

Cap-and-trade – why it is the wrong approach

Bruno Prior

There is strong support in certain circles for relying on the European Union Emissions Trading Scheme (EU-ETS) to internalise the social cost of carbon. It is often acknowledged that the scheme has not so far worked, but argued that it can be broadened and strengthened to make it work. There are many reasons to think that this is a mistake.

The reasons why Phase 1 failed have not gone away

The *UK Manifesto on EU-ETS* (DEFRA, 2007) argued that what was mainly needed to make the mechanism work was increased clarity and transparency. It was clarity that caused the market to collapse. For as long as it was not clear that every country bar the UK had not been honest in their Phase 1 allocations, the market was able to exist in a fool's paradise that yielded prices of €15-30/tonne (forward prices for Phase 2 currently exist in a similar fool's paradise). As soon as the mendacity of most European governments became clear, the market collapsed to less than €1/tonne.¹

Honesty and selflessness are needed more than clarity. Yet the National Allocation Plans (NAPs) for Phase 2 submitted in November 2006 demonstrated that European “partners” intend to continue to game the process. The Association of Electricity Producer's (AEP's) European representative reported shortly after the NAPs had been submitted that “*a senior DG Tren official noted that only the UK appeared to have taken the process seriously and there were considerable problems of over-allocation.*” If the NAPs were approved as submitted, the cap for 2008-12 would be 10% higher than the level of emissions in 2005.

The Commission has responded by reducing the allowed emissions of most countries, but the reductions that will be achieved, even if all countries accept the revised allowances and go on to achieve their targets, are pitiful – a saving of 43 million from over two billion tonnes (see table below). In other words, the EU-ETS (which covers almost half of all greenhouse-gas emissions in the region) will, by 2012, be responsible for at best a reduction of 2% relative to 2005 levels if all countries comply fully. That is a lot of bureaucracy and interference in the market for very little carbon benefit. In practice, given the history of Phase 1 and the cynical attitude demonstrated by the submitted NAPs, compromise, gaming and non-compliance is likely to result in emissions exceeding those of 2005.

No wonder Europe's emissions are not on track to meet its modest Kyoto obligations; and, in fact, are being reduced less effectively than in the USA, which was widely castigated for rejecting the cap-and-trade approach, though their reasons have been borne out by experience.² The EU-ETS is failing to deliver sufficient savings from the sectors and countries covered by it to make their contribution to a target which, if achieved, might reduce temperatures in 2050 by 0.06°C.

A rational basis for allocating emissions-rights?

France obtains a little under one-third of its energy from nuclear power, but is this any reason why France should be entitled to emit less than forty percent of Germany's *per-capita* entitlement? If there is a carbon-benefit to nuclear power, should France not be entitled to that benefit? Germany produces more goods for export than most European countries. To what extent should Germany's entitlement be increased to take account of this?

Latvia is one of the greenest countries in Europe. It produces more of its energy from renewable sources than most other nations, resulting in the lowest carbon emissions *per capita* in the EU. However, most of this is in the form of biomass for heating and therefore falls outside the sectors covered by the EU-ETS. Should Latvia be punished for achieving its carbon-savings in this way, by being allocated just over half the *per-capita* entitlement of Lithuania, and less than one-sixth of the *per-capita* entitlement of Estonia? On the other hand, Estonia has been more successful than its neighbours in growing its economy. To what extent should it therefore be allowed to emit more than those neighbours?

The following table shows how the EU-ETS allocations (in million tonnes of CO₂ equivalent) from the Phase 2 NAPs, as applied for and “approved” (i.e. heavily modified) by the Commission, compare with actual performance.

Member State	1st period cap	2005 verified emissions	Pro-posed Phase 2 cap	Allowed Phase 2 cap	Population	Per capita						
						1st period cap	2005 emissions per capita	Pro-posed Phase 2 (P2) cap	Ap-proved P2 cap	P2 cap relative to Germany	P2 cap relative to Estonia	P2 cap relative to Latvia
Austria	33	33.4	32.8	30.7	8,361,000	3.95	3.99	3.92	3.67	66.78%	38.54%	253.35%
Belgium	62.1	55.58	63.3	58.5	10,392,226	5.98	5.35	6.09	5.63	102.37%	59.08%	388.42%
Bulgaria		40.6	67.6	42.3	7,323,000		5.54	9.23	5.78	105.05%	60.62%	398.57%
Cyprus	5.7	5.1	7.12	5.48	855,000	6.67	5.96	8.33	6.41	116.56%	67.27%	442.25%
Czech Rep.	97.6	82.5	101.9	86.8	10,228,744	9.54	8.07	9.96	8.49	154.32%	89.06%	585.53%
Denmark	33.5	26.5	24.5	24.5	5,550,000	6.04	4.77	4.41	4.41	80.28%	46.33%	304.59%
Estonia	19	12.62	24.38	12.72	1,335,000	14.23	9.45	18.26	9.53	173.28%	100.00%	657.44%
Finland	45.5	33.1	39.6	37.6	5,310,000	8.57	6.23	7.46	7.08	128.78%	74.32%	488.59%
France	156.5	131.3	132.8	132.8	63,713,926	2.46	2.06	2.08	2.08	37.91%	21.88%	143.82%
Hungary	31.3	26	30.7	26.9	9,956,108	3.14	2.61	3.08	2.70	49.14%	28.36%	186.43%
Germany	499	474	482	453.1	82,400,996	6.06	5.75	5.85	5.50	100.00%	57.71%	379.41%
Greece	74.4	71.3	75.5	69.1	10,706,290	6.95	6.66	7.05	6.45	117.38%	67.74%	445.34%
Ireland	22.3	22.4	22.6	21.15	4,234,925	5.27	5.29	5.34	4.99	90.82%	52.42%	344.60%
Italy	223.1	225.5	209	195.8	58,147,733	3.84	3.88	3.59	3.37	61.24%	35.34%	232.34%
Latvia	4.6	2.9	7.7	3.3	2,277,000	2.02	1.27	3.38	1.45	26.36%	15.21%	100.00%
Lithuania	12.3	6.6	16.6	8.8	3,390,000	3.63	1.95	4.90	2.60	47.21%	27.24%	179.12%
Luxembourg	3.4	2.6	3.95	2.7	467,000	7.28	5.57	8.46	5.78	105.14%	60.68%	398.93%
Malta	2.9	1.98	2.96	2.1	407,000	7.13	4.86	7.27	5.16	93.83%	54.15%	356.02%
Netherlands	95.3	80.35	90.4	85.8	16,570,613	5.75	4.85	5.46	5.18	94.16%	54.34%	357.27%
Poland	239.1	203.1	284.6	208.5	38,518,241	6.21	5.27	7.39	5.41	98.44%	56.81%	373.50%
Portugal	38.9	36.4	35.9	34.8	10,643,000	3.65	3.42	3.37	3.27	59.46%	34.32%	225.61%
Romania		70.8	95.7	75.9	22,276,000		3.18	4.30	3.41	61.96%	35.76%	235.10%
Slovakia	30.5	25.2	41.3	30.9	5,390,000	5.66	4.68	7.66	5.73	104.26%	60.17%	395.57%
Slovenia	8.8	8.7	8.3	8.3	2,020,000	4.36	4.31	4.11	4.11	74.72%	43.12%	283.51%
Spain	174.4	182.9	152.7	152.3	40,448,191	4.31	4.52	3.78	3.77	68.48%	39.52%	259.81%
Sweden	22.9	19.3	25.2	22.8	9,150,000	2.50	2.11	2.75	2.49	45.32%	26.15%	171.93%
UK	245.3	242.4	246.2	246.2	60,776,238	4.04	3.99	4.05	4.05	73.67%	42.52%	279.51%
Total	2,181	2,123	2,325	2,080	490,848,231	4.44	4.33	4.74	4.24	77.06%	44.47%	292.37%

There is (presumably) method to these allocations, but not logic. This is a central-planner's fantasy, and a libertarian's nightmare.

The EU-ETS fails to deliver long-term price signals

It is future certainty that the *UK Manifesto on EU-ETS* has in mind when calling for greater clarity. It is optimistic to imagine that a reliable, efficient and long-term market will result from a system that relies on 27 democracies to set themselves targets, and to self-administer honestly and carefully a scheme that requires them to inflict pain on their own economies while trusting that their neighbours will be equally rigorous. Is there anything in the history of the EU to suggest that such selflessness will be ubiquitous and sustained? Even if present governments commit to future reductions beyond the usual 5-10-year timescale, how will they bind their successors under democratic systems? If a means could be found to bind them, how will future recidivist governments be prevented from fudging a system that depends on all participants acting in good faith?

There are, in any case, practical obstacles to fixing a scheme beyond 2012. The EU-ETS is an offshoot of the Kyoto process, and integrates with other Kyoto mechanisms, such as the Clean Development Mechanism (CDM) and Joint Implementation (JI). The Kyoto Treaty covers the period to 2012. Beyond that, it is not clear what global mechanisms will be available for the EU-ETS to link to. As Certified Emission Reduction (CER) Certificates from CDM/JI represent a safety-valve for the EU-ETS (a way of balancing the carbon books at low cost), the uncertainty about their prospects beyond 2012 will make forecasting the EU-ETS market after that date very difficult, even if market-players are confident about the long-term reliability of the internal European mechanism.

Markets will emerge where rational values can be derived. The absence of long-term prices is a sign that future uncertainty is sufficient to make prediction foolhardy. It is typical hubris of politicians to imagine that they can reduce this uncertainty by declaring their intentions for a time when they will almost certainly not be in power, and for a market over which they have only partial control. It is likely that not even increased federalism would be sufficient to deliver greater certainty, and only a Napoleonic solution would suffice.

Penalising Europe and offshoring our carbon

Even if the EU-ETS could be made to work efficiently, fairly and on a long-term basis, it would disadvantage European nations for as long as other nations did not impose similar costs of carbon on themselves. Some argue for a 'Son of Kyoto' to resolve this problem, by extending emissions targets to rapidly-developing countries, and bringing America back into the process. Others suggest that the weakness can be reduced by negotiating the interoperability of EU-ETS with other emissions trading schemes springing up around the world in New Zealand, Australia, Japan, Canada and various US states, aiming perhaps for a single global cap-and-trade carbon market. This is not just optimistic, but positively panglossian.

- a) Even as the White House finally agreed (31 May 2007) to commit to action on climate change, it *“ruled out carbon trading as the way to cut emissions”*.³
- b) The Lieberman-McCain Climate Stewardship Bill of 2003, which would have implemented a cap-and-trade mechanism, was voted down by the Senate. It has been amended and reintroduced in 2007, but the constraints have been loosened, to the extent that McCain acknowledges that *“significant reductions in greenhouse gases - well beyond those required by this bill - are feasible over the next 15-20 years using technologies available today”*.⁴ The EU-ETS demonstrated the failings of cap-and-trade schemes with easily-achievable caps. Any attempt to integrate the EU-ETS with American cap-and-trade schemes with loose caps will result in Europe paying America for notional savings, while America's carbon emissions remain well above ours. Similar effects could be expected for Australian and Canadian trading schemes.
- c) India has recently reiterated its refusal to consider a cap on its greenhouse-gas emissions,⁵ let

alone agreeing to enter a trading mechanism, other than taking incidental gains from the largely spurious Clean Development Mechanism (CDM) of the Kyoto Treaty (see below).

- d) China and several other major developing nations are said to share India's view.⁶
- e) Russia and much of the old Soviet Bloc are still mainly interested in selling “hot air” – the source of many Joint Implementation (JI) carbon credits. “Hot air” is the notion that, because emissions in Soviet Bloc countries collapsed along with their economies, they should be entitled to count the reduction as a contribution towards tackling climate change. The *per-capita* CO₂ emissions of Russia are higher than those of every country in the EU listed above, except Estonia, the Czech Republic, Luxembourg, Finland and (just) Ireland, i.e. than 95% of Europe (by GDP or population). If measured relative to GDP, Russia and its satellites are the dirtiest major nations on earth (closely followed by China and India). Thanks to strongly-subsidised energy-pricing, many of the developing nations remain some of the most energy-profligate. Subsidising their continued inefficiency, by paying them for improvements that were in any case inevitable once economic reality bit and they stopped producing for production's sake and started producing in order to meet market demand, is our money for their old rope.
- f) A significant proportion of carbon credits from projects developed under the CDM are bogus. *The FT* identified in February 2007 that “billions of dollars are being wasted in the international carbon trading system as a result of a loophole in the Kyoto protocol....by exploiting the regulations in the protocol surrounding a potent greenhouse gas, HFC-23”.⁷ *The Guardian* reports a litany of problems, including that a “senior figure” estimates “there may be faults with up to 20% of the [CDM] carbon credits”, that another “one of the CDM's experts calculates that as many as one third of the projects registered in India....do not produce any additional cut in greenhouse gases and were wrongly approved”, that Ernst & Young were complicit in some of the fraudulent auditing reports, and that 53% of existing CERs come from six projects to reduce HFCs from refrigerant-manufacture.⁸ Not surprisingly, given the low cost of these spurious savings, in a recent survey of companies involved in the EU-ETS, most were planning to buy these bogus credits rather than reduce their own emissions.⁹

There is no merit in cooperating for cooperation's sake. If the cooperation is with countries whose mechanisms are less rigorous than the EU-ETS, inter-mechanism trading will simply result in transfer of funds and activities from Europe to countries that take a more relaxed view of their environmental obligations, without a proportionate environmental benefit. We will be suckers in a rigged global market for hot air.

Market distortion and perverse incentives

The allocation of emissions rights to existing players rewards dirty incumbents and disadvantages their cleaner or newer competitors. For instance, the Irish cement-producer Ecocem pioneered the use of blast-furnace slag in its production process. Their emissions were reduced to one-sixteenth that of their competitors – too low to qualify for the allocation of permits. Their competitors, on the other hand, did qualify for permits, and could profit from them by introducing the techniques that Ecocem had pioneered, putting Ecocem at a competitive disadvantage.¹⁰

This perverse incentive, to avoid unnecessary reductions in emissions to ensure maximum future allocations, can be avoided by auctioning rather than allocating the carbon-credits. However, the companies currently receiving free allocations have so far fought a successful campaign to hang on to their advantage. If it is not politically possible to move to full auctioning of credits, the EU-ETS will continue to embed the market power of incumbents (who, perhaps not coincidentally, are notably enthusiastic about the mechanism). The role of government should be to prevent incumbents from erecting barriers to entry, not to institute those barriers for them.

Preferential pricing of some sources of greenhouse gases

The EU-ETS applies only to a subset of greenhouse-gas emissions and cannot practically be extended to cover all emissions. Below the size of installation currently covered, the transaction costs of this bureaucratic system exceed the benefits of its extension. This means, at best, that alternative mechanisms are required to price carbon from smaller installations, and in reality, that improvements in areas that cannot practically be covered by cap-and-trade are encouraged (ineffectively) by means of cajoling, grants and regulation, rather than pricing. The result is differential pricing of identical goods (greenhouse-gas emissions), and a skewed market that encourages favoured solutions rather than the most efficient means of delivering carbon-reductions.

Most European countries with low levels of emissions, such as Latvia, Lithuania, Denmark, Austria and Sweden, have high levels of renewable heating (e.g. wood-fired boilers, ground-source heat-pumps etc). Typical green-heat installations are too small to integrate into the EU-ETS. Reliance on the EU-ETS for large installations and a hodge-podge of dirigiste interventions at the lower end of the market explains why the UK has so far failed to make any meaningful progress on renewable heat, despite the fact that the sector offers more efficient and significant savings than the electricity and transport sectors that have received most of the attention.¹¹

Burning biomass to produce electricity is strongly encouraged under the Renewables Obligation. Burning biomass to produce heat receives very little encouragement. As most of our heat is produced using gas-boilers, and (conversely) twice as much of our gas is used for heat as electricity, increased use of renewable heat would have a bigger impact on our gas-import dependency than efforts to further diversify our electricity supply, which is already relatively diversified. In what way does it meet our carbon and energy-security objectives to encourage production of electricity from biomass at 30% efficiency and of heat from gas at 90% efficiency, rather than heat from biomass at 90% efficiency and electricity from gas at 60% efficiency?

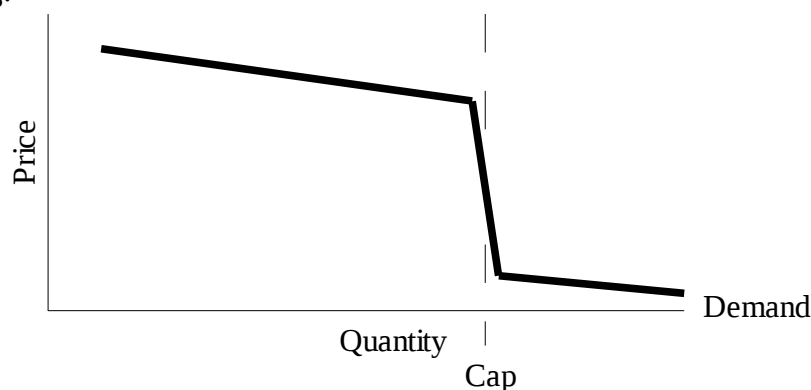
Our incentives are irrational, and they are largely so because there is not a single carbon-price applying equally to large and small installations and to the fuelling of electricity, heat and transport. The European idolization of the cap-and-trade approach is a barrier to more rational carbon-pricing.

Wrong in principle as well as practice

Cap-and-trade mechanisms would be the wrong approach, even if they could be broadened to cover, with tight, fair, and strongly-enforced caps, all sources of emissions from all locations. They inevitably provide distorted price signals, regardless of the details of implementation.

Cap-and-trade produces an irrational, discontinuous demand curve

For most goods, price falls gradually as supply increases. There is no reason to think that prices for carbon-savings should not behave like this, at least up to the point where atmospheric emissions stabilise at an acceptable level. The caps in cap-and-trade systems are always set at a level very much above the stable level, close to current emissions-levels, in order to avoid so-called “deadweight costs” (a misapplication of this term). Consequently, the demand curve looks more like the following:



The consequence of this irrational demand curve is severe. While emissions are above stable levels, each extra tonne of carbon saved is almost as useful as the previous saving. Yet under a cap-and-trade scheme with a cap set close to current emissions-levels, it does not take very much to save sufficient carbon that the value of additional savings falls to close to zero in the market, even though the utility of those savings is not very different to the utility of the high-priced savings. It is difficult to predict, in a market with hundreds of players making thousands of investments, the exact point at which one approaches the “cliff-edge”. Businesses are strongly disincentivised from investing in all but the very cheapest carbon savings if they fear that the market is close to the level of the cap. As the cap is deliberately set to be close to the current level of emissions, this is a real fear in most circumstances.

It is not an accident of current implementations that cap-and-trade has failed to incentivise significant investment in its own market, and has instead relied on cheap (largely artificial) carbon-savings from outside the market. It is fundamental to the concept. It is not obvious what would justify the design of a market in such a way that the marginal value collapses when supply reaches the level of an arbitrary cap that bears no relation to the stable emissions-level.

Cap-and-trade focuses on gross emissions

The carbon-cycle is very much larger than that part which is amenable to control by cap-and-trade. Failure to incorporate all sources of emissions and all means of absorption distorts choices.

The classic example is forests. Existing forests absorb carbon each year. Conversely, destruction of existing forests releases stores of carbon into the atmosphere. Given the complex contribution of existing forests to ecosystems, rainfall patterns, soil-based carbon etc, preserving those forests is at least as important as planting new forests. Yet our carbon markets only value the planting of new forests. The result is small plantations sprouting up to “offset” the carbon emissions from our various activities, while swathes of existing forest are cut down for lack of a value for their preservation. The carbon contribution of the new plantations is over-valued, counting (in a mark-to-market exercise that would have embarrassed even Enron) all absorption for the notional 100-year life of the trees during year one, whilst the carbon contribution of existing forests is under-valued.

What matters is not a nation's gross emissions from combustion of fossil fuels, but its net carbon emissions taking into account all sources of emissions (including agricultural emissions, deforestation, etc) and all absorption in that year by carbon-sinks within the nation's boundaries (arguably, this should include oceanic absorption within national waters as well as forests and mechanical/chemical sequestration). Taking net rather than gross emissions as the basis for trading would result in a very different picture, significantly reducing the contribution of some supposedly polluting nations like America, Canada and Russia, and significantly increasing others' shares. The former are aware of this, which is one reason why they have refused (and will probably continue to refuse) to sign up to a system where they are held to account for their gross emissions. The latter are equally unlikely to accept allocation on the basis of net emissions. Yet without this modification, prices are likely to remain seriously distorted, so that we carry on cutting down our forests while investing heavily in symbolic but wasteful gestures like photovoltaic energy.

Cap-and-trade applies a positive price to “non-carbon”, not a negative cost to carbon

The assumption is that one is simply the inverse of the other, but this is incorrect. There are indeed “carbon-positive” and “carbon-negative” activities. But activities that do not emit carbon are **not** carbon-negative, they are at the zero point of the scale that runs from carbon-negative to carbon-positive. Carbon-neutral – the zero-carbon option – is worth less than the carbon-negative option. In

fact, carbon-neutrality really has no positive value – its value is in the avoidance of the carbon-positive cost. Renewable energy is carbon-neutral, not carbon-negative, yet we treat it as though it has actually reduced our carbon emissions. Renewable energy should not receive a value for carbon-reduction, but should be attributed a value for avoidance of the cost of carbon-emission.

This may sound esoteric, but it has very practical impacts. Currently, by treating the installation of renewable-energy projects as effectively carbon-negative, we use them to offset the costs of our continued emissions. But if we do not reduce those emissions, there is no amount of renewable-energy that will reduce the environmental impact. It is possible to envisage, in a *reductio ad absurdum*, a scenario where we have installed so much renewable energy that the whole world is notionally carbon-neutral according to cap-and-trade accounting, and yet our carbon emissions remain as high as they ever were. This situation requires (besides massive engineering and expense) only that we increase our total consumption of energy in proportion to the increasing renewables contribution. That is precisely what is happening (and more) in many of the countries that are selling us the notional “carbon-savings” from CDM renewable-energy projects.

There is no easy solution to this in a cap-and-trade approach. One has to attribute a notional carbon-saving to renewable-energy projects if they are to be able to trade on the market. And yet that carbon-saving is fictional, and provides excessive encouragement to engineering solutions relative to behavioural changes and protection/encouragement of carbon-sinks. Very often, the latter choices, requiring very little investment, will be the cheaper options, and will have additional benefits for the environment, and security of supply. But engineering solutions have been, and will continue to be, the preferred solutions of cap-and-trade market participants.

Cap-and-trade assumes that there is any rationale for an arbitrary cap

Efforts to calculate these caps have been based on scientists' judgments about what level of emissions will be acceptable, how we should get there, and how the pain of getting there should be divvied up. We have already considered the impracticability of developing a rational basis for allocation of the emissions allowances within an overall cap. But what about that cap itself?

It is often assumed that this is just a question of science – what is the level of emissions that presents an acceptable level of risk? But risk is subjective and uncertain. Avoidance of risk carries costs, as does incurring that risk. It is a question of choice and subjective judgment. Where we face many alternatives and circumstances, uncertainty, risk, and subjective choices generally, the market is a more effective tool than is central calculation.

This is about the balance between adaptation and mitigation. When we set a cap, scientists have decided for us what that balance should be. Reducing emissions to the level of that cap will carry a cost. Some of that cost could have been spent instead on measures to reduce the risk of damage from any global-warming impacts, or indeed simply on investment to improve the current quality-of-life of those who are subject to the risk. The balance between investing in adaptation and mitigation should not be decided for us by scientists, but discovered in markets that establish people's preferences and perceptions of the balance of risks.

Conclusion

There is no way of adapting cap-and-trade mechanisms to satisfy these objections. We should carry through with Phase 2 of the EU-ETS, because the market has a reasonable expectation that it will be fulfilled. But we should agree now to put it out of its misery after that, and to use the period before 2012 to negotiate an alternative system to replace Kyoto – one that provides a more rational price, reflecting all sources and sinks, and taking account of adaptation as well as mitigation, and that is agreeable to all nations, or at least all major emitters. There are alternatives, if people are prepared to open their minds.

- 1 Presenting evidence to the House of Commons Environmental Audit Committee in November 2006, representatives of the Environment Agency observed that, to that point, they were not aware of any “*documented cases where a particular business has reduced its emissions because it has been in the scheme*”, that where businesses had made preparatory investments to save carbon, “*that has actually almost stopped because there is little incentive to burn fuels other than coal*”, and, in fact, that it is not “*clear whether we are really seeing any environmental benefits just yet*”. They concluded that Phase 1 had to be written-off as experimental, and that it was possible that the same would happen to Phase 2. <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmenvaud/70/6112103.htm>
- 2 Lawrence Summers, “We need to bring climate idealism down to earth”, Financial Times (FT), April 30, http://blogs.ft.com/wolfforum/2007/04/we_need_to_brin.html
- 3 Financial Times (FT), June 1, frontpage: “Bush in U-turn on global warming”, <http://www.ft.com/cms/s/32856c56-0f84-11dc-a66f-000b5df10621.html>
- 4 http://mccain.senate.gov/press_office/view_article.cfm?id=803
- 5 Daily Telegraph (DT), May 30, “India to shun G8 demands on gas emissions”, <http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2007/05/30/eagas30.xml>
- 6 DT, June 1, “Leave global warming to market forces”, <http://www.telegraph.co.uk/opinion/main.jhtml?xml=/opinion/2007/06/01/dl0101.xml>
- 7 FT, Feb 8, “Billions lost in Kyoto carbon trade loophole”, <http://search.ft.com/iab?id=070208000416>
- 8 The Guardian, June 2, “Abuse and incompetence in fight against global warming” (<http://environment.guardian.co.uk/climatechange/story/0,,2093835,00.html>) and “Truth about Kyoto: huge profits, little carbon saved” (<http://environment.guardian.co.uk/climatechange/story/0,,2093815,00.html>)
- 9 The Economist, May 31, “Trading thin air”, http://www.economist.com/surveys/displaystory.cfm?story_id=9217960
- 10 Submission of Ecocem Ireland Limited to the Environmental Protection Agency in respect of Draft NAP 2, http://www.epa.ie/downloads/pubs/air/etu/nap2firstpublicconsultationsubmissionsreceived/epa_nap2_submission_ecocem_ireland_limited_2_of_3.pdf
- 11 I must declare an interest – since writing this paper, my company has invested in a green-heat business.