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The EU Emission Trading system: too little too late?

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The EU emission trading in the context of Kyoto

The EU emission trading system (ETS) is a market based policy tool to reduce the emissions of greenhouse gases (GHG) and includes around 10.000 installations in the EU that have to render emission allowances for every ton of CO_2 and two other green house gases that they emit. The total amount of allowances in the system is limited and will gradually be reduced. Allowances can be traded, so those emitters that have not enough allowances have to buy them from those that have emission allowances left. This generates a market price for the allowances and that price should also make it interesting to reduce emissions by efficiency measures and low carbon production methods in the sector.

The EU ETS should be considered as a sub system of the international Kyoto Protocol.

The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), is an international environmental treaty establishing the agreement under which industrialized countries (the so called Annex I countries) will reduce their collective emissions of six greenhouse gases[1] by 5.2% compared to the year 1990 averaged over the period of 2008-2012. This 5.2% overall reduction has been shared into agreed national limitations ranging from 8% reduction for the European Union to 7% for the US, 6% for Japan, 0% for Russia, and a permitted increase of 8% for Australia. China, India, and other "developing" countries are no Annex I countries and were not included in any numerical limitation of the Kyoto Protocol, because they were not the main contributors to the greenhouse gas emissions during the pre-treaty industrialization period.

The protocol became legally binding on 16 February 2005 following the ratification by Russia on 18 November 2004.

Kyoto is in fact a 'cap and trade' system that imposes national caps on the emissions of Annex I countries. In order to meet these objectives of the Protocol, Annex I countries are required to prepare policies and measures for the reduction of greenhouse gases in their respective territories. However, in addition, they can also "trade" by using the flexible mechanisms available in the system, such as joint implementation (JI), the clean development mechanism (CDM) and emissions trading, in order to be rewarded with credits that would allow more greenhouse gas emissions at home.
The CDM allows the creation of new carbon credits by developing emission reduction projects in Non-Annex I countries, whilst JI allows any Annex I country to invest in emission reduction projects (referred to as "Joint Implementation Projects") in any other Annex I country (often countries in transition) as an alternative to reducing emissions domestically.
National governments that have a net deficit of allowances will buy the necessary additional credits for their own account, mainly from JI/CDM developers. These deals are occasionally done directly through a national fund or agency or via collective funds such as the World Bank's Prototype Carbon Fund.

Although these Kyoto caps are national-level commitments, in practice the participating countries translate their emissions targets, in so far these will not be covered by the national purchase of credits, directly to emission reduction policies and measures covering end consumers, transport and large entities on their territory , such as a power plants or energy intensive industries.

[1] carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydro fluorocarbons, and per fluorocarbons.

These policies include regulations, efficiency standards, subsidies for low carbon technologies, fiscal incentives and benchmarks for industrial sectors. It can also mean that for specific sectors in a country or a group of countries a subsidiary cap and trade system is developed that can be linked to the Kyoto cap and trade system thus creating a market within a market.
So, although Kyoto created a framework and a set of rules for a global carbon market, there are in practice several other (sub) carbon markets in operation today, with varying degrees of linkages among them. There are also examples of such markets at regional level in the USA[2] such as the Regional Greenhouse Gas Initiative (RGGI) with participation of nine Northeast states and the Western Climate Initiative with participation of seven states and four Canadian provinces.

However, by far the most important one is the EU Emissions Trading Scheme (ETS) which developed into the world's largest single carbon market accounting for 67% in terms of volume and 81% in terms of value of the global carbon market. The EU ETS is a cap within the overall cap imposed by Kyoto on the EU (minus 8% compared to 1990) as it covers around 45 % of the GHG produced within the EU. It also worked as the main driver of the above described global carbon credit market and in that triggered investments in emission reduction JI/CDM projects. The direct linkage of the EU ETS system to Kyoto means that the ultimate buyers of carbon credits are often European individual companies that expect their emissions to exceed their allocated quota of allowances in the EU ETS. They purchase credits directly from another party in this system with excess allowances, from a broker, from a JI/CDM developer, or on an exchange.

Since allowances and carbon credits are tradable instruments with a transparent price, financial investors can buy them on the spot market for speculation purposes, or link them to futures contracts. This market has grown substantially, with banks, brokers, funds, developers, arbitrageurs and private traders now participating in a market that values at about $ 85 billion yearly.[3]

The development of EU ETS as policy instrument

The EU Emission Trading System (ETS) was adopted by means of its Directive 2003/87/EC and had to be implemented in national law by 31 December 2003. After this initial legislation the EU ETS was amended by Directive 2004/101/EC, linking the EU ETS to the Kyoto project based credits by providing the possibility to use the clean development mechanism(CDM's) and joint implementation (JI's) to meet the national caps within the EU ETS.

The first phase of the EU ETS (2005 to 2007) was considered to be a trial period and successfully established free trade of emission allowances across the EU, set up the necessary infrastructure for monitoring, reporting and verification including registries. However, the environmental outcome of the first phase of the EU ETS was very limited due to excessive allocation of allowances in some Member States and some sectors, which must mainly be attributed to reliance on projections and a lack of verified emission data. Once the first realistic data became available showing this over allocation the market price of allowances dropped dramatically.

The second trading period 2008-2012 was conceived as the means to ensure a part of the EU's compliance with the Kyoto Protocol. Thanks to verified emission data and experience gathered in the

[2] The USA has not ratified the Kyoto agreement and therefore is not yet subject to any cap on emissions at federal level

[3] See: www.ecx.eu

first trading period, the Commission could in 2007 much better assess the national allocation plans of Members States and tried to ensure that these would result in real emission reductions. The national allocation plans as approved by the Commission now show in the ETS sector an absolute emission reduction of 6.5% for the yearly average allowed emissions in the 2008-2012 period compared to the 2005 verified emissions.

However, for the second phase around 1400 million tonnes of CDM and JI credits are allowed to enter the EU ETS. This means over the five years of this second trading period, a yearly average of 1400/5=280 million tonnes. Relative to the verified 2005 emissions the cap for this second trading period represents an average yearly reduction of approximately 130 million tonnes. So, if full use of credits was made by operators, few domestic reductions would occur and total domestic emissions in the EU ETS could even increase! This was one of the reasons for the Commission to decide in 2008 in the proposed amending Directive for the EU ETS that CDM credits, up to the remainder of the level which they were allowed in the second trading period (2008-12), should be allowed to be used as well in the third trading period (2013-2020). It was assumed that operators would not use these credits in the second trading period these but would save these potential credits for the more difficult times to come and until now this seems indeed to be the case.

The EU ETS as an European contribution to the global climate negotiations.

The legislation laying down the rules for the third trading period 2013-2020 for EU ETS was agreed in December 2008 as the main element of the so called climate package and was formally adopted by the EU on 6 April 2009. The core elements of this whole package dealing with climate change[4] are the two legal acts to limit the greenhouse gas emissions in the ETS (emission trading system) sector and in the non- ETS sector, which means that in theory all greenhouse gases are covered by binding reduction targets as from 2013. The most important difference between these two legal acts is that the target for the ETS sector is one community target whilst in the non-ETS sector in a burden sharing for all 27 Member States separate targets have been agreed.

The reduction agreed for the EU in the Kyoto agreement until end 2012 was totally shared over the Member States and also in the second trading period every country was made responsible for all emissions on its territory including the ETS sector. From 2013 there will now be a community part covering around 45 % of the emissions and managed by the ETS system for which Member States will report and monitor but the policy tools and accountability have been transferred to the Community. The ETS system for the period 2013 to 2020 includes also the aviation sector and two other greenhouse gases additional to CO_2. Another important change compared to the previous Directive on ETS is that most allowances will be auctioned by the public authorities. It is mainly left to the national governments what they are going to do with the money that they will receive from the auctioning. Only a limited amount is earmarked for green measures.

This climate package was presented as the first bid of the EU in the forthcoming discussions in December in Copenhagen and puts on the table the unilateral decision of the EU to reduce its total green house gases in 2020 by **20 %**[5].

[4] The same package also includes a Directive imposing a share of renewable energy of 20 % in the final demand of the EU with differentiated compulsory targets for all Member States.

[5] In case the other major countries in Copenhagen agree upon a substantial reduction, the EU will increase its effort to a reduction of 30 %

Unfortunately, this looks much better than it is in reality for two reasons.

Firstly, it is still calculated from the state of play of 1990 and since that year the EU has lowered its GHG emissions a lot without any special effort because of the phasing out of old fashioned industry in East Europe after the fall of the iron curtain.

It is fair to say that the Commission has always been very clear about the fact that compared to 2005 the proposed reduction in the climate package is only 14 %. In absolute figures this means that total yearly green house gas (GHG) emissions should go down around 720 Mt CO_2 equivalents (CO_2e) [6] from the verified 5060 Mt CO_2e in 2005 to 4340 Mt CO_2e in 2020. In the package this reduction has been distributed as a reduction of 460 Mt for the ETS sector[7] until 1720 Mt and a reduction of 260 Mt for the non ETS sector until 2620 Mt.

Secondly, and most important is the important change of the original Commission proposal in the finally agreed climate package that occurred in the co decision process between the Council and the European Parliament. According to the finally agreed text, in the ETS sector 230 Mt (50 %)[8] can be covered by CDM credits from outside the EU and also in the non ETS sector more than 150 Mt (3-4 % of the total GHG in the EU in 2005)[9] can be bought as credits from emission saving projects outside the EU. Moreover, originating from the original proposal of the Commission, there is still the possibility to use the approved non used credits from the period 2008-2012.

Therefore the total required GHG reduction compared with 2005 inside the EU will most likely be less than 300 Mt CO_2e in total and that is **less than 6 %**.[10]

In this context it is good to remember that the Commission wrote in its own impact assessment presented in the beginning of 2008[11] the following:

" *Under a 20% GHG reduction scenario where only the EU would be in demand for CDM credits and with limitless access to such credits, carbon prices are projected to be potentially as low as of 4 €/tonne and EU domestic emissions would be reduced only marginally. This would imply that no significant changes in our energy system would be achieved, that oil and gas savings would not materialise and that technological innovation is not spurred within the EU.* "

Although the allowed use of CDM's up to 50 % is not yet a limitless access, it seems that we are still in a situation where the Council an Parliament have changed the proposal in such a way that only an international agreement in Copenhagen and the subsequent increase of the overall reduction target to 30 % would more or less save the credibility of the EU ETS system in the period 2013-2020.

This means that the other countries in Copenhagen may not be so impressed by the domestic effort that the EU is going to present as their initial contribution to a global agreement. There will certainly be a lot of interest in the wider possibility to obtain investments from the EU for CDM projects. However, the market prices for these credits may turn out to be rather disappointing and quality control will be essential in this matter.

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[6] One ton of CO_2 equivalent means a quantity of greenhouse gases of which the greenhouse effect is equal to that of one ton of CO_2. For instance, one ton of methane equals 21 tons CO_2e.

[7] This gradual reduction for the 10.000 installation in the ETS sector is calculated starting at the mid-point of the 2008-12 period average until 2020.

[8] Art 11a par 8

[9] Art 5

[10] For people that reject the suggestion of President Obama to bring the USA back to the 1990 level of GHG as not sufficient it would be good to realize that this means for the USA a reduction of 16 % compared to 2005!

[11] SEC(2008) 85/3 of 23 January 2008

The EU ETS is the example for many politicians worldwide as a means to reduce greenhouse gases in the most cost effective way. Similar cap and trade systems are in discussion and are being compared with more straight forward measures like CO_2 taxation, for instance in the US where Waxman and Markey have submitted a bill for such a system at federal level. The principles of the EU ETS may look attractive enough to come to some global application and agreements in Copenhagen, but that makes assessing its effectiveness in the EU even more important. The urgency to combat global climate change would make wrong policy choices at this stage disastrous.

The essential question that therefore should be addressed is: what are the prospects that the EU ETS system is effectively and in time going to generate the necessary reforms in the domestic EU energy and production system.

Is the EU ETS going to deliver tangible results in greenhouse gas reductions in the EU?

For the proponents of the ETS the answer to the above question is obviously yes. Their reasoning is rather simple: we have set a cap, that cap will be guaranteed by strict monitoring and will be met in the most cost effective way as a result of ETS. They are not at all worried about the recent price drop for allowances from 20 €/ ton to 15 €/ ton, because they consider it to be very good for the economy that apparently it is now cheaper than expected to meet the cap.

The first problem of this theory is that the allowance price has until now been rather volatile and is also unpredictable as regards its development in the future, whilst the necessary reforms in our energy system are to be based on long term planning. It is claimed that the market always sets a realistic carbon price, but that is simply not true. It is the level of the cap that sets the price as this price will develop on the basis of expected supply and demand of allowances. And the level of the cap is a pure political decision like setting a carbon tax. The EU ETS cap in the climate package was agreed when everybody still believed in an average annual growth of the EU economy of 2.3 %. Now the economy is shrinking around 5 % and so are the industrial production and emissions of GHG. However, the cap as it was set in the climate package remains the same, so it will even take longer than expected before the assumed scarcity of allowances may drive up the price to a level that will generate investments in alternatives. Maybe this will not even happen at all, given the scale of the recession and the wide open back door to cheaper CDM's!

The EU emission figures for 2008 as released in May 2009 show already a decrease of emissions in the ETS sector of 3.06 % compared to 2005. Although the Commission could not indicate which part of it was the direct result of ETS, it downplayed the impact of the economic crisis and presented this figures as a proof that it all works well. However, it looks rather obvious that for instance a worldwide decline of steel production of 30 % would indeed have an influence on the decline of CO_2 emissions. The reason that the price of allowances has not dropped even more drastically can be explained from the equalizing effect of the decision that the allowances of the second period can now be banked and used in the third period as well, so effectively until 2020.

In stead of taking advantage of the slow down of the economy by combating climate change with more success, the market based approach of ETS could well result into postponement of strategic decisions and investments. It is interesting that a company like Exxon declared recently to prefer a clear carbon tax in order to have certainty for their climate investments[12].

[12] Speech CEO Rex Tillerson on 8/1/2009

The second problem of the assumed effect of market forces of carbon prices is that they are anyhow far too low to make important changes happen.

An allowance price of 20 €/ton CO_2 would mean around 1 cent per kWh. This is totally insufficient to bridge the gap between fossil fuel electricity and renewable electricity (4 ct per kWh extra is needed for on shore wind) or to compensate for the extra costs of carbon capture and storage (CCS), which would add to the price of coal generated electricity at least 3 ct per kWh. This means the market of ETS allowances on its own would only push for strategic alternatives in energy generation at a carbon price of at least 80 € and that only when this price is stable enough to give long term confidence to investors. At lower prices the main effect probably will be a fuel switch from coal to gas or simply closing down industry. This is confirmed by recent studies that indicate that the main factor determining the CO_2 price until now and in the near future is the price difference between coal and gas[13].

Indeed, the individual power industries have always an incentive to produce less CO_2 because that would give them a competitive advantage. However, if there is not enough competition they can simply pass the extra costs to the consumers. Power industries with large assets in hydro and nuclear electricity will have this competitive advantage immediately anyhow and will make large profits. These profits may lead to buying their competitors and a reduced number of competitive players in the market and thus less competition.

Energy intensive industry needs large quantities of allowances. They can make money if they can sell their surplus and will have to pay for the allowances that they will need on top of those that are given for free. So there is indeed also an incentive for them to reduce CO_2 emissions by efficiency. However the question is why these industries would not have done that already as energy is such a large part of their costs. It can easily be calculated that paying an emission allowance price of 20 €/ton has the same effect as a rise of the oil price of 10 $ per barrel. So if an oil based industry receives 70 % of its allowances for free then an allowance price of 20 € equals the effects of only 3 dollar price difference per barrel oil on their balance. The main issue for the EU industry is indeed that a higher oil price is paid by everybody in the world and the ETS price only in the EU. Once this effect would have been neutralized by a global carbon market, the global industry would react like with higher oil prices and we have already seen the effect of a fluctuation of that price of 100 $ per barrel!

Finally, also for the consumers an increase of the price of electricity of 1 ct per kWh at an allowance price of 20 € is by far not enough to bring a change of behavior. Moreover, for transport and direct (non electric) heating the consumers will not pay any allowance.

It can certainly be stated that the EU ETS system is in principle a very clever way to bring the greenhouse costs to the market and it may have the desired impact in the long term, but unfortunately there are enough reasons to doubt about at least its short term effectiveness by its instability and the absence of strong incentives to cause strategic changes. There is therefore a growing awareness that it would be wise to start developing enough safeguards for a scenario in which it will not work according to theoretical models. Unforeseen developments such as the current economic crisis may render the system powerless for a long period and there is no time to loose in experiments.

[13] Brattle report

Complementary action to the ETS is needed

As the CO_2 reducing actions that should be triggered by the market mechanism may in practice occur too late or not at all it may be rather risky to rely so much on the ETS and neglect other measures that could have a more guaranteed performance. In fact, ETS has too often been welcomed as a good reason to stop or delay other activities that are more straight forward solutions to reduce carbon.

Nevertheless, such other measures were already partly introduced:

- The European renewables Directive will deliver its 20 % share of green energy independent of the economic recession and with a predictable schedule.
- The standards for appliances set by the European ecodesign Directive and the implementing national measures will deliver energy savings without further economic incentive and independent of economic recession.
- The car industry is forced toe downsize their products independent of oil price by means of the 130gCO2/km benchmark.

These measures and national subsidies and tax measures all deliver GHG reductions which partly fall in the ETS sector and that will make allowances even cheaper for the remaining sectors that are to be covered by ETS alone.

Therefore, it seems there is no good reason to stop here and to take the risk that finally too little will happen in the important remaining sectors, notably the power industry.

Additional regulations that could complement ETS include:

- Performance standards for power industry and energy intensive industry
- Tax measures (preferable internationally harmonised) to discourage CO_2 emissions, especially in transport
- Binding targets for the application of energy saving technology like CHP
- Binding targets for energy efficiency in final demand such as in the building sector.

The use of such regulations could be rather forceful but "command and control" policy is often considered to be old fashioned and turned down because of sub optimal allocation of resources. However, if the ETS would indeed deliver what is promised it would not do great harm if standards were set on top of the ETS system and it would create a level playing field right from the beginning.

Conclusions

- The EU ETS is a clever system based on sound economic theory but the effects until now are overestimated by opaque calculations and by taking adjustments of earlier mistakes in allocations on board as a success of the system.
- The future impact of the EU ETS is totally dependent of the price of an emission allowance and that price is set by the cap. In time of recession this cap ought to be adapted (lowered) in order to maintain the desired drive for strategic changes. However adaptation of the cap in the EU institutional process is a very slow political process so a quick and adequate reaction to changing circumstances is unfortunately out of the question.

- The large possibilities of using "cheap" CDM's and the over allocation of allowances based on economic growth figures that are outdated will probably remove the necessary incentives to actively reduce emissions in the ETS sector in period until 2020.
- Complementary actions should be initiated without further delay, notably EU wide performance standards for power industry (e.g. maximum quantity CO_2 per MWh) and binding standards based on benchmarks for the energy intensive industry

Because of the seriousness and urgency of the underlying problem, the primary goal should not be to keep the costs for mitigation of climate change as low as possible, but rather to have a mechanism that bites enough in the short term to convince all stakeholders to make extra efforts in changing the energy system. In theory this may finally also happen with a cap and trade system when the market is fluid, everything is in balance and the control is perfect. However, how high will the concentration of GHG in the atmosphere be when we know for sure that this works well?