

Market-based mechanisms in a post 2012 climate change regime

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Executive brief

This paper summarizes the findings of a larger analysis concerning a possible transition from the status quo of current market mechanisms under the Kyoto Protocol (the Clean Development Mechanism - CDM) to potential new market mechanisms at the sector level. The research was commissioned by the German Federal Environment Agency (Umweltbundesamt (UBA)).

The report illustrates why this transition can be desirable to both developing and industrialized countries, looks at the parties' official positions on new market mechanisms under the UN Framework Convention on Climate Change (UNFCCC) and details the many challenges involved in such a transition. These include diplomatic hurdles, design issues, implementation questions, and concerns about the ensuing market for emission reduction units. Throughout, the research distinguishes between two possible scenarios for the implementation of new market mechanisms: a "centralized" future in which parties pursue a treaty-like approach with top-down governance and global institutions, and a "fragmented" future in which various countries/regions pursue different market-based approaches that may or may not be compatible.

Empirical analysis was undertaken, evaluating which countries and which sectors are best suited for such a transition. Those with high political willingness for market-based solutions include several Latin American, Small Island and European countries. In terms of sectors, power generation and cement production as well as buildings have the highest abatement potential - power, steel and aluminium have the most suitable sector structure.

The research also evaluated interim solutions that can continue market-based mitigation incentives while the transition to new market mechanisms is occurring: the CDM programmes of activities (PoAs), standardized baselines for CDM, and CDM discounting. The authors find that PoAs are most suitable as an interim solution in both a "centralized" and "fragmented" future for new market mechanism implementation, as they retain the CDM's structure and thus the trust of existing market players, while encouraging expansion of mitigation activities beyond the project level to the sector level.

The research also highlights the critical role of *demand* for emission limitation or reduction credits as a driver for the development of flexible mechanisms. In the absence of tighter targets, the low demand and resulting low carbon price leaves few incentives for the development of new mechanisms. Looking forward, the authors conclude that the climate regime may evolve in such a way that elements of the scenarios used in the analysis occur in sequence, with a more fragmented world potentially developing

into a more centralized set of rules over the next 3–8 years. Given such a context, Germany and the EU could seek to facilitate a transition to new market mechanisms in ways that can work in both a centralized and fragmented future, including

- ▶ engaging in bi- and multilateral cooperation to support the establishment of new market mechanisms, particularly with the countries this report’s empirical analysis has concluded to be good candidates for such cooperation
- ▶ facilitating creation of the institutional infrastructure necessary for participation in new market mechanisms
- ▶ offering financial and material support for data gathering and emissions assessment at the sector level
- ▶ creating venues for the exchange of technical expertise around e.g. data gathering and analysis

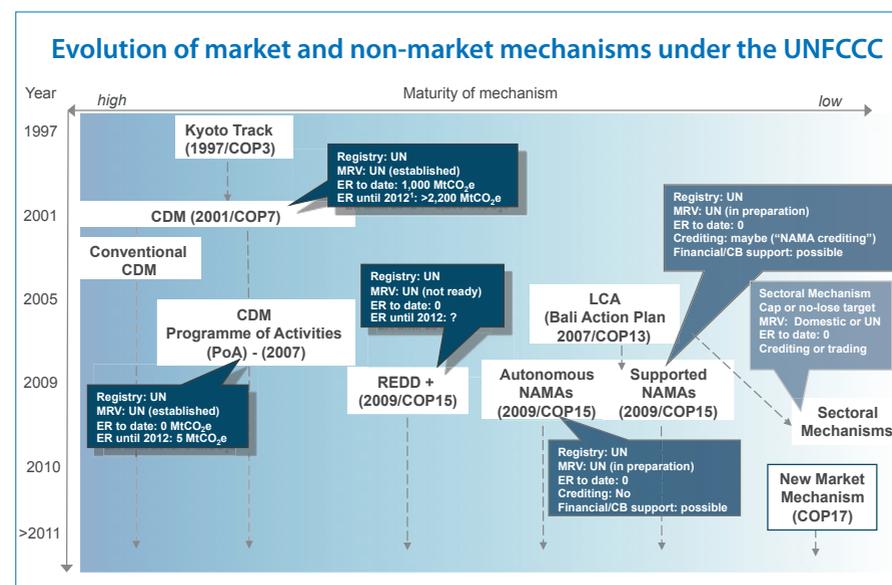
Introduction and background

Discussion about the establishment of new market mechanisms as part of a post 2012 climate change regime have been formally underway since 2007, when the Bali Action Plan under the UNFCCC called for the consideration of “various approaches, including opportunities for using markets, to enhance the cost-effectiveness, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries”. These discussions were spurred by the scale of the global mitigation challenge, the potential for enhanced carbon markets to increase cost-efficiency of climate action, as well as the prospect of increased climate finance flows to developing countries.

Although new market mechanisms and existing market mechanisms are negotiated under two different tracks – under the UNFCCC and the Kyoto Protocol (KP) tracks, respectively – the two are closely linked: work on the new mechanisms is driven in large part by the desire to overcome shortcomings of the existing mechanisms, most notably the Clean Development Mechanism (CDM). See for a schematic overview of existing and new mechanisms under the UNFCCC.

This Summary Report considers the potential transition from the existing market-based mechanisms, in particular the CDM, to potential new market-based mechanisms being discussed as part of a post-2012 climate policy framework. It is based on a larger research project funded by the German Federal Environment Agency (UBA) that included interviews with key experts from both Annex 1 nations (industrialized

Figure 1: Evolution of market and non-market mechanisms under the UNFCCC



Source: Perspectives analysis; UNEP Risoe 2012

countries) and non-Annex1 nations (developing countries) whose insights are incorporated into this text. The Agency requested information on the following points, which are detailed as individual sections of the report:

- ▶ an overview of parties’ positions on market mechanisms in the UNFCCC negotiations, with two scenarios as to how they could move forward
- ▶ detailed discussion of practical and institutional issues involved in a transition to new market mechanisms
- ▶ a criteria-based evaluation of countries and sectors suited to making that transition; and
- ▶ recommendations for interim solutions needed during the transition period.

While we analyze the first points by evaluating parties’ stances on new market mechanisms, the relevant literature on new market mechanisms, and recent events in this area, the latter two points are explored via more empirical analysis involving statistical evaluation of criteria pertaining to countries, sectors, and interim solutions.

Status of negotiations on new market mechanisms

At the 2010 Cancun climate summit, the Ad Hoc Working Group on Long-term Cooperative Action (AWG LCA) decided to consider the “establishment of one or more market-based mechanisms” at the 2011 climate summit in Durban, South Africa. The Durban summit resulted in decision to establish such mechanisms and a call for parties and observers to submit their views on such mechanisms, and to hold workshops discussing those views. This happened during the first half of 2012. The views expressed in those documents and at the workshop differ strongly in structure and specificity, ranging from the EU’s concrete proposal for a global sectoral program to mere lists of conceptual questions about market mechanisms.

This report analyses components of a transition to new market mechanisms as outlined by the EU, as that proposal is the most detailed to date and also (largely) compatible with the views expressed by several other parties in their submissions. Several of the experts consulted in our interviews noted that a sectoral approach of some kind (crediting or trading) is the most detailed new market mechanism framework outlined so far and that it, in the words of an Annex 1 government official, “has the most support” (Interview 11).

The EU plan

In short, the EU proposes to create a market incentive for at least one “broad segment of an economy” in a developing country to become less carbon intensive relative to some pre-agreed baseline or benchmark – that benchmark could be set in terms of emissions intensity or absolute emissions. Either countries set the benchmark very high and are rewarded ex-post with credits if they exceed it (the crediting approach also known as “no lose”), or they set the benchmark rather like a target that earns emission units if exceeded, but requires countries to buy such units if emissions end up above the agreed level (the “trading” approach).

This concept meshes with the generally accepted idea of attributing credit to countries’ nationally appropriate mitigation actions (NAMAs): mitigation activities in a given sector would constitute NAMAs in that sector, such that any emissions reduction credits resulting from those NAMAs could be sold to a developed country (or entity therein) to help meet its emissions reduction obligations.

Other parties’ positions

Other countries do not share the view that a sectoral program is desirable. Although the EU position is broadly compatible with those of several other country groupings, including the Association of Small Island States (AOSIS) and the Least Developed Countries (LDCs) because these do not confine the definition of a NAMA, it does conflict with that of China, which maintains that market mechanisms must be project-based only. However, China seems to be increasingly isolated in its total opposition: An interviewee from another non-Annex1 party confirmed their countries’ interest in a sectoral crediting mechanism (Interview 2) and an expert from a UN institution pointed to “a growing interest in it [sectoral crediting/trading] from the main target constituencies.” (Interview 4).

Countries are also at odds about the overlapping issue of carbon finance and market mechanisms, with developing countries requiring that the two be kept separate when it comes to “counting” reductions toward targets and getting credit for having funded reductions in other nations. An interviewee from an Annex1 country noted that money put into capacity building efforts like the World Bank’s Partnership for Market Readiness should definitely be counted as a contribution to international climate finance, but that from his country’s perspective, offset/credit purchases should also be counted toward the industrialized nations’ collective climate finance goal of \$100bn per year by 2020 spent on mitigation in developing nations (Interview 3). A non-Annex1 interviewee pointed out that if developing countries take on targets and also host measures that produce reduction units under a new market mechanism, it remains unclear whether those units should be counted toward the host country’s target or toward the purchasing entity (Interview 8).

The way forward: Possible pathways to a new political framework

Given these differences among UNFCCC parties that may prevent the adoption of a “top down” approach like the one taken with the Kyoto Protocol, we account for the increasingly likely situation in which market mechanisms develop in a “bottom up” manner, i.e. as a result of individual national/regional/subnational emissions trading programs that cross-recognize credits and allow use of them to fulfil self-set reduction targets.

Our analysis of the transition to market mechanisms from the current status quo is therefore applied under *two broad scenarios* in which new mechanisms could be implemented, and enables us to discuss different elements relating to their design despite the considerable uncertainty around the UNFCCC negotiating outcomes.

- ▶ The “*centralized*” scenario implies a treaty-like agreement to create new market mechanisms within the UNFCCC that involves agreement on and establishment of centralized global institutions to manage that mechanism.
- ▶ The “*fragmented*” scenario implies a lack of internationally-agreed binding emission reduction targets, a range of market-based approaches implemented at the national and sub-national level, no common framework or rules, and a lack of common governance institutions.

These two scenarios represent the ends of a spectrum, with the path achieved by upcoming negotiations lying somewhere in the middle. The fragmented scenario is likely to prevail in the short term, whereas an agreement in 2015 on the long-term structure of a global climate regime could make for a more centralized global mitigation scenario after that year.

Indeed, experts largely agree that the negotiations are trending towards a decentralized system, arguing that “It seems there is now broader support for a framework for mechanisms, rather than for a specific mechanism itself” (Interview 8) and that “the notion that there is one carbon market dominated by the UNFCCC [...] is antiquated” (Interview 11). However, they do not agree on whether this trend is desirable: to one non-Annex1 government representative, “a central approach is theoretically preferable, but only a flexible approach is feasible” (Interview 13). Another interviewee points out that “from a host country perspective, it is scary to think that projects would have to meet procedures that vary from country to country” under a fragmented scenario in which there are several potential buyers, each with their own credit eligibility rules. Another warns that “if the track to fragmentation is started once, it will be almost impossible to get back to a real centralized approach” (Interview 9).

Regardless of preference, accounting for the potential that negotiations end up more on one or the other side of the spectrum is important: it affects how best to go about implementing interim solutions while new market mechanisms develop.



Enabling the transition: steps toward a new market mechanism

What changes are necessary to get from today’s CDM-focused world to one in which new market mechanisms, with crediting of reductions in large sectors of entire economies, are in place? We separate the many factors this transition would involve into four topical areas, analysing the issues at stake and the options for moving forward within each – where applicable, we consider the differences in the transition under the “centralized” versus “fragmented” scenarios laid out above.

Diplomatic issues affect parties’ negotiating positions on the key elements of new market mechanisms including use of credits/ offsets, whether intensity-based or absolute targets are preferable, and economic competitiveness concerns.

One such issue is that proposed market-based mechanisms should constitute a “*stepping stone*” for more advanced developing countries on the path toward binding national mitigation commitments and engaging in international emissions trading – but key advanced developing countries do not wish to go down a path toward such internationally binding targets. These countries have many reasons not to take on binding targets and instead to stay with the status quo of the CDM. Addressing this discrepancy may involve negotiating a timetable for the transition at the outset, for example a “sunset clause” for being able to engage in the CDM and sectoral crediting. The timetable might outline the process for moving from a “no-lose” crediting target to a fixed trading target within a certain number of years – with developing countries participating in the setting of such a timetable, they have leverage and thus a possible incentive not to reject a path to sectoral trading entirely.

Another critical factor concerns *who may claim or use credits/offsets* generated by new market mechanisms – developing countries would prefer that reductions achievable at low marginal cost (the “low hanging fruit”) be reserved for their own use while outside entities finance the reductions that are more expensive. Industrialized countries prefer it the other way around, as a significant return on investment will stimulate involvement from their private sectors. The extent to which a developing country government could in reality “reserve” its low cost options for unilateral or supported NAMAs depends on how well informed the government is about mitigation options, how quickly public finance can be mobilized, and how important it is for the government to show it has undertaken unilateral actions - i.e. demonstrated to the world that it has actually reduced emissions. Soon, some advanced developing countries may themselves generate demand for credits or offsets: China, South Korea, Brazil and Mexico are all at some stage of preparing emissions trading programs, in most cases at the regional level.

Countries also differ strongly in their interpretations of what constitutes “supplemental” in the case of credit use, with the EU and Australia having interpreted it as accounting for less than half of an entity’s compliance obligation while Bangladesh’s UN submission on this point suggesting a 20 percent limit and an interviewee pointing to South Africa’s view that “no more than 10 percent [of a country’s target/goal] should be met through offset mechanisms” (Interview 2). Measures that identify the mitigation options and importance of unilateral actions for developing countries, as well as efforts to nail down a common definition of supplementarity, could move the process forward in this regard.

At both the national and sectoral level, the major emerging economies are concerned that limits on their *absolute* emissions will restrict their economic growth – but a number of these countries have shown a willingness to commit to *intensity-based* emissions goals in their NAMA pledges in, for example, commitments to reduce CO₂ per unit of GDP. If intensity targets should be pursued first – to get the relevant actors onboard a transition to new market mechanisms at all – they must be a bridge to eventual absolute targets in order for the world not to exceed the 2°C goal. The pathway for moving from intensity-based approaches to sectoral trading, and ultimately national trading, requires significant policy changes at the implementing countries’ domestic levels, which industrialized countries can support and help facilitate. More concretely, Butzengeiger, et al (2010) suggest “converting” an intensity-based goal into an absolute emissions target via a so-called Efficiency Target Factor (ETF). Using this approach, countries that are concerned about absolute targets at the sectoral level could still participate in carbon markets in a more environmentally-credible way by using the ETF to calculate a no-lose absolute target at the installation level on an ex-post basis. Similarly, the International Emission Trading Association (IETA) proposes a “credit conversion mechanism” through which countries pursuing market-based mechanisms that do not use tons of CO₂-equivalent as the relevant “currency” (but instead for instance renewable energy credits measured in kWh, energy efficiency credits) could translate their value into a single tradable currency for international (or inter-crediting-scheme) trading. This takes Butzengeiger et al’s intensity-to-absolute conversion metric to an even broader level in an attempt to facilitate global harmonization of credit trading absent a centralized program.

Concerns about *international competitiveness* are also a hurdle to developing country participation in new market mechanisms - since the proposed sectoral programs would involve high-emitting sectors of advanced developing nations’ economies. As it is precisely these sectors in which firms compete globally, negotiators’ stances on new market mechanisms are strongly influenced by their country’s position relative to other nations. Depending on the domestic circumstances in their countries’ respective emissions-intensive industry sectors for which the new market-based approach

has been suggested (such as iron and steel, cement, aluminium), negotiators will be more or less likely to endorse the global sectoral approach. A potential strategy to address these concerns could be to highlight the role of scaled-up market-based mechanisms in supporting “green growth” pathways more generally. The scale of mitigation activity that new market mechanisms involve is more likely than a mere collection of individual CDM projects to support the creation of a domestic clean energy industry and related job opportunities.

Design issues consider the “rules” of potential new market mechanisms, including the structure and stringency of targets, monitoring and verification, and whether / how to recognize early actions.

The more *ambitious the emissions target or baseline*, the greater the share of emissions reductions that needs to be achieved domestically before reduction units can be generated or excess units can be sold. This level of ambition therefore has major implications for the ability of the implementing country to recover the costs associated with undertaking mitigation action. There are likely to be information asymmetry issues favouring the developing country government, which presumably knows more about its own business-as-usual emission trajectory and its abatement costs than an authority set up under the UNFCCC to approve baseline proposals. Thus the developing country government would be able to negotiate an emissions reduction baseline that enables it to extract rents. Along the same lines, developing countries are subject to a perverse incentive: the implementing country could inflate emissions baselines in the negotiating period so as to obtain a more favourable baseline. Finding and closely examining historical data would help to avoid this situation – industrialized country parties’ capacity building efforts could be directed at gathering and analysis of such data.

Aside from their ambitiousness, agreeing on a *foundation from which to set baselines* presents a design challenge. Where finding the appropriate factors from which to set baselines (not only for each developing country but also for each relevant sector) is unworkable, there are several baseline-setting approaches parties could settle on in the negotiations. These include technology penetration goals such as Megawatt hours of wind generation or number of electric vehicles, an ex-post calculation of baselines whereby parties agree on the methodology for developing a formula for a composite baseline index on an ex-ante basis (but would only calculate the actual baseline itself ex-post) to allow for uncertainty about business-as-usual emission trajectories, and the development of standardized baselines for the CDM discussed later as an interim solution in this report. A non-Annexe interviewee favours the technology penetration goals because “a technology-based approach will face fewer problems as more public data is available and not so much (additional) data is needed” (Interview 12, text in brackets added).

Another interviewee pointed to a proposal from Colombia under which parties simply deduct a percentage of the emissions reductions they have achieved according to national reports – in this case, no baseline negotiations are needed (Interview 10).

All of these options pertain to a “centralized” scenario in which baselines are negotiated at a high level (i.e. the UNFCCC), but also might be chosen by the parties involved in setting up a bilateral or regional mechanism under a “fragmented” scenario. Indeed, Castro, et al describe a top-down approach to set up baselines on the basis of aggregated sectoral data, and this common set of guidelines for baselines is desirable even under a fragmented system to avoid baseline “gaming” (Castro et al 2012).

Concerning monitoring, reporting, and verification (*MRV*), external oversight of mitigation actions has met with opposition from several major developing countries – China and India in particular. Negotiations with respect to NAMAs have made progress in this regard, with decisions saying that internationally-supported NAMAs will be subject to “international MRV” in accordance with guidelines to be developed under the Convention (Decision -/CP. 16, para 61) while unsupported NAMAs would be subject to the implementing country’s MRV. Requirements for implementing a market-based scheme are likely to be quite different from the requirements for linking such a scheme to others, and the literature suggests that there may be a minimum of MRV factors needing to be internationally harmonised. While a domestic MRV system must be regarded as robust and transparent internationally, linking of crediting systems does not have to entail international MRV per se – as long as there is agreement on principal elements of each domestic MRV system. These principal elements could be considered minimum requirements and relate specifically to the crediting mechanism in question – some form of harmonisation would be needed for the methodologies for measurement and the type of information that is reported internationally – i.e. the basic information needed to assess performance against the established emission goal.

Again, the process of agreeing to alternative reporting guidelines is time consuming and, like that of agreeing on baselines, will delay establishment of new market mechanisms if made a prerequisite to pursuing them. Another design question is whether and how to give credit for so-called *early action*. Governments want to “count” reductions from mitigation actions that took place before the official setting of a sectoral baseline. Greenhouse gas savings, however, could have resulted from efficiency improvements under programs not necessarily related to greenhouse gas abatement – an example is the recent Chinese program to shut down many coal-fired power stations for local air pollution reasons. Addressing this issue could involve two-tiered baselines with differentiated treatment for existing and new plants, as developed by the cement industry in the context of the CDM.

Implementation issues pertain to institutional frameworks for and interaction among important groupings of interested parties, including an overarching governing body for the program, the interaction between governments and the private sector, and the programme’s overlap with the CDM.

New institutions

Someone must be responsible for enforcing the details of the various market mechanism design attributes explained above. Under a scenario close to the most “fragmented” end of our potential implementation spectrum, the task of developing, upholding, and enforcing the design elements would fall mainly to the governments of the countries or regions involved in bilateral or regional arrangements. If, however, parties decide to adopt and implement new market-based mechanisms “formally” under the UNFCCC and as part of a treaty-like arrangement involving global crediting/trading, they will need to adopt central institutional structures that perform specified governance functions.

If parties choose to retain the approach used under the Kyoto Protocol, they may consider creating an institutional entity with similar functions to the CDM Executive Board (CDM EB) – a “Sectoral Crediting Authority (SCA)”. Like the CDM EB, such an SCA could be given a mandate to administer the implementation of the new mechanisms, in this case focused not on individual projects but on mitigation in an entire sector. Functions could include participating in or leading the definition of sectoral baselines, monitoring and reviewing mitigation efforts in relevant sectors, issuing units and facilitating the subsequent transfer of units through designated registry infrastructures, and applying eligibility requirements.

Even under a fragmented scenario in which individual parties strike their own governance arrangements, a coordinating body will be needed. Rather than effecting actual governance, such a platform would be limited to issuing recommendations and providing advice on the implementation and harmonization of market-based mechanisms. Its creation could occur by way of a decision of the parties, affording it a certain degree of formality, or by way of a less formal Memorandum of Understanding (MoU) between participating jurisdictions. An example for such loose cooperation exists with the International Carbon Action Partnership (ICAP) launched in October 2007 by more than 15 national and regional governments, expressly aimed at creating a “forum to discuss relevant questions on the design, compatibility and potential linkage of regional carbon markets.” Likewise, initiatives such as the International Partnership for Mitigation and MRV and the REDD+ Partnership reflect attempts to facilitate cooperation and coordination without creating formal institutions.

Aligning government and private sector interests

Sectoral crediting arrangements face the challenge of maintaining incentives for individual actors within a sector to reduce emissions - the so-called “free rider” problem in which it is in each actor’s interest not to reduce emissions while others in the sector do. This is less of a concern in economies where the main actors are government-owned monopolies and the state makes or heavily influences investment decisions – and some of the advanced developing nations best prepared for new market mechanisms (including China) have such economies.

Aside from the incentives for private entities that operate in the sectors for which a new market mechanism might be established, there is the problem of capturing private sector investment, i.e. getting members of the private sector to fund mitigation efforts. To facilitate these actors’ financing of mitigation, it is essential to minimize the steps through which carbon revenues have to go before reaching investors – the longer the timeframe and the greater the complexity of the link between a carbon market and project-level incentives, the higher the risk that costs will not be recovered.

Host country governments have several policy options for engaging the private sector – these include positive incentives to take mitigation action (feed-in tariff, tax breaks, etc.), negative incentives (liability to meet targets, tax on emissions above baseline, etc.), direct regulation (mandatory efficiency standard or technology obligation, etc.), a domestic emissions trading system, and ways of structuring the pass-through of credits to individual entities – for instance with or without a guarantee to reward the entity for achieving targets. All of these require the host country government to take a much more active role in new market mechanisms than in the CDM.

Experts suggest that advanced developing country governments are willing to adopt such a role: as one interviewee put it, “something has to change the balance between what governments do and the UNFCCC does. There should be a bigger role for national governments” (Interview 8). The interviewees also suggest that industrialized countries in turn have a role in helping advanced developing country governments in this regard, by e.g. sharing of best practices: “The key role of developed countries will be to support capacity building, development of a market infrastructure, legal framework and share experiences” (Interview 1). One non-Annex1 expert notes, however, that “international support will not be very helpful for institution building, as institutions in China are very different to institutions in industrialized countries” (Interview 12).



Dealing with CDM overlap

Since the decision was taken at the Durban summit to initiate second commitment period of the Kyoto Protocol, there is now near certainty that the CDM will continue to exist and projects will continue to generate CERs. Policymakers aim to ensure that this does not hinder a move toward new market mechanisms, but rather facilitates/complements that move. The CDM’s coexistence with new market mechanisms creates a risk of violating both programs’ environmental integrity through double-counting of emissions reductions. The discussion is already playing out in China, where individual regions are implementing pilot emissions trading schemes (Guangdong, Beijing) and CERs from CDM projects there may or may not count as “domestic offsets” for use by emitters covered by those schemes. In a (not unlikely) situation where some CERs continue to be issued for projects within a sector to be covered by one of the new mechanisms, it is necessary to avoid double counting of emissions reductions at the project level and at the sectoral level. One interviewee suggested that as soon as countries “enter into a ‘sectoral agreement’, [they] would stop registration of new projects and ring-fence existing projects until the end of their crediting period” (Interview 3). Another suggested either (1) excluding CDM from the baseline or (2) integrating CDM projects in the sectoral baseline but leaving decisions on how credits are distributed among participating entities to the host country (Interview 1).

Butzengeiger-Geyer et al (2010) outlined a solution for avoiding double counting of CERs and sectoral credits whereby the quantitative emissions reductions resulting from any CDM projects in the sector are deducted from the sector “emissions budget” or maximum allowable emissions given the target. Authorities can estimate the impact of the CERs on the emissions budget at the outset, based on CDM project PDDs, and might then revise it ex-post in line with the defined compliance period to reflect actual performance of projects. Existing CDM MRV requirements would support this approach.

Market issues discuss the uncertainty around carbon price signals for new market mechanisms due to lack of knowledge about the overall demand/supply balance, looking at forecasts and evaluating future scenarios.

Parties are unlikely to be interested in new market mechanisms without the prospect that there will be demand for the emissions reduction units these mechanisms generate. As a non-Annex1 negotiator pointed out, “the main concern that we have when looking at the new market mechanisms is demand. Without demand, the market will not work” (Interview 10). However, the size of demand for such units remains highly uncertain. There are few participants in the Kyoto Protocol’s second commitment period, which is the most discernible measure of a credit supply-demand balance since it involves the

existing CDM for which analysts routinely predict supply volumes. Beyond the CDM, what even constitutes “demand” and “supply” with respect to emission reduction units is subject to various definitions: will avoided deforestation be a creditable act and thus generate supply, and will large industrialized economies put in place emissions trading programs that allow such credits to count as offsets, thus creating demand?

Studies on future demand/supply balance are inconclusive, though in general those that assume credits for avoided deforestation (REDD credits) will be part of the program also result in higher supply estimates.

Experts generally agree that there is a clear lack of demand, with one citing the economic crisis in the EU and US as a major cause of oversupply (Interview 6) and one pointing out that “in the current context, there is no need for new market mechanisms as the demand for credits can be met by the CDM” (Interview 7). The biggest wild card on the demand side is the US, as the country has given no indication of potential offset use and indeed is experiencing reduced need for climate-specific policies to achieve emission reduction since the low price of natural gas is changing the country’s power mix toward achieving its Copenhagen target (17 percent below 2005 emissions levels) regardless of explicit mitigation actions. As one developing country interviewee stated, “any climate change regime needs the US on board, and we all know that. The idea of having this new mechanism in the Convention is because the Protocol [to which the US is not a party] has not done what it had to do” (Interview 8, text in brackets added).

In light of this uncertainty about the supply-demand balance, which tends toward a likely surplus of credits given the lack of demand, there is an array of options to prevent the oversupply of offsets:

- ▶ “Carbon Bank” to sell or purchase allowances to ensure a certain carbon price level
- ▶ Regular review of supply and demand with appropriate measures (e.g. higher targets for industrialized countries, more ambitious baselines for developing countries)
- ▶ Cap on issuance of credits from a sectoral crediting mechanism (on global or country level) based e.g. on the reduction commitments of the industrialized countries
- ▶ Restricting the eligibility of sectors and activities for crediting, with mitigation to be encouraged by other measures

- ▶ Discounting of credits produced under a sectoral crediting mechanism
- ▶ Acquiring and cancelling a portion of credits to remove these from the market

All of these options, however, apply to a situation in which a sectoral market mechanism has been adopted and regulators are trying to adjust the supply/demand balance. If the overall demand for reductions remains at its current low levels, there is little incentive to create a new market mechanism in the first place.



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Preparedness: which countries could use such a mechanism

After exploring hurdles involved in a transition towards new market mechanisms, we analyze the actual capability and readiness of non-Annex1 countries to undertake this transition. After defining the criteria and indicators used to assess “preparedness,” we apply them to all non-Annex I countries, using both rankings and cluster analysis to find the groups of countries that are better prepared to implement new market mechanisms.

Table 1: Criteria, indicators and data sources for the country assessment

Criteria	Indicators	Data sources
Responsibility for climate change	Total annual CO ₂ emissions from energy consumption Annual CO ₂ emissions per capita	World Development Indicators 2010
Economic capacity	GDP per capita	World Development Indicators 2010
Technical capacity	Mean years of schooling (for adults aged 25 or above)	Human Development Report 2010
Institutional capacity	Regulatory quality Amount of National Communications to UNFCCC	Worldwide Governance Indicators 2010 UNFCCC website
Willingness towards new market mechanisms	0 – 100 scale 0 – 100 scale	Country submissions to UNFCCC ^a Domestic market plans reported in World Bank’s State and Trends of the Carbon Market 2012, Point Carbon’s Carbon 2012 report, the websites of the Partnership for Market Readiness and the Nordic Partnership Initiative, and UNFCCC / Ecofys compilations of NAMA proposals ^b
Ties with industrialized countries	Trade as percentage of GDP FDI as percentage of GDP	World Development Indicators 2010
	Trade with EU27 countries as % of total trade	Correlates of War Trade Dataset 2008

^a: Used to measure willingness under the “treaty” scenario.

^b: Used to measure willingness under the “fragmentation” scenario.

Criteria and indicators for assessing capability and readiness of countries

We used the principle of common but differentiated responsibilities and related capabilities as the starting point for the selection of *criteria* and respective indicators to assess countries’ readiness and capacity for new market mechanisms. The rationale is that a country’s contribution to mitigating climate change should be related to its share of the *responsibility* for causing climate change and its *capacity* to implement measures to prevent it. We also include its *negotiation position* on market mechanisms, *domestic willingness* to engage with markets and *ties with industrialized countries* as criteria to assess readiness. Table 1 details the indicators and sources of information used to measure each of these criteria.

Assessing capability and readiness of countries: country rankings

For each of the criteria described above, we created a simple *ranking* of countries, and made them comparable by normalizing all indicators to a scale from 0 to 100 (where 100 indicates the highest capacity, responsibility, willingness, level of ties with industrialized countries, etc). For criteria that include more than one indicator, the ranking is created on the basis of a simple average across all indicators.

Table 2 presents the top-10 countries for each of the assessment criteria. It shows that the different criteria yield very different lists of “most suitable” countries for new market mechanisms. Still, several countries appear to be suitable in terms of more than one of the assessment criteria. Middle-Eastern countries, for example, typically display high levels of responsibility and capacity. Interestingly, some countries with high level of responsibility also appear to be willing to engage in new market mechanisms, either through domestic initiatives (China and India), or through positive official negotiating positions (Saudi Arabia).

Experts cited examples of this apparent willingness, including India’s efforts towards its “Perform Achieve and Trade (PAT) scheme (Interview 4) and China’s past tendency for speedy implementation of environmental measures if the relevant institutions approve (Interview 5). AOSIS countries have a very positive position towards new market mechanisms, and several of them appear to have a high level of capacity or of ties with industrialized countries that may facilitate bilateral cooperation. Similarly, several Latin American countries appear to be consistent in having a supportive position in the negotiations and in having started considering such mechanisms domestically. Finally, some European countries also seem quite prepared to engage in new market mechanisms.

Table 2: Top-ten non-Annex I countries for each assessment criterion

Top-ten countries for each capability and readiness criterion				
Responsibility	Capacity	Ties with industrialized countries	Official willingness	Domestic willingness
China	Singapore	St. Kitts and Nevis	AOSIS	China
Qatar	South Korea	St. Lucia	EU partners ¹	Costa Rica
Kuwait	United Arab Emirates	Liberia	South Korea	Colombia
United Arab Emirates	Israel	Montenegro	Latin American ²	Mexico
Bahrain	Qatar	St. Vincent and the Grenadines	Singapore	India
Trinidad and Tobago	Malta	Guyana	Ecuador	Chile
Saudi Arabia	Bahrain	Seychelles	Rainforest nations ³	Peru
Brunei Darussalam	Mexico	Antigua and Barbuda	Bangladesh	Vietnam
India	Chile	Belize	Saudi Arabia	Thailand
Oman	Bahamas	Bosnia and Herzegovina	Pakistan	Indonesia

¹: Includes Albania, Bosnia and Herzegovina, Cyprus, Macedonia, Malta, Montenegro, Serbia

²: Includes Colombia, Costa Rica, Mexico, Panama, Peru

³: Includes Cameroon, Central African Republic, Congo, Rep., Congo DR, Cote D'Ivoire, Gabon, Ghana, Honduras, Kenya, Sierra Leone, Sri Lanka, Uganda.

As all these criteria are important, we created a composite ranking that incorporates them all. We weighted each criteria by importance, as shown in Table 3: we list the top-10 countries for a simple average across all criteria, (a) without including the willingness towards new market mechanisms, (b) using the positions data to measure willingness under a centralized scenario, and (c) using the domestic plans data to measure willingness under a fragmented scenario. An alternative version of the ranking, based on a reduced weight for the “ties with industrialized countries” criterion, produces very similar results to those displayed here.

⁴Including the indicators for ties with industrialized countries (openness to trade, openness to foreign direct investment, and percentage of trade with EU from total trade) does not change the results substantially. The results remain also quite consistent if the LDCs are excluded from the analysis.

Table 3: Overall country suitability ranking – all criteria with equal weights

Top-ten countries across all criteria		
Without willingness indicators	With official willingness	With domestic willingness
Singapore	Trinidad and Tobago	China
Qatar	St. Lucia	Costa Rica
United Arab Emirates	Singapore	Mexico
Bahrain	Antigua and Barbuda	Chile
Trinidad and Tobago	St. Kitts and Nevis	Colombia
St. Lucia	Malta	Singapore
Antigua and Barbuda	Montenegro	Qatar
St. Kitts and Nevis	Bahamas	Peru
Malta	Cyprus	South Korea
Montenegro	Bosnia and Herzegovina	Thailand

Besides the “usual suspects” with high emissions levels, such as China and some oil-producing countries, many middle-income countries and – surprisingly – some small island states would qualify as ready for new market mechanisms. Indeed, several small island states are relatively advanced and stable economies with high institutional and economic capacity and a positive stance on new market mechanisms. However, it is not clear whether that stance reflects a wish for deeper engagement of large developing countries in mitigation, or an intention to engage in new market mechanisms themselves. These countries are mostly very small, so their abatement potential is also not significant (in absolute numbers). Finalising the list of suitable countries, we find several Latin American and European nations that have relatively good capacity levels and positive positions both at the negotiations and in terms of domestic initiatives.

Assessing capability and readiness of countries: cluster analysis

Cluster analysis is a statistical technique that allows us to generate groupings among observations (in our case, non-Annex I countries), according to their proximity or similarity to each other in terms of a series of variables. In this case, we applied the following group of indicators: annual CO₂ emissions, CO₂ emissions per capita, GDP per capita, years of schooling, regulatory quality and amount of national communications.⁴ The variables measuring ties with industrialized countries and willingness to engage in new market mechanisms were not included, but instead a set of countries believed to be unwilling was excluded from the analysis (ALBA countries except

Ecuador; North Korea, Iran, Iraq and Libya). Further, many countries did not have data for all the above variables. These countries were also automatically excluded.

We started with a hierarchical clustering method, which allows us to see which countries are so different from all other countries that they build their own clusters. China and India consistently constituted such outliers. These two countries were hence identified as “special cases”, and excluded from the subsequent analysis. In a second step, we compared results for several amounts of clusters to decide which amount of clusters is appropriate. This was done using Ward’s clustering method. In a third and final step, the results from the Ward clustering were refined using the k-means algorithm, which iteratively refines results obtained through Ward’s clustering until it finds a stable cluster structure. Table 4 below shows the resulting groups of countries, using 4 clusters and excluding China, India, Iran, Iraq, North Korea Libya, and parties that have declared specific opposition to market mechanisms (the so-called ALBA group of Latin American countries including Bolivia, Cuba, and Venezuela).

Table 4: Results of the cluster analysis

Cluster	Countries in the groups (k-means algorithm, after defining starting values with Wards algorithm)
1	Brazil, Indonesia, Mexico, Saudi Arabia, South Africa, South Korea
2	Algeria, Argentina, Egypt, Malaysia, Pakistan, Thailand, United Arab Emirates
3	Bangladesh, Chile, Colombia, Israel, Kuwait, Morocco, Nigeria, Peru, Philippines, Qatar, Serbia, Singapore, Syria, Trinidad and Tobago, Turkmenistan, Uzbekistan, Vietnam
4	All other countries with data

More detailed analysis of the characteristics of each of the clusters can help to interpret the results. On average, the countries in Cluster 1 are those with highest total CO₂ emissions, better governance indicators, highest number of National Communications submitted, and longest schooling. Countries in Cluster 3, however, have highest per capita emissions and per capita GDP.

Countries in Cluster 2 are somewhat in between, and countries in Cluster 4 have the lowest values on all indicators. Clusters 1 and 3 thus include those countries that, according to the variables included in the analysis, are on average most suitable for new market mechanisms, and those in Cluster 2 are also quite well prepared. China and India, as outliers, are not included in any of the clusters but due to very high total CO₂ emissions and relatively good institutional characteristics, they should be counted among the countries that are suitable for new market mechanisms.

Feasibility: what sectors could work?

Beyond countries’ readiness to implement new market mechanisms, it is important to know what sectors can be suitable for sectoral crediting or trading approaches. We qualitatively analyzed nine important economic sectors in terms of their suitability for sector-based new market mechanisms: power generation, steel, cement, aluminium, pulp & paper, oil / gas / coal mining, buildings, transport and waste. We define the following evaluation criteria:

Abatement potential: Indicates how effective and cost-effective it would be to embark on a market mechanism to reduce emissions in the sector. The largest the abatement potential, the lowest the relative costs of setting up institutions and an MRV system. Following indicators will be used: (i) estimates of global abatement potential, and (ii) estimated sectoral emission levels (abatement potential), wherever possible at the national or regional level.

Sector structure: Certain sectors have very different structures in different countries, including different industrial processes or different size and age of installations, all of which affect their performance in terms of emissions. The more homogeneous and concentrated an industry, the easier it will be to gather data, to set up an MRV system and to organise the sector for a market mechanism. Sector structure is assessed in terms of (i) estimates of the amount of installations in the sectors and, (ii) literature review. For the dispersed sectors (transport, buildings and waste), we also include a discussion of their organization and regulatory aspects.

Data availability: Sectors that already have systems to collect the activity and/or emissions data necessary to establish baselines and measure emission reductions will be able to set up a sectoral market mechanism earlier. We base our analysis on (i) the existence of a global industry association that is collecting such data for the sector, (ii) the coverage of such data, (iii) the amount of CDM projects and host countries in the sector, and (iv) literature review.

Table 5 summarizes the results of the sector assessment.

Table 5: Suitability of sectors for new market mechanisms – Summary of findings

Sector	Abatement potential	Countries with large emissions or sectors	Sector structure	Data availability
Power	Large	China, India, South Africa, Pakistan, South Korea, Mexico, Saudi Arabia	Low international competitiveness concerns Relatively high concentration of sources, but this varies across countries Baselines need to consider base load and peak load plants, and renewables versus fossil-based plants	No global industry association (IEA has limited data for developing countries) National energy balance statistics sometimes unreliable Grid emissions factors from CDM available for 52 countries
Steel	Medium	EITs, Africa, India, Latin America, China, South Korea, Iran	Few important companies (20 largest cover 40% production; 80 largest cover 70%), but many small ones High international trade raises competitiveness concerns	Still limited APP with low coverage in China and India World Steel Association with unknown coverage
Cement	Large	China, EITs, Middle East, Africa, South Africa, other Asian countries India has large sector but is already efficient	Highly fragmented (10 largest companies cover only 1/3 of production); many small companies especially in China Mainly locally traded, with low competitiveness concerns	CSI has good coverage in Latin America, but low in all other developing countries, especially China
Aluminium	Small	Large sectors: China, Brazil, India, UAE, Bahrain, South Africa, Mozambique, Venezuela Low efficiency of smelting: Central Europe and EITs, South America Low efficiency of alumina production: China, Africa, Europe	Highly concentrated: 20 companies cover about 65% of production Indirect emissions from electricity use are important	IAI covers about 60-70% of primary production (alumina and aluminium)

Sector	Abatement potential	Countries with large emissions or sectors	Sector structure	Data availability
Pulp and paper	Small	China, Korea, Brazil, Indonesia, Chile	Complex sector: Many different products, three different types of pulp, use of waste biomass for energy versus recycling, level of integration of plant Both large multinational and small companies and plants. China dominated by small plants	Still very limited Initiatives by ICFPA and IEA exist, but calculations need to be harmonized (e.g. with the EU ETS)
Oil refining	Small	China, India, South Africa, developing Asia, MENA	Relatively concentrated Emissions intensity depends on quality of crude, product mix and processing equipment – complex metrics required	Solomon Associates collects data since 1990, covering about 2/3 of global production capacity; data confidential even at country level
Coal mining	Medium	China	Feasibility of methane collection in coal mines depends on methane concentration in air	Not known
Buildings	Large	China, South Korea, India, Mexico, Indonesia, Brazil	Complex sector, emissions depend on local climate, building type, socio-economic conditions Many measures available, including education and information campaigns Institutional and organizational barriers exist	Likely very limited
Transport	Small (difficult to identify)	China, Mexico, Brazil, India, Saudi Arabia, South Korea	Complex sector: technology, transport mode, alternative fuels, behavioural aspects influence emissions City-level mechanisms an opportunity	Very limited (and uncertainty of data even when available)
Waste	Small-Medium	China, India, Brazil, Indonesia	Complex sector: Decentralized, institutional barriers (waste collection, informality) and link to sanitation measures. Landfills (and industrial plants) are a relatively low-hanging fruit.	Very limited

In terms of abatement potential; power generation, cement production and buildings appear to be the most attractive sectors for new market mechanisms; with several countries having quite large sectors. In terms of sector structure; power, steel and aluminium seem relatively simple to manage.

Data availability is still a concern for most sectors. While several industry associations have already started collecting emissions data (steel, aluminium, cement, oil refining), their coverage is usually insufficient or unknown. The CDM experience can be helpful in providing sectoral data for power generation. Decentralized sectors – buildings, transport, waste – pose the highest organizational challenges for new market mechanisms due to their dispersed nature and the complexity of sources and/or institutional barriers. Opportunities for them may exist at the sub-sectoral (e.g. city) level.



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² Applied evaluation criteria: Environmental effectiveness; cost-effectiveness, including for MRV; data availability; sustainable development benefits to host country; encourages host country to transition to new market mechanisms; incentives for private sector investment; negotiability and time period required for implementation.

Interim solutions: what to do during the transition?

Reasons and requirements for interim solutions

The above described hurdles to establishing new market mechanisms show that full implementation of any such mechanism is still several years away at best. Such a new mechanism, if adopted, will not be at the stage of producing tradable reduction units under a centralized scenario until several years after a new global climate agreement is decided in 2015. Factoring in that a new climate agreement will not enter into force until 2020, a gap in market-based mitigation activity is virtually inevitable for many parties. Therefore this study focuses not only on outlining the transition from the existing market mechanisms under the Kyoto Protocol to new ones, but also on *interim solutions* that

- ▶ bridge the gap between the Kyoto Protocol and the date when a reinstated, overarching successor agreement including all major parties enters into force,
- ▶ are based on the CDM to use existing structures and guarantee legal security for the post 2012 timeframe as far as possible,
- ▶ keep the trust and interest of players in the global carbon market,
- ▶ help prepare for new mechanisms and encourage host countries to implement them.

Especially the first two requirements narrow the range of possible options. From the possible solutions that meet the criteria best, we analysed the following CDM reform options currently being implemented or discussed, to determine their applicability as interim solutions:

- ▶ **CDM Programme of Activities**
- ▶ **Standardized Baselines**
- ▶ **CDM-Discounting**

Expert interviews indicate that this is justified: “it will take so long to set up sectoral crediting, NAMA crediting etc, in the meantime the reform of the CDM will play a proxy-role” (Interview 3).

To assess the effectiveness and viability of each option as an interim solution, we selected a set of specific criteria². We illustrate the impact of the criteria via a qualitative evaluation approach using a scale in the form of a “traffic light system,” with an overall result pertaining to both scenarios for a global climate policy future outlined above: Scenario A is the centralized future involving a treaty-like outcome and Scenario B is

a fragmented future in which countries or regions largely “go it alone” in terms of new market mechanisms. An overall ranking shows the aggregated suitability.

Assessment

1. CDM-PoAs

The approach of “Programme of Activities” (PoAs) under the CDM, accepted by the CDM EB in 2007, aims to expand the applicability of the CDM to small, highly replicable projects by reducing transaction costs.

So far the PoA approach has not worked as expected, due mainly to barriers at the regulatory level. Including CDM Programme Activities (CPAs) that do not fulfil CDM rules created a virtually unlimited liability for validators, and the application of multiple methodologies significantly complicated the coverage of heterogeneous sectors. As a result, only 37 PoAs have been registered thus far and no CERs have been issued to them yet. For the assessment below, we expect that the liability challenge is solved without significant transaction cost increases for stakeholders and that a simplified inclusion of multiple technologies and methodologies in one PoA is possible.

	Scenario A	Scenario B
Overall ranking		
Based on the evaluation of the key criteria, the overall ranking counts for the slightly reformed PoA: one for which the current liability and multiple technology challenges have been resolved. This mechanism would serve as an interim solution that is easy to “reform” and exists at least as long as the second commitment period of the Kyoto Protocol stays in place. It maintains investment and trust in the carbon market – but only if CER prices are sufficiently attractive, which they are currently not. PoAs can prepare for a sectoral approach only to a limited extent, but one interviewed expert highlighted their potential as a precursor to sectoral market-based mechanisms. There is no significant difference between the two scenarios.		

2. Standardized approaches

Stakeholders increasingly criticize lengthy, costly and subjective procedures for determining baseline emissions and the additionality of a CDM project. To facilitate project development, increase the credibility and reduce inconsistency of decisions on project registration, a standardization of baseline setting and additionality determination through benchmarking has been proposed.

Since the COP / MOP accepted in the Cancun agreement “that baseline and monitoring methodologies using standardized baselines can be developed”, the CDM can involve standardized baselines in the future. Private actors, public institutions and NGOs are already developing such approaches.

	Scenario A	Scenario B
Overall ranking		
Standardized baselines’ increased cost-effectiveness and reduced transaction costs could open doors for new mitigation activities - especially in sectors and regions currently void of CDM projects. This could lead to additional sustainable development benefits for poorer countries and might even deliver valuable data and baseline blueprints for the preparation of new mechanisms. Standardization is a prerequisite for sectoral market mechanisms. On the other hand, standardized baselines could endanger environmental effectiveness if set at loose levels, especially under the fragmented Scenario B. Even though interviewees highlighted the potential of standardized baselines to serve as a basis for new market mechanisms, they might also discourage countries from adopting new market mechanisms, as they may seem worth keeping as more than a mere interim solution.		

3. CDM Discounting

Discounting of the CERs generated by CDM projects would provide a net global GHG emission reduction, as only part of the reductions certified as having taken place by the CDM EB would generate offsets for Annex 1 countries. Discounting can be done in several ways, either by setting discount factors according to project types or according to host countries - and either directly at the point of supply, during the process of issuance, or on the demand side of the CDM. The main challenge is agreeing on discount criteria, as all parties have vested interests at stake.

	Scenario A	Scenario B
Overall ranking		
Of the three discussed interim solutions, CDM discounting involves the most political negotiation to change from the current system. Environmental effectiveness could be increased due to global net emission reductions. Furthermore, discounting may be unattractive enough to host countries that they are encouraged to move towards the new mechanisms - another major objective of an interim solution. On the other hand, decisions about what to discount are nearly impossible to negotiate at the international level, especially under Scenario A, such that the option itself is unlikely to exist. We thus evaluate CDM discounting as a slightly negative option under Scenario A, and see it being useful as an interim solution only if CDM host countries show support for it. Under Scenario B, however, the process of deciding which CERs to discount (and by how much) is a matter of uni- or bilateral negotiation and could thus proceed faster. The EU, for instance, could implement a discounting system for its ETS only.		

Conclusions

If a transition from the current status quo in market mechanisms (the CDM) to new market mechanisms takes place, it could happen in any number of different scenarios depending on the future of global climate negotiations. In order to explore these scenarios in a useful way, we took two extremes of the spectrum, a *centralized* scenario in which the new mechanisms are decided in a “top-down” fashion mainly at the UNFCCC level, and a *fragmented* “bottom-up” approach where the “rules” for sectoral program would be set by the participating entities rather than at the global level.

Having looked at elements of the transition to new market mechanisms in light of both these scenarios, we conclude that a fragmented scenario is more likely in the near term, as many countries are pursuing local (national or regional) emissions trading regimes that may involve offset credit trading on a bi- or multilateral basis, but not as decided/determined by UNFCCC consensus. We find that a more centralized scenario may be realistic from 2015 onwards, when parties are to decide an agreement for a global climate regime in 2020 and beyond. Depending on how far along the establishment of new market mechanisms has come in the fragmented world by then, there may be ample opportunities for linking or uniting diverse mechanisms at that point.

Hurdles to be overcome during this time of new market mechanism creation include *diplomatic* disparities among parties’ positions on new mechanisms, *design* questions about the “rules” of new mechanisms, *implementation* factors such as necessary new institutional frameworks and/or governing and monitoring bodies, and *market-related* issues concerning the above-mentioned lack of demand for credits.

Overcoming these hurdles should be considered especially with respect to the countries and sectors most suited for starting implementation of new market mechanisms. Our empirical analysis finds that, given the high relevance of political willingness for market-based solutions, this includes several Latin American, Small Island and European countries. The sectors whose current structure and data availability are best suited for new market mechanisms are aluminium and steel, with cement having good characteristics in some countries.

Meanwhile, interim solutions can bridge the gap in market-based mitigation activity between the current use of CDM and an eventual sectoral mechanism. Of the three options deemed most suitable in this regard (CDM PoAs, standardized baselines, and CDM discounting) we conclude PoAs are the best.

The success of any interim solution, however, depends on demand for CERs – policy-makers must ensure that there is a market for the credits PoAs generate, which in Europe means stringent reduction targets that create demand for offsets. This is true for credits from eventual new market mechanisms as well – as a whole, the industrialized world can contribute most to establishment of new market mechanisms by *ensuring there is demand* for the units of reduction they cause.

Since the scenario for new market mechanism implementation may be more fragmented in the near term, but potentially develop into a more centralized set of rules over the next 3-8 years, contributions toward the establishment of new market mechanisms from Germany and the EU should be ones that apply to both a centralized and fragmented future.

These include *continued engagement in bi- and multilateral cooperation* to support the establishment of new market mechanisms, particularly with the countries this report’s empirical analysis has shown to have high willingness to implement market-based mitigation approaches. To the extent that Germany and the EU are already engaged in such efforts, they should continue their involvement.

In particular, such engagement can include *facilitating creation of the institutional infrastructure* these countries need to be able to participate in new market mechanisms – the relevant agencies and institutions to run and oversee market-based mitigation programs.

This report has shown the urgent need for emissions data on which to base decisions about how to structure a new market mechanism (see design issues within the section “Enabling the transition”) but also the current lack of such data (see the note on data availability in the section “Feasibility”) within sectors that might be good candidates for new mechanisms. Thus Germany and the EU could contribute significantly to a transition to new market mechanisms by *offering financial and material support for data gathering* and emissions assessment at the sector level. A related contribution along these lines is to continue *creating venues for the exchange of technical expertise* around e.g. data gathering and analysis.

List of interviews

No.	Region	Type
1	Annex 1	Govt
2	Non-Annex 1	Institution
3	Annex 1	Govt
4	Annex 1	Institution
5	Annex 1	Expert/Institution
6	Annex 1	Expert/Institution
7	Non-Annex 1	Govt
8	Non-Annex 1	Govt
9	Annex 1	Expert/Institution
10	Non-Annex 1	Govt
11	Annex 1	Govt
12	Non-Annex 1	Institution
13	Non-Annex 1	Govt



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