TWENTY-FIRST CENTURY MACROECONOMICS:RESPONDING TO THE CLIMATE CHALLENGE (Jonathan M. Harris and Neva R. Goodwin, eds, Cheltenham UK and Northampton MA: Edward Elgar Publishing, 2009)

11. The New EU Emissions Trading Scheme: A Blueprint for the Global Carbon Market?

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INTRODUCTION

Tackling climate change has been identified by the EU as one of the world's greatest challenges, recognising that climate change is likely to have major negative consequences for the environment, the economy and societies at large. The EU has repeatedly confirmed its position that an increase in the global annual mean surface temperature should not exceed 2°C above pre-industrial levels. After the withdrawal of the United States from the Kyoto Protocol, the EU has found itself being catapulted into global leadership on climate change. While few had predicted at the time that the Kyoto Protocol would survive, Japan, Canada and Russia ratified the Protocol to bring it into force in 2005, at least in part due to active EU diplomacy,. To implement the Protocol, the EU has adopted numerous laws to fulfil its commitments and also to prepare the path for a new follow-up post-Kyoto agreement, when commitments expire in 2012. Among them have been a host of policies to support renewable energy, improve energy efficiency in buildings and transport. The centrepiece of EU climate change policy, however, has been the EU Emissions Trading Scheme (EU ETS) that started in 2005.

Implemented in 2005 with a 3-year pilot phase from 2005-2007, the EU ETS suffered from a number of teething problems such as significant delays of registries and National Allocation Plans (NAPs), inconsistency of installation definitions, issues related to monitoring, reporting and verification, and data collection questions. The original EU ETS Directive has a number of deficiencies, essentially stemming from a high degree of decentralisation. The main effects have been overallocation of allowances, leading to a price collapse in 2006, distortion of competition for firms

operating in the EU internal market, high transaction costs, lack of transparency and finally, windfall profits for the power sector. As a result, the European Commission has proposed a review of the EU ETS Directive, which is pending adoption by the Council of Ministers and the European Parliament. The objective of this review has been to improve the scheme based on experiences so far, to ensure a cost-effective achievement of the EU greenhouse gas (GHG) reduction commitments during the second phase of the ETS, form 2008-2012. Other goals include enhancing the predictability and certainty of long-term emission reductions, and contributing to international carbon markets and encouraging action globally. If efficient and effective, the EU ETS could become a 'docking station' for other schemes to link to, or even become a global standard for GHG emissions trading.

This chapter will review experiences of the EU ETS so far, assess the proposed reform to evaluate whether the new EU ETS can become the "open system promoting global innovation" that the EU – according to the European Commission website – had in mind when adopting it. The chapter is structured as follows:

1. A brief sketch of the origins and the political context
2. A review of the initial experiences in phase one and phase two.
3. An assessment of the Commission proposal to reform the ETS
4. An analysis of the ETS' role in the context of international and domestic climate change policy.
5. A discussion of competitiveness and carbon leakage
6. Conclusion on EU ETS prospects as part of a global carbon market.

ORIGINS AND POLITICAL CONTEXT

Prior to adoption of the EU ETS, experience with tradable permits has largely been confined to the United States, which introduced such schemes in the 1970s. Among them was the successful US SO_2 trading programme, which has become the reference point for emissions trading globally (e.g. Klaassen 1996). While there is little doubt that the EU ETS has strongly been influenced by the US SO_2 trading program and the NOx Budget Trading Program,[2] EU and US schemes differs in several important aspects. The principal difference is the high level of decentralization in the EU and the significant degree of discretion for member states in the implementation phase, even if compared to the NOx Budget Trading Program.

EU decentralization

A decentralized approach is consistent with the makeup of the EU political system, based on sovereign member states with their own legal systems,

traditions, and languages, within which the EU layer of governance (the Council of Ministers and the European Parliament) agrees on the framework and member states enjoy a high level of discretion in implementation in their respective jurisdictions.[3] As there are as many jurisdictions as member states, one-size-fits-all policies seldom are an option.[4] Consistency across member states is sought by so-called Comitology Committees, consisting of European Commission and member state officials who are responsible for the harmonization of implementation provisions. The mandate (and hence the limit) of Comitology Committees are set both by the relevant provisions in the Directive and EU primary, secondary and case law such as EC internal and competition law.

Despite the fact that the EU exhibits elements of a federal system, one would miss the very essence of the diversity within the EU if one perceived it as a federation. The high degree of decentralization is – at least partly – also the result of consensual decision-making in the EU.[5] As the EU is made up of sovereign states, effective implementation of EU laws by member states is best ensured if legitimate member states' concerns are taken into account during the negotiations in the Council of Ministers when the laws are formulated. As a result, initially the EU tends to choose decentralized options, followed by steps to establish and coordinate a common approach among member states. But initial experiences usually feed into a formal review, which in many cases – including for the EU ETS – is built into the legislation.

Increasing use of market-based solutions

Market solutions have in many instances proven easier than harmonisation across 27 or more national jurisdictions, which display major differences in legal systems, enforcement cultures and administrative capacities. In the case of the EU ETS, EU legislation has been initiated by nationally proposed legislation. European Commission action towards an emissions trading scheme has – at least partly – been triggered by the establishment of national emissions trading schemes in Denmark and the UK, and the associated risks of "proliferation" of such schemes in other member states (see e.g. Zapfel and Vainio, 2002). At the same time companies such as BP and Shell, the EU electricity sector and industrial associations such as Entreprises pour l'environnement started to promote emissions trading schemes for greenhouse gases (e.g. Egenhofer 2003; Philibert and Reinaud 2004).

Ultimately, the EU ETS has been promoted on the basis of a mixture of economic, environmental and EU internal market arguments. First, emissions trading offers the prospect of meeting environmental goals in the most cost-effective way by ensuring that the market price of carbon is equal to the lowest marginal abatement cost amongst all controlled sources. Ultimately, it provides a mechanism by which emitters – factory operators, oil refineries,

power plants etc. – can identify the most cost-effective ways to reduce their emissions, and thus factor carbon-reduction strategies into day-to-day business decisions. A second potential advantage is that the resulting carbon price should improve long-term predictability, a crucial factor for business to make efficient investment decisions. Thirdly, a cap-and-trade system such as the EU ETS provides environmental certainty by capping the overall emission level from the covered sources. Fourthly, emissions trading can be expected to minimise the distortions to competition in the EU market as it imposes an EU-wide carbon price for all industries alike (See Delbeke, 2006).

Another strand of the literature associates the rise of emissions trading with the "entrepreneurial role" that DG Environment of the European Commission has played (Christiansen, and Wettestad, 2003; Skjærseth and Wettestad, 2008). One could also hold that there was something inevitable about the EU ETS, as all other tools to address greenhouse gas emissions in the context of the Kyoto Protocol at the EU level of governance had failed. Most spectacularly, the 1992 carbon/energy tax proposal by the European Commission failed to be adopted and was later withdrawn. Under the EC treaty – the relevant part of the EU primary law – taxation measures need to be adopted unanimously, meaning de facto that each member state has a veto on taxation. Taxation for environmental purposes has therefore been confined to member states (see e.g. Fujiwara et al, 2006). Similarly, voluntary agreements or "negotiated environmental agreements" have made very little impact at the EU level of governance, again mainly due to institutional reasons. Since voluntary agreements are negotiated between the European Commission and the industry concerned, the European Parliament has been opposed to such agreements since effectively their content is withheld from parliamentary scrutiny and approval. The conclusion of voluntary agreements is also complicated because of a lack a suitable interlocutors at EU industry level (ten Brink et al, 2003).

INITIAL EXPERIENCES

The EU ETS has been the result of rigorous consultation on the part of the European Commission with stakeholders both before, during and after the European Climate Change Programme (European Commission, 2001), followed by intensive discussions within and between the Council of Ministers and the European Parliament. The EU ETS was adopted unanimously by the Council of Ministers and by a very large majority in the European Parliament. In general, business was favourably disposed to the scheme, as were environmental NGOs.

Under the EU ETS cap-and-trade scheme, the covered sectors must monitor and annually report their CO_2 emissions, and are obliged every year

to surrender an amount of EU emission allowances (EUAs) to the government that is equivalent to their CO_2 emissions in that year. The schemes covers electricity and heat generation, cement production and pulp and paper production, which initially represent a total of some 40 percent of total EU CO_2 emissions. Additional sectors include other industries (e.g. refining, coke ovens), iron and steel, glass, ceramics, paper and board. The EU ETS was to cover about 46 percent of total EU CO_2 projected emissions in 2010, equivalent to 38 percent of the EU's total greenhouse gases in 2010. For an authoritative overview on design, see Meadows (2006) and Vis (2006). Credits from the Kyoto Protocol's project mechanisms, the Clean development mechanism (CDM) and Joint Implementation (JI),[6] can be used for compliance within certain limits (Lefevere, 2006).

In order to ensure support from member states and industry to ensure fast adoption the European Commission had to offer a number of concessions, One such concession is free allocation of allowances of up to 95 percent for phase one (2005-07) and up to 90 percent for the second phase (2008-12). The principal reason for free allocation was to "buy" industry acceptance. As long as allowances are given for free, companies receive additional revenues to partly or entirely offset higher production costs as a result of the EU ETS.

Another necessary concession – this time to member states – has been to leave the allocation *process* in the hands of member states. Although this is in line with the general EU practice of leaving implementation to member states, the high degree of decentralisation was the price that had to be paid for both member state and industry support. Member states are reluctant to cede influence on the energy and energy-related industries. And most of the industries felt more comfortable with allocation undertaken at member state rather than at EU level. During the negotiations between Council and European Parliament, for example, attempts by the European Parliament to reduce member state discretion failed due to member states' reluctance to cede 'too much' influence – as they perceived it – to the European Commission on allocation. As a result, the EU could not even agree on a common methodology for allocation, except that the main method of allocation should be free of charge.[7] Discretion of member states is constrained, however, by EC competition law, notably Articles 87-88 on state aid, which are the relevant rules to ensure that free allocation does not amount to state aid.

Teething problems

The fact that the ETS was been adopted in record time to implement the EU's determination to tackle climate change posed great challenges to governments and industry in preparing for it. There were a number of significant delays. Most importantly, member states registries and National Allocation Plans (NAPs) were delayed in some cases by more than a year.

Delays were also caused by the need to adapt many national laws. Further "teething problems" included inconsistency of installation definitions, issues related to monitoring, reporting and verification, and insufficiently operating CDM and JI programmes. Finally, the absence of the International Transaction Log, to be set up by the UN system to verify the validity of emissions transactions governed by the Kyoto Protocol, meant that credits from CDM could only be traded as forward transactions (see Egenhofer, 2007).

The initial phase also saw volatility, a phenomenon often observed in new trading schemes. In the initial phase, only the power sector engaged in active trading with other participating companies. Rising gas prices and falling coal prices had compelled power plants to burn more coal, which in return meant more emissions. The power sector therefore had been generally short (of allowances). This gave market participants the false impression that there was a real shortage in the market, pushing EU allowances prices to a record price of €30 per tonne despite the overall market being in oversupply. Market participants from those countries with less tight allocation, including but not limited to potential sellers from the new EU member states, had not yet engaged in trading, both as a lack of registries and in some cases, the absence of installation level allocation.

There were also questions on data. Data collection issues were most apparent when member states started to allocate (basically) for free as the Directive foresaw. Only three member states could rely on verified data. In other member states, data collection was a "voluntary" effort by all stakeholders, leading to an intensive government-industry dialogue. While member states were cross-checking data they received from industry, this took time with no guarantee that data was accurate. This was compounded by the inclusion of small installations, which has led to overall high administrative burdens on both governments and small installations. Small installations emitting less than 10,000 tonnes CO_2/year make up 32 percent (or about 3400 participants) of all EU ETS installations and account for about 1 percent of all emissions. Installations emitting under 25,000 tonnes CO_2/year make up 55 percent of all installations while emitting only 2.4 percent of all EU ETS emissions (Worrel and Woosen 2005). Hence, by excluding 55 percent of the smallest installations, the total number installations of covered installations could have been reduced to around 4,700 while covered emissions would remain as high as 97.6 percent of the current coverage.

Still, although there have been plenty of "rough edges", the EU ETS managed to deliver "a transparent and widely accepted price for tradable CO_2 emissions allowances" as well as the necessary "infrastructure of market institutions, registries, monitoring, reporting and verification" (see Ellerman and Joskow, 2008). The significant allowance price of up to €30 for 18 months is expected to have measurable effects for operation of installations.

Ellerman and Buchner (2008) conclude that between 2005 and 2006 there has been abatement of "probably between 50 and 100 million tons in each of these years". This would amount to between 2 to 5 percent of total covered emissions. However as recent work (e.g. Delarue et al, 2008a and b) shows, the relationship between abatement and CO_2 prices seems to be too complex to allow for the identification of standard patterns or averages of abatement. .

Most importantly, the EU ETS has introduced carbon management systems within companies. The fact that the EU ETS created a price for carbon makes carbon management both a legal necessity, requiring monitoring, reporting and verification of emissions and the registration of allowances in the registry, and a management priority. Investors will want to know about performance, liability and risks. Managers will try to exploit opportunities through better management and participation in the trading market. In some cases, better carbon management can reveal hitherto unnoticed reduction potentials (Browne, 2004).

Design flaws

These successes should not hide the reality that the original EU ETS Directive and its implementation in the first phase had a number of deficiencies including notably overallocation, distorting allocation between member states, windfall profits for the power sector, and the risk of deferred investment.[8] Overallocation has been largely a result of two factors: an excessive degree of de-centralisation of the EU ETS, and the absence of a hard constraint. In their National Allocation Plans (NAPs), member states pitched their caps somewhere between "less than the Business as usual" and moving towards a "path consistent with the Kyoto Protocol". Most NAPs foresaw modest caps and high dependence on projections. It turned out that most if not all projections were largely inflated (LETS Update 2006). This combination of modest cuts and inflated projections has led to overallocation of as much as 97Mt of CO_2 out of a total of about 2.2 billion annual EU allowance, i.e. almost 5 percent of total annual allowances (Kettner et al, 2007).

The experience of allocation in the first phase has been that each member state has developed its own rules, notably for allocation to new entrants and closures and that these rules varied considerably between member states. This high degree of discretion for member states has increased complexity, administrative burdens and transaction costs while decreased transparency. Moreover, industry has been able to put pressure on governments not to hand out fewer allowances than other governments (e.g. Zetterberg et al., 2004; Matthes et al., 2005).[9]

In Europe's liberalised (regional) wholesale power market, prices are set by the marginal production costs, including the value of emissions in the allowance market. If the marginal producer is a (high-carbon) coal power

generator, the power price can increase significantly as a result of the EU ETS. Low carbon electricity generators such as hydro, nuclear or renewables receive substantial gains from generally higher power prices without incurring extra costs. This effect was intended. However power companies were able to receive considerable windfall profits. Power generators operating essentially in a domestic EU market find it easy to pass on additional CO_2 cost. The windfall effect occurred as a result of free allocation, as power generators could pass on the full CO_2 costs while having received allowances for free. Windfall profits have been estimated to amount to as much as €13 billion annually (e.g. Keats/Neuhoff 2005). Another criticism has been that the EU ETS discourages rather than encourages investment in new and low-carbon technologies as a result of uncertainty. Although a fair degree of uncertainty is due to international indecision on a post-2012 agreement, some of the causes for deferral of investment are closer to home. Initial allocation periods provide certainty for only three, and then five years – periods that are far shorter than those associated with investment cycles. Other uncertainty stems from possibly perverse effects from new allocation methodologies, notably new entrants and closure rules or the possible depletion of New Entrants Reserves (the amount of EUAs handed out to new investors). National new entrants and closure rules have been markedly different across the EU, which has created distortions between member states and in some cases perverse incentives (e.g. Reinaud, 2003; Matthes et al., 2005; European Commission and Ecofys, 2006).

Phase two improvements

The second round of National Allocation Plans (NAPs) in the period from 2008-12 has seen some improvements in the implementation by EU member states and the EU. Member states have less leeway on allocation as a result of the need for consistency towards the Kyoto path. Most importantly, overallocation has been avoided since the European Commission can impose a formula to assess member states' allocation plans and thereby de facto impose an EU-wide cap. For all NAPs-2, the European Commission has used explicit "objective" projections based on 2005 verified emissions across the board for all member states.[10] As a result, the European Commission could shave off 10 percent of member states' proposed allocations, leaving the ETS sector allowances about 5 percent short of expected emissions in a business-as-usual scenario. Phase two allowances are currently trading at around €25 (as of June 2008).

THE NEW EMISSIONS TRADING SCHEME

Experiences from the initial phases and design flaws have been the basis for the European Commission to propose radical changes to the EU ETS including. Principal proposed changes include:

- A single EU-wide cap, decreasing annually to 2020 and beyond in a linear way, starting in 2013, to reach 1.720 million tonnes of CO_2 in 2020, leading to an overall cap 21 percent lower than 2005 verified emissions;
- EU-wide harmonised allocation rules; full auctioning to sectors that can pass through their costs, e.g. the power sector, partial free allocation to industry based on EU-wide harmonised benchmarks. Overall, this would translate into 60 percent auctioning, which would generate about €33 billion per annum in revenues at a price of €30 per tone of CO_2;
- Partial free allocation to industry as a transitional measure (to be phased out by 2020). Free allocation is proposed as a measure to cope with the risk of carbon leakage (discussed further below);
- The use of left-over CDM/JI credits from 2008-1012 until 2020; according to the European Commission this amounts to 1.4 billion allowances or one third of total reduction effort;
- 10 percent of the overall auctioning rights would be re-distributed to lower per capita member states. As auctions in one member state are open to operators across the EU, this redistribution does not trigger distortions of competition across the EU market;
- In case of a global climate change agreement, the EU ETS cap will be adjusted downwards in line with the EU's 30 percent target. The ceiling for CDM/JI credits would increase accordingly.

In addition, the European Commission has proposed to extend the scheme to the chemicals and aluminium sectors, to other GHGs (e.g. nitrous oxide from fertilizers and perfluourocarbons from aluminium). Under a separate proposal, pending adoption, the European Commission wants to include aviation in the EU ETS as of 2011 or 2012. This proposal has raised major disputes with the US administration on trade matters including assessment of responsibility for aviation emissions.

There is a very strong likelihood that these changes will be formally adopted – possibly with minor adjustments – by early 2009. Outstanding issues are: i) the ceiling of CDM and JI credits; ii) the inclusion of forestry; iii) the addition of international shipping; iv) carbon leakage and competitiveness; and v) criteria that a global agreement must meet to trigger the 30 percent GHG emissions target.

The Role of the New ETS in Climate Change Policy

The EU ETS review must be seen in the broader context of EU climate change policy and the new integrated climate and energy policy for which formal legislative proposals have been published on 23 January 2008. Principal elements are:

1) A binding absolute emissions reduction commitment of 30 percent by 2020 compared to 1990, conditional on a global agreement, and a "firm independent commitment" to achieve at least a 20 percent reduction by 2020. At the same time, the EU advocated that industrialised countries reduce their emissions collectively by 60 percent to 80 percent by 2050 compared to 1990. The European Parliament in its resolution has insisted that the EU should unilaterally commit to 30 percent;
2) 20 percent reduction of primary energy consumption by 2020 compared to projections;
3) A binding target of 20 percent of renewable energy in total energy consumption by 2020;
4) A binding minimum target of 10 percent biofuels for all transport fuels by 2020;
5) A commitment for up to 12 large-scale carbon capture and storage (CCS) power plants.

While dealing with climate change, the scope of EU policy is wider than that, attempting to address Europe's energy challenges in general. The integrated energy and climate package has made the link between energy and climate in a systematic way, not least due to changing conditions. The EU's resources are dwindling at the same time that government intervention in the energy industry is on the rise in precisely those countries that potentially could fill the gap, creating doubts as to whether the necessary investment will happen. Many countries that supply oil and other energy resources seem unable to increase production. And even if the necessary investments were made, the fact that supplies are tightly controlled by governments in the exporting countries raises the spectre of "excessive" leverage by supplier countries, some of which are hostile towards the West or politically unstable.[11]

Many reserves will take years to develop due to problems of access, investments and physical conditions. A prolonged tight market might increase political tension and possibly some sort of "resource nationalism". The EU has finally realized that success in integrating Russia into a strategic energy partnership is very unlikely. Despite an institutionalised energy dialogue (since 2000) and some recent foreign investments in the Russian energy sector, the strategy aimed at opening the Russian market to European and other western enterprises and thus to gain large scale access to Russian

gas and oil reserves has largely failed, and should be expected to continue to do so.

In such a scenario, the EU and its member states have been examining domestic and external policy options to move to a more sustainable and secure energy supply, including: investment in renewable energy sources; promoting carbon capture and storage techniques; and, for those member states that so choose, investment in nuclear energy. Externally, the objective is to diversify (away from Russia). Energy security and climate change now forms part of foreign policy. According to the European Commission, the integrated climate and energy package is expected to bring additional benefits:

- The renewable policy can provide technological leadership in sun-rise technologies;
- Renewable electricity can reduce long-term electricity price and price and price volatility;
- Substitution of fossils combined with renewables may reduce pricing power by Russia (notably on gas); and
- Finally, the introduction of the EU CO_2 Emissions Trading Scheme (or taxation measures) will effectively retain some of the economic rents from producer countries, including Russia.

To offset the higher prices both for industry and domestic customer, energy efficiency is a central element of the policy, certainly for a transition period until new technologies and new fuels become available. Reducing consumption while prices increase gives a reasonable prospect of keeping energy bills constant.

There has been an additional aspect of the targets that is often overlooked. The first phase of the EU ETS has shown that setting a hard cap in the EU is next to impossible unless some sort of legally binding constraint exists. In a scenario of a post-2012 agreement without absolute caps, it is indeed difficult to see how the EU ETS could continue to exist in a meaningful way.

Economics of the ETS and the Climate Change Package

Hard targets for the EU ETS and the non-ETS sectors as well as for renewables have been set on the basis of an "efficiency approach", i.e. reflecting a least-cost approach for the EU as a whole, but with some adjustment to ensure that in per capita terms, costs for member states remain roughly similar. Note that GDP per capita differences (in PPP) between EU member states are significant. In 2006 differences ranged from somewhat below 40 percent to more than 250 percent of the EU27 per capita average of around €25,000 (excluding the richest member state, Luxembourg, as an

outlier with per capita GDP of €70,440, more than twice as high as the other rich member states).

- GHG reduction target: Countries with a low GDP per capita will be allowed to emit more than they did in 2005 in non-EU ETS sectors, reflecting projected higher emissions due to higher economic growth mainly in transport. According to European Commission modelling, this increases overall EU compliance costs for GHG reduction targets by 0.03 percent of total EU GDP.
- Renewables targets: half is calculated based on a flat-rate increase in the share of renewable energy and the other half weighted by GDP, modulated to take into account national starting points and efforts already made.
- In the EU ETS sector, where an EU-wide cap would be set, and allocation among member states would be based on EU-wide allocation methodologies, 10 percent of the overall auctioning rights will be re-distributed to lower per capita member states.

According to European Commission calculations in the Integrated Impact Assessment (European Commission 2008a and b), the total cost of the package in the form of increased energy and mitigation costs is around 0.61 percent of 2020 GDP, or some €90 billion. GDP growth is reduced by approximately 0.04-0.06 percent between 2013 and 2020, or by some 0.5 percent of GDP in 2020 compared to the baseline. Higher global oil prices than the ones upon which the calculations were based, i.e. $61 per barrel, would reduce costs, as would a more extensive use of CDM. The calculations do also not take into possible macroeconomic benefits as a result of recycling of auctioning revenues.

CARBON LEAKAGE

The EU ETS has triggered a debate on "competitiveness" (of industry) and carbon leakage, documented in a sizable body of literature. Carbon leakage is one of the critical issues for the EU ETS review. Several studies (e.g. Matthes and Neuhoff, 2007; Climate Strategies, 2007; Smale et al, 2006; European Commission/McKinsey/Ecofys, 2006; Grubb and Neuhoff, 2006; Renaud, 2005; Demailly & Quirion, 2005; Carbon Trust, 2004) tend to confirm that the EU ETS could lead to market share losses and, as a result, to carbon leakage, especially if the indirect effects owing to the inclusion of carbon in the power price are realised.

Potential losses in market share, however, depend on the extent to which EU producers can pass on the extra cost to consumers and suppliers. A second element is how quickly non-EU producers can increase their

production in the short-term. Therefore it is most likely that negative effects on competitiveness will not fully come into play in the short-term. This is even truer as long as investors assume that over a reasonable period other countries will gradually become subject to carbon constraints. Most studies agree that there are only a few products among a small number of sectors (e.g. aluminium, steel, chemicals, paper and pulp, cement) that may be negatively affected by the EU ETS.

The European Commission has identified (in the ETS draft directive) a hierarchy of three possible measures to address carbon leakage:

- Free allocation, which in fact constitutes a subsidy;
- A global sectoral approach or agreement, i.e. a global sectoral policy for one or all of the vulnerable sectors;
- Border-measures, e.g. imposing carbon costs on importers.

While the choice of the first option (free allocation) is a pragmatic approach of "taking the heat out" of a potentially poisonous debate, it allows only for compensation of direct effects, i.e. costs arising due to the fact that emissions need to be covered by an allowance. It does not address the vulnerabilities of those sectors that experience indirect effects through higher input costs, notably higher power prices as a result of the ETS, (e.g.. aluminium, basic chemicals, paper and pulp). Therefore, it should not be expected that debate on the other two options will continue.

Under the leadership of the Enterprise and Industry Directorate General, the European Commission has launched a process involving industry, member states, research and stakeholders to assess as exactly as possible the vulnerability of sectors and sub-sectors. Industry has submitted very detailed data for the European Commission to assess the degree of vulnerability. The Commission is not willing to hand out allowances for free to those sectors that in fact can pass through all or parts of the carbon costs. Thereby it is hoped to avoid another round of windfall profits, this time for industry rather than for the power sector. The Commission has set itself a deadline to complete this analysis in such a timeframe as to come out with a decision for the extent of free allocation by 2011 at the latest. Most likely this deadline will be brought forward.

Nevertheless, there are voices from some member states, notably France and some companies, in favour of border measures. So far, these voices are few and there is an overwhelming consensus among EU industry that border measure for an export-dependent economy like the EU would be self-defeating. However, it is clear that border measures as spelled out in the proposed ETS review directive are seen by the EU as a possible legitimate means to put pressure on potential free-riders to sign up to a post-2012 agreement. There appears to be a consensus that a multi-lateral approach

towards border measures in a post-2012 agreement is sensible or necessary to address free-riding.

THE EU ETS AS BLUEPRINT FOR A GLOBAL CARBON MARKET?

European heads of governments at the Spring 2008 Council have endorsed the package, and the Council of Ministers and the European Parliament are currently negotiating to reach a political agreement towards the end of 2008 – possibly before the Poznan climate change negotiations (COP14) – and final adoption in early 2009. It should be expected that this package will be adopted. All EU governments have given full support to the package. Reopening any of the key elements by one member state would almost certainly lead to an unravelling of the full package, a price too high for any member state to pay, not only because of peer pressure in EU institutions but also due to the high public support that climate change policy enjoys. Nevertheless, a number of issues will be debated within the Council of Ministers and the European Parliament (EP) including:

- Costs and distribution of costs across member states, especially for renewables;
- Trading rules for renewable electricity quotes; some member states with very aggressive targets and electricity utilities argue for more flexibility in trade, while other member states fear a rush to the cheapest source, thereby crowding out certain technologies;
- New calculations seem to suggest that application of EU sustainability criteria will make achievement of EU biofuels targets very difficult;
- Funding of the up to 12 CCS demonstration projects is still unresolved;
- There is a more fundamental debate on the relationship between the EU ETS and other sectoral targets (e.g. renewables and biofuels) and commitments such as on energy efficiency.

One of the critical factors that will shape the outcome of the negotiations on the EU climate and energy package and the EUETS is the debate on competitiveness. If the Commission manages to hold the line that any policy dealing with carbon leakage must be based on facts rather than on political pressure, then the New ETS is most likely to look very much like the Commission proposal, with only minor adjustments. By new design choices, notably an EU-wide cap, EU-wide allocation methodologies, and expanding the scope of coverage, the European Commission has incorporated the lessons from the experiences of the first phases. With the new ETS covering

about half of the EU's emissions, a failure of the EU ETS reform would become a failure of EU climate change policy.

Could the New ETS become a blueprint for the global carbon market? The original EU ETS directive allowed for linking the EU ETS with other emissions trading schemes by international agreement. The proposed new directive goes a step further. It foresees different types of linking arrangements, e.g. via a treaty, an international agreement as foreseen under EU law, or through reciprocal commitments applied through domestic policies. The latter provision is innovative, both internally and internationally, as it would allow schemes to be linked through administrative decisions. In essence, this could mean that over time non-EU emissions trading schemes could be linked to the EU ETS, the notion being the EU ETS as a 'docking station' for the global carbon market.

Trading schemes in different jurisdictions may have widely divergent designs,[12] including such aspects as banking rules, coverage of sectors, and which gases are included. Nonetheless, linking schemes does not necessarily run into fundamental problems as long as technical fixes such as gateways or restrictions are put into place. Such fixes, however, generally reduce the efficiency through additional transaction costs, market fragmentation or through perverse effects and trade distortions (Blyth & Bosi, 2004; Baron & Bygrave, 2002; Haites, 2003). This will an even more significant problem if linking of schemes is seen as a substitute for – and not a complement to – a post-2012 regime on climate change. While linking might lead to some sort of a post-2012 climate change regime, the emerging market would be likely to be inefficient.

We should also expect political obstacles to linking as a result of potential distributional impacts. When two schemes are linked, the market price will be higher than the pre-link price in one of the trading schemes and lower than the pre-link price in the other zone, thereby creating winners and losers. The winners will be net sellers in the low price scheme, as the price will go up for them, and net buyers in the high price scheme, as prices will go down for them. The reverse is true for net buyers in the low price scheme and net sellers in the high price scheme (Haites, 2003; Bode, 2003).

While formal linking through an international agreement may be an option for the long-term, a global carbon market may yet emerge as participants of different emissions trading schemes search for arbitrage possibilities between different carbon markets or commodities. Such arbitrage is highly probable as most national or regional climate change policies or ET schemes foresee the use of project type of mechanisms either in the form of the Kyoto Protocol projects (CDM/JI) or comparable mechanisms. As long as domestic or regional emissions trading schemes allow for the use of credits from such projects, and there is sufficient volume, carbon prices will converge.

A third option for an emerging global carbon market would be to move towards sectoral agreement on an international scale (e.g. Ellis and Baron,

2005; Mathy and Hourcade, 2006; Egenhofer and Fujiwara, 2008) as opposed to linking domestic schemes that include a variety of sectors. This would have the benefits of combining similar sectors or 'carbon commodities' with similar characteristics. Whichever path is pursued, the EU ETS will almost certainly play a significant role in the shaping of global carbon markets.

NOTES

1. Christian Egenhofer, Senior Fellow, Centre for European Policy Studies (CEPS); Jean-Monnet Lecturer, Centre for Energy, Petroleum and Law and Policy (CEPMLP), University of Dundee, Scotland/UK and Lecturer MBA Programme, Solvay Business School, Brussels.; Christian..Egenhofer@ceps.eu; CEPS, Place du Congrès 1, B - 1000 Brussels, Tel. +32 2 229 3960, Fax. +32 2 219 4151
2. For example, note the 1999 study by the Center for Clean Air Policy (CCAP, 1999) commissioned by DG Environment of the European Commission. Similarities include particularly the choice of a cap-and-trade model, grandfathering, emphasis on monitoring, reporting and verification, transparency and public involvement (see also Kruger and Pizer, 2004).
3. Law that is adopted by the EU needs to be implemented and enforced by member states. This is among other laid out in the principle of Community loyalty in Article 10 of the EC Treaty that guides the EU.
4. In some cases, implementation of a EU law goes even beyond EU member states and may include non-EU countries grouped in the so-called European Economic Area (EEA). The concept of the EEA has been developed for those countries that do not wish to share the political objectives of the European Union such as progressive political integration but want to benefit from economic integration. It allows for the full (and legally binding) integration of countries into the EU internal market without being member. This approach is currently being applied to Iceland, Liechtenstein and Norway (see for example, Emerson, M et al (2002) .
5. Although the EU ETS as almost all other internal market-related legislation can be adopted by a qualified majority, voting is used only in exceptional cases. This is even more true for important laws, such as the EU ETS
6. The Clean Development Mechanism (CDM) and Joint Implementation (JI) are arrangements under the Kyoto Protocol allowing industrialised countries with a greenhouse gas reduction commitment and their established companies to invest in emission reducing projects in developing countries (i.e. CDM) or other industrialised countries (i.e. JI) as an alternative to what is generally considered more costly emission reductions in their own countries.
7. The European Commission has published non-binding 'Guidance Documents' (European Commission, 2003; 2005) on Annex III in the form of a Commission Communication to ensure the necessary consistency between the different allocation processes.
8. For details, see also e.g. Matthes et al, 2005 ; Swedish Energy Agency, 2006 ; Ellerman, Buchner, and Carraro, 2007; Egenhofer, 2007 ; Ellerman and Joskow, 2008.
9. For example under phase one rules, , a new natural gas combined heat and power plant – producing both electricity and heat – would in Germany receive allowances corresponding to 130 percent of its expected emissions. The corresponding figures are 120 percent for Finland, 90 percent for Denmark and 60 percent for Sweden. For a new natural gas combined cycle electricity production unit (no heat) the differences are even larger. In Germany the installation would receive 105 percent of the required allowances. In Finland 100 percent, in Denmark 82 percent, and in Sweden 0 percent - Sweden does not give allowances for non-combined heat and power (Zetterberg et al, 2004)

10. The projections are based on verified 2005 ETS emissions x GDP growth rates for 2005-2010 x carbon intensity improvements rate for 2005-2010 + adjustment for new entrants and other changes, for example in ETS coverage.
11. Russia plays the single biggest role in European energy imports with being responsible for EU27 45 percent gas, 30 percent of oil, and 21 percent of hard coal imports.
12. Emissions trading schemes such as the Regional Greenhouse Gas Initiative (RGGI) in the North-east of the US, in California or the various proposals for a US cap-and-trade scheme in the US Senate or in Australia exhibit very different design features to the EU ETS with regard to sector coverage, commitments, allocation and even monitoring, reporting and verification. The design of these emissions trading schemes is driven by the domestic political economy with little or no concern for effects on linking.

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