Harvard Project on Climate Agreements

Can New Market Mechanisms Mobilize Emissions Reductions from the Private Sector?

Axel Michaelowa
University of Zurich
Perspectives GmbH

One in a series of annual discussion papers supported by the Enel Foundation

November 2012
Discussion Paper ES 12-1

Can New Market Mechanisms Mobilize Emissions Reductions from the Private Sector?

Axel Michaelowa

University of Zurich
Perspectives GmbH

Prepared for the

Harvard Project on Climate Agreements

November 13, 2012

THE HARVARD PROJECT ON CLIMATE AGREEMENTS

The goal of the Harvard Project on Climate Agreements is to help identify and advance scientifically sound, economically rational, and politically pragmatic public policy options for addressing global climate change. Drawing upon leading thinkers in Argentina, Australia, China, Europe, India, Japan, and the United States, the Project conducts research on policy architecture, key design elements, and institutional dimensions of domestic climate policy and a post-2012 international climate policy regime. The Project is directed by Robert N. Stavins, Albert Pratt Professor of Business and Government, Harvard Kennedy School. For more information, see the Project's website: http://belfercenter.hks.harvard.edu/climate

Acknowledgments

The Harvard Project on Climate Agreements is grateful to the Enel Foundation for its generous support of a series of annual discussion papers on climate policy and agreements, of which this paper is the first.

The Harvard Project also receives support from the Harvard University Center for the Environment; Christopher P. Kaneb (Harvard AB 1990); the James M. and Cathleen D. Stone Foundation; ClimateWorks Foundation; and the Qatar National Food Security Programme. The Project is very grateful to the Doris Duke Charitable Foundation, which provided major funding during the period July 2007–December 2010. The Project also receives ongoing support from the Belfer Center for Science and International Affairs at the Harvard Kennedy School.

The closely affiliated, University-wide Harvard Environmental Economics Program receives major support from the Enel Endowment for Environmental Economics at Harvard University. The Program receives additional support from the Alfred P. Sloan Foundation, the Mossavar-Rahmani Center for Business and Government at the Harvard Kennedy School, Chevron Services Company, Duke Energy Corporation, and Shell.

Citation Information

Michaelowa, Axel. "Can New Market Mechanisms Mobilize Emissions Reductions from the Private Sector?" Discussion Paper ES 2012-1. Cambridge, Mass.: Harvard Project on Climate Agreements, November 2012.

Can New Market Mechanisms Mobilize Emissions Reductions from the Private Sector?

Axel Michaelowa*

Discussion Paper for the Harvard Project on Climate Agreements

Executive summary

In the international climate negotiations, new market mechanisms (NMM) have been proposed that would generate greenhouse-gas credits for entire sectors or for specific mitigation policies. The proponents of NMM have widely differing aims. Some want to upscale market mechanisms beyond distinct projects, *inter alia* through a reduction of transaction costs and simplification of additionality determination. Others want to achieve a contribution of market mechanisms to global emissions reduction. However, NMM face a number of challenges. Under a sectoral mechanism with a no-lose target, emitters reducing emissions cannot be sure that their efforts will not be invalidated by other emitters who increase their emissions above the baseline level. Setting baselines for sectoral emissions and policy implementation is notoriously difficult, especially if having to be negotiated politically. Competition with existing mechanisms is likely to be fierce.

Incentives for emitters can be retained if governments are willing to "bail out" the entities that can be shown to have generated emission reductions. This, however, leads to an unpredictable burden for government. A sectoral trading scheme with binding commitments for emitters would solve the problem but could be seen as first step towards national-level emissions commitments. Alternatively, a tax could be levied on emissions increases of entities beyond their baseline whose proceeds are used to acquire emission credits. Another option would be collection of financial deposits for each ton of greenhouse-gas emissions that are refunded if the emissions of the entity remain below the baseline.

Given the problems in achieving an incentive-compatible design of NMM, the current project-based mechanisms should be retained for sectors with large emitters or replaced by sectoral trading. Sectoral crediting would be appropriate for sectors with widely-dispersed emitters, such as transportation, where government policies provide better incentives than project-based mechanisms. Policy-based crediting could be used for households, waste, and parts of the power sector.

---

*Axel Michaelowa is head of research on international climate policy in the Center for Comparative and International Studies, University of Zurich. He is senior founding partner of the consultancy, Perspectives.

1. Introduction

The Kyoto Protocol, adopted in 1997, introduced three market-based mechanisms for greenhouse-gas emissions reductions, the so-called Kyoto Mechanisms. Two mechanisms generate project-based offsets: the Clean Development Mechanism (CDM) aims to mobilize emission-reduction projects in countries without legally-binding emissions commitments, whereas Joint Implementation (JI) is limited to projects in countries with such commitments. International Emissions Trading (IET) allows countries with emissions commitments to trade parts of their emissions budgets.

The rapid upswing of the Kyoto Mechanisms within a few years has shown that market mechanisms can play an important role in mobilizing low-cost greenhouse-gas mitigation throughout the world. In particular, the take-off of the Clean Development Mechanism (CDM) whose almost 5,000 registered projects have generated over 1 billion issued certified emissions reductions had not been expected by any observer (see Michaelowa and Buen 2012 for a history of the CDM). However, the Kyoto Mechanisms are seen to suffer from a number of flaws. (See High Level Panel on the CDM Policy Dialogue [2012] for a discussion of the flaws of the CDM and proposals how to remedy them.) This might make the Kyoto Mechanisms only partially suited for a situation where substantial emissions reductions are required to reach the 2°C target agreed upon by the member states of the UNFCCC in Cancun in 2010.

Therefore, New Market Mechanisms (NMM) are a key element of current negotiations on the international climate policy regime after 2012. Their principles have been agreed at the Durban conference in decision 2/CP.17 (UNFCCC 2012) and detailed rules are expected to be emerging within the next years. On the international level, there are two streams of negotiations on NMM, one bottom-up ("a framework for various approaches including markets"), and one top-down ("A new market-based mechanism operating under the guidance of the COP")[1]. So eventually, centrally-governed and unilaterally-developed market mechanisms might coexist. This paper covers both forms under the term NMM.

NMMs can principally take a number of forms (see Table 1), most of which are based on the concept of crediting if emissions are reduced below a "no-lose target."

1 The principles for the former strand are listed in para 79 of decision 2/CP.17 (UNFCCC 2012, p. 17): "...deliver real, permanent, additional and verified mitigation outcomes, avoid double counting of effort, and achieve a net decrease and/or avoidance of greenhouse gas emissions." The principles for the latter are listed in para 80 of decision 1/CP.16 (UNFCCC 2011, p. 14): "Ensuring voluntary participation of Parties, supported by the promotion of fair and equitable access for all Parties; complementing other means of support for nationally appropriate mitigation actions by developing country Parties; stimulating mitigation across broad segments of the economy; safeguarding environmental integrity; ensuring a net decrease and/or avoidance of global greenhouse gas emissions; assisting developed country Parties to meet part of their mitigation targets, while ensuring that the use of such a mechanism or mechanisms is supplemental to domestic mitigation efforts; ensuring good governance and robust market functioning and regulation."

Table 1: Types of New Market Mechanisms

NMM type	Characteristics	Discussed by	Supported by
Project-based	Similar to CDM and JI	CDC Climat (2012), Japan (2012)	China, Japan[1]
Sectoral crediting	Credits are awarded if emissions from a sector are kept below a pre-defined level	Schmidt et al. (2006), Schneider and Cames (2009), IETA (2010)	AOSIS, EU, Japan, Norway, Papua New Guinea
Sectoral trading	Allowances are issued *ex ante* based on a sectoral target, with penalty for missing target	Marcu (2009), Butzengeiger et al. (2012)	AOSIS, EU, Japan, Norway, Papua New Guinea
NAMA[2]/policy crediting	Crediting of mitigation effects of policies and actions that go beyond projects	Röser and de Wit (2012)	South Korea, Switzerland
Net avoided emissions	Credits for not exploiting fossil fuel deposits	Ecuador (2012)	Ecuador

[1] Bilateral Offset Crediting Mechanism

[2] NAMA = Nationally Appropriate Mitigation Action, a concept agreed at the Cancun Conference covering voluntary activities of GHG emissions mitigation in developing countries that can be supported by industrialized countries in form of financing, technology transfer, or capacity building.

Source: Sterk and Mersmann (2012), additions by the author

All NMM approaches relate to targets set by governments and conceptually presume that governments introduce policies to incentivize reductions by emitters. The appropriateness of policies for specific sectors is shown in Table 2:

Table 2: Policy appropriateness according to sectors

Sector	Policy
Energy production	Feed-in tariff, renewable portfolio standard, green credit lines, guarantees
Industrial energy use	Carbon tax
Transportation	Fuel efficiency standards, road fees, carbon taxes
Buildings	Building codes, green credit lines, energy efficiency certificates
Waste	Regulations
Industrial processes	Performance standards for electric motors etc.

Source: KfW (2012), modified by the author

With the exception of the sectoral trading scheme, the situation that emitters are solely driven by the price of emission credits has not really been foreseen by the policymakers developing the different proposals.

The perceived attractiveness of the NMM and acceptance by many countries are due to a diverse range of aims, some of which are inconsistent. In order to prevent disillusionment with the NMM that might jeopardize long-term mitigation, this discussion paper assesses how NMM and existing mechanisms could coexist and mobilize low-cost mitigation by providing credible incentives to emitters.

2. New Market Mechanisms: a haze of partially conflicting aims

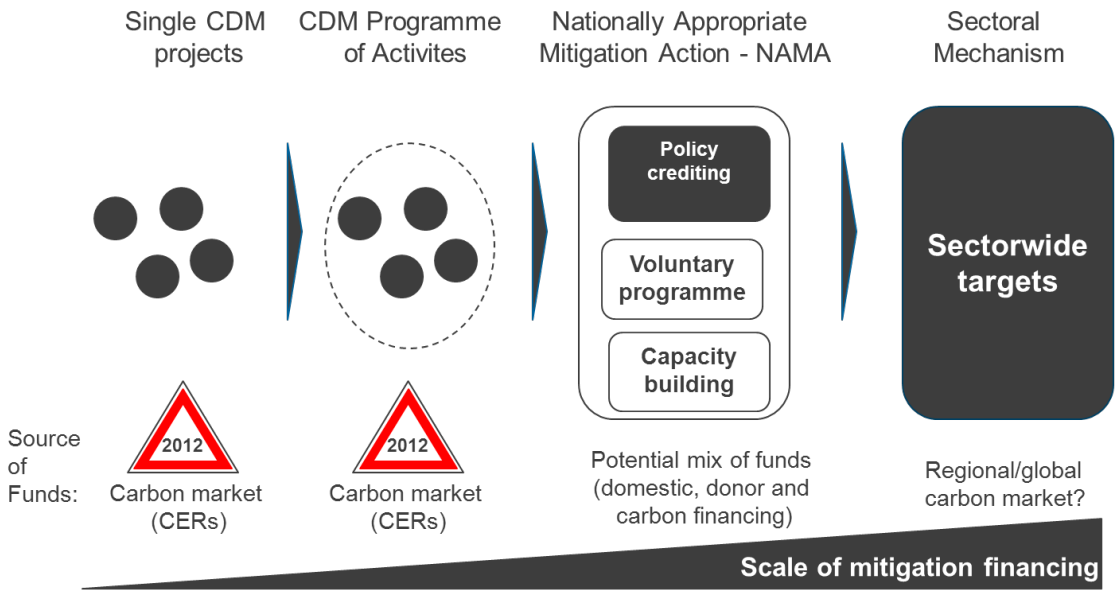
Policymakers supporting the introduction of NMM pursue a number of different aims:

a. Upscaling mitigation beyond projects

Experience with the CDM has shown that a large-scale transformation of whole economic sectors could not be achieved through the generation of project-based offset credits. For example, the CDM was unable to mobilize activities in the transportation sector and has only had a limited impact on the share of electricity derived from fossil fuels. In fact, crediting of the effects of emission-reduction policies is explicitly prohibited under the CDM.

In the context of the 2°C target agreed at Cancun, which would require a peaking of global emissions in the next decade, policy instruments are desired that could drive a transformation. A transformative approach requires the mobilization of policies that give incentives for mitigation throughout a whole economic sector, going beyond distinct projects (see Figure 1).

Figure 1: Upscaling of effort from project-based CDM to sectoral mechanisms



Thus, the main proposals of NMM want to set an emissions baseline for a whole sector, reductions below which generate credits. According to Butzengeiger et al. (2012), this has the advantage that all installations within an *ex-ante* determined boundary will be covered, increasing the mitigation potential that can be addressed, expanding the portfolio of technical mitigation measures, and increasing environmental integrity by reducing the risk of leakage, since output cannot be transferred to non-covered activities. Differences then relate to the means that trigger reductions. Under a sectoral crediting scheme, credit accrual can be linked either to emitting entities or to a central agency managed by government or an industry association.

The concept of policy/NAMA crediting would directly link emission credits to the policy implementation. Here, the government would hope that it could recoup part of or the entire policy cost through the sale of the credits. It would be willing to do the former if it gets externalities from the policy implementation such as reduction of local pollution or improvement of infrastructure. Expectations of the government regarding the level of credit prices will play a big role. Butzengeiger et al. (2012) stress that the success of any policy will be influenced by the differing legal character of emitters – state-owned companies, public-private entities, or private businesses (either purely domestic or joint ventures with foreign shareholders). Reactions on the same type of policy might differ. Governments may simply mandate public actors to apply certain mitigation measures, whereas private emitters will usually require specific "carrots" or "sticks" to deviate from the profit maximizing path.

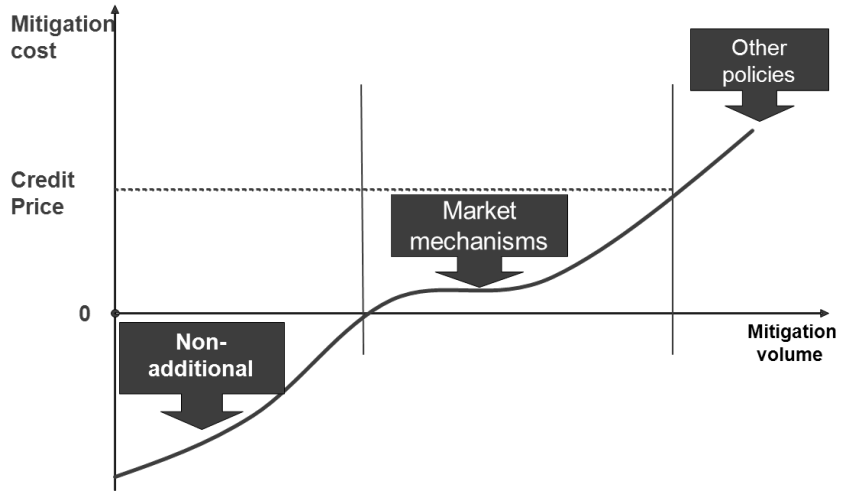
b. Reducing transaction costs through standardization

A key criticism of the CDM has been that it entails substantial transaction costs, especially with setting up the regulatory structure, developing the baseline, and monitoring methodologies. Project developers have complained about time spent before projects are registered and credits issued. While the reorganization of CDM procedures has improved the situation, standardization of accounting methodologies and credit generation is still seen as crucial (Füssler 2012), especially to harness mitigation in sectors where sources are small and dispersed. NMM could apply baseline methodologies that would be standardized across countries for specific sectors.

c. Resolving the additionality challenge

The CDM has been severely criticized for giving credits to projects that would have happened as well under a business-as-usual scenario. Speaking in economic terms, any project with negative mitigation costs should not qualify for market mechanisms in countries without emissions caps, in order to safeguard environmental integrity (see Figure 2).

Figure 2: Additionality and market mechanisms

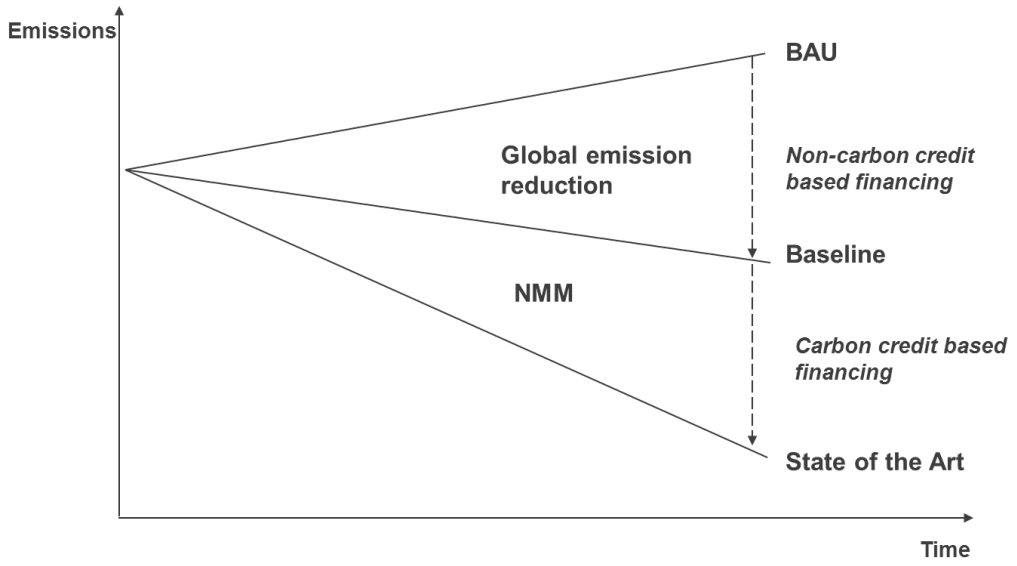


On the other hand, the additionality rules of the CDM were seen as an obstacle to the introduction of policies providing incentives to mitigation. The resulting compromise – not to account for the policy-related incentives while checking the financial attractiveness of a project – cannot be stable in the long term because eventually many countries will introduce policies, but project developers capture the rent from the sale of greenhouse-gas credits. Many stakeholders see NMM as a way to overcome this dilemma and to avoid cumbersome and arbitrary project-specific additionality determination.

d. Contributing to global emissions reductions

The CDM generates offset credits for each ton of emissions reduction compared to the business-as-usual scenario and thus does not generate emissions reductions *per se* – each reduction from the CDM is mirrored by an equivalent increase of the emissions budget of industrialized countries. In a context of increased mitigation requirements linked to the 2°C target, some stakeholders, including the EU, want the NMM to contribute directly to global emissions reductions. This can be achieved if baselines for the NMM are made more stringent than the likely business-as-usual scenario. The difference between the business-as-usual scenario and the baseline would be an emissions reduction that would not generate any credits (see Figure 3).

Figure 3: NMM baseline contributing to global emission reduction



e. Allowing design of market mechanism as per national preferences

In their submissions to the UNFCCC, some countries, including Japan and Australia, have called for decentralized, "hybrid" governance models with only minimum criteria set under the UN and a strong role for bilateral cooperation (Japan 2012, see also the discussion in De Sépibus and Tuerk 2011).

It should be noted that existing market mechanisms could easily be reformed in a way to contribute to global emissions reduction. For the CDM, the emissions credit issued could be less than 100% of the mitigation volume achieved. Such discounting could be done across the board or differentiated according to host countries (see Castro and Michaelowa 2010).

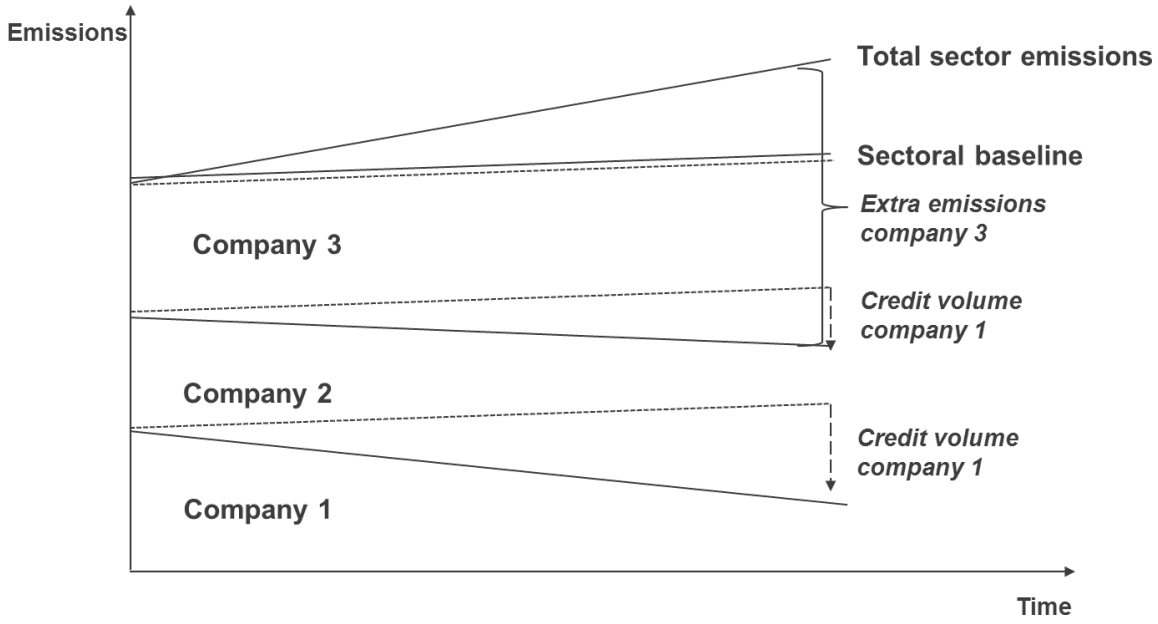
3. Challenges of New Market Mechanisms

The many aims of the NMM lead to a number of challenges which might reduce their effectiveness if not tackled proactively.

a. Free riding: dilution of mitigation incentives

A sectoral mechanism with a no-lose target suffers from massive incentive problems, as emitters who mitigate cannot be sure that their efforts will not be invalidated by other emitters who increase their emissions above the baseline level (see Figure 4).

Figure 4: Incentive problem for emitters under sectoral mechanism



The sector covered by the sectoral mechanism covers three companies. The sectoral baseline is broken down on the company level. Company 1 and 2 reduce emissions compared to their dotted baselines whereas company 3 increases them. The sector as a whole overshoots the baseline and generates no credits.

The resulting free-riding problem is akin to the one encountered on the international level. Given the key role of incentives for market mechanisms, solving this problem is crucial to make NMM relevant in situations where the economy is not planned by the state. The problem may be less relevant in sectors with highly dispersed emissions sources, where government policies can provide sufficient sticks and carrots, and emitters do not deliberately free ride.

b. The elusive counterfactual: setting baselines and determining additionality

The reduced transaction cost in setting baselines can become a major weakness of the NMM, as one wrong political decision can lead to major problems regarding the credibility of the credits. This is especially the case if there is no UNFCCC-level oversight on baseline setting. As Spalding-Fecher and Michaelowa (2012) show, baseline standardization can only work if baseline users cannot choose a more attractive, non-standardized baseline as an alternative. Hayashi and Michaelowa (2012) stress that an appropriate level of performance-standard stringency strongly depends on sectoral and technology characteristics. According to them, choosing the same level of benchmark for baseline and additionality determination is appropriate only for greenfield mitigation activities, but not for retrofit ones. Overly simple, highly aggregated performance standards are unlikely to ensure high environmental integrity, and eventually the difficult questions regarding stringency and updating frequency will eventually have to be addressed on a rather disaggregated level. A careful balance between data requirements and practicability of performance standards is essential because heavy data requirements of the existing performance-standard methodologies have been the key barrier to the actual implementation. This means that sector-level baselines can only be set in a robust fashion if a reliable emissions inventory exists for the sector.

Most approaches for baseline setting require specification of the business-as-usual scenario. According to Sterk and Mersmann (2012) and Prag and Briner (2012), business-as-usual projections have to be built on assumptions about the future impact of current policies, the development and penetration of technologies, and the development of economic activity. A good example of the problem in setting baselines is the 2008 economic and financial crisis, which led to a massive reduction of greenhouse-gas emissions within the EU. While prior to the crisis, all observers foresaw substantial scarcity of emissions allowances and consequently high allowance prices, it has become clear that there is an allowance surplus. Prices only remain above zero due to the possibility of banking them for use in future commitment periods.

Uncertainties are especially large if countries are growing rapidly or a sudden economic crisis hits. Moreover, the greenhouse-gas intensity of production can vary significantly over the period of the projection, either due to shifts in technology use or development of new technology. Even over short periods, projection errors can become massive. For example, the IEA's World Energy Outlook 2000 forecast an electricity production of 2,408 TWh in China in 2010 (IEA 2000, p. 204), while actual production in 2010 reached 3,904 TWh (US EIA 2012), i.e. over 60% higher than the forecast.

Once the business-as-usual level has been defined, the baseline can be set as a simple percentage deviation from that level. A more sophisticated variant is to assess the mitigation costs compared to the business-as-usual level and set the baseline at the level where mitigation costs become positive.

Baselines can also be based on technology-specific emissions factors that serve as baselines until a certain penetration rate of a low-carbon technology has been achieved. Technology-specific benchmarks, e.g. the best 20% of recently installed capacity, have been used in the context of the CDM and the EU emissions trading scheme (EU ETS). (For an in-depth discussion see Prag and Briner 2012). In order to cover an entire sector, the technology shares need to be known. For policy-based crediting mechanisms, the baseline can take into account the penetration rate of the technologies targeted by the policy, e.g. for the case of a feed-in tariff, the percentage of electricity provided by renewable energy.

Setting the baseline at a level that is too high could be akin to the "hot air" generation under the Kyoto Protocol due to an overly lenient baseline for countries in transition. Correcting a wrong decision requires strong political power. This is not straightforward, as currently shown in the discussion about prohibiting banking of "hot air," where the EU is internally split because Eastern European member states do not want to give up the banked surplus. Moreover, negotiating the stringency of the baseline linked to the aim of achieving global emissions reductions will be highly politically charged. The negotiations of the national allocation plans for the first and second phase of the EU ETS have shown how difficult it is to strike a balance between environmental integrity and the need to keep burdens for entities covered by the system as low as possible.

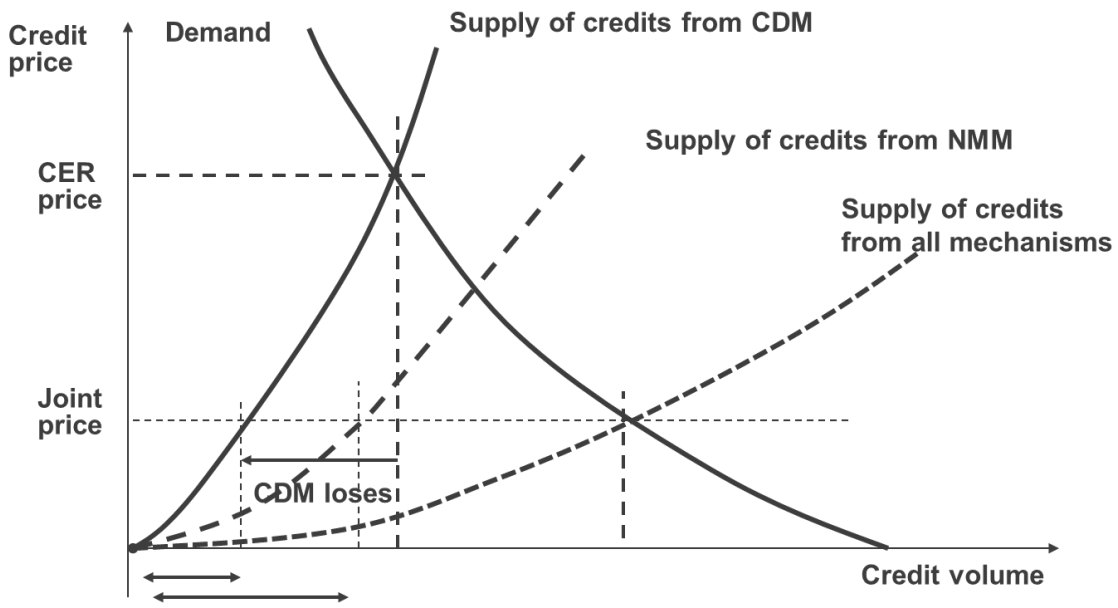
According to Sterk and Mersmann (2012), intensity targets could alleviate many baseline problems. However, they become highly constraining in a situation of economic crisis and require measurement of the unit (e.g. GDP, production level) to which the intensity refers.

Most proponents of NMM think that additionality determination can be covered through setting of the baseline at a level where "false positives" (mitigation that is not additional) and "false negatives" (mitigation that is additional but not credited) balance each other. Given technology-specific characteristics of additionality, this however requires highly disaggregated baselines, which would increase transaction costs (see Hayashi and Michaelowa 2012). Recent discussions in the CDM context show that standardization of additionality determination runs into severe data problems (Füssler 2012). Initial attempts to set a global benchmark level have shown not to be workable in practice.

c. Cut-throat competition between mechanisms on the national and international level

Already during the first commitment period, there has been strong competition between the different Kyoto Mechanisms, which developed political connotations. Governments in countries in transition tried to sell surplus emissions units from their Kyoto emissions budgets at prices below the price of credits from CDM and JI; JI project developers competed with CDM developers for buyers. The introduction of the NMM would further increase this competition unless buyers limit their acquisition to a specific kind of credit, as done by the EU in the context of CDM credits after 2012 (see Figure 5).

Figure 5: Competition between mechanisms



While from an efficiency point of view, such competition would be beneficial, it might cause attempts to change the rules of a mechanism to improve its competitive position. In particular, incumbents – especially the CDM – might try to defend their current position.

On a national level, suppliers of project-based credits might compete with suppliers of credits from NMM; governments will have to decide which way to go in case the choice of mechanisms is free, and double counting is to be avoided. This is particularly relevant if governments prefer emissions trading schemes to baseline and credit schemes.

4. How to safeguard incentives for private sector mitigation

Remedies for the incentive problem have been discussed right from the outset of the discussion on NMM. Baron et al. (2009, p. 27) proposed options "ranging from a separation from the price signal (credit revenues go to the government) to an attempt at a full link (with full liability assumed by the government in case of overselling)". IETA (2010) assessed the incentive properties of centrally-coordinated sectoral crediting, installation-level sectoral crediting, and sectoral trading. Dransfeld et al. (2011) discuss options outlined below in detail.

A necessary condition for safeguarding incentives for emitters in the context of a sectoral-crediting scheme is clear accounting of emissions on an entity-specific level in order to understand which entities generate emissions reductions and which ones increase emissions. For example, three entities may reduce emissions while one entity increases them; thus no credits accrue on an aggregated level. This can only be avoided if other entities, such as the government, are willing to "bail out" the entities that can be shown to have generated emissions reductions (see Butzengeiger et al. 2012). In the example of the four entities, this would mean that the government buys credits to cover the emissions increase of the fourth entity in order to make sure that the three other entities receive their credits. Of course, this would be akin to an open guarantee by the government (see discussion below).

While Marcu (2009) discusses alternative approaches, such as a government credit reserve or the implementation of additional policies for emissions mitigation once it becomes clear that the target is not reached, these approaches are not viable. In the first case, the reserve would have to be generated through a tax on the reductions actually achieved, slashing the incentives for reductions. If the reserve were planned to be big, the tax would strangle the reductions directly; if it were small, it would not be credible. In the second case, the time required to detect underperformance prevents the underperformance being remedied.

Incentives also depend on the quality of the monitoring, reporting, and verification (MRV) system that the NMM uses. Castro et al. (2011) propose a flexible MRV approach depending on the capacity of the host country, with countries that have low capacity reporting according to a lower tier of data requirements. Only after a number of years should the MRV rules be tightened. Obviously, the degree of incentives for emitters to engage in mitigation depends on whether the effects of their activities can actually be monitored. If the monitoring is built on CDM-type methodologies and independently audited, this is likely to be ensured. If new methodologies more akin to emissions trading systems are introduced, it is important that auditors have a sufficient qualification.

For policy-crediting schemes, a rational government interested in generating credits would be interested in structuring the policies in a way that mobilize emissions reductions. Otherwise, the development of the policy would just lead to transaction costs and no revenues. In order to achieve this, the government has to have a clear picture of the mitigation costs in order to determine the incentive level required to be set by the policy.

a. Binding commitments for emitters

In the context of a sectoral NMM, the free-riding problem could only be eliminated if every entity in the sector has an incentive not to increase its emissions compared to the baseline level. The simplest way would be to introduce a mandatory emissions trading system with penalties for entities exceeding

their budget of emissions allowances (see Marcu 2009 and Whitesell and Helme 2009). Allocation of allowances could be done according to the methods implemented in emissions trading schemes to date, such as grandfathering, allocation according to specific benchmarks, or auctioning of allowances. As experience has shown, trading schemes only make sense for relatively large point sources, unless operated in an upstream fashion. However, an upstream system would have to cover the entire economy in order to prevent arbitrage.

Even if a mandatory sectoral trading scheme would not be mirrored by any emissions commitment of the government on the international level, this could of course be seen as the first step towards such a commitment and thus be politically highly contentious in developing countries. However, in the context of an international climate policy system based on the principle of "pledge and review," this problem would become less relevant. An alternative would also be the tradable intensity standard proposed by Whitesell and Helme (2009), where the host country government would specify an intensity benchmark. All emitters beating the benchmark would receive credits from the host country government, whereas entities with emissions above the benchmark would have to purchase credits domestically or on the global carbon market. In order to safeguard environmental integrity of such a system, Butzengeiger et al. (2012) propose limiting crediting to output levels below a historical output baseline.

b. Government guarantees for private mitigation

Another approach to protecting entities that have mitigated their emissions – politically less contentious than mandatory emissions commitments – would be a government guarantee to cover the difference between the sum of mitigation achieved by mitigating entities and level of credit accruing as per the difference between baseline and sector emissions. This could be done through the acquisition of internationally valid emission units. Such a guarantee suffers from a potentially unlimited exposure to emissions increases. A way to reduce government exposure would be to levy a (low-level) tax on emissions, revenues from which could be used to acquire emission units. Butzengeiger et al. (2012) propose an emissions tax for emissions above the baseline set at a level equal to the credit prices. This would require determination of baseline emissions on the level of each entity. Due to the variability of these prices, the tax level should probably be set higher to avoid frequent changes. Another alternative would be a deposit-refund system, as discussed below.

c. Deposit-refund systems

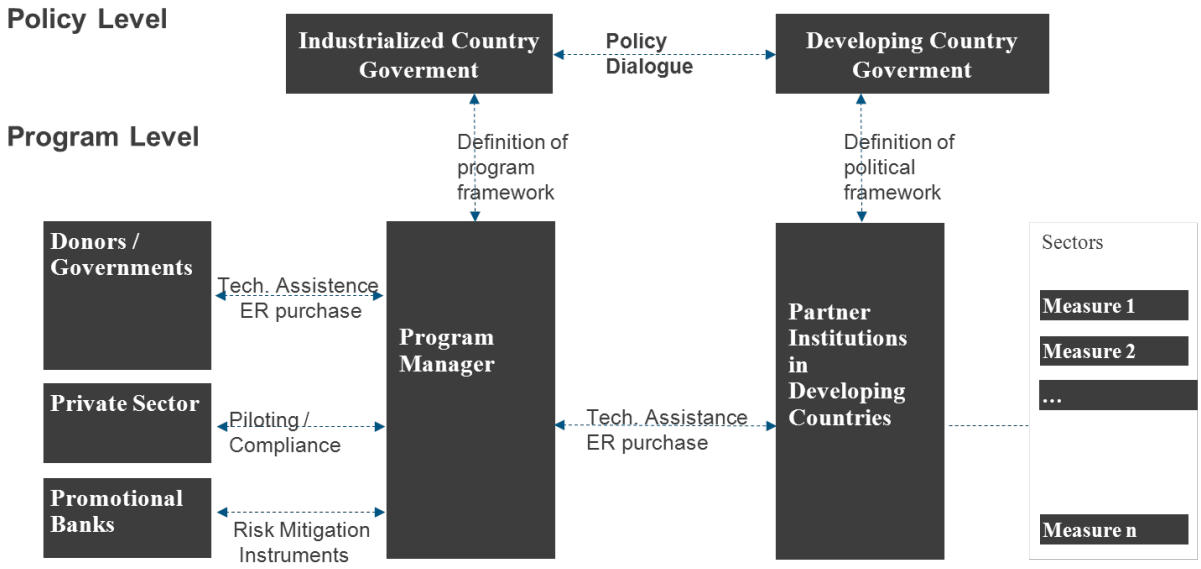
Deposit-refund systems have worked well in the context of waste management (Walls 2011). Emitters could be required to provide a monetary deposit for each ton of greenhouse-gas emissions that will be refunded if their emissions remain below the baseline. This requires trust in government with

respect to the refund. The deposit should be invested in government bonds and the accrued interest paid to the emitter when the deposit is paid back in order to make it equivalent to an investment in government bonds. The key issue for the functioning of the deposit-refund system is the level of the deposit. Ideally, the total amount of deposit to be collected from an emitter would just be higher than the price of emissions credits multiplied by the degree of eventual overshooting the baseline. At that level, the unclaimed deposit could be used by the government to buy credits on the market to cover the overshooting. However, overshooting levels will be only known *ex post*. If overshooting theoretically can be unlimited, the deposit would have to be set at the expected price for emissions credits. This will be resisted by emitters because their production will usually generate higher internal rates of return than the interest on the deposit. If, due to the characteristics of the production technology operated by the emitters, emissions can only rise by a certain percentage compared to the baseline, the deposit level could be limited to that percentage of the credit price.

5. Short-term recommendations for stakeholders

NMM are not the magic bullet with which all greenhouse-gas emissions mitigation woes can be resolved. Thus, the inconsistencies between targets for the NMM should be made transparent. NMM may be appropriate for sectors with distributed emissions sources, but are less compelling in those sectors that have large-scale emissions reduction options in a small number of companies. Therefore, the appropriateness of a reformed CDM, sectoral crediting, and policy crediting with regard to their incentive structures in the context of different sectoral characteristics should be assessed and tested in pilot activities. These should receive a budget that would allow going beyond pure feasibility studies. KfW Carbon Fund (2012) has provided a good structure for such pilots (see Figure 6).

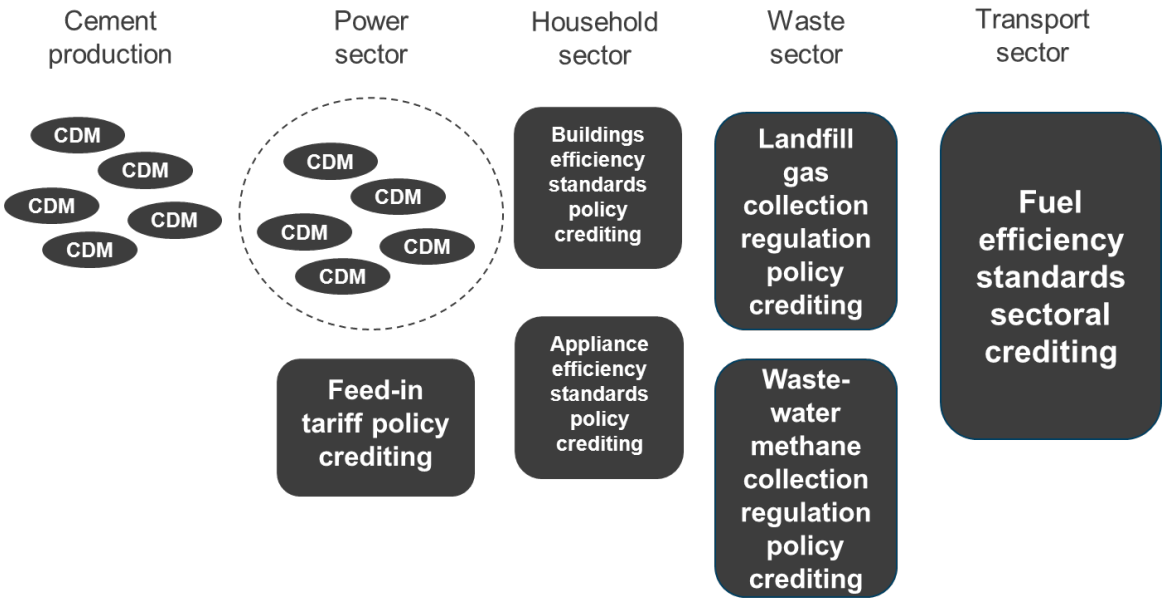
Figure 6: NMM pilot structure



Source: KfW Carbon Fund (2012)

These could also serve to understand the robustness of baseline setting on different levels of disaggregation. In order for the CDM to contribute to global emissions reductions, a discount rate should be applied to CDM credits that is comparable to the difference between the business-as-usual scenario and the baseline for a sectoral mechanism. The outcome should be a basket of mechanisms allocated to sectors (see Figure 7).

Figure 7: Coexistence of mechanisms in different sectors



The transportation sector would be an excellent target for sectoral crediting, while household energy efficiency could apply a policy-crediting approach. Large emitters in heavy industry would engage in CDM projects if they are private entities; a sector dominated by public entities might choose sectoral crediting. In advanced developing countries, sectoral trading might become attractive for these sectors. For the power sector, a "nested approach" could be envisioned where large entities wanting to generate emissions credits would undergo robust emissions accounting, whereas the rest of the sector would not be able to generate credits and be subject to more traditional policy instruments such as feed-in tariffs.

A critical precondition for the coexistence of mechanisms is strong national and international oversight to prevent double counting of emissions reductions and "baseline shopping." The current Designated National Authority for CDM projects should be restructured accordingly to become a Market Mechanism Authority. The lessons from CDM methodologies, especially regarding leakage, should inform methodologies for NMM. As Butzengeiger et al. (2012) stress, investors, in particular from industrialized countries, will only invest if (i) they have trust in the respective government and (ii) believe the implementation of the NMM is credible enough. The latter requires UNFCCC-level oversight comparable to the CDM Executive Board, as proposed by De Sépibus and Tuerk (2011).

A thriving landscape of market mechanisms is only possible with a significant level of demand for credits. As the current price crash on the CDM market shows, markets react quickly and decisively on demand shifts. It does not make sense to build a "Potemkin village" without a breakthrough in the international negotiation that mobilizes demand commensurate with the requirements of the 2°C target.

References

Baron, R.; Buchner, B.; Ellis, J. (2009): "Sectoral Approaches and the Carbon Market," OECD/IEA, Paris, June

Butzengeiger, S.; Dransfeld, B.; Cames, M.; Michaelowa, A.; Healy, S. (2012): "New market mechanisms for mitigation: Getting the incentives right," in: Michaelowa, A. (ed.): *Carbon Markets or Climate Finance? Low carbon choices for the developing world*, Routledge, New York, p. 146–167

Castro, P.; Hayashi, D.; Stadelmann, M.; Michaelowa, A.; Cames, M.; Healy, S. (2011): "Solving the MRV challenge for new market-based mechanisms: What can past experience teach us?" Discussion Paper, Federal Environmental Office, Berlin, November 23

Castro, P.; Michaelowa, A. (2010): "The impact of discounting emission credits on the competitiveness of different CDM host countries," in: *Ecological Economics*, 70, p. 34–42, http://dx.doi.org/10.1016/j.ecolecon.2010.03.022

CDC Climat (2012): "Japan's Bilateral Offset Crediting Mechanism: A Bilateral Solution to a Global Issue?" Climate Brief 11, Paris, January

de Sépibus, J.; Tuerk, A. (2011): "New Market-based Mechanisms post-2012: Institutional Options and Governance Challenges when Establishing a Sectoral Crediting Mechanism," Climate Economics at the NCCR Climate, Research Paper 2011/06, University of Berne, Berne

Dransfeld, B.; Michaelowa, A.; Cames, M.; Healy, S. (2011): "Design of the post-2012 climate regime: Sectoral approaches for greenhouse gas mitigation. Discussion paper: Incentives for mitigation investments," Climate Change 14/2011, German Federal Environment Agency, Dessau

Ecuador (2012): "Net avoided emissions," presentation at UNFCCC *Workshops on various approaches and new market-based mechanism*, May 19, Bonn

Füssler, J. (2012): "CDM baseline approaches for PoA upscaling and new market mechanisms (NMM). Building NMM on CDM elements," Infras/KfW Bankengruppe, Zurich, April 20

Hayashi, D.; Michaelowa, A. (2012): "Standardization of baseline and additionality determination under the Clean Development Mechanism," in: *Climate Policy*, forthcoming

High Level Panel on the CDM Policy Dialogue (2012): "Climate change, carbon markets and the CDM: a call to action," Luxembourg

IETA (International Emissions Trading Association) (2010): "Thinking Through the Design Possibilities for a Sectoral Crediting Mechanism - Three Options to Encourage Discussion," Geneva, March 5

International Energy Agency (2000): *World Energy Outlook 2000*, Paris

Japan (2012): "Outline of the Bilateral Offset Credit Mechanism," Tokyo, August

KfW Carbon Fund (2012): "New market mechanisms – status and key design questions," Helsinki, October 4

Marcu, A. (2009): "Sectoral Approaches in Greenhouse Gas Market: A Viable Proposition?" in: Holm Olsen, K.; Fenhann, J.; Hinostroza, M. (eds): *NAMAs and the Carbon Market. Nationally Appropriate Mitigation Actions of Developing Countries*, UNEP Risø Centre, Roskilde, p. 97–111

Michaelowa, A.; Buen, J. (2012): "The CDM gold rush," in: Michaelowa, A. (ed.): *Carbon markets or climate finance?* Routledge, Abingdon, UK, p. 1–38

Prag, A.; Briner, G. (2012): "Crossing the Threshold: Ambitious Baselines for the UNFCCC New Market Mechanism," OECD/IEA, Paris, May

Röser, F.; de Wit, C. (2012): "Nationally Appropriate Mitigation Actions (NAMAs) and Carbon Markets," Policy Update IV, Ecofys, Utrecht, May

Schmidt, J.; Helme, N.; Lee, J.; Houdashelt, M. (2006): "Sector based approach to post 2012 climate change policy architecture," Center for Clean Air Policy, Washington, D.C., August

Schneider, L.; Cames, M. (2009): "A framework for a sectoral crediting mechanism in a post-2012 climate regime," Öko-Institut, Report for the GWEC (Global Wind Energy Council), Berlin

Spalding-Fecher, R.; Michaelowa, A. (2012): "Should the use of standardized baselines in the CDM be mandatory?" in: *Climate Policy*, forthcoming

Sterk, W.; Mersmann, F. (2012): "New market mechanisms: Prerequisites for implementation," JIKO Policy Paper 1/2012, Wuppertal, April

UNFCCC (2011): Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Addendum. Part Two: Action taken by the Conference of the Parties at its sixteenth session. Decisions adopted by the Conference of the Parties, FCCC/CP/2010/7/Add.1, Bonn

UNFCCC (2012): Report of the Conference of the Parties on its seventeenth session, held in Durban from 28 November to 11 December 2011. Addendum. Part Two: Action taken by the Conference of the Parties at its seventeenth session. Decisions adopted by the Conference of the Parties, FCCC/CP/2011/9/Add.1, Bonn

US Energy Information Administration (2012): International Energy Statistics, Total Electricity Net Generation, http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=2&pid=2&aid=12

Walls, M. (2011): "Deposit-Refund Systems in Practice and Theory," RFF DP 11-47, Resources for the Future, Washington, November

Whitesell, W.; Helme, N. (2009): "A tradable intensity standard for no-lose sector crediting," Center for Clean Air Policy, Washington, D.C.

HARVARD Kennedy School
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

Harvard Project on Climate Agreements

79 John F. Kennedy Street
Cambridge, MA 02138

+1 617 496 8054
climate@harvard.edu

belfercenter.hks.harvard.edu/climate

This publication was printed on 100% post-consumer-waste recycled paper.