

The Kyoto Protocol and its flexibility mechanisms

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1. Introduction

As greenhouse gases are a global pollutant, they are theoretically perfectly suitable for a global emissions trading regime if absolute emission targets have been set. This allows to equalise marginal abatement cost and thus minimises overall cost of compliance with the target. However, their impact on long-term innovation is unclear. On the one hand, cheaper achievement of targets makes it politically more palatable to strengthen subsequent targets. On the other hand, currently expensive technologies that have the potential to become a backstop technology in the long run will not be attractive for trading. In a regime that does not cover all countries, direct trading is only possible within; externally offsets can be created through projects.

The Kyoto Protocol negotiated in 1997 defines legally binding emissions targets for a basket of six greenhouse gases. The targets apply to industrialised countries and some countries in transition (so-called Annex B countries) and have to be reached in the “commitment period” 2008-2012. They can be reached via domestic mitigation, by investment in emission reduction projects abroad or the acquisition of emission rights from another country. The latter two options are possible because four so-called “Kyoto Mechanisms” have been set up that allow transboundary cooperation in emission reduction. These four mechanisms are: the Clean Development Mechanism (CDM), Joint Implementation (JI), International Emissions Trading (IET) and bubbles. A large part of their rules was agreed in the 2001 Marrakech Accords. To participate in the mechanisms, countries have to ratify the Kyoto Protocol and fulfil certain reporting requirements. They need to

- Have established their emissions budget
- Have a national system to collect data for inventories
- Have a national registry for transactions in emission rights
- Have an up-to-date reviewed inventory

Whether all Annex B countries, particularly countries in transition will fulfil these rules, remains to be seen.

2. The history of the Kyoto Mechanisms

During the negotiation of the U.N. Framework Convention on Climate Change (UNFCCC), in 1991 Norway proposed that investment in emission reduction projects abroad should be credited to the emission target of the investing country. Thus Art. 4,2a of the Convention states that industrialised countries “may implement such policies and measures jointly with other Parties” and the principle became known as “Joint Implementation”, the meaning being different from the post-Kyoto use.

From 1993, developing countries and NGOs mounted strong opposition to Joint Implementation. Therefore, the first UNFCCC Conference of the Parties in 1995 decided that the concept should first be tested without accrual of emission credits and changed the term to “Activities Implemented Jointly” (AIJ). AIJ started relatively slowly and did not lead to the desired convergence of methodologies (Chatterjee 1997, Dixon 1999). Reporting was uneven and it was totally unclear which projects were just on paper and which ones actually implemented (see Table 1 and Michaelowa 2003, Beuermann et al. 2000). So less experiences could be drawn than expected. However, an important result was that host country institutions are crucial to attract projects. The tiny Costa Rica hosted nine projects due to a very efficient legal and institutional framework.

Table 1: The AIJ pilot phase over time

	1995	1996	1997	1998	1999	2000	2001
Accepted projects	10	16	61	95	122	143	152
Projects actually being implemented*	0	3	13	60	86	n.a.	n.a.
Investing countries	3	3	5	8	11	12	12
Host countries	7	7	12	24	34	38	41
Countries in transition	5	5	7	10	11	11	11
Share of countries in transition in all projects (%)	60	50	74	72	65	58	56
Planned emission reduction (mill.t.CO ₂)**	23	111	140	162	217	366	442
Share in countries in transition (%)	56.5	39.5	32.6	31.3	24.3	15.6	13.6

* These are estimates as no reliable information exists. The implemented projects tend to be small projects in countries in transition.

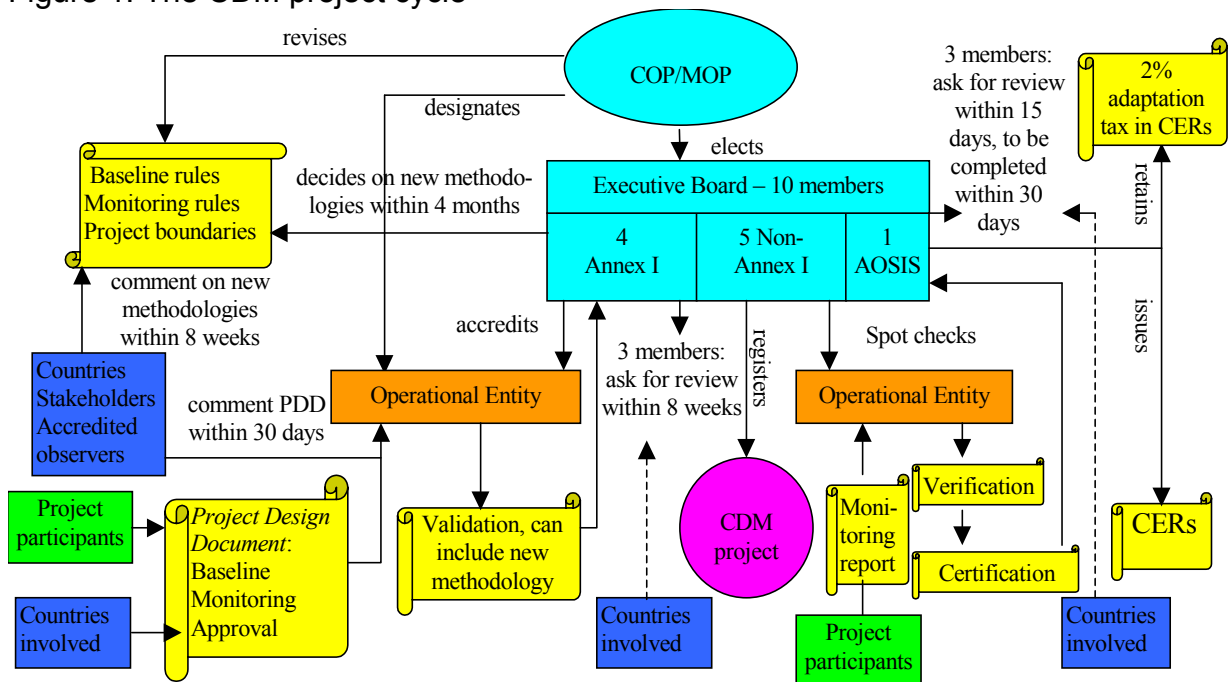
** The emission reduction actually implemented is much lower (see previous note).

Officially, the AIJ pilot phase is still ongoing but de facto stalled since 2001 due to the fact that AIJ projects are not eligible as CDM projects. During the negotiation on the Kyoto Protocol, the U.S. and other market-oriented OECD countries argued strongly in favour of far-ranging spatial flexibility of reaching emissions targets while all other countries and the NGOs were opposed. Observers thought that - if at all - flexibility would only be allowed within the group of countries that had committed to emissions targets (Michaelowa/Dutschke 2000). So it came as a great surprise that four flexibility mechanisms were agreed at Kyoto, also including developing countries without emissions targets. This was due to the unexpected collaboration between Brazil and the U.S. that created the concept of the Clean Development Mechanism (CDM, see Grubb et al. 1999).

3. The CDM

The CDM allows countries with emission targets to buy emission credits from projects in countries without targets. It also has the goal to further sustainable development in the latter countries and already formally started in 2000. Due to the fact that CDM emission credits are added to the overall emissions budget of Annex B countries, their quality has to be guaranteed. Therefore, they only accrue after independent verification through so-called “Operational Entities”, most probably commercial certification companies, and thus are called Certified Emission Reductions (CERs). The Marrakech Accords defined an elaborate project cycle (see Figure 1) that is overseen by the CDM Executive Board, whose 10 members are elected by the UNFCCC Conference of the Parties. It has to check whether projects conform to the rules and formally register them.

Figure 1: The CDM project cycle



Any institutional arrangement is possible to set up CDM projects – bilateral agreements, multilateral funds or even unilateral activity by the host country. This is helped by the full interchangeability of CERs with other types of emission rights under the Kyoto Protocol. Both host and investor country have to set up an official approval agency for CDM projects; the host country defines criteria to check whether the project leads to sustainable development.

To calculate the amount of CERs of a project, a baseline has to be fixed which shall describe the situation that would have existed in the absence of the project (OECD 2000). Baseline rules have only partly been defined. Only some of them can really check whether the project is “additional”, i.e. would not have happened anyway. If business-as-usual projects are accepted, the CERs will not be real. However, a quantitative check of the economic attractiveness of a project has not been made mandatory due to the pressure of business and governments that want to reduce costs of reaching

their targets. As the text currently stands, there is a free choice among three baseline options:

Current or historical emissions

Emissions of an economically attractive investment, taking into account investment barriers

Average emissions of “similar” projects undertaken in the last five years in “similar” social, economic, environmental and technological circumstances as long as they belong to the top 20% of their category

This menu will lead to moral hazard as every project participant will choose the baseline maximising the CERs. It is doubtful that certifiers will be able to prevent this fully despite being liable for faulty certification. Much now depends on the first projects that are registered by the Executive Board because they will set the “case law” that will be applied for future projects.

Projects can have a lifetime of ten or three times seven years. They are subject to an in-kind adaptation tax of 2% that is waived for projects in LDCs. Another tax shall cover CDM administration costs but its rate remains to be specified. Until then, project participants will have to pay a fee for administration that is fairly stiff, ranging from \$5000 for the smallest projects to \$30,000 for large ones.

Due to the fear that transaction costs will be prohibitive for small projects (Michaelowa and Stronzik 2003), more lenient rules have been decided for renewable energy projects below 15 MW capacity, energy efficiency projects that save less than 15 GWH per annum and other projects that annually directly emit less than 15,000 t CO₂. They can use standardised baselines. However, even with the special rules, it is unclear whether small projects will be competitive.

CDM projects shall not lead to “diversion” of development aid; however, the term is not defined. Annex B countries can only “use” CERs if they fulfil the eligibility criteria described above; this means that they can buy CERs in periods of non-eligibility. However, private entities can only buy and sell CERs when their home country is eligible. Thus US companies cannot buy CERs; however this prohibition can be circumvented by setting up subsidiaries in a country that has ratified.

Forestry projects under the CDM are limited to afforestation and reforestation and capped at 1% of Annex B country base year emission levels. Their rules are only decided in late 2003. Main issues discussed are the guarantee of permanence and the prevention of leakage.

Experience shows that it is difficult for many developing countries to put the institutional structures in place and provide the necessary know how for project preparation. It is thus likely that relatively advanced countries will profit most from the CDM.

4. Joint Implementation

The term “Joint Implementation” has got a narrow significance through the Kyoto Protocol. It now only applies to projects that take place in Annex B countries. Emission credits (“Emission Reduction Units”, ERUs) can only accrue from 2008. JI has two distinct “tracks”. The first track is very liberal and leaves choice of baselines and project lifetimes to the participating countries. This is due to the fact that ERUs are deducted from the emissions budget of the host country and thus there is no incentive for baseline manipulation. The

second track is similar to the CDM and applies if the host country does not fulfil the reporting requirements for Annex B countries listed above; of course it can also be chosen voluntarily. It is overseen by a “Supervisory Committee” and the Emission Reduction Units have to be certified by “Independent Entities”.

To garner the potential for emission reductions before 2008, some countries already now invite investments into “early JI” emission reduction projects and grant post-2008 emission rights from their budgets for the pre-2008 reductions.

5. International Emissions Trading

International Emissions Trading is only possible between Annex B countries and does not involve any projects. It consists just of a transfer of a part of the emissions budget (“Assigned Amount Units”, AAUs) of one country to another, once again only after 2008. If a country wants to allow companies to directly participate in IET, it has to publish their names. As the countries in transition have a considerable surplus of AAUs due to their economic decline in the 1990s (often called “hot air”), they are likely to use IET intensively.

Countries have to hold a commitment period reserve (CPR) at 90% of their emissions budget or at 100% of their last reviewed inventory if this is lower. The latter applies to all countries whose “hot air” is higher than 10% of the emissions budget. These countries effectively can only sell “hot air”. If such a country is on an upward emissions trend and has sold all its free AAUs at the beginning of the commitment period, it has to re-buy permits to honour the increasing CPR. The opposite case of declining emissions progressively lowers the CPR and frees AAUs for sale (Missfeldt/Haites 2002).

6. Bubbles

Many researchers do not count this instrument among the Kyoto Mechanisms, but it is their most far-reaching form. Countries forming a bubble can redistribute their targets internally as long as the sum of the targets is not exceeded. A bubble has to be notified when the participating countries ratify the Kyoto Protocol and cannot be changed until the end of the commitment period. Only the EU has done so. It has redistributed its target of –8% so that Portugal can increase its emissions by 25% while Luxemburg has to reduce them by 28%. In case of non-compliance of the bubble, each country is responsible for its target under the bubble.

7. Competition between the Mechanisms

As Annex B countries can use all Mechanisms at their choice, there will be a competition between them. Due to the withdrawal of the US and the weakening of the Kyoto targets through the decision on sinks taken in the Marrakech Accords, currently the demand of the remaining Annex B countries is lower than the Russian hot air alone. So the fate of CDM and JI depends on Russian behaviour. If Russia maximises its revenue and only offers a part of its hot air, they will still play a role, but Russian behaviour in the past has been erratic and will not necessarily be rational. Even then, total CDM revenues could reach several billion Euro up to the end of the commitment period (Jotzo/Michaelowa 2002). However, an exclusion of some countries in transition due to reporting failures would change the picture significantly.

The CDM and the second track of JI are burdened by high transaction costs. Moreover, the CDM loses its temporal advantage with every further delay of rulesetting. Nevertheless, the early market has seen a considerable amount of CDM and JI transactions. Demand comes primarily through tender programmes of the Netherlands, Finland and Sweden, but the lion's share is from the World Bank that operates three funds, the Prototype Carbon Fund, the Community Development Carbon Fund and the BioCarbon Fund. Prices offered are around 3-4 Euro/t CO₂ with overall demand mobilising around 500 million Euro. Under current prices, attractive projects are primarily found in the waste sector and renewable energy in good locations.

The hitherto lacklustre experience with private sector involvement shows that domestic incentives such as exemptions from an emissions tax or the possibility to use CERs and ERUs for a domestic trading system are necessary.

8. Outlook

If the negotiations that start in 2005 for the second commitment period lead to a strengthening of targets, the demand for the project-based Mechanisms is set to increase. A first step would be the inclusion of CDM and JI in the internal EU emission trading system from 2005 that is envisaged but not clearly defined. An expansion of Annex B with new hot air would lead to an increase in JI and IET.

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Online references:

Kyoto Mechanisms in general :

[Foundation JIN](#) is a node for information on the Kyoto Mechanisms with all issues of its Joint Implementation Quarterly available online.

The [World Bank](#) provides a wealth of information on its Kyoto Mechanism funds including all project documentation, background papers and discussion groups.

The [NSS Programme](#) provides in-depth studies on the potential for Kyoto mechanisms use of many developing countries and countries in transition.

The OECD has a rich lode of detailed documents on [emissions trading](#) and on the [project based mechanisms](#). The latter is particularly strong on baseline issues.

[CICERO](#) is a Norwegian research institute with a lot of downloadable publications on various aspects of the Kyoto Mechanisms

[Weathervane](#) is a platform of the U.S. think tank Resources for the Future with several interesting texts on the Kyoto Mechanisms, albeit its activity in the field has been reduced since the U.S. pullout.

The [Hamburg Institute of International Economics](#) provides a lot of research papers on the Kyoto Mechanisms.

[PointCarbon](#) produces a daily e-mail newsletter and background information about the current situation on the international greenhouse gas market.

CDM

The [CDM website of the UNFCCC Secretariat](#) contains the officially adopted CDM rules, reports of the CDM Executive Board meetings and provides links to the Designated National Authorities, Operational Entities and information about registered projects.

[CDM Watch](#) is a NGO that aims at critically assessing proposed CDM projects. It contains a database on CDM projects.

[CDM Connect](#) provides discussion groups for business people and other persons interested in CDM.

[UCCEE](#) provides information about a large scale CDM capacity building programme

[SouthSouthNorth](#) is a developing country initiative that tries to develop CDM projects in four countries.