

Carbon Dioxide Trading in the European Union

-Full Committee Roundtable Discussion-
Monday, March 26th
2:00-4:00pm
-Dirksen G50-



The European Union Emissions Trading Scheme (EU-ETS) is the world's largest tradable permit system for carbon dioxide and the cornerstone of the EU's strategy to meet its Kyoto emission target. The first phase the program began more than two years ago, in January 2005, and will be followed by a second phase commencing in January 2008.

This discussion will provide an overview of the trading system and will focus on lessons that have a bearing on the design of a CO₂ trading system for the United States.

Participants were asked two questions:

*“What was done **right** in the EU Emissions Trading Scheme?”*
and
*“What was done **wrong** in the EU Emissions Trading Scheme?”*

Participants answered each question in one page or less.
Background on the EU-ETS and the responses are compiled [here](#).

The European Union Emissions Trading Scheme (EU-ETS): A Brief Overview

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-Resources for the Future-

Cap and Trade—A Quick Tutorial

EU ETS is an emission allowance cap & trade system. All such systems establish a cap on annual emissions (or if banking is allowed, on the annual allocation of emission allowances), identify those entities whose emissions will be regulated, and set a few rules. In most contexts, one allowance is required for each ton of emission. Allowances are usually freely transferable, although in some programs constraints on trading have been imposed. Allowances can be initially distributed in the market through free allocation based on some metric or another, or sold through an auction. A key question is whether allowances that are not used in the year they are issued can be banked for use in a subsequent year.

EU ETS Structure

- The EU ETS began in January 2005 and includes the 27 countries of the European Union
- The program is run in two phases. Phase 1 from 2005–2007 was intended to be a trial period to work the bugs out of the system; however, in all respects, it is a real cap-and-trade system. Phase 2 (2008–2012) coincides with the Kyoto commitment period.
- The cap covers only carbon dioxide (CO₂), although other greenhouse gases (GHGs) may be added in the future. (CO₂ accounts for 80% of all GHGs.)
- About 12,000 CO₂ emissions sources are covered by the cap, accounting for some 40% of all EU CO₂ emissions. Covered emissions sources include iron and steel; cement, glass, and ceramics; pulp and paper; and energy (electric power generation and refineries).
- Transport is not currently included in the system, although the EU will include air transport in the EU ETS in 2011.
- Each country submitted a National Allocation Plan (NAP) for approval for Phase 1. The European Commission is in the process of finalizing NAPs for Phase 2. NAPs describe three decisions each country must make.
 1. How much of a country's Kyoto target is assigned to the sectors participating in the trading system (by implication, the remainder of the target must be met by sectors outside the system—for example, transport). The EU offers strong guidelines and regulatory oversight to require that at least the major sources such as those listed above be included in the program.
 2. How much of the cap will be assigned to each sector—determining how much of the burden and cost sectors will have to bear.
 3. How the sector allocation is then further subdivided among individual companies.
- EU ETS rules allow countries to auction an upper bound of 5% of the allowances, only Denmark chose to auction the full 5%, the remainder being allocated gratis. More auctioning is likely to occur in Phase 2.
- Emissions sources covered by the EU ETS may satisfy their commitments by surrendering allowances in an amount equal to their emissions or may supplement the EU-ETS allowances with JI (Joint Implementation) and CDM (Clean Development Mechanism) credits (which are generated by undertaking CO₂ reduction projects outside the European Union in accordance with Kyoto Protocol rules.)
- As a result, the price and availability of CDM credits will have bearing on the price of EU allowances.

EU ETS Market Performance

- Early in Phase 1, allowance trades were handled by brokers outside of formal exchanges. Currently about ½ the trading volume occurs on exchanges and the other ½ over the counter.
- In 2005 about 8 billion dollars of trades took place in the EU ETS. By the end of 2006, this is thought to have grown to 25–27 billion. Trades in the worldwide carbon market for 2006 may be on the order of 30 billion dollars—with the lion's share owing to the EU ETS.
- Prices March 20, 2007
 - The current spot price is € 1.00, \$ 1.33
 - The December 08 Future price (Phase 2) is € 15.60, \$ 20.75

Lessons Learned

There are three features of a cap-and-trade system that are important when evaluating its policy effectiveness.

1. Cap-and-trade systems establish a new class of asset—the emissions allowance—and these assets will have immediate value once the system is established; therefore, initial allocation of allowances is an allocation of wealth.
2. Cap-and-trade emissions-reduction policies impose a cost on society, and once the initial allocation is made, the distribution of that cost will be determined by the market, not government policy.
3. The allowance prices are visible signals regarding the current cost of CO₂ reductions (the spot price) and expectations regarding the future cost (futures prices). These expectations take into account expectations regarding the policy decisions determining the required reductions and the future cost of abatement—closely linked to abatement technology.

The performance of the market hinges on accurate monitoring, reporting and enforcement. At the outset of the ETS in Phase 1, many nations lacked reliable data reporting systems, which contributed to the extraordinary price volatility.

- Lesson—Inclusion of sectors and sources should be preconditioned by the development of strong monitoring and accounting systems.

The ability of government to distribute the economic burden a cap-and-trade system will impose on the economy is greatest during the allowance allocation stage.

- Lesson—think twice, allocate once

Allowances are assets that can have significant value. Allowances that have fixed lives, like Phase 1 of the EU ETS, must have asset values that go to zero at their terminal points. This raises difficult issues of asset management for those required to hold allowances.

- Lesson—develop banking rules, or least short-term overlapping rules

Investments in technology needed to radically lower GHG emissions are likely confined to the energy sector, where they tend to be large and very long lived. In that case, allowance prices are intended to incentivize these investments and must have as little non-market uncertainty as possible. At the current time in the European Union, there is considerable uncertainty concerning the level of emissions reductions required post 2012.

- Lesson—governments need to be as clear as possible about emissions-reduction targets, the "commitment" periods need to be as long as feasible—certainly longer than Kyoto periods, and banking is required.



Jos Delbeke – Director, DG Environment, *European Commission*

Right

- A mandatory cap-and-trade system was put in place, based on absolute emissions levels determined in advance. It is a multi-sector scheme covering installations that are major emitters across the 27 countries that are members of the European Union. Today, the system covers some 45 % of total CO₂ emissions. In 2006 the volume of allowances traded over-the-counter and at exchanges is reported at some 18 billion Euro [approx. \$ 24 billion (rates March 19, 2007)]. By giving large installations flexibility, it engages them in finding least cost approaches to reducing greenhouse gas emissions and can spur innovation
- Harmonised emissions monitoring and reporting requirements were set, building on work carried out in this area by industry.
- The private sector was used for verifying greenhouse gas emissions.
- Stringent penalties were set for non-compliance, to ensure that the environmental integrity of the system is maintained (from 2008, €100/tonne plus making up any shortfall).
- A straight-forward and secure electronic allowance transfer system was set up, enabling companies to transfer allowances across the EU. The Commission is considering licensing this system, developed with US expertise, to third countries and regions to ensure that the global carbon market develops smoothly at the technical level.
- Market operation was left up to the market. The private sector quickly developed services (trading platforms, daily price quotes) needed for smooth operation of the allowance market. There is no 'price-cap'. The market is allowed to function freely, setting the right signal to invest in cleaner technology and efficiency improvements to meet the target (cap). Price-caps would inhibit the linking of emission trading schemes to form a global carbon market.
- As from the start-up period 2005-07, the EU ETS is open to least-cost global emission reductions, by accepting – with qualitative and quantitative safeguards - most types of credits generated from project-mechanisms in 169 countries worldwide under the Kyoto Protocol, and by foreseeing linking to emissions trading systems in other developed countries that have ratified the Protocol. The Commission is currently considering widening its linking provisions to include links to systems in other countries and regions.
- The system was set up for an unlimited duration. The initial 3-year learning period has proven to be extremely valuable to put in place and fine-tune the infrastructure needed for a trading system and for the collection of sound and verified data on which 2008-12 will be based. The learning period means that both regulators and companies are much better prepared for the trading period 2008-12.



Jos Delbeke – Director, DG Environment, *European Commission*

Wrong

- The lead-time from the entry into force of the Directive (October 2003) to the start of the system (January 2005) was too short.
- When setting caps for the 2005-07 start-up period, with hindsight, the EU had insufficient historic emissions and other data for participating installations. As a result, some Member States based their allocations on projections and estimates rather than actual emissions. The resulting inaccuracies resulted in insufficiently ambitious levels for emission reductions, and a significant drop in the market price for allowances when this became apparent. This shortcoming is now corrected for the second period running from 2008-12.
- Auctioning was limited to 5% of allowances. As a consequence, Member States which wished to auction a higher proportion were not able to. The limit on auctioning is raised to 10% for the second period running from 2008-12, and no limit is set beyond then.
- Despite commonly agreed criteria for allocation, Member States proposed caps that varied widely in stringency. The Commission needed to take corrective action for most national plans. This shortcoming should be overcome through greater harmonisation in terms of setting caps from 2013 onwards.
- Differing national approaches were taken in respect of the EU ETS's scope in the 2005-7 start-up period, resulting in some combustion installations being covered in some Member States and not others (e.g. crackers). This shortcoming has been overcome by a common approach being agreed between the Commission and Member States on the precise scope.
- Not all significant emitters were initially included in the EU ETS. This shortcoming is being addressed during the 2008-12 period through unilateral extension of the EU ETS by Belgium, France and the Netherlands to other greenhouse gases (N₂O), and by the UK to carbon capture and storage installations. From 2011, the Commission has proposed to include aviation, where this is not covered by other States' emissions trading schemes. Further extensions are under consideration.
- Relatively small installations were included whose emissions might more appropriately be addressed through alternative policies. This potential shortcoming has been addressed by simplifying the EU's monitoring and reporting rules for small installations. From 2013 onwards, the Commission is considering whether further action is needed, for example through enabling small installations to be 'opted-out' of the EU ETS if they are covered by alternative policies.



Per-Otto Wold – Founding Partner and CEO, *Point Carbon*

Right

Financial Market Efficiency

- A trusted market-wide price on carbon was established quickly and distributed widely in the market.
- The market price responded from the start to changes in supply and demand, with fuel prices influencing supply and weather influencing both supply and demand.
- A market with reasonable liquidity has been established. More than 1,000 million metric tons were traded in the EU ETS in 2006, for a value of €18bn (\$23bn). The market turnover, measured as the ratio of traded volume to the total number of allowances allocated, has been about 50%. Point Carbon estimates trading volume will further double in 2007.
- Infrastructure for international emissions trading is in place and functioning. This includes registries, accredited verifiers, market places (exchanges and over-the-counter) and other market intermediaries, such as information providers, project developers and financial institutions.

Environmental Effectiveness

- The cost of carbon has been absorbed as part of operational decisions for thousands of installations across the European Union. By early 2007, companies participating in the EU ETS had to a large degree (65%) initiated internal abatement measures (Point Carbon survey – Carbon 2007). This compares to 18% in a similar survey a year earlier.
- The EU ETS has been a key driving force behind investments in project-based mechanisms (CDM/JI) in 128 countries and a range of project types. Point Carbon estimates that investments in CDM/JI projects will provide reductions totaling more than 2 billion metric tons of CO₂ equivalent emissions by 2012.
- The start of the EU ETS produced a consistent set of verified emission data across more than 10,000 installations in 25 countries. The European Commission made “extensive” use of 2005 data in assessing allocation plans for Phase II.

Policy Efficiency

- The EU ETS represents the first international emissions trading scheme to date. Lessons learned from the “test phase” (2005-2007) are providing valuable experience for stakeholders ahead of the start of the first commitment period under the Kyoto Protocol, from 2008-2012.
- Although uncertainties prevail with regards to international framework conditions for the post-2012 period, the EU ETS Directive secures the continuation of the EU ETS beyond 2012, which is critical for investor confidence.
- The EU ETS Directive provides an opportunity for linking to other national or regional emissions trading schemes (US, Japan, Canada and Australia). Along with the indirect links via offset markets (CDM/JI), this provides a path for convergence and towards a truly global carbon market.



Per-Otto Wold – Founding Partner and CEO, *Point Carbon*

Wrong

Financial Market Efficiency

- The timing of demand and supply is important, but was not fully understood:
 - The demand from utilities, which were generally under-allocated, was present from the beginning of the market. Utilities manage their current and future combined exposure to carbon, fuel and electricity risks on a daily basis;
 - The supply from companies in energy-intensive sectors, who were generally over-allocated, typically came to market later and episodically.
- The difference in timing of demand and supply largely explains why prices increased above €30/t in April 2006, despite the market being fundamentally oversupplied.
- The unauthorized leaks of market sensitive verified emission figures for 2005 created information asymmetries and “undue” opportunities for some market participants.
- The implementation of registries was delayed in many countries, most notably Poland and Italy, likely preventing market access and impairing liquidity.

Environmental Effectiveness

- The release of verified emission figures in April/May 2006 showed that the market was over allocated by about 5% (100 Mt) in 2005. Although some abatement is likely to have taken place due to high carbon and energy prices, the long position is in our view largely explained by over-allocation and lack of consistent, historical data.
- Uncertainties about Phase II (2008-2012) and the post-2012 period have made investments in more energy-efficient capital stock uncertain.

Regulatory Risk and Policy Efficiency

- A number of factors are specific to the EU and its principle of subsidiarity and are therefore more unlikely to carry over to the United States:
 - Distributed responsibilities for allocation processes at national level led to countries opting for favorable allocation to domestic industries.
 - Lack of harmonization in monitoring, reporting and verification procedures.
 - Different rules and procedures for treatment of new entrants.
- Grandfathering penalizes early action.
- The EU ETS extends beyond 2012, but there is a lack of clarity about rules due to ongoing review process and international negotiations.

Distributional Issues

- Free allocation by grandfathering has created windfall profits for utilities.
- The principle of opportunity costs was not fully understood or anticipated amongst policymakers:
 - The pass through of the cost of carbon into power prices is seen by many as unduly favoring the power industry and thus a challenge for the integrity of the scheme. This pass through was, however, anticipated in a few countries, notably the UK, as highlighted in their National Allocation Plans;
 - Perception of fairness will affect the support for and sustainability of the EU ETS and international emissions trading.



Garth Edward – Trading Manager - Environmental Products, *Shell Oil*

Right

- Coverage: 10,365 installations in the electricity, cement, metals, and refining sectors are covered by the EU-ETS Directive and the relevant national legislation.
- Registries: Each installation is connected to one of the 27 national registries which then communicate through the Community Independent Transaction Log. These registries are operational and provide the basic infrastructure for assessing compliance as well as operating the market. Registries enable allowances to be issued to companies, transferred between companies, stored, and redeemed for annual compliance.
- Compliance: Verified emission statements have been obtained and submitted by companies in line with the reporting and compliance timelines. Essentially all installations have demonstrated annual compliance by holding a volume of allowances on their registry accounts that is equal or larger than their verified emissions statement.
- Establishment of a market price: Significant trading takes place with a daily market turnover in the EU-ETS of approximately USD\$50m. Approximately 50% of volume transacts on exchanges such as Nordpool, Powernext and the ECX. While the balance of trading activity takes place through brokers. The forward curve extends from spot out to 2012 and this provides a long term price signal comparable to oil or power markets. This price signal is integrated into electricity dispatch decisions across the EU with companies deciding to run gas or coal plant on the margin depending on the price of allowances.
- Development of the international Clean Development Mechanism (CDM) and Joint Implementation (JI) markets: The demand generated by the EU-ETS has driven the quick development of international project credit markets. CDM now has 517 registered projects with a projected flow 2008-12 of 761m CERs. At an average of USD\$13.3 this represents a capital flow from rich to developing countries of USD\$10.11bn up to 2012. A further 3,831 projects are in the UN approval process representing another 2,147m CERs and USD\$26.7bn. This pipeline is being added to daily. JI (Joint Implementation) is picking up speed now as we approach 2008 and 271m Emission Reduction Units (worth approx USD\$3.59bn) will be generated from projects currently undertaking approval with the UN. This pipeline will be added to considerably over the coming year as Russia and Ukraine build the necessary institutions. In summary we can say that CDM/JI will flow approx USD\$6.65bn per year into developing countries from now till 2012. Alongside this flows technology transfer, improved local employment, and better local environmental quality.



Garth Edward – Trading Manager - Environmental Products, *Shell Oil*

Wrong

- Delays in infrastructure: Some governments were late in establishing their registries which meant that issuance of allowances were delayed and some installations were held off of the market.
- Delay in connecting to the UN International Transaction Log: The EC has not yet connected to the ITL which means that the Certified Emission Reduction (CER) credits flowing from CDM projects cannot be physically imported and used for compliance/
- Auctions: Some EU Governments have chosen to auction EU Allowances, either as part of their primary allocation process or as a distribution method for surplus allowances left in New Entrant Reserves (e.g. UK, Ireland, Hungary, Denmark). These auctions have been frequently delayed as governments have found that auctions require significant logistical organization.
- Inconsistent allocation methodologies across the Member States: This meant that the definitions of installations were different, monitoring and verification guidelines were different and baseline periods were different. As a result, the same kind of installation (refinery, power plant, cement plant etc) would have very different allocations depending on its jurisdiction.



Jean-Yves Caneill – Project Manager, *Electricité de France*

Right

Setting the scene - Implementation of the EU Emissions Trading Scheme (hereafter EU ETS) was proposed after about three years discussion (that involved all stakeholders), which started in 1999, and continued to its final adoption. Although we can consider that this time duration is short for the implementation of a new economic instrument, it was done in a way, that made industry and power sector, faced with the reality of the carbon constraint. The EU ETS allowed immediately for the setting of a single allowance price for CO₂ throughout EU in early 2005 when it started effectively.

Simplicity - Making a decision to consider “direct emissions” and not base the ETS on “indirect emissions” was also a wise decision to take, although discussed strongly at the beginning among the different stakeholders. Including both would have complicated too much the design at the and simplicity of the approach was an essential feature for having a prompt start of the scheme. This does not mean that one cannot make more complex the scheme over time, but it should have to be done cautiously and in a progressive manner.

Learning by doing - It was clear at the beginning that use of such an instrument was very new for European actors, and such, the fact that a learning phase was proposed (the years 2005/2007) was important. This allowed different constituencies to discover the instrument, its potential advantages, as well as its difficulties. In a sense the period has largely been used to monitor accurately the perimeter of action that was defined, and perhaps a recommendation one can take from that experimental phase is that it is worthwhile to start by the monitoring and assessment of the perimeter covered by the ETS regulation, before starting the allocation process and the real trading.

Reducing the costs - As soon as the ETS Directive was adopted, Commission prepared the so called “linking directive” devoted to allow actors to use credits generated by the CDM and JI mechanisms, allowing more flexibility for complying with the environmental objectives. Although there was a lot of discussion on the way these mechanisms should supplement actions “done at home”, one can consider this achievement as an important one in the design of the economic instrument itself. It allowed to embed the EU ETS system in a larger perspective, in line with the international agreements, recognizing in the same time, that reducing the costs of compliance was an integral part of the process.

Monitoring emissions - Articulation of the flow of information between the company, national and EU levels, as far as the building of the CO₂ emission registries, have been an important piece of the functioning of the scheme. Together with the monitoring, reporting and verification procedures that were put in place, these features helped to build the necessary framework for gathering the necessary data to monitor compliance, and allowing transparency requirements for future allowance distribution process.



Jean-Yves Caneill – Project Manager, *Electricité de France*

Wrong

The EU Emissions Trading System is a regulation that has been adopted through a compromise between the Commission, the EU Council and the EU Parliament. Although some of the features discussed hereafter were not part of the first proposals discussed, some of them were part of the compromise and it is worthwhile to mention them, as they seem to me critical for the design of a well functioning emissions market.

Length of the commitment period - The relevant time frame of the EU ETS regulation had two major drawbacks : first the overall time frame was too short, second the period was decomposed in a trial period and the commitment period corresponding to the international agreement. Although one can understand that the trial period was necessary to start the system, the margins that were led to the EU Member States in deciding some implementation rules led to counteractive proposals, namely : no banking provisions from period 1 to period 2, except for two countries (that are now in the process to abandon it), re-opening of the discussion of the distribution of allowances between the two periods. One can discuss the reasons for this status of play, but it is important that in any future design, actors get a stronger visibility and predictability: longer time frame and predictability of the rules. As a matter of fact it is important to favor right conditions for future new investments.

New entrants and closures rules - EU ETS directive specified that these provisions should be defined by the Member States in their national allocation plans. This led to different treatments of installations over EU, and behavior that could lead in the long term to non appropriate decisions as far as the reduction of emissions are concerned. For instance, very often an installation which is going to be closed has to give back allowances non used (in an emissions trading system, keeping the allowances non used is an incentive to close an old installation and build a new one); a new installation should get allowances for free (on the basis of a new entrant reserve), often on the basis of its needs. These provisions were decided by Member States, because of the short time frame, and to avoid disputes based on competition arguments between incumbents and newcomers. However in the future, and on the basis on longer allocation periods, incumbents should be given the signal that they have to reduce their emissions on the long term (in the case they get free allocation, they should get less over time), and new projects (and/or new entrants) should have to pay their allowances, in order that CO₂ signal appears in the full investment cost, for taking appropriate decisions aligned with the environmental goal.

Reflecting the costs in the operations – Many factors concurred to the fact that spot electricity prices reflected immediately the CO₂ price that appeared on the market. Although quite normal, this feature was not enough recognized by the actors at the start of the scheme and generated strong misunderstanding. Inherent volatility of the carbon price due to imbalances of allocation between the industry and the power sector, and differences of behavior between the two communities in front of this new market, led to a significant increase of the power prices. To alleviate this situation, one should pay strong attention to the realism of the targets set to the different sectors over time (in line with the investment cycles) and proper and harmonized allocation rules, especially to the new entrants.



Bruno Vanderborght – Vice President of Climate Protection, *Holcim Cement*

Right

The objective of the EU Emissions Trading System is to reduce CO₂ emissions from industry in a cost efficient way while fostering economic development and employment.

The EU ETS may form a solid foundation to this end:

1. The necessary European legislation and regulations are in place and implemented by all Member States;
2. Monitoring, reporting and verification of emissions provides reliable quantitative historical information;
3. The CO₂ market systems and tools are in place and operate in a competitive environment;
4. The CO₂ emissions trading market functions;
5. Reducing CO₂ emissions and improving energy efficiency are now firmly embedded in business strategies and risk management.



Bruno Vanderborght – Vice President of Climate Protection, *Holcim Cement*

Wrong

Despite this solid foundation, the EU ETS building is not yet completed, therefore not yet sufficiently delivering to its objectives.

The main deficiencies are not so much related to the Emissions Trading Directive but rather to the method of allocation of emission allowances.

1. Allowance allocation based on absolute historical emissions by installations rewards pollution and punishes efficiency and early action;
2. There is no predictability for the medium- and long-term objective;
3. The international coverage is too small;
4. An absolute cap based on historical emissions and lower allocation to new installations freeze market share and inhibit innovation, investment and growth of economy;
5. The counterproductive allocation method causes intense lobbying, undue distortion of competition between sectors and companies and affects the credibility of the system.

What we need to make the ETS an effective and efficient system is:

1. A clear, simple, long-term (i.e. ~2030) objective for each industrial sector, equitable to the technical and economic potential to reduce emissions;
2. Based on CO₂ or energy efficiency performance, i.e. CO₂ emission per unit of output;
3. With a predictable path from current performance to the long-term objective;
4. With linking to similar CO₂ performance objectives and market systems in countries with developed and emerging industrial economies.

The global and regional burden sharing should be based on an international sectoral rather than on a national approach.



A. Denny Ellerman – Senior Lecturer, *Massachusetts Institute of Technology*

Right

1. **An Initially Modest but Effective Constraint.** The most important achievement of the EU Emissions Trading Scheme (EU ETS) is that a constraint and a price have been placed on about half of the CO₂ emissions from a region of the world that accounts for a significant fraction of global economic activity (about 10% of global CO₂ emissions). The initial ambition is modest, but the real achievement is putting in place a policy structure that can deliver the CO₂ emissions reductions that may be required. From the perspective of global climate policy, this is only a start but it is the most significant and promising development to date in a domain where grand ambition has often thwarted achievable result.
2. **A Multinational Trading System.** This achievement is the more impressive in that it has been adopted by all 27 members of the European Union despite significant differences among the member states in economic circumstance and commitment to climate policy. The federal structure of the EU is far weaker than that of the US and the differences among the EU's constituent nation-states are far greater than those among US states. In fact, the East-West axis in Europe bears many similarities to the global North-South divide. As such, the EU ETS is a proto-type multinational trading system from which many lessons can be drawn concerning what attracts participating nations and how participation affects economic and environmental performance.
3. **A Replicable Approach.** In placing a constraint on CO₂ emissions, the EU has chosen an instrument, cap-and-trade, that is more likely to propagate to other nations and thus to create a global regime for controlling greenhouse gas emissions than other instruments, such as taxes or assorted other policies and measures. The cap-and-trade approach is more promising because it allows the issues of equity and efficiency created by a CO₂ constraint to be dealt with separately at global and national levels and because the trade in the financial instruments thereby created closely resembles existing investment flows and trade in goods, services, and capital. This is not to say that propagation will be easy; only that it will be easier than by any other approach.
4. **Openness to Equivalent External Credits.** In placing a price on a significant fraction of EU CO₂ (and greenhouse gas) emissions, the EU has recognized the essential equivalence of emission reductions in any part of the world through the linkage provisions of the EU ETS. This openness to equivalent external credits has provided a great impetus to project-based emission reductions in key developing economies, such as China, India, and Brazil, through the Clean Development Mechanism. In addition to familiarizing these nations with the requirements and institutions of emissions trading (and thus of what will ultimately be required of them), this openness to external credits provides the means for indirect linkage and eventual formal mutual recognition among the independently developed, “bottom-up,” national trading systems that may emerge.



A. Denny Ellerman – Senior Lecturer, *Massachusetts Institute of Technology*

Wrong

1. **An Incomplete Cap.** The EU has chosen to apply the cap-and-trade approach to large stationary sources and to adopt other policy measures to deal with CO₂ emissions from mobile and small stationary sources. While multiple instruments can in theory be equivalent in cost, they rarely are in practice so that their use is inevitably inefficient. Even worse, alternative “command-and-control” measures have a tendency to over-promise and to under-deliver thereby adding ineffectiveness to inefficiency. Consumers who bear the ultimate burden of CO₂ limitation are unlikely to prefer to pay more for the abatement measures associated with their driving than for those affecting the electricity they consume at home, or vice versa.
2. **Repeated, Sequential Cap-setting and Allocation.** In conformity with the Kyoto Protocol, the EU ETS has been set up in discrete commitment or trading periods in which the cap for the next five (or x) years is decided along the way. For instance, the cap for 2008-12 is currently being decided and the cap beyond 2012 is unknown. While there is not much doubt that the system will continue, this circumstance has created considerable uncertainty about longer term reduction requirements with consequent effects on investment. Also, the possibility that future allocations would be based on current period emissions may lead some firms to abate less than they would otherwise. A better approach would be to establish a longer term cap or schedule that is subject to review but which, barring later adjustment, would be the operational default.
3. **New entrant and closure provisions.** A novel feature of the EU ETS is the set of provisions whereby new installations are endowed with free allowances from a new entrant set-aside and closed facilities forfeit allowances granted to them. While perhaps understandable from an equity standpoint, these provisions distort long-term investment decisions and create over-capacity. Older facilities that would otherwise be closed (and which are usually inefficient) are kept open if the value of the allowance endowment is greater than the losses incurred by continuing production at the minimally acceptable level. Endowing new facilities with a free allocation compensates the investor for all or most of the carbon costs that will be incurred and thereby keeps the investment criteria largely what they were prior to the start of the program. In addition, both provisions will tend to create excess capacity in the affected industry.
4. **Limit on Banking.** The carry-over of unused allowances from the 2005-07 period into the 2008-12 period is prohibited and this provision has created a significant price disparity between 07 and 08 allowances that will lead to strange abatement behavior around the turn of the year as firms and traders arbitrage this price difference. Aside from this restriction, the EU ETS does allow complete intra-period banking and borrowing. This has resulted in very stable price relationships among years in each trading period and efficient abatement within these periods.