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The Role of the Clean Development Mechanism – Now and in the Future

by

Lars Friberg
Gudrun Benecke
Miriam Schröder

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Corresopnding Author: ***friberg.l@gmail.com***
Editor: hermann.ott@wupperinst.org

HEINRICH BÖLL STIFTUNG

Science Centre North Rhine-Westphalia Institute of Work and Technology
Institute for Culture Studies
Wuppertal Institute for Climate, Environment and Energy

WWF

European Climate Forum

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1. Introduction

The ultimate goal of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) is to avoid a dangerous interference with the climate system through stabilizing concentrations of greenhouse gases (GHG) in the atmosphere.[1] With 189 ratifying Parties the UNFCCC has almost universal support, hence it is fair to say that avoiding dangerous climate change is seen as a global public good of the highest order. The Kyoto Protocol created three innovative 'flexible' market-based instruments to deliver GHG emission reductions: International Emissions Trading (IET); the project based Joint Implementation (JI) carried out in countries in transition; and the Clean Development Mechanism (CDM) that focuses on projects in developing countries. CDM dominates the project based carbon market with reductions in 2006 representing 93% of the traded volume.[2] This analysis will focus on the CDM as most experience so far has been with CDM projects and because it has the highest relevance for developing countries.

The Clean Development Mechanism (CDM)

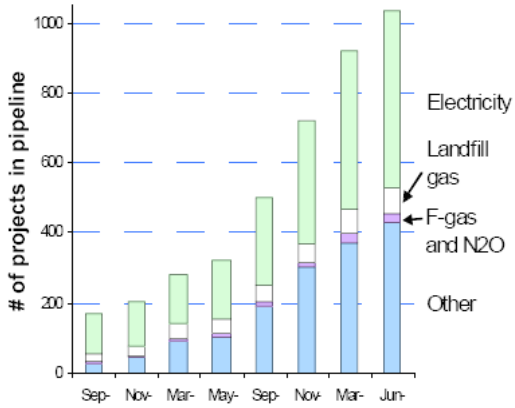
CDM is a mechanism to reduce GHG emissions through investments in projects that reduce or avoid emissions in developing countries. The project developer is entitled to receive Certificates of Emission Reductions (CERs), the first tradable commodity created through international environmental law. The demand for CERs comes from industrialized countries that have ratified the Kyoto Protocol and may count these credits towards Kyoto compliance. The 12.000 industry installations covered by the EU emission trading system (EU ETS) can also use CERs for compliance within this internal EU system for CO_2 reductions. Under the EU ETS, each EU country assigns a certain allowance of CO_2 emissions to individual installations of the covered power and heavy industry sectors. Through an EU law from 2004 called the linking directive, companies under the EU ETS may use CERs generated from CDM projects to account for a part of their emission reduction obligations.[3] Japanese firms buy CERs to meet their voluntary targets.

[1] UNFCCC, Article 2 of Convention.
[2] Point Carbon; 2006.
[3] DIRECTIVE 2004/101/EC; 2004.

The CDM has the dual goal of providing cost efficient GHG emission reductions and local sustainable development benefits. It is the prerogative of the host country government to assess if a project lives up to sustainable development requirements.

The Executive Board (EB) is the highest authority of the CDM and is composed of six members from Non-Annex I and four members from Annex I countries.[4] It approves projects and issues CERs after a successfully completed registration and verification process.
Worth noting is that of all the projects 247 approved by July 2006, more than half were renewable energy projects. Nevertheless more than 80% of all CERs come from a handful of Hydrofluorocarbon (HFC) destruction projects, which have only little or no sustainable development effect.[5]

Figure 1 Number of CDM projects



Source: Jane Ellis (2006)

The market for CERs has grown considerably since the Kyoto Protocol entered into force in February 2004. As of June 2006, it is estimated that the CDM will generate more than one billion tonnes of emission reductions by the end of 2012, equivalent to the combined current annual emissions of Spain and United Kingdom.[6] In particular linking the CDM to the EU Emission Trading System (EU ETS) hugely boosted demand in 2004.

The future of this new market is fundamentally dependent on governments reaching agreement on further GHG emission reductions and the continued use of the flexible mechanisms after the expiry of the Kyoto Protocol's first commitment period in 2012. Once this decision has been made, market forces can continue to develop cost efficient opportunities for GHG emission reductions.

In this article, we will present how the CDM evolved and its present state, and which conclusions can be derived for its future development. The first part will briefly describe the emergence of the CDM. The second part addresses the future of the CDM and its possible role in the future climate regime post-2012. We will show that a viable privately driven market successfully has been created through the Kyoto Protocol. We also believe that the CDM will continue to play a key role in the future climate regime as this is in the interest of key actors.

[4] Industrialized countries are known as Annex I countries in Kyoto jargon; developing countries are consequently known as Non-Annex I countries.
[5] UNFCCC web page: http://cdm.unfccc.int/Statistics, July 2006.
[6] UNFCCC press release, June 9, 2006.

2. Exploring the Changing Roles of Actors within the CDM

To understand the CDM we have decided to focus on three groups of actors that have been decisive: The World Bank group, Governments and the Business Sector.[7] We start with the World Bank due to its comparatively outstanding agenda-setting and market regulating influence on the CDM.

The World Bank

In the development of the UNFCCC regime the World Bank has to a large extent stayed on the sidelines with the exception of its role in the development of the carbon market. Examining the set-up and the evolution of the CDM, the World Bank has adopted three main functions:

First of all, the World Bank was centrally important for jump-starting the CDM. Studies from the very early start of the CDM acknowledge a significant role to the World Bank in organising and providing institutional infrastructure to the mechanism.[8] For several issues such as the political risks of host counties, high transactions costs and little knowledge among business actors about the use of CDM, the World Bank has taken up the role of a facilitator for CDM projects by setting up several funds. Thus most of the early CDM activities and investment were operated through public-private partnerships (PPP) such as the Prototype Carbon Fund[9]. The twin objectives were to 'crowd in' the private sector by reducing operational risks and transactions costs of project activities while contributing to sustainable development and poverty reduction in host countries.

Between 2003 and 2004, an increased interest from the private sectors was observed.[10] The World Bank Carbon Funds, together with the Dutch government and Japanese companies, were responsible for nearly 90% of the demand for GHG emission reduction projects.

Considering the CDM market in 2006, it is evident that Least Developed Countries particularly in Africa have been bypassed by the CDM. The World Bank has tried to address this market failure (e.g. through the Community Development Carbon Fund).[11]

[7] NGOs played a large role in the UNFCCC negotiations that created the CDM but has since they kept a relatively low profile on CDM with the exception of supporting the creation of the CDM Gold Standard (www.cdmgoldstandard.org). Several NGOs such as Sink Watch (www.sinkwatch.org) or CDM Watch (www.cdmwatch.org) have been critical of the use of sinks such as forests as possible CDM projects.
[8] PCF plus Research, 2002.
[9] In 1999 the World Bank created a trust fund dedicated to buy CDM and JI credits on behalf of its 'owners'. The fund was financed by the Japanese, Canadian, Dutch and three Nordic governments as well as a number of companies.
[10] World Bank Carbon Finance, 2004.
[11] In May 2006, WB pledged another 17 Million US$ to the existing 2 Million US$ already earmarked to buy CERs from African CDM projects and provide administrative and management support for project implementation.

The second main function of the World Bank is capacity development in host countries. It is worth noting that the WB faces a potential conflict of interest in this role in its double function as advisor to developing countries and manager of the large carbon portfolios for Annex I countries. This double role of the World Bank in the carbon market and general contradictions in its policies of promoting renewable energy projects while simultaneously supporting projects of fossil energy development has raised many sceptical voices from NGOs.[12]

Annex I governments

The major challenge for politicians committed to dealing with climate change is how to distribute costs of mitigation among different interest groups and taxpayers/voters. While the overall societal cost of tackling climate change is comparatively small, especially considering the avoided cost of non-action, it is considered significant for particular groups such as owners of aluminum smelters.[13] The CDM, having cost efficiency as its focus, thus remains of great interest for Annex I governments.

Even before the details of the CDM were agreed in 2001 some governments such as the Dutch set in motion different processes to translate the tentative agreement from Kyoto on flexible mechanisms into actual institutional infrastructures for the embryonic carbon market. The Dutch strategy for Kyoto compliance is to meet 50% of their reduction target by using the flexible mechanisms. In 2004 several other European countries followed the Dutch example establishing national CDM or JI buying strategies although none are at the same scale.[14]

It is worth noting that several European countries such as the UK, France, and Sweden, have decided not to use flexible mechanisms for their Kyoto compliance but instead focus on domestic reductions.[15] This reflects different political sentiment towards the flexible mechanisms, influenced by NGOs and other lobby groups.

However the role of governments is changing. They are no longer needed as market creators or drivers of main actors. Business and private carbon funds have overtaken governments and represent the largest segment of the CDM market. Ultimately, the viability of the CDM and the carbon market beyond 2012 is ultimately dependent on governments creating additional demand for emission permits through agreeing to new reduction targets in the climate regime.

[12] CDM Watch: 2005.
[13] Azar; 2005.
[14] It is questionable if late entrants such as Spain and Italy will be successful in contracting the significant amounts of CER credits they need by 2012, given that the existing high volume industrial gas projects are already captured by other actors.
[15] This does not mean that these governments are not involved in CDM capacity building through their development agencies or stake in the World Bank Prototype Carbon Fund.

Non-Annex I governments

Apart from mitigating climate change, CDM offers tangible benefits and few regrets for Non-Annex I governments. CDM holds the potential to increase the flow of investments, in particular into cash-strapped energy sectors struggling to keep up with ever increasing demands for more electricity as populations grow and economies expand. While the investments in CDM projects so far are but a fraction of overall foreign direct investments, (FDI) they go to sectors and projects that would not receive much attention otherwise. In addition, the trade balance and government budgets of many developing countries today suffer from high and volatile prices of imported and subsidized fossil fuels. Developing countries therefore have strong financial incentives to decrease their use of fossil fuels by expanding renewable energy sources especially through CDM projects.

Given their vulnerability to climate change, funding for adaptation (i.e. measures to adapt to adverse climate change) is of the greatest concern for developing countries. The CDM has a 2% adaptation levy on all CERs issued. This levy is the only significant funding mechanism so far established to finance developing countries adaptation. Developing countries therefore have a strong interest in the expansion and continuation of the CDM.[16] The funding for adaptation via the CDM levy is far below the need. This financing failure can partly be explained by the fact that GHG mitigation is a global public good while adaptation mainly is a private good with local benefits. So far only small, voluntary contributions have been donated towards adaptation as the mitigation interests of rich countries tend to dominate the climate change agenda.[17]

Business actors

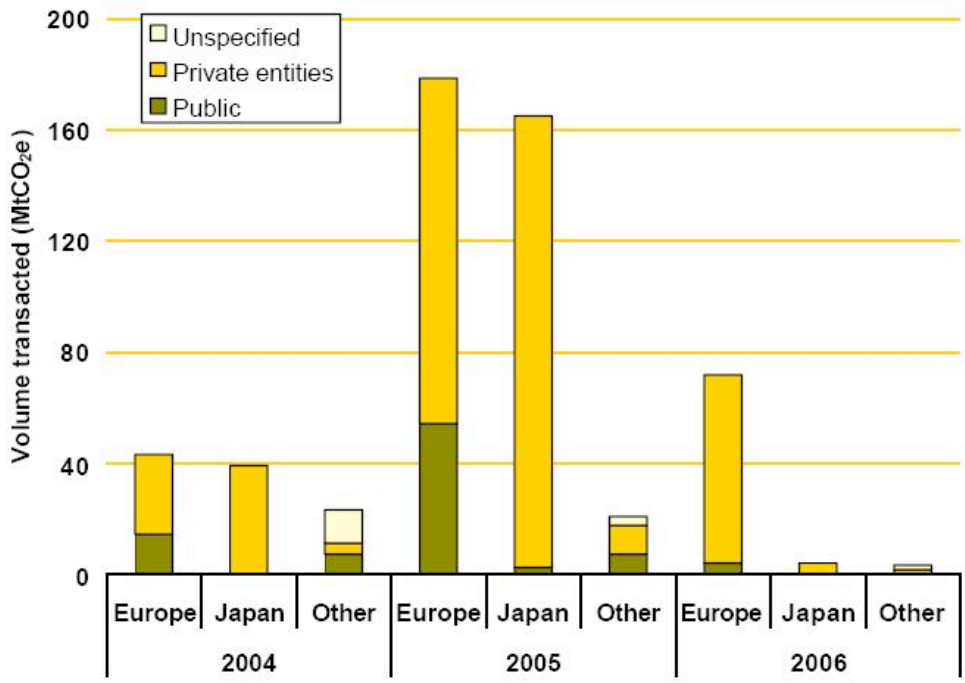
The demand for CERs is created by the GHG emission reduction targets set for Annex I countries. Within the EU, governments have passed parts of their emission reduction obligations to companies that are responsible for GHG emissions – mostly power producers and industries in sectors with high energy needs. The supply of CERs is created by CDM projects in developing countries. However, professional project developers and carbon funds (mainly) from Annex I countries often act as intermediaries, advisors and financiers for the development and implementation of CDM projects.

In the last quarter of 2004, when it became clear that the Kyoto Protocol would enter into force, private actors became much more active. With the EU ETS in place since 2005, the demand for credits from CDM projects for company compliance is rising. As shown in figure 2, in 2005 the private sector was responsible for over 80% of the traded volume of the project-based market.

[16] Due to controversy over the Global Environmental Facility's trustee role of the Adaptation Fund managing the share of the CDM proceeds so far no adaptation measures have been paid for. The other existing adaptation funds rely on voluntary contributions.
[17] Holm Olsen; 2006.

European and Japanese buyers dominate the carbon market for project-based transactions in 2004 and 2005, whereas Canadian private as well as public actors are almost absent from the market.[18]

Figure 2: Breakdown of CDM and JI credits purchases for compliance along the nature of buyer (volume in million tCO2e)



Source: World Bank, February 2006

As GHG emission reduction certificates becomes increasingly commoditized, a diverse array of market actors become attracted as service providers to buyers and sellers of CERs. Exchange platforms and auctions seek to facilitate transactions, to reduce risk and to improve transparency. In this new carbon market, where accurate information is scarce, a secondary market seeking to exploit the volatility of the price for CERs is emerging where US-based investment and hedge funds are particularly strong. In 2005, privately run funds like the European Carbon Fund were created. These funds do not offer certificates but financial returns for investments.[19] Although CERs are still dominantly purchased directly, about one

[18] The Japanese government considers CDM to be an instrument for private actors. Among the Annex I countries, Canada stands out by its absence from the carbon market despite a substantial and growing gap to its Kyoto target.

[19] The authors of the WB report (WB 2006:23) estimate that at least 1/3 of transactions on the primary market were conducted by buyers (mainly conducted by Japanese and European trading houses) that intend to resell the credits on the secondary market.

third of CERs is acquired on the secondary market, which offers less risks and lower transaction costs but demands a higher buying price.[20]

3. The Role of CDM in the Future Climate Regime

In 2005 at the UNFCCC meeting in Montreal a decision was made to open discussions on the future of the climate regime. While the CDM market is still evolving and far from mature, it is therefore time to start contemplating what role this new commodity market might play in this future regime. As described above, in the initial phase the WB played a key role in getting the mechanism off the ground. We therefore begin our analysis looking at the future role of the WB.

The World Bank

At the G-8 Gleneagles meeting in 2005, the WB was assigned a leading role in developing a new framework for financing clean energy and development. Given that the Carbon Finance Unit is where the WB so far has had its greatest involvement on climate change, we assume it will expand and build on this experience.

Following the current trend, business will increasingly source their carbon credits from private sellers and not from the WB, which is perceived as slow and bureaucratic. However, we believe that the WB will maintain its dominant role as carbon fund manager and purchaser for Annex I governments. It is also plausible that the WB will continue its work to expand and deepen the carbon project market through sourcing credits from countries currently not engaged in the CDM and from niches such as afforestation / reforestation projects.[21]

As the carbon market continues to expand into additional countries, there is a great need for capacity development for host governments. Here the WB has an important role to play as honest broker, assisting and supporting these public actors in their initial interactions with the market. For the WB to be able to do this in an acceptable way it needs to resolve its inherent conflict of interest that arises from its double role acting as a buyer as well as advisor to host countries. Like all bureaucracies the WB has dynamics of its own, and we expect that it will seek to expand its role and influence on financing of climate change mitigation measures. Therefore it will favor the continuation of the CDM beyond 2012.

[20] World Bank 2006:23.

[21] The EU Linking directive of 2004 bans the use of credits from afforestation/reforestation projects, this has recently come under critique from market actors who want to source credits from sinks projects.

Annex I governments

We now will outline three main arguments why in the future Annex I governments (including the USA) have a strong interest in the continuation of the CDM. To start, any climate change regime capable of tackling the problem builds on significant emission reductions in the near future by industrial countries.[22] This enhances the previously outlined argument for cost efficiency of any climate policy.

Secondly, for governments, 'outsourcing' mitigation efforts abroad through CDM for meeting national reduction targets decreases the need for stringent and possibly unpopular domestic climate policies and can lower the countries' cost of Kyoto compliance. This practice can be portrayed as industry being subsidized by taxpayers. However, so far this has raised little criticism in countries where CDM is a substantial part of the government's Kyoto strategy.[23]

Thirdly, one should not underestimate the path dependency of government action both in the UNFCCC negotiations as a whole and in the compliance policies they employ. The greatest policy achievement of the EU on climate change besides - cajoling Russia to ratify Kyoto - is the successful establishment of its emission trading system. The system will continue to be one of the key features of the EU's mitigation efforts in the future regime and discussions are underway on how to expand its scope to include new sectors such as aviation. The link between the EU ETS and the CDM will by all likelihood also stay and even expand in importance. In conclusion, even if no agreement on the continuation of the climate regime is found before the first commitment period of the Kyoto Protocol expires, the EU ETS could provide some demand to keep the CDM alive for a transition period.

For Annex I countries the continuation of the CDM is also one of the few political 'carrots' they have in enticing reluctant non-Annex I countries such as India to commit in earnest in the negotiations on the future regime.

Non-Annex I governments

It is conceivable that developing countries that are not ready or able to take on any binding reduction targets would agree to implement policies that curb the growth of their emission curves if they could sell reduction credits to industrialized countries or companies.[24] A greater role for an up-scaled version of CDM, which covers progressive government policies, could provide developing countries under pressure from industrialized countries with the means to show that they are committed and willing to engage in the next step of the climate regime. Such

[22] Höhne; 2005.
[23] It is not uncommon to see vocal interest groups being successful in shifting costs over on larger collectives who are not organized to resist, as with farmers in the Common Agriculture Policy and large electricity utilities shifting the cost of EU-ETS and increasing gas prices onto household consumers.
[24] Smith: (2006) gives the example of sectoral targets.

approaches could allow developing countries to scale up the benefits from CDM projects and lower the transaction costs of CDM. It is also possible that entrepreneurial developing countries express a wish to submit parts of official energy or transport policies as eligible 'policy CDMs' in order to afford the implementation of them.[25] Such approaches could potentially generate substantial amounts of credits.

Business actors

Regarding the future of the CDM, the financial sector as well as private carbon market actors and the different service providers who have profited from this new business niche will be influential proponents for a continuation and expansion of the role of the CDM in the future regime. London City is busy establishing itself as the financial centre for the new carbon market, arguably this may also have contributed to the prominent role climate change had during the UK G-8 presidency. Mainstream industry actors in Europe and increasingly in the US have accepted that the climate change problem needs to be addressed.[26] Today, speaking out against addressing climate change is increasingly seen as outdated and carries a significant public relations risk as NGOs, the broader public but more importantly also investors increasingly denounce such behavior.[27] The focus of business actors is shifting away from trying to block any action on climate change towards advocating their preferred climate policy.[28] While companies often lament the high costs of complying with new regulatory measures, what matters to them is predictability and having a 'level playing field' with competitors. The CDM as a market based solution with its strong focus on cost efficiency and flexibility is hence attractive to business facing reduction compliance.[29] With the CDM, companies have a broader range of emission reduction options even if far from all choose to use it.

Continued growth, but also consolidation of the plethora of companies active in the carbon market, is to be expected over the coming years. As the carbon market matures we will increasingly see new financial actors that securitize and manage the inherent project risks that CDM carries with it and a narrowing of the price arbitrage between EU allowances and CDM credits.

As the quest for profitable projects has already sourced most large non-CO_2 gas projects in order for CDM projects to stay economically competitive, we are likely to see increased efforts in exploring ways to improve profitability such as

[25] This is just one example of several ideas of how the CDM could be scaled up, see Smith for other examples.
[26] Pinkse; 2006.
[27] Cogan: 2006.
[28] *The Economist*: 2006.
[29] Following the release of EU ETS emission data in May 2006 it became clear that there was significant over allocation in many National Allocation Plans the price for EUAs and CERs dropped significantly but has since recovered if not back to the previous level. Price volatility is to be expected in a emerging market, similar fluctuations occurred in the US sulfur trading system during its first years.

bundling of CDM projects and CDM programs as well as other approaches to scale up.

The greatest concern for the carbon market is the post-2012 uncertainty. Without assurances that CERs will have a value beyond 2012, the booming market we see today might flounder after 2008 as the pay-back period for new projects becomes too short.[30]

Conclusions – Evolution, Present State and the Future of the CDM

The first embryonic phase for the CDM is now clearly over. The size of the CDM and the existing carbon market is beyond the forecasts of most experts only a few years ago. The value of the carbon market increased by 2500% from 2004 to an estimated €9.4Bn in 2005, and involves players in about 150 countries. At the same time, it is noteworthy that only 7% of the market actors surveyed in December 2005 thought that the CDM market was mature.[31] We observe that the WB is changing its role and business including speculative hedge funds dominate trading on the CDM market.

Critics of the CDM claim that it fails to provide sustainable development benefits and bypasses the poorest countries, which is a market failure the CDM shares with conventional markets.[32] It is true that profit-driven project developers are reluctant to engage in countries that are seen as difficult; with high transaction costs, weak institutions and scant industry base. Unless governments are willing to pay a premium and create a demand for credits specifically from the poorest regions of the world this situation is not likely to change.

While not a result of the critique, we are starting to see increasing numbers of renewable and energy efficiency projects being developed. It is mainly the shortage of viable industry gas projects that is pushing project developers to engage in less profitable projects. One of the greatest challenges facing the CDM is maintaining sufficient profitability in the remaining categories, which is the main driver behind the bundling and scaling-up efforts.

CDM is charged with fulfilling several objectives, primarily cost efficient GHG mitigation and promoting host country sustainable development. So far, the CDM has been more successful in allocating cost efficient GHG emission reductions

[30] A political market that has seen a boom-bust cycle is the US renewable energy market, following funding bills that repeatedly expired in Congress before renewed.
[31] Point Carbon; 2006.
[32] It is worth remembering that it is the sole responsibility of host governments to judge if the project delivers on the sustainability criteria.

than in delivering sustainable development. This might change with an increased focus on renewable energy projects.

As the worlds manufacturing increasingly takes place in countries in the developing world, this results in rapidly increasing emissions there. For this reason an environmentally viable climate regime needs to put a price on carbon emissions globally that lead to a change in the carbon intensity across the world. Via the CDM the opportunity 'cost' of reduction potentials can be transferred to developing countries as well. If this process leads to technology spill-over effects and increased diffusion of environmentally sound production processes, so much better.

From our review of the main actors we come to the conclusion that it is in the interest of all of them to keep the CDM in a future regime, albeit for different reasons. According to forecasts some 17 trillion US$ of investments are needed in energy sector infrastructure globally over the coming two decades, some 8 of these are needed in developing countries.[33] To successfully curb climate change it is fundamental that these investments are steered towards cleaner, low carbon technologies. The question is whether the CDM can be sufficiently scaled up to have an impact on these investment flows or if we need a different financial mechanism for this.

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