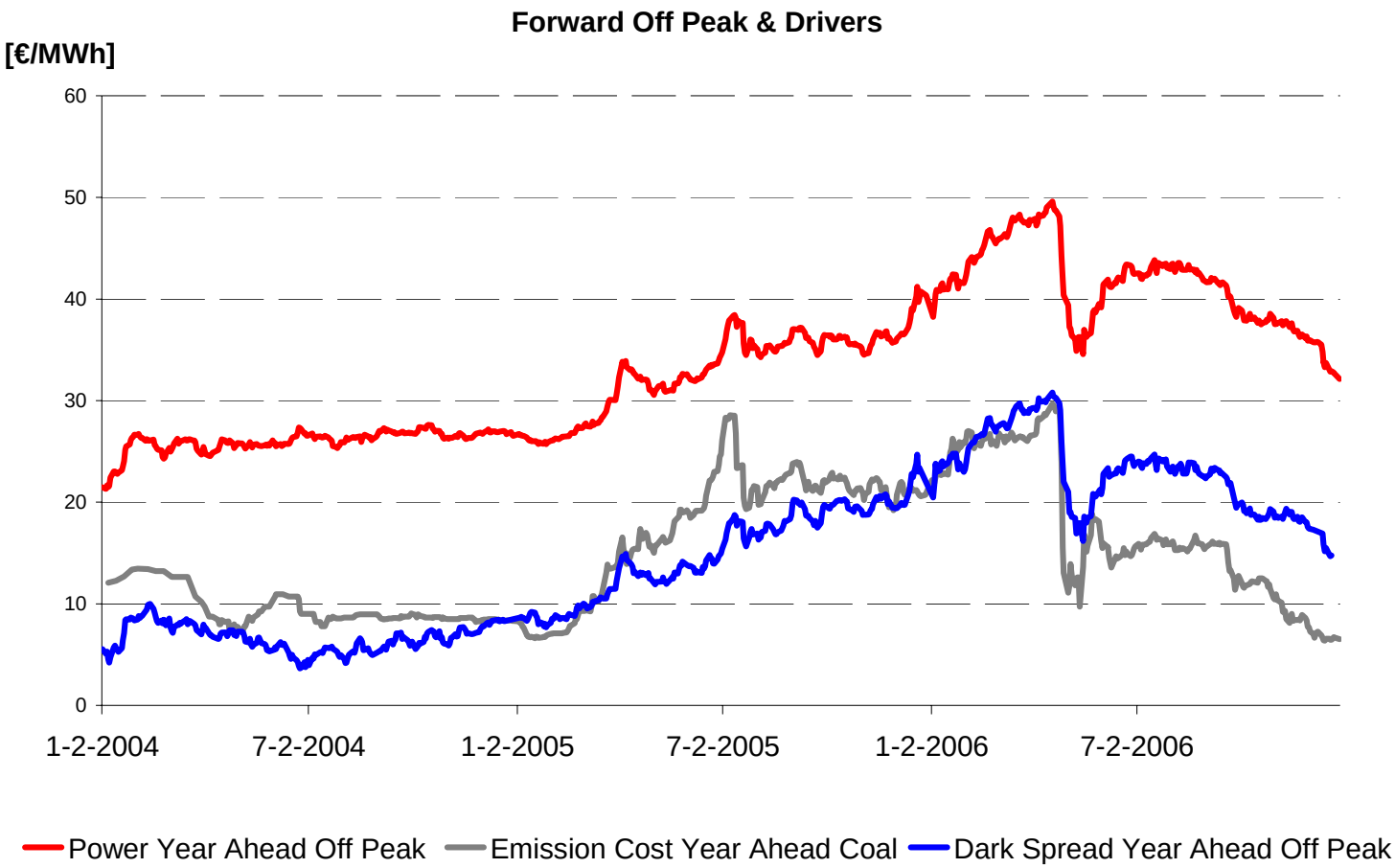
Aim & scope of DG Environment project

- **Project:** Impact of the EU ETS on electricity prices
- **Aim:** impact analyses & policy recommendations
- **Scope:**
  - Review of the literature
  - *Empirical & statistical analyses:*
    - 9 countries: FR, GE, IT, PO, SP, SW, CZ, NL & UK
    - Several power markets: spot/forward, peak/off-peak, and wholesale/retail markets
    - 2 years: 2005 and 2006
  - Model analyses (COMPETES extended)
  - Policy evaluation analyses
- **Duration**: 2007

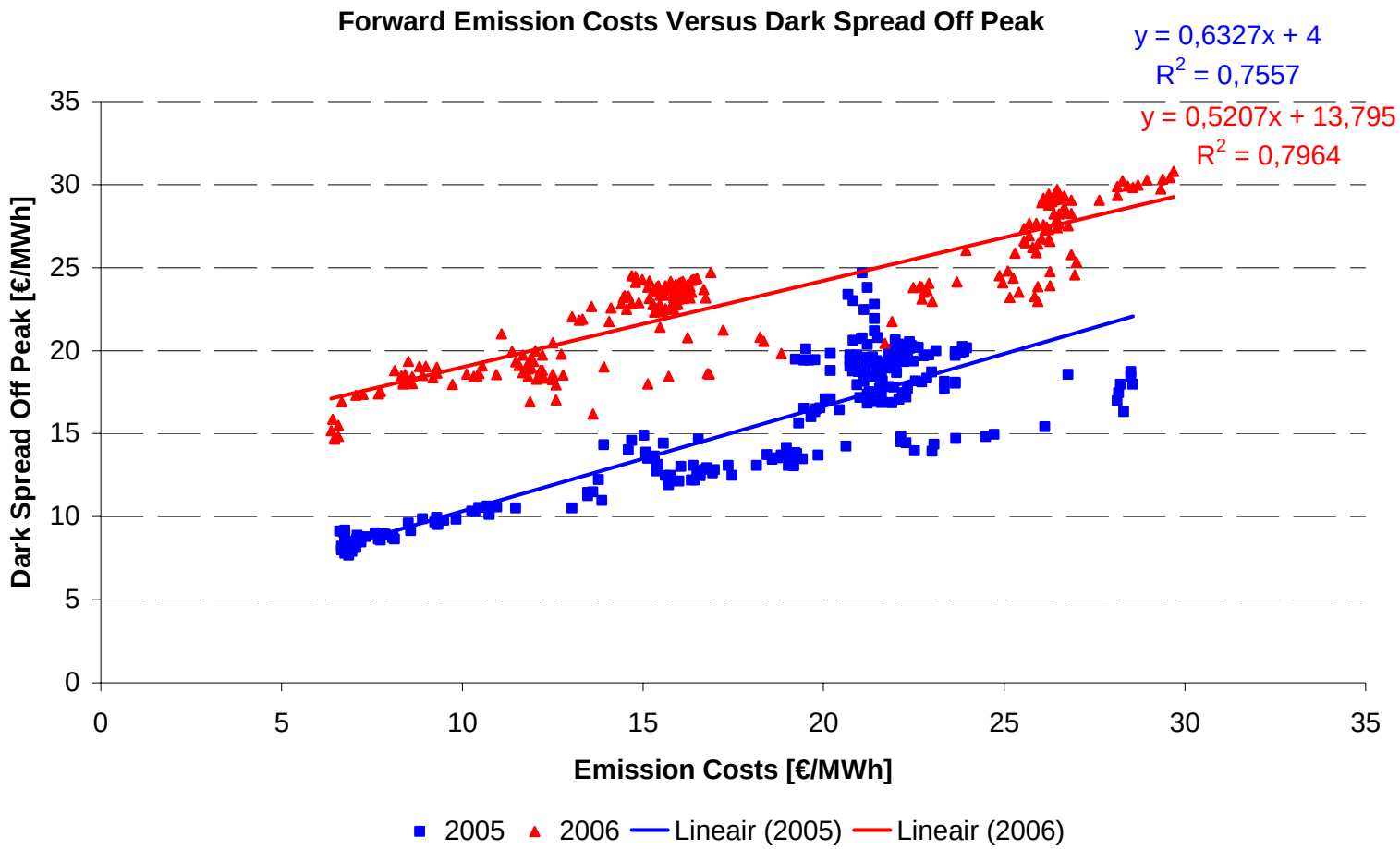
Some preliminary results

- Increase in forward power prices/spreads (2005-2006)
- Increasing trends in spot markets, but more volatility
- Main price drivers on 2005 forward markets:
  - gas-fired: fuel & carbon costs
  - Coal-fired: carbon costs
- Forward markets (2006), spot markets (2005-2006):
  - Links between carbon costs and power price/spread is less clear
- Best statistical results:
  - 2005; forward; off-peak; coal-fired; liberalised markets (GE, NL, UK); during specific periods of 2005-2006
- Worst statistical results:
  - 2006; spot; peak, gas-fired

The Netherlands: trends on forward off-peak markets



The Netherlands: scatter plots of carbon costs versus spreads on forward off-peak markets



Some preliminary model results (reference scenario, i.e calibrated 2006)

- Extended (EU-20) COMPETES model)
- Change in power prices (due to carbon cost of 20 €/tCO2):
  - EU-20: 13 €/MWh (Sweden-Poland: 10-19 €/MWh)
  - EU-20: 29% (Portugal-Poland: 17-82%)
- Pass-through rate:
  - Marginal: EU-20: 89% (UK-Slovakia: 56-124%)
  - Average: EU-20: 174% (Poland-France: 111-339%)
- Changes in generators' profits:
  - Windfall A: 6-15 bn € (4-21%)
  - Windfall B: 18-20 bn € (11-27%)
  - Total: 24-35 bn € (15-48%)

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Policy options

Policy option	Intended effect		Other effects/comments	Feasibility
	Power price	Windfall profits (A/B)		
1. Indirect (free) allocation	No	No (A) Yes (B)	•Compensates (only) covered EIIs •Double compensation •Perverse power use effects	•Questionable
2. Auctioning + recycling	No	No (A) Yes (B)	•Most efficient price signal •Recycling: compensation + other benefits •(Adverse) effects on industrial competitiveness	•Sheltered sectors: feasible •Other sectors: questionable
3. Relative benchmarking / output-based allocation	Yes	Yes (A/B)	•Less environmental certainty •Less efficient •Administrative demanding	•Sheltered sectors: questionable •Other sectors: feasible
4. Taxation + recycling	No	Yes (A/B)	•Recycling: compensation + other benefits •Hard to determine exact windfall profits •Tax both categories of windfall profits?	•Hard to implement

Policy option	Intended effect		Other effects/comments	Feasibility
	Power price	Windfall profits (A/B)		
5. Price regulation: - wholesale - retail - carbon	 Yes Yes Yes	 Yes (A) No (B) Yes (A) No (B) Yes (A/B)	•Against market liberalisation •Risks of market disruption •Less environmental effectiveness	•Questionable
6. Reducing CO_2 price - lower cap - more JI/CDM	 Yes Yes	 Yes (A/B) Yes (A/B)	•Less (domestic) emission reductions •Less dynamic efficiency (?)	•Feasible
7. Encouraging power sector competition	No	No	•Paradox: more competition may reduce oligopolistic pricing/profits, but increase CO_2 cost pass through and ETS induced windfall profits	•Difficult, feasible, but not effective to address EU ETS adverse effects

Policy option	Intended effect		Other effects/comments	Feasibility
	Power price	Windfall profits (A/B)		
8. providing state aid to Energy Intensive Industries (EIIs)	No	No	•May violate EU state aid rules •Adverse competitive effects •Adverse fiscal effects	•Questionable
9. Promoting EII strategies: - Energy saving - Self generation - long term contracts	 No No No	 No No No	•Lack of cost-effective options •Several constraints •Only temporary solution (‘hedging’)	•Limited feasibility •Limited feasibility •Feasible
10. Border tax adjustments	No	No	•Trade conflicts? •Compatible with WTO rules (only when auctioning)?	•Perhaps feasible (more study/discussion needed)
11. Long-term options: - global climate policy regime - technological innovations	 No Yes	 No Yes (A/B)	•Avoids leakage and adverse competitive effects •Enhances dynamic efficiency	•Difficult, but maybe feasible in the long run • Feasible in the long run

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Some conclusions and points for discussion

Is carbon pass through a problem?

- No, it is a rational (intended) effect
- Yes; although overstated generally by energy-intensive industries, some sectors do suffer
- The competitive position of the energy-intensive industries in a carbon constrained environment is a general policy issue (i.e. not a specific ETS issue) and, hence should be treated as such

Are windfall profits a problem?

- Yes, although several qualifications can be made, EU ETS induced windfall profits are a problem – notably those due to the free allocation of allowances – as they raise all kinds of efficiency, equity and, hence, legitimacy questions with regard to this system.

Will carbon pass through & windfall profits continue in the future?

- Yes (widely accepted practice), although impact in the long run will be mitigated by induced additional investments in generation capacity
- However, free allocations (and resulting windfall profits) undermine incentive structure towards carbon reducing investments
- A shift of free allocation towards auctioning will have a beneficial impact on carbon reducing investments, reduce (windfall) profits of fossil generators, but most likely not have a (significant) impact on cost pass through or windfall profits of non-fossil generators

Are there feasible policies to address EU ETS induced increases in power prices and windfall profits?

- There is no ‘silver bullet’ or any specific policy option that addresses both EU ETS induced increases in power prices and (both categories of) windfall profits without adverse, socio-economic effects.
- However, there is a sensible mix of policy options conceivable that can address some effects, including auctioning (power & sheltered sectors), benchmarking (other, exposed sectors), stabilising CO2 prices (increased market transparency; long-term policy certainty), and/or introducing Border Tax Adjustments.

More information

- ECN Report (Sijm et al. 2005):
  - http://www.ecn.nl/docs/library/report/2005/c05081.pdf
- Article Climate Policy (Sijm et al. 2006):
  - http://www.electricitypolicy.org.uk/pubs/tsec/sijm.pdf
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