



Avoiding dangerous climate change through environmental tax reform: existing research and COMETR*

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Thesis

- Avoiding dangerous climate change requires global policies to reduce GHG and a carbon price signal: loud, long and legal
- EU is the global leader:
 - political targets, institutional reform: e.g. EU ETS, MSs' Environmental Tax Reforms (ETRs)
 - EU has responsibilities beyond global targets – historic additions to GHG stock
- Modelling studies suggest the profile and scale of carbon prices required
- For an EU price signal, ETS coverage is incomplete: an ETR could be a complement, covering small combustion sources
- An ETR could raise real carbon prices steadily, with flexible use of revenues to improve effectiveness, efficiency and equity
- A prospective ETR can benefit from earlier Member States' experience with ETRs, especially as regards competitiveness:
this is the contribution of COMETR

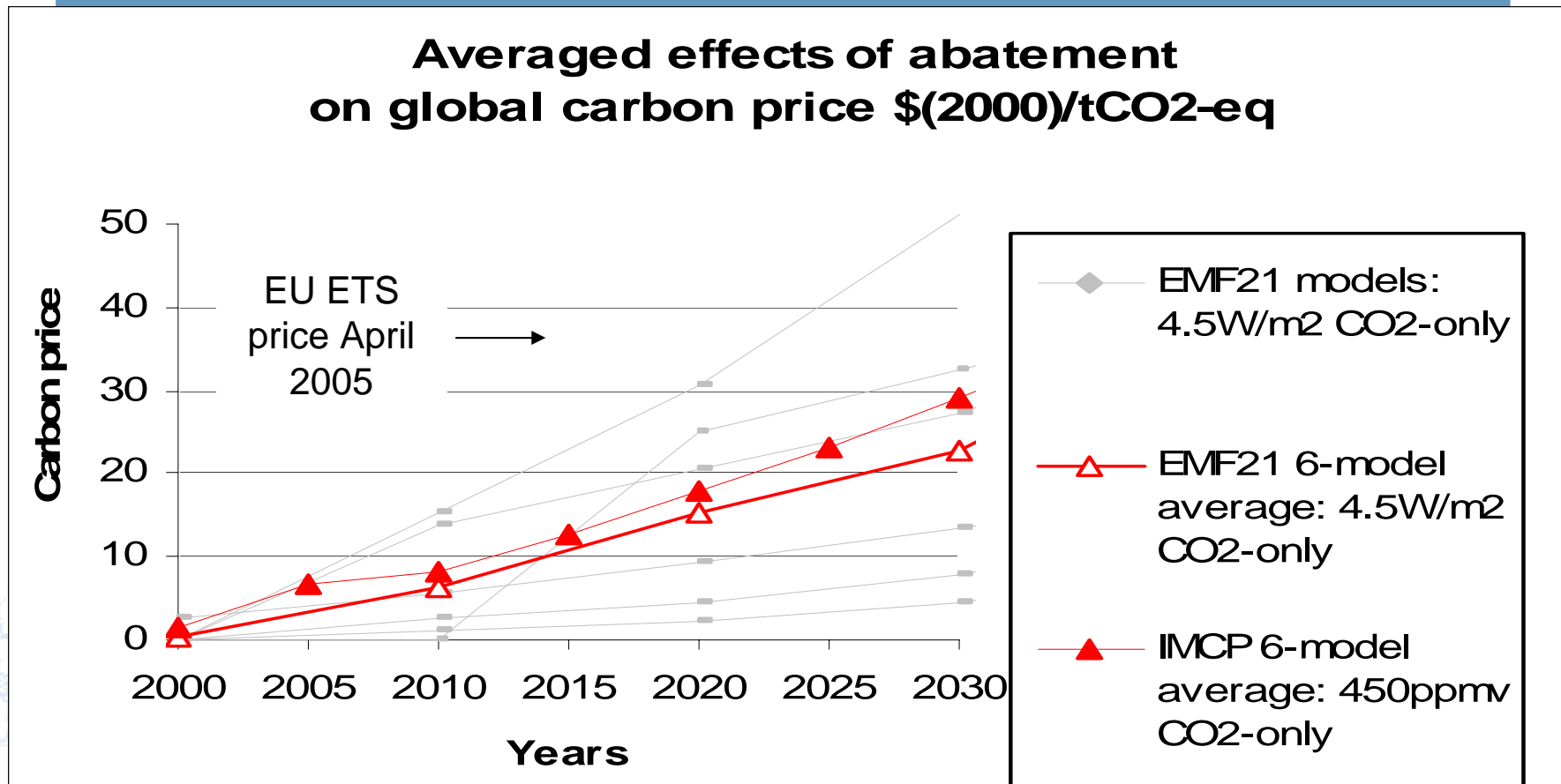


Targets to avoid “dangerous” climate change

- “dangerous” is an ethical and political issue
- EU’s target of 2°C above pre-industrial is very stringent and requires stabilisation below 450ppm CO₂-equivalent to have a 50% probability of being met
- Stern, p. 284: “The current evidence suggests aiming for stabilisation somewhere within the range 450 - 550ppm CO₂e. Anything higher would substantially increase risks of very harmful impacts..”
- Most modelling scenarios have been for targets around 650ppm CO₂eq (EMF19, EMF21)
- Innovation Modelling Comparison Project (IMCP)
 - considered one around 550 CO₂eq (450 CO₂ only)
 - and focused on effects of Induced Technological Change (ITC)



Carbon-price profile for 550ppmv CO₂-eq stabilisation: evidence from 12 model studies



Note: The model studies have been extracted from EMF21 and IMCP model comparison exercises, excluding outliers.



Implications for policies to avoid dangerous climate change

- Models have limitations – stylised, partial coverage, problems in treatment of technological change - but
 - macroeconomic costs are very small in relation to expected GDP
 - recycling revenues, multigas options and encouraging technological change all significantly reduce the costs
- General technological change alone unlikely to work
 - improvements in energy efficiency are offset in their effects on CO₂ emissions by higher growth in exports, incomes and energy demand
 - therefore a rising real carbon price is required
- The problem is that of international agreement on action – hence importance of EU lead with 2020 targets
- Carbon-price policies are most efficient if all sectors of the economy are covered



Implications for the carbon price for the EU to 2030

- A 550ppmv CO₂-eq target implies
 - 20% global CO₂ reduction below baseline
 - carbon prices rising to about 15-20 €/tCO₂ by 2020
- The literature:
 - insufficient and inadequate modelling studies for more stringent stabilisation below 450ppmv CO₂-eq (implied by 2°C target)
 - (current levels: c430ppmv CO₂-eq)
- The EU and other OECD countries bear more responsibility of the stock of GHGs (from historical emissions) and for action
- In consequence, the implicit carbon price required
 - probably higher, about 10-12 €/tCO₂ 2010, rising to 30-40 €/tCO₂ 2020
 - i.e. an increase of 2 €/tCO₂ a year indefinitely in real terms
- EU-wide ETS and ETR should be designed to provide this signal for lowest costs



Current EU policies to achieve GHG targets

- EU Regulation (e.g. energy efficiency for auto-engines, appliances, clean coal) but
 - upward trends in energy use from income growth and new products e.g. hi-definition TVs, heavier cars
 - rebound effects
- EU ETS but
 - large combustion plants
 - excess profits (free allowance allocation)
 - transaction costs
- EU additional taxes on energy products: now at low rates
- Member State policies
 - Environmental tax reforms (ETR) including carbon taxes for household and small business GHG emissions



Environmental tax reform – political acceptance

- History: political attractions, but repeated defeats
 - 1993 EU carbon-energy tax – recycled revenues via lower employment tax – but unacceptable to business
 - ETRs have failed in France and Italy
- ETRs have not been understood or accepted by voters (PETRAS project Energy Policy 2006)
- ETR has to be flexible depending on local labour market conditions
 - recycling via employment or more general tax reductions
- EU ETR should combine EU-wide additional energy taxes (for single-market efficiency) and MS use of revenues to suit local conditions

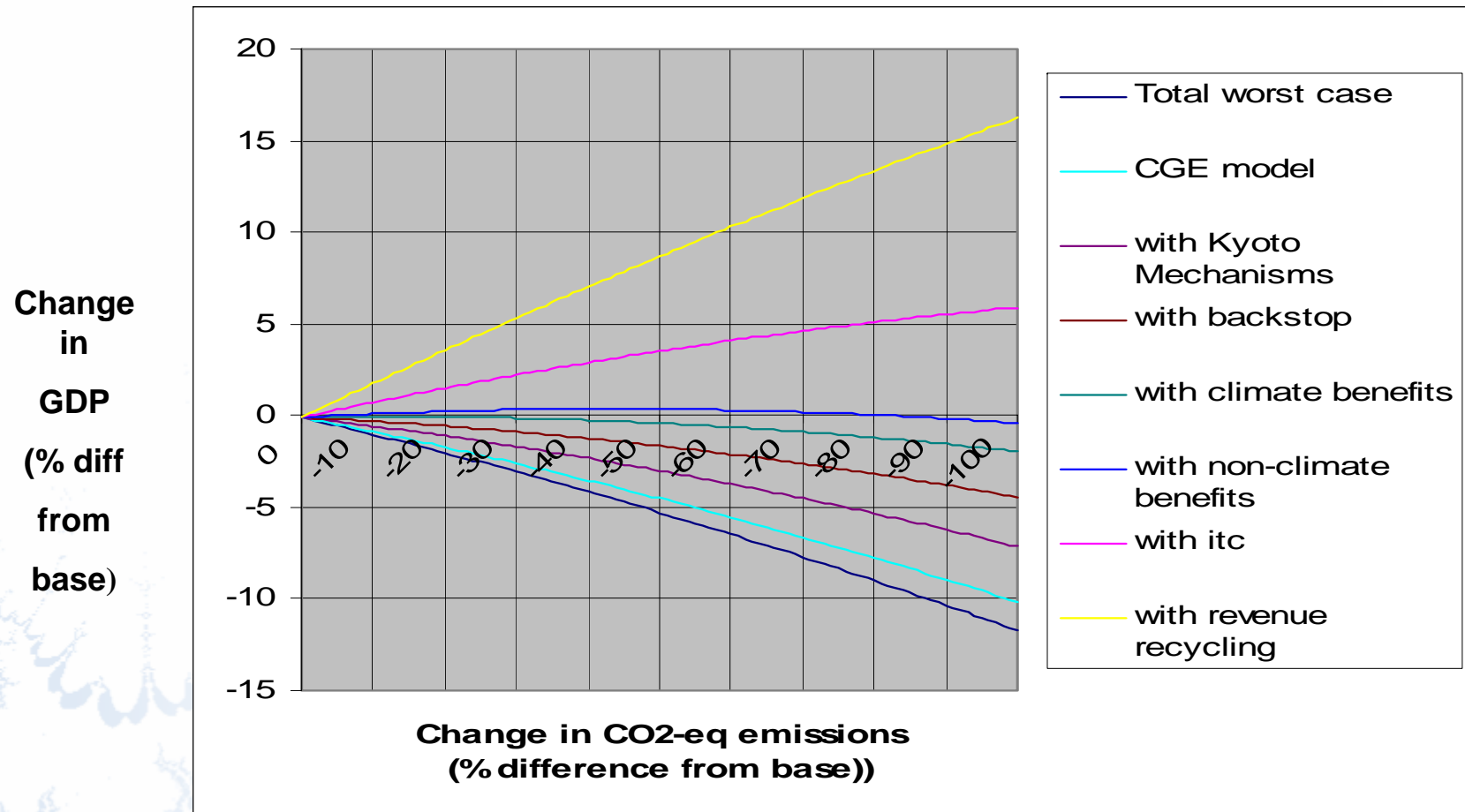


The macroeconomic costs of environmental tax reform (ETR)

- Costs not observable from market prices because
 - outcome of complex energy-environment-economy (E3) system interactions
 - involve changes in environment that have no market valuations
 - hypothetical: comparison of 2 states of the E3 system over future years
- Macroeconomic costs are usually measured in terms of future loss of GDP, comparing one hypothetical state of the world with another
 - but GDP often a poor measure of welfare – distribution of income and unemployment also count
 - Include benefits from use of tax or emission permit revenues
- Such costs can be offset by environmental benefits such as lower GHGs and air pollutions
- Free allocation of emission permits (as in phase I, EU emissions trading scheme (ETS)) yields no revenues to recycle



Meta-analysis of WRI-post-SRES-IMCP data : effects of assumptions (450ppm CO₂ only)



Source: Barker, T., M. Qureshi, and J. Köhler, 2006: *The Costs of Greenhouse Gas Mitigation with Induced Technological Change: A Meta-Analysis of Estimates in the Literature*. Working Paper 89, Tyndall Centre for Climate Change Research, Norwich, 63pp.

The literature on competitiveness and carbon leakage

- Both price and non-price competitiveness can be significant,
 - literature more developed for price competitiveness (esp. using CGE models)
- Important to allow for exchange rate offsetting for EU competitiveness
- Barriers to re-location of firms
 - information (local markets, laws, business), labour skills
- Energy costs are usually a small component of overall costs; emissions changes even lower
- Overall conclusion: sectoral competitiveness effects are likely to be insignificant, if policies are well designed, encourage new products and processes, allow time for adjustment and cover many countries



Contribution from COMETR: evidence from Member State policies

- Few studies in the literature are on *ex post* analysis – nearly all are *ex ante* evaluations of proposed policies (e.g. effects of Kyoto)
- The COMETR project has studied a diverse set of innovative, experimental policies in ETRs for 6 Member States 1994-2005, with projections to 2012
- Assessment of effects on competitiveness and carbon leakage in the context of the single market
 - Macroeconomic and sectoral effects
 - Detailed dynamic counterfactual modelling
 - Complemented by industrial analysis



Conclusion

- Critical time in environmental policy in EU
- Targets supported by ETS and regulations, but “price-signal” gap in policy for small GHG emitters
- ETR fills that gap
 - very attractive politically (e.g. UK politics)
 - many EU countries have experimented
 - but there have been and are industrial concerns

