

Reflections on the European Union Emissions Trading Scheme (EU ETS) – what can we learn?

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The European Union Emissions Trading Scheme (EU ETS) is the largest greenhouse gas market (GHG) ever established. Upon its launch in 2005, the EU ETS covered the CO₂ emissions of energy-intensive sectors in 25 Member States, which represented 41% of all European GHG emissions. Today, the scheme includes 27 Member States and claims 80 percent of the value of the world carbon market. Allowance trades in 2007 were valued at €24.1 billion.

The pilot phase of EUETS finished in December 2007. What lessons can we draw from the experience? There are many, but the following strike me as being of particular interest.

These are drawn mainly from the following sources:

Ellerman, A Denny and Joskow, Paul L. 2008. *The European Union's Emissions Trading System in perspective*, Pew Center on Global Climate Change, Washington DC, May 54p. See:
<http://www.pewclimate.org/docUploads/EU-ETS-In-Perspective-Report.pdf>

Convery, Frank, De Perthuis, Christian, Ellerman, Denny, 2008. *The European Carbon Market in Action: Lessons from the First Trading Period – Intermediate Report*, March 39p. See: http://www.aprec.net/documents/08-03-25_interim_report_en.pdf

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The fruits of intellectual osmosis – insights absorbed by listening to stakeholders of differing perspectives and researchers beginning a process of formal ex post analysis

I. Second Mover Advantage - The European scheme learned lots from the US in two respects.

- The early failed efforts in the US, where restrictions on trade, and transactions costs choked the development of the market.
- The acid rain scheme, where most of these lessons were internalised, and the market worked. The documentation by Ellerman et al (2000) was a key source.

II Miracles happen, and people evolve.

The stone which the builders rejected has become the corner stone. Getting what you want is not always for the best. The European Union opposed trading in the Kyoto negotiations, but fortunately did not prevail.

III. People and institutions matter

Edward Mortimer observed that: *A nation..is a group of people united by a common dislike of their neighbours, and a shared misconception about their ethnic origins* This comes close enough to capturing the European essence, so it takes a strong ring master to move a collective agenda forward. In the European system, the European Commission has singular responsibility for proposing legislation and - once it is enacted – for its enforcement via the European Court. There was focused leadership from a variety of individuals including the Commissioner (Margot Wallstrom), Director General (Catherine Day) and Unit chief (Jos Delbeke), and subsequently the European Parliament (Jorge da Silva). This focus resulted in a European scheme achieving a sufficiency of convergence across a continent of diverse economies and cultures; allow¹ance allocation and implementation mechanisms were developed in 25 countries (now 27) with 23 official languages, GDP per capita –ppp basis - ranging from \$45,600 in Ireland to \$11,100 in Romania [- much wider spread than the US (Delaware per capita GDP €50,601 vs. Mississippi at 24,062)]; the European Union comprises the largest economy in the world [GDP of \$14.5 trillion (2005) vs. US \$13.86 trillion] with close to 500 million people (CIA, 2008).

IV. Europe can lead effectively and Kyoto was important

Henry Kissinger famously expressed bemusement about ‘who to call’ when he wanted to speak to Europe, the plausible implication being that a headless organism cannot lead. The decision in March 2001 by the Bush administration

¹ Regional Data for US from Bureau of Economic Analysis Gross Domestic Product by State 2006 (in 2000 \$) See: http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm
National Data for Europe from Central Intelligence Agency World Factbook – rank order GDP per capita (ppp). See: <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html>

Note that Norway is the richest country in Europe (\$55,600 per capita) but not in the Union. Luxembourg and District of Columbia not included.

to reject Kyoto created a realisation in Europe that if we didn't lead, Kyoto would not come into effect, and the attempt to address the climate change challenge might be mortally wounded or seriously delayed. In the environmental and renewable energy arenas, a supportable case can now be made that the Union is the global leader, and EU ETS is a symbol and flagship of this phenomenon. The fact that Kyoto gave us a cap – 1990 emissions minus 8 per cent by 2008-'12 – created an underlying logic for a policy instrument that would manage to achieve this in ways that were fair and economically efficient.

V. Panic can be a useful motivator

It became clear that, notwithstanding the emission reduction benefits of the dash for gas in the UK and the carbon emission reducing restructuring in unified Germany, under business as usual, the Union would not meet its collective Kyoto target; this led to a 'something must be done' deliberation at EU level. In parallel, national trading schemes, led by Denmark and the UK, were emerging which could have resulted in 25 individual national schemes, all with special features reflecting local interest group pressures, and posing potential trans frontier incompatibilities, single market problems, and generally comprising a 'tyranny of small decisions' that would suffer from serious diseconomies of scale and scope.

VI. History is always a surprise – most allowance price predictions got it wrong and 'new' abatement actions emerged.

The price stayed in the 15-30 Euro a tonne range for about 12 months – higher than most expectations. This was a product on the demand side of those being short (utilities) being willing and able to buy, and reluctance on those who were long to sell, shifts in relative natural gas and coal prices that increased demand, weather effects that resulted in reduced hydro supply, and perhaps most saliently, delay in supply from (supply-rich) Poland coming on stream due to delays in approval of allocation plans and registry set up.' Bet against the pundits' seems to be the lesson.

Also some of the sources of abatement were a surprise. In Germany there was a move from lignite to hard coal, more use of biomass in many countries, more carbon efficient coal generation in the UK, and more use of zero carbon blast furnace slag in cement production.

VII. Keep it simple

The European Union scheme has no price caps, is cap and trade instead of baseline and credit, based on installations, there is no need for permission to trade, one gas initially (CO₂), and the sectors included are readily identifiable, being those already in the Integrated Pollution Prevention and Control (IPPC) licensing system - electricity and heat (>20MW) and most heavy industry. Undue complexification was avoided in part because of lessons from US experience, and some of the complexities emerging in the UK domestic trading scheme.

VIII. Let the market work, but help it work better

There have been great swings in allowance price, but no price cap. Price does what it should do in every well functioning market, it allows demand and supply to balance. The biggest change came when real information on the demand and supply balance prevailing for year 2005 became available in April 2006, showing the most countries and sectors were 'long'. There was an immediate downward adjustment, from €30 to about €12, and this continued. The fall has been exacerbated by the fact that there is virtually continued towards zero, because banking allowed between the pilot and Kyoto phases.

The sharp price oscillations in EU ETS in the pilot phase (2005-2007) were in part a product of (a) infrequent (annual) provision of data on supply of and demand for allowances and (b) inability to carry forward (bank) allowances into the next period.

The solution lies in releasing data quarterly, and allowing banking forward. This will cost and also 'complexify', but will pay off in terms of smoother price adjustments. In the European Commission proposals for the trading scheme in the 2013-20 period,² 'surplus' allowances banked in the 2008-12 period can be carried forward.

The most important actors in meeting the climate change challenge are the Innovators. They see reducing carbon and other greenhouse gas emissions as an environmental challenge and a commercial opportunity. It is important not presume to set a ceiling on their ambition by setting a ceiling on the CO₂ price.

IX. The trading impulse takes hold quickly

As Adam Smith observed, it is not the fact that we have a soul that explains our uniqueness, but rather our impulse to trade: *Man is the only animal that makes bargains; one dog does not change bones with another dog* The market emerged very quickly. The futures market in Europe appeared over a year before the regulations and registries etc were finalised. There are many options for trading, with about one third of trading taking place on exchanges, with ECX (London) by far the largest, offering spot, forward and futures contracts.

X. Reduction in emissions is quickly achieved.

As the pilot phase took off, natural gas prices rose sharply - in the EU they are linked to oil prices – while coal prices did not increase proportionately. There was a strong incentive for utilities that could do so to bring relatively

² See: Proposal for a **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community** {COM(2008) 30 final}
http://ec.europa.eu/environment/climat/emission/pdf/com_2008_16_en.pdf

carbon intensive coal fired plant on line and move them up the dispatch order. But this required the acquisition of more allowances, which increased the costs of this plant, and this in turn in some cases changed the tradeoffs. So the CO₂ market acted as wedge, limiting the extent of the default to coal, the calculus in some cases in favour of less carbon with intensive natural gas. or shifting advantage from lignite (more carbon) to less carbon intensive hard coal. Independent estimates by Ellerman and Buchner (2008) and Delarue *et al* (2008) indicate that annual reductions from the counterfactual of about 50-100 million tonnes of CO₂ were achieved, and this is consistent with the performance of overall performance by the European Environment Agency (2007).

XI. The European horizon – 2005-2012 – is too short on its own to induce major new capital investment in carbon reduction and carbon-reducing innovation.

It is too early to definitely conclude that this is the case, but all the feedback from those in the trading scheme is that they need a longer horizon to justify major investment.

To provide more assurance, the current EU proposal is to set a mandatory reduction target of 20 per cent to be achieved by 2020, and to reflect this in the allocations to the trading scheme.

XII. Free allocation of allowances was necessary to get sufficient Member State support, but the implications in terms of pass through in electricity prices are proving contentious.

As the EU ETS proposal was being debated, the main stakeholder involvement was industry, the main concern was competitiveness, and the main consequence was free and generous allocation of allowances – with the non power sectors getting what they needed or more, and the power sector being left moderately short. An outcome has been the passing through by some utilities of some of the opportunity costs of the free allowances, with consequent implications for electricity prices to consumers. In countries with deregulated electricity markets – Germany, UK, Netherlands – the pass through was estimated at 40-70 per cent of the CO₂ value; in countries with more regulated markets – France, Spain, Ireland – pass through was typically not permitted.³ This gave rise to talk - in the Netherlands - of 'double taxation' - with the tax in this case accruing to the utilities and their shareholders in the first instance, with some claw back by government depending on the ownership structure of the utilities in question, and how corporation profits and dividends are taxed.

XIII. Competitiveness has not yet emerged as a major phenomenon.

³ See a series of articles in the June 2006 edition of *Climate Policy*, including: Sijm, J., Neuhoff, K, and Chen, Y., 2006. 'CO₂ cost pass through and windfall profits in the power sector', *Climate Policy*, June.

As always, the estimated outcomes of *ex ante* analyses depended crucially on the assumptions made concerning the counterfactual. Those who wished to show substantial negative effects assumed that no other policy action would take the place of emissions trading – i.e. that ‘do nothing’ was the counterfactual. Those making the case assumed that command and control was the option, in which case of course trading, and especially trading across European frontiers, showed large net gains. Sectoral work tended to show that, at least in the short run, only sectors not in the trading scheme – and therefore not benefiting from free allowances – but importing electricity prices that reflected in part CO₂ allowance prices, such as smelters, would suffer competitive disadvantage. The *ex post* work supports this conclusion – so far, there is no evidence of negative effects on capped sectors, but high commodity prices and free allocation may mask potential effects.

XIV. The Importance of the Pilot Phase (and luck) in achieving a scarcity price

We need a price for CO₂ that, however imperfectly, tells the world that the capacity to absorb more greenhouse gas is scarce, and must be paid for. The pilot phase of the European scheme was focused mainly on getting the system up and running. Allocations were mostly free, and were perceived as generous relative to likely demand, which would imply a low price. However, a combination of forces yielded a rising price up to April 06, which succeeded in making people sit up and take notice. However, as the demand supply realities have been recognised post April 06, the price fell sharply, reaching less than one Euro per tonne for 2007 vintage allowances. In contrast, the forward price for allowances in 2008 is in the range €14-26⁴. These two prices recognise two realities; there is a ‘surplus’ of allowances in the pilot phase that can’t be carried forward, and the supply of allowances for the Kyoto phase (2008-12) has been cut by 6.5 per cent relative to emissions in the pilot phase. They also illustrate the importance of luck – the concatenation of events that yielded a strong price signal in the first half of the pilot phase notwithstanding the fact that the market was technically in surplus – and the change in policy which internalised the lessons of the pilot phase and cut allowances by 6.5 per cent with the resulting firming of the price in the 2008-12 period.

XV. But a Half Loaf is Better than No Bread

The emissions trading scheme has emerged as the pan-European policy instrument of choice in part because an effort to introduce a Europe-wide carbon tax failed. Because tax measures require unanimous approval of all 27 Member State governments, it has no chance of succeeding. There remains much academic debate about how much more desirable a tax would be. But it’s not an option for the EU in this life, and perhaps not in the next. Likewise, a strong case can be made for auctioning allowances, and using the revenues to reduce distorting taxes elsewhere. But the Commission judged that insistence on auctioning most of the allowances would have engendered such

⁴ Price per tonne of CO₂ on 23rd May 2008 was €26.10

virulent opposition and acrimonious debate that no action would be the outcome.

XVI. Ensuring the integrity of the system

Europe learned the importance of credible monitoring, verification and enforcement lessons from the acid rain programme. While there are strict provisions in these regards in the Directive, and backed by the European Court, application in the form of base line estimation and emissions monitoring in the pilot phase seems in some countries to be uneven and this will have to be improved. As in the acid rain programme, enforcement is automatic, not dependent on unspecified civil and criminal penalties. Non-compliance is a lot more costly than going to the market. The automatic enforcement provisions in EU ETS and acid rain are to be preferred to the civil and criminal penalties in RECLAIM NOx.

XVII. A key benefit of the European Scheme has been to animate greenhouse gas reducing projects in third countries

The European scheme is 'linked' to the Clean Development Mechanism (CDM) whereby emissions abatement in projects that reduced emissions in developing countries could be counted as reductions for the firms paying for such reduction. This animated the CDM market, which heretofore had been moribund, and encouraged and facilitated China and India in particular to become involved, including the establishment in China of a carbon trading exchange in Beijing that 'could establish the Chinese capital as a centre for the global trade in carbon credits' (*Financial Times*, February 6, 2007, p.1).

XVIII. Complement trading with other policies that drive the innovation impulse.

The key feature of trading is that it provides an immediate and tangible cash dividend to greenhouse gas reducing innovation. If the allowance price is €25 per tonne, an innovation that reduces emissions by 2 million tonnes of CO₂ per annum immediately on implementation yields a cash dividend of €50 million annually. In Europe, the availability of this dividend is being complemented by large expansions in funding for R&D and a range of supports for the development of carbon neutral renewables.

XIX. Coverage and Flexibility

It is notable that the European scheme does not include road transport, which is recognised as the main source of growth in emissions. This is because excise duties on petrol (gasoline) and diesel are high in Europe [The excise duties on gasoline in Germany is equivalent to €275.20 per tonne of CO₂]. Governments did not wish to risk the loss of this revenue, and environmentalists worried that if trading were substituted for the tax, the environmental achievements of the tax would be compromised. Conversely, there is a proposal to include aviation in the scheme, because it is a rapidly

growing source of emissions, and there are no taxes to be foregone on aviation fuel. There is an examination ongoing in Europe at present of the feasibility, costs and benefits of allowing domestic offsets – where verified reductions are achieved in projects and sectors not now included in the trading scheme can qualify for carbon allowances in EU ETS. The outcome of these deliberations may allow such an evolution.

XX. Allowances are tonnes of CO₂, not tons of carbon

Adopt the European convention

XXI Dealing with new Entrants

In EU ETS, there are free allocations set aside by Member States for new entrants. This has weakened the environmental effectiveness of the scheme, in particular as some carbon intensive new projects have been so supported. Indeed it may be the case that free allowances associated with new entrants subsidise such projects. An important lesson from the pilot phase is that there should be no free allocation for new entrants

XXII Policy is a process

It is common to hear European (and other) efforts to address climate change characterised as fruitless, as they only account for a relatively small and diminishing share of global emissions. This rationale has been a basis for inaction at US Federal level. However, by providing a price signal, other things begin to happen, including for example the triggering of action in China in regard to the Clean Development Mechanism and prospective setting up of a carbon exchange in Beijing. As innovators begin to emerge, their successes, driven by the profits to be captured in the context of the trading scheme, will spill over to enhance global performance. A platform is also established from which to link with other emerging trading schemes. It is particularly important that the EU ETS and whatever emerges in California has sufficient symmetry that they can be linked, and comprise a nexus and fulcrum around which future policy can be levered.

XXIII. The Future

In her beautiful poem *Birthday*, Wislawa Szymborska writes:

*Take dioxide: a lightweight, but mighty in deeds;
What about octopodes, what about centipedes?
I could look into prices, but don't have the nerve:
These are products I just can't afford, don't deserve.
Isn't sunset a little too much for two eyes
That, who knows, may not open to see the sun rise?*

Europe has had the nerve to 'look into prices,' and EU ETS is the result. It is likely to become a permanent feature of our economy and society, because it: has strong political support – no Member State leader opposes its continuance; is producing results; is more congenial and lower cost to emitters than command and control at individual plant level. It is already characterised by a number of vested interests, including: a large group of traders who like to make money; bureaucracies established to issue allowances, set up registries and monitor performance; free allocations that involve billions of assets transferred to emitters; and no evidence that

competitiveness is being damaged. So, perhaps for some of the wrong reasons, it will be with us for a while.

XXIV The Future 2

The Commission has made proposals, which include:

Revision of emissions trading Directive⁵:

- Cap tightening –stepwise reduction to achieve 20 per cent by 2020
- Centralisation ('harmonisation') of – cap fixing, allocation, monitoring verification and enforcement
- Auctioning of allowances (power and..)
- Leakage provisions for the non power sectors – more free allowances and/or 'equivalent effort' required of imports to EU
- Banking (including CERs) over 13 years - 2008-2020
- New CERs post 2012 parked pending UN agreement
- Exclude small-scale installations (but equivalent effort?)
- Effort sharing – distribute 10% of auctioned allowances to poorer Member States

Capping non-trading sectors⁶

Distribution of mandatory cap between the trading and non-trading sectors
Effort sharing by EU 27

3. Renewables Directive⁷

Mandatory targets (-20 per cent)
Effort Sharing by EU 27
Trading in excess of the mandatory target

4. Promotion of Carbon Capture and Storage (CCS)

Demonstration as key requirement
Include emissions 'stored' in EUETS
Commercialisation by 2020 with CO₂ price of 30-40 per tonne

These will be decided on within the next year. If implemented, they will further strengthen environmental performance and generate substantial auction revenues.

XXV Lessons for California

If certainty is important, emission trading ensures that you meet the cap for the sectors covered. Make sure that you create scarcity early on – you need a

⁵ See: Proposal for a **DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community**{COM(2008) 30 final}

http://ec.europa.eu/environment/climat/emission/pdf/com_2008_16_en.pdf

⁶ The 'Effort Sharing' Directive. See: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0017:FIN:EN:HTML>

⁷ Proposal for a Directive of the European Parliament and the Council on the promotion of the use of energy from renewable sources COM (2006) 30 final. See: http://ec.europa.eu/energy/climate_actions/doc/2008_res_directive_en.pdf

price signal right away. Provide an early-on review period that allows you to correct dysfunction. Keep it simple, report quarterly, and allow banking and borrowing. Don't cap allowance price – you need to signal to innovators that you are on their side. Complement the price signal with other support for research development and innovation. Auction revenues compensates for electricity price rises. They can be used to compensate the most vulnerable and to further intensify abatement. Confine coverage to sectors whose emissions can be monitored and verified, and allow expanded coverage of sectors and gasses as it becomes feasible.

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