

Origins of CO₂ price uncertainty

Professor Michael Grubb

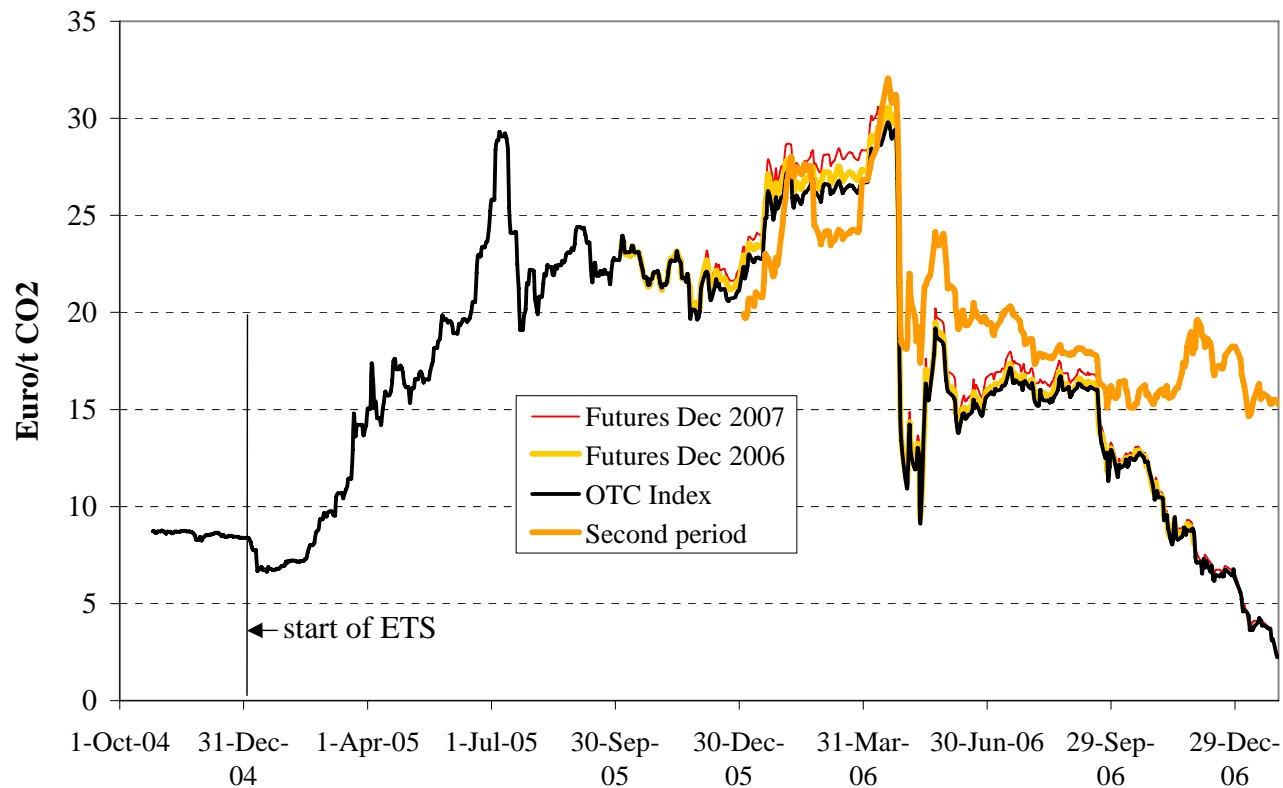
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General lesson from Phase I: allocation is central, projections are unreliable, few people understand the fundamentals – was it predictable?

EUA price 25 October 2004-30 January 2007



*"We compare Phase I allocations against historical emissions, projections and Kyoto targets .. they are **excessive on all these measures** ... we note the UK ETS [also] had a price spike early in its operation before prices collapsed to near zero towards the compliance date ..."*

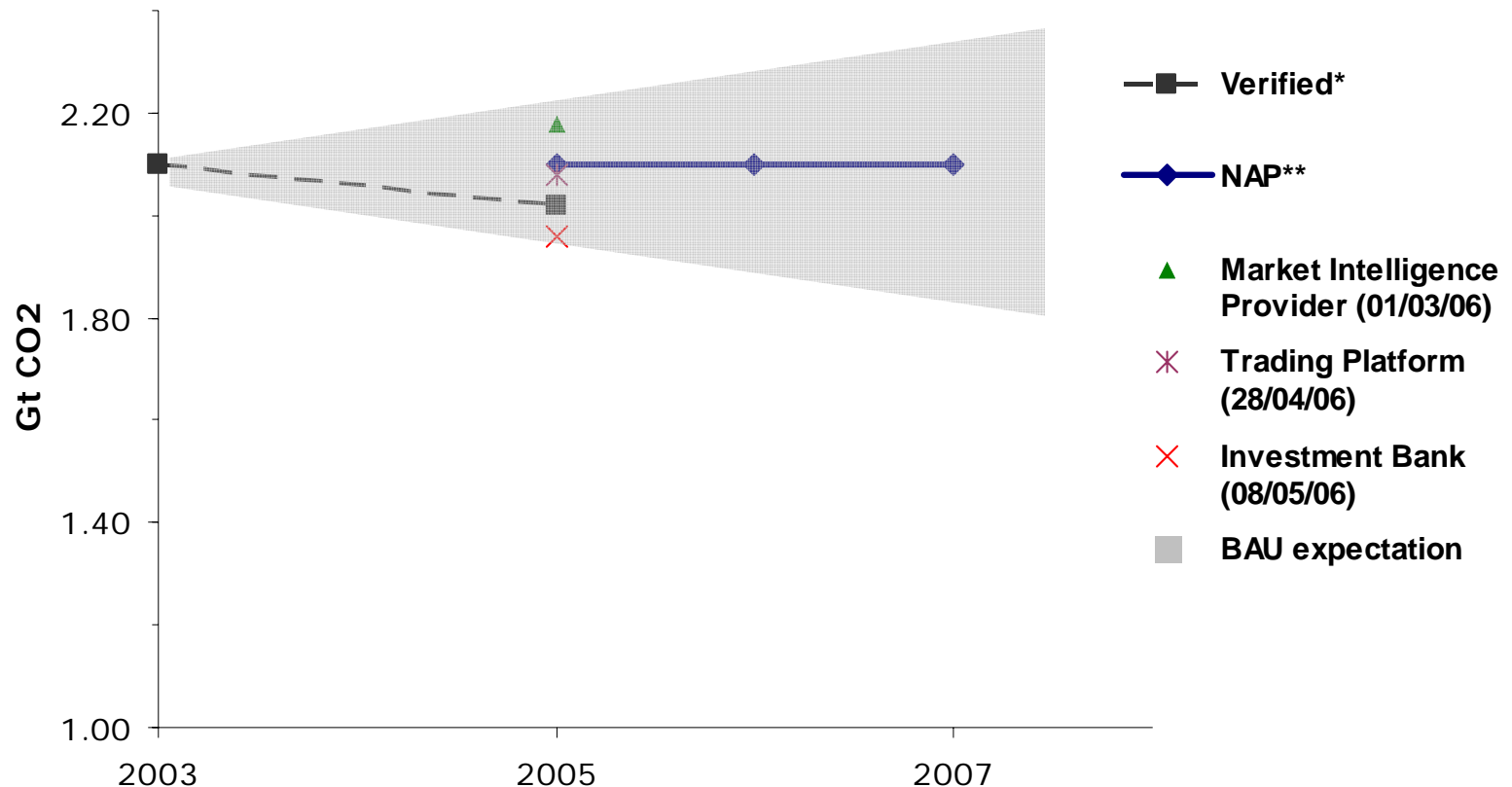
- Grubb, Azar and Peterson, *Climate Policy*, Vol.5 no.1, **April 2005**

Note first – we are having trouble even “predicting the past ...” !!

- Ellerman & Buchner analysis of 2005 that still ends with considerable uncertainty
- Some ‘uncertainty’ still over the actual surplus:
 - 97MtCO₂’ (Ketter, Koppl, Schleicher & Thierus, 2007) not including NER
 - Complications from a few sources (including time profile of Danish allocation), accounting of NERs and auction
- The balance of abatement vs overallocation remains quite uncertain
 - 2005 Surplus was 5%
 - Abatement represented ... how much .. 25-75% of this ?
- Additional insights available from installation distribution
 - Eg. Kettner et al find more consistent surplus from the larger installations, and speculate this to be evidence of greater lobbying power

The price crash of Spring 2006 shows how small cutbacks with projection uncertainties carries potential for price volatility

- *Cutbacks were only about 1% below projected 'BaU'*
- *As late as March 06, major provider got "retrospective estimate" completely wrong*
- *Power sector emissions were focus of all cutbacks and shortages (tbc) – surplus in other sectors must be much bigger*



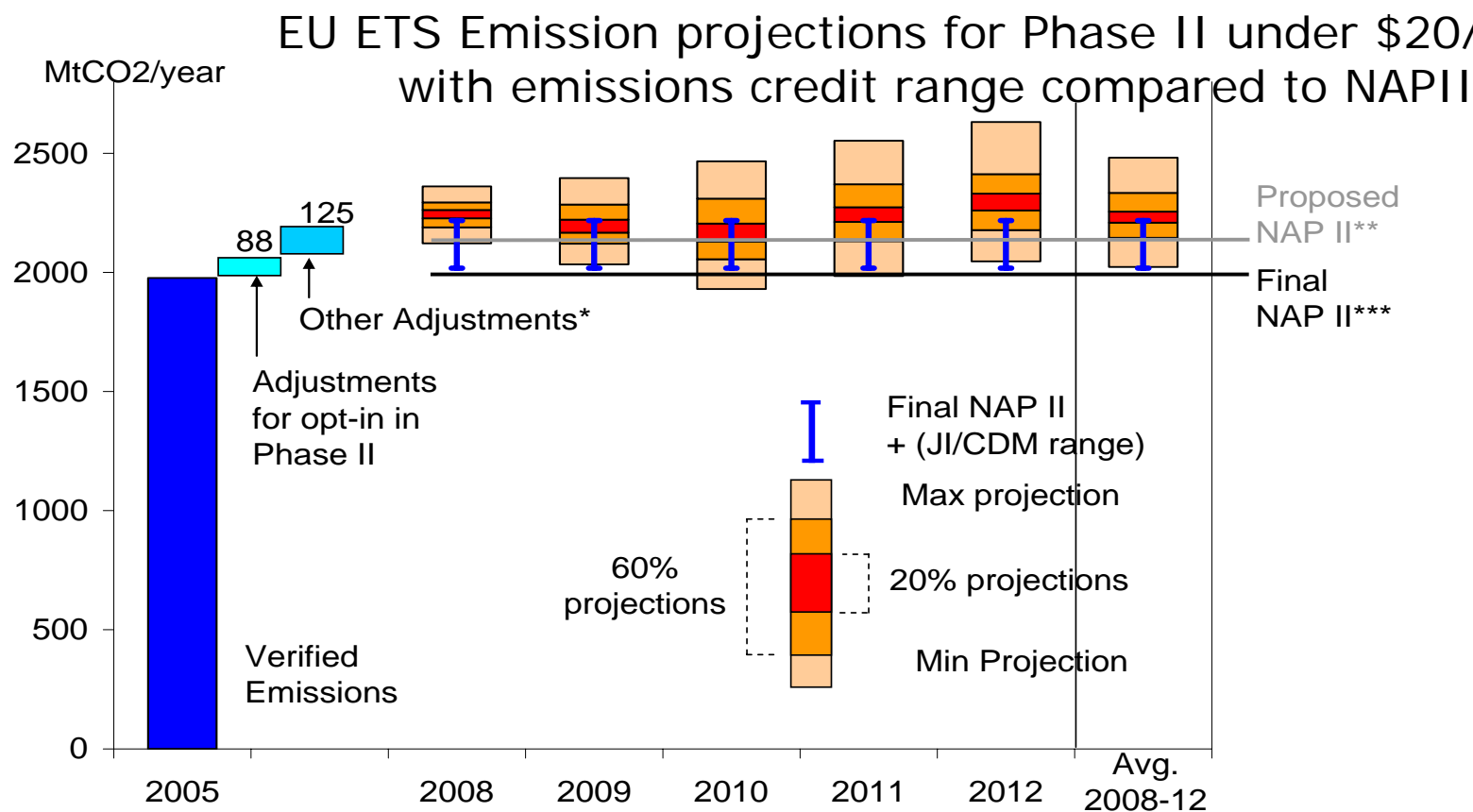
"Energy forecasting invented to make economic forecasting look good ..."

- The 'politics of forecasting' was acknowledged two decades ago ..
 - "largely because of the importance of forecasters in the policy process, they are subject to a variety of influences which prevent their forecasts from being objective" (review of Baumgartner and Middtun, *The Politics of Energy Forecasting*, 1987)
- Improved forecasting at national level masks systematic errors at sectoral level:
 - "Low errors for total energy consumption are concealing much larger sectoral errors .. [for EIA] 5-year forecasts made between 1982 and 1998 industrial sector was overestimated by an average of 5.9%, and the transportation sector was underestimated by an average of 4.5%. ..no evidence that forecasts within each sector have improved over the two decades studied here." (Winebrake and Sakva, 2006)
- No comparable dataset outside the US

Systematic upward bias in emission projections is to be expected and the empirical evidence is now overwhelming

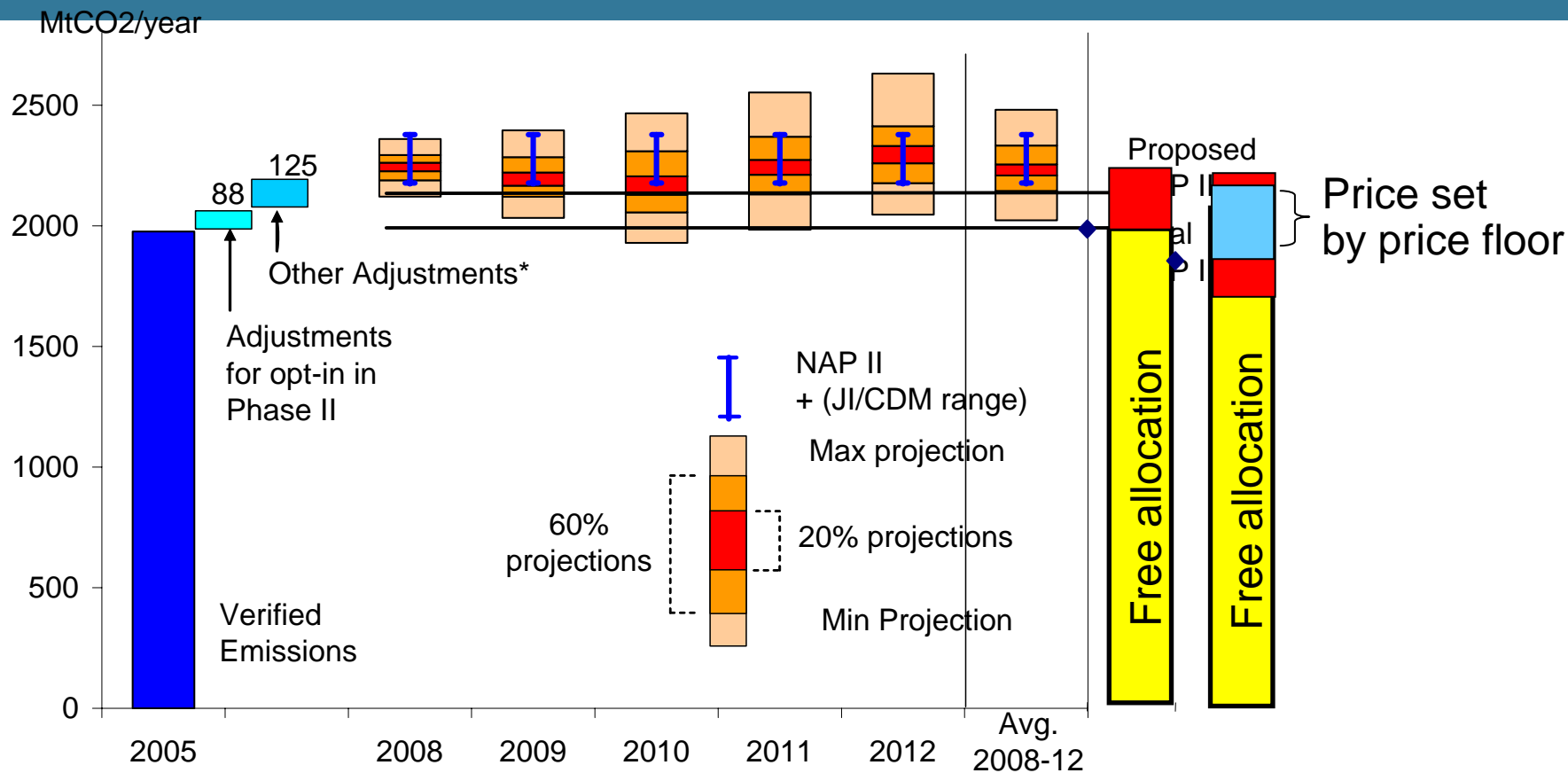
- At least three factors explain upward bias in emission projections
 - Inherent optimism of macroeconomic and sector growth assumptions: no-one plans for or promotes the possibility of underperformance or failure
 - The 'gaming' incentives combined with asymmetric information between government and industry
 - 'You don't know what you don't know' in emission abatement possibilities: repeated evidence of 'awareness' effects in mitigation delivery
- The empirical evidence in is consistent and overwhelming
 - UK ETS
 - Climate Change Agreements
 - .. And now European-wide overallocation for 2005
- "From a limited evidence base, we conclude that **uncertainty is at least $\pm 2\%/yr$, overlaying an upward bias (projection inflation) on the order of $1\%/yr$** , cumulative ... this has important implications both for allocation approaches, and for some other design elements in the EU ETS" (Grubb and Ferrario, *Climate Policy* 6: 4)

'Demand' uncertainties from **GDP**, **relative fuel prices** (& weather) combine with 'supply' uncertainties from **external credit supply** (and abatement)



Source: Emissions Projections 2008-2012 versus NAP2 (2006) by Neuhoff, Ferrario, Grubb, Gabel, and Keats and . Published in Climate Policy 6(5), pp 395-410. Electricity sector analysis using ICF European electricity model

10% auctions with price floor could facilitate investment



Coordinated auction with price floor can reduce risk of low prices

Source: Emissions Projections 2008-2012 versus NAP2 (2006) by Neuhoff, Ferrario, Grubb, Gabel, and Keats and . Published in Climate Policy 6(5), pp 395-410.

EU ETS: Learning the Lessons

ETS Special Issues of *Climate Policy* journal:

Allocation and competitiveness

Vol.6 no.1, June 2006

Phase I Lessons and Phase II analysis

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(published online, 13 March)

www.climatepolicy.com

national allocation plans in the EU emissions trading scheme

LESSONS AND IMPLICATIONS FOR PHASE II

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