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Often, putting in place a new policy instrument requires a lot of persuasion. Once policymakers have understood the concept behind the instrument, it can seem very attractive as long as it has not been applied in practice. But when the first real-life implementation challenges have to be faced, politicians lose interest and switch their attention to new, as yet uncompromised, instruments. Once this instrument has lost its lustre as well, sometimes they then ruefully turn back to the first instrument and try to make the best of it.

In international climate policy the Clean Development Mechanism (CDM) has completed the first part of this cycle. It took about a decade from 1991 to convince policymakers that the concept of project-based offsets was not some lunatic idea but a sensible incentive that could mobilise low-cost emission reductions. After 2000, several years were spent setting up the rules to prevent 'paper credits', ie credits not covered by real emissions reductions, with a small group of overworked UN officials performing near miracles.

With these rules in place and the European Union's emissions trading scheme providing a powerful monetary incentive, the CDM took off in 2005 in a way that had not previously been imagined. By early 2009, almost 5,000 projects were working their way through the system and the creation of close to three billion CDM credits

(Certified Emissions Reductions or CERs) was forecast by the end of 2012.

The key challenges to the CDM

While the success of the CDM has spawned an industry of project developers and consultants, since mid-2007 the mass media have started to draw attention to the scheme's shortcomings. US newspapers in particular have stridently criticised the mechanism as a failure. The increasing media attention has led to a reaction on the part of CDM regulators, as well as to a negative attitude on the part of US policymakers. The latter is surprising because the US had been the country pushing most strongly for the inclusion of the CDM in the Kyoto Protocol. What challenges does the current CDM face?

The CDM gold rush and additionality

Obviously, a gold rush like the one experienced by the CDM will expose any weaknesses of the instrument. The CDM's key weakness was the challenge in defining the concept of 'additionality'. A CDM project should only be awarded emission credits if the project would not have taken place without the incentive provided by the CERs, making the credits 'additional' to business as usual. Of course it is not easy to judge entrepreneurs' minds or to assess their project investment decisions. It is no surprise that business lobbies wanted to get CERs for any project where emissions were below a predetermined baseline, whereas environmental NGOs wanted to reject any profitable project. But the CDM regulators worked out a sensible compromise. The entrepreneur defines the most profitable realistic alternative to the CDM project and as long as the CDM project is less profitable, it is additional. Optionally, the project developer can also show that his project faced prohibitive barriers that were only removed by access to CDM credits. But the problems started when this apparently sensible rule had to be applied in practice.

In the CDM system, independent auditors play a crucial role. They check ('validate') the project documentation provided by the entrepreneur, making sure it is in

conformity with the rules. If they had done their job properly, the additionality crisis would probably never have erupted. But from the outset, the validators became servants of the project developers and wilfully repeated their sometimes extremely flimsy arguments. At that stage, the regulators did not have enough manpower to check the project documentation, and therefore a non-negligible share of projects without demonstrable additionality was registered.

The regulators did however notice that problems were building up, and so introduced a second layer of checks through CDM experts, the so-called Registration and Issuance Team. These checks immediately led to the review and rejection of some projects, but it was not until the UNFCCC Secretariat had hired more staff that another layer of checks was introduced. Moreover, the additionality test was specified much more clearly. Currently, about 10 percent of projects are rejected because they are not additional. However, most of these projects are relatively small and other projects based on the same flawed argumentation continue to pass. A reason for this inconsistent treatment by the regulators might be their lack of immunity against legal cases brought by large companies whose projects have been rejected.

Project developers have therefore become increasingly bold. They submit projects that started long ago. More and more large renewable energy projects with doubtful additionality are entering the pipeline. Chinese hydropower plants that report an unrealistically low plant load factor and therefore manage to show low profitability are particularly notorious. However, since late 2008, validators have become much more careful after market leader Det Norske Veritas was suspended for non-compliance with the rules for auditors (Det Norske Veritas was suspended in late 2008, and reinstated in February 2009).

Baseline methodology challenges

To calculate the number of CERs generated by a CDM project, a reference emissions level or 'baseline' has to be defined. According to the CDM rules, this has to be done

using a methodology specific to each emissions mitigation technology. Methodologies – which also apply to the monitoring of emission reductions – are proposed by the project developers and checked by an expert panel, prior to the regulators finalising their decision on a proposal. While such a bottom-up procedure makes sense insofar as scarce regulatory capacity does not have to be spread too thinly, the stubbornly high rejection rate of submitted methodologies is a cause for concern. Over half of the proposals have been rejected and the success rate has not improved over time. This is a consequence of parallel learning by the project developers and regulators. A methodology approved in 2005 would no longer stand a chance of passing today. Therefore, methodology development has become an art exercised by highly skilled and paid consultants.

Several strategies have been developed to get methodologies approved. The easiest one is an extremely narrow definition of applicability criteria. This allows the formulae to be kept very specific, and the number of baseline scenario alternatives to be limited. Somewhat more complex is the submission of a simple methodology first that is approved relatively easily, and is then revised successively to fit to the project. For some time, it was also possible to submit a proposal for a small-scale methodology, which was almost sure to be passed. But after this route had been used excessively, it was aligned with the standard procedure.

But even once a developer has got a methodology approved, he cannot rest on his laurels. This is due to the fact that the regulators can see the flaws of the methodology once its application has started. The regulators then revise it, frequently requiring more complex equipment or reducing the CER volume that can be generated by a project. Some methodologies have been revised every three months, and almost none have been retained in their original versions. A particularly challenging activity is the 'consolidation' of methodologies, meaning that similar methodologies are thrown together and afterwards lose their validity.

Data used for baseline methodology development have also become a headache. To facilitate project development, some countries have published emission factors for

their electricity grids. This has made life easier for the project developers. However, once the methodology changes, the data are no longer consistent with it. In early 2009, a number of renewable energy and energy-efficiency projects in India were stalled because the regulators required validation of the officially published grid electricity baseline data. As this validation is difficult and requires in-depth understanding of the Indian power sector, no private project developer was willing to bear the cost of this exercise, which could easily reach €100,000.

Monitoring and issuance challenges

Once a CDM project has been registered and starts operation, it has to monitor the emission reductions it achieves. This monitoring must be done according to the monitoring plan described in the project documentation. Many projects now face the challenge that their design changes between the point at which documentation is submitted for registration and actual implementation. For example, a hydropower plant might use a generator from a different supplier than originally envisaged, with a different capacity. Or an energy-efficiency improvement project might use newly introduced technology that did not exist when the documentation was written. For any design change, the CDM rules require a revision of the monitoring plan. Due to the regulatory overload, such revisions can easily take half a year.

Another challenge, especially for projects that started in the early phase of the CDM, is that local staff do not understand the importance of monitoring and there are periods where the monitoring equipment does not work. For example, in a large gas-flaring reduction project in South East Asia, data was not collected properly for a period of several months. The project developer asked for a (one-time) deviation from the monitoring plan. It took more than a year before a regulatory decision was made to accept this deviation. Currently, there is an intense discussion about the interpretation of the principle of achieving a 95 percent confidence interval in monitoring if there are only a limited number of data points during a certain period.

A major problem is that, initially, technology-specific expertise was scarce at the

UNFCCC Secretariat. Therefore, in order to be conservative, very strict requirements for monitoring equipment were set. For example, quarterly monitoring of the methane content of the exhaust gas from flares burning landfill gas was required. The necessary equipment is very expensive and not available in many CDM host countries. It took more than a year before the regulators allowed use of a default factor for flare efficiency, which then led to an upswing of landfill gas project submissions.

Where technologies become more complex, monitoring standards from industrialised countries have frequently been prescribed. However, the regulators decided in a landmark ruling that no standard should be prescribed. How this rule is going to be implemented remains to be seen.

Notwithstanding all these challenges, until early 2009, issuance of CERs was rarely rejected. However, the share of reviews is creeping upwards. It is also a sign of relevant problems that CERs have so far been issued for only a third of registered projects.

Reform proposals on the table

As the negotiations of the post-2012 climate policy regime are currently in full swing, there are several fora for discussing CDM reform. One centres on short-term reform, the other discusses sweeping reforms for the time after 2012.

Short-term reform

Additionality testing can be substantially improved. Investment analysis should become mandatory and should be made subject to checs by a local expert. Incentives for the validators should be improved by hiring them through the UNFCCC Secretariat. Parameters used in the investment test should be checked by a local expert hired by the Executive Board (EB) of the CDM. Benchmarks used to determine the attractiveness of an investment should be based on objective criteria

supported by published data. Definition of the prohibitive character of barriers can be further clarified.

The current institutional structure of the CDM is seen by some observers as being incapable of effective administration of the CDM. The EB has reacted to criticism regarding the performance of validators by drafting a Validation and Verification Manual, which became mandatory in late 2008. Moreover, the huge increase in support staff allows the EB to delegate tasks and improve the consistency of its decision-making. However, the introduction of an appeals mechanism for project developers as well as a clear hierarchy for decisions has been proposed, and was endorsed by the Conference of Parties at Poznan in 2008[19].

In mid-2007, the CDM regulators introduced a new 'programmatic' CDM approach. This allows the bundling of many small projects over a period of 28 years, even if the exact timing and number of projects are not known at the time the programme starts. Unfortunately, the detailed rules for registration of a programme contain several prohibitive elements so that, to date, not a single programme has been registered. The Poznan conference asked the CDM regulators to remove these obstacles as quickly as possible but they have not yet been able to do so.

Post-2012 reform

The main reform options under discussion represent an attempt to improve the environmental integrity of the CDM. They can be differentiated into three main strands:

- Replacing project-based additionality testing by benchmarking;
- Going beyond 1:1 offsetting as a means of generating a contribution of the CDM to global emissions reductions;
- Introducing a sectoral crediting mechanism.

Benchmarking, ie deriving the baseline from the performance of a certain percentile

of similar projects, has had a chequered history. In general, the sectors that can most easily be benchmarked produce goods or services identical in their nature and in their production processes, are highly concentrated, have no geographical factors distorting the level of performance, and already have a large amount of available data. Benchmarking was already under discussion in the late 1990s and retained a small foothold through a rule that allowed the baseline to be set at the level of the 20 percent best comparable installations. However, this option featured only in a small number of approved baseline methodologies. Nevertheless, many observers have proposed using benchmarks for determining additionality.

Using the same benchmark for the demonstration of additionality and the level of the baseline does not, however, seem to be an appropriate way of guaranteeing the additionality of CDM projects. Thus a double benchmark concept has been proposed by some. This sets separate benchmarks for additionality and the baseline, with the additionality benchmark more stringent than the emissions benchmark. However, the setting of the additionality benchmark level is challenging. If it is set too stringently, no CDM projects will be implemented, while a loose benchmark will allow too many projects to generate CERs, which would have happened anyway. Contrary to the current situation of bottom-up methodology development by single project developers, a higher-level institution, for example an industry association, would develop benchmarks under the CDM. The institutions developing the benchmark have to incur significant costs for benchmark development, while the individual project developers would benefit due to reduced transaction costs. If data or benchmarks collected and developed by industry initiatives are used under the CDM, rules and monitoring, reporting, and verification procedures will have to be established at international level. At the same time, solutions will have to be found for dealing with confidentiality of data. Benchmarking might be as prone to gaming as project-based baseline setting.

A top-down approach to protecting the additionality of the CDM and even to generating net global emission reductions has recently been proposed. Emissions reductions achieved by CDM projects would no longer be converted 1:1 into CERs,

but there would be a discount factor. For example one tonne of CO2 reduction would only generate 0.5 CERs. Discounting could be differentiated according to countries or project types. In the former case, more advanced countries would face a higher discount factor than less advanced ones. This would encourage the advanced countries to take up emission reduction commitments. Differentiation according to project type could take into account the probability that projects of a certain type are additional, or the contribution of a project type to sustainable development. Discounting has been boosted by the draft American Clean Energy and Security Act, which was passed by the US House of Representatives in June 2009. This bill initially proposed a 20 percent discount for CERs to apply from 2012. In a later version, this was modified so that the discount would kick in only after a certain grace period.

The EU has proposed a sectoral crediting mechanism. A host country would propose coverage of a sector and the target level, allaying fears of being bullied into the sectoral crediting mechanism. A new UNFCCC body or the current CDM regulators would evaluate the proposed target and the target level would have to be confirmed by the Conference of the Parties. The EU wants the no-lose target to be stricter than business as usual. There is consensus that registered CDM projects in a sector covered by the new crediting mechanism can continue to generate CERs until the end of their current crediting period, even if this goes beyond 2012. This amount of CERs would have to be deducted from the sectoral credits generated through the sectoral mechanism. Given the key role of the host-country government in this sector-wide approach, the question looms large of incentives for the individual entities actually reducing emissions as well as the treatment of 'free riders' increasing their emissions. Beyond a sectoral crediting mechanism, sectoral emissions trading on the basis of a mandatory target would be possible if the target is below business as usual.

Summary

Despite implementation problems, the CDM has been a success. It is the only bridge

between industrialised and developing countries when it comes to concrete emissions-mitigation action. The success of the CDM has however also shown starkly several shortcomings that need to be remedied to ensure that the mechanism does not lose its near universal acceptance among policymakers. The key challenge is the lack of additionality of a sizeable share of CDM projects. Each non-additional project increases global emissions. Thus the international climate negotiations are discussing reforms. Short-term reforms would improve governance and make regulatory decisions more consistent. Long-term reforms could lead to a shift from the current 1:1 offsetting system to a system that only credits part of the reductions. This would improve additionality on the aggregate level and provide an incentive for advanced developing countries to accept their own emission reduction commitments.