

**A CARBON DEPOSIT SYSTEM FOR GLOBAL CLIMATE POLICY.
CHANGING THE GLOBAL CARBON METABOLISM,
WITH A QUANTIFIED APPLICATION TO THE EU GOING ALONE.
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Abstract

Rethinking global climate policy

Global climate policy is at a cross road, with the Kyoto mechanisms politically halted. A strategic reconsideration of long term options seems due, taking into account experiences with cap-and-trade mechanism and views on emission taxes as preferred instrument coming up with several authors (Nordhaus; Joel; Poterba; Tol; Ackerman; Hansen; Aldy/Barrett/Stavins; Sachs; Pielke; Yan Dong; and many more, and institutions like the Carbon Tax Centre (Komanoff).

Not precluding the results of this discussion but contributing to it, it seems that the emission tax option should be developed intellectually as an internationally applicable system. The emission tax system is to reckon with the physical and administrative constraints and options, not only for Annex 1 countries, but broader. Softly converting from a cap-and-trade to a carbon tax system is essential. The system has to involve the larger part of the world by 2050, at least including the US, China, India, Russia, the South-East Asian and South American countries. Still, in any realistic scenario, some countries will not participate.

From direct to indirect measurement of emission: carbon deposit

One major problem for both cap-and-trade and emissions tax systems is the difficulty of measuring emissions directly. That is not possible now and will not be possible precise enough for policy instrumentation purposes for most emission sources. If emissions cannot well be measured directly, indirect measurement will have to do, or policies will have to revert to technology based standards and regulations. The latter option is most cumbersome and will hardly be possible to implement at a global level due to policy competition. The incentive for countries is to favor their own industry and, sadly, all countries will do the same. When combining direct and indirect measurement systems in one policy instrument framework, the overlap problems will be substantial, with difficult to resolve equality issues: some will not pay while others pay double or more. The near global carbon deposit system would solve these inconsistency problems by fully going for indirect measurement, at the boundary of each country involved in the system. It is based on an MFA analysis, specifying carbon flows going in and out of each country.

Deposit versus tax: Technical similarity, conceptual difference

The carbon deposit is paid on any fossil carbon taken from geological stocks. The deposit is refunded upon final storage, as in deep aquifers or in stable chemical bonding. Any carbon not brought back to storage effectively becomes an emission, and is paid for in advance. A key technical advantage of this most upstream and downstream measurement for taxing is that actual emission measurement at the hundreds of billions of emission sites in the world is fully superfluous. The conceptual difference is that payment is in advance, not after the act of emission, avoiding a number of market imperfections and giving the keeper of the carbon a clear responsibility for what may happen to the carbon: to emit or not. This responsibility extends to consumers and to post-consumer waste managers.

Global governance versus interstatal relations

The carbon deposit might be set up globally, by a global government. That route is not open politically. National implementation is the only feasible option, with countries cooperating. The interference with national policies implied in the Kyoto Protocol seems one reason not to join or not to join effectively. For Cap-and-Trade systems, an international body has to decide on the allowances per country. For the carbon deposit system, national governments retain more of their autonomy. What they have to agree on internationally is the level of the carbon deposit.

Solving the imports and export problem

A nationally implemented carbon deposit has to deal with the import and export flows, which contain carbon and have *embodied carbon*, that includes the CO₂ emitted in upstream processes of the products imported and exported. The solutions are very different for product flows between countries with the same carbon deposit, and between such countries and non-deposit countries. For the product flows *between deposit countries*, only a statistical correction on physical carbon is required, relevant mostly for high energy flows as in fossil fuels and agricultural and forestry products. For such a statistical analysis, data are well available. For product flows *between deposit and non-deposit countries*, a much more cumbersome procedure is required. There the embodied carbon, actual carbon and upstream emissions together, are to be specified for both imports and exports. Exports from deposit countries get a refund not only on the carbon in the product but also on all emissions in the deposit country implicitly paid for. This refund on transfer payments brings prices back to the level of those in the non-deposit country, though of course the real cost of emission reduction are still included in the price. Conversely, upon import to the deposit country, the deposit is levied, not only on the carbon in the product but also on its upstream carbon emissions in the non-deposit country. Such border corrections seem mainly in line with WTO rules.

Equal deposits in all countries; currency issues

The international agreement is on having the same level of the deposit between them. As currencies move relative to each other, some adjustment level is required. To avoid the cumbersome discussions as now with the dollar as reserve currency, the deposit price could be specified in terms of SDRs or similar basket type of international currency. The deposit would start at zero, increasing to intended level in for example 20 years.

Rough quantifications EU going alone

The relatively high carbon price from Stern(2006) amounts to \$ 320 per ton of carbon. Rough quantification based on current carbon flows then leads to the following deposit flows. A deposit is paid on primary fossil production of billion dollar (B\$) 106 and on imports B\$ 194. A refund is paid on exports of B\$ 65. Net proceeds for EU governments is B\$ 335, that is tax proceeds of around 2% of GDP. This is a high estimate, as introduction of the deposit system must be slow, and the (expected) deposit level will help reduce emissions in the course of time.

For lower income countries the percentage will be roughly the same, with carbon intensive economies having somewhat higher tax proceeds. For fossil producing countries the rent income, mostly accruing to governments, will go down, while rent incomes of renewables will go up.

Prospects

One key element for political feasibility is a soft transformation from Kyoto Cap-and-Trade concepts to a carbon deposit system, also reckoning with vested interests in Clean Development Mechanisms transfer payments. As a first step relevant in all systems, mechanisms are to be developed stabilize the price of tradable permits, now too sensitive to shifts in economic growth, and which cover the emissions not yet under the CaT. For the EU-ETS system this is still over 50%. With the option of the carbon deposit in mind, such hybrid systems may ease the transfer to the administratively much easier and economically more optimal carbon deposit system.