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Tightening the system: Central allocation of emission rights

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Abstract

A whole bundle of so-called "flexible mechanisms" has been foreseen by the Kyoto Protocol in order to help industrial countries to fulfil their agreed reduction targets in the most cost-effective way.

Emission permits will act as the backbone of all market-orientated mechanisms. Therefore, their initial allocation to the market participants is crucial. The deposit-refund model of Central Allocation is an alternative to the distribution of emission permits actually discussed in the context of flexible mechanisms. A Climate Bank is proposed that issues permits equal to the aggregate budget of all Annex-B countries. The system of Central Allocation is aimed to achieve an equitable distribution according to real emission needs, a positive sanction for compliance and overall system integrity.

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Introduction

The Kyoto Protocol in its Annex B sets upper limits for the emission of greenhouse gases for 38 countries and for the European Community as a whole. These limits apply to the first budget period 2008 - 2012. They are differentiated between each Annex-B country and are generally measured against the emissions in the year 1990.¹ A system of five so-called "flexible mechanisms" allows the countries with targets to find the most cost-effective way to fulfil their commitment by

- combining the emission budgets of several countries, commonly denominated "forming a bubble";
- executing joint emission reduction projects among two or more Annex-B countries, which is known as "joint implementation";
- executing joint GHG mitigation projects in non-committed countries within a so-called "Clean Development Mechanism" (CDM) and transferring (part of) the resulting emission reductions to the account of the investing Annex-B country;
- trading parts of the emissions budget between Annex-B countries;
- banking emission permits for use in future commitment periods.

There are several problems to be solved in this context:

- "Hot air": Some of the emission targets may be higher than the real emissions in the business-as-usual case. This criticism mainly refers to the former socialist countries whose emissions lie about 30% below the target today. But this may as well be true for other countries whose economies suffer from a structural crisis until the start of the commitment period.
- Critics fear that flexible mechanisms might keep the industrial countries from changing their lifestyle. They propose limiting the use of flexible instruments. The problem is that these instruments are so flexible that they can hardly be limited in a normative way without jeopardizing the efficiency gains.
- Only one of the project-based instruments, the Clean Development Mechanism, has to bear the burden of financing adaptation measures in countries especially affected by climate change (Article 12 (8)).
- On the other hand, certified reductions achieved by CDM projects will increase the overall assigned amount for the Annex-B countries, thus inflating the emission budgets. Moreover, they accrue from 2000 onwards.
- Compliance: If a country does not comply with its emission target, it will be hard to enforce any penalties.

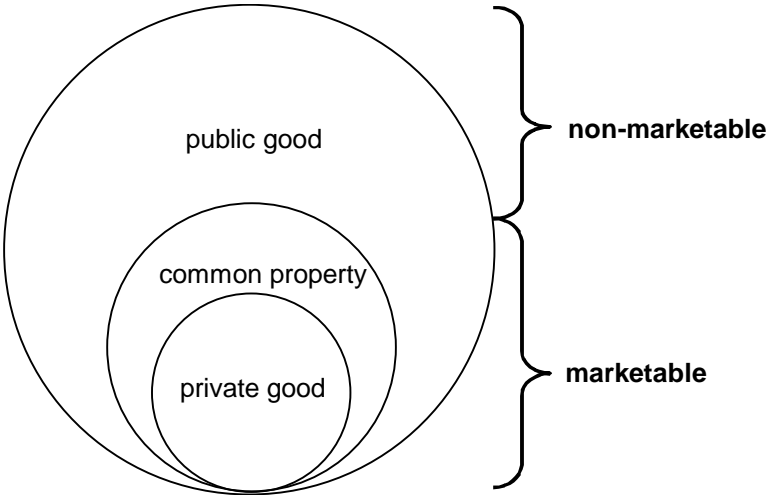
¹ Some countries with economies in transition are allowed to choose another base year.

These problems may endanger the legitimacy of the greenhouse gas limitation and reduction system. Moreover, the system described above remains yet to be created. However, a market will only work if the participants can take calculable risks and achieve calculable benefits. Up to the present, the uncertainties prevail. These uncertainties refer to the traded good itself, to the trading unit and to the confines of the market.

The traded good

The emission of greenhouse gases can be described as an extracting use of the atmosphere. Until now the atmosphere was considered a good of common access. The envisaged situation is that now some countries (the industrial world, denominated Annex-B countries in the Kyoto Protocol) have to pay for polluting the atmosphere, thus making it a good of common property. Others, in contrast, do not pay for its use. The reason is that successful industrial development in the past has only been possible due to the excessive use of the atmosphere. Although hosting only 20% of the world population, the Annex-B countries have been releasing more than 80% of anthropogenic greenhouse gases within the last 50 years.

Figure 1: Marketable and non-marketable goods



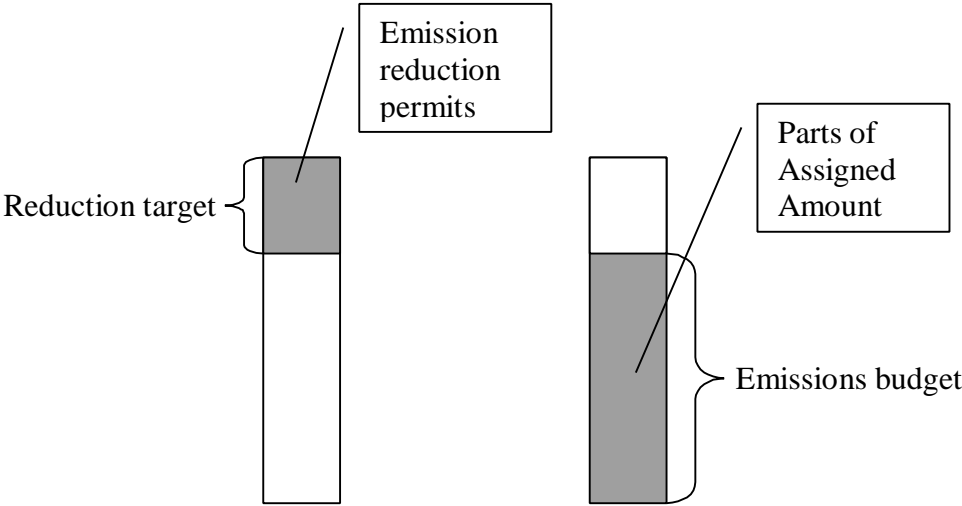
A totality of six gases has to be reduced globally, all of which tend to foster the greenhouse effect, although they do so in different forms and on different time scales. In order to flexibilize the reduction efforts, over-accomplishing reductions in one gas can replace the reduction commitment in another. A level of comparison has been agreed upon them, comparing the relative warming potential of each gas over 100 years in relation to the warming caused by CO₂ within the same time frame. However, uncertainty concerning measurement remains: While the release of CO₂ is directly linked to the burning of fossil and organic matter and can therefore be estimated to a ±5% level of uncertainty, the measurement uncertainties of

emissions of other gases vary largely. The temptation is to claim spurious reductions, which inflates the market, thus jeopardizing the value of all goods traded on it.

The trading unit

The Kyoto Protocol makes the distinction between “emission reduction units” (ERU), “certified emission reductions” (CER) and “parts of the assigned amounts” (PAA). The difference is in the perspective: While the ERU and CER describe the *reduction*, the assigned amount is defined as the reduced *budget* of greenhouse gases each country is allowed to emit in comparison to historic emission levels (base year 1990). Transparency of the market is only assured if everybody uses the same measurement units. This calls for taking one perspective for all reduction efforts. The text of the Kyoto Protocol indicates that the PAA perspective should prevail. This requires a change in perspective: not the emission reduction is subject to trade, but the right to emit. Reductions achieved outside the market have to be transformed to emission rights when they enter the market. This may seem simplistic, but it changes the trading system. The reduction perspective is top-down, which means that only the reduction obligations can be traded. The bottom-up perspective means, market participants will have to distribute the budget of allowed emissions among themselves. Thus the market becomes broader and more liquid.

Figure 2: Difference in perspective: Emission reduction permits vs. parts of assigned amount



The limits of the market

As indicated above, not everybody needs to pay for pollution. The problem is that GHG emission is at the same time a public good of common access (for Non-Annex-B countries) and managed common property (for Annex-B countries). The instrument to bring in reductions

not produced within the Annex-B countries is the CDM. Thus, a baseline-credit system is mixed with a cap-allowance system. On the other hand, emissions risk to be brought outside the system by shifting the most polluting parts of the industry to developing countries (so-called “leakage”). This means that the scarcity needed for pricing the good is at permanent risk, which endangers the emerging market, but most of all, the environment. Inflation provides an analogue: bad money drives out the good.

Polluter pays vs. grandfathering

In constructing the worldwide greenhouse gas trading system, much reference is being made to the US system of SO₂ permits. However, this system has relevant differences from the GHG trading system to be built. The main differences are the following:

- The limits between human-induced and natural emissions are easier to draw.
- Only one gas is subject to control.
- The trading unit is clearly defined.
- Measurement and verification are standardized.
- Measurement happens downstream, i.e. at the smokestack, while in most cases, greenhouse gas emissions can only be estimated.
- There may be leakage of pollutants to other countries, but within the US, the market is closed.

For all these reasons, the allocation of SO₂ pollution rights does not fit the needs resulting from the Kyoto Protocol. In the US case, a relatively small number of electric utilities need to present their emission rights at the Environmental Protection Agency. In the past, all these emitters have been living in the same regulatory environment. This is why the “grandfathering” of permits according to historic emissions has been relatively unchallenged, although to newcomers this system is unfair, as they have to pay for permits and their competitors did not. On a global scale, the number of “newcomers” is the vast majority. To less developed countries, the idea that pollution rights are given to the big polluters of the past, seems contradictory to the generally recognized *polluter pays* principle. On the other hand, industrial countries argue that strict per-capita limits neglect the real necessities of each economy which can hardly be standardized. The developed countries’ position imposed itself at Kyoto, which in the end tends to benefit allocation by grandfathering. If allocation rules are left completely up to the governments of committed nations, there will be a race to the bottom. Permits will be given out freely to the historic polluters in all Annex-B countries, because grandfathering is least controversial and no government will risk the competitive position of its industry by imposing high costs on the emitters through auctioning the permits. As shown above and given the presence of “hot air”, this could lead to an over-supply of permits and to the erosion of the

emerging market. Ideally, permits have to be positively priced to set a price signal to all market participants.

Central Allocation — the basic idea in four cycles

If PAA are to be the unit traded, and if their value is to be maintained by limiting the absolute number of allowances, they have to be issued by one institution. This means, that the sum of the emission budgets of all Annex-B countries is regarded as one overall budget. The idea is the implementation of a strict *polluter-pays* principle.

A Climate Bank (CB) would be related to the UNFCCC secretariat and the upcoming CDM institution. It would issue PAAs and market them. We interpret Article 17 in a way that allows seizure of PAAs through the CB. The regime of Central Allocation consists of four cycles:

The first cycle: Between CB and Annex B central banks

The CB issues PAAs at the end of every budget year to the national banks of Annex-B countries. The central banks pay a fixed deposit per ton of CO₂ - equivalent, e.g. 4 \$ per ton. Another 10% could be set aside for administration fees or common purposes². The CB however is a non-profit organization. The quantity given to every central bank is determined by the share of the overall emissions budget the country has been agreed to at Kyoto. This budget, divided by five, is given out on an annual basis in order to prevent market distortions. Portions not sold by the central bank can be returned to the CB without charge. The Annex-B governments would have to present PAAs for each unit of CO₂ - equivalent emitted on their territories during the compliance period at the end hereof. Central banks may return unsold PAAs to the CB with full refund of the deposit.

The second cycle: Between central banks and market participants

The second cycle is between the national central banks and the market participants. These can be private entities, organizations and states. In principle, participation in the market should not be restricted, although for domestic reasons, governments could decide to do so. The individual central bank sells or auctions PAAs. The government is free to restrict the group of buyers or buy all PAAs needed itself, but in general would rely on private finance to buy the certificates.

² One possible common purpose will be the adaptation fund named below.

The third circle: Between emitters and governments

The third circle is between the emitters and the government. If private entities have to hold PAAs for their domestic GHG emissions they will buy the corresponding amount at their national central bank or on the international market. If the aggregate domestic demand is higher than available supply at the central bank the market price for PAAs will rise above the issue price. The issue price is the bottom threshold price for the market price. If global demand is lower than the overall budget central banks will return unused PAAs and recover the deposit. If there is a regime of emission taxes or regulation private entities are free to trade in PAAs but need not hold them for domestic compliance purposes. That even applies if they cannot acquire PAAs from their domestic central bank due to government regulation. In such a case the government will buy the full supply of PAAs.

The fourth cycle: Between governments and CB

The fourth cycle is between the governments and the CB. Each government has to possess enough PAAs to cover the country's emission inventory. If it does, the CB returns the deposit as initial PAA price to the government. The upper limit of the refund is the country's initial Kyoto budget. This is thought to make domestic action attractive.

If the government fails to hold the quantity of permits needed, the entire prime will be lost. The dramatic opportunity costs in the case of non-compliance can be avoided by buying up the surplus of other market participants. This all-or-nothing solution makes negative sanctions obsolete.

Modifications

In order to include project-based mechanisms, modifications are needed to the four-cycle system. The project-oriented mechanisms JI and CDM relate to real, certified GHG mitigation. Because of the costs generally involved with implementation, emission rights derived from these project-based mechanisms shall be exempt from the deposit to be paid by the investor. Nonetheless, both project-based mechanisms should be charged the administration fee, a share of which goes to the adaptation fund, in order to create a level playing field for all flexible mechanisms.

Joint Implementation

JI projects will have to report their mitigation at the end of each project period to the UNFCCC Secretariat. The investor will be granted free emission rights from the CB immediately, according to Art. 3 (10). In order to keep the balance, evidently these will have to

be subtracted from the host country's budget, as stated in Art. 3 (11). Likewise, the allocation to the host country's central bank must be reduced.

Clean Development Mechanism

The drawback for the CDM is that a "share of the proceeds" has to be diverted to adaptation measures for countries most vulnerable to the effects of climate change (Kyoto Protocol, Article 12 (8)). The central allocation offers a unique opportunity to close the system without the need for developing countries emission caps and without disadvantages for the CDM. How does this operate?

The CDM institution will report annually the emission rights it distributed to its projects. There is no provision in the Kyoto Protocol that the rights granted by the CDM should not come out of the overall Annex-B budget. The argument that these mitigations achieved outside the Annex-B do not relate to Annex-B emissions does not apply, because this is the core of the CDM. Each CDM project will be fully granted credits while the costs of accounting for external reductions will be distributed between all market participants. Inflating the budget would in change charge the costs to global climate, which in the end would turn out more costly to the individual than the slight price increase experienced by the buyers of emission rights.

Evidently, giving out emission permits for free requires modifying the refund rules. There are two possible way to do so:

- a) There is no refund for project-based emission rights. This would lower the incentive for investing countries' governments to foster JI or CDM measures.
- b) The overall refund value for all Annex B countries is discounted equally, according to the share of project-based emission rights. This goes to the advantage of certified mitigation projects.

Further options

The above mentioned design is kept as simple as possible in the margin defined by the Kyoto Protocol. However the system could be further refined according to necessities arising from the political process. For instance, a controlled increase of the overall budget could be allowed for, or basic infrastructural emission needs could be taken into account.

Controlled budget increase

Some parties may argue, that certified mitigations from developing countries refer to real emission reductions and are therefore to a certain degree additional to the overall emission budget of Annex B. On the other hand, developing countries' and NGO representatives fear that the overall Annex B budget might become inflated by a large number of CDM projects. In the present situation, quantitative estimates of external mitigation options are quite uncertain. Two possible options can be thought of:

- a) A certain percentage (e.g. 50%) of each CER created by a CDM project is allowed to increase the overall Annex B budget.
- b) Analogously to a central bank in the monetary system, the CB could allow for CERs to inflate the PAA budget of emission rights up to a certain limit (e.g. 5%). Beyond that limit, the system will go on working as described above.

Basic emission needs

The Central Allocation implies that every Annex-B country will have to acquire the emissions it has been allowed for at Kyoto. This is the element of the proposal which will arise most criticism. Part of the problem is pure wording: Business and public of many countries are already facing taxes on carbon contents of fossil fuels. As everybody is subject to these taxes, there is no market distortion. Paying for emission rights is basically the same thing. Their advantage is that their price is equal in all Annex-B countries. On the other hand, the necessity to pay even for the first ton of CO₂ - equivalent emitted, could prevent poor Annex-B countries from fulfilling basic needs for heating or marginal food production. Therefore a modification could consist in giving a basic quantity to every country for free. As basic needs refer to human needs, this quantity should not be determined by unit of GDP produced, but on a per-capita-basis. Possibly 30-50% of the average per-capita emissions of the Annex-B countries could be regarded as such basic need. This ratio should not be too high in order to maintain incentives for compliance to the Annex-B countries whose per-capita GHG emissions are relatively low (e.g. Japan).

Conclusions

The model of Central Allocation covers all market-based instruments of the Kyoto Protocol. It is easy to apply and will provide planning security to the market participants. It secures the existence of a market by setting a bottom price threshold to the emission permits. If emission budgets turned out to be too generous, Central Allocation could even lead to over-compliance. Each government is free to decide how many participants it allows for. However, if the number is restricted too much, national governments will have to buy all emission rights themselves. This could be done by depositing government securities with the Climate Bank. If the polluters themselves are allowed to acquire emission rights, their government will profit from the refund at the end of the commitment period. Both alternatives make compliance attractive without the need for international institutions to enforce penalties.

- Each polluter pays for its emission necessities.
- The proportion of emissions trading versus domestic reductions by definition cannot be limited, but avoiding domestic reduction through acquisition of foreign permits will simply not be primed after the end of the commitment period.
- Both project-based mechanisms will be treated equally in terms of permit creation.
- The annual central sales will smoothen the volatility of permit markets.
- The agreed budgets will not be inflated.
- The system of flexible mechanisms will be credible to the public.